



منظمة الطيران المدني الدولي

فريق الخبراء المعني بالبضائع الخطرة

الاجتماع السادس والعشرون

مونتريال، ٢٠١٧/١٠/١٦ إلى ٢٠١٧/١٠/٢٧

ملف التقرير

لم تنتظر لجنة الملاحة الجوية في المادة الواردة في هذا التقرير. وينبغي اعتبار الآراء المعرب عنها فيه بوصفها مشورة مقدمة من فريق من الخبراء تابع للجنة الملاحة الجوية، وأنها لا تمثل آراء المنظمة. ويعد أن تنتظر لجنة الملاحة الجوية في هذا التقرير، سوف تصدر إضافة له تتضمن الإجراءات التي اتخذتها لجنة الملاحة الجوية في هذا الشأن.


الاجتماع السادس والعشرون
فريق خبراء البضائع الخطرة (٢٠١٧)

كتاب إحالة

إلى: رئيس لجنة الملاحة الجوية

من: رئيسة فريق خبراء البضائع الخطرة (٢٠١٧)

أشرف بتقديم تقرير الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة
الذي عقد في مونتريال من ١٦ إلى ٢٧/١٠/٢٠١٧.



ميشلين باكيت

رئيسة فريق خبراء البضائع الخطرة

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* التوصيات التي ترد إلى جانبها عبارة "التوصيات بشأن القواعد القياسية والتوصيات والإجراءات" تخص اقتراحات بتعديل القواعد والتوصيات الدولية وإجراءات خدمات الملاحة الجوية والمواد الإرشادية الواردة في ملحق من الملاحق.

الاجتماع السادس والعشرون لفريق خبراء البضائع الخطرة

مونتريال، من ١٦ إلى ٢٧/١٠/٢٠١٧

الخلفية التاريخية للاجتماع

١- مدة الاجتماع

١-١ افتتح السيد هاجيمي يوشيمورا، رئيس لجنة الملاحه الجوية، الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة في مونتريال في الساعة العاشرة صباحاً، يوم ١٦/١٠/٢٠١٧. وكان من المقرر أن ينتهي الاجتماع في يوم ٢٧/١٠/٢٠١٧، إلا أن فريق الخبراء كان قادراً على إكمال عمله في ٢٥/١٠/٢٠١٧.

٢- الحضور

١-٢ حضر الاجتماع أعضاء ومراقبون رشحتهم ٢٢ دولة متعاقدة وخمس منظمات دولية، فضلا عن عدد من المستشارين وآخرين على النحو الوارد أدناه.

الأعضاء	المستشارون	جهة الترشيح
أ. توسك		أستراليا
ل. كاسكارو	س. دياز	البرازيل
م. باكيت	د. إيفانز أ. سلطان ا. ورسزكو	كندا
ج. جين	س. تشان ه. لي ز. تشيو ج. وان ك. يانغ	الصين
ب. تاتين	ت. دومينغو	فرنسا
ه. بروكهاوس	غ. كلوشن س. سوربيير	ألمانيا
ب. بريفيتيرا	س. كاروني	إيطاليا

الأعضاء	المستشارون	جهة الترشيح
هـ. سوقيموتو	ي. فوناي م. إيشي ك. ناكانو ك. تاكيدا أ. أوشيزاوا	اليابان
ت. مولر	ا. بون ر. داردن ك. فيرميرتس	هولندا
س. و. بارك	س. م. يو	جمهورية كوريا
د. كوردشينكو		الاتحاد الروسي
ل. جكيكي	ت. زمبي	أفريقيا الجنوبية
ر. لوباتو غالوتي	م. أ. دي كاسترو	إسبانيا
هـ. المهيري	ك. البلوشي ر. حميد ت. هوارد أ. وجيه	الإمارات العربية المتحدة
ا. غيلت	د. واردن	المملكة المتحدة
أ. ستيفيلد	م. غيفينز ر. هيل س. كيلي ك. ليري ج. ماكلفلين د. بفتد	الولايات المتحدة
د. برينان	ن. كارين ب. هورنر ب. أوبنهايمر	اتحاد النقل الجوي الدولي
ب. روهرياخ	د. فيرغسون	المجلس التنسيقي الدولي لاتحادات صناعات الطيران والفضاء
س. شوارتز		الاتحاد الدولي لرابطات طياري الخطوط الجوية

المستشارون	
المجلس الاستشاري المعني بالبضائع الخطرة	ن. ماكلوتش أ. ألتيموس ج. ليتش
منظمة الصحة العالمية	ك. كوجيما
المراقبون	
النمسا	م. بويهم ف. فينديثش
الدانمرك	ج. و. بنغتون
سويسرا	ن. هاغمان ر. كاتالدو
وكالة السلامة الجوية الأوروبية (EASA)	ل. كاليجا-بارسينا
رابطة شركات البريد السريع العالمية (GEA)	أ. ماكلوتش ر. ماكلياند
مجلس نقل بطاريات الأجهزة الطبية (MDBTC)	ك. أوشي
منظمة حلف شمال الأطلسي (الناتو)	أ. ريمي
رابطة المعنيين بالبطاريات القابلة لإعادة الشحن (PRBA)	ج. كيرشندر
مختبرات مكتبي التأمين (UL)	ج. جيفاراجان

٣- المسؤولين والأمانة

- ١-٣ انتُخبت السيدة ميشلين باكيت (كندا) رئيسة للاجتماع كما انتُخب السيد تون مولر (هولندا) نائباً للرئيس.
- ٢-٣ وتولت مهام أمانة الاجتماع الدكتورة كاثرين روني، رئيسة قسم سلامة البضائع، وساعدتها في ذلك السيدة هابا بالده والسيدة لين ماكغوين المسؤولتان الفنيّتان من القسم ذاته.

- ٤ جدول أعمال الاجتماع

- ١-٤ أقرت لجنة الملاحة الجوية في ٦/٧/٢٠١٧ جدول أعمال الاجتماع الوارد أدناه:
- البند ١ من جدول الأعمال: وضع مقترحات، إذا دعت الضرورة إلى ذلك، بإجراء تعديلات على الملحق الثامن عشر — النقل الآمن للبضائع الخطرة بطريق الجو
- البند ٢ من جدول الأعمال: إعداد توصيات لإجراء تعديلات على التعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (الوثيقة (Doc 9284)) لإدراجها في طبعة ٢٠١٩-٢٠٢٠
- البند ٣ من جدول الأعمال: إعداد توصيات لتعديل الإضافة إلى التعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (الوثيقة (Doc 9284 SU)) لإدراجها في طبعة ٢٠١٩-٢٠٢٠
- البند ٤ من جدول الأعمال: إعداد توصيات لتعديل وثيقة إرشادات التعامل مع حالات الطوارئ المرتبطة بحوادث الطائرات الناتجة عن البضائع الخطرة (Doc 9481) لإدراجها في طبعة ٢٠١٩-٢٠٢٠
- البند ٥ من جدول الأعمال: تنسيق المادة الإرشادية لفريق خبراء البضائع الخطرة للمعاونة في إعداد التعليمات الفنية ودعم الوثائق بأحكام منقحة للبضائع الخطرة
- البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدتها لجنة الملاحة الجوية أو فريق الخبراء:
- ١-٦: التنسيق بين أمن الطيران والبضائع الخطرة (بطاقة الوظيفة (DGP.001.01))
- ٢-٦: نظام الإبلاغ عن حوادث ووقائع البضائع الخطرة (بطاقة الوظيفة (DGP.002.01))
- ٣-٦: تخفيف المخاطر التي يشكلها نقل بطاريات الليثيوم عن طريق الجو (بطاقة الوظيفة (DGP.003.01))
- ٤-٦: نطاق الملحق الثامن عشر (بطاقة الوظيفة (DGP.004.01))
- ٥-٦: إيضاح مسؤوليات الدولة عن المراقبة في الملحق الثامن عشر (بطاقة الوظيفة (DGP.005.01))
- البند ٧ من جدول الأعمال: الأعمال الأخرى

- ٥ ترتيبات العمل

- ١-٥ عقد فريق الخبراء اجتماعه في شكل هيئة واحدة، وشكل أفرقة خاصة للصياغة حسب الحاجة. وأجريت المناقشات في الاجتماع الرئيسي باللغات العربية والصينية والإنجليزية والفرنسية والروسية والإسبانية. وقُدمت بعض ورقات العمل باللغة الإنجليزية فقط. وصدر التقرير باللغات العربية (السرد فقط) والصينية والإنجليزية والفرنسية والروسية والإسبانية.

٦- الملاحظات الافتتاحية من جانب رئيس لجنة الملاحة الجوية

١-٦ رحب الرئيس بأعضاء ومستشاري ومراقبي فريق خبراء البضائع الخطرة في مونتريال وفي الإيكاو نيابة عن لجنة الملاحة الجوية. وأعرب عن أمله في أن يهبط هذا الاجتماع لأسبوعين بيئة مواتية لتطوير علاقات طيبة من شأنها أن تساعد على تعزيز المناقشات لبعض المسائل الهامة.

٢-٦ وقد لاحظ عدة تغييرات في العضوية منذ الاجتماع الخامس والعشرين. وترك فريق الخبراء السيد فيركينز والسيد كرارا والسيدة شو والسيد روس والسيد ميركو والسيد ماكلاكلان والسيد روجرز. وحلّ محلهم السيد توسيك الذي عينته أستراليا والسيد كاسكارو الذي عينته البرازيل والسيد جين جونهاو الذي عينته الصين والسيدة لوباتو جاليوتي التي عينتها إسبانيا والسيد كورد تشينكو الذي عينته الاتحاد الروسي والسيد جيليت الذي عينته المملكة المتحدة والسيد شفارتز الذي عينته الاتحاد الدولي لرابطات طياري الخطوط الجوية. فضلاً عن ذلك، وافقت اللجنة على تعيين السيد جيكوي، وهو عضو جديد من جنوب أفريقيا. ونتج عن هذه التغييرات أن فريق الخبراء يتألف من تسعة عشر عضواً عينتهم ست عشرة دولة وثلاث منظمات دولية. ونيابة عن فريق الخبراء، أعرب الرئيس عن التقدير للمساهمات التي قدمها الأعضاء المغادرون وقدم ترحيباً حاراً بالأعضاء الجدد.

٣-٦ أحاط الرئيس فريق الخبراء علماً بتوصيات لجنة الملاحة الجوية وقرارات المجلس منذ الاجتماع الخامس والعشرين لفريق خبراء البضائع الخطرة. وقد نظرت اللجنة في تقرير الاجتماع المذكور وأوصت المجلس بقبول جميع توصيات فريق الخبراء. وكان المجلس قد وافق على التعديلات من ٢٠١٧ إلى ٢٠١٨ للتعليمات الفنية وإضافتها وإرشادات الطوارئ لمعالجة الأحداث الناتجة عن البضائع الخطرة على متن الطائرات، وجميعها أصبحت قابلة للتطبيق في ١ يناير ٢٠١٧. ووافق المجلس أيضاً على التعديلات التي اقترحها الاجتماع الخامس والعشرون لإدراجها في طبعة ٢٠١٥-٢٠١٦ من التعليمات الفنية. وهذه هي حظر على نقل كاتيتشولبورين جواً وقيود إضافية على نقل بطاريات الليثيوم، التي أدرجت في الضميمة رقم ٣ لطبعة ٢٠١٥-٢٠١٦.

٤-٦ لاحظ الرئيس أن التعديلات المقترحة لأحكام بطارية الليثيوم أثارت كثيراً من النقاش داخل اللجنة والمجلس اختتم في النهاية بقرار المجلس منع نقلها كبضاعة على طائرات الركاب عن طريق الضميمة رقم ٤ لطبعة ٢٠١٥-٢٠١٦ من التعليمات الفنية. وقد أوصت اللجنة المجلس بهذا الحظر كإجراء مؤقت إلى حين وجود ضوابط للتخفيف بقدر كاف من المخاطر. وشملت هذه:

(أ) أحكاماً ومواد إرشادية داعمة للمشغلين لإجراء عمليات تقييم الخطر على السلامة عند نقل البضائع الخطرة جواً،

(ب) ومعايير تغليف قائم على الأداء لبطاريات الليثيوم.

تمّ تكليف فريق خبراء عمليات الطيران بمهمة وضع أحكام تقييم الخطر على السلامة بالتنسيق مع فريق خبراء البضائع الخطرة وفريق خبراء الصلاحية للطيران ولجنة تغليف بطاريات الليثيوم الدولية لجمعية مهندسي المحركات التي أنشئت لتطوير القواعد القياسية القائمة على الأداء. وسيتم تزويد الاجتماع ٢٦ لفريق خبراء البضائع الخطرة بتحديثات خلال الاجتماع بما في ذلك جلسة إحاطة بشأن وضع جمعية مهندسي المحركات سيحضرها أعضاء في لجنة الملاحة الجوية. ولاحظ الرئيس أن كلاً من اللجنة والمجلس شدد على الحاجة إلى آلية لإنشاء مزيد من الحبيبية فيما يتعلق بتصنيف أنواع البطاريات المختلفة من أجل نقل الأخطار المتنوعة التي تشكلها وتخفيفها على النحو الملائم. وتم تشجيعه بأن فريق عمل غير رسمي تم إنشاؤه بواسطة لجنة الخبراء الفرعية للأمم المتحدة المعنية بنقل البضائع الخطرة للنظر في مثل هذا النظام القائم على الخطر.

٥-٦ أعربت اللجنة عن تقديرها لأن فريق العمل التابع لفريق الخبراء تفاعل بسرعة لاعتماد تدابير تهدف لمعالجة مخاطر السلامة المحتملة التي تم دون قصد إدخالها من خلال تدابير أمنية تم تنفيذها في دول معينة على طرق معينة في مارس ٢٠١٧. وأيدت اللجنة توصية فريق العمل بإدخال تدابير سلامة إضافية عند حمل أجهزة إلكترونية نقالة في أمتعة مسجلة للتخفيف من هذه المخاطر. وأدرجت هذه التدابير في الضميمة رقم ٢ إلى طبعة ٢٠١٧-٢٠١٨ للتعليمات الفنية. ولاحظ أنه منذ ذلك الوقت أنشئت مجموعة لسلامة الشحن متعددة الاختصاصات ومؤقتة للمزيد من تقييم الخطر بالتنسيق مع القوة المعنية بالأجهزة المتفجرة الارتجالية والتابعة لفريق خبراء أمن الطيران. ووضعت مجموعة سلامة الشحن عدة توصيات تم توجيه بعضها إلى فريق خبراء البضائع الخطرة. ولم يرق المجلس بعد باستعراض التقرير الذي احتوى على هذه التوصيات، لكن توخياً للكفاءة أوصت لجنة الملاحة الجوية بأن ينظر فريق الخبراء في بعضها خلال الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة.

٦-٦ لاحظ الرئيس أن اللجنة كانت تستكشف سبلاً لتحقيق نهج متعدد التخصصات شامل لسلامة البضائع وآلية لضمان التنسيق السليم بين فرق الخبراء ذات الصلة. وقدم إلى فريق الخبراء نظرة عامة إلى التوجيهات الخاصة بأفرقة الخبراء التابعة للجنة الملاحة الجوية (الوثيقة Doc 7984) وموقع شبكة لجنة الملاحة الجوية لجميع فرق الخبراء. وشجّع أعضاء فريق الخبراء على قراءة الوثيقة Doc 7984 بغية تعويد أنفسهم على أهداف فرق خبراء لجنة الملاحة الجوية ومنهجياتها وأدوار ومسؤوليات كل عضو. وقدم الموقع على الشبكة مورداً مركزياً لجميع فرق خبراء لجنة الملاحة الجوية بما في ذلك قوائم العضوية وتقارير فرق الخبراء وبطاقات الوظائف واختصاصات كل فريق خبراء لجنة الملاحة الجوية. وشجّع أعضاء فرق الخبراء على استخدام هذا الموقع كمورد لفهم عمل فرق الخبراء الأخرى ولتسهيل التنسيق معها.

٧-٦ أعرب الرئيس عن القلق لعدم قدرة فريق الخبراء على التوصل إلى توافق آراء بشأن قرارات هامة وشدد على الأهمية التي أولتها لجنة الملاحة الجوية للعمل في سبيل التوصل إلى حلول يمكن أن يوافق عليها جميع أعضاء فريق الخبراء. وقرارات تتطلب دعم أغلبية واضحة من الأعضاء. وإذا كان توافق الآراء غير ممكن، فإن القرار يحتاج لعكسه بوضوح في تقرير الاجتماع إلى جانب آراء الأقلية وحججها. ولاحظ عرض فرق خبراء لجنة الملاحة الجوية، الذي يتمثل في التقدم، ضمن أطر زمنية محددة، في حل مشكلات متخصصة أو وضع معايير للتطور المخطط للملاحة الجوية. وشدد على أنه على الرغم من أن كل عضو تم تعيينه بواسطة حكومتهم أو منظماتهم، فهو كان بواسطة لجنة الملاحة الجوية بوصفه خبيراً في مجال البضاعة الخطرة. وهم كانوا هناك قدرة شخصية تمثل آراءهم المهنية الخاصة، التي قد لا تكون بالضرورة آراء إدارتهم أو منظماتهم.

٨-٦ أكد الرئيس أنه هو وأعضاء اللجنة وأعضاء الأمانة موجودون لإسداء المشورة أو المساعدة وتطلّع إلى استخلاص معلومات غير رسمي لمناقشة إنجازات فريق الخبراء في نهاية الاجتماع.

٩-٦ أعلن الرئيس افتتاح الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة، وتمنى للفريق التوفيق والنجاح في عمله وطيب الإقامة في مونتريال.

البند ١: وضع مقترحات، إذا دعت الضرورة لذلك، بإجراء تعديلات على الملحق الثامن عشر — النقل الآمن للبضائع الخطرة بطريق الجو

١-١ مشروع تعديلات على الملحق الثامن عشر (DGP/26-WP/10)

١-١-١ التدريب

١-١-١-١ وضع فريق الخبراء تعديلات جوهرية للتعريف في الفصل الأول ولأحكام التدريب في الفصل العاشر ولأحكام التوافق في الفصل الحادي عشر بمقتضى البند ٦ من جدول الأعمال (انظر الفقرة ٦-٤-١ من التقرير في إطار البند ٦ من جدول الأعمال).

٢-١-١ التصنيف

١-٢-١-١ استنتجت لجنة الأمم المتحدة للخبراء بشأن نقل البضائع الخطرة وبشأن النظام المنسق عالمياً للتصنيف ووضع البطاقات على المواد الكيميائية، في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩)، أن كلمتا "risk" (خطر) و "hazard" (مفرد المخاطر) استخدمت كل منهما بدل الأخرى وليس دائماً بشكل صحيح في جميع توصيات الأمم المتحدة بشأن نقل البضائع الخطرة - اللائحة النموذجية (المشار إليها فيما بعد في هذا التقرير، توجيهاً للإيجاز، بوصفها "لائحة الأمم المتحدة النموذجية"). أدرجت تعديلات في الطبعة العشرين المنقحة من لائحة الأمم المتحدة النموذجية لتصويب هذا. ويوصى بتعديلات مناظرة للتعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (الوثيقة Doc 9284) بمقتضى البند ٢ من جدول أعمال هذا التقرير. وإدخال تعديل تبعية لأحكام التصنيف الواردة في الفصل الثالث من الملحق الثامن عشر ضروري ولذلك فهو مقترح.

٣-١-١ العزل للمواد السامة والمعدية

١-٣-١-١ تمّت في الاجتماع الخامس والعشرين لفريق الخبراء المعني بالبضائع الخطرة (مونتريال، ١٩ إلى ٣٠/١٠/٢٠١٥) الموافقة على تعديل يزيل شروط العزل للمواد السامة والمعدية من الفصل الثامن (انظر الفقرة ١-١ من التقرير DGP/25). كان النص متكرراً، نظراً لأنه أشار إلى شروط العزل التفصيلية التي لم تعد تظهر في التعليمات الفنية. لأن التعديل كان طفيفاً ولا يتعلق بأمر السلامة، فقد تم الاتفاق على الانتظار حتى التوصية بالمزيد من التعديلات الموضوعية المقترح إدخالها على الملحق ١٨، قبل وضع المقترح أمام لجنة الملاحة الجوية لاستعراضه بشكل أولي ثم إرساله إلى الدول لتلقي تعليقاتها عليه. وهذا ما اتفق عليه. وتم الاتفاق على أنه ينبغي تقديم التعديل إلى لجنة الملاحة الجوية لإجراء استعراض أولي مع أحكام التصنيف للفصل الثالث والتعديلات الموضوعية المقترحة للفصول الأول والعاشر والحادي عشر بمقتضى البند ٦ من جدول الأعمال (انظر الفقرة ٦-٤ من التقرير بموجب البند ٦ من جدول الأعمال).

٢-١ التوصية

١-٢-١ في ضوء المناقشات الآتفة الذكر، صدر عن الاجتماع التوصية التالية:

التوصية ١/١ - تعديل أحكام التصنيف والعزل للمواد السامة والمعدية الواردة في الملحق ١٨	القواعد والتوصيات الدولية
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يتعين طلب الحصول على تعليقات من الدول بشأن التعديل المقترح إدخاله على الملحق ١٨ فيما يتعلق بشروط التصنيف والعزل للمواد السامة والمعدية على النحو الوارد في المرفق بالتقرير عن هذا البند من جدول الأعمال.

٢-٢-١ تم بمقتضى البند ٦ من جدول الأعمال (انظر الفقرة ٦-٤-٢ والتوصية ٣/٦ من التقرير بمقتضى البند ٦ من جدول الأعمال) وضع توصية بالسعي للحصول على تعليقات من الدول بشأن تعديل مقترح للملحق الثامن عشر يتعلق بالتدريب والامتنال. وهي معروضة في المرفق بالتقرير بشأن هذا البند من جدول الأعمال لغرض الحفاظ على جميع التعديلات للملحق الثامن عشر في مكان واحد.

المرفق

التعديل المقترح إدخاله على الملحق ١٨

الفصل الأول - التعاريف

انظر الفقرة ٦-٤-١ من التقرير تحت البند ٦ من جدول الأعمال:

...

عضو طاقم القيادة — عضو في طاقم طائرة يحمل إجازة ويكلف بواجبات ضرورية لتشغيل الطائرة خلال مدة مأمورية الرحلة.

ناقل البضائع — شخص أو منظمة تعرض خدمة تدبير نقل البضائع جواً.

...

انظر الفقرة ١-١-١ من التقرير تحت البند ١ من جدول الأعمال:

الفصل الثالث - التصنيف

يتم تصنيف السلعة أو المادة وفقاً لأحكام التعليمات الفنية .

ملاحظة — تتضمن التعليمات الفنية تعاريف مفصلة لأصناف البضائع الخطرة. وهذه الأصناف تدل على المخاطر المحتملة المرتبطة بنقل البضائع الخطرة بطريق الجو، وهي الأصناف التي أوصت بها لجنة خبراء الأمم المتحدة المعنية بنقل البضائع الخطرة.

...

انظر الفقرة ٢-١-١ من التقرير تحت البند ١ من جدول الأعمال:

الفصل الثامن - مسؤوليات المشغل

...

٧-٨ الفصل والعزل

٧-٨-١ الطرود التي تحتوي على بضائع خطيرة قد يحدث بينها تفاعل خطر يجب عدم وضعها على الطائرة متلاصقة أو في وضع يسمح بتفاعل بينها في حالة حدوث تسرب.

٧-٨-٢ يجب ترتيب طرود المواد المشعة على متن الطائرة بحيث تكون مفصولة عن الأشخاص والحيوانات الحية والأفلام غير المحمضة، وفقاً لأحكام التعليمات الفنية.

٨-٧-٣ يجب ترتيب طرود المواد المشعة على متن الطائرة بحيث تكون مفصولة عن الأشخاص والحيوانات الحية والأفلام غير المحمّضة، وفقاً لأحكام التعليمات الفنية.

...

انظر الفقرة ٦-٤-١ من التقرير تحت البند ٦ من جدول الأعمال:

الفصل العاشر — البرامج التدريبية

١-١٠ وضع البرامج التدريبية

١-١-١٠ يجب وضع وصيانة برامج تدريبية أولية ومتكررة بشأن البضائع الخطرة وفقاً لوثيقة التعليمات الفنية بواسطة أو بالنيابة

عن:

(أ) شاحني البضائع الخطرة، بمن في ذلك المعبّون والأشخاص أو المنظمات التي تنهض بمسؤوليات الشاحن؛

(ب) المشغلين؛

(ج) وكالات الخدمات الأرضية التي تؤدي، نيابة عن المشغل، فعل قبول أو مناولة أو شحن أو تفريغ أو تحويل أو معالجة أخرى للبضائع أو البريد؛

(د) وكالات الخدمات الأرضية القائمة على مطار يؤدي، نيابة عن المشغل، فعل التعامل مع الركاب؛

(هـ) الوكالات، غير القائمة على مطار، التي تؤدي، نيابة عن المشغل، فعل تسجيل الركاب؛

(و) متعهدي الشحن؛

(ز) الوكالات العاملة في الكشف الأمني على الركاب والطاقت وأمتعتهم و/أو على البضائع أو البريد؛

(ح) وهيئات البريد المعتمدة.

١٠-١-٢ من أجل منع الدخول في النقل الجوي للبضائع الخطرة كسحنة أو بريد لم يتم إعداده وفقاً للقواعد والتوصيات الدولية

لهذا الملحق والأحكام التفصيلية للتعليمات الفنية، يجب وضع وصيانة برامج تدريب أولية ومتكررة على البضائع الخطرة بواسطة أو بالنيابة عن الكيانات بخلاف (أ) أو (د) أو (هـ) أعلاه التي لا تعالج أو تتناول أو تقبل بضائع خطرة.

...

انظر الفقرة ٦-٤-١ من التقرير تحت البند ٦ من جدول الأعمال:

الفصل الحادي عشر — التوافق مع الأنظمة

...

١١-٥ البضائع الخطرة غير المعلنة

١١-٥-١ يجب أن تتفقد الدول تدابير بهدف:

(أ) منع عرض البضائع الخطرة غير المعلنة من أجل النقل؛

(ب) ومنع الركاب والطاقم من أخذ بضائع خطرة غير مسموح لهم بحملها على متن طائرة؛

٢-٥-١١ يجب على الدول أن تضمن أن المشغلين يضعون إجراءات بهدف ما يلي:

(أ) منع تحميل بضائع خطرة غير معلنة على طائرة؛

(ب) ومنع الركاب والطاقم من أخذ بضائع خطرة غير مسموح لهم بحملها.

البند ٢ من جدول الأعمال: إعداد توصيات لإجراء تعديلات على التعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (الوثيقة (Doc 9284) لإدراجها في طبعة ٢٠١٩-٢٠٢٠)

١-٢ التعديلات على الجزء ١ من التعليمات الفنية:

أحكام عامة

١-١-٢ مسودة التعديلات على التعليمات الفنية بغرض مواعمتها مع توصيات الأمم المتحدة — الجزء ١ (DGP/26-WP/11)

١-١-١-٢ استعرض الاجتماع التعديلات على الجزء ١ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة خبراء الأمم المتحدة المعنية بنقل البضائع الخطرة وبالنظام العالمي المنسق لتصنيف المواد الكيميائية ووسمها (ويشار إليها لاحقاً في التقرير، توخياً للإيجاز، باسم "لجنة الخبراء التابعة للأمم المتحدة" في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعه (DGP-WG/16)، مونتريال من ١٠/١٧ إلى ٢١/١٠/٢٠١٦) وفي اجتماعه (DGP-WG/17)، مونتريال من ٤/٢٤ إلى ٢٨/٤/٢٠١٧).

٢-١-١-٢ تمت الموافقة على التعديلات، بشرط الاستعاضة عن "علامات" بـ "علامة" في المذكرة ٢ من الفصل الخامس للتوحيد مع تصويبات الطبعة العشرين المنقحة من اللوائح النموذجية للأمم المتحدة التي يحتوي عليها تقرير لجنة الخبراء الفرعية المعنية بنقل البضائع الخطرة (المشار إليها فيما بعد في التقرير، توخياً للإيجاز، باسم "لجنة الأمم المتحدة الفرعية") في دورتها الحادية والخمسين (جنيف، ٣ إلى ٧/٧/٢٠١٧).

٢-١-٢ تعريف سجل التدريب (DGP/26-WP/26)

١-٢-١-٢ تم اقتراح تعريف جديد لسجل التدريب لإدراجه في الجزء ٣٤١. واقترح أنه كان هناك استنتاج في أحكام التدريب أن سجل التدريب يصف ما إذا كان أم لم يكن الموظف مدرباً وفقاً للتعليمات الفنية وأن الموظف لن يكون عندئذ خاضعاً لتدريب أولي إذا غير مخدميه. وعلى الرغم من أن المقصود بها أنها مواد إرشادية، فإن الجداول في الجزء ٤٤١ (الجدولين ٤-١ و ٥-١) الذي حدّد الموضوع في التعليمات الفنية أن فئات مختلفة من الموظفين ينبغي أن تكون معتادة على أنها استخدمت في بعض الدول كأداة لوصف ما إذا كان موظف قد تم تدريبه بقدر كاف. وهناك قلق من أن أحكام التدريب الجديدة المقترحة (انظر الفقرة ٤-١-٢)، التي ركّزت على الكفاءات بدلاً عن الموضوع، لن تسمح بهذا. أما التعريف الجديد فقد عرّف سجلاً تدريبياً بوصفه وثيقة تؤكد التأهيل. وكان القصد هو سجل تدريب معرّف على هذا النحو يمكن تقديمه إلى أرباب عمل جدد للتحقق من صحة أن الموظفين الجدد تم تدريبهم بقدر كاف.

٢-٢-١-٢ حُظي الاقتراح بدعم قليل. وتضارب التعريف المقترح مع الجزء ٥-٢-٤٤١ الذي تضمّن قائمة بعناصر عديدة مطلوب إدراجها مع سجل تدريب. واقترح أيضاً أن رب العمل لا يمكن أن يصادق على أن مستخدماً جديداً قد تم تدريبه بقدر كاف لأداء وظائف يُكلّف بها بالاستناد فقط إلى وثيقة من مخدّم سابق. وسيعتمد التصديق على الخلفية التشغيلية الخاصة للمشغل. وفي حين أن نهجاً مستنداً للكفاءة للتدريب والتقييم جعل هذا المفهوم واضحاً، لم يكن أحد المتطلبات الجديدة في الأحكام الجديدة. ولوحظ أيضاً أن سجلات التدريب كان مرجعها الجزء ٦ من التعليمات الفنية فيما يتعلق بتدريب المفتشين المكلفين بالتفتيش الدوري وإصدار شهادات الاسطوانات وأوعية التجميد المغلقة وأن تعريفاً قد يتضارب مع مقصد تلك الأحكام.

٣-٢-١-٢ لم تتم الموافقة على التعديل المقترح.

٣-١-٢ البضائع الخطرة التي ينقلها مشغلو الطائرات لأغراض الاستبدال (DGP/26-WP/31)

١-٣-١-٢-٢ طلب من اجتماعي الفريق العامل التابع لفريق خبراء البضائع الخطرة السادس عشر والسابع عشر النظر في حذف "ما لم ترخص بخلاف ذلك دولة المشغل" التي سبقت كلاً من الأحكام التي تتطلب مواد أو موضوعات يُقصد بها أن تكون بدائل لتلك الخاضعة للاستثناءات بالنسبة للبضائع الخطرة للمشغل التي يتعين نقلها وفقاً للتعليمات الفنية (الجزء ٢٤١-٢-٢ و ٣-٢-٢ و ٤-٢-٢). واحتج بأن عدم وجود أي إشارة إلى موافقة أو إعفاء كانت تعني أن الدول الأخرى المعنية في نقل مثل هذه البضائع لن تكون لها كلمة في كيفية شحن المشغل للبضائع وأنه لا يوجد اقتضاء لمستوى مماثل من السلامة. واقترح أن هذا يوفر قدرًا كبيراً من المرونة ويمكن أن يؤدي إلى انعدام التوافق الدولي وإدخال مخاطر إذا قررت دولة المشغل السماح باستثناءات عند نقل البضائع الخطرة كبداية. وفي حين أن البعض في الاجتماع السادس عشر والاجتماع السابع عشر للفريق العامل التابع لفريق خبراء البضائع الخطرة لم يرى مشكلة، ووافق آخرون على أن ثمة حاجة لإيضاح. ورأى البعض أن الإشارة إلى موافقة عوضاً عن "مرخص" قد تكون أكثر ملاءمة، نظراً لأن هذا قد يوضح أن الأحكام لموافقة في الجزء ١٤١-٢-١ كانت تنطبق وأن المستوى الإجمالي للسلامة في النقل مساوٍ للمستوى الموفر في التعليمات الفنية قد تم تحقيقه. ورأى آخرون أن إزالة الجملة ستكون ملائمة أكثر، نظراً لأن هذا سيجعل منح إعفاء من جميع الدول المعنية لازماً. وعقب الاجتماع السابع عشر للفريق العامل التابع لفريق خبراء البضائع الخطرة، طلبت لجنة الملاحة الجوية من فريق خبراء البضائع الخطرة النظر في إيضاح فيما يتعلق بالاستثناءات للبضائع الخطرة للمشغل في الجزء ٢٤١-٢-٢ (أنظر الفقرة ٦-٣-٦ من البند ٦ من جدول أعمال هذا التقرير).

٢-٣-١-٢-٢ اقترح تعديل جديد على الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة في محاولة لمعالجة المسائل التي أثرت في اجتماعات فريق العمل فيما يتعلق بدرجة المرونة التي تتاح لدولة المشغل في السماح باستثناءات مع مراعاة مشاغل لجنة الملاحة الجوية. التعديل:

(أ) أدمج البنود في الجزء ٢٤١-٢-١ المتعلقة بالأجهزة الإلكترونية في فقرة وحيدة وفصل الأحكام المتعلقة بالبطاريات الاحتياطية إلى فقرتين فرعيتين جديدتين؛

(ب) تطلب موافقة الدول المعنية على السماح بالاستثناءات بالنسبة للبضائع الخطرة المطلوب وجودها على متن أي طائرة وفقاً لمتطلبات الصلاحية للطيران ولأجهزة المزودة ببطاريات المنقولة كبداية؛

(ج) والموافقة المطلوبة بواسطة دولة المشغل للسماح باستثناءات من المواد الواردة بالقائمة في ٢٤١-٢-١ (ب و ج).

٣-٣-١-٢-٢ بينما كان ثمة تعاطف لدواعي القلق المثارة، كان ثمة دعم ضئيل لتعديل التعليمات الفنية. فقد كانت الأحكام قديمة العهد، ولم توجد أي علامات لسوء الاستعمال أو الآثار المضادة على السلامة. ولوحظ أن استخدام الاصطلاح "ترخيص" بدلاً من "موافقة" كان متعمداً. فهو أتاح للمشغل، بترخيص الدولة، تحديد أساليب التخفيف من المخاطر التي يشكلها نقل شركته لمواد قد تكون بشكل لا يمكن تفاديه مختلفة عما قد يكون مطلوباً بواسطة التعليمات الفنية. غير أنه لم يمكن مقصوداً، لإعفاء المشغل عن أي مسؤولية عن الإبقاء على مستوى مماثل من السلامة. وكان ثمة قلق لأن التعديل كان يمكن أن يكون له أثر ضار على العمليات الجارية التي لم تُعتبر غير مأمونة. واقترح أن نهجاً أفضل سيكون وضع مواد إرشادية لإيضاح القصد من الأحكام. والحاجة إلى الاتساق فيما يتعلق بقصد الترخيص مقابل الموافقة كان قد أُثير أيضاً، مع ملاحظة أن الألفاظ قد استُخدمت في الملحق السادس. وكانت ثمة شواغل أُثيرت بأن الافتقار إلى إرشاد أو معايير في الحد الأدنى

لتحديد متى يتم إعطاء ترخيص ترك مجالاً واسعاً للغاية للمشغل. وأفادت الأمانة بأن فريق خبراء عمليات الطيران قد توصل إلى أن وثائق الإيكاو لم تحدد معايير السلامة الأساسية لتحديد متى سيكون ترخيص أو موافقة أو قبول مطلوباً وأن لجنة الملاحة الجوية كلّفت فريق الخبراء ذلك بتعريف وإيضاح استخدامها (ANC Job card OPSP.018.03). وسيطرح الأمين المسائل التي أثيرت خلال المناقشة على اهتمام فريق خبراء عمليات الطيران. وأبدى المقترح تقديره للتعليقات التي أثيرت وسيستخدمها لإعادة النظر في كيفية معالجة المسألة.

٤-١-٢ التعديلات على الأحكام المتعلقة بالتدريب التي أعدتها مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة (DGP/26-WP/39) والمادة الإرشادية للتدريب في مجال البضائع الخطرة التي أعدتها مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة (DGP/26-WP/40)

١-٤-١-٢ أحكام التدريب المنقحة التي دعمت نهجاً على أساس الكفاءة للتدريب والتقييم قد أُدرجت في المرفق ٤ بطبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية لغرض الاستعراض والمعلومات المرتدة إلى الإيكاو بواسطة الدول والمنظمات الدولية والصناعة. وقد تم تقديم المعلومات المرتدة استجابة لكتاب المنظمة AN11/2.1-16/91 ولدراسة استقصائية تم تقديمها بشأن الشبكة العامة للإيكاو. وقُدّم ملخص للمعلومات المرتدة إلى فريق خبراء البضائع الخطرة - فريق العمل/١٧ (انظر الفقرة ٣-٢-١-٦ من التقرير DGP-WG/17 الوارد في DGP/26-WG/3). واجتمع الفريق العامل التابع لفريق خبراء البضائع الخطرة والمعني بالتدريب (DGP-WG/Training) قبل DGP-WG/17 في أوتاوا (١٨ و ٢٠١٧/٤/١٩) لمعالجة المعلومات المرتدة المستلمة وفي واشنطن العاصمة من ١٧ إلى ٢٠١٧/٧/٢١ لإحراز تقدم في العمل المتبقي الذي تم تحديده في DGP-WG/17. وقد نتج هذا عن إعادات نظر في الأحكام التي يحتوي عليها المرفق ٤ بطبعة ٢٠١٧-٢٠١٨ على النحو المبين أدناه.

الأحكام التدريبية المقترحة لتحل محل الأحكام في الجزء ٤:١ من طبعة ٢٠١٧-٢٠١٨

٢-٤-١-٢ قُدّم رئيس مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة موجزاً إلى فريق الخبراء بشأن إعادات النظر المقترحة للأحكام الإلزامية التي يحتوي عليها المرفق ٤ للفصل الأول التي أعدتها مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة/التدريب أوصت بأن تحل هذه الأحكام محل الأحكام الواردة في الجزء ٤:١ من طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية. واقتُرحت أحكام للفترة الانتقالية عن طريق مذكرة في بداية الجزء ٤:١، بإتاحة المتطلبات التدريبية التي يحتوي عليها الجزء ٤:١ من طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية لكي تُستخدم حتى ٢٠٢٠/١٢/٣١. وأيد فريق الخبراء هذا، على الرغم من أن الجميع لم يرى أنها ضرورية. واقتُرِح أن تُدرج أحكام الباب ٤:١ من طبعة ٢٠١٧-٢٠١٨ في المرفق ٤ بطبعة ٢٠١٩-٢٠٢٠ لسهولة الاستخدام. وحُظي هذا أيضاً بالدعم من فريق الخبراء.

٣-٤-١-٢ كان رئيس اللجنة الفرعية للأمم المتحدة حاضراً وسجّل أن الأمين قدم معلومات موجزة إلى تلك الهيئة بشأن الأحكام التدريبية الجديدة المقترحة. وكانت اللجنة الفرعية مؤيدة، علماً بأنهم حسّنوا ما تم تقديمه بالفعل من أجل الأنظمة النموذجية للأمم المتحدة. وكان هذا هاماً بسبب الطبيعة المتعددة الطرائق لنقل البضائع الخطرة. ولاحظت اللجنة الفرعية أن المتطلبات عالية المستوى لوعي عام ووظيفة محددة وتدريب على السلامة في اللائحة النموذجية للأمم المتحدة قد تمت إزالتها وطلبت الحفاظ عليها. واقتُرِح أن خبرة طريقة الطيران ستشجّع الطرائق الأخرى لتحسين التدريب بنفس الطريقة، والحفاظ على هذا الإطار سيسهّل التكامل. ووافق فريق الخبراء على الحفاظ على المتطلبات عالية المستوى من أجل تدريب يتسم بالوعي العام والوظيفة المخصصة والسلامة الذي يحتوي عليه الجزء ٤:١-٢-١ من طبعة ٢٠١٧-٢٠١٨.

٤-٤-١-٢ ظلت هناك جوانب قلق من أن إزالة الجداول في الجزء ٤:١ (الجداول ٤-١ و ٥-١) التي حدّدت الموضوع في التعليمات الفنية التي من أجلها ينبغي أن تكون شتى فئات العاملين معتمدة ستثير مشكلات في الدول التي تستخدم هذه

الجدول كأداة لتوصيف التدريب. وبينما يُدعم النهج القائم على الكفاءة، توجد رغبة لدى البعض في الحفاظ على ما يسمونه نهج "التأهيل" الذي توفّره الجداول. وجرى إعداد مواد إرشادية إضافية لمعالجة هذه الشواغل (انظر الفقرة ٢-٤-١-٨ تحت هذا البند من التقرير).

٢-٤-١-٥ الفريق العامل التابع لفريق خبراء البضائع الخطرة للتدريب لا يستطيع الوصول لتوافق آراء بشأن ما إذا كان ينبغي تكليفه بالتدريب الخاص بالبضائع الخطرة للعاملين الذين توظفهم كيانات لا تتعامل مع البضائع الخطرة. وتم الجدال بشأن هذه المسألة طوال اجتماعات عديدة ونوقشت بتفصيل أكبر ضمن إطار البند ٦-٤ من جدول الأعمال — نطاق الملحق ١٨ (انظر الفقرة ٦-٤-١ تحت البند ٦ من جدول أعمال هذا التقرير). اعتبر بعض الأعضاء التدريب أحد المتطلبات التي ظلت سارية لعدة سنوات طوال تطبيق الجدولين ٤-١ و ٥-١ وأحكام الجزء ٤١-١-١. ونتجت عن إزالة الجداول إزالة هذا الاقتضاء. وكان من رأيهم أن هذا كان نتيجة غير مقصودة في حاجة لتصويبها وأن الإزالة للوضع الإلزامي تجاوزت تفويض المجموعة. ولم يفسّر آخرون وجود أحكام لتكون إلزامية. وكان من رأيهم أن طلب التدريب للعاملين الذين لا يؤدون أي وظائف في التعليمات الفنية كان يتناقض مع مبادئ التدريب القائم على الكفاءة والتقييم وتجاوز نطاق الملحق الثامن عشر. ورأى أعضاء من دول لديها إطار قانوني لمنح تدريب لهؤلاء العاملين أنه ضروري لتوسيع نطاق الملحق الثامن عشر إذا لم يكن بالفعل يشملهم واختتمت مجموعة عمل فريق خبراء البضائع الخطرة للتدريب بأن اتخاذ قرار بشأن هذه المسألة سيحتاج لأن يصدره فريق الخبراء بأكمله.

٢-٤-١-٦ أثار فريق الخبراء بأكمله حججاً مماثلة ما بين مؤيدة ومضادة. واحتج أولئك الذين يدعمون متطلباً إلزامياً بأن هذه الكيانات تؤدي دوراً في منع دخول البضائع الخطرة مسار البضائع وإزالة هذا المتطلب طويل الأمد من شأنها أن يكون لها تأثير ضار على السلامة سيصعب تبريره. وبينما وافق آخرون على أن خطر دخول البضائع الخطرة غير المعلنة مجرى البضائع يتعين تخفيفه، احتجوا بأن التكليف بتدريب العاملين الذين توظفهم كيانات لا تؤدي أي وظائف في التعليمات الفنية لم يكن ممكناً ضمن الإطار القانوني لدولهم وأنه تتوافر تدابير أخرى للتخفيف من الخطر (انظر الفقرة ٦-٤-١ تحت البند ٦ من جدول أعمال هذا التقرير). وإذ لم يتسن التوصل إلى توافق الآراء، تم اتخاذ قرار عن طريق رفع الأيدي. وأيدت أغلبية واضحة متطلباً إلزامياً. وتقرر إدراج حكم كمتطلب إلزامي في الفقرة المقترحة ٤-١-٢ من الباب الأول الفصل الرابع، للتعليمات الفنية (انظر المرفق أ) بالتقرير بشأن هذا البند من جدول الأعمال).

٢-٤-١-٧ كان ثمة تأييد شامل للمادة التي تم إعدادها واتفاق على أنها ينبغي إدماجها في طبعة ٢٠١٩-٢٠٢٠ مع فترة انتقالية لعامين قبل أن تصبح إلزامية.

المواد الإرشادية المقترحة لإدراجها في كتاب دوري جديد للإيكاو

٢-٤-١-٨ قدم رئيس مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة إلى فريق الخبراء معلومات شفوية مقترحة للمواد الإرشادية الواردة في المرفق ٤، الفصول من الثاني إلى الخامس من طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية. وقد تم تعديلها لتتوافق مع التدريب القائم على الكفاءة وأحكام التقييم الواردة في التعديل ٥ لإجراءات خدمات الملاحة الجوية — التدريب (PANS-TRG, Doc 9868) التي ستصبح قابلة للتطبيق في نوفمبر ٢٠٢٠. ونتجت عن التعديل ٥ تعاريف ومصطلحات منقحة استوجبت التغييرات التبعية التالية للمواد الإرشادية للبضائع الخطرة:

أ) الإطار القائم على الكفاءة المدرج في المرفق ٤، الفصل ٣ من طبعة ٢٠١٧-٢٠١٨ تم تحويله إلى قائمة مهام للبضائع الخطرة. وبينما ظل مضمون وبنية الإطار كما هما، فإن الإشارة إلى "وحدات الكفاءة" و"عناصر الكفاءة" استعيض عنهما بإشارات إلى "المهام"؛

ب) تم تطوير إطار شامل جديد لكفاءة الإيكاو من أجل العاملين في مجال البضائع الخطرة. واشتمل على مجموعة مختارة من الكفاءات المستخدمة للتنبؤ بالأداء الناجح في الوظيفة ويمكن أن يُستمد منه نموذج كفاءة ملائم ليعكس المتطلبات المحددة لأحد الموظفين؛

ج) مواد إرشادية جديدة لدعم استخدام إطار كفاءة الإيكاو العامة ونموذج الكفاءة المكيف وقائمة المهام.

٢-١-٤-٩ قامت مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة بإعداد قوائم مهام مكيفة ستؤدي بشكل خاص في أدوار معينة محددة جيداً ولذلك سيكون من المطلوب من أجلها التدريب والتقييم. وراجعت المجموعة أيضاً أداة مصفوفة المهمة/المعرفة الموقرة في المرفق ٤، الفصل الخامس من طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية. وكانت بعض الخلايا في المصفوفة مظلمة لتعيين عناصر المعرفة التي عادت ما تكون غير ذات موضوع لمهمة مناظرة. وعلى الرغم من أن قوائم المهام المكيفة وأداة المصفوفة كان يُقصد بهما أن تكونا دليلين، كانت ثمة شواغل لأن العاملين يستخدمونهم كمواضع مكتوبة من أجل برامجهم التدريبية الخاصة بدون النظر في احتياجاتهم الخاصة. غير أن قائمة المهام المكيفة وأداة المصفوفة قد خففتا من الشواغل التي أثارها الغير فيما يتعلق بإزالة الجداول في الباب ٤؛١ من طبعة ٢٠١٧-٢٠١٨ (انظر الفقرة ٢-٤-١-٤ من هذا التقرير).

٢-١-٤-١٠ اعتقد فريق الخبراء أن المواد الإرشادية ستكون مفيدة، مع اعترافه بأنها قد تحتاج لمزيد من التكيف والتحسين بمجرد اكتساب الخبرة من استخدامها. وأوصت مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة بإدراج المادة في كتاب دوري جديد للإيكاو وبأن يتم مجاناً توفير نسخة منه على موقع الإيكاو المتاح للجمهور على الشبكة. ووافق فريق الخبراء على هذا النهج.

٢-١-٤-١١ لاحظ رئيس مجموعة عمل التدريب التابعة لفريق خبراء البضائع الخطرة أن ثمة مزيداً من العمل الذي يتعين القيام به فيما يتعلق بالمرفق. وتتعين مواءمة المادة مع التعديل ٥ لإجراءات خدمات الملاحة الجوية — التدريب، والإرشادات للدول للموافقة على برامج التدريب في مجال البضائع الخطرة المطلوبة مواءمتها مع النهج القائم على الكفاءة في التدريب والتقييم. وقد يستمر العمل خلال فترة العامين المقبلة.

٢-١-٤-١٢ أعرب فريق الخبراء عن تقديره للرئيس ومجموعة العمل لما اضطلعوا به من أعمال.

٢-١-٥ التدريب في مجال البضائع الخطرة للعاملين الذين

تستخدمهم أو تتعامل معهم صناعة الطيران في مجالي

الهندسة والصيانة (DGP/26-WP/52)

٢-١-٥-١ تم إبلاغ الاجتماع بواقعة بضائع خطرة حدثت مؤخراً شملت عشر وحدات لخدمات الطائرات مصنفة بوصفها UN 3356 — موالد أوكسيجين، كيميائي لكنها قُدمت للنقل على متن طائرة ركاب بواسطة هيئة لصيانة الطائرات، بالتنسيق مع وكالات لشحن البضائع مثل UN 1072 — أوكسيجين مضغوط. وكان الموالد يحمل بطاقة بوصفه غير قابل للتشغيل، الأمر الذي، وفقاً للحكم الخاص A111، يعني أنه ممنوع نقله جواً. وكانت توجد أيضاً تناقضات بين الوثائق والعلامة والبطاقة. وكشف التحقيق في الواقعة أنه لم يحدث قط أن تلقى أي من العاملين تدريباً على البضائع الخطرة. وأثارت الواقعة قلقاً بشأن ما

إذا كانت أحكام التدريب في التعليمات الفنية كافية وما إذا كان ينبغي أن يُضاف اقتضاء واضح لأن يكون العاملون في الهندسة والصيانة مدرّبين. ودُعي فريق الخبراء للنظر في تطلب تدريب على البضائع الخطرة للعاملين في مجالات مثل الهندسة والصيانة.

٢-٥-١-٢ كان هناك تعاطف مع المسألة التي أثيرت. ولاحظ أعضاء فريق الخبراء التحديات في ضمان أن العاملين في صيانة الطيران يدركون أن أجزاء معينة من الطائرات كانت تخضع لمتطلبات البضائع الخطرة عند نقلها كبضائع. واقترح أن معالجة المسألة في ملحق آخر قد تكون نهجاً أكثر فعالية. وأعرب المقترح عن تقديره لما تُلقَى من تعليقات وسيُنظر في تقديم اقتراح لمعالجة المسألة خلال فترة العامين المقبلة.

٢-٢ التعديلات على الجزء ٢ من التعليمات الفنية: تصنيف البضائع الخطرة

١-٢-٢ مشروع التعديلات على التعليمات الفنية بحيث تتوافق مع توصيات الأمم المتحدة — الجزء ٢ (DGP/26-WP/12)

١-١-٢-٢ استعرض الاجتماع التعديلات للجزء ٢ من التعليمات الفنية كي تُعكس القرارات الصادرة عن لجنة خبراء الأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). والتعديلات تعكس أيضاً اقتراحات وافق عليها فريق العمل السادس عشر التابع لفريق خبراء البضائع الخطرة وفريق العمل السابع عشر التابع لفريق خبراء البضائع الخطرة.

٢-١-٢-٢ تمت الموافقة على تعديلات، تخضع للشروط التالية:

(أ) الأحكام لعيّنات المواد ذات الطاقة التي تُخصص لـ UN 3223 — سائل ذاتي التفاعل من النوع ج أو UN 3224 — صلب ذاتي التفاعل من النوع ج تمت إضافتهما كجزء جديد ٢٠٤٢-٥-٤ من أجل التوافق مع توصيات الأمم المتحدة. وقد أضيفتا لمعالجة حاجة إلى نقل مواد للمزيد من الاختبار بغية تحديد ما إذا كانت المادة مرشحة لمادة متفجرة من الدرجة ١، كان يُمنع نقلها كعيّنات أو مادة ذاتية التفاعل من القسم ٤-١، كان يُسمح بنقلها كعيّنات. ولوحظ أن أحكام الأمم المتحدة لم تشمل دلالة على كيفية وصف المواد على وثيقة النقل. وكان يُضاف إلى التعليمات الفنية اقتضاء لاسم شحن سليم يُستكمل بكلمة "عيّنة" أُضيف إلى التعليمات الفنية، على افتراض أنه إغفال غير متعمد من جانب اللجنة الفرعية للأمم المتحدة. وسيسعى الأمين للحصول على تأكيد من اللجنة الفرعية للأمم المتحدة في دورتها الثانية والخمسين (جنيف، ١١/٢٧ إلى ١١/٢٦/٢٠١٧).

(ب) أُضيفت أحكام جديدة لتصنيف أدوات تتضمن بضائع خطرة غير محددة على نحو آخر بوصفها جزءاً جديداً ٢٠٤٢-٦ من أجل التوافق مع توصيات الأمم المتحدة. وأدخلت التعديلات التالية على التعليمات الفنية:

(١) شملت توصيات الأمم المتحدة مذكرة تشير إلى UN 3363 — مواد خطرة في أجهزة أو بضائع خطرة في آلات بالنسبة للأغراض بدون اسم شحن خاص موجود وتتضمن فقط بضائع خطرة ضمن الحدود المسموح بها للمقادير الكمية المحددة في قائمة البضائع الخطرة لتوصيات الأمم المتحدة. واستُعيض عن المذكرة بفقرة جديدة ٢٠٤٢-٦-٠ في التعليمات الفنية راعت الأسلوب المختلف لتحديد حدود الكمية بالنسبة إلى UN 3363 في التعليمات الفنية. وأُجريت تعديلات تبعية للحكم

الخاص A107، الذي خُصص لـ UN 3363، بما في ذلك نص يسمح بالنقل بموافقة دولة المصدر ودولة المشغل عندما تتجاوز كمية البضائع الخطرة الحدود المسموح بها في تعليمات التغليف المخصصة (962) وذلك بينما يتم الوفاء بالحدود المنشأة في توصيات الأمم المتحدة.

(٢) أُجريت عمليات إعادة نظر للمواءمة مع التصويبات حتى الطبعة المنقحة العشرين من لائحة الأمم المتحدة التنظيمية النموذجية الواردة في تقرير اللجنة الفرعية في دورتها الحادية والخمسين (جنيف، ٣ إلى ٧/٧/٢٠١٧).

(ج) هناك متطلب جديد للصانعين والموزعين التاليين للخلايا أو البطاريات لتوفير ملخص الاختبار تمت إضافته كجزء جديد ٢-٩-٣-١ (ز) من أجل التوفيق مع توصيات الأمم المتحدة. ووافقت اللجنة الفرعية للأمم المتحدة، في دورتها ٥١ (جنيف، ٣ إلى ٧/٧/٢٠١٧)، على أن هذا الملخص للاختبار ينبغي أن يكون مطلوباً فقط من ٢٠٢٠/١/١ لبطاريات الليثيوم أو البطاريات المصنوعة في البداية في أو بعد ٢٠٠٣/٧/١. وسيُعكس هذا فقط في الطبعة المنقحة الحادية والعشرين من اللوائح النموذجية للأمم المتحدة، لكن اللجنة الفرعية أوصت بمراعاته بواسطة منظمات الأسلوب عند تحقيق التوافق بين أحكام الطبعة المنقحة العشرين من التوصيات. وبناء على ذلك، وافق فريق الخبراء على إدراج الأحكام.

٣-٢ التعديلات على الجزء ٣ من التعليمات الفنية: قائمة البضائع الخطرة والأحكام الخاصة والكميات المحدودة والمستثناة

١-٣-٢ مشروع التعديلات على التعليمات الفنية بغرض مواءمتها مع توصيات الأمم المتحدة - الجزء ٣ (DGP/26-WP/13)

١-١-٣-٢ استعرض الاجتماع التعديلات على الجزء ٣ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٩/١٢/٢٠١٦). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعه DGP-WG/16، و DGP-WG/17.

٢-١-٣-٢ تمت الموافقة على التعديلات، مع مراعاة ما يلي:

(أ) تم إدخال التعديلات التبعية على الأحكام الخاصة A107 من أجل تحقيق التوافق مع الأحكام الجديدة لتصنيف المواد التي تحتوي على بضائع خطرة غير محددة على نحو آخر (انظر ٢-١-٢-٢ ب) من هذا التقرير)؛

(ب) تم الاتفاق على تخصيص A176، الذي خصص متطلبات لنظم تخزين الهيدريد المعدني إلى UN 3529 (المحركات والآلات التي تستمد قوتها من خلايا وقود غازي قابل للاحتهاب). وقد تم بالفعل التخصيص لـ UN 3528 (المحركات والآلات التي تستمد قوتها من خلايا وقود سائل قابلة للاحتهاب) و UN 3166 (السيارات التي تستمد قوتها من خلايا وقود سائل قابلة للاحتهاب). أما الحكم الخاص للأمم المتحدة المناظر (SP356) فلم يُخصص لـ UN 3528 أو UN 3529 في اللوائح النموذجية، على الرغم من أنها كانت مخصصة لجميع أسماء الشحن الصحيحة من أجل UN 3166. وسيتم إبلاغ اللجنة الفرعية للأمم المتحدة بإعادة النظر؛

(ج) تم إجراء تصويبات وتعديلات تحريرية بسيطة توكياً للوضوح والموافقة مع التصويبات للطبعة المنقحة العشرين من اللوائح النموذجية للأمم المتحدة التي احتوى عليها تقرير اللجنة الفرعية في دورتها الحادية والخمسين (جنيف، من ٣ إلى ٧/٧/٢٠١٧).

٢-٣-٢ تنقيح الحكم الخاص ٧٨١ (DGP/26-WP/7)

١-٢-٣-٢ لوحظ أن الحكم الخاص ٧٨١ ينطبق على مواد مشعة تنطوي على واحد أو أكثر من الأخطار الإضافية. ولوحظ أيضاً أن هذا الحكم الخاص لم يشتمل على أي قيود للمكوّن الذي أسهم في الخطر الإضافي عندما أدرج في القائمة كمادة ممنوعة في الجدول ٣-١. ولذلك اقترح تعديل للحكم الخاص ٧٨١ لمنع نقل المادة المشعة عندما يكون المكوّن الذي أسهم بأكثر نحو سائد في خطر فرعي تم منعه. وشمل التعديل أيضاً أحكاماً للموافقة عندما يكون قد تم تعيين حكم خاص ١١ أو ٢١ للمكوّن.

٢-٢-٣-٢ بينما لم توجد أي اعتراضات على التعديل من حيث المبدأ، فإن الفقرة الأخيرة من الحكم الخاص ٧٨١ اشتملت بالفعل على قيود كانت تتعارض مع النص المنقح. وتم الاتفاق على تعديل منقح.

٣-٣-٢ تنقيح الحكم الخاص ٦٧١ (DGP/26-WP/8)

١-٣-٣-٢ تنطبق تعليمات التعبئة ٨٧٢ على UN 2800 — البطاريات السائلة وغير القابلة للانسكاب واحتوت على أحكام للاختبار تُستخدم لغرض التصنيف. واقترح أن إدراج معايير التصنيف في تعليمات التعبئة متعارض نظراً لأن تخصيص تعليمات تعبئة للبضائع الخطرة يستند إلى تصنيفها. ولذلك اقترح تعديل أزال معايير التصنيف من تعليمات التعبئة ٨٧٢ إلى الحكم الخاص ٦٧١ وحذف إشارة إلى تعليمات التعبئة ٨٧٢ من أحكام الركاب لمعينات الحركة. ولوحظ أن هذه الأحكام كانت مدرجة بالفعل في الحكم الخاص المناظر في اللوائح النموذجية للأمم المتحدة (SP 238).

٢-٣-٣-٢ لم تكن ثمة اعتراضات على الاقتراح، بالرغم من أنه لوحظ أن الأحكام القائمة لم تكن تتواءم مع اللوائح النموذجية للأمم المتحدة. وجرى التساؤل بشأن ما إذا كان أو لم يكن الانحراف مقصوداً. وتم الاتفاق على أنه قد توجد حاجة للتواءم والوضوح. ولكن هذا ينبغي معالجته على حدة خلال فترة العامين المقبلة. وتمت الموافقة على التعديل.

٤-٣-٢ الأيروسولات (DGP/26-WP/25)

١-٤-٣-٢ دُعي فريق الخبراء للنظر فيما إذا كان ينبغي تخصيص أرقام الأمم المتحدة الفريدة لمجموعات الأيروسولات التي في نفس الدرجة أو القسم وعند الانطباق، الخطر الجانبي. واقترح أن هذا سيسمح باتصال أوضح بشأن الأخطار المحددة التي تشكلها.

٢-٤-٣-٢ لوحظ أن نفس المسألة قد أثبتت في اللجنة الفرعية للأمم المتحدة قبل سنوات مضت وأن إضافة مزيد من أرقام الأمم المتحدة للأيروسولات لم يُحظ بالعدم. وكان رئيس اللجنة الفرعية للأمم المتحدة حاضراً واعترف بأن اللجنة كانت مهتمة بإضافة بنود جديدة ما لم يكن ثمة سبب وجيه. ولاحظ أن الأرقام الإضافية للأمم المتحدة كانت تُعتبر أنها تتناول شروط نقل مشروط، لكن عادة فقط عندما تكون ثمة حاجة للتمييز تشغيلياً على أساس المخاطر. ولاحظ مراقب عن الصناعة معتاد على شحن الأيروسولات أن أعضاء صناعته راضون عن الوضع الراهن.

٣-٤-٣-٢ أعرب المقدم عن تقديره للتعليقات التي تم تلقيها وسيُنظر فيما إذا كان سيُنخذ أو لا يُنخذ إجراء آخر.

٤-٢ إدخال تعديلات على الجزء ٤ من التعليمات الفنية: تعليمات التعبئة

١-٤-٢ مشروع التعديلات على التعليمات الفنية بغرض مواعمتها مع توصيات الأمم المتحدة — الجزء ٤ (DGP/26-WP/14)

١-١-٤-٢ استعرض الاجتماع التعديلات على الجزء ٤ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعيه: DGP-WG/16 و DGP-WG/17.

٢-١-٤-٢ تم الاتفاق على التعديلات، مع مراعاة ما يلي:

(أ) التعديلات لتعليمات التعبئة ٢١٨ من التعليمات الفنية الصادرة عن لعكس القرارات التي اتخذتها لجنة خبراء الأمم المتحدة لم تظهر في الطبعة المنقحة العشرين من توصيات الأمم المتحدة. وتمت مراجعة التعديلات من أجل جعلها متوافقة مع الطبعة المنشورة.

(ب) نص تعليمات التعبئة ٢٢٠ تم حذفه خطأً. وقد أعيد في مكانه من جديد.

(ج) أحكام عينات مواد الطاقة المصنفة بوصفها UN 3223 — النوع السائل ج ذاتي التفاعل أو UN 3224 — النوع الصلب ج ذاتي التفاعل وفقاً للأحكام الجديدة في الجزء ٢-٥-٠؛٤ (انظر ٢-١-٢-٢ أ) من هذا التقرير) أضيفت لتعليمات التعبئة ٤٥٩ من أجل تحقيق التوافق مع توصيات الأمم المتحدة. ورأى فريق الخبراء أن بنية الأحكام بالغة التعقيد. وأجريت عمليات مراجعة تحريرية لتحقيق المزيد من الوضوح. وسيخطر الأمين للجنة الفرعية للأمم المتحدة بالتغييرات.

(د) الإشارات إلى معايير التصنيف لبطاريات الليثيوم الواردة في الجزء ٣-٩؛٢ تم تعديلها في تعليمات التعبئة ٩٥٠-٩٥٢ و ٩٦٥-٩٧٠ مع مراعاة الأحكام الجديدة التي أضيفت إلى ٩؛٢-٣-١.

٢-٤-٢ المركبات التي تعمل بواسطة غاز قابل للاشتعال أو سائل قابل للاشتعال (DGP/25-WP/4)

١-٢-٤-٢ اقتضاء تخصيص المركبات التي تعمل بواسطة سائل قابل للاشتعال أو غاز قابل للاشتعال لـ UN 3166 — المركبات التي تعمل بواسطة غاز قابل للاشتعال احتوى عليه الحكم الخاص A203. ولوحظ أن ذلك الحكم الخاص A203 سوف يُحذف من التعليمات الفنية ٢٠١٩-٢٠٢٠، لكن الاقتضاء في A203 سيتم دمجها في حكم خاص جديد A214 (انظر الفقرة ١-٣-٢ من هذا التقرير).

٢-٢-٤-٢ بينما أن الصيغة المدرجة في الحكم الخاص A214 حددت بوضوح التصنيف الصحيح للمركبات التي تعمل بواسطة سائل قابل للاشتعال وغاز قابل للاشتعال على السواء، وما لم يكن واضحاً هو أن الشاحن يجب أن يمثل للأجزاء القابلة للتطبيق من تعليمات التعبئة ٩٥٠ التي تتعلق بالسائل القابل للاشتعال في خزان وقود بالإضافة إلى جميع الأجزاء القابلة للتطبيق من تعليمات التعبئة ٩٥١.

٣-٢-٤-٢ تم لمعالجة هذا اقتراح تعديل يتضمن إحالات إلى متطلبات تعليمات التعبئة ٩٥٠ من أجل خزانات الوقود السائلة القابلة للاشتعال في الحكم الخاص A214 وتعليمات التعبئة ٩٥١. وتمت الموافقة على تعديل تعليمات التعبئة ٩٥١، لكن فريق الخبراء لم يعتقد أن تعديل الحكم الخاص A214 كان ضرورياً.

٣-٤-٢ شروط إضافية خاصة بالتغليف لرقم الأمم المتحدة 1308 UN
(DGP/26-WP/6)

١-٣-٤-٢ سمحت التعليمات الفنية بتعبئة وحيدة من أجل UN 1308 — زيرقونيام معلق في سائل قابل للاشتعال عندما خُصص لمجموعة التعبئة ١ أو ٢. غير أن اللوائح النموذجية للأمم المتحدة لم تفعل ذلك. ولذلك اقترح تعديل لتعليمات التعبئة ٣٦٦-٣٦٠ يمنع استخدامها من أجل التوافق.

٢-٣-٤-٢ تمت الموافقة على التعديل من حيث المبدأ، لكن إعادة النظر في الصياغة لتحقيق التوافق بمزيد من الدقة مع الصياغة في اللوائح النموذجية للأمم المتحدة كان مقترحاً وتمت الموافقة عليه، أي "المجموعتي التعبئة ١ و ٢، يُسمح بالعبوات المختلطة فقط". ولوحظ أنه لم يُسمح باقتراح للاستعاضة عن صياغة الأمم المتحدة بـ "التعبئة الوحيدة..." في لجنة الأمم المتحدة الفرعية وأثار ذلك قلقاً نظراً لأن هذا قد يوحي بأن العبوات المركبة مسموح بها، وهذا غير صحيح.

٣-٣-٤-٢ تم الاتفاق أيضاً على إدخال حد التعبئة الإجمالي الكبير البالغ ٧٥ كيلوجراماً الذي تتضمنه اللوائح النموذجية للأمم المتحدة. ولم يرفق المقترح هذا الحد، معترفاً بأن تعليمات التعبئة قد تحد من الكمية الإجمالية لكل عبوة إلى ٦٠ ليترًا. غير أنه اقترح أن كثافة UN 1308 جعلت من الممكن تحديد الكتلة الإجمالية بحيث لا تتجاوز ٧٥ كيلوجراماً بينما لا تتجاوز حد الكمية لكل عبوة البالغة ٦٠ ليترًا.

٤-٣-٤-٢ تم الاتفاق على التعديل بصورته المنقحة.

٤-٤-٢ توجيه التعبئة ٩٥٨: رقم الأمم المتحدة 2590 UN (DGP/26-WP/9)

١-٤-٤-٢ هناك عدد من أوجه التضارب بين التعليمات الفنية واللوائح النموذجية للأمم المتحدة تم تحديدها في DGP-17/WG، واقترح توجيه جديد للتعبئة لمعالجتها (انظر الفقرة ٣-٢-٤-٤ من التقرير DGP-WG/17 يحتوي عليها DGP/26-WP/3). ووافقت مجموعة العمل على أن بعض أوجه التضارب التي حُددت تتعين معالجتها، وبعضها متضارب بشكل متعمد، وبعضها يحتاج إلى مزيد من النظر. واقترح تعديل جديد لـ DG/26 على أساس مناقشات مجموعة العمل.

٢-٤-٤-٢ التعديل المقترح على DGP/26 أزال الحظر على نقل UN 2212 — أسبستوس، أمفيبول على متن كل من طائرات الركاب والبضائع، أضاف تعليمات تعبئة جديدة مخصصة لـ UN 2212 و UN 2590 — أسبستوس، كريسوتيل وأدخلت أحكاماً للكمية المحدودة لكليهما. وإزالة الحظر كانت أيضاً مقترحة في DGP-WG/17 لكن مجموعة العمل أرادت أن تقيم الاستدلال الأصلي لحظره قبل اتخاذ قرار. ولاحظ المقترح أن UN 2212 كان تاريخياً يُعتبر خطراً على الصحة أكبر من UN 2590 (المسموح به على كل من طائرات الركاب والبضائع)، ولكن تم منذ ذلك إثبات أن هذه ليست هي الحالة وأن كلاهما ضاران بشكل متساو. بيد أنه لم تكن توجد بيانات مقدمة إلى فريق الخبراء لدعم هذا. وتم الاعتراف بأن الخطر على الصحة كان يستند إلى التعرض طويل الأجل، لكن فريق الخبراء احتج بأن الخطر المحتمل على موظفي المشغل والركاب والطاقم في حاجة إلى النظر فيه. ولوحظ أنه كانت توجد أنظمة لإعادة التدوير على معظم الطائرات التي قد تسمح للجزيئات التي علق في الهواء بأن تُجذب من جديد إلى داخل مقصورة الركاب. وهناك اقتراح للسماح بالنقل على طائرات البضائع فقط، لكن حجة مضادة كانت أن هذا ينبغي أن يكون اقتراحاً فقط للسماح بالنقل على طائرات البضائع فقط، لكن حجة ينبغي أن يكون مبرراً فقط إذا كانت توجد تدابير مخففة إضافية على متن طائرات البضائع للتخفيف من الخطر لا تتوافر على متن طائرات ركاب. ولوحظ أنه يمكن النظر في حقيقة أن الهواء النقي كان يتم تدويره إلى مقصورة القيادة. غير أن أعضاء فريق الخبراء لم يصدقوا أن ثمة حاجة لنقل هذه المواد بكميات كبيرة، على الرغم من أنه قد توجد حالات عندما تكون هناك

حاجة لعينات يحتاج لنقلها. ولذلك تمت الموافقة على الحفاظ على الحظر بالنسبة إلى UN 2212 لكن تخصيص حكم خاص A2 له، وبذلك يُسمح بالنقل على طائرات البضائع بموافقة دولتي المشغل والمصدر. وتمت الموافقة أيضاً على تعديل تبقي للجدول S-3-1 من أجل UN 2212.

٢-٤-٤-٣ استنتج فريق الخبراء أن تخصيص تعليمات التعبئة ٩٥٨ لـ UN 2590 سوف يُستبقى عوضاً عن تعليمات تعبئة جديدة لكنه وافق على أنه كانت ثمة حاجة للتعديلات من أجل الاتساق والتوافق مع اللوائح النموذجية للأمم المتحدة. وتضمنت هذه إضافة توليفة من أحكام التعبئة واستحداث تعبئة منفردة كانت يُسمح بها في اللوائح النموذجية للأمم المتحدة لكن ليس التعليمات الفنية، وإعادة النظر في متطلبات التعبئة الإضافية لكل من المجموعة والتعبئة المنفردة لتحقيق التوافق مع مقصد اللوائح النموذجية للأمم المتحدة مع الإبقاء على حدود التعليمات الفنية. وأزيلت أحكام الكمية المحدودة المقترحة نظراً لعدم وجود دعم لها من فريق الخبراء.

٢-٤-٤-٤ تمت الموافقة على التعديل المنقح.

٢-٥ التعديلات على الجزء ٥ من التعليمات الفنية: مسؤوليات الشاحن

٢-٥-١ مشروع التعديلات على التعليمات الفنية بغرض موافقتها مع توصيات الأمم المتحدة — الجزء ٥ (DGP/26-WP/15)

٢-٥-١-١ استعرض الاجتماع التعديلات على الجزء ٥ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعه (DGP-WG/17).

٢-٥-١-٢ تمت الموافقة على التعديلات مع مراعاة ما يلي:

أ) نقل الأحكام الجديدة لوضع العلامات للأشياء التي تحتوي على بضائع خطرة غير محددة على نحو آخر لاستكمال التعليمات الفنية (وافق فريق الخبراء على أن هذه الأشياء ينبغي منعها للترحيل جواً).

ب) وإزالة اقتضاء القياس المحدد لعرض الخط الذي يمثل شكلاً دينارياً لعلامات الخطر.

اقتضاء العرض المحدد، الذي أُدخل في الطبعة الثامنة عشرة المنقحة من توصيات الأمم المتحدة، سبب مشكلات في أن الشحنات كانت تُرفض خلال فحص القبول إذا كان العرض ٢ ملم على الأقل. وتم لفت انتباه اللجنة الفرعية في دورتها ٥١ إلى هذه المسألة. ووافقت اللجنة الفرعية على أن تحديد سمك كحد أدنى للخط غير ضروري للسلامة ووافقت على اعتماد تعديل في الطبعة المنقحة العشرين من اللوائح النموذجية للأمم المتحدة. ودعت المنظمات المسؤولة عن اللوائح الشكلية إلى تعديل كل منها لآلاتها وفقاً لذلك.

٢-٦ تعديلات على الجزء ٦ من التعليمات الفنية: تسميات

التعبئة والعلامات والمتطلبات والاختبارات

٢-٦-١ مشروع التعديلات على التعليمات الفنية بغرض موافقتها مع توصيات الأمم المتحدة — الجزء ٦ (DGP/26-WP/16)

٢-٦-١-١ استعرض الاجتماع التعديلات على الجزء ٦ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعه (DGP-WG/17).

٢-١-٦-٢ وتم الاتفاق على التعديلات .

٧-٢ تعديلات على الجزء ٧ من التعليمات الفنية: مسؤوليات المشغل

١-٧-٢ مشروع تعديلات على التعليمات الفنية بغرض مواعمتها مع

توصيات الأمم المتحدة — الجزء ٧ (DGP/26-WP/17)

١-١-٧-٢ استعرض الاجتماع التعديلات على الجزء ٧ من التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعيه (DGP-WG/16) و (DGP-WG/17).

٢-١-٧-٢ تمت الموافقة على التعديلات مع مراعاة ما يلي:

(أ) التعديلات التحريرية في الجزء ٧؛ ٢-١-٢-٢ وحذف النص المتكرر؛

(ب) إزالة الإشارات إلى المواد المثبتة عن طريق السيطرة الحرارية والمواد المبلمرة في الجزء ٧؛ ٢-١-٣. وقد أضيف النص إلى توصيات الأمم المتحدة، لكن فريق الخبراء وافق على أنه لا ينبغي إدراجه في التعليمات الفنية نظراً لأن هذه المواد مُنَع نقلها جواً.

٢-٧-٢ الوصول إلى المحركات المحمولة على متن طائرات الشحن

(DGP/26-WP/5)

١-٢-٧-٢ تمت تصنيف المحركات بوصفها درجة ٩ وحُصصت لـ UN 3166 قبل طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية. على الرغم من أن غازاً قابلاً للاشتعال يزود المحركات بالقدرة كان مسموحاً به على طائرات البضائع فقط، وكما مادة من الدرجة ٩ لم تكن تخضع لمتطلبات الشحن المحددة للعبوات أو العبوات المجمعّة للبضائع الخطرة التي تحمل بطاقة "طائرات البضائع فقط" في الجزء ٧؛ ٢-٤-١. ولذلك فإن محركات الطائرات الضخمة كانت تُشحن عادة على الرصيف الرئيسي بالقرب من مركز جاذبية الطائرات وفقاً لقيود الوزن والتوازن. وشملت التعديلات في طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية المخصصة لها UN 3529 إلى القسم ٢-١ و UN 3528 إلى الدرجة الثالثة وقصرت UN 3529 على طائرات البضائع فقط. وهذا يعني أن UN 3529 ستخضع لمتطلبات الوصول في الجزء ٧؛ ٢-٤-١. وسبب هذا صعوبات لأن المحركات قد يكون من غير المحتمل إذا كانت مشحونة بالقرب من مركز ثقل الطائرة. ولوحظ أن قرار اللجنة الفرعية للأمم المتحدة بإعادة التصنيف لم يكن يستند إلى أي شواغل سلامة بل بالأحرى لمعالجة احتياج محدد للنقل الأرضي. ولذلك اقترح تعديل أضاف UN 3528 و UN 3529 إلى قائمة الاستثناءات من متطلبات الشحن المحددة للعبوات أو العبوات المجمعّة التي تحمل علامة "طائرات البضائع فقط" في الجزء ٧؛ ٢-٤-١.

٢-٢-٧-٢ في حين أنه لم توجد اعتراضات على إضافة UN 3529 إلى قائمة الاستثناءات من منظور للسلامة، كان بعض أعضاء فريق الخبراء غير مرتاحين لاستثناء مواد أو أشياء فريدة من الحكم نظراً لأن هذا يتعارض مع فلسفة استثناء قائمة على الأخطار. وكان ثمة اتفاق على أن الفلسفة العامة ينبغي الالتزام بها، لكن فريق الخبراء كان مرغماً على التعامل مع القرار الذي جعلته اللجنة الفرعية للأمم المتحدة يغيّر التصنيف، على الرغم من حقيقة أن الأخطار لم تتغير. ومع أخذ ذلك في الاعتبار، لم يكن يوجد أعضاء في فريق الخبراء يعتقدون أن متطلبات الوصول كانت ضرورية لهذه المحركات.

٣-٢-٧-٢ تساءل بعض أعضاء فريق الخبراء بشأن الحاجة لشمول UN 3528 في قائمة الاستثناءات، نظراً لأن العلامة الوحيدة على طائرات البضائع لم تكن مطلوبة على المحركات من هذه الدرجة ٣ ولذلك فهي لا تخضع لمتطلبات الشحن. وتم

أيضاح أنه على الرغم من أن العلامة لم تكن ضرورية، فإن بعض الشاحنين كانوا يريدون ضمان أن شحنة محركاتهم توضع على طائرة بضائع. وأثيرت عدة شواغل بشأن هذا النهج:

- (أ) استخدام علامة طائرة بضائع فقط لأسباب بخلاف السلامة سيضعف الرسالة التي تنقلها العلامة؛
- (ب) إضافة UN 3528 إلى قائمة الاستثناءات انحرفت عن المبدأ العام للحكم ولذلك ستسبب خطأ؛
- (ج) استخدام العلامة يدل على أن البضائع الخطرة كانت ممنوعة على متن طائرة ركاب عندما لم تكن تناقضاً.

٢-٧-٢-٤ على الرغم من إحساسات القلق المثارة، كان هناك تعاطف لأن عدم إضافة البند إلى القائمة سيغيّر الممارسات الحالية وأن هذه الممارسات لم يكن لها تأثير سلبي على السلامة. وسيقدم شرح لإدراج UN 3528 في قائمة الاستثناءات وذلك في *DGP Guidance Document to Aid in Preparation of the Technical Instructions and Supporting Documents* (انظر التقرير بشأن البند ٥ من جدول الأعمال).

٢-٧-٢-٥ تمت الموافقة على التعديل على النحو المقترح.

٢-٧-٣ شحن طائرات البضائع (DGP/26-WP/24)

٢-٧-٣-١ أدرجت في الجزء ٧-٢-٤-١ من التعليمات الفنية متطلبات شحن محددة للأغلفة أو الأغلفة الخارجية للبضائع الخطرة تحمل بطاقة "طائرة بضائع فقط". وكان هذا الحكم ينطبق على الأغلفة أو الأغلفة الخارجية للبضائع الخطرة التي تحتاج إلى شحنها لنقلها بواسطة طائرة بضائع إما في جزء من الدرجة ج من طائرة بضائع مجهزة بأداة تحميل للوحدة ومزودة بنظام لاكتشاف الحريق/منع الحريق مساو لذلك المطلوب بواسطة متطلبات استخراج الشهادة لمقصورة طائرة بضائع من الدرجة ج، أو متاحة لعضو في الطاقم أو شخص مرخص له آخر لكي يتمكنوا من معالجة وفصل الأغلفة أو الأغلفة الخارجية من البضائع الأخرى في حالة طوارئ. ودُعي فريق الخبراء للنظر في إيضاح ما يُعنى بـ "متاح". وأبلغ الأعضاء عن أساليب متنوعة تُستخدم لتحقيق الامتثال لهذا المتطلب داخل دولهم، لكن يوجد افتقار للبيانات التي تبيّن عملياً ما إذا كان امتلاك أو عدم امتلاك هذه الأغلفة أو الأغلفة الخارجية المتاحة فعلياً نتجت عنه استجابة فعالة للطوارئ.

٢-٧-٣-٢ كشفت المناقشة عن افتراضات متعارضة بين البضائع الخطرة والصلاحية للطيران وخبراء العمليات. ولاحظ خبير في الصلاحية للطيران أن أنظمة التصميم لا تعتبر إمكان الدخول شكلاً لاستجابة الطوارئ لحساب من أجل القمات من الفئة E. واستشهد بالقدرة على تحديد والاستجابة إلى تهديد يعتمد على الرؤية الكافية كمثال، نظراً لأنه لا توجد متطلبات تصميم لأنظمة الطائرات لاستئصال الدخان من المقصورة لهذا الغرض. واقترح أيضاً أن التشكيل القياسي للشحن جنباً إلى جنب لم يترك حيزاً كافياً للدخول الملائم، على الرغم من أن خبراء عمليات البضائع وصفوا بعض أساليب شحنهم التي لم تسمح بهذا. واقترح كتناقض آخر توقع أن يترك عضو في الطاقم المقصورة ليستجيب لطوارئ، نظراً لأن متطلبات طاقم من رجلين في المقصورة قد لا يسمح بهذا. غير أنه لوحظ أيضاً أن طاقم الطيران كان مزوداً بمستوى تقدير لاستخدام أي تدابير ضرورية في حالة طوارئ.

٢-٧-٣-٣ كان ثمة اتفاق على أن الافتراضات التي تقوم عليها متطلبات إمكان دخول طائرات البضائع كانت في حاجة إلى إعادة النظر. وكانت الأحكام في التعليمات الفنية منذ بدايتها، وتغيّر الكثير منذ ذلك الوقت من معايير تصميم الطائرات وعملياتها. ولوحظ أن إمكانية الدخول هي مقياس يشار إليه كمبرر للسماح بالبضائع الخطرة على متن طائرات البضائع والتي لم يكن مسموحاً بها على متن طائرات الركاب. واقترح أن ثمة حاجة إلى التنسيق بين خبراء عمليات صلاحيات الطائرات للطيران وخبراء البضائع الخطرة لضمان أن هذا التبرير لا يزال صحيحاً.

٢-٧-٣-٤ أعرب الاجتماع عن تقديره لعضو فريق الخبراء لإحراز تقدم في المسألة وأوصى بتقديم بطاقة المهمة بشأن الموضوع إلى لجنة الملاحه الجوية للاعتماد (انظر الفقرة ٢-٩ من هذا التقرير).

٢-٧-٤ المعلومات المقدمة إلى قائد الطائرة (DGP/26-WP/27)

٢-٧-٤-١ تضمّن الجدول ٧-٩ قائمة بالبضائع الخطرة التي ليس من المطلوب أن تظهر على إخطار قائد الطائرة (NOTOC). وقد أُبلغ عن أن حقيقة أن هذا الجدول عرّف ما لم يكن مطلوباً على عكس الأحكام الأخرى في التعليمات الفنية التي عرّفت ما هو مطلوب فجعلت بعض المشغّلين يتساءلون عما إذا كان يمكن أن يكونوا أكثر صرامة. ولذلك فإن ملاحظة توصي بأن المعلومات التي تخص جميع البضائع الخطرة تقدّم إلى قائد الطائرة ولذلك اقترح الإدراج تحت الجدول ٧-٩.

٢-٧-٤-٢ كان ثمة قلق لأن التعديل قد يسبب مزيداً من الخلط. وعنوان الجدول لم يوحي بأي طريقة أياً كانت بأن البنود المدرجة بالقائمة لا يمكن أن تظهر على إخطار قائد الطائرة، ويدرج الجدول في القائمة ببساطة البنود التي لم تكن من المطلوب إدراجها بالقائمة. ولا يوجد أي شيء يمنع أي شخص من أن يكون أكثر صرامة. ولم تتم الموافقة على التعديل.

٢-٧-٥ أحكام الملصقات على وحدات التحميل (DGP/26-WP/30)

٢-٧-٥-١ لوحظ أنه بينما أن الجزء ٧-٢؛٨-٣ كان يتطلب معلومات بشأن الملصقات للتعرف على الهوية المعروضة على خارج أجهزة شحن الوحدات لتكون مقروءة ومرئية عند وضعها داخل حاملة ملصقة حامية، وكان لا يوجد اقتضاء لأن تكون المعلومات مقروءة عندما لا تكون داخل حاملة ملصقة حامية. وكانت ثمة وقائع حيث كانت الملصقة نفسها مرئية لكن المعلومات التي عليها لم تكن مرئية في جميع الأوقات. واقترح تعديل الجزء ٧-٢؛٨-٢ لإيضاح أن المتطلب ينطبق بصرف النظر عما إذا كانت أم لم تكن البطاقة في حاملة محمية.

٢-٧-٥-٢ لم تتم الموافقة على التعديل. وكان أعضاء فريق الخبراء يعتقدون أن الأحكام أوضحت أن المعلومات يجب أن تكون مقروءة، لكن طلبوا أن تكون المعلومات مرئية في كل الأوقات وأوضحوا ضمناً أنها ستحتاج لتكرارها على كل جانب من الملصقة. ولم يعتبر هذا ضرورياً. أما اقتضاء أن تكون على الحافة خطوط حمراء متقاربة بارزة لتظهر على كلا الجانبين فقد اعتُبر كافياً.

٢-٧-٦ نقل مادة ممغنطة (DGP/26-WP/32)

٢-٧-٦-١ دُعي فريق الخبراء لمناقشة دواعي القلق التي أثارها بعض المشغّلين بالنسبة لكيف تتفدّ الأحكام المتصلة بنقل المواد الممغنطة. وبعض الأحداث مع UN 2807 — مواد ممغنطة تم الإبلاغ عنها شاملة تدخلاً في آلات الطائرة. وجرى التساؤل عما إذا كان التأثير المتراكم لعدة أدوات ممغنطة يمكن أن يسبب تدخلاً حتى ولو كانت كل أداة وحدها لم تف تصنيف المعايير للمواد الممغنطة. وأثيرت كيفية أنه كان متوقّعا من المشغّلين الامتثال لمتطلبات التعليمات الفنية، نظراً لأن مواصفات القوة المغنطيسية لم تكن توفّر عادة مع المواد المغنطيسية، وكان من غير المحتمل أن الركاب سيعرفون ما إذا كانوا يحملون مواد ممغنطة مصنّقة كبضائع خطيرة.

٢-٧-٦-٢ كانت الحوادث التي تشمل تدخلاً مغنطيسياً نادرة للغاية. ولاحظ أحد أعضاء فريق الخبراء أن خبراء السلامة للطيران داخل دولته اعتبروا أن الحدود المنشأة في التعليمات الفنية للطرود المنقولة كبضائع تقليدية للغاية ولا ينبغي أن تسبب

أي مشكلات مع الطائرات التجارية. ولاحظ العضو الذي عينته الاتحادات الدولية لرابطات طياري الخطوط الجوية (إيفالبا) أنه على الرغم من ذلك نادر للغاية، هناك حالات معزولة عندما يُنقل عدد أكبر من الأدوات الممغنطة التي كان قد نقلها الركاب وتراكماً كان لها تأثير على أنظمة الطائرة. واقترح أنه ينبغي تنفيذ تدابير لزيادة وعي الركاب.

٢-٧-٦-٣ اقترح تحذير خبراء العمليات والصلاحية للطيران من الشواغل المثارة. وسيقوم الأمين باستعراض انتباه أمين فريق خبراء الصلاحية للطيران وأمين فريق خبراء عمليات الطيران لذلك.

٢-٨-٨ تعديلات على الجزء ٨ من التعليمات الفنية: الأحكام المتعلقة بالركاب والطاقم

٢-٨-٨-١ مشروع التعديلات على التعليمات الفنية بحيث تتوافق مع الفريق العامل السادس عشر والسابع عشر التابع لخبراء البضائع (DGP/26-WP/18)

٢-٨-١-١ استعرض الاجتماع التعديلات على الجزء ٨ من التعليمات الفنية لمراعاة الاقتراحات التي وافق عليها DGP-WG/17 و WG/16. وأوصى DGP-WG/17 بإدراج تعديل يحظر البطاريات الاحتياطية وبنوك الطاقة من إعادة شحنها أو من توصيلها كهربائياً أو توفير الطاقة لأداة خارجية في طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية وذلك عن طريق ضمنية، لكن ذلك التعديل سُحب في وقت لاحق (انظر الفقرة ٦-٣-٤ من التقرير تحت البند ٦ من جدول الأعمال). وتمت الموافقة على التعديلات الأخرى، بشرط عكسها في البنية الجديدة التي وافق عليها فريق الخبراء (انظر الفقرة ٢-٨-٢).

٢-٨-١-٢ أوصى فريق خبراء البضائع الخطرة/٢٥ بأحكام لبطاقات الأمتعة ذات التحقق الإيجابي (انظر الفقرة ٥-٩ من تقرير DGP/25). ولم تؤيد لجنة الملاحة الجوية إدخال هذه الأحكام في طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية بدون مُدخل من فريق خبراء صلاحية الطائرات للطيران (AIRP) بشأن الآثار المحتملة من التدخل الكهرومغناطيسي. وكلف فريق خبراء صلاحية الطائرات للطيران فيما بعد عن طريق بطاقة مهمة AIRP.012.01 بتحليل المخاطر وإعداد أحكام عند الضرورة. وخطب أمين فريق خبراء صلاحية الطائرات للطيران فريق خبراء البضائع الخطرة/٢٦ وأفاد بأن العمل سيبدأ في الاجتماع الخامس لفريق خبراء صلاحية الطائرات للطيران (AIRP/5) الذي سيعقد من ٦ إلى ١٠/١١/٢٠١٧. وأكد عضو في فريق خبراء البضائع الخطرة على الحاجة لمعالجة المسألة على قيد السرعة، ملاحظاً أن الصناعة واستخدام الأجهزة يتزايد. وتمت الموافقة على إدراج التعديل المقترح في تقرير فريق خبراء البضائع الخطرة/٢٦ في انتظار الاستعراض الذي يجريه فريق خبراء صلاحية الطائرات للطيران. وسوف يُطلب من لجنة الملاحة الجوية إعادة النظر في تعديل الجزء ٨ بالاستناد إلى استنتاجات فريق خبراء صلاحية الطائرات للطيران.

٢-٨-٢ تنقيح الجزء ٨ (DGP/26-WP/35)

٢-٨-٢-١ كان فريق خبراء البضائع الخطرة/٢٥ قد دُعي للتعليق على اعادة النظر الرامية إلى تبسيط أحكام الركاب في الجدول ٨-١ للإدراج في الطبعة ٢٠١٩-٢٠٢٠ من التعليمات الفنية (انظر الفقرة ٢-٨-٤ من التقرير DGP/25). وتم تبسيط القائمة عن طريق تجميع القيود وفقاً لمصادفتها ووظيفتها. وسمح هذا بإزالة نص متكرر كان قد أعيد في الأحكام الحالية. واستمر العمل في تبسيط القائمة في DGP-WG/16 (انظر الفقرة ٣-٨-٢-٣ من تقرير DGP-WG/16) و DGP-WG/17 (انظر الفقرة ٣-٨-٢-٧ من تقرير DGP-WG/17). وتم تقديم اقتراح منقح إلى DGP/26 لمعالجة تعليقات تم الإدلاء بها في هذه الاجتماعات السابقة.

٢-٨-٢-٢ اقترحت تعديلات أخرى بالإضافة إلى إعادة هيكلة الجدول إلى تجميعات نوعية. وشملت هذه ما يلي:

أ) أُجريت تعديلات للأحكام السابقة للجدول لغرض التبسيط وإيضاح أن البضائع الخطرة ممنوع نقلها بواسطة الركاب والطاقم ما لم يكونوا مدرجين بالقائمة في الجدول ٨-١ ويقصد الاستعمال الشخصي فقط. والنص على وجه التحديد على أنها يجب أن تكون للاستعمال الشخصي فقط كان محاولة لمنع البائعين وتجار التقسيط من حمل كميات كبيرة من الأصناف وفقاً للأحكام للركاب والطاقم، وهو شيء سبق الإبلاغ عنه؛

ب) ونص تمهيدي يمنع أنواعاً محددة من السلع التي تحتوي على بضائع خطيرة نُقلت إلى مذكرة جديدة وينود إضافية قد يحملها عموماً الركاب على وسائل نقل أخرى لكنها مُنعت عن طريق الجو فأضيفت إلى هذه القائمة؛

ج) خُلطت القيود لبطاريات الليثيوم في مدخل واحد. وتمت إشارة محددة للأجهزة الإلكترونية المحمولة (PEDs) بسبب انتشارها؛

د) أُزيل عمود "على الشخص" نظراً لأن الاقتضاء لحمل الركاب بضائع خطيرة "على الشخص" كان ينطبق على اللواصات والكبريت فقط. وأدرج الاقتضاء مع القيود الأخرى لتلك الأشياء؛

هـ) والقيود على الأصناف الطبيعية غير المشعة (بما في ذلك الأيروسولات) ومواد التواليت (بما في ذلك الأيروسولات) وأيروسولات القسم ٢-٢ بدون خطر جانبي، للرياضة أو الاستخدام المنزلي، فقد أُدمجت في أحد الأصناف بسبب قيودها المتماثلة؛

و) وأنشئ جدول منفصل ٨-٢ للأصناف التي ليس من المعتزم أن يحملها الراكب المتوسط، مثل الآلات التي تحملها منظمة حظر الأسلحة الكيميائية أو الوكالات الحكومية الأخرى.

٢-٨-٢-٣ كان فريق الخبراء مؤيداً بقوة للبنية الجديدة وأعرب عن تقديره للعمل المنجز. وتمت الموافقة على التعديل، رهنأ بعدد من التنقيحات من أجل الوضوح والاتساق.

٢-٨-٣ الأجهزة المساعدة على التنقل المزودة ببطاريات (DGP/26-WP/36)

٢-٨-٣-١ نظر الاجتماع الخامس والعشرون لفريق خبراء البضائع الخطرة في اقتراح لتبسيط الأحكام من أجل الأجهزة المساعدة على التنقل المزودة ببطاريات (انظر الفقرة ٢-٨-٣ من تقرير الاجتماع الخامس والعشرين لفريق خبراء البضائع الخطرة) حيث أن البنود الثلاثة المدرجة في الجدول ٨-١ لطبعة ٢٠١٧-٢٠١٨ أُدمجت في بند واحد. وكانت هذه هي الأجهزة المساعدة على التنقل المزودة ببطاريات عن طريق ما يلي:

أ) البطاريات السائلة غير القابلة للانسكاب؛

ب) والبطاريات القابلة للانسكاب؛

ج) وبطاريات أيونات الليثيوم.

مع ملاحظة أن الأحكام في طبعة ٢٠١٧-٢٠١٨ شملت متطلبات يمكن أن يطبقها فقط مشغل وهي خارجة عن سيطرة الراكب، والباب المنفرد الجديد جعل الأحكام تقتصر على تلك التي تكون خاضعة لسيطرة الراكب. وتلك التي كانت من مسؤولية المشغل نُقلت إلى قسم جديد في فصل التخزين والشحن من الباب السابع (الجزء ٧-٢-١٣).

٢-٣-٨-٢ كان ثمة دعم قوي للمبادئ التي طُبقت في إعداد التعديل في DGP/25. وتمّ تقديم عدد من الاقتراحات للتحسين في ذلك الوقت واستمر العمل في الأحكام خلال DGP-WP/16 (انظر الفقرة ٣-٢-٨-٢ من تقرير DGP-WP/16 الذي يحتوي عليه DGP/26-WP/2) و DGP-WP/17 (انظر الفقرة ٣-٢-٨-٦ من تقرير DGP-WP/17 الوارد في DGP/26-WP/3). وتم تقديم اقتراح منقح إلى الاجتماع السادس والعشرين لفريق خبراء البضائع الخطرة تضمن ما يلي:

أ) أزال الإشارات إلى "الأجهزة المساعدة على التنقل" القابلة للطّي استجابة للاستنتاج الذي توصل إليه DGP-WP/16 أن قدرة جهاز مساعد على التنقل على أن يكون قابلاً للطّي كانت لا صلة لها بالموضوع طالما كانت البطارية محمية؛

ب) وطلب من المشغل تأمين الأجهزة المساعدة على التنقل المزوّدة ببطاريات ببطاريات مثبتة عن طريق استخدام أجهزة سيطرة استجابة للاستنتاج الذي تم التوصل إليه في DGP-WP/17 أن المطالبة ببساطة بتثبيت الأجهزة المساعدة على التنقل لمنع الحركة كانت غامضة.

٢-٣-٨-٣ أثيرت في اجتماعات سابقة شواغل فيما يتعلق بجدوى ومعايير لوضع حدود ساعة واط لبطاريات الليثيوم التي زوّدت بالطاقة الأجهزة المساعدة على التنقل (انظر الفقرة ٣-٥-٣-٩ من تقرير DGP-WP/16 الذي يحتوي عليه DGP/26-WP/2). والأجهزة المساعدة على التنقل المزوّدة ببطاريات ليثيوم بمعدل واط في الساعة أعلى من ما كان مسموحاً به وفقاً لأحكام الركاب كانت معروضة في السوق. وجرى الاعتراف بأن أوجه التقدم في التكنولوجيا في كلا النوعين من الأجهزة المساعدة التنقل المتوافرة وحجم البطارية المطلوبة لتزويدها بالطاقة من المحتمل أن تؤدي إلى اتجاه متصاعد باستمرار في كثافة طاقة البطاريات. وخلق هذا معضلة بين حقوق الركاب ذوي التنقل المحدود والحاجة لتأمين السلامة على متن الطائرة. ومن شأن نهج كلي للاعتراف بحقوق الركاب بدون المساس بالسلامة أن يتطلب جهوداً تفوق فريق خبراء البضائع الخطرة. ودُعي الأمين لإبلاغ هذه الشواغل للجنة الملاحة الجوية خلال استعراضها لتقرير DGP/26.

٢-٣-٨-٤ كان فريق الخبراء يؤيد بقوة إعادة النظر وأعرب عن تقديره للعمل المنجز. وتم الاتفاق على تعديل، خاضع لعدد من المراجعات توخياً للوضوح والاتساق.

٢-٨-٤ البطاريات الاحتياطية غير القابلة للانسكاب المستخدمة في الأجهزة

المساعدة على التنقل (DGP/26-WP/21)

٢-٨-٤-١ تم اقتراح تعديل يسمح للركاب ذوي الحركة المحدودة بحمل بطارية احتياطية غير قابلة للانسكاب من أجل جهازهم المساعد على التنقل. ولوحظ أن بطاريات الليثيوم الاحتياطية كانت مسموحاً بها للركاب ذوي الأجهزة المساعدة على التنقل التي تزوّدها بالطاقة بطارية ليثيوم قابلة للطّي. وكان لا يبدو مبرراً السماح ببطاريات ليثيوم احتياطية في حين لا يُسمح ببطاريات احتياطيات غير قابلة للانسكاب، وخاصة منذ أن اعتُبرت البطاريات غير القابلة للانسكاب "غير مقبّدة" وفقاً للحكم الخاص A67 إذا تم شحنها كبضائع.

٢-٨-٤-٢ تمت الموافقة على أن أي بطارية احتياطية غير قابلة للانسكاب ينبغي السماح بها. وعُكس هذا في الجزء ٨ المعاد تشكيله وفي الجزء الجديد ٧-٢-١٣ (انظر الفقرتين ٢-٨-٢ و ٢-٨-٣ من هذا التقرير).

٢-٩ التوصيات

٢-٩-١ في ضوء المناقشات الآتفة الذكر، أصدر الاجتماع التوصيات التالية:

التوصية ٢-١ تعديل التعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (Doc 9284) الذي يتعين إدراجه في طبعة ٢٠١٩-٢٠٢٠

تُعدّل التعليمات الفنية على النحو المشار إليه في المرفق (أ) بالتقرير عن هذا البند من جدول الأعمال.

التوصية ٢/٢ — تعديل أحكام التدريب في الباب ١ الفصل ٤ من التعليمات الفنية

تُعدّل أحكام التدريب من التعليمات الفنية على النحو المشار إليه في المرفق (ب) بالتقرير عن هذا البند من جدول الأعمال.

التوصية ٣/٢ — المواد الإرشادية لدعم نهج قائم على الكفاءة في التدريب على البضائع الخطرة وتقديرها

أن تُدرج المواد الإرشادية التي يحتوي عليها المرفق (ج) للتقرير بشأن هذا البند من جدول الأعمال في كتاب دوري جديد للإيكاو وتوفير المواد بلا قيد على موقع الإيكاو العام على الإنترنت.

التوصية ٤/٢ — متطلبات الدخول للبضائع الخطرة المسموح به فقط على طائرات البضائع

هذه الاقتضاءات للدخول للبضائع الخطرة المسموح به فقط على طائرات البضائع يُستعرض بواسطة خبراء البضائع الخطرة وصلاحيّة الطائرات للطيران والعمليات بغية تحديد ما إذا كانت فعاليتها كتدبير مخفّف في مواجهة الوقائع خلال الطيران يظل صحيحاً على النحو الموصوف في مشروع بطاقة الوظيفة الذي يحتوي عليه المرفق (د) بالتقرير بشأن هذا البند من جدول الأعمال.

APPENDIX A

PROPOSED AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

Part 1

GENERAL

...

Chapter 1

SCOPE AND APPLICABILITY

...

 UN Model Regulations, Chapter 1.1, Note 1 (see ST/SG/AC.10/44/Add.1)

Note.— Recommendations on Tests and Criteria, which are incorporated by reference into certain provisions of these Instructions, are published as a separate Manual (United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria) (ST/SG/AC.10/11/Rev.6 [and Amend.1](#)), the contents of which are:

...

1.1 GENERAL APPLICABILITY

...

1.1.5 General exceptions

1.1.5.1 Except for 7;4.2, these Instructions do not apply to dangerous goods carried by an aircraft where the dangerous goods are:

...

 DGP-WG/17 (see paragraph 3.2.1.1 of DGP/26-WP/3):

c) for dropping in connection with agricultural, horticultural, forestry, ~~avalanche control~~, ice jam control and landslide clearance or pollution control activities;

~~d) for dropping or triggering in connection with avalanche control activities;~~

~~e) to provide, during flight, or related to the flight, aid in connection with search and rescue operations;~~

~~f) vehicles carried in aircraft designed or modified for vehicle ferry operations and all of the following requirements are met:~~

1) authorization has been given by the appropriate authorities of the States concerned, and such authorities have prescribed specific terms and conditions for the particular operator's operation;

...

~~g) required for the propulsion of the means of transport or the operation of its specialized equipment during transport (e.g. refrigeration units) or that are required in accordance with the operating regulations (e.g. fire extinguishers) (see 2.2).~~

Note.— This exception is only applicable to the means of transport performing the transport operation.

~~h) contained within items of excess baggage being sent as cargo provided that:~~

...

Consequential/editorial amendments:

1.1.5.2 Provision must be made to stow and secure dangerous goods transported under 1.1.5.1 a), b), c) ~~and d)~~ and e) during take-off and landing and at all other times when deemed necessary by the pilot-in-command.

...

1.1.5.4 Dangerous goods transported under 1.1.5.1 a), b), c) ~~and d)~~ and e) may be carried on a flight made by the same aircraft before or after a flight for the purposes identified above, when it is impracticable to load or unload the dangerous goods immediately before or after the flight, subject to the following conditions:

- a) the dangerous goods must be capable of withstanding the normal conditions of air transport;
- b) the dangerous goods must be appropriately identified (e.g. by marking or labelling);
- c) the dangerous goods may only be carried with the approval of the operator;
- d) the dangerous goods must be inspected for damage or leakage prior to loading;
- e) loading must be supervised by the operator;
- f) the dangerous goods must be stowed and secured in the aircraft in a manner that will prevent any movement in flight which would change their orientation;
- g) the pilot-in-command must be notified of the dangerous goods loaded on board the aircraft and their loading location. In the event of a crew change, this information must be passed to the next crew;
- h) all personnel must be trained commensurate with their responsibilities;
- i) the provisions of 7;4.2 and 7;4.4 apply.

1.1.5.5 Dangerous goods transported under 1.1.5.1 a), b), c) ~~and d)~~ and e) may be carried on flights made by the same aircraft for other purposes (e.g. training flights and positioning flights prior to or after maintenance), subject to the conditions in 1.1.5.4 a) to i).

...

Chapter 2

LIMITATION OF DANGEROUS GOODS ON AIRCRAFT

...

2.3 TRANSPORT OF DANGEROUS GOODS BY POST

...

DGP-WG/16 (see paragraph 3.2.1.6 of DGP/26-WP/2):

...

2.3.2 The following dangerous goods may be acceptable in mail for air carriage subject to the provisions of the appropriate national authorities concerned and these Instructions ~~which relate to such material~~:

...

DGP-WG/16 (see paragraph 3.2.1.3 of DGP/26-WP/2):

2.3.3 The procedures of designated postal operators (DPOs) for controlling the introduction of dangerous goods in mail into air transport are subject to review and approval by the civil aviation authority of the State where the mail is accepted.

2.3.4 ~~Before a~~The designated postal operator DPO must have received specific approval from the civil aviation authority before the DPO can introduce the acceptance of lithium batteries as identified in 2.3.2 d) and e) ~~they must have received specific approval from the civil aviation authority.~~

...

Chapter 3

GENERAL INFORMATION

...

3.1 DEFINITIONS

...

UN Model Regulations, Chapter 1.2.1 (see ST/SG/AC.10/44/Add.1)

Animal material. Animal carcasses, animal body parts ~~or animal~~, foodstuffs or feedstuffs derived from animals.

...

UN Model Regulations, Chapter 1.2.1 (see ST/SG/AC.10/44/Add.1)

GHS. The ~~sixth~~ seventh revised edition of the *Globally Harmonized System of Classification and Labelling of Chemicals*, published by the United Nations as document ST/SG/AC.10/30/Rev.6 Rev.7.

...

UN Model Regulations, Chapter 1.2.1 (see ST/SG/AC.10/44/Add.1)

Liquids. Dangerous goods which at 50°C have a vapour pressure of not more than 300 kPa (3 bar), which are not completely gaseous at 20°C and at a pressure of 101.3 kPa, and which have a melting point or initial melting point of 20°C or less at a pressure of 101.3 kPa. A viscous substance for which a specific melting point cannot be determined must be subjected to the ASTM D 4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the *European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)* (United Nations publication: ECE/TRANS/225 257 (Sales No. E.44 16.VIII.1).

...

UN Model Regulations, Chapter 1.2.1 (see ST/SG/AC.10/44/Add.1)

Manual of Tests and Criteria. The sixth revised edition of the United Nations publication entitled Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (ST/SG/AC.10/11/ Rev.6 and Amend.1).

...

Dangerous goods. Articles or substances which are capable of posing a ~~risk~~ hazard to health, safety, property or the environment and which are shown in the list of dangerous goods in these Instructions, or which are classified according to these Instructions.

...

Chapter 4

TRAINING

Revisions to the dangerous goods training provisions to support a competency-based approach to training and assessment are provided in Appendix B and Appendix C to the report under Agenda Item 2. DGP/26 recommended allowing the provisions contained in the 2017-2018 Edition of the Instructions to be used in place of the new provisions until 31 December 2020 and proposed that they be included in Attachment 4 to the 2019-2020 Edition, as shown in Appendix B to the report under Agenda Item 2..

...

Chapter 5

DANGEROUS GOODS SECURITY

...

Note 1.— This Chapter addresses the security responsibilities of operators, shippers and others involved in the transport of dangerous goods aboard aircraft. It should be noted that Annex 17 — Security, provides comprehensive requirements for implementation of security measures by States to prevent unlawful interference with civil aviation or when such interference has been committed. In addition, the Aviation Security Manual (Doc 8973 — Restricted) provides procedures and guidance on aspects of aviation security and is intended to assist States in the implementation of their respective national civil aviation security programmes. The requirements in the Chapter are intended to supplement the requirements of Annex 17 and to implement measures to be taken to minimize theft or misuse of dangerous goods that may endanger persons or property. The provisions of this Chapter do not supersede requirements of Annex 17 or the Aviation Security Manual.

UN Model Regulations, Chapter 1.4.3.2.1 (see ST/SG/AC.10/44/Add.1) and ST/SG/AC.10/C.3/102/Add.1

Note 2.— In addition to the security provisions of these Instructions, appropriate national authorities may implement further security provisions for reasons other than safety of dangerous goods during transport. In order to not impede international and multimodal transport by different explosives security marks, it is recommended that such marks be formatted consistent with an internationally harmonized standard (e.g. European Union Commission Directive 2008/43/EC).

5.3 PROVISIONS FOR HIGH CONSEQUENCE DANGEROUS GOODS

5.3.1 Definition of high consequence dangerous goods

...

UN Model Regulations, Chapter 1.4.3.1.5 (see ST/SG/AC.10/44/Add.1)

5.3.1.5 When radioactive material possess subsidiary ~~risks~~ hazards of other classes or divisions, the criteria of Table 1-7 should also be taken into account (see also 1;6.5).

...

Chapter 6

GENERAL PROVISIONS CONCERNING RADIOACTIVE MATERIAL

...

6.1 SCOPE AND APPLICATION

Corrigendum 1 to UN Model Regulations, Chapter 1.5.1.1 (see ST/SG/AC.10/1/Rev.19/Corr.1)

6.1.1 These Instructions establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material. These Instructions are based on the IAEA *Regulations for the Safe Transport of Radioactive Material*, (2012 Edition), IAEA Safety Standards Series No. SSR-6, IAEA, Vienna (2012). Explanatory material can be found in *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition)*, Safety Standard Series No. ~~TS-G-1.1 (Rev. 1)~~ **SSG-26**, IAEA, Vienna (2008~~2014~~). The prime responsibility for safety must rest with the person or organization responsible for facilities and activities that give rise to radiation risk.

6.1.2 The objective of these Instructions is to establish requirements that must be satisfied to ensure safety and to protect persons, property and the environment from the effects of radiation in the transport of radioactive material. This protection is achieved by requiring:

- a) containment of the radioactive contents;
- b) control of external radiation levels;
- c) prevention of criticality; and
- d) prevention of damage caused by heat.

These requirements are satisfied firstly by applying a graded approach to the limits of the contents for packages and aircraft and to the performance standards, which are applied to package designs depending upon the hazard of the radioactive contents. Secondly, they are satisfied by imposing conditions on the design and operation of packages and on the maintenance of the packagings, including consideration of the nature of the radioactive contents. Finally, they are satisfied by requiring administrative controls including, where appropriate, approval by competent authorities.

UN Model Regulations, Chapter 1.5.5.1 (see ST/SG/AC.10/44/Add.1)

6.5 RADIOACTIVE MATERIAL POSSESSING OTHER DANGEROUS PROPERTIES

In addition to the radioactive and fissile properties, any subsidiary ~~risk~~ **hazard** of the contents of a package, such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness, must also be taken into account in the documentation, packing, labelling, marking, placarding, stowage, segregation and transport, in order to be in compliance with all relevant provisions for dangerous goods of these Instructions.

...

Part 2

CLASSIFICATION OF DANGEROUS GOODS

...

INTRODUCTORY CHAPTER

Parts of this Chapter are affected by State Variations DE 5, NL 4; see Table A-1

1. RESPONSIBILITIES

1.1 Classification must be made by the appropriate national authority when so required or may otherwise be made by the shipper.

1.2 A shipper who has identified, on the basis of test data, that a substance listed by name in column 1 of the Dangerous Goods List in Part 3, Chapter 2, Table 3-1 meets classification criteria for a hazard class or division that is not identified in the list, may, with the approval of the appropriate national authority, consign the substance:

- a) under the most appropriate generic or not otherwise specified (n.o.s.) entry reflecting all hazards; or

UN Model Regulations, 2.0.0.2 (see ST/SG/AC.10/44/Add.1)

- b) under the same UN number and name but with additional hazard communication information as appropriate to reflect the additional subsidiary ~~risk~~ hazard(s) (documentation, label) provided that the primary hazard class remains unchanged and that any other transport conditions (e.g. limited quantity, packaging provisions) that would normally apply to substances possessing such a combination of hazards are the same as those applicable to the substance listed.

...

2. CLASSES, DIVISIONS, PACKING GROUPS — DEFINITIONS

2.1 Substances (including mixtures and solutions) and articles subject to these Instructions are assigned to one of nine classes according to the hazard or the most predominant of the hazards they present. Some of these classes are subdivided into divisions. These classes and divisions are:

Class 1: Explosives

- Division 1.1: Substances and articles which have a mass explosion hazard
- Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard
- Division 1.3: Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard
- Division 1.4: Substances and articles which present no significant hazard
- Division 1.5: Very insensitive substances which have a mass explosion hazard
- Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard

Class 2: Gases

- Division 2.1: Flammable gases
- Division 2.2: Non-flammable, non-toxic gases
- Division 2.3: Toxic gases

Class 3: Flammable liquids

Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases

- Division 4.1: Flammable solids, self-reactive and related substances and solid desensitized explosives and polymerizing substances
- Division 4.2: Substances liable to spontaneous combustion
- Division 4.3: Substances which, in contact with water, emit flammable gases

Class 5: Oxidizing substances and organic peroxides

Division 5.1: Oxidizing substances
Division 5.2: Organic peroxides

Class 6: Toxic and infectious substances

Division 6.1: Toxic substances
Division 6.2: Infectious substances

Class 7: Radioactive material

Class 8: Corrosive substances

Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances

The numerical order of the classes and divisions is not that of the degree of danger.

...

2.5 Dangerous goods are determined to present one or more of the dangers represented by Classes 1 to 9 and divisions and, if applicable, the degree of danger on the basis of the requirements in Part 2, Chapters 1 to 9.

UN Model Regulations, 2.0.1.5 (see ST/SG/AC.10/44/Add.1)

2.6 Dangerous goods presenting a danger of a single class and division are assigned to that class and division and the degree of danger (packing group), if applicable, determined. When an article or substance is specifically listed by name in the Dangerous Goods List (Table 3-1), its class or division, its subsidiary ~~risk~~ hazard(s) and, when applicable, its packing group are taken from this list.

UN Model Regulations, 2.0.1.6 (see ST/SG/AC.10/44/Add.1)

~~2.7 Where a substance or article is not specifically listed by name in Table 3-1 and there are two or more hazards of Class 3, 4 or 8 or Division 5.1 or 6.1 associated with its air transport in that it meets the definition for two of those classes or divisions as shown in Part 2, Chapters 1 to 9, it must be classified in accordance with the precedence of hazards table (Table 2-1). Dangerous goods meeting the defining criteria of more than one hazard class or division and which are not listed by name in Table 3-1, are assigned to a class and division and subsidiary hazard(s) on the basis of the precedence of hazards in 4.~~

...

3. UN NUMBERS AND PROPER SHIPPING NAMES

3.1 Dangerous goods are assigned to UN numbers and proper shipping names according to their hazard classification and their composition.

UN Model Regulations, 2.0.2.2 (see ST/SG/AC.10/44/Add.1)

3.2 Dangerous goods commonly carried are listed in Table 3-1. Where an article or substance is specifically listed by name, it must be identified in transport by the proper shipping name in Table 3-1. Such substances may contain technical impurities (for example, those deriving from the production process) or additives for stability or other purposes that do not affect its classification. However, a substance listed by name containing technical impurities or additives for stability or other purposes affecting its classification must be considered a mixture or solution (see 3.5). For dangerous goods not specifically listed by name, "generic" or "not otherwise specified (n.o.s.)" entries are provided (see 3.8) to identify the article or substance in transport. The substances listed by name in column 1 of Table 3-1 must be transported according to their classification in the list or under the conditions specified in 1.2. Each entry in Table 3-1 is characterized by a UN number. Table 3-1 also contains relevant information for each entry, such as hazard class, subsidiary ~~risk~~ hazard(s) (if any), packing group (where assigned), packing requirements, passenger and cargo aircraft requirements, etc. Entries in Table 3-1 are of the following four types:

...

3.5 A mixture or solution meeting the classification criteria of these Instructions and composed of a single predominant substance identified by name in Table 3-1 and one or more substances not subject to these Instructions and/or traces of one or more substances identified by name in Table 3-1 must be assigned the UN number and proper shipping name of the predominant substance named in Table 3-1, unless:

- a) the mixture or solution is identified by name in Table 3-1 in which case this name must be applied; or
- b) the name and description of the substance named in Table 3-1 specifically indicates that it applies only to the pure substance; or

UN Model Regulations, (2.0.2.5 c) (see ST/SG/AC.10/44/Add.1)

- c) the hazard class or division, subsidiary-risk **hazard**(s), physical state or packing group of the solution or mixture is different from that of the substance named in Table 3-1; or
- d) the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in Table 3-1.

If b), c) or d) is applicable, the mixture or solution must be treated as a dangerous substance not specifically listed by name in Table 3-1.

Note.— Although traces of substances may not need to be taken into account for classification purposes, those traces may affect the properties of the substance and do need to be taken into account when considering the compatibility requirements of 4.1.1.3.

3.6 For a solution or mixture when the hazard class, the physical state or the packing group is changed in comparison with the listed substance, the appropriate n.o.s. entry must be used including its packaging and labelling provisions.

3.7 A mixture or solution containing one or more substances identified by name in Table 3-1 or classified under an n.o.s. entry and one or more substances not subject to these Instructions is not subject to these Instructions if the hazard characteristics of the mixture or solution are such that they do not meet the criteria (including human experience criteria) for any class.

3.8 Substances or articles which are not specifically listed by name in Table 3-1 must be classified under a “generic” or “n.o.s.” entry. The substance or article must be classified according to the class definitions and test criteria in this Part, and is then assigned the “generic” or “n.o.s.” entry in Table 3-1 which most appropriately describes the article or substance.¹ This means that a substance is to be assigned to an entry of type c), as defined in 3.2, only if it cannot be assigned to an entry of type b), and to an entry of type d) only if it cannot be assigned to an entry of type b) or c)¹.

UN Model Regulations, 2.0.2.9 (see ST/SG/AC.10/44/Add.1)

3.9 A mixture or solution meeting the classification criteria of these Instructions that is not identified by name in Table 3-1 and that is composed of two or more dangerous goods must be assigned to an entry that has the proper shipping name, description, hazard class or division, subsidiary-risk **hazard**(s) and packing group that most precisely describe the mixture or solution.

4. PRECEDENCE OF HAZARD CHARACTERISTICS

UN Model Regulations, 2.0.3.1 (see ST/SG/AC.10/44/Add.1)

4.1 The precedence of hazards table (Table 2-1) must be used to determine the class of a substance, mixture or solution having more than one ~~risk~~ **hazard**, when it is not named in Table 3-1 or to assign the appropriate entry for articles containing dangerous goods n.o.s (UN Nos. 3537 to 3548, see 6). For goods having multiple ~~risks~~ **hazards**, which are not specifically listed by name in Table 3-1, the most stringent packing group denoted to the respective hazards of the goods takes precedence over other packing groups, irrespective of Table 2-1. The correct class or division to be used is shown at the point at which the column and row intersect in Table 2-1. The correct packing group to be used is also shown at the point at which the column and row intersect. The precedence of hazard characteristics of the following have not been dealt with in Table 2-1, as the primary characteristics always take precedence:

- a) substances and articles of Class 1;
- b) gases of Class 2;
- c) liquid desensitized explosives of Class 3;

¹. See also the “List of n.o.s. and generic proper shipping names” in Attachment 1, Chapter 2.

- d) self-reactive substances and solid desensitized explosives of Division 4.1;
- e) pyrophoric substances of Division 4.2;
- f) substances of Division 5.2;
- g) substances of Division 6.1 with a Packing Group I inhalation toxicity. Except for substances or preparations meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC₅₀) in the range of Packing Group I, but toxicity through oral ingestion or dermal contact only in the range of Packing Group III or less, which must be allocated to Class 8;
- h) substances of Division 6.2; and
- i) material of Class 7.

UN Model Regulations, 2.0.3.2 (see ST/SG/AC.10/44/Add.1)

4.2 Apart from radioactive material in excepted packages (where the other hazardous properties take precedence), radioactive material having other hazardous properties must always be classified in Class 7 and the subsidiary-risk **hazard** must also be identified. For radioactive material in excepted packages, except for UN 3507, **Uranium hexafluoride, radioactive material, excepted package**, Special Provision A130 applies.

4.3 An article which, apart from its other hazards, also meets the criterion for a magnetized material, must be identified in accordance with the provisions of this section and in addition as a magnetized material.

5. TRANSPORT OF SAMPLES

...

UN Model Regulations, 2.0.4.3 (see ST/SG/AC.10/44/Add.1) and DGP/26 (see paragraph 2.2.1.2 a) of this report)

5.4 Samples of energetic materials for testing purposes

5.4.1 Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.3 in Appendix 6 (Screening Procedures) of the UN Manual of Tests and Criteria may be transported under UN 3224 (self-reactive solid type C) or UN 3223 (self-reactive liquid type C), as applicable, of Division 4.1 provided that:

- a) the samples do not contain any:
 - i) known explosives;
 - ii) substances showing explosive effects in testing;
 - iii) compounds designed with the view of producing a practical explosive or pyrotechnic effect; or
 - iv) components consisting of synthetic precursors of intentional explosives;
- b) for mixtures, complexes or salts of inorganic oxidizing substances of Division 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:
 - i) less than 15 per cent, by mass, if assigned to Packing Group I (high hazard) or II (medium hazard); or
 - ii) less than 30 per cent, by mass, if assigned to Packing Group III (low hazard);
- c) available data do not allow a more precise classification;
- d) the sample is not packed together with other goods;
- e) the sample is packed in accordance with Packing Instruction 459; and
- f) the proper shipping name is supplemented with the word "sample".

UN Model Regulations, 2.0.5 (see ST/SG/AC.10/44/Add.1) and DGP-WG/17 (see paragraph 3.2.2.1 of DGP/26-WP/3) and ST/SG/AC.10/C.3/102/Add.2

6. CLASSIFICATION OF ARTICLES AS ARTICLES CONTAINING DANGEROUS GOODS N.O.S.

6.0 Articles which do not have an existing proper shipping name and which contain only dangerous goods as a residue or as an integral element of the machinery or apparatus must be classified as follows:

- a) where the dangerous goods meet the provisions of Packing Instruction 962: UN 3363 — **Dangerous goods in apparatus or Dangerous goods in machinery**; or
- b) where the net quantity of dangerous goods in the machinery or apparatus exceeds the limits of Packing Instruction 962 but contains dangerous goods permitted as limited quantities within the quantity limits specified in column 7(a) of the UN Model Regulations, see Special Provision A107; or
- c) in accordance with paragraphs 6.1 to 6.6 of this section, as applicable.

6.1 Articles containing dangerous goods may be classified as otherwise provided by these Instructions under the proper shipping name for the dangerous goods they contain or in accordance with this section. For the purposes of this section “article” means machinery, apparatus or other devices containing one or more dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning and that cannot be removed for the purpose of transport. An inner packaging is not an article.

6.2 Such articles may in addition contain batteries. Lithium batteries that are integral to the article must be of a type proven to meet the testing requirements of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3, except when otherwise specified by these Instructions (e.g. for pre-production prototype articles containing lithium batteries or for a small production run, consisting of not more than 100 such articles).

6.3 This section does not apply to articles for which a more specific proper shipping name already exists in Table 3-1.

6.4 This section does not apply to dangerous goods of Class 1, Division 6.2, Class 7 or radioactive material contained in articles.

6.5 Articles containing dangerous goods must be assigned to the appropriate class or division determined by the hazards present using, where applicable, Table 2-1 for each of the dangerous goods contained in the article. If dangerous goods classified as Class 9 are contained within the article, all other dangerous goods present in the article must be considered to present a higher hazard.

6.6 Subsidiary hazards must be representative of the primary hazard posed by the other dangerous goods contained within the article. When only one item of dangerous goods is present in the article, the subsidiary hazard(s), if any, is the subsidiary hazard(s) identified in column 4 of Table 3-1. If the article contains more than one item of dangerous goods and these could react dangerously with one another during transport, each of the dangerous goods must be enclosed separately (see 4;1.1.8).

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Table 2-1. Precedence of hazards and packing groups for Classes 3, 4 and 8 and for Divisions 5.1 and 6.1

...

* Substances of Division 4.1 other than self-reactive substances, and solid desensitized explosives and substances of Class 3 other than liquid desensitized explosives.

** For pesticides only, the primary-risk hazard must be Division 6.1.

— Denotes an impossible combination.

Note.— For hazards not shown in this table, see 4.

Chapter 1

CLASS 1 — EXPLOSIVES

...

Note 4.— Class 1 is unique in that the type of packaging frequently has a decisive effect on the hazard and therefore on the assignment to a particular division. The correct division is determined by use of the procedures provided in this Chapter.

...

1.1 DEFINITIONS AND GENERAL PROVISIONS

Class 1 comprises:

- a) explosive substances (a substance that is not itself an explosive but which can form an explosive atmosphere of gas, vapour or dust is not included in Class 1), except those that are too dangerous to transport or those where the predominant hazard is appropriate to another class;
- b) explosive articles, except devices containing explosive substances in such quantity or of such a character that their inadvertent or accidental ignition or initiation during transport will not cause any effect external to the device either by projection, fire, smoke, heat or loud noise (see 1.5.2); and

UN Model Regulations, 2.1.1.1 c) (see ST/SG/AC.10/44/Add.1)

- c) substances and articles not mentioned under 1.1 a) and b), which are manufactured with a view to producing a practical, explosive or pyrotechnic effect.

...

1.3 DIVISIONS

1.3.1 Class 1 is divided into six divisions:

- a) Division 1.1 — Substances and articles which have a mass explosion hazard (a mass explosion is one which affects almost the entire load virtually instantaneously).
- b) Division 1.2 — Substances and articles which have a projection hazard but not a mass explosion hazard.
- c) Division 1.3 — Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

This division comprises substances and articles which:

- i) give rise to considerable radiant heat, or
- ii) burn one after another, producing minor blast or projection effects or both.
- d) Division 1.4 — Substances and articles which present no significant hazard.

This division comprises substances and articles which present only a small hazard in the event of ignition or initiation during transport. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

Note.— Substances and articles of this division are in Compatibility Group S if they are so packaged or designed that any hazardous effects arising from accidental functioning are confined within the package, unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder fire fighting or other emergency response efforts in the immediate vicinity of the package.

- e) Division 1.5 — Very insensitive substances which have a mass explosion hazard.

This division comprises substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

Note.— For the normal conditions of transport, see Notes 2 to 4 of the Introductory Notes to Part 4.

UN Model Regulations, 2.1.1.4 f) (see ST/SG/AC.10/44/Add.1)

- f) Division 1.6 — Extremely insensitive articles which do not have a mass explosion hazard.

This division comprises articles which predominantly contain extremely insensitive substances and which demonstrate a negligible probability of accidental initiation or propagation.

Note.— ~~The risk~~ **hazard** from articles of Division 1.6 is limited to the explosion of a single article.

...

1.4 COMPATIBILITY GROUPS

1.4.1 Goods of Class 1 are assigned to one of six divisions, depending on the type of hazard they present (see 1.3.1), and to one of thirteen compatibility groups which identify the kinds of explosive substances and articles that are deemed to be compatible. Tables 2-2 and 2-3 show the scheme of classification into compatibility groups, the possible hazard divisions associated with each group, and the consequential classification codes.

UN Model Regulations (Part 1;4.2.1 provisions aren't included in the UN Model Regulations. Amendment is proposed for the sake of alignment with current reference.

1.4.2.1 Certain Division 1.4S explosives, identified by Special Provision A165 in Table 3-1, are subject to Test Series 6 (d) of Part I of the *UN Manual of Tests and Criteria* (see ST/SG/AC.10/11/Rev.6 **and Amend.1**) to demonstrate that any hazardous effects arising from functioning are confined within the package. Evidence of a hazardous effect outside the package includes:

- a) denting or perforation of the witness plate beneath the package;
- b) a flash or flame capable of igniting such as a sheet of 80 ± 3 g/m² paper at a distance of 25 cm from the package;
- c) disruption of the package causing projection of the explosives contents; or
- d) a projection which passes completely through the packaging (a projection or fragment retained or stuck in the wall of the packaging is considered as non-hazardous).

Editorial amendment.— Move paragraph 1.5 after Tables 2-2 and 2-3:

1.5 CLASSIFICATION OF EXPLOSIVES

Note.— ~~For additional information regarding classification of explosives, see UN Recommendations, 2.1.3.1.4, 2.1.3.1.5 and 2.1.3.4.~~

...

 UN Model Regulations, 2.1.2.1.1 (see ST/SG/AC.10/44/Add.1)

Table 2-2. Classification codes

<i>Description of substance or article to be classified</i>	<i>Compatibility group</i>	<i>Classification code</i>
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...

Explosive substance or article containing an explosive substance and presenting a special-risk **hazard** (e.g. due to water activation or presence of hypergolic liquids, phosphides or a pyrophoric substance) and needing isolation of each type

L

1.1L

1.2L

1.3L

...

...

Table 2-3. Scheme of classification of explosives, combination of hazard division with compatibility group

Hazard	Compatibility Group													A-S Σ
	A	B	C	D	E	F	G	H	J	K	L	N	S	
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G		1.1J		1.1L			9
1.2		1.2B	1.2C	1.2D	1.2E	1.2F	1.2G	1.2H	1.2J	1.2K	1.2L			10
1.3			1.3C			1.3F	1.3G	1.3H	1.3J	1.3K	1.3L			7
1.4		1.4B	1.4C	1.4D	1.4E	1.4F	1.4G						1.4S	7
1.5				1.5D										1
1.6												1.6N		1
1.1-1.6 Σ		3	4	4	3	4	4	2	3	2	3	1	1	35

...

Editorial amendment.— Paragraph 1.5 has been moved from before Table 2-2:

1.5 CLASSIFICATION OF EXPLOSIVES

Note.— For additional information regarding classification of explosives, see UN Recommendations, 2.1.3.1.4, 2.1.3.1.5 and 2.1.3.4.

...

 UN Model Regulations, 2.1.3.1.2 c) (see ST/SG/AC.10/44/Add.1)

1.5.1.3 Except for substances that are listed by their proper shipping name in the Dangerous Goods List (Table 3-1), goods must not be offered for transport as Class 1 until they have been subjected to the classification procedure prescribed

in this Chapter. In addition, the classification procedure must be undertaken before a new product is offered for transport. In this context, a new product is one which, in the opinion of the appropriate national authority, involves any of the following:

- a) a new explosive substance or a combination or a mixture of explosive substances which is considered to be significantly different from other combinations or mixtures already classified;
- b) a new design of article or an article containing a new explosive substance or a new combination or mixture of explosive substances;
- c) a new design of package for an explosive substance or article including a new type of inner packaging.

Note.— The importance of this can be overlooked unless it is realized that a relatively minor change in an inner or outer packaging can be critical and can convert a lesser-risk hazard into a mass explosion-risk hazard.

...

1.5.2 Exclusion from Class 1

1.5.2.1 The appropriate national authority may exclude an article or substance from Class 1 by virtue of test results and the Class 1 definition.

1.5.2.2 Where a substance provisionally accepted into Class 1 is excluded from Class 1 by performing Test Series 6 on a specific type and size of package, this substance, when meeting the classification criteria or definition for another class or division, should be listed in the Dangerous Goods List in that class or division with a special provision restricting it to the type and size of package tested.

UN Model Regulations, 2.1.3.6.3 (see ST/SG/AC.10/44/Add.1)

1.5.2.3 Where a substance is assigned to Class 1 but is diluted to be excluded from Class 1 by Test Series 6, this diluted substance (hereafter referred to as desensitized explosive) should be listed in the Dangerous Goods List with an indication of the highest concentration which excluded it from Class 1 (see 2;3.1.4 and 2;4.2.4) and if applicable, the concentration below which it is no longer deemed subject to these Instructions. New solid desensitized explosives subject to these Instructions should be listed in Division 4.1, and new liquid desensitized explosives should be listed in Class 3. When the desensitized explosive meets the criteria or definition for another class or division, the corresponding subsidiary-risk hazard(s) should be assigned to it.

1.5.2.4 An article may be excluded from Class 1 when three unpackaged articles, each individually activated by its own means of initiation or ignition or external means to function in the designed mode, meet the following test criteria:

- a) no external surface has a temperature of more than 65°C. A momentary spike in temperature up to 200°C is acceptable;
- b) no rupture or fragmentation of the external casing or movement of the article or detached parts thereof of more than one metre in any direction;

Note.— Where the integrity of the article may be affected in the event of an external fire, these criteria must be examined by a fire test, such as described in ISO 12097-3.

- c) no audible report exceeding 135 dB(C) peak at a distance of one metre;
- d) no flash or flame capable of igniting a material such as a sheet of 80 ± 10 g/m² paper in contact with the article; and
- e) no production of smoke, fumes or dust in such quantities that the visibility in a one cubic metre chamber equipped with appropriately sized blow out panels is reduced more than 50 per cent as measured by a calibrated light (lux) meter or radiometer located one metre from a constant light source located at the midpoint on opposite walls. The general guidance on optical density testing in ISO 5659-1 and the general guidance on the photometric system described in Section 7.5 in ISO 5659-2 may be used or similar optical density measurement methods designed to accomplish the same purpose may also be employed. A suitable hood cover surrounding the back and sides of the light meter must be used to minimize effects of scattered or leaking light not emitted directly from the source.

Note 1.— If during the tests addressing criteria a), b), c) and d), no smoke, or very little smoke is observed, the test described in e) may be waived.

UN Model Regulations, 2.1.3.6.4 (see ST/SG/AC.10/44/Add.1)

Note 2.— The appropriate national authority may require testing in packaged form if it is determined that, as packaged for transport, the article may pose a greater-risk hazard.

...

1.5.3 Classification documentation

...

1.5.3.4 Examples of the information that may be provided in the classification documents are as follows:

...

- f) the proper shipping name, UN number, class, hazard division and corresponding compatibility group of the explosives;

...

Chapter 2

CLASS 2 — GASES

...

2.2 DIVISIONS

2.2.1 Substances of Class 2 are assigned to one of three divisions based on the primary hazard of the gas during transport.

Note.— UN 1950 — Aerosols, UN 2037 — Receptacles, small, containing gas and UN 2037 — Gas cartridges must be regarded as being in Division 2.1 when the criteria in 2.5.1 a) are met.

- a) Division 2.1 — Flammable gases.

Gases which at 20°C and a standard pressure of 101.3 kPa:

- i) are ignitable when in a mixture of 13 per cent or less by volume with air; or
- ii) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Flammability must be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:2010). Where insufficient data are available to use these methods, tests by a comparable method recognized by the appropriate national authority must be used.

DGP-WG/16 (see paragraph 3.2.2.1 of DGP/26-WP/2):

Note.— UN 1950 — Aerosols and UN 2037 — Receptacles, small, containing gas must be regarded as being in Division 2.1 when the criteria in 2.5.1 a) are met.

...

- c) Division 2.3 — Toxic gases.

Gases which:

- i) are known to be so toxic or corrosive to humans as to pose a hazard to health; or
- ii) are presumed to be toxic or corrosive to humans because they have an LC₅₀ value equal to or less than 5 000 mL/m³ (ppm) when tested in accordance with 6.2.1.3.

UN Model Regulations, 2.2.2.1 (see ST/SG/AC.10/44/Add.1)

Note.— Gases meeting the above criteria owing to their corrosivity are to be classified as toxic with a subsidiary corrosive-risk hazard.

2.3 HAZARD PRECEDENCE

Gases and gas mixtures with hazards associated with more than one division take the following precedence:

- a) Division 2.3 takes precedence over all other divisions;
- b) Division 2.1 takes precedence over Division 2.2.

UN Model Regulations, 2.2.3 (c) (see ST/SG/AC.10/44/Add.1)

2.4 MIXTURES OF GASES

For the classification of gas mixtures into one of the three divisions (including vapours of substance from other classes), the following principles must be used:

...

- c) A gas mixture has a subsidiary ~~risk~~ **hazard** of corrosivity when the mixture is known by human experience to be destructive to the skin, eyes or mucous membranes or when the LC₅₀ value of the mixture's corrosive components is equal to or less than 5 000 mL/m³ (ppm) when the LC₅₀ value is calculated by the formula:

$$LC_{50} \text{ Corrosive (mixture)} = \frac{1}{\sum_{i=1}^n \frac{f_{ci}}{T_{ci}}}$$

...

2.5 AEROSOLS

2.5.1 For aerosols, the division of Class 2 and the subsidiary ~~risks~~ **hazards** depend on the nature of the contents of the aerosol dispenser. The following provisions must apply:

- a) Division 2.1 applies if the contents include 85 per cent by mass or more flammable components and the chemical heat of combustion is 30 kJ/g or more;
- b) Division 2.2 applies if the content contains 1 per cent by mass or less flammable components and the heat of combustion is less than 20 kJ/g;
- c) otherwise the product must be classified as tested by the tests described in the UN *Manual of Tests and Criteria*, Part III, section 31. Extremely flammable and flammable aerosols must be classified in Division 2.1; non-flammable in Division 2.2;
- d) gases of Division 2.3 must not be used as a propellant in an aerosol dispenser;
- e) where the contents other than the propellant of aerosol dispensers to be ejected are classified as Division 6.1, Packing Groups II or III or Class 8, Packing Groups II or III, the aerosol must have a subsidiary ~~risk~~ **hazard** of Division 6.1 or Class 8;
- f) aerosols with contents meeting the criteria of Packing Group I for toxicity or corrosivity are forbidden from transport.

2.5.2 Flammable components are flammable liquids, flammable solids or flammable gases and gas mixtures as defined in Notes 1 to 3 of subsections 31.1.3 of Part III of the UN *Manual of Tests and Criteria*. This designation does not cover pyrophoric, self-heating or water-reactive substances. The chemical heat of combustion must be determined by one of the following methods: ASTM D 240, ISO/FDIS 13943: 1999 (E/F) 86.1 to 86.3 or NFPA 30B.

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Chapter 3

CLASS 3 — FLAMMABLE LIQUIDS

...

3.2 ASSIGNMENT OF PACKING GROUPS

UN Model Regulations, 2.3.2.1, 2.3.2.1.1 and 2.3.2.1.2 (see ST/SG/AC.10/44/Add.1) and DGP-WG/16 (see paragraph 3.2.1.6 of DGP/26-WP/2)

3.2.1 Table 2-4 should be used for the determination of the packing group of a liquid that presents a risk **hazard** due to flammability. For liquids whose only hazard is flammability, the packing group for the ~~material~~ **liquid** is the packing group shown in Table 2-4. For a liquid possessing an additional hazard(s), the packing group, determined by using Table 2-4, and the packing group based on the severity of the additional hazard(s), must be considered. In such cases, the table of precedence of hazard characteristics appearing in Table 2-1 should be used to determine the correct classification of the liquid.

3.2.2 Viscous flammable liquids such as paints, enamels, lacquers, varnishes, adhesives and polishes having a flash point of less than 23°C may be assigned to Packing Group III in conformity with the procedures prescribed in Part III, subsection 32.3 of the UN *Manual of Tests and Criteria* provided that:

- a) the viscosity² and flash point are in accordance with Table 2-5;
- b) less than 3 per cent of the clear solvent layer separates in the solvent separation test;
- c) the mixture or any separated solvent does not meet the criteria for Division 6.1 or Class 8;
- d) the net quantity per package does not exceed 30 L for passenger aircraft or 100 L for cargo aircraft.

3.2.3 Substances classified as flammable liquids due to their being transported or offered for transport at elevated temperatures are included in Packing Group III.

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Chapter 4

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

INTRODUCTORY NOTES

Note 1.— Where the term “water-reactive” is used in these Instructions, it refers to a substance which, in contact with water, emits flammable gas.

Note 2.— Because of the different properties exhibited by the dangerous goods within Divisions 4.1 and 4.2, it is impracticable to establish a single criterion for classification in either of these divisions. Tests and criteria for assignment to the three divisions of Class 4 are addressed in this chapter and in the UN Manual of Tests and Criteria, Part III, section 33.

². Viscosity determination: Where the substance concerned is non-Newtonian, or where a flow cup method of viscosity determination is otherwise unsuitable, a variable shear-rate viscometer must be used to determine the dynamic viscosity coefficient of the substance, at 23°C, at a number of shear rates. The values obtained are plotted against shear rate and then extrapolated to zero shear rate. The dynamic viscosity thus obtained, divided by the density, gives the apparent kinematic viscosity at near-zero shear rate.

UN Model Regulations, 2.4, Introductory notes (see ST/SG/AC.10/44/Add.1)

Note 3.— Since organometallic substances can be classified in Divisions 4.2 or 4.3 with additional subsidiary risks hazards, depending on their properties, a specific classification flowchart for these substances is given in 2.4.5 of the UN Recommendations on the Transport of Dangerous Goods.

...

4.2.3 Division 4.1 — Self-reactive substances

...

UN Model Regulations, 2.4.2.3.2.2 (see ST/SG/AC.10/44/Add.1)

4.2.3.2.3 Self-reactive substances permitted for transport are listed in 4.2.3.2.4. For each permitted substance listed, the appropriate generic entry of the Dangerous Goods List (UN 3221 to 3240) is assigned, and appropriate subsidiary risks hazard(s) and remarks providing relevant information are given. The generic entries specify:

- the self-reactive substance type (B to F);
- the physical state (i.e. liquid/solid); and
- when temperature control is required.

...

UN Model Regulations, 2.4.2.3.2.3 (see ST/SG/AC.10/44/Add.1)

Table 2-6. List of currently assigned self-reactive substances in packages

<i>Self-reactive substance</i>	<i>Concentration (%)</i>	<i>Control temperature (°C)</i>	<i>Emergency temperature (°C)</i>	<i>UN generic entry</i>	<i>Notes</i>
...					
4-Nitrosophenol	100	+35	+40	3236	
<u>Phosphorothioic acid, O-[(cyanophenyl methylene) azanyl] O,O-diethyl ester</u>	<u>82-91 (Z isomer)</u>			<u>3227</u>	<u>8</u>
Self-reactive liquid, sample				3223	6
...					

UN Model Regulations, 2.4.2.3.2.3 Remarks 2 and 10 (see ST/SG/AC.10/44/Add.1)

NOTES:

1. Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2 (b) of the UN Recommendations.
2. "EXPLOSIVE" subsidiary-risk hazard label required and consequently forbidden for transport by air under any circumstance.
3. Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2 (c) of the UN Recommendations.
4. Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2 (d) of the UN Recommendations.
5. With a compatible diluent having a boiling point of not less than 150°C.
6. See 4.2.3.2.6.
7. This entry applies to mixtures of esters of 2-diazo-1-naphthol-4-sulphonic acid and 2-diazo-1-naphthol-5-sulphonic acid meeting the criteria of 2.4.2.3.3.2 d) of the UN Recommendations.
8. This entry applies to the technical mixture in n-butanol within the specified concentration limits of the (Z) isomer.

...

4.2.5 Division 4.1 — Polymerizing substances and mixtures (stabilized)

4.2.5.1 Definitions and properties

4.2.5.1.1 Polymerizing substances are substances which, without stabilization, are liable to undergo a strongly exothermic reaction resulting in the formation of larger molecules or resulting in the formation of polymers under conditions normally encountered in transport. Such substances are considered to be polymerizing substances of Division 4.1 when:

- a) their self-accelerating polymerization temperature (SAPT) is 75°C or less under the conditions (with or without chemical stabilization as offered for transport) and in the packaging in which the substance or mixture is to be transported;
- b) they exhibit a heat of reaction of more than 300 J/g; and
- c) they do not meet any other criteria for inclusion in Classes 1 to 8.

4.2.5.1.2 A mixture meeting the criteria of a polymerizing substance must be classified as a polymerizing substance of Division 4.1.

UN Model Regulations, 2.4.2.5.2 (see ST/SG/AC.10/44/Add.1)

4.2.5.1.3 Polymerizing substances are subject to temperature control in transport if their self-accelerating polymerization temperature (SAPT) is 50 °C or less in the packaging in which the substance is to be transported.

Note.—Substances meeting the criteria of a polymerizing substance and also for inclusion in Classes 1 to 8 are subject to the requirements of Special Provision A209.

4.3 SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION (DIVISION 4.2)

4.3.1 Definitions and properties

4.3.1.1 Division 4.2 includes:

- a) pyrophoric substances: substances, including mixtures and solutions (liquid or solid), which even in small quantities ignite within 5 minutes of coming into contact with air. These substances are the most liable to spontaneous combustion and are called pyrophoric substances; and
- b) self-heating substances: other substances which in contact with air without energy supply are liable to self-heating. These substances will ignite only when in large amounts (kilograms) and after long periods of time (hours or days) and are called self-heating substances.

...

4.4 SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES (DIVISION 4.3)

4.4.1 Definitions and properties

DGP-WG/16 (see paragraph 3.2.2.3 of DGP/26-WP/2):

~~—4.4.1.1—Division 4.3—Substances which, in contact with water, emit flammable gases.~~

~~—4.4.1.2—Certain substances in contact with water emit flammable gases which can form explosive mixtures with air. Such mixtures are easily ignited by all ordinary sources of ignition, for example, naked lights, sparking handtools or unprotected lamps. The resulting blast wave and flames may endanger people and the environment. The test method referred to in 4.4.2 must be used to determine whether the reaction of a substance with water leads to the development of a dangerous amount of gases which may be flammable. It must not be applied to pyrophoric substances.~~

...

Chapter 5

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

...

5.2 OXIDIZING SUBSTANCES (DIVISION 5.1)

5.2.1 Classification in Division 5.1

5.2.1.1 Oxidizing substances are classified in Division 5.1 in accordance with the test methods, procedures and criteria in 5.2.2, 5.2.3 and the UN *Manual of Tests and Criteria*, Part III, section 34. In the event of divergence between test results and known experience, the appropriate authority of the State in which the dangerous goods were manufactured must be consulted to establish the appropriate classification and packing group.

Note.— Where substances of this division are listed in the Dangerous Goods List in 3;2, reclassification of those substances in accordance with these criteria need only be undertaken when this is necessary for safety.

UN Model Regulations, 2.5.2.1.2 (see ST/SG/AC.10/44/Add.1)

5.2.1.2 By exception, solid ammonium nitrate based fertilizers must be classified in accordance with the procedure as set out in the UN *Manual of Tests and Criteria*, Part III, section 39.

5.2.1.3 For substances having other hazards, e.g. toxicity or corrosivity, the requirements of Part 2, Introductory Chapter must be met.

...

5.3.2.3 Organic peroxides permitted for transport are listed in 5.3.2.4. For each permitted substance, Table 2-7 assigns the appropriate generic entry in the Dangerous Goods List (UN 3103 to 3120) and provides relevant information. The generic entries specify:

- a) organic peroxide type (B to F);
- b) physical state (liquid or solid); and
- c) temperature control, when required (see 5.3.3).

...

5.3.2.4 *List of currently assigned organic peroxides in packagings*

~~—The following table (Table 2-7) is reproduced from 2.5.3.2.4 of the UN *Recommendations on the Transport of Dangerous Goods* (Eighteenth revised edition), with irrelevant material removed.~~

5.3.2.5 Table 2-7 provides a list of currently assigned organic peroxides in packagings. Classification of organic peroxides not listed in ~~5.3.2.4~~ Table 2-7 and assignment to a generic entry must be made by the appropriate authority of the State in which the dangerous goods were manufactured on the basis of a test report. Principles applying to the classification of such substances are provided in 2.5.3.3 of the UN Recommendations. The applicable classification procedures, test methods and criteria, and an example of a suitable test report, are given in the current edition of the UN *Manual of Tests and Criteria*, Part II. The statement of approval must contain the classification and the relevant transport conditions.

5.3.2.6 Samples of new formulations of organic peroxides not listed in 5.3.2.4 for which complete test data are not available and which are to be transported for further testing or evaluation may be assigned to one of the appropriate entries for **Organic peroxide Type C** provided that the following conditions are met:

- a) the available data indicate that the sample would be no more dangerous than organic peroxide type B;
- b) it is packed in a combination packaging consisting of a plastic IP.2 inner packaging with a capacity not exceeding 0.5 L or 0.5 kg which is placed in a wooden box (4C1), plywood box (4D) or fibreboard box (4G) with the maximum net quantity per package not exceeding 1 L or 1 kg; and

- c) the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

...

Table 2-7. List of currently assigned organic peroxides in ~~packages~~ packagings

UN Model Regulations 2.5.3.2.4 (see ST/SG/AC.10/44/Add.1)

Organic peroxide	Concentration (per cent)	Diluent type A (per cent)	Diluent type B (per cent) (Note 1)	Inert solid (per cent)	Water (per cent)	Control tempera- ture (°C)	Emergency tempera- ture (°C)	UN generic entry	Notes <u>S</u> <u>ub-</u> <u>sidary</u> <u>hazards</u> <u>and</u> <u>notes</u>
...									
Di-(4-tert-butylcyclohexyl) peroxydicarbonate	≤100					+30	+35	3114	
<u>Di-(4-tert-butylcyclohexyl) peroxydicarbonate</u>	<u>≤42 as a paste</u>					<u>+35</u>	<u>+40</u>	<u>3116</u>	
Di-(4-tert-butylcyclohexyl) peroxydicarbonate	≤42 as a stable dispersion in water					+30	+35	3119	
...									
Diisobutyl peroxide	>32-52		≥48			-20	-10	FORBIDDEN	3
<u>Diisobutyl peroxide</u>	<u>≤42 as a stable dispersion in water</u>					<u>-20</u>	<u>-10</u>	<u>3119</u>	
Diisobutyl peroxide	≤32		≥68			-20	-10	3115	
nn									
...									
Peroxy lauric acid	≤100					+35	+40	3118	
<u>1-Phenylethyl hydroperoxide</u>	<u>≤38</u>		<u>≥ 62</u>					<u>3109</u>	
Pinanyl hydroperoxide	>56-100							3105	13
...									

UN Model Regulations, 2.5.3.2.4 (see ST/SG/AC.10/44/Add.1)

Notes:

- Diluent type B may always be replaced by diluent type A. Boiling point diluent type B should be at least 60°C higher than the SADT of the organic peroxide.
- Available oxygen ≤4.7 per cent.
- "EXPLOSIVE" subsidiary-risk hazard label required and consequently forbidden for transport by air under any circumstance.
- Diluent may be replaced by Di-tert-butyl peroxide.
- Available oxygen ≤9 per cent.
- With ≤9 per cent hydrogen peroxide; available oxygen ≤10 per cent.
- Only non-metallic packagings allowed.
- Available oxygen >10 per cent and ≤10.7 per cent, with or without water.
- Available oxygen ≤10 per cent, with or without water.
- Available oxygen ≤8.2 per cent, with or without water.

11. See 5.3.2.6.
12. Not used.
13. "CORROSIVE" subsidiary-risk **hazard** label required (see Figure 5-24).
14. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
15. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
16. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
17. Addition of water to this organic peroxide will decrease its thermal stability.
18. No "CORROSIVE" subsidiary-risk **hazard** label required for concentrations below 80 per cent.
19. Mixtures with hydrogen peroxide, water and acid(s).
20. With diluent type A, with or without water.
21. With ≥ 25 per cent diluent type A by mass, and in addition ethylbenzene.
22. With ≥ 19 per cent diluent type A by mass, and in addition methyl isobutyl ketone.
23. With < 6 per cent di-tert-butyl peroxide.
24. With ≤ 8 per cent 1-isopropylhydroperoxy-4-isopropylhydroxybenzene.
25. Diluent type B with boiling point $> 110^{\circ}\text{C}$.
26. With < 0.5 per cent hydroperoxides content.
27. For concentrations more than 56 per cent, "CORROSIVE" subsidiary-risk **hazard** label required (see Figure 5-24).
28. Available active oxygen ≤ 7.6 per cent in diluent type A having a 95 per cent boil-off point in the range of $200\text{--}260^{\circ}\text{C}$.
29. Not subject to the requirements of these Instructions for Division 5.2.
30. Diluent type B with boiling point $> 130^{\circ}\text{C}$.
31. Active oxygen ≤ 6.7 per cent.

Chapter 6

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

...

UN Model Regulations, 2.6.2.2.1 (a) (b) and (c) (see ST/SG/AC.10/44/Add.1)

6.2.2 Assignment of packing groups

6.2.2.1 Substances of Division 6.1, including pesticides, are allocated among the three packing groups, according to the degree of their toxic hazards in transport as follows:

- a) Packing Group I — Substances and preparations presenting a very severe toxicity ~~risk~~ **hazard**;
- b) Packing Group II — Substances and preparations presenting a serious toxicity ~~risk~~ **hazard**;
- c) Packing Group III — Substances and preparations presenting a relatively low toxicity ~~risk~~ **hazard**.

...

Editorial amendment:

6.2.2.4.1 The grouping criteria for the oral and dermal routes as well as for inhalation of dusts and mists are as shown in Table 2-8.

Note. — Substances meeting the criteria of Class 8 and with an inhalation toxicity of dusts and mists (LC_{50}) leading to Packing Group I are only accepted for an allocation to Division 6.1 if the toxicity through oral ingestion or dermal contact is at least in the range of Packing Group I or II. Otherwise, an allocation to Class 8 is made when appropriate (see ~~8.2.3~~ **8.2.4**).

...

6.2.4 Classification of pesticides

UN Model Regulations, 2.6.4.1 (see ST/SG/AC.10/44/Add.1)

6.2.4.1 All active pesticide substances and their preparations for which the LC_{50} and/or LD_{50} values are known and which are classified in Division 6.1 must be classified under appropriate packing groups in accordance with the criteria given in 6.2.2. Substances and preparations which are characterized by subsidiary ~~risks~~ **hazards** must be classified according to the precedence of hazards table (Table 2-1) with the assignment of appropriate packing groups.

6.2.4.2 If the oral or dermal LD₅₀ value for a pesticide preparation is not known, but the LD₅₀ value of its active substance(s) is known, the LD₅₀ value for the preparation may be obtained by applying the procedures in 6.2.3.

Note.— LD₅₀ toxicity data for a number of common pesticides may be obtained from the most current edition of the document The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification available from the International Programme on Chemical Safety, World Health Organization (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD₅₀ data for pesticides, its classification system should not be used for purposes of transport classification of, or assignment of packing groups to, pesticides which must be in accordance with these Instructions.

UN Model Regulations, 2.6.4.3 (see ST/SG/AC.10/44/Add.1)

6.2.4.3 The proper shipping name used in the transport of the pesticide must be selected on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary-risks hazards it may exhibit.

...

6.3 DIVISION 6.2 — INFECTIOUS SUBSTANCES

...

6.3.6 Infected animals

6.3.6.1 Infected live animals

Live animals must not be used to consign infectious substances unless such a substance cannot be consigned by any other means. A live animal that has been intentionally infected and is known or suspected to contain an infectious substance may only be transported by air under the terms and conditions of an approval granted by the appropriate national authorities of the States of Origin, Transit, Destination and Operator in accordance with the Supplement to these Instructions (Part S-1;2).

UN Model Regulations, 2.6.3.6.2 (see ST/SG/AC.10/44/Add.1)

6.3.6.2 ~~Infected animal material~~ Deleted

~~Animal material from animals intentionally infected for the purpose of propagating pathogens of Category A or which would be assigned to Category A in cultures only, must be assigned to UN 2814 or UN 2900, as appropriate. Animal material infected by pathogens of Category B other than those which would be assigned to Category A if they were in cultures must be assigned to UN 3373.~~

...

UN Model Regulations, Chapter 2.8 (see ST/SG/AC.10/44/Add.1)

Chapter 8

CLASS 8 — CORROSIVE SUBSTANCES

8.1 DEFINITION OF CLASS 8 AND GENERAL PROVISIONS

8.1.1 Class 8 substances (Corrosive substances) are substances which, by chemical action, will cause severe irreversible damage when in contact with living tissue to the skin or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport.

8.1.2 For substances and mixtures that are corrosive to skin, general classification provisions are provided in 8.2. Skin corrosion refers to the production of irreversible damage to the skin, namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.

8.1.3 Liquids and solids which may become liquid during transport, which are judged not to be skin corrosive, must still be considered for their potential to cause corrosion to certain metal surfaces in accordance with the criteria in 8.3.3 c) ii).

8.2 ~~ASSIGNMENT OF PACKING GROUPS~~ GENERAL CLASSIFICATION PROVISIONS

8.2.1 Substances and ~~preparations~~ mixtures of Class 8 are divided among the three packing groups according to their degree of ~~hazard~~ danger in transport as follows:

- a) Packing Group I: Very dangerous substances and ~~preparations~~ mixtures;
- b) Packing Group II : Substances and ~~preparations~~ mixtures presenting medium danger;
- c) Packing Group III: Substances and ~~preparations~~ mixtures presenting minor danger.

8.2.2 Allocation of substances in Class 8 listed in Table 3-1 to the packing groups referred to in the Introductory Chapter to Part 2 in Class 8 has been made on the basis of experience, taking into account such additional factors as inhalation risk (see 8.2.4.) and reactivity with water, including the formation of hazardous decomposition products.

8.2.3 ~~New substances, including and mixtures, can be assigned to packing groups on the basis of the length of time of contact necessary to produce full thickness destruction of human skin~~ irreversible damage of intact skin tissue in accordance with the criteria in 8.3. Liquids, and solids which may become liquid during transport, which are judged not to cause full thickness destruction of human skin must still be considered for their potential to cause corrosion to certain metal surfaces in accordance with the criteria in 8.2.5 c) ii). Alternatively, for mixtures, the criteria in 8.4 can be used.

~~8.2.3~~ 8.2.4 A substance or ~~preparation~~ mixture meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC₅₀) in the range of Packing Group I, but toxicity through oral ingestion or dermal contact only in the range of Packing Group III or less, must be allocated to Class 8 (see Note under 6.2.2.4.1).

8.3 PACKING GROUP ASSIGNMENT FOR SUBSTANCES AND MIXTURES

8.3.1 Existing human and animal data, including information from single or repeated exposure, must be the first line of evaluation, as they give information directly relevant to effects on the skin.

~~8.2.4~~ 8.3.2 In assigning the packing group to a substance in accordance with ~~8.2.2~~ 8.2.3, account must be taken of human experience in instances of accidental exposure. In the absence of human experience, the ~~packing group~~ ing must be based on data obtained from experiments in accordance with OECD Guideline for the Testing of Chemicals No. 404, *Acute Dermal Irritation/Corrosion*, ~~2002~~ 2015 or No. 435, *In Vitro Membrane Barrier Test Method for Skin Corrosion*, ~~2006~~ 2015. A substance or mixture which is determined not to be corrosive in accordance with OECD Guideline for the Testing of Chemicals No. 430, *In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)*, ~~2004~~ 2015 or No. 431, *In Vitro Skin Corrosion: Human Skin Model Test*, ~~2004~~ 2015 may be considered not to be corrosive to skin for the purposes of these Instructions without further testing.

~~8.2.5~~ 8.3.3 Packing groups are assigned to corrosive substances in accordance with the following criteria (see Table 2-15):

- a) *Packing Group I* is assigned to substances that cause ~~full thickness destruction~~ irreversible damage of intact skin tissue within an observation period of up to 60 minutes starting after ~~an~~ the exposure time of 3 minutes or less.
- b) *Packing Group II* is assigned to substances that cause ~~full thickness destruction~~ irreversible damage of intact skin tissue within an observation period of up to 14 days starting after ~~an~~ the exposure time of more than 3 minutes but not more than 60 minutes.
- c) *Packing Group III* is assigned to substances that:
 - i) cause ~~full thickness destruction~~ irreversible damage of intact skin tissue within an observation period of up to 14 days starting after ~~an~~ the exposure time of more than 60 minutes but not more than 4 hours; or
 - ii) are judged not to cause ~~full thickness destruction~~ irreversible damage of intact skin tissue but which exhibit a corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55°C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574; or Unified Numbering System (UNS) G10200 or a similar type or SAE 1020, and for testing aluminium, non-clad types 7075-T6 or AZ5GU-T6, must be used. An acceptable test is prescribed in the UN *Manual of Tests and Criteria*, Part III, Section 37.

Note.— Where an initial test on either steel or aluminium indicates the substance being tested is corrosive, the follow up test on the other metal is not required.

Paragraph 8.3 of the 2017-2018 Edition is moved to 8.5

8.3—SUBSTANCES FORBIDDEN FOR TRANSPORT

Chemically unstable substances of Class 8 are forbidden for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see Special Provision A209. To this end, particular care must be taken to ensure that receptacles do not contain any substances liable to promote these reactions.

Table 2-15. Summary of criteria for assigning packing groups to corrosive substances

Packing group	Exposure time	Observation period	Effect
	≤ 3 min	≤ 60 min	Full thickness destruction <u>Irreversible damage</u> of intact skin
II	> 3 min ≤ 1 h	≤ 14 d	Full thickness destruction <u>Irreversible damage</u> of intact skin
III	> 1 h ≤ 4 h	≤ 14 d	Full thickness destruction <u>Irreversible damage</u> of intact skin
III	—	—	Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55°C when tested on both materials

8.4 Alternative packing group assignment methods for mixtures: Step-wise approach

8.4.1 General provisions

8.4.1.1 For mixtures, it is necessary to obtain or derive information that allows the criteria to be applied to the mixture for the purpose of classification and assignment of packing groups. The approach to classification and assignment of packing groups is tiered, and is dependent upon the amount of information available for the mixture itself, for similar mixtures and/or for its ingredients. The flow chart of Figure 2-2 outlines the process to be followed.

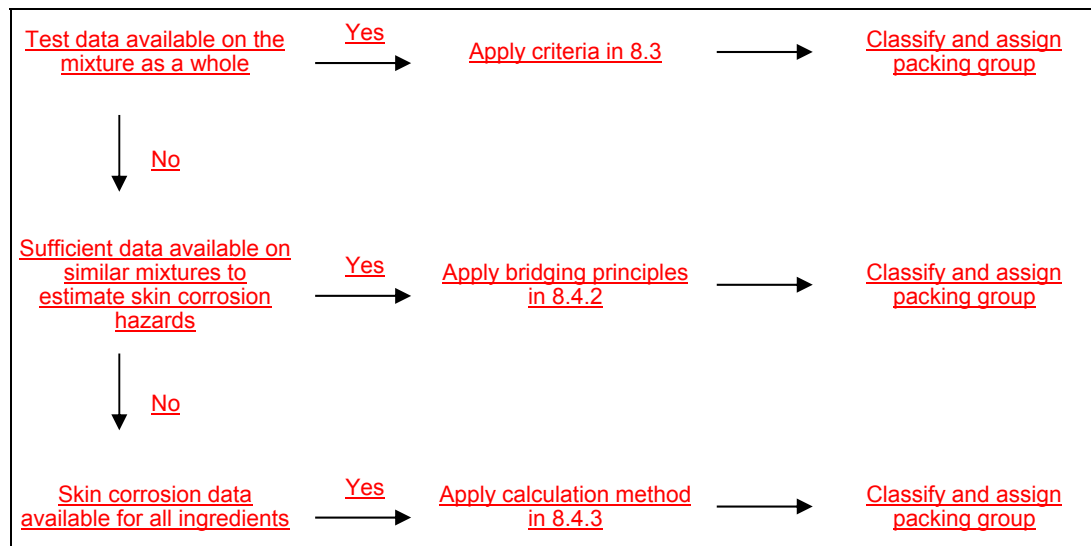


Figure 2-2 Step-wise approach to classify and assign packing group of corrosive mixtures

8.4.2 Bridging principles

8.4.2.1 Where a mixture has not been tested to determine its skin corrosion potential, but there are sufficient data on both the individual ingredients and similar tested mixtures to adequately classify and assign a packing group for the mixture, these data will be used in accordance with the following bridging principles. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture.

- a) *Dilution.* If a tested mixture is diluted with a diluent which does not meet the criteria for Class 8 and does not affect the packing group of other ingredients, then the new diluted mixture may be assigned to the same packing group as the original tested mixture.

Note.— In certain cases, diluting a mixture or substance may lead to an increase in the corrosive properties. If this is the case, this bridging principle cannot be used.

- b) *Batching.* The skin corrosion potential of a tested production batch of a mixture can be assumed to be substantially equivalent to that of another untested production batch of the same commercial product when produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the skin corrosion potential of the untested batch has changed. If the latter occurs, a new classification is necessary.

- c) *Concentration of mixtures of Packing Group I.* If a tested mixture meeting the criteria for inclusion in Packing Group I is concentrated, the more concentrated untested mixture may be assigned to Packing Group I without additional testing.

- d) *Interpolation within one packing group.* For three mixtures (A, B and C) with identical ingredients, where mixtures A and B have been tested and are in the same skin corrosion packing group, and where untested mixture C has the same Class 8 ingredients as mixtures A and B but has concentrations of Class 8 ingredients intermediate to the concentrations in mixtures A and B, then mixture C is assumed to be in the same skin corrosion packing group as A and B.

- e) *Substantially similar mixtures.* Given the following:

i) two mixtures: (A+B) and (C+B);

ii) the concentration of ingredient B is the same in both mixtures;

iii) the concentration of ingredient A in mixture (A+B) equals the concentration of ingredient C in mixture (C+B);

iv) data on skin corrosion for ingredients A and C are available and substantially equivalent, i.e. they are the same skin corrosion packing group and do not affect the skin corrosion potential of B;

if mixture (A+B) or (C+B) is already classified based on test data, then the other mixture may be assigned to the same packing group.

8.4.3 Calculation method based on the classification of the substances

8.4.3.1 Where a mixture has not been tested to determine its skin corrosion potential, nor is sufficient data available on similar mixtures, the corrosive properties of the substances in the mixture must be considered to classify and assign a packing group. Applying the calculation method is only allowed if there are no synergistic effects that make the mixture more corrosive than the sum of its substances. This restriction applies only if Packing Group II or III would be assigned to the mixture.

8.4.3.2 When using the calculation method, all Class 8 ingredients present at a concentration of ≥ 1 per cent must be taken into account, or < 1 per cent if these ingredients are still relevant for classifying the mixture to be corrosive to skin.

8.4.3.3 To determine whether a mixture containing corrosive substances must be considered a corrosive mixture and to assign a packing group, the calculation method in the flow chart in Figure 2-3 must be applied.

8.4.3.4 When a specific concentration limit (SCL) is assigned to a substance following its entry in Table 3-1 or in a special provision, this limit must be used instead of the generic concentration limits (GCL). This appears where 1 per cent is used in the first step for the assessment of the Packing Group I substances, and where 5 per cent is used for the other steps respectively in Figure 2-3.

8.4.3.5 For this purpose, the summation formula for each step of the calculation method must be adapted. This means that, where applicable, the generic concentration limit must be substituted by the specific concentration limit assigned to the substance(s) (SCL_i), and the adapted formula is a weighted average of the different concentration limits assigned to the different substances in the mixture:

$$\frac{PGx_1}{GCL} + \frac{PGx_2}{SCL_2} + \dots + \frac{PGx_i}{SCL_i} \geq 1$$

Where:

PG_x = concentration of substance 1, 2 ... i in the mixture, assigned to Packing Group x (I, II or III)

GCL = generic concentration limit

SCL_i = specific concentration limit assigned to substance i

The criterion for a packing group is fulfilled when the result of the calculation is ≥ 1 . The generic concentration limits to be used for the evaluation in each step of the calculation method are those found in Figure 2-3.

Note.— Examples for the application of the above formula:

Example 1

A mixture contains one corrosive substance in a concentration of 5 per cent assigned to Packing Group I without a specific concentration limit:

Calculation for packing group I:

$$\frac{5}{5 (GCL)} = 1 \rightarrow \text{assign to Class 8, Packing Group I:}$$

Example 2

A mixture contains three substances corrosive to skin; two of them (A and B) have specific concentration limits; for the third one (C) the generic concentration limits apply. The rest of the mixture needs not to be taken into consideration:

<u>Substance X in the mixture and its packing group assignment within Class 8</u>	<u>Concentration (conc) in the mixture</u>	<u>Specific concentration limit (SCL) for Packing Group I</u>	<u>Specific concentration limit (SCL) for Packing Group II</u>	<u>Specific concentration limit (SCL) for Packing Group III</u>
<u>A — assigned to Packing Group I</u>	<u>3%</u>	<u>30%</u>	<u>none</u>	<u>none</u>
<u>B — assigned to Packing Group I</u>	<u>2%</u>	<u>20%</u>	<u>10%</u>	<u>none</u>
<u>C — assigned to Packing Group III</u>	<u>10%</u>	<u>none</u>	<u>none</u>	<u>none</u>

Calculation for Packing Group I:

$$\frac{3 (conc A)}{30 (SCL PGI)} + \frac{2 (conc B)}{20 (SCL PGI)} = 0.2 < 1$$

The criterion for Packing Group I is not fulfilled.

Calculation for Packing Group II:

$$\frac{3 (conc A)}{5 (GCL PG II)} + \frac{2 (conc B)}{10 (SCL PG II)} = 0.8 < 1$$

The criterion for Packing Group II is not fulfilled.

Calculation for Packing Group III:

$$\frac{3 (\text{conc A})}{5 (GCL PG III)} + \frac{2 (\text{conc B})}{5 (GCL PG III)} + \frac{10 (\text{conc C})}{5 GCL PG III} = 3 \geq 1$$

The criterion for Packing Group III is fulfilled, the mixture must be assigned to Class 8, Packing Group III.

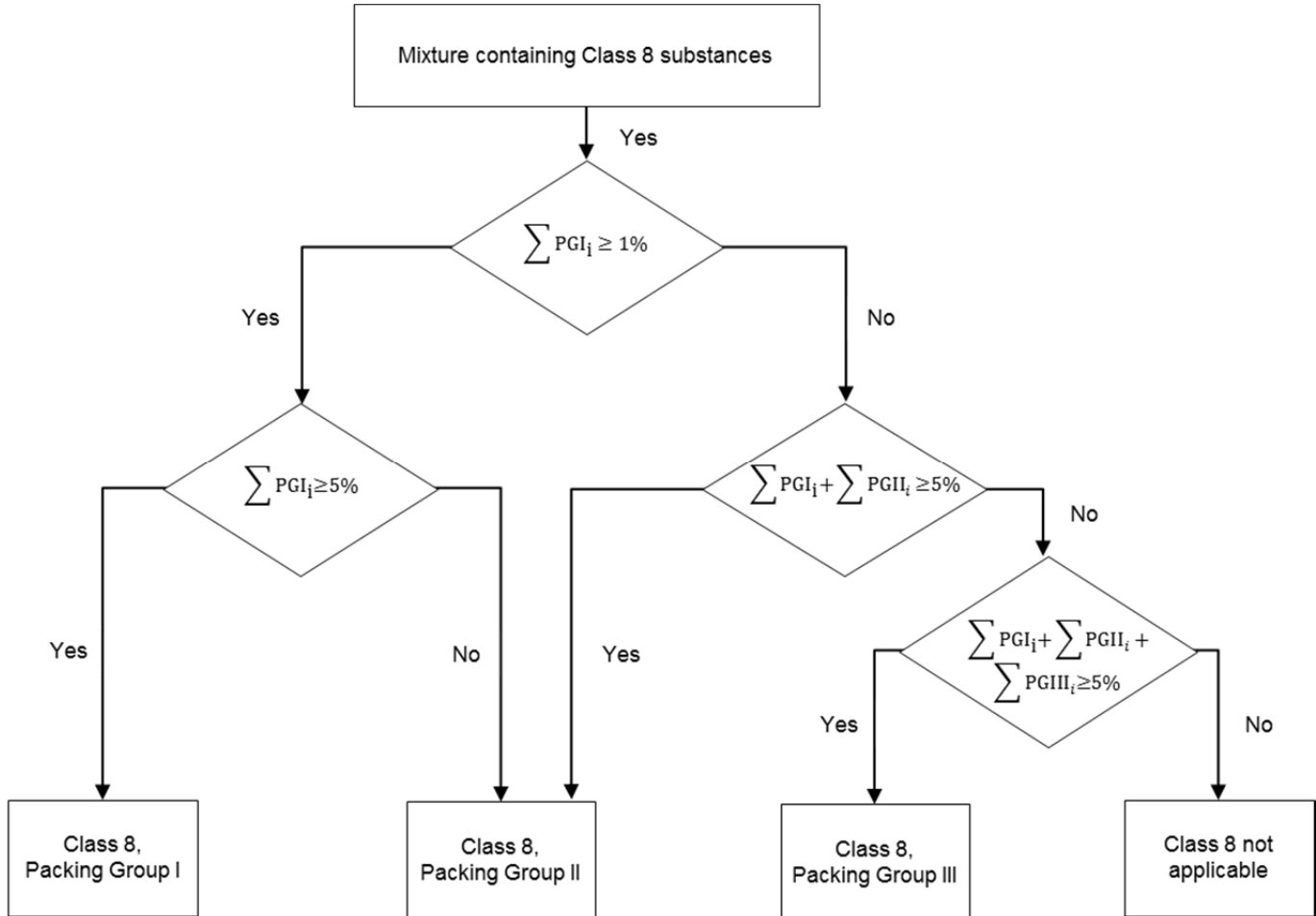


Figure 2-3. Calculation method

Paragraph 8.5 was moved from 8.3 of the 2017-2018 Edition (no changes).

8.5 SUBSTANCES FORBIDDEN FOR TRANSPORT

Chemically unstable substances of Class 8 are forbidden for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see Special Provision A209. To this end, particular care must be taken to ensure that receptacles do not contain any substances liable to promote these reactions.

Chapter 9

CLASS 9 — MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES, INCLUDING ENVIRONMENTALLY HAZARDOUS SUBSTANCES

...

9.3 LITHIUM BATTERIES

9.3.1 Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form must be assigned to UN Nos. 3090, 3091, 3480 or 3481, as appropriate. They may be transported under these entries if they meet the following provisions:

- a) each cell or battery is of the type proved to meet the requirements of each test of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;

Cells and batteries manufactured according to a type meeting the requirements of subsection 38.3 of the UN *Manual of Tests and Criteria*, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type testing may continue to be transported, unless otherwise provided in these Instructions.

Cell and battery types only meeting the requirements of the UN Manual of Tests and Criteria, Revision 3, are no longer valid. However, cells and batteries manufactured in conformity with such types before 1 July 2003 may continue to be transported if all other applicable requirements are fulfilled.

Note.— Batteries must be of a type proved to meet the testing requirements of the UN Manual of Tests and Criteria, Part III, subsection 38.3, irrespective of whether the cells of which they are composed are of a tested type.

- b) each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;
- c) each cell and battery is equipped with an effective means of preventing external short circuits;
- d) each battery containing cells or a series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (e.g. diodes, fuses, etc.);
- e) cells and batteries must be manufactured under a quality management programme that includes:
- 1) a description of the organizational structure and responsibilities of personnel with regard to design and product quality;
 - 2) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;
 - 3) process controls that should include relevant activities to prevent and detect internal short circuit failure during manufacture of cells;
 - 4) quality records, such as inspection reports, test data, calibration data and certificates. Test data must be kept and made available to the appropriate national authority upon request;
 - 5) management reviews to ensure the effective operation of the quality management programme;
 - 6) a process for control of documents and their revision;
 - 7) a means for control of cells or batteries that are not conforming to the type tested in accordance with Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*;
 - 8) training programmes and qualification procedures for relevant personnel; ~~and~~
 - 9) procedures to ensure that there is no damage to the final product. ~~;~~

Note.— In-house quality management programmes may be accepted. Third-party certification is not required, but the procedures listed in 1) to 9) above must be properly recorded and traceable. A copy of the quality management programme must be made available to the appropriate national authority upon request.

UN Model Regulations, 2.9.4 (see ST/SG/AC.10/44/Add.1) and DGP/26 (see paragraph 2.2.1.2 c) of this report)

f) lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see Special Provision A213) must meet the following conditions:

(i) the rechargeable lithium ion cells can only be charged from the primary lithium metal cells;

ii) overcharge of the rechargeable lithium ion cells is precluded by design;

iii) the battery has been tested as a lithium primary battery;

iv) component cells of the battery must be of a type proved to meet the respective testing requirements of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and

g) manufacturers and subsequent distributors of cells or batteries manufactured after 30 June 2003 must make available the test summary as specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3, paragraph 38.3.5. This test summary must be made available from 1 January 2020.

...

Part 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

Chapter 1

GENERAL

...

1.2.7 Generic or "not otherwise specified" (n.o.s.) names

...

1.2.7.1.1 The technical name must be a recognized chemical or biological name or other name currently used in scientific and technical handbooks, journals and texts. Trade names must not be used for this purpose. In the case of pesticides, only ISO common name(s), other name(s) in the World Health Organization (WHO) *Recommended Classification of Pesticides by Hazard and Guidelines to Classification*, or the name(s) of the active substance(s) may be used.

UN Model Regulations, 3.1.2.8.1.2 (see ST/SG/AC.10/44/Add.1)

1.2.7.1.2 When a mixture of dangerous goods ~~is~~ or articles containing dangerous goods are described by one of the "n.o.s." or "generic" entries where an asterisk is indicated in column 1 of the Dangerous Goods List, not more than the two constituents which most predominantly contribute to the hazard or hazards of ~~a~~ the mixture or of the articles need to be shown, excluding controlled substances when their disclosure is prohibited by national law or international convention. If a package containing a mixture is labelled with any subsidiary ~~risk~~ hazard label, one of the two technical names as shown in parentheses must be the name of the constituent which compels the use of the subsidiary ~~risk~~ hazard label.

UN Model Regulations, 3.1.2.8.1.3 (see ST/SG/AC.10/44/Add.1)

1.2.7.1.3 Examples illustrating the selection of the proper shipping name supplemented with the technical name of the dangerous goods for such n.o.s. entries are:

UN 3540 Articles containing flammable liquids n.o.s. (pyrrolidine)

UN 3394 Organometallic substance, liquid, pyrophoric, water-reactive (Trimethylgallium)

UN 2902 Pesticide, liquid, toxic, n.o.s. (Drazoxolon).

Note. — As an aid to choosing the most appropriate n.o.s. or generic name, all the n.o.s. entries and the main generic entries of Table 3-1 are listed in Attachment 1, Chapter 2.

...

1.3 MIXTURES OR SOLUTIONS

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1.3.2 A mixture or solution meeting the classification criteria of these Instructions composed of a single predominant substance identified by name in Table 3-1 and one or more substances not subject to these Instructions and/or traces of one or more substances identified by name in Table 3-1 must be assigned the UN number and proper shipping name of the predominant substance named in Table 3-1, unless:

- a) the mixture or solution is specifically identified by name in Table 3-1 in which case this name must be applied; or
- b) the name and description of the substance named in Table 3-1 specifically indicates that it applies only to the pure substance; or

UN Model Regulations, 3.1.3.2 (c) (see ST/SG/AC.10/44/Add.1)

- c) the hazard class or division, subsidiary-risk **hazard**(s), physical state or packing group of the solution or mixture is different from that of the substance named in Table 3-1; or
- d) the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in Table 3-1.

If b), c) or d) is applicable, the mixture or solution must be treated as a substance not specifically listed by name in Table 3-1.

Note.— Although traces of substances may not need to be taken into account for classification purposes, those traces may affect the properties of the substance and do need to be taken into account when considering the compatibility requirements of 4;1.1.3.

...

UN Model Regulations, 3.1.3.3 (see ST/SG/AC.10/44/Add.1)

1.3.4 A mixture or solution meeting the classification criteria of these Instructions that is not identified by name in Table 3-1 and that is composed of two or more dangerous goods must be assigned to an entry that has the proper shipping name, description, hazard class or division, subsidiary-risk **hazard**(s) and packing group that most precisely describe the solution or mixture.

Chapter 2

ARRANGEMENT OF THE DANGEROUS GOODS LIST (TABLE 3-1)

...

2.1 ARRANGEMENT OF THE DANGEROUS GOODS LIST (TABLE 3-1)

UN Model Regulations, 3.2.1, description of Column 4 (see ST/SG/AC.10/44/Add.1)

- Column 4 “Subsidiary-risk **hazard**” — this column contains the class or division number of any important subsidiary-risk **hazards** which have been identified by applying the classification found in Part 2; Chapters 1 to 9. Requirements for the labelling of dangerous goods which have subsidiary-risk **hazards** are given in 5;3.2.
- Column 5 “Labels” — this column specifies the class hazard label followed by the subsidiary-risk **hazard** label(s) (after the symbol “&”) to be applied to each outside packaging and overpack. Subsidiary-risk **hazard** labels are not shown for all n.o.s. or generic articles and substances which possess more than one hazard. When such an article or substance has more than one hazard and no subsidiary-risk **hazard** label is indicated in column 5 of Table 3-1, subsidiary-risk **hazard** labels must be applied in accordance with 5;3.2.2 and 5;3.2.3. For magnetized material the required handling label is also shown. In the instances where no label is required the word “None” will appear.

...

Table 3-1. Dangerous Goods List

UN Model Regulations, Dangerous goods list (see ST/SG/AC.10/44/Add.1)

Name	UN No.	Class or division	Subsidiary risk hazard	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	6	7	8	9	10	11	12	13

See Appendices A (alphabetical order) and B (UN number order) for proposed amendments to Table 3-1.

...

Chapter 3

SPECIAL PROVISIONS

...

Table 3-2. Special provisions

TIs UN

...

UN Model Regulations, Special Provision 240 (see ST/SG/AC.10/44/Add.1)

A21 (~~≈240~~) ~~Not used.~~ This entry only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries which are transported with these batteries installed.

~~For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of vehicles are electrically powered cars, motorcycles, scooters, three and four wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with an electric motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheelchairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft.~~

TIs UN

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UN Model Regulations, Special Provision 251 (see ST/SG/AC.10/44/Add.1)

A44 (≈251) The entry chemical kit or first-aid kit is intended to apply to boxes, cases, etc., containing small quantities of various dangerous goods which are used, for example, for medical, analytical or testing or repair purposes. Components must not react dangerously (see 4;1.1.8). The packing group assigned to the kit as a whole must be the most stringent packing group assigned to any individual substance in the kit. The assigned packing group must be shown on the dangerous goods transport document. Where the kit contains only dangerous goods to which no packing group is assigned, a packing group must not be indicated on the dangerous goods transport document.

~~The only dangerous goods which are permitted in the kits are substances which may be transported as~~
Such kits must only contain dangerous goods that are permitted as:

- a) excepted quantities not exceeding the quantity indicated by the code as specified in column 9 of Table 3-1, ~~provided the inner packagings and quantities~~ that the quantity per inner packaging and quantity per package are as prescribed in 5.1.2 and 5.1.3 and the inner packagings are as prescribed in 5.2.4 a); or
- b) limited quantities as prescribed under 3;4.1.2.

...

DGP-WG/16 (see paragraph 3.2.3.2 of DGP/26-WP/2):

A59 A tire assembly unserviceable or damaged is not subject to these Instructions if the tire is ~~completely~~ deflated to a gauge pressure of less than 200 kPa at 20°C. A tire assembly with a serviceable tire is not subject to these Instructions provided the tire is not inflated to a gauge pressure exceeding the maximum rated pressure for that tire. However, such tires (including valve assemblies) must be protected from damage during transport, which may require the use of a protective cover.

...

DGP/26 (see paragraph 2.3.3 of this report):

A67 (≈238) Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

Vibration test: The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test: Following the vibration test, the battery is stored for six hours at 24°C ±4°C while subjected to a pressure differential of at least 88 kPa. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

Note.— Non-spillable type batteries which are an integral part of, and necessary for the operation of, mechanical or electronic equipment must be securely fastened in the battery holder on the equipment and protected in such a manner so as to prevent damage and short circuits.

Non-spillable batteries ~~meeting the requirements of Packing Instruction 872~~ are not subject to these Instructions when carried as cargo if, at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case. The battery must not contain any free or unabsorbed liquid. Any electrical battery or battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be prepared for transport so as to prevent:

- a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and
- b) unintentional activation.

TIs UN

The words “not restricted” and the special provision number A67 must be provided on the air waybill when an air waybill is issued.

...

DGP-WG/16 (see paragraph 3.2.1.6 of DGP/26-WP/2):

A72 (163) A substance specifically listed by name in Table 3-1 must not be transported under this entry. ~~Materials~~ Substances transported under this entry may contain 20 per cent or less nitrocellulose provided the nitrocellulose contains not more than 12.6 per cent nitrogen.

...

UN Model Regulations, Special Provision 172 (see ST/SG/AC.10/44/Add.1)

A78 (=172) Where a radioactive material has a subsidiary-~~risk~~ hazard(s):

- a) The substance must be allocated to Packing Group I, II or III, if appropriate, by application of the packing group criteria provided in Part 2 corresponding to the nature of the predominant subsidiary ~~risk~~ hazard.
- b) Packages must be labelled with subsidiary-~~risk~~ hazard labels corresponding to each subsidiary-~~risk~~ hazard exhibited by the material in accordance with the relevant provisions of 5;3.2; corresponding placards must be affixed to cargo transport units in accordance with the relevant provisions of 5;3.6.

DGP/26 (see paragraph 2.3.2 of this report):

- c) For the purposes of documentation and package marking, the proper shipping name must be supplemented with the name of the constituents which most predominantly contribute to this subsidiary-~~risk~~ hazard(s) and which must be enclosed in parenthesis. However, where the constituent is listed by name in Table 3-1 and:

i) “forbidden” is shown in columns 10 and 11, the dangerous goods transport document must indicate Cargo Aircraft Only and the package must bear cargo aircraft only labels, except that the substance may be shipped on a passenger aircraft with the prior approval of the appropriate authority of the State of Origin and the State of the Operator under the conditions established by those authorities. A copy of the document of approval, showing the quantity limitations and the packaging requirements, must accompany the consignment; and

ii) “forbidden” is shown in columns 12 and 13, the substance is forbidden for transport by air except that the substance may be shipped on a cargo aircraft with the prior approval of the appropriate authority of the State of Origin and the State of the Operator under the conditions established by those authorities. A copy of the document of approval, showing the quantity limitations and the packaging requirements, must accompany the consignment.

Radioactive material with a subsidiary hazard of Division 4.2 in Packing Group I must be transported in Type B packages. These may be transported on passenger or cargo aircraft.

- d) The dangerous goods transport document must indicate the subsidiary class or division and, where assigned, the packing group as required by 5;4.1.4.1 d) and e).

For packing, see also 4;9.1.5.

TIs UN

~~Radioactive material with a subsidiary risk of Division 4.2 (Packing Group I) must be transported in Type B packages. Radioactive material with a subsidiary risk of Division 2.1 is forbidden from transport on passenger aircraft, and radioactive material with a subsidiary risk of Division 2.3 is forbidden from transport on passenger or cargo aircraft except with the prior approval of the appropriate authority of the State of Origin and the State of the Operator under the conditions established by those authorities. A copy of the document of approval, showing the quantity limitations and the packaging requirements, must accompany the consignment.~~

...

 UN Model Regulations, Special Provision 307 (see ST/SG/AC.10/44/Add.1)

A79 (307) This entry may only be used for ~~uniform mixtures containing ammonium nitrate fertilizers. They must be classified in accordance with the procedure as set out in the *Manual of Tests and Criteria, Part III, Section 39.* as the main ingredient within the following composition limits:~~

- ~~a) not less than 90 per cent ammonium nitrate with not more than 0.2 per cent total combustible/organic material calculated as carbon and with added matter, if any, which is inorganic and inert towards ammonium nitrate; or~~
- ~~b) less than 90 per cent but more than 70 per cent ammonium nitrate with other inorganic materials or more than 80 per cent but less than 90 per cent ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4 per cent total combustible/organic material calculated as carbon; or~~
- ~~c) nitrogen type ammonium nitrate based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45 per cent but less than 70 per cent ammonium nitrate and not more than 0.4 per cent total combustible/organic material calculated as carbon such that the sum of the percentage composition of ammonium nitrate and ammonium sulphate exceeds 70 per cent.~~

...

 UN Model Regulations, Special Provision 310 (see ST/SG/AC.10/44/Add.1)

A88 Pre-production prototypes of lithium batteries or cells, when these prototypes are transported for testing, or low production runs (i.e. annual production runs consisting of not more than 100 lithium batteries ~~and or~~ cells) of lithium batteries or cells that have not been tested to the requirements in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria* may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the requirements in Packing Instruction 910 of the Supplement are met.

...

 UN Model Regulations, Special Provision 186 (see ST/SG/AC.10/44/Add.1)

A89 (186) ~~In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture must be calculated as ammonium nitrate.~~ **Not used.**

 UN Model Regulations, Special Provision 193 (see ST/SG/AC.10/44/Add.1)

A90 (193) This entry may only be used for ~~uniform ammonium nitrate based~~ **compound** ~~fertilizers~~ **mixture**s of the nitrogen, phosphate or potash type, containing not more than 70 per cent ammonium nitrate and not more than 0.4 per cent total combustible/organic material calculated as carbon or with not more than 45 per cent ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to these instructions if shown by a Trough Test (see UN *Manual of Tests and Criteria, Part III, subsection 38.2*) not to be liable to self sustaining decomposition. **They must be classified in accordance with the procedure as set out in the UN *Manual of Tests and Criteria, Part III, Section 39.***

TIs UN

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- A92 (199) Lead compounds which, when mixed in a ratio of 1:1000 with 0.07 M hydrochloric acid and stirred for 1 hour at a temperature of 23°C ±2°C, exhibit a solubility of 5 per cent or less (see ISO 3711:1990 "Lead chromate pigments and lead chromate-molybdate pigments — Specifications and methods of test") are considered insoluble and are not subject to these Instructions unless they meet the criteria for inclusion in another hazard class or division.

...

- A106 This entry may only be used for samples of chemicals taken for analysis in connection with the implementation of the Chemical Weapons Convention.

They may be transported on a passenger or cargo aircraft providing prior approval has been granted by the appropriate authority of the State of Origin or the Director General of the Organization for the Prohibition of Chemical Weapons and providing the samples comply with the requirements shown against the entry for chemical samples in Table S-3-1 of the Supplement.

The substance is assumed to meet the criteria of Packing Group I for Division 6.1. Subsidiary-risk hazard labelling is not required.

A copy of the document of approval showing the quantity limitations and the packing requirements must accompany the consignment.

Note.— The transport of substances under this description must be in accordance with chain of custody and security procedures specified by the Organization for the Prohibition of Chemical Weapons.

DGP/26 (See paragraph 2.2.1.2 b) of this report):

- A107 (≈301) This entry only applies to machinery or apparatus containing dangerous goods as a residue or as an integral element of the machinery or apparatus. It must not be used for machinery or apparatus for which a proper shipping name already exists in Table 3-1.

Where the quantity of dangerous goods contained as an integral element in machinery or apparatus exceeds the limits permitted by Packing Instruction 962, and the dangerous goods meet the provisions of Special Provision 301 of the UN Model Regulations, the machinery or apparatus may be transported only with the prior approval of the appropriate authority of the State of Origin and the State of the Operator under the written conditions established by those authorities.

...

- A112 Consumer commodities may only include substances of Class 2 (non-toxic aerosols only), Class 3, Packing Group II or III, Division 6.1 (Packing Group III only), UN 3077, UN 3082, UN 3175, UN 3334 and UN 3335 provided such substances do not have a subsidiary-risk hazard. Dangerous goods that are forbidden for transport aboard passenger aircraft must not be transported as consumer commodities.

...

- A115 (280) This entry applies to safety devices for vehicles, vessels or aircraft, e.g. air bag inflators, air bag modules, seat belt pretensioners, and pyromechanical devices and which contain dangerous goods of Class 1 or dangerous goods of other classes and when transported as component parts and if these articles as presented for transport have been tested in accordance with test series 6 (c) of Part I of the UN *Manual of Tests and Criteria*, with no explosion of the device, no fragmentation of the device casing or pressure receptacle, and no projection hazard or thermal effect which would significantly hinder firefighting or other emergency response efforts in the immediate vicinity.

This entry does not apply to life saving appliances described in Packing Instruction 955 (UN Nos. 2990 and 3072).

Tls UN

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 UN Model Regulations, Chapter 3.3, Special Provision 293 (see ST/SG/AC.10/44/Add.1)

A125 (293) The following definitions apply to matches:

- a) Fusee matches are matches the heads of which are prepared with a friction-sensitive igniter composition and a pyrotechnic composition which burns with little or no flame, but with intense heat;
- b) Safety matches are matches combined with or attached to the box, book or card ~~that~~ which can be ignited by friction only on a prepared surface;
- c) Strike anywhere matches are matches that can be ignited by friction on a solid surface;
- d) Wax Vesta matches are matches that can be ignited by friction either on a prepared surface or on a solid surface.

...

 UN Model Regulations, Chapter 3.3, Special Provision 290 (see ST/SG/AC.10/44/Add.1)

A130 (290) When this radioactive material meets the definitions and criteria of other classes or divisions as defined in Part 2, it must be classified in accordance with the following:

- a) Where the substance meets the criteria for dangerous goods in excepted quantities as set out in 3;5, the packagings must be in accordance with 3;5.2 and meet the testing requirements of 3;5.3. All other requirements applicable to radioactive material, excepted packages as set out in 1;6.1.5 apply without reference to the other class or division;
- b) Where the quantity exceeds the limits specified in 3;5.1.2, the substance must be classified in accordance with the predominant subsidiary ~~risk~~ hazard. The dangerous goods transport document must describe the substance with the proper shipping name and UN number applicable to the other class supplemented with the name applicable to the radioactive excepted package according to column 1 of the Dangerous Goods List, and must be transported in accordance with the provisions applicable to that UN number. An example of the information shown on the dangerous goods transport document is:

UN 1993 Flammable liquid, n.o.s. (ethanol and toluene mixture), Radioactive material, excepted package — limited quantity of material, Class 3, PG II

The radioactive material, excepted package label (Figure 5-33) is not required on packages meeting the conditions set out in this sub-paragraph. To aid acceptance, it is recommended that "A130" be indicated on the dangerous goods transport document. In addition, the requirements of 2;7.2.4.1.1 apply;

- c) The provisions of 3;4 for the transport of dangerous goods packed in limited quantities do not apply to substances classified in accordance with sub-paragraph b);
- d) When the substance meets a special provision that excepts this substance from all dangerous goods provisions of the other classes, it must be classified in accordance with the applicable UN number of Class 7 and all requirements specified in 1;6.1.5 apply.

TIs UN

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UN Model Regulations, Special Provision 204 (see ST/SG/AC.10/44/Add.1)

- A132 (204) Articles containing smoke-producing substance(s) corrosive according to the criteria for Class 8 must be labelled with a "Corrosive" subsidiary-risk **hazard** label. Articles containing smoke-producing substance(s) toxic by inhalation according to the criteria for Division 6.1 must be labelled with a "TOXIC" subsidiary-risk **hazard** label (Figure 5-18), except that those manufactured before 31 December 2016 may be offered for transport until 31 December 2018 without a "TOXIC" subsidiary label.

...

UN Model Regulations, Special Provision 312 (see ST/SG/AC.10/44/Add.1)

- A134 (312) ~~Vehicles powered by a fuel cell engine must be consigned under the entries UN 3166 **Vehicle, fuel cell, flammable gas powered** or UN 3166 **Vehicle, fuel cell, flammable liquid powered**, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.~~ **Not used.**

...

- A150 An additional subsidiary-risk hazard label may be required by a Note found adjacent to the technical name entry in Table 2-7.

...

DGP/26 (see paragraph 6.3.9 under Agenda Item 6 of this report)

- A154 Lithium batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons **or cells or batteries that cannot be diagnosed as damaged or defective prior to transport**).

...

- A162 (339) Fuel cell cartridges containing hydrogen in a metal hydride transported under this entry must have a water capacity less than or equal to 120 mL.

The pressure in the fuel cell cartridge must not exceed 5 MPa at 55°C. The design type must withstand, without leaking or bursting, a pressure of two (2) times the design pressure of the cartridge at 55°C or 200 kPa more than the design pressure of the cartridge at 55°C, whichever is greater. The pressure at which this test is conducted is referred to in the drop test and the hydrogen cycling test as the "minimum shell burst pressure".

Fuel cell cartridges must be filled in accordance with procedures provided by the manufacturer. The manufacturer must provide the following information with each fuel cell cartridge:

...

- b) safety precautions and potential hazards to be aware of;

...

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TIs *UN*

A186 (361) This entry applies to electric double layer capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to these Instructions. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. All capacitors to which this entry applies, including capacitors containing an electrolyte that does not meet the classification criteria of any class or division of dangerous goods, must meet the following conditions:

- a) capacitors not installed in equipment must be transported in an uncharged state. Capacitors installed in equipment must be transported either in an uncharged state or protected against a short circuit;
- b) each capacitor must be protected against a potential short circuit hazard in transport as follows:
- ...

...

UN Model Regulations, Special Provision 362 (see ST/SG/AC.10/44/Add.1)

A187 (362) This entry applies to liquids, pastes or powders, pressurized with a propellant which meets the definition of a gas in 2;2.1.1 and 2;2.1.2 a) or b).

Note.— A chemical under pressure in an aerosol dispenser must be transported under UN 1950.

The following provisions must apply:

- a) The chemical under pressure must be classified based on the hazard characteristics of the components in the different states:
 - i) the propellant;
 - ii) the liquid; or
 - iii) the solid.

If one of these components, which can be a pure substance or a mixture, needs to be classified as flammable, the chemical under pressure must be classified as flammable in Division 2.1. Flammable components are flammable liquids and liquid mixtures, flammable solids and solid mixtures or flammable gases and gas mixtures meeting the following criteria:

- i) a flammable liquid is a liquid having a flashpoint of not more than 93°C;
- ii) a flammable solid is a solid which meets the criteria in 2;4.2.2 of these Instructions;
- iii) a flammable gas is a gas which meets the criteria in 2;2.2.1 of these Instructions;
- b) gases of Division 2.3 and gases with a subsidiary ~~risk~~ **hazard** of 5.1 must not be used as a propellant in a chemical under pressure;
- c) where the liquid or solid components are classified as dangerous goods of Division 6.1, Packing Groups II or III, or Class 8, Packing Groups II or III, the chemical under pressure must be assigned a subsidiary ~~risk~~ **hazard** of Division 6.1 or Class 8 and the appropriate UN number must be assigned. Components classified in Division 6.1, Packing Group I, or Class 8, Packing Group I, must not be used for transport under this proper shipping name;
- d) in addition, chemicals under pressure with components meeting the properties of: Class 1, explosives; Class 3, liquid desensitized explosives; Division 4.1, self-reactive substances and solid desensitized explosives; Division 4.2, substances liable to spontaneous combustion; Division 4.3, substances which, in contact with water, emit flammable gases; Division 5.1, oxidizing substances; Division 5.2, organic peroxides; Division 6.2, infectious substances; or Class 7, radioactive material, must not be used for transport under this proper shipping name;
- e) Chemicals under pressure containing components forbidden for transport on both passenger and cargo aircraft (columns 10 to 13 of Table 3-1) must not be transported by air.

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A191 Notwithstanding the Division 6.1 subsidiary ~~risk~~ hazard shown in column 4 of Table 3-1, the toxic subsidiary ~~risk~~ hazard label and an indication of this subsidiary ~~risk~~ hazard on the dangerous goods transport document are not required when the manufactured articles contain not more than 5 kg of mercury. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

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UN Model Regulations, Special Provision 369 (see ST/SG/AC.10/44/Add.1) and Corrigendum 1 to UN Model Regulations, Chapter 3.3, special provision 369 (see ST/SG/AC.10/1/Rev.19/Corr.1)

(Note.— DGP/26 decided not to align with the UN Model Regulations with respect to “radioactivity and corrosivity subsidiary hazards” (see paragraph 2.3.1.2 c) of this report).

A194 (369) In accordance with Part 2, Introductory Chapter, paragraph 4, this radioactive material in an excepted package possessing toxic and corrosive properties is classified in Division 6.1 with radioactive ~~material~~ and corrosive subsidiary ~~risks~~ hazards.

Uranium hexafluoride may be classified under this entry only if the conditions of 2;7.2.4.1.1.2, 2;7.2.4.1.1.5, 2;7.2.4.5.2 and, for fissile-excepted material, of 2;7.2.3.6 are met.

In addition to the provisions applicable to the transport of Division 6.1 substances with a corrosive subsidiary ~~risk~~ hazard, the provisions of 5;1.2.2.2, 5;1.6.3, 7;1.6 and 7;3.2.1 to 7;3.2.4 apply.

No Class 7 label is required to be displayed.

2A-42

Appendix A to the Report on Agenda Item 2

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DGP/26 (see paragraph 6.3.8 under Agenda Item 6 of this report)

A201

~~States concerned may grant an exemption from the prohibition to transport lithium metal or lithium ion batteries on passenger aircraft in accordance with Part 1;1.1.3.~~ In instances where other forms of transport (including cargo aircraft) is impracticable, lithium cells or batteries may be transported as Class 9 (UN 3480 or UN 3090) on passenger aircraft with the prior approval of the authority of the State of Origin, the State of the Operator and the State of Destination under the written conditions established by those authorities, provided that the following types and quantities are met:

a) quantities of lithium metal cells or batteries (UN 3090) are limited to the allowance permitted in Table 968-II of Packing Instruction 968; and

b) quantities of lithium ion cells or batteries (UN 3480) are limited to the allowance permitted in Table 965-II of Packing Instruction 965.

When States, other than the State of Origin, the State of the Operator or State of Destination have notified ICAO that they require prior approval of shipments made under this special provision, approval must also be obtained from these States, as appropriate.

The requirements of Part 5 for Class 9 (UN 3090 or UN 3480) lithium metal and lithium ion batteries apply. A copy of the document of approval including the quantity limitations must accompany the consignment. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

If transport in accordance with this special provision is not possible, States concerned may grant an exemption from the prohibition to transport lithium metal or lithium ion batteries on passenger aircraft in accordance with Part 1;1.1.3.

Authorities issuing exemptions or approvals in accordance with this special provision must provide a copy to the Chief of the Cargo Safety Section within three months via email at CSS@icao.int, via facsimile at +1 514-954-6077 or via post to the following address:

Chief, Cargo Safety Section
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Quebec
CANADA H3C 5H7

Note.— Guidance for the processing of exemptions or approvals from the prohibition to transport lithium batteries may be found in Part S-1;4 and Table S-3-1, Special Provision A334 of the Supplement to the Technical Instructions.

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UN Model Regulations, Special Provision 380 (see ST/SG/AC.10/44/Add.1)

A203 ~~(380) If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it must be assigned to UN 3166 — Vehicle, flammable gas powered.~~ Not used.

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UN Model Regulations, Special Provision 385 (see ST/SG/AC.10/44/Add.1)

A207 ~~(≈385) This entry applies to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.~~

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~~Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed must be consigned under this entry. Vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed, must be consigned under the entry UN 3171 — **Battery-powered vehicle** (see Special Provision A21).~~

~~For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, trucks, locomotives, scooters, three- and four-wheeled vehicles or motorcycles, lawn tractors, self-propelled farming and construction equipment, boats and aircraft.~~

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 UN Model Regulations, Special Provision 363 (see ST/SG/AC.10/44/Add.1)

- A208 (≈363) a) This entry applies to engines or machinery, powered by fuels classified as dangerous goods via internal combustion systems or fuel cells (e.g. combustion engines, generators, compressors, turbines, heating units).
- b) Engines and machinery containing fuels meeting the classification criteria of Class 3 must be consigned under the entries UN 3528 — **Engine, internal combustion, flammable liquid powered** or UN 3528 — **Engine, fuel cell, flammable liquid powered** or UN 3528 — **Machinery, internal combustion, flammable liquid powered** or UN 3528 — **Machinery, fuel cell, flammable liquid powered**, as appropriate.
- c) Engines and machinery containing fuels meeting the classification criteria of Division 2.1 must be consigned under the entries UN 3529 — **Engine, internal combustion, flammable gas powered** or UN 3529 — **Engine, fuel cell, flammable gas powered** or UN 3529 — **Machinery, internal combustion, flammable gas powered** or UN 3529 — **Machinery, fuel cell, flammable gas powered**, as appropriate.
- Engines and machinery powered by both a flammable gas and a flammable liquid must be consigned under the appropriate UN 3529 entry.
- d) Engines and machinery containing liquid fuels meeting the classification criteria for environmentally hazardous substances and not meeting the classification criteria of any other class or division, must be consigned under the entries UN 3530 — **Engine, internal combustion** or UN 3530 — **Machinery, internal combustion**, as appropriate.

~~*Note. — Until 31 March 2017, shippers may identify engines as Class 9, UN 3166 using the proper shipping names and Packing Instruction 950 or 951 as shown in the 2015-2016 Edition of these Instructions. In that instance the dangerous goods transport document must indicate the packing instruction number and the UN number and proper shipping name in effect in the 2015-2016 Edition of these Instructions. The marks and labels applied, when required, must be consistent with the information shown on the dangerous goods transport document.*~~

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 UN Model Regulations, Special Provision 387 (see ST/SG/AC.10/44/Add.1) (see paragraph 2.3.1.2 c) of this report).

A213 (387) Lithium batteries in conformity with 2.9.3.1 f) containing both primary lithium metal cells and rechargeable lithium ion cells must be assigned to UN Nos. 3090 or 3091 as appropriate. When such batteries are transported in accordance with Section II of Packing Instruction 968, 969 or 970, the total lithium content of all lithium metal cells contained in the battery must not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery must not exceed 10 Wh.

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UN Model Regulations, Special Provision 388 (see ST/SG/AC.10/44/Add.1)

A214 (388) UN No. 3166 entries apply to vehicles powered by flammable liquid or flammable gas internal combustion engines or fuel cells.

Vehicles powered by a fuel cell engine must be assigned to UN 3166 **Vehicle, fuel cell, flammable gas powered** or UN 3166 **Vehicle, fuel cell, flammable liquid powered**, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

Other vehicles which contain an internal combustion engine must be assigned to UN 3166 **Vehicle, flammable gas powered** or UN 3166 **Vehicle, flammable liquid powered**, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it must be assigned to UN 3166 **Vehicle, flammable gas powered**.

Entry UN 3171 only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries transported with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with a motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheelchairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. This includes vehicles transported in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries must be assigned to UN 3091 **Lithium metal batteries contained in equipment** or UN 3091 **Lithium metal batteries packed with equipment** or UN 3481 **Lithium ion batteries contained in equipment** or UN 3481 **Lithium ion batteries packed with equipment**, as appropriate.

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Chapter 4

DANGEROUS GOODS IN LIMITED QUANTITIES

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4.1 APPLICABILITY

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4.1.2 Only dangerous goods which are permitted on passenger aircraft and which meet the criteria of the following classes, divisions and packing groups (if appropriate) may be carried under these provisions for dangerous goods in limited quantities:

Class 2	Only UN 1950 in Divisions 2.1 and 2.2, UN 2037 in Divisions 2.1 and 2.2 without a subsidiary risk hazard , UN 3478 (Fuel cell cartridges , containing liquefied flammable gas) and UN 3479 (Fuel cell cartridges , containing hydrogen in metal hydride)
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Note.— Many articles or substances, including the following, are NOT permitted under these limited quantity provisions:

- a) those permitted only on cargo aircraft;
- b) those in Packing Group I;
- c) those in Class 1 or 7 or Divisions 2.1 (except as permitted above), 2.3 or 6.2;
- d) those in Division 4.2 or with a subsidiary-risk **hazard of 4.2**.

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Chapter 5

DANGEROUS GOODS PACKED IN EXCEPTED QUANTITIES

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DGP-WG/16 (see paragraph 3.2.4.2 of DGP/26-WP/2):

5.1 EXCEPTED QUANTITIES

5.1.2.1 For gases, the volume indicated for inner packagings refers to the water capacity of the inner receptacle and the volume indicated for outer packagings refers to the combined water capacity of all inner packagings within a single outer package **packaging**.

...

5.3 TESTS FOR PACKAGES

5.3.1 The complete package as prepared for transport, with inner packagings filled to not less than 95 per cent of their capacity for solids or 98 per cent for liquids, must be capable of withstanding, as demonstrated by testing which is appropriately documented, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:

...

DGP-WG/16 (see paragraph 3.2.3.3 of DGP/26-WP/2):

- b) a force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the ~~drop~~ sample).

...

5.4 MARKING OF PACKAGES

5.4.1 Packages containing excepted quantities of dangerous goods prepared in accordance with this chapter must be durably and legibly marked with the mark shown in Figure 3-2. The primary hazard class or, when assigned, the division of each of the dangerous goods contained in the package must be shown in the mark. Where the name of the shipper or consignee is not shown elsewhere on the package, this information must be included within the mark.

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5.6 DE MINIMIS QUANTITIES

Dangerous goods assigned to codes E1, E2, E4 or E5 are not subject to these Instructions when carried as cargo provided that:

DGP-WG/16 (see paragraph 3.2.1.6 of DGP/26-WP/2):

- a) the maximum net quantity ~~of material~~ per inner packaging is limited to 1 mL for liquids and gases and 1 g for solids;
- b) the provisions of 5.2 are met, except that an intermediate packaging is not required if the inner packagings are securely packed in an outer packaging with cushioning material in such a way that, under normal conditions of transport, they cannot break, be punctured, or leak their contents; and for liquid dangerous goods, the outer packaging contains sufficient absorbent material to absorb the entire contents of the inner packagings;
- c) the provisions of 5.3 are complied with; and
- d) the maximum net quantity of dangerous goods per outer packaging does not exceed 100 g for solids or 100 mL for liquids and gases.

...

Part 4

PACKING INSTRUCTIONS

...

Chapter 3

CLASS 1 — EXPLOSIVES

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Packing Instruction 101

Inner packagings

Intermediate packagings

Outer packagings

As specified by the appropriate national authority.

UN Model Regulations, Chapter 4.1, packing instruction P101 (see ST/SG/AC.10/44/Add.1)

The ~~State's~~ distinguishing sign ~~for motor~~ used on vehicles in international road traffic of the country for which the authority acts must be marked on the dangerous goods transport document as follows: "Packaging approved by the competent authority of ..."

Note 1.— In this instance the term "competent authority" is used for intermodal compatibility; it refers to the appropriate national authority.

Note 2.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

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Chapter 4

CLASS 2 — GASES

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4.1 SPECIAL PACKING PROVISIONS FOR DANGEROUS GOODS OF CLASS 2

4.1.1 General requirements

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UN Model Regulations, 4.1.6.1.4 (see ST/SG/AC.10/44/Add.1)

4.1.1.4 Refillable cylinders must not be filled with a gas or gas mixture different from that previously contained unless the necessary operations for change of gas service have been performed. The change of service for compressed and liquefied gases must be in accordance with ISO 11621:1997, as applicable. In addition, a cylinder that previously contained a Class 8 corrosive substance or a substance of another class with a corrosive subsidiary ~~risk~~ hazard must not be authorized for the transport of a Class 2 substance unless the necessary inspection and testing as specified in 6;5.1.6 have been performed.

UN Model Regulations, 4.1.4.1, packing instruction P200 (see ST/SG/AC.10/44/Add.1)

Packing Instruction 200

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- 3) In no case must cylinders be filled in excess of the limit permitted in the following requirements:

...

- e) For liquefied gases charged with compressed gases, both components — the ~~liquid phase~~ **liquefied gas** and the compressed gas — have to be taken into consideration in the calculation of the internal pressure in the cylinder.

The maximum mass of contents per litre of water capacity must not exceed 0.95 times the density of the liquid phase at 50°C; in addition, the liquid phase must not completely fill the cylinder at any temperature up to 60°C.

When filled, the internal pressure at 65°C must not exceed the test pressure of the cylinders. The vapour pressures and volumetric expansions of all substances in the cylinders must be considered. When experimental data is not available, the following steps must be carried out:

- i) Calculation of the vapour pressure of the ~~liquid component~~ **liquefied gas** and of the partial pressure of the compressed gas at 15°C (filling temperature);
- ii) Calculation of the volumetric expansion of the liquid phase resulting from the heating from 15°C to 65°C and calculation of the remaining volume for the gaseous phase;
- iii) Calculation of the partial pressure of the compressed gas at 65°C considering the volumetric expansion of the liquid phase;

Note.— The compressibility factor of the compressed gas at 15°C and 65°C must be considered.
- iv) Calculation of the vapour pressure of the ~~liquid component~~ **liquefied gas** at 65°C;
- v) Calculation of the total pressure, which is the sum of the vapour pressure of the ~~liquid component~~ **liquefied gas** and the partial pressure of the compressed gas at 65°C;
- vi) Consideration of the solubility of the compressed gas at 65°C in the liquid phase.

The test pressure of the cylinder must not be less than the calculated total pressure minus 100 kPa (1bar).

If the solubility of the compressed gas in the ~~liquid component~~ **liquefied phase** is not known for the calculation, the test pressure can be calculated without taking the gas solubility (sub-paragraph (vi)) into account.

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Table 1. COMPRESSED GASES									
UN No.	Name and description	Class or Division	Subsidiary risk hazard	LC ₅₀ ml/m ³	Cylinders	Test period, years	Test pressure, bar*	Maximum working pressure, bar*	Special packing provisions*
...									
Table 2. LIQUEFIED GASES AND DISSOLVED GASES									
UN No.	Name and description	Class Or Division	Subsidiary risk hazard	LC ₅₀ ml/m ³	Cylinders	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
...									

...

Packing Instruction 202
...
UN Model Regulations, 4.1.4.1, packing instruction P203 (see ST/SG/AC.10/44/Add.1)
7) Compatibility
Materials used to ensure the leakproofness of the joints or for the maintenance of the closures must be compatible with the contents. In the case of receptacles intended for the transport of oxidizing gases (i.e. with a subsidiary- risk hazard of 5.1), these materials must not react with these gases in a dangerous manner.
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Packing Instruction 211

1.

The general packing requirements of 4;1 must be met.

Refrigerating machines or components containing non-toxic liquefied gases or Ammonia solutions (UN 2672) must meet the following requirements:

- a) each cylinder must not contain more than 450 kg of a Division 2.2 gas without subsidiary ~~risk~~ **hazard** or 25 kg of Ammonia solutions (UN 2672);
- b) machines or components having two or more charged cylinders may not contain an aggregate of more than 910 kg of a Division 2.2 gas without subsidiary ~~risk~~ **hazard** or more than 45 kg of Ammonia solutions (UN 2672);
- c) each cylinder must be equipped with a safety device meeting the requirements of a recognized national standard;
- d) each cylinder must be equipped with a shut-off valve at each opening except openings used for safety devices and with no other connection. These valves must be closed prior to and during transport;
- e) cylinders must be manufactured, inspected and tested in accordance with a recognized UN or national standard;
- f) all parts subject to refrigerant pressure during shipment must be tested in accordance with a recognized UN or national standard;
- g) the liquid portion of the refrigerant, if any, must not completely fill any pressure vessel at 55°C;
- h) the amount of refrigerant, if liquefied, must not exceed the filling density prescribed by applicable State regulations.

Packing Instruction 218

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UN Model Regulations, 4.1.4.1, packing instruction P206 (see ST/SG/AC.10/44/Add.1) and DGP/26 (see paragraph 2.4.1.2 a) of the report)

ADDITIONAL PACKING REQUIREMENTS

- a) Cylinders must be so filled that at 50°C the non-gaseous phase does not exceed 95% of their water capacity, and they are not completely filled at 60°C. When filled, the internal pressure at 65°C must not exceed the test pressure of the cylinders. The vapour pressures and volumetric expansion of all substances in the cylinders must be taken into account.
- b) Spray application equipment (such as a hose and wand assembly) must not be connected during transport.
- c) The minimum test pressure must be in accordance with Packing Instruction 200 for the propellant but must not be less than 20 bar.
- d) Non-refillable cylinders used may have a water capacity in litres not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 litres.
- e) For liquids charged with a compressed gas, both components — the liquid ~~phase~~ and the compressed gas — have to be taken into consideration in the calculation of the internal pressure in the cylinder. When experimental data is not available, the following steps must be carried out:
 - i) Calculation of the vapour pressure of the liquid ~~component~~ and of the partial pressure of the compressed gas at 15°C (filling temperature);
 - ii) Calculation of the volumetric expansion of the liquid phase resulting from the heating from 15°C to 65°C and calculation of the remaining volume for the gaseous phase;
 - iii) Calculation of the partial pressure of the compressed gas at 65°C considering the volumetric expansion of the liquid phase;

Note.— The compressibility factor of the compressed gas at 15°C and 65°C must be considered.

- iv) Calculation of the vapour pressure of the liquid-component at 65°C;
- v) Calculation of the total pressure, which is the sum of the vapour pressure of the liquid-component and the partial pressure of the compressed gas at 65°C;
- vi) Consideration of the solubility of the compressed gas at 65°C in the liquid phase.

The test pressure of the cylinders must not be less than the calculated total pressure minus 100 kPa (1 bar).

If the solubility of the compressed gas in the liquid-component **phase** is not known for the calculation, the test pressure can be calculated without taking the gas solubility (sub-paragraph vi)) into account.

OUTER PACKAGINGS

Boxes

Drums

Jerricans

Strong outer packagings

...

UN Model Regulations, 4.1.4.1, Packing Instruction P006 (see ST/SG/AC.10/44/Add.1) and DGP-WG/17 (see paragraph paragraphs 3.2.2.1.2 and 3.2.2.1.3 of DGP/26-WP/3)

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Chapter 5

CLASS 3 — FLAMMABLE LIQUIDS

Replace all references to “subsidiary risk” with “subsidiary hazard”

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DGP/26 (see paragraph 2.4.3 of this report):

Packing Instructions 360 – 366

Cargo aircraft only

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ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

For UN 1308

For Packing Groups I and II, only combination packagings are permitted. The completed package must not have a gross mass exceeding 75 kg.

Packing Group III

- Packagings must meet the Packing Group II performance requirements if the substance has a Class 8 subsidiary risk.

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Chapter 6

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

Replace all references to “subsidiary risk” with “subsidiary hazard”

Packing Instruction 459

Passenger and cargo aircraft — self-reactive substances and polymerizing substances

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ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Cushioning materials must not be readily combustible.
- Packagings must meet the Packing Group II performance requirements.

UN Model Regulations, 4.1.4.1, P520, new PP94 (see ST/SG/AC.10/44/Add.1) and DGP/26 (see paragraph 2.4.1.2 c)

UN 3223 or UN 3224

Energetic samples classified in accordance with Part 2, Introductory Chapter, paragraph 5.4 may be carried under UN 3223 or UN 3224, as appropriate, provided that:

1. The quantity per individual inner cavity does not exceed 0.01 g for solids or 0.01 mL for liquids and the maximum net quantity per outer packaging does not exceed 20 g for solids or 20 mL for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 20:
 - a) the samples are carried in microtiter plates or multi-titer plates made of plastics, glass, porcelain or stoneware as an inner packaging;
 - b) only combination packaging with outer packaging comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are permitted; or
2. The maximum content of each inner packaging does not exceed 1 g for solids or 1 mL for liquids and the maximum net quantity per outer packaging does not exceed 56 g for solids or 56 mL for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 56:
 - a) The individual substance is contained in an inner packaging of glass or plastics of maximum capacity of 30 mL placed in an expandable polyethylene foam matrix of at least 130 mm thickness having a density of 18 ±1 g/L;
 - b) Within the foam carrier, inner packagings are segregated from each other by a minimum distance of 40 mm and from the wall of the outer packaging by a minimum distance of 70 mm. The package may contain up to two layers of such foam matrices, each carrying up to twenty-eight inner packagings;
 - c) The outer packaging consists only of corrugated fibreboard boxes (4G) having minimum dimensions of 60 cm (length) by 40.5 cm (width) by 30 cm (height) and minimum wall thickness of 1.3 cm.

When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, all applicable requirements of these Instructions must be met. Interior supports must be provided to secure the inner packagings in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or overpack must be leakproof. If dry ice is used, the requirements in Packing Instruction 954 must be met. The inner and outer packagings must maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

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Chapter 7

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

Packing Instruction 620

This packing instruction applies to UN 2814 and UN 2900.

The following packagings are authorized provided the special packing provisions are met.

Packagings meeting the requirements of 6.6 and approved accordingly consisting of:

...

- e) Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range -40°C to $+55^{\circ}\text{C}$. This primary receptacle or secondary packaging must also be capable of withstanding temperatures in the range -40°C to $+55^{\circ}\text{C}$.

...

Special packing provisions

- a) Shippers of infectious substances must ensure that packages are prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

...

DGP-WG/16 (see paragraph 3.2.4.2 of DGP/26-WP/2):

Packing Instruction 650

...

7) For liquid substances:

...

- e) The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar);
- f) The outer ~~package~~ packaging must not contain more than 4 litres. This quantity excludes ice, dry ice or liquid nitrogen when used to keep specimens cold.

...

8) For solid substances:

...

- d) Except for packages containing body parts, organs or whole bodies, the outer ~~package~~ packaging must not contain more than 4 kg. This quantity excludes ice, dry ice or liquid nitrogen when used to keep specimens cold;
- e) If there is any doubt as to whether or not residual liquid may be present in the primary receptacle during transport, then a packaging suitable for liquids, including absorbent materials, must be used.

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...

Chapter 9

CLASS 7 — RADIOACTIVE MATERIAL

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

Chapter 10

CLASS 8 — CORROSIVE SUBSTANCES

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

DGP/26 (see paragraph 2.3.3 of this report):

Packing Instruction 872

Passenger and cargo aircraft for UN 2800

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS				SINGLE PACKAGINGS
UN number and proper shipping name	Packing conditions	Total quantity per package — passenger	Total quantity per package — cargo	
UN 2800 Batteries, wet, non-spillable	Batteries must be protected against short circuits and must be securely packed in strong outer packagings.	No limit	No limit	No

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Drums

Jerricans

Strong outer packagings

TESTING

~~Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.~~

~~*Vibration test:* The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.~~

~~*Pressure differential test:* Following the vibration test, the battery is stored for six hours at $24^{\circ}\text{C} \pm 1^{\circ}\text{C}$ while subjected to a pressure differential of at least 88 kPa. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.~~

~~— *Note.* — Non-spillable type batteries which are an integral part of, and necessary for the operation of, mechanical or electronic equipment must be securely fastened in the battery holder on the equipment and protected in such a manner so as to prevent damage and short circuits.~~

...

Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

...

Replace all references to “subsidiary risk” with “subsidiary hazard”

...

Packing Instruction 950

Passenger and cargo aircraft for UN 3166 only

(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 951 for flammable gas-powered vehicles, Packing Instruction 952 for battery-powered equipment and vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

...

ADDITIONAL PACKING REQUIREMENTS

Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;

DGP/26 (see paragraph 2.4.1.2 d) of this report):

- 2) if lithium batteries are installed in a vehicle, they must meet the provisions of ~~subparagraphs a) to e) of Part 2;9.3.1~~, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

...

Packing Instruction 951

Cargo aircraft only for UN 3166 only

(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 950 for flammable liquid-powered vehicles, Packing Instruction 952 for battery-powered equipment and vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

...

ADDITIONAL PACKING REQUIREMENTS

Flammable gas vessels

- 1) for flammable gas-powered vehicles, pressurized vessels containing the flammable gas must be completely emptied of flammable gas. Lines from vessels to gas regulators, and gas regulators themselves, must also be drained of all trace of flammable gas. To ensure that these conditions are met, gas shut-off valves must be left open and connections of lines to gas regulators must be left disconnected upon delivery of the vehicle to the operator. Shut-off valves must be closed and lines reconnected at gas regulators before loading the vehicle aboard the aircraft;

or alternatively,

- 2) flammable gas-powered vehicles that have pressure receptacles (fuel tanks) equipped with electrically operated valves that close automatically in case the power is disconnected, or with manual shut-off valves, may be transported under the following conditions:
 - i) the tank shut-off valves must be in the closed position and in the case of electrically operated valves, power to those valves must be disconnected;
 - ii) after closing the tank shut-off valves, the vehicle must be operated until it stops from lack of fuel before being loaded aboard the aircraft;
 - iii) in no part of the closed system must the remaining pressure of compressed gases exceed 5 per cent of the maximum allowable working pressure of the pressure receptacle (fuel tank) system, or more than 2 000 kPa (20 bar), whichever is the lower.

DGP/26 (see paragraph 2.4.2 of this report):

Flammable liquid fuel tanks

If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, the requirements set out in Packing Instruction 950 for flammable liquid fuel tanks must also be met.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;
- 2) if lithium batteries are installed in a vehicle, they must meet the provisions of ~~subparagraphs a) to e)~~ of Part 2;9.3.1, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

Packing Instruction 952

Passenger and cargo aircraft for UN 3171 only
 (See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 950 for flammable liquid-powered vehicles, Packing Instruction 951 for flammable gas-powered vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

...

ADDITIONAL PACKING REQUIREMENTS

...

Where vehicles could possibly be handled in other than an upright position, the vehicle must be secured in a strong, rigid outer packaging of the type below. The vehicle must be secured by means capable of restraining the vehicle in the outer packaging to prevent any movement during transport which would change the orientation or cause the vehicle to be damaged.

Battery-powered vehicles, machines or equipment must meet the following requirements:

Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;

DGP-WG/17 (see paragraph 3.2.4.1 of DGP/26-WP/3) and DGP/26 (see paragraph 2.4.1.2 d) of this report):

- 2) if lithium batteries are installed in a vehicle, they must meet the provisions of ~~subparagraphs a) to e)~~ of Part 2;9.3.1, unless otherwise approved by the appropriate authority of the State of Origin, ~~must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits~~ Where the lithium battery is removed from the vehicle and is packed separate from the vehicle in the same outer packaging, the package must be consigned as UN 3481— Lithium ion batteries packed with equipment or UN 3091 — Lithium metal batteries packed with equipment and packed according to Packing Instruction 966 or 969 as applicable; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

...

...

Packing Instruction 955

Passenger and cargo aircraft for UN 2990 and UN 3072 only

The term "life-saving appliances" applies to articles such as life rafts, life vests, aircraft survival kits or aircraft evacuation slides.

The description "Life-saving appliances, self-inflating" (UN 2990) is intended to apply to life-saving appliances that present a hazard if the self-inflating device is activated accidentally.

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

<i>UN number and proper shipping name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 2990 Life-saving appliances, self-inflating UN 3072 Life-saving appliances, not self-inflating containing dangerous goods as equipment	No limit	No limit

ADDITIONAL PACKING REQUIREMENTS

Life-saving appliances may only contain the dangerous goods listed below:

- a) Division 2.2 gases, must be contained in cylinders which conform to the requirements of the appropriate national authority of the country in which they are approved and filled. Such cylinders may be connected to the life-saving appliance. These cylinders may include installed actuating cartridges (cartridges, power device of Division 1.4C and 1.4S) provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per unit. When the cylinders are shipped separately, they must be classified as appropriate for the Division 2.2 gas contained and need not be marked, labelled or described as explosive articles;
- b) signal devices (Class 1), which may include smoke and illumination signal flares; signal devices must be packed in plastic or fibreboard inner packagings;
- c) small quantities of flammable substances, corrosive solids and organic peroxides (Class 3, Class 8, Division 4.1 and 5.2), which may include a repair kit and not more than 30 strike-anywhere matches. The organic peroxide may only be a component of a repair kit and the kit must be packed in strong inner packaging. The strike-anywhere matches must be packed in a cylindrical metal or composition packaging with a screw-type closure and be cushioned to prevent movement;
- d) electric storage batteries (Class 8), which must be disconnected or electrically isolated and protected against short circuits;
- e) lithium batteries:
 - 1) must meet the applicable requirements of 2;9.3;
 - 2) must be disconnected or electrically isolated and protected against short circuits; and
 - 3) must be secured against movement within the appliance.
- f) first aid kits which may include flammable, corrosive and toxic articles or substances.

The appliances must be packed, so that they cannot be accidentally activated, in strong outer packagings and, except for life vests, the dangerous goods must be in inner packagings packed so as to prevent movement. The dangerous goods must be an integral part of the appliance without which it would not be operational and in quantities which do not exceed those appropriate for the actual appliance when in use.

Packing Instruction 955

UN Model Regulations, Chapter 3.3, Special Provision 296 (see ST/SG/AC.10/44/Add.1)

Life-saving appliances packed in strong rigid outer packagings with a total maximum gross mass of 40 kg, containing no dangerous goods other than Division 2.2 compressed or liquefied gases with no subsidiary-risk **hazard** in receptacles with a capacity not exceeding 120 mL, installed solely for the purpose of the activation of the appliance, are not subject to these Instructions when carried as cargo.

Life-saving appliances may also include articles and substances not subject to these Instructions which are an integral part of the appliance.

...

DGP/26 (see paragraph 2.4.4 of this report):

Packing Instruction 958

Passenger and cargo aircraft for UN 2071 and UN 2590 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS				
<i>UN number and proper shipping name</i>	<i>Inner packaging (see 6.3.2)</i>	<i>Inner packaging quantity (per receptacle) Quantity — passenger</i>	<i>Total Quantity — cargo per package</i>	SINGLE PACKAGINGS
UN 2071 Ammonium nitrate fertilizers UN 2590 Asbestos, chrysotile	<u>Glass</u>	200-10 kg	200 kg	Yes <u>200 kg</u>
	<u>Fibre</u>	50 kg		
	<u>Metal</u>	50 kg		
	<u>Paper bag</u>	50 kg		
	<u>Plastics</u>	50 kg		
	<u>Plastic bag</u>	50 kg		

ADDITIONAL PACKING REQUIREMENTS **FOR COMBINATION PACKAGINGS**

For UN-2071 and 2590

- All rigid packagings must be sift proof. Plastic, paper and fibre inner packagings must be siftproof.

For UN-2590

- ~~Bags must be palletized and unitized by methods such as shrink wrapping in plastic film or wrapping in fibreboard secured by strapping.~~

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6:3.1)**Boxes**

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B1, 1B2)
Fibre (1G)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

- ~~Plastic, paper and fibre inner packagings must be siftproof~~ Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.
- For UN 2590, bags must be placed in closed rigid overpacks.

SINGLE PACKAGINGS***Bags***

Paper (5M2)
Plastics (5H4)
Textile(5L3)
Woven plastics (5H3)

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B1, 1B2)
Fibre (1G)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction 961

Passenger and cargo aircraft for UN 3268 only

UN Model Regulations, Chapter 4.1.4.1, packing instruction P902 (see ST/SG/AC.10/44/Add.1)

...

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must meet the Packing Group III performance requirements.
- The packagings must be designed and constructed to prevent movement of the articles and inadvertent operation during normal conditions of transport.
- Any pressure receptacle must be in accordance with the requirements of the appropriate national authority for the substance(s) contained therein.

Cargo aircraft only

Air bag inflators, air bag modules and seat-belt pretensioners may also be transported unpackaged on cargo aircraft in dedicated handling devices when transported ~~from where they are manufactured to vehicle assembly plants~~ to, from, or between where they are manufactured and an assembly plant including intermediate handling locations. When transported in handling devices, the following conditions must be met:

...

Packing Instruction 962

Passenger and cargo aircraft for UN 3363 only

...

ADDITIONAL PACKING REQUIREMENTS

UN Model Regulations, Chapter 3.3, Special Provision 301 (see ST/SG/AC.10/44/Add.1)

- If the machinery or apparatus contains more than one item of dangerous goods, the individual dangerous goods must be enclosed to prevent them reacting dangerously with one another during transport (see 4;1.1.3).
- Receptacles containing dangerous goods must be so secured or cushioned so as to prevent their breakage or leakage and so as to control their movement within the machinery or apparatus during normal conditions of transport. Cushioning material must not react dangerously with the contents of the receptacles. Any leakage of the contents must not substantially impair the protective properties of the cushioning material.
- "Package orientation" labels (Figure 5-29), or preprinted orientation labels meeting the same specification as either Figure 5-29 or ISO Standard 780-1997 must be affixed on at least two opposite vertical sides with the arrows pointing in the correct direction only when required to ensure liquid dangerous goods remain in their intended orientation.
- Irrespective of 5;3.2.10, machinery or apparatus containing magnetized material meeting the requirements of Packing Instruction 953 must also bear the "Magnetized material" label (Figure 5-27).
- For Division 2.2 gases, cylinders for gases, their contents and filling ratios must conform to the requirements of Packing Instruction 200.
- Dangerous goods in apparatus or machinery must be packed in strong outer packagings unless the receptacles containing the dangerous goods are afforded adequate protection by the construction of the apparatus or machinery.

Fuel system components

- Fuel system components must be emptied of fuel as far as practicable and all openings must be sealed securely. They must be packed:
 - 1) in sufficient absorbent material to absorb the maximum amount of liquid which may possibly remain after emptying. Where the outer packaging is not liquid tight, a means of containing the liquid in the event of leakage must be provided in the form of a leakproof liner, plastic bag or other equally efficient means of containment; and
 - 2) in strong outer packagings.

Packing Instruction Y963

DGP-WG/17 (see paragraph 3.2.4.3 of DGP/26-WP/3):

Limited quantities

Passenger and cargo aircraft for ID 8000 only

Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for the purposes of personal care or household use. These include items administered or sold to patients by doctors or medical administrations. Except as otherwise provided below, dangerous goods packed in accordance with this packing instruction do not need to comply with 4;1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.

- a) Each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transport.

...

DGP-WG/16 (see paragraph 3.2.4.1 of DGP/26-WP/2):

- f) Inner packagings containing liquids, ~~excluding flammable liquids in inner packagings of 120 mL or less,~~ must be packed with their closures upward and the upright position of the package must be indicated by "Package orientation" labels (Figure 5-29). These labels, or pre-printed package orientation labels meeting the same specification as either Figure 5-29 or ISO Standard 780-1997, must be affixed to, or printed on, at least two opposite vertical sides of the package with the arrows pointing in the correct direction. The requirements of this sub-paragraph do not apply to:

- 1) dangerous goods in inner packagings each containing not more than 120 mL with sufficient absorbent material between the inner and outer packagings to completely absorb the liquid contents; or
- 2) dangerous goods in gas tight inner packagings such as tubes, bags or vials which are opened by breaking or puncturing.

...

Packing Instruction 965

Cargo aircraft only for UN 3480

1. Introduction

This entry applies to lithium ion or lithium polymer batteries. This packing instruction is structured as follows:

- Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
- Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. SECTION IA

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

IA.1 General requirements

- Part 4;1 requirements must be met.
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.

Note.— Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-IA

<i>UN number and proper shipping name</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3480 Lithium ion batteries	Forbidden	35 kg

Packing Instruction 965

IA.2 Additional requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Lithium ion cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).
- Lithium ion batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

IA.3 Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

IB. SECTION IB

Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.

Lithium ion cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number "965" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5;4 apply.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;

Packing Instruction 965

IB.1 General requirements

- Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.

Note.— Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-IB

Contents	Net quantity per package	
	Passenger	Cargo
Lithium ion cells and batteries	Forbidden	10 kg

IB.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with electrically conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).

Note.— The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

IB.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 965

II. SECTION II

Lithium ion cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);
- Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);
- Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009.

II.1 General requirements

- Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity.

Note.— Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-II

Contents	<i>Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh</i>	<i>Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh</i>	<i>Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh</i>
1	2	3	4
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

Packing Instruction 965

II.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- ~~Cells and batteries must not be packed in the same outer packaging with other dangerous goods.~~

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.

~~Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.~~

- A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.
- The words “lithium ion batteries, in compliance with Section II of PI965” — cargo aircraft only” or “lithium ion batteries, in compliance with Section II of PI965 — CAO” must be placed on the air waybill, when an air waybill is used.
- Packages and overpacks of lithium ion batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 965

II.4 Overpacks

Not more than one package prepared in accordance with this section may be placed into an overpack.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

Packages prepared in accordance with this section must not be placed into an overpack with packages containing substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

Note.— For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.

Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

1. Introduction

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

I.1 General requirements

Part 4;1 requirements must be met.

Packing Instruction 966

<i>UN number and proper shipping name</i>	<i>Package quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3481 Lithium ion batteries packed with equipment	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 Additional requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a packaging that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 under Agenda Item 6 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spare~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

II. SECTION II

Lithium ion cells and batteries packed with equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;

Packing Instruction 966

- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 — the Watt-hour rating must be marked on the outside case except for those batteries manufactured before 1 January 2009.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	Package quantity (Section II)	
	Passenger	Cargo
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

- Lithium ion cells and batteries must:
 - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong rigid outer packaging.

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 under Agenda Item 6 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number **required** for the equipment's operation, plus two ~~spares~~ **spare sets**. **A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.**
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- The words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Where a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment that meet the limits for lithium cells or batteries of Section II, the following additional requirements apply:
 - the shipper must ensure that all applicable parts of both packing instructions are met. The total mass of lithium batteries contained in any package must not exceed 5 kg;
 - the words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Packing Instruction 966

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high.**

Packing Instruction 967

Passenger and cargo aircraft for UN 3481 (contained in equipment) only

1. Introduction

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

1.1 General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Packing Instruction 967

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3481 Lithium ion batteries contained in equipment	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 Additional requirements

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

- The equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 Outer packagings

DGP-WG/16 (see paragraph 3.5.3.1.3 of DGP/26-WP/2) (incorporated in the 2017-2018 Edition of the Technical Instructions through Addendum/Corrigendum No. 1) (Steel, although not included in of DGP/26-WP/2, was also added under “boxes”):

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

~~Strong outer packagings~~

II. SECTION II

Lithium ion cells and batteries contained in equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and~~ e) and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009.

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Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3). The package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - This requirement does not apply to:
 - packages containing only button cell batteries installed in equipment (including circuit boards); and
 - packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- Where a consignment includes packages bearing the lithium battery mark, the words "lithium ion batteries, in compliance with Section II of P1967" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high.**

Packing Instruction 968

Cargo aircraft only for UN 3090

1. Introduction

This entry applies to lithium metal or lithium alloy batteries. This packing instruction is structured as follows:

- Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and
- Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN Manual of Tests and Criteria is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. SECTION IA

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

IA.1 General requirements

Part 4;1 requirements must be met.

Table 968-IA

<i>UN number and proper shipping name</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3090 Lithium metal batteries	Forbidden	35 kg

IA.2 Additional requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Lithium metal cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).
- Lithium metal batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.

IA.3 Outer packagings*Boxes*

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Other metal (4N)
 Plastics (4H1, 4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

IB. SECTION IB

Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968-II, are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.

Lithium metal cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number "968" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5;4 apply.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~, f) (if applicable) and g) and the following:

- 1) for lithium metal cells, the lithium content is not more than 1 g;
- 2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g.

IB.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-IB

<i>Contents</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium metal cells and batteries	Forbidden	2.5 kg

IB.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with electrically conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).

Note. The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

IB.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II. SECTION II

Lithium metal or lithium alloy cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);
- Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);
- Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e, f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-II

<i>Contents</i>	<i>Lithium metal cells and/or batteries with a lithium content not more than 0.3 g</i>	<i>Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g</i>	<i>Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.

II.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with other dangerous goods.

 UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.

Note. — ~~The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.~~

- A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.
- The words "lithium metal batteries, in compliance with Section II of PI968 — cargo aircraft only" or "lithium metal batteries, in compliance with Section II of PI968 — CAO" must be placed on the air waybill, when an air waybill is used.
- Packages and overpacks of lithium metal batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

Not more than one package prepared in accordance with this section may be placed into an overpack.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

Packages prepared in accordance with this section must not be placed into an overpack with packages containing substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

 UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be ~~affixed~~ **reproduced** on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high.**

Note. — *For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.*

Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

1. Introduction

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN Manual of Tests and Criteria is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

I.1 General requirements

Part 4;1 requirements must be met.

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3091 Lithium metal batteries packed with equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 Additional requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a packaging that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 under Agenda Item 6 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spares~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
 - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging surrounded by cushioning material that is non-combustible and non-conductive and placed inside an outer packaging.

Packing Instruction 969

I.3 Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

II. SECTION II

Lithium metal or lithium alloy cells and batteries packed with equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

— Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

— [Part 5;2.4.16 \(Shipper's responsibilities — Special marking requirements for lithium batteries\)](#);

— Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);

— Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and

— Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e), f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	Package quantity (Section II)	
	Passenger	Cargo
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

— Lithium metal cells ~~or~~ **and** batteries must:

- be placed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging; or
- be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong rigid outer packaging.

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Packing Instruction 969

DGP/26 (see paragraph 6.3.1 under Agenda Item 6 of this report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spares~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- The words "lithium metal batteries, in compliance with Section II of PI969" must be placed on the air waybill, when an air waybill is used.
- Where a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment that meet the limits for lithium cells or batteries of Section II, the following additional requirements apply:
 - the shipper must ensure that all applicable parts of both packing instructions are met. The total mass of lithium batteries contained in any package must not exceed 5 kg;
 - the words "lithium metal batteries, in compliance with Section II of PI969" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

1. Introduction

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

I.1 General requirements

Equipment must be packed in strong ~~rigid~~ outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3091 Lithium metal batteries contained in equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

- The equipment must be packed in strong **rigid** outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- The quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

Packing Instruction 970

I.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II. SECTION II

Error discovered and corrected through Addendum/Corrigendum No. 1 to 2017-2018 Edition):

Lithium metal or lithium alloy cells and batteries contained ~~with in~~ equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

— Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

— ~~Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);~~

— Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);

— Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and

— Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e), f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 General requirements

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2)

Equipment ~~containing batteries~~ must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

Packing Instruction 970

II.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3). The package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - This requirement does not apply to:
 - packages containing only button cell batteries installed in equipment (including circuit boards); and
 - packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- Where a consignment includes packages bearing the lithium battery mark, the words "lithium metal batteries, in compliance with Section II of PI970" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ **reproduced** on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high**.

...

Part 5

SHIPPER'S RESPONSIBILITIES

Chapter 1

GENERAL

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1.1 GENERAL REQUIREMENTS

Before a person offers any package or overpack of dangerous goods for transport by air, that person must ensure that:

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Note 1.— Packages and overpacks containing dangerous goods may be included on the same air waybill as cargo which is not subject to these Instructions.

Note 2.— The requirement in 1.1 j) also applies to consolidated shipments offered to the operator.

Note 3.— For cooling purposes, an overpack may contain dry ice, provided that the overpack meets the requirements of Packing Instruction 954.

UN Model Regulations, 5.1.1 (see ST/SG/AC.10/44/Add.1)

Note 4.— In accordance with the GHS, a GHS pictogram not required by these Instructions should only appear in transport as part of a complete GHS label and not independently (see GHS 1.4.10.4.4).

1.6 EMPTY PACKAGINGS

...

1.6.2 Before an empty packaging which had previously contained an infectious substance is returned to the shipper, or sent elsewhere, it must be disinfected or sterilized to nullify any hazard, and any label or mark indicating that it had contained an infectious substance must be removed or obliterated.

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1.7 MIXED PACKING

UN Model Regulations, 5.1.4 (see ST/SG/AC.10/44/Add.1)

When two or more dangerous goods are packed within the same outer packaging, the package must be labelled and marked as required for each substance. Labels need not be applied for a subsidiary-risk hazard if the hazard is already represented by a primary-risk hazard label.

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Chapter 3

LABELLING

...
UN Model Regulations, 5.2 (see ST/SG/AC.10/44/Add.1)

3.1 THE REQUIREMENT TO LABEL

3.1.1 Where articles or substances are specifically listed in the Dangerous Goods List (Table 3-1), a danger class label must be affixed for the hazard shown in column 3 of Table 3-1. A subsidiary ~~risk~~ hazard label must also be affixed for any ~~risk~~ hazard indicated by a class or division number in column 4 of Table 3-1. However, special provisions indicated in column 7 may also require a subsidiary ~~risk~~ hazard label where no subsidiary ~~risk~~ hazard is indicated in column 4 or may exempt from the requirement for a subsidiary ~~risk~~ hazard label where such a ~~risk~~ hazard is indicated in the Dangerous Goods List.

3.1.2 Labels identifying the primary and subsidiary ~~risk~~ hazards of the dangerous goods must bear the class or division number as required in 3.5.1.

3.1.3 All labels must be able to withstand open weather exposure without a substantial reduction in effectiveness.

3.2 APPLICATION OF LABELS

3.2.1 The labels required to be displayed on packages of dangerous goods are identified in the Dangerous Goods List for articles and substances specifically listed by name and for articles and substances not specifically listed by name which are covered by generic or n.o.s. entries.

3.2.2 Packages containing substances of Class 8 need not show a subsidiary ~~risk~~ hazard label for Division 6.1 if the toxicity arises solely from the destructive effect on tissue. Substances of Division 4.2 need not show a subsidiary ~~risk~~ hazard label for Division 4.1 if the substance is also a flammable solid.

3.2.3 Packages containing organic peroxides which meet the criteria for Class 8, Packing Group I or II must be labelled with a corrosive subsidiary ~~risk~~ hazard label.

Note.— Many liquid organic peroxide formulations are flammable; however, no subsidiary ~~risk~~ hazard flammable label is required because the organic peroxide label itself is considered to imply that the product may be flammable.

...
3.2.8 Except as provided in 3.5.1.1 b), each class hazard label must:

- a) be affixed to a background of contrasting colour or must have a dotted or solid line outer boundary;
- b) be located on the same surface of the package near the proper shipping name mark, if the package dimensions are adequate;
- c) be so placed on the packaging that they are not covered or obscured by any part of or attachment to the packaging or any other label or mark;
- d) when primary and subsidiary ~~risk~~ hazard labels are required, be displayed next to each other; and
- e) be affixed at an angle of 45° (diamond shaped), unless the package dimensions are inadequate.

...

3.5.1 Class hazard label specifications

3.5.1.1 Labels must satisfy the provisions of this section and conform, in terms of colour, symbols and general format, to the specimen labels shown in Figures 5-4 to 5-26.

Note.— Where appropriate, labels in Figures 5-4 to 5-26 are shown with a dotted outer boundary as provided for in 3.5.1.1 a). This is not required when the label is applied on a background of contrasting colour.

Class hazard labels must conform to the following specifications:

DGP/26 (see paragraph 2.5.1.2 of this report):

- a) Labels must be configured as described below (see Figure 5-4).
 - i) Labels must be displayed on a background of contrasting colour, or must have either a dotted or solid outer boundary line.
 - ii) The label must be in the form of a square set at an angle of 45° (diamond shaped). The minimum dimensions must be 100 mm × 100 mm and the minimum width of the There must be a line inside the edge forming the diamond must be 2 mm. The line inside the edge which must be parallel and approximately 5 mm from the outside of that line to the edge of the label. The line inside the edge on the upper half of the label must be the same colour as the symbol, and the line inside the edge on the lower half of the label must be the same colour as the class or division number in the bottom corner. Where dimensions are not specified, all features must be in approximate proportion to those shown.
 - iii) Labels of 50 mm × 50 mm may be used on packages containing infectious substances where the packages are of dimensions such that they can only bear smaller labels. ~~The line inside the edge must remain 5 mm to the edge of the label. The minimum width of the line inside the edge must remain 2 mm.~~ Dimensions for labels on cylinders must comply with 3.5.1.1 b).

...

UN Model Regulations, 5.2.2.2.1.2 (see ST/SG/AC.10/44/Add.1)

- b) Cylinders for Class 2 may, on account of their shape, orientation and securing mechanisms for transport, bear labels representative of those specified in this chapter, which have been reduced in size, according to ISO 7225:2005 "Gas cylinders — Precautionary labels", for display on the non-cylindrical part (shoulder) of such cylinders. Labels may overlap to the extent provided for by ISO 7225:2005 "Gas cylinders — Precautionary labels"; however, in all cases the labels representing the primary hazard and the numbers appearing on any label must remain fully visible and the symbols recognizable.

Corrigendum 1 to UN Model Regulations, Chapter 5.2, 5.2.2.2.1.3, see ST/SG/AC.10/1/Rev.19/Corr.1)

- c) With the exception of labels for Divisions 1.4, 1.5 and 1.6 of Class 1, the upper half of the label must contain the pictorial symbol and the lower half must contain the class or, in the case of labels for Class 5, the division number, as appropriate. ~~The lower half of the label must also contain the pictorial symbol on the Class 9 label for lithium batteries (Figure 5-26).~~ However for the Class 9 label for lithium batteries (Figure 5-26), the upper half of the label must only contain the seven vertical stripes of the symbol and the lower half must contain the group of batteries of the symbol and the class number. Except for the Class 9 label for lithium batteries (Figure 5-26), the label may include such text as the UN number, or words describing the hazard class (e.g. "flammable") in accordance with 3.5.1.1 e) provided that the text does not obscure or detract from the other required label elements.

...

UN Model Regulations, 5.2 (see ST/SG/AC.10/44/Add.1)

- e) On labels other than those for material of Class 7, the insertion of any text (other than the class or division number or compatibility group) in the space below the symbol must be confined to particulars indicating the nature of the risk hazard and precautions to be taken in handling. In the case of the Class 9 label for lithium batteries (Figure 5-26), no text other than the class number must be included in the bottom part of the label.

...

3.5.1.2 Illustrations of the class hazard labels, showing the approved symbols and colours, are given in Figures 5-5 to 5-26. The label descriptions used in column 5 of Table 3-1 are indicated in parentheses.

Note 1.— The asterisk appearing in the bottom corner of the label indicates the location of the class or division number when the label is used to show the primary risk hazard. See Figures 5-5 to 5-8 concerning the location of information on explosives labels.

Note 2.— Minor variations in the design of the symbol on labels or other differences such as the width of vertical lines on labels as shown in these Instructions or in regulations of other modes, which do not affect the obvious meaning of the label, are acceptable. For example the hand shown on the Class 8 label may be shown with or without shading, the extreme right and left vertical lines on the Division 4.1 and Class 9 labels may extend to the edge of the label or there may be some white space at the edge, etc.

UN Model Regulations, 5.2.2.2.2 (see ST/SG/AC.10/44/Add.1) and DGP/-WG/17 (see paragraph 3.2.5.1.3 of DGP/26-WP/3).

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Chapter 4

DOCUMENTATION

4.1.4 Information required on the dangerous goods transport document

4.1.4.1 Dangerous goods description

The dangerous goods transport document must contain the following information for each dangerous substance, material or article offered for transport:

- a) the UN or ID number preceded by the letters "UN" or "ID" as appropriate;
- b) the proper shipping name, as determined according to 3.1.2, including the technical name enclosed in parenthesis, as applicable (see 3.1.2.7);
- c) the primary hazard class or, when assigned, the division of the goods, including for Class 1 the compatibility group letter. The words "Class" or "Division" may be included preceding the primary hazard class or division numbers;

UN Model Regulations, 5.4.1.4.1 (d) (see ST/SG/AC.10/44/Add.1)

- d) subsidiary hazard class or division number(s) corresponding to the subsidiary-risk hazard label(s) required to be applied, when assigned, must be entered following the primary hazard class or division and must be enclosed in parenthesis. The words "Class" or "Division" may be included preceding the subsidiary hazard class or division numbers;
- e) where assigned, the packing group for the substance or article which may be preceded by "PG" (e.g. "PG II").

~~+ Note. — Until 31 March 2017, shippers may identify engines as Class 9, UN 3166 using the proper shipping names and Packing Instruction 950 or 951 as shown in the 2015-2016 Edition of these Instructions. In that instance the dangerous goods transport document must indicate the packing instruction number and the UN number and proper shipping name in effect in the 2015-2016 Edition of these Instructions. The marks and labels applied, when required, must be consistent with the information shown on the dangerous goods transport document.~~

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UN Model Regulations, 5.4.1.5.5 (see ST/SG/AC.10/44/Add.1)

4.1.5.4 Self-reactive substances and organic peroxides

4.1.5.4.1 When organic peroxides and self-reactive substances are transported under conditions where approval is required (for organic peroxides, see 2;5.3.2.5 for self-reactive substances, see 2;4.2.3.2.5), a statement to this effect must be included in the dangerous goods transport document. A copy of the classification approval and conditions of transport for non-listed organic peroxides and self-reactive substances must be attached to the dangerous goods transport document.

4.1.5.4.2 When a sample of an organic peroxide (see 2;5.3.2.6) or a self-reactive substance (see 2;4.2.3.2.6) is transported, a statement to this effect must be included in the dangerous goods transport document.

4.1.5.6 Firework classification reference

4.1.5.6.1 When fireworks of UN 0336 or UN 0337 are transported, the dangerous goods transport document must include a classification reference(s) issued by the appropriate national authority.

UN Model Regulations, 5.4.1.5.10 (see ST/SG/AC.10/44/Add.1)

4.1.5.6.2 The classification reference(s) must consist of the appropriate national authority's State, indicated by the distinguishing sign ~~for motor~~ used on vehicles in international traffic, the appropriate national authority identification and a unique serial reference. Examples of such classification references are:

GB/HSE123456
D/BAM1234
USA EX20091234.

Note.— The distinguishing sign used on vehicles in international traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

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Part 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

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Chapter 2

MARKING OF PACKAGINGS OTHER THAN INNER PACKAGINGS

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UN Model Regulations, 6.1.3.1 f) (see ST/SG/AC.10/44/Add.1)

- f) the State authorizing the allocation of the mark, indicated by the distinguishing sign ~~for motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

...

UN Model Regulations, 6.1.3.8 (h) (see ST/SG/AC.10/44/Add.1)

2.1.8 After reconditioning a packaging, the reconditioner must apply to it, in sequence, durable marks showing:

- h) the State in which the reconditioning was carried out, indicated by the distinguishing sign ~~for motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

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Chapter 4

PACKAGING PERFORMANCE TESTS

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4.7 TEST REPORT

4.7.1 A test report containing at least the following particulars must be drawn up and must be available to the users of the packaging:

- a) name and address of the test facility;
- b) name and address of the applicant (where appropriate);
- c) a unique test report identification;

- d) date of the test report;
- e) manufacturer of the packaging;
- f) description of the packaging type (e.g. dimensions, materials, closures, thickness, etc.), including method of manufacture (e.g. blow moulding); drawings and/or photographs may be included;
- g) maximum capacity;

UN Model Regulations, 6.1.5.7.1 (see ST/SG/AC.10/44/Add.1)

- h) characteristics of the test contents (e.g. the viscosity and relative density for liquids and the particle size for solids) [\(for plastics packagings subject to the internal pressure test in 4.5, the temperature of the water used\)](#);
- i) test descriptions and results;
- j) a signature and name and status of the signatory.

...

Chapter 5

REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF CYLINDERS AND CLOSED CRYOGENIC RECEPTACLES, AEROSOL DISPENSERS AND SMALL RECEPTACLES CONTAINING GAS (GAS CARTRIDGES) AND FUEL CELL CARTRIDGES CONTAINING LIQUEFIED FLAMMABLE GAS

...

5.1.6 Periodic inspection and testing

5.1.6.1 Refillable cylinders other than cryogenic receptacles must be subjected to periodic inspections and tests by a body authorized by the appropriate national authority, in accordance with the following:

- a) check of the external conditions of the cylinder and verification of the equipment and the external marks;
- b) check of the internal conditions of the cylinder (e.g. internal inspection, verification of minimum wall thickness);
- c) check of the threads if there is evidence of corrosion or if the fittings are removed;
- d) a hydraulic pressure test and, if necessary, verification of the characteristics of the material by suitable tests;

UN Model Regulations, 6.2.1.6.1 d) (see ST/SG/AC.10/44/Add.1)

Note 1.— With the agreement of the appropriate national authority, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger.

Note 2.— ~~With the agreement of the appropriate national authority, the hydraulic pressure test of cylinders may be replaced by an equivalent method based on acoustic emission testing or a combination of acoustic emission testing and ultrasound examination. ISO 16148:2006 may be used as a guide for acoustic emission testing procedures. For seamless steel cylinders the check of 5.1.6.1 b) and hydraulic pressure test of 5.1.6.1 d) may be replaced by a procedure conforming to ISO 16148:2016 "Gas cylinders — Refillable seamless steel gas cylinders and tubes — Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing".~~

Note 3.— ~~The check of 5.1.6.1 b) and the hydraulic pressure test of 5.1.6.1 d) may be replaced by ultrasonic examination carried out in accordance with ISO 10461:2005 + A1:2006 for seamless aluminium alloy gas cylinders and in accordance with ISO 6406:2005 for seamless steel gas cylinders.~~

- e) check of service equipment, other accessories and pressure-relief devices, if to be reintroduced into service.

...

5.2 REQUIREMENTS FOR UN CYLINDERS AND CLOSED CRYOGENIC RECEPTACLES

...

5.2.1 Design, construction and initial inspection and testing

5.2.1.1 The following standards apply for the design, construction and initial inspection and test of UN cylinders, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

Reference	Title	Applicable for manufacture
...		
+ ISO-ISO 7866: 2012+ Cor 1:2014	Gas cylinders — Refillable seamless aluminium alloy gas cylinders — Design, construction and testing	Until further notice
	<i>Note.— Aluminium alloy 6351A or equivalent must not be used.</i>	

...

UN Model Regulations, 6.2.2.1.1 (see ST/SG/AC.10/44/Add.1)

ISO 11118:1999	Gas cylinders — Non-refillable metallic gas cylinders — Specification and test methods.	Until further notice
<u>ISO 11118:2015</u>	<u>Gas cylinders — Non-refillable metallic gas cylinders — Specification and test methods</u>	<u>Until 31 December 2020</u> Until further notice

...

...

UN Model Regulations, 6.2.2.1.8 (see ST/SG/AC.10/44/Add.1)

5.2.1.8 Not used.

...

5.2.3 Service equipment

The following standards apply to closures and their protection:

Reference	Title	Applicable for manufacture
ISO 11117:1998	Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests.	Until 31 December 2014
ISO 11117:2008+ Cor 1:2009	Gas cylinders — Valve protection caps and valve guards — Design, construction and tests.	Until further notice
ISO 10297:1999	Gas cylinders — Refillable gas cylinder valves — Specification and type testing.	Until 31 December 2008
ISO 10297:2006	Gas cylinders — Refillable gas cylinder valves — Specification and type testing.	Until 31 December 2020
ISO 10297:2014	Gas cylinders — Cylinder valves — Specification and type testing	Until further notice

UN Model Regulations, 6.2.2.3 (see ST/SG/AC.10/44/Add.1)

ISO 13340:2001	Transportable gas cylinders — Cylinder valves for non-refillable cylinders — Specification and prototype testing.	Until further notice <u>Until 31 December 2020</u>
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ISO 14246:2014	Gas cylinders — Cylinder valves — Manufacturing tests and examination	Until further notice
ISO 17871:2015	Gas cylinders — Quick-release cylinders valves- Specification and type testing	Until further notice

...

5.2.4 Periodic inspection and test

UN Model Regulations, 6.2.2.4 (see ST/SG/AC.10/44/Add.1)

5.2.4.1 The following standards apply to the periodic inspection and testing of UN cylinders and UN metal hydride storage systems and their closures:

Reference	Title	Applicable for manufacture
ISO 6406:2005	Seamless steel gas cylinders — Periodic inspection and testing.	Until further notice
ISO 10460:2005	Gas cylinders – Welded carbon-steel gas cylinders – Periodic inspection and testing.	Until further notice
	<i>Note.— The repair of welds described in clause 12.1 of this standard must not be permitted. Repairs described in clause 12.2 require the approval of the appropriate national authority which approved the periodic inspection and test body in accordance with 5.2.6.</i>	
ISO 10461:2005/A1:2006	Seamless aluminium-alloy gas cylinders — Periodic inspection and testing.	Until further notice
ISO 10462:2005	Transportable cylinders for dissolved acetylene — Periodic inspection and maintenance.	Until 31 December 2018
ISO 10462:2013	Gas cylinders — Acetylene cylinders — Periodic inspection and maintenance.	Until further notice
ISO 11513:2011	Gas cylinders — Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) — Design, construction, testing, use and periodic inspection.	Until further notice
ISO 11623:2002	Transportable gas cylinders — Periodic inspection and testing of composite gas cylinders.	Until further notice
ISO 11623:2015	Gas cylinders — Composite construction — Periodic inspection and testing	Until further notice December 2020
ISO 22434:2006	Transportable gas cylinders — Inspection and maintenance of cylinder valves	Until further notice
	<i>Note.— These requirements may be met at times other than at the periodic inspection and test of UN cylinders.</i>	

5.2.4.2 The following standard applies to the periodic inspection and testing of UN metal hydride storage systems:

ISO 16111:2008	Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.	Until further notice
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Editorial amendment (redundant text, it appears under 5.2.4.1, ISO 10460:2005):

~~*Note.— The repair of welds described in clause 12.1 of this standard must not be permitted. Repairs described in clause 12.2 require the approval of the appropriate national authority which approved the periodic inspection and test body in accordance with 5.2.6.*~~

...

Consequential/editorial amendments:

5.2.6.5 Periodic inspection and test and certification

5.2.6.5.1 The application of the periodic inspection and test marks to a cylinder and closed cryogenic receptacle must be considered a declaration that the cylinder and closed cryogenic receptacle complies with the applicable cylinder and closed cryogenic receptacle standards and the requirements of these Instructions. The periodic inspection and test body must affix the periodic inspection and test marks, including its registered mark, to each approved cylinder and closed cryogenic receptacle (see ~~5.2.7.8~~ [5.2.7.7](#)).

...

**5.2.7 Marking of UN refillable cylinders
and closed cryogenic receptacles**

...

 UN Model Regulations, 6.2.2.7.2 (c) (see ST/SG/AC.10/44/Add.1)

- c) The character(s) identifying the country of approval, as indicated by the distinguishing signs ~~of motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

...

 UN Model Regulations, 6.2.2.7.4 (see ST/SG/AC.10/44/Add.1)

5.2.7.4 The following manufacturing marks must be applied:

- m) Identification of the cylinder thread (e.g. 25E). This mark is not required for closed cryogenic receptacles;

Note.— Information on marks that may be used for identifying threads for cylinders is given in ISO/TR 11364, Gas cylinders — Compilation of national and international valve stem/gas cylinder neck threads and their identification and marking system.

- n) The manufacturer's mark registered by the appropriate national authority. When the country of manufacture is not the same as the country of approval, then the manufacturer's mark must be preceded by the character(s) identifying the country of manufacture, as indicated by the distinguishing signs ~~of motor~~ used on vehicles in international road traffic. The country mark and the manufacturer's mark must be separated by a space or slash;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.


...

 Consequential/editorial amendments:

5.2.7.5 The above marks must be placed in three groups:

- a) Manufacturing marks must be the top grouping and must appear consecutively in the sequence given in 5.2.7.4 except for the marks described in 5.2.7.4 q) and r) which must be adjacent to the periodic inspection and test marks of ~~5.2.7.8~~ 5.2.7.7;
- b) The operational marks in 5.2.7.3 must be the middle grouping and the test pressure f) which must be immediately preceded by the working pressure (i) when the latter is required;
- c) Certification marks must be the bottom grouping and must appear in the sequence given in 5.2.7.2.

The following is an example of marking a cylinder:

m) 25E	n) D MF	o) 765432	p) H	
<hr/>				
i) PW200PH	f) 300BAR	g) 62.1KG	j) 50L	h) 5.8MM
<hr/>				
 a)	b) ISO 9809-1	c) F	d) IB	e) 2000/12
<hr/>				

5.2.7.6 Other marks are allowed in areas other than the side wall, provided they are made in low stress areas and are not of a size and depth that will create harmful stress concentrations. In the case of closed cryogenic receptacles, such marks may be on a separate plate attached to the outer jacket. Such marks must not conflict with required marks.

Deleted because requirements for composite cylinders are included in 5.2.7.4 q) and r):

~~5.2.7.7 Cylinders of composite construction with limited life must be marked with the letters "FINAL" followed by the expiry date, the year (four digits) and the month (two digits).~~

5.2.7.7 In addition to the preceding marks, each refillable cylinder and closed cryogenic receptacle that meets the periodic inspection and test requirements of 5.2.4 must be marked indicating:

UN Model Regulations, 6.2.2.7.7 (a) (see ST/SG/AC.10/44/Add.1)

- a) the character(s) identifying the country authorizing the body performing the periodic inspection and test as indicated by the distinguishing sign used on vehicles in international road traffic. This mark is not required if this body is approved by the appropriate national authority of the country approving manufacture;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

- b) the registered mark of the body authorized by the appropriate national authority for performing the periodic inspection and test;
- c) the date of the periodic inspection and test, the year (two digits) followed by the month (two digits) separated by a slash (i.e. "/"). Four digits may be used to indicate the year.

The above marks must appear consecutively in the sequence given.

5.2.7.8 For acetylene cylinders, with the agreement of the national authority, the date of the most recent periodic inspection and the stamp of the body performing the periodic inspection and test may be engraved on a ring held on the cylinder by the valve. The ring must be configured so that it can be removed only by disconnecting the valve from the cylinder.

...

5.2.9 Marking of UN metal hydride storage systems

...

5.2.9.2 The following marks must be applied:

- a) The UN packaging symbol 

This symbol must not be used for any purpose other than for certifying that a packaging complies with the relevant requirements in Chapters 1 to 6;

- b) "ISO 16111" (the technical standard used for design, manufacture and testing);

UN Model Regulations, 6.2.2.9.2 (c) (see ST/SG/AC.10/44/Add.1)

- c) The character(s) identifying the country of approval, as indicated by the distinguishing signs ~~of motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

...

UN Model Regulations, 6.2.2.9.2 (h) (see ST/SG/AC.10/44/Add.1)

- h) The manufacturer's mark registered by the appropriate national authority. When the country of manufacture is not the same as the country of approval, then the manufacturer's mark must be preceded by the character(s) identifying the country of manufacture, as indicated by the distinguishing signs ~~of motor~~ used on vehicles in international road traffic. The country mark and the manufacturer's mark must be separated by a space or slash;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

...

UN Model Regulations, 6.2.2.9.4 (a) (see ST/SG/AC.10/44/Add.1)

5.2.9.4 In addition to the preceding marks, each metal hydride storage system that meets the periodic inspection and test requirements of 5.2.4 must be marked indicating:

- a) the character(s) identifying the country authorizing the body performing the periodic inspection and test, as indicated by the distinguishing sign ~~of motor~~ used for vehicles in international road traffic. This mark is not required if this body is approved by the appropriate national authority of the country approving manufacture;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

...

Chapter 6

PACKAGINGS FOR INFECTIOUS SUBSTANCES OF CATEGORY A

...

6.4 MARKING

...

6.4.2 A packaging that meets the requirements of this section and of 6.5 shall be marked with:

...

UN Model Regulations, 6.3.4.2 (e) (see ST/SG/AC.10/44/Add.1)

- e) the State authorizing the allocation of the mark, indicated by the distinguishing sign ~~for motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

- f) the name of the manufacturer or other identification of the packaging specified by the competent authority; and
- g) for packagings meeting the requirements of 6.5.1.6, the letter "U", inserted immediately following the mark required in b) above.

...

Chapter 8

REQUIREMENTS FOR INTERMEDIATE BULK CONTAINERS

8.1 MARKING OF PACKAGING FOR INTERMEDIATE BULK CONTAINERS

...

8.1.2 The packaging mark consists of:

UN Model Regulations, 6.5.2.1 (e) (see ST/SG/AC.10/44/Add.1)

- e) the State authorizing the allocation of the mark; indicated by the distinguishing sign ~~for motor~~ used on vehicles in international road traffic;

Note.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

- f) the name or symbol of the manufacturer and other identification of the IBC, as specified by the appropriate national authority;
- g) the stacking test load in kg. For IBCs not designed for stacking, the figure "0" must be shown;
- h) the maximum permissible gross mass in kg.

...

Part 7

OPERATOR'S RESPONSIBILITIES

...

Chapter 2

STORAGE AND LOADING

...

2.2 INCOMPATIBLE DANGEROUS GOODS

2.2.1 Segregation

UN Model Regulations, 7.1.2.3 c) (see ST/SG/AC.10/44/Add.1) and DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3)

2.2.1.1 Packages containing dangerous goods which might react dangerously one with another must not be stowed on an aircraft next to each other or in a position that would allow interaction between them in the event of leakage. As a minimum, the segregation scheme shown in Table 7-1 must be followed in order to maintain acceptable segregation between packages containing dangerous goods having different hazards. The scheme applies irrespective of whether the hazard is the primary or subsidiary ~~risk~~ hazard.

DGP/26 (see paragraph 2.7.1.2 a) of this report:

2.2.1.2 Packages and overpacks containing lithium ion batteries prepared in accordance with Section IA or Section IB of Packing Instruction 965 and packages and overpacks containing lithium metal batteries prepared in accordance with Section IA or Section IB of Packing Instruction 968 must not be stowed on an aircraft next to, or in a position that would allow interaction with packages or overpacks containing dangerous goods which bear a Class 1, other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1 hazard label. To maintain acceptable segregation between packages and overpacks, the segregation requirements shown in Table 7-1 must be followed. The segregation requirements apply based on all hazard labels applied on the package or overpack, irrespective of whether the hazard is the primary or subsidiary hazard.

...

2.2.2 Separation of explosive substances and articles

...

DGP-WG/16 (see paragraph 3.2.7.7 of DGP/26-WP/2):

~~2.2.2.4~~ Except as provided for in ~~2.2.2.5~~, explosives of different compatibility groups may be stowed together whether or not they belong to the same division.

DGP-WG/16 (see paragraph 3.2.7.6 of DGP/26-WP/2) (para numbering changed consequential to deletion of ~~2.2.2.4~~ above:

~~2.2.2.5~~2.2.2.4 For explosives of different division numbers and compatibility groups, the ~~segregation~~ separation scheme shown in Table 7-2 must be followed in order to maintain acceptable distances between such packages.

...

DGP-WG/17 (see paragraphs 3.2.7.1 and 3.5.3.1 of DGP/26-WP/3):

Table 7-1. Segregation between packages

Hazard label	Class or division											
	1	2.1	2.2, 2.3	3	4.1	4.2	4.3	5.1	5.2	8	⁹ see 2.2.1.2	
1	Note 1	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
2.1	Note 2	—	==	—	==	—	—	—	—	—	—	x
2.2, 2.3	Note 2	==	==	==	==	==	==	==	==	==	==	==
3	Note 2	—	==	—	==	—	—	x	—	—	—	x
4.1	Note 2	==	==	==	==	==	==	==	==	==	==	x
4.2	Note 2	—	==	—	==	—	—	x	—	—	—	==
4.3	Note 2	—	==	—	==	—	—	—	—	x	—	==
5.1	Note 2	—	==	x	==	x	—	—	—	—	—	x
5.2	Note 2	—	==	—	==	—	—	—	—	—	—	==
8	Note 2	—	==	—	==	—	x	—	—	—	—	==
⁹ see 2.2.1.2	Note 2	x	==	x	x	==	==	x	==	==	==	==

An “x” at the intersection of a row and column indicates that packages containing these classes of dangerous goods may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents. Thus, a package containing Class 3 dangerous goods may not be stowed next to or in contact with a package containing Division 5.1 dangerous goods.

Note 1.— See 2.2.2.2 through ~~2.2.2.5~~ 2.2.2.4.

Note 2.— This class or division must not be stowed together with explosives other than those in Division 1.4, Compatibility Group S.

Note 3.— Packages containing dangerous goods with multiple hazards in the class or divisions which require segregation in accordance with Table 7-1 need not be segregated from other packages bearing the same UN number.

Note 4.— UN 3528, **Engines, internal combustion, flammable liquid powered, Engines, fuel cell, flammable liquid powered, Machinery internal combustion, flammable liquid powered and Machinery, fuel cell, flammable liquid powered** need not be segregated from packages containing dangerous goods in Division 5.1.

...

2.4 LOADING AND SECURING OF DANGEROUS GOODS

2.4.1 Loading of cargo aircraft

...

DGP-WG/16 (see paragraph 3.2.7.4 of DGP/26-WP/2):

2.4.1.2 The requirements of 2.4.1.1 a), b or c) do not apply to:

Alignment with the UN agreement that the word “risk” was inappropriately used in many paragraphs of the Model Regulations and should be replaced by the word “hazard” (see ST/SG/AC.10/C.3/98).

- a) flammable liquids (Class 3), Packing Group III, other than those with a subsidiary-risk hazard of Class 8;
- b) toxic substances (Division 6.1) with no subsidiary-risk hazard other than Class 3;

- c) infectious substances (Division 6.2);
- d) radioactive material (Class 7);

DGP/26 (see paragraph 2.7.2 of this report):

- e) miscellaneous dangerous goods (Class 9);
- f) UN 3528 — Engine, internal combustion, flammable liquid powered or Engine, fuel cell, flammable liquid powered or Machinery, internal combustion, flammable liquid powered or Machinery, fuel cell, flammable liquid powered; and
- g) UN 3529 — Engine, internal combustion, flammable gas powered or Engine, fuel cell, flammable gas powered or Machinery, internal combustion, flammable gas powered or Machinery, fuel cell, flammable gas powered.

DGP-WG/17 (see paragraph 3.2.7.2 of DGP/26-WP/3):

Note — When transporting goods in a non-pressurized cargo-hold compartment, there will be a large pressure differential up to 75 kPa at cruise altitudes. Packages that are filled at a normal atmospheric pressure may not be capable of withstanding this pressure differential. Confirmation of the suitability of the packagings from the shipper should be obtained.

...

2.9 SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF RADIOACTIVE MATERIAL

2.9.1 LIMITATION OF EXPOSURE OF PERSONS TO RADIATION

...

2.9.3 STOWAGE DURING TRANSPORT AND STORAGE IN TRANSIT

...

2.9.3.3 Loading of freight containers and accumulation of packages, overpacks and freight containers must be controlled as follows:

...

DGP-WG/16 (see paragraph 3.2.7.6 of DGP/26-WP/2):

- b) Where a consignment is transported under exclusive use, there is no limit on the sum of the transport indexes aboard a single aircraft, but the requirement on minimum ~~segregation~~-separation distances established in 2.9.6 applies;

...

DGP-WG/17 (see paragraph 3.2.7.2 of DGP/26-WP/3):

2.12 LOADING OF UN 2211, POLYMERIC BEADS, EXPANDABLE OR UN 3314, PLASTICS MOULDING COMPOUND

A total of not more than 100 kg net mass of expandable polymeric beads (or granules), or plastic moulding materials, referenced to Packing Instruction 957, may be carried in any inaccessible-hold cargo compartment on any aircraft.

DGP/26 (see paragraph 2.8.3 of this report):

2.13 LOADING OF BATTERY POWERED MOBILITY AIDS CARRIED UNDER THE PROVISIONS OF PART 8

2.13.1 Loading of non-spillable wet battery powered mobility aids

2.13.1.1 An operator must secure, by use of straps, tie-downs or other restraint devices, a battery powered mobility aid with installed batteries. The mobility aid, the batteries, electrical cabling and controls must be protected from damage including by the movement of baggage, mail or cargo.

2.13.1.2 An operator must verify that:

a) the passenger has confirmed that the battery is a non-spillable wet battery that complies with Special Provision A67;

b) the battery terminals are protected from short circuits (e.g. by being enclosed within a battery container);

c) the battery is either:

1) securely attached to the mobility aid and the electrical circuits are isolated following the manufacturer's instructions; or

2) removed by the user, if the mobility aid is specifically designed to allow it to be, following the manufacturer's instructions.

d) a maximum of one spare battery may be carried per passenger.

2.13.1.3 An operator must ensure that any battery(ies) removed from the mobility aid and any spare battery are carried in strong, rigid packagings, protected from short circuit and stowed in the cargo compartment.

2.13.1.4 The operator must inform the pilot-in-command of the location of any mobility aids with installed batteries, removed batteries and spare batteries.

2.13.2 Loading of spillable battery powered mobility aids

2.13.2.1 An operator must secure, by use of straps, tie-downs or other restraint devices, a battery powered mobility aid with installed batteries. The mobility aid, the batteries, electrical cabling and controls must be protected from damage including by the movement of baggage, mail or cargo.

2.13.2.2 An operator must verify that:

a) the battery terminals are protected from short circuits (e.g. by being enclosed within a battery container);

b) the battery is fitted, where feasible, with spill resistant-vent caps; and

c) the battery is either:

1) securely attached to the mobility aid and the electrical circuits are isolated following the manufacturer's instructions; or

2) removed from the mobility aid following the manufacturer's instructions when required by 2.13.2.3.

2.13.2.3 An operator must load, stow, secure, and unload a spillable battery-powered mobility aid in an upright position. If the mobility aid cannot be loaded, stowed, secured and unloaded always in an upright position or if the mobility aid does not adequately protect the battery, the operator must remove the batteries and carry them in strong, rigid packagings, as follows:

a) packagings must be leak-tight, impervious to battery fluid and be protected against being overturned by securing them to pallets or by securing them in cargo compartments using appropriate means of securement;

b) batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; and

c) these packagings must be marked "Battery, wet, with wheelchair" or "Battery, wet, with mobility aid" and be labelled with a "Corrosive" label (Figure 5-24) and with package orientation labels (Figure 5-29) as required by 5.3.

2.13.2.4 The operator must inform the pilot-in-command of the location of any mobility aids with installed spillable batteries and removed batteries.

2.13.3 Loading of lithium ion battery powered mobility aids

2.13.3.1 An operator must secure, by use of straps, tie-downs or other restraint devices, a battery powered mobility aid with installed batteries. The mobility aid, the batteries, electrical cabling and controls must be protected from damage including by the movement of baggage, mail or cargo.

2.13.3.2 An operator must verify that:

a) the battery terminals are protected from short circuits (e.g. by being enclosed within a battery container);

b) the battery is either:

1) securely attached to the mobility aid and the electrical circuits are isolated following the manufacturer's instructions; or

2) removed by the user, if the mobility aid is specifically designed to allow it to be, following the manufacturer's instructions; and

c) the removed battery does not exceed 300 Wh and that its spare battery does not exceed 300 Wh or its two spare batteries do not exceed 160 Wh each.

2.13.3.3 An operator must ensure that any battery removed from the mobility aid and any spare batteries are carried in the cabin and protected from damage (e.g., by placing each battery in a protective pouch) and the battery terminals protected from short circuit (by insulating the terminals, e.g. by taping over exposed terminals).

2.13.3.4 The operator must inform the pilot-in-command of the location of any mobility aids with installed lithium ion batteries, removed batteries and spare batteries.

...

Renumber subsequent paragraphs accordingly

...

Chapter 4

PROVISION OF INFORMATION

...

4.1 INFORMATION TO THE PILOT-IN-COMMAND

...

DGP-WG/16 (see paragraph 3.2.7.2 of DGP/26-WP/2):

4.1.1.1 Except as otherwise provided, the information required by 4.1.1 must include the following:

a) the date of the flight;

ab) the air waybill number (when issued);

Alignment with the UN agreement that the word “risk” was inappropriately used in many paragraphs of the Model Regulations and should be replaced by the word “hazard” (see ST/SG/AC.10/C.3/98).

bc) the proper shipping name (the technical name(s) shown on the dangerous goods transport document is not required) and UN Number or ID number as listed in these Instructions. When chemical oxygen generators contained in protective breathing equipment (PBE) are being transported under Special Provision A144, the proper shipping name of “oxygen generator, chemical” must be supplemented with the statement “Aircrew protective breathing equipment (smoke hood) in accordance with Special Provision A144”.

- ed) the class or division, and subsidiary-risk hazard(s) corresponding to the subsidiary-risk hazard label(s) applied, by numerals, and in the case of Class 1, the compatibility group;
- de) the packing group shown on the dangerous goods transport document;
- ef) the number of packages and their exact loading location. For radioactive material see g) below;
- ≠ fg) the net quantity, or gross mass if applicable, of each package, except that this does not apply to radioactive material or other dangerous goods where the net quantity or gross mass is not required on the dangerous goods transport document (see 5;4.1.4) or, when applicable, alternative written documentation. For a consignment consisting of multiple packages containing dangerous goods bearing the same proper shipping name and UN number or ID number, only the total quantity and an indication of the quantity of the largest and smallest package at each loading location need to be provided. For consumer commodities, the information provided may be either the gross mass of each package or the average gross mass of the packages as shown on the dangerous goods transport document;
- gh) for radioactive material the number of packages, overpacks or freight containers, their category, their transport index (if applicable) and their exact loading location;
- hi) whether the package must be carried on cargo aircraft only;
- ij) the aerodrome at which the package(s) is to be unloaded;
- jk) where applicable, an indication that the dangerous goods are being carried under a State exemption; and
- kl) the telephone number where a copy of the information provided to the pilot-in-command can be obtained during the flight if the operator allows the pilot-in-command to provide a telephone number instead of the details about the dangerous goods on board the aircraft, as specified in 4.3.

DGP-WG/17 (see paragraph 3.2.7.2 of DGP/26-WP/3):

4.1.2 For UN 1845 — **Carbon dioxide, solid** (dry ice), the information required by 4.1.1 may be replaced by the UN number, proper shipping name, class, total quantity in each-held cargo compartment on the aircraft and the aerodrome at which the package(s) is to be unloaded.

DGP/26 (see paragraph 6.3.2 under Agenda Item 6 of this report):

4.1.3 For UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**), the information required by 4.1.1 may be replaced by the UN number, proper shipping name, class, total quantity at each specific loading location, the aerodrome at which the package(s) is to be unloaded and whether the package must be carried on cargo aircraft only. UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**) carried under a State exemption must meet all of the requirements of 4.1.

...

DGP-WG/17 (see paragraph 3.2.7.5 of DGP/26-WP/3):

Table 7-9. Dangerous goods not required to appear in the information to the pilot-in-command

<i>UN Number</i>	<i>Item</i>	<i>Reference</i>
n/a	Dangerous goods packed in excepted quantities	3;5.1.1
UN 2807	Magnetized material with field strengths causing a compass deflection of not more than 2 degrees at a distance of 4.6 m	Packing Instruction 953
UN 2908	Radioactive material, excepted package — empty packaging	1;6.1.5.1 a)
UN 2909	Radioactive material, excepted package — articles manufactured from natural uranium or depleted uranium or natural thorium	1;6.1.5.1 a)
UN 2910	Radioactive material, excepted package — limited quantity of material	1;6.1.5.1 a)
UN 2911	Radioactive material, excepted package — instruments or articles	1;6.1.5.1 a)
UN 3090	Lithium metal batteries (including lithium alloy batteries) when meeting the requirements of Packing Instruction 968, Section II	Packing Instruction 968, Section II
UN 3091	Lithium metal batteries contained in equipment (including lithium alloy batteries) when meeting the requirements of Packing Instruction 970, Section II	Packing Instruction 970, Section II

<i>UN Number</i>	<i>Item</i>	<i>Reference</i>
UN 3091	Lithium metal batteries packed with equipment (including lithium alloy batteries) when meeting the requirements of Packing Instruction 969, Section II	Packing Instruction 969, Section II
UN 3245	Genetically modified micro-organisms	Packing Instruction 959
UN 3245	Genetically modified organisms	Packing Instruction 959
UN 3373	Biological substance, Category B	Packing Instruction 650, sub-paragraph 11
UN 3480	Lithium ion batteries (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 965, Section II	Packing Instruction 965, Section II
UN 3481	Lithium ion batteries contained in equipment (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 967, Section II	Packing Instruction 967, Section II
UN 3481	Lithium ion batteries packed with equipment (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 966, Section II	Packing Instruction 966, Section II

...

Alignment with the UN agreement that the word “risk” was inappropriately used in many paragraphs of the Model Regulations and should be replaced by the word “hazard” (see ST/SG/AC.10/C.3/98).

4.3 INFORMATION TO BE PROVIDED BY THE PILOT-IN-COMMAND IN CASE OF IN-FLIGHT EMERGENCY

If an in-flight emergency occurs, the pilot-in-command must, as soon as the situation permits, inform the appropriate air traffic services unit, for the information of aerodrome authorities, of any dangerous goods carried as cargo on board an aircraft. Wherever possible this information should include the proper shipping name and/or UN number, the class/division and, for Class 1, the compatibility group, any identified subsidiary ~~risk~~ hazard(s), the quantity and the location on board the aircraft, or a telephone number where a copy of the information provided to the pilot-in-command can be obtained. When it is not considered possible to include all the information, those parts thought most relevant in the circumstances or a summary of the quantities and class or division of dangerous goods in each cargo compartment should be given.

...

Chapter 6

PROVISIONS TO AID RECOGNITION OF UNDECLARED DANGEROUS GOODS

...

Consequential/editorial amendment:

unaccompanied passengers' baggage/personal effects — may contain items meeting any of the criteria for dangerous goods not permitted under Table 8-1

Note.— *Excess baggage carried as cargo may contain certain dangerous goods, as provided for by 1;1.1.5.1-g) ~~h)~~.*

...

Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

Chapter 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

Parts of this Chapter are affected by State Variations US 15, VE 9, VE 10; see Table A-1

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

DGP/26 (see paragraph 2.8.2 of this report):

~~1.1.1 Except as otherwise provided in 1.1.2, dangerous goods, including excepted packages of radioactive material, must not be carried by passengers or crew members, either as or in carry on baggage or checked baggage or on their person. Except as provided for in Table 8-1, 31), security type equipment such as attaché cases, cash boxes, cash bags, etc., incorporating dangerous goods, for example lithium batteries or pyrotechnic material, are totally forbidden; see entry in Table 3-1. Personal medical oxygen devices that utilize liquid oxygen are forbidden either as or in carry on baggage or checked baggage or on the person. Electroshock weapons (e.g. tasers) containing dangerous goods such as explosives, compressed gases, lithium batteries, etc., are forbidden in carry on baggage or checked baggage or on the person.~~

1.1.1 Passengers or crew are forbidden to carry dangerous goods either as or in carry-on baggage, checked baggage or on their person unless the dangerous goods are:

a) permitted by Table 8-1; and

b) for personal use only.

~~1.1.2 Notwithstanding any additional restrictions which may be implemented by States in the interests of aviation security, except for the incident reporting provisions of 7:4.4 or 7:4.5, as applicable, the provisions of these Instructions do not apply to the dangerous goods listed in Table 8-1 when carried by passengers or crew members or in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage) or in excess baggage carried as cargo as permitted by 1:1.1.5.1 g):~~

1.1.2 Except for the reporting provisions of 7:4.4 and 7:4.5, the provisions of these Instructions do not apply to the dangerous goods permitted by Table 8-1 when those dangerous goods are:

a) carried by passengers or crew for personal use only;

b) contained in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage); or

c) contained within items of excess baggage sent as cargo as permitted by 1:1.1.5.1 h).

1.1.3 The entry in Table 8-1 that most appropriately describes the item or article must be selected.

Note.— For instance, electronic cigarettes must meet the requirements of the entry for “Battery powered portable electronic smoking devices” not the entry for lithium batteries or non-spillable batteries.

1.1.4 An item or article that contains multiple dangerous goods must meet all applicable entries.

Note.— For instance, the restrictions and conditions for entries 1) and 14) of Table 8-1 apply to an avalanche backpack that contains lithium batteries and gas cartridges.

1.1.5 Baggage intended to be carried in the cabin that is placed in the cargo compartment must only contain dangerous goods permitted in checked baggage. When baggage intended as carry-on is taken by the operator and placed into the cargo compartment for carriage, the operator must confirm with the passenger that dangerous goods which are only permitted in carry-on baggage have been removed.

1.1.36 Any organization or enterprise other than an operator (such as a travel agent), involved in the air transport of passengers, should provide passengers with information about the types of dangerous goods which they are forbidden to ~~transport~~ carry aboard an aircraft. This information should consist of, as a minimum, notices at those locations where there is an interface with the passengers.

1.1.47 Where provision is made for the purchase of tickets via the Internet, information on the types of dangerous goods which a passenger is forbidden to ~~transport~~ carry aboard an aircraft should be provided in either text or pictorial form and should be such that ticket purchase cannot be completed until the passenger, or a person acting on their behalf, has indicated that they have understood the restrictions on dangerous goods in baggage.

1.1.8 The Organization for the Prohibition of Chemical Weapons (OPCW) and government agencies may carry instruments containing dangerous goods permitted by Table 8-2.

1.1.9 Except for the reporting provisions of 7:4.4 and 7:4.5, the provisions of these Instructions do not apply to the dangerous goods permitted by Table 8-2 when those dangerous goods are:

- a) carried by staff members of the OPCW on official travel or government agencies;
- b) contained in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage); or
- c) contained within items of excess baggage sent as cargo as permitted by 1;1.1.5.1 h).

Note 1.— The following dangerous goods may be commonly carried by passengers on other modes of transport, however, they are prohibited either as or in carry-on baggage or checked baggage:

- a) personal medical oxygen devices that utilize liquid oxygen;
- b) electroshock weapons (e.g. tasers) containing dangerous goods such as explosives, compressed gases, lithium batteries, etc.;
- c) "strike anywhere" matches;
- d) lighter fuel and lighter refills;
- e) premixing burner lighter (see the Glossary of Terms in Attachment 2) without a means of protection against unintentional activation; and
- f) battery-powered lighters powered by a lithium ion or lithium metal battery (e.g. laser plasma lighters, tesla coil lighters, flux lighters, arc lighters and double arc lighters) without a safety cap or means of protection against unintentional activation.

Note 2.— Exceptions found in these Instructions are not reproduced in Table 8-1. The following dangerous goods are not subject to these Instructions:

- Radio-pharmaceuticals contained within the body of a person as the result of medical treatment; and
- Energy efficient lamps when in retail packaging and intended for personal or home use. (see 1;2.6).

Note 3.— States may implement additional restrictions in the interests of aviation security.

[1.1.10 Active devices must meet defined standards for electromagnetic radiation to ensure that the operation of the devices does not interfere with aircraft systems.]

Table 8-1. Provisions for dangerous goods carried by passengers or crew

DGP/26 (see paragraph 2.8.2 of this report):

Replace Table 8-1 with the following:

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
Batteries				
1) Lithium batteries (including portable electronic devices)	Yes (except for g)	Yes	(see c) and d)	<p>a) each battery must be of a type which meets the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, subsection 38.3;</p> <p>b) each battery must not exceed the following:</p> <ul style="list-style-type: none"> — for lithium metal batteries, a lithium content of 2 grams; or — for lithium ion batteries, a Watt-hour rating of 100 Wh; <p>c) each battery may exceed 100 Wh but not exceed 160 Wh Watt-hour rating for lithium ion with the approval of the operator;</p> <p>d) each battery may exceed 2 grams but not exceed 8 grams lithium content for lithium metal for portable medical electronic devices with the approval of the operator;</p> <p>e) batteries contained in portable electronic devices should be carried as carry-on baggage; however, if carried as checked baggage:</p> <ul style="list-style-type: none"> — measures must be taken to prevent unintentional activation and to protect the devices from damage; and — the devices must be completely switched off (not in sleep or hibernation mode); <p>f) batteries and heating elements must be isolated in portable electronic devices capable of generating extreme heat, which could cause a fire if activated, by removal of the heating element, battery or other components;</p> <p>g) spare batteries, including power banks:</p> <ul style="list-style-type: none"> — must be carried as carry-on baggage; and — must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); <hr/> <p>DGP/26 (see paragraph 6.3.5 under Agenda Item 6 of this report):</p> <hr/> <p>h) baggage equipped with a lithium battery(ies) must be carried as carry-on baggage unless the battery(ies) is removed from the baggage, in which case the battery(ies) must be carried in accordance with g);</p> <p>i) no more than two spare batteries meeting the requirements of c) or d) may be carried per person.</p>

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
2) Non-spillable batteries	Yes	Yes	No	<p>a) must meet the requirements of Special Provision A67;</p> <p>b) each battery must not exceed a voltage of 12 volts and a Watt-hour rating of 100 Wh;</p> <p>c) each battery must be protected from short circuit by the effective insulation of exposed terminals;</p> <p>d) no more than two spare batteries per person may be carried; and</p> <p>e) if contained in equipment, the equipment must be either protected from unintentional activation, or each battery must be disconnected and its exposed terminals insulated.</p>
3) Battery-powered portable electronic smoking devices (e.g. e-cigarettes, e-cigs, ecigars, e-pipes, personal vaporizers, electronic nicotine delivery systems)	No	Yes	No	<p>a) if powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g);</p> <p>b) the devices and/or batteries must not be recharged on board the aircraft; and</p> <hr/> <p>DGP/26 (see paragraph 6.3.7 under Agenda Item 6 of this report):</p> <hr/> <p>c) measures must be taken to prevent unintentional activation of the heating element while on board the aircraft.</p>

DGP/26 (see paragraphs 2.3.3, 2.8.3 and 2.8.4 of this report):

4) Battery-powered mobility aids (e.g. wheelchairs)	Yes	(see d))	Yes	<p>a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p>b) the passenger should make advance arrangements with each operator and provide information on the type of battery installed and on the handling of the mobility aid (including instructions on how to isolate the battery);</p> <p>c) in the case of a non-spillable wet battery:</p> <p>i) each battery must comply with Special Provision A67; and</p> <p>ii) a maximum of one spare battery may be carried per passenger.</p> <p>d) in the case of a lithium ion battery:</p> <p>i) each battery must be of a type which meets the requirements of each test in the UN Manual of Test and Criteria, Part III, subsection 38.3;</p> <p>ii) when the mobility aid does not provide adequate protection to the battery:</p> <ul style="list-style-type: none"> — the battery must be removed in accordance with the manufacturer's instructions; — the battery must not exceed 300 Wh; — the battery terminals must be protected from short circuit (by insulating the terminals, e.g. by taping over exposed terminals); — the battery must be protected from damage (e.g. by placing each
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<i>Dangerous Goods</i>	<i>Location</i>		Approval of the operator(s) is required	<i>Restrictions</i>
	Checked baggage	Carry-on baggage		
				battery in a protective pouch); and — the battery must be carried in the cabin; iii) a maximum of one spare battery not exceeding 300 Wh or two spare batteries not exceeding 160 Wh each may be carried.

Flame and fuel sources

DGP-WG/17 (see paragraph 3.5.3.6 of DGP/26-W/3):

5) Cigarette lighter Small packet of safety matches	No	(see b))	No	a) no more than one per person; b) must be carried on the person; c) must not contain unabsorbed liquid fuel (other than liquefied gas); and d) if cigarette lighter is powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g) and 3) b) and c).
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DGP/26 (see paragraph 2.8.2 of DGP/26-W/3):

6) Alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume	Yes	Yes	No	a) must be in retail packagings; and b) no more than 5 L total net quantity per person. <i>Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.</i>
7) Internal combustion engines or fuel cell engines	Yes	No	No	Measures must be taken to nullify the hazard. Refer to Special Provision A70 for more information.
8) Fuel cells containing fuel	No	Yes	No	a) fuel cell cartridges may only contain flammable liquids, corrosive substances, liquefied flammable gas, water reactive substances or hydrogen in metal hydride; b) refuelling of fuel cells on board an aircraft is not permitted except that the installation of a spare cartridge is allowed; c) the maximum quantity of fuel in any fuel cell or fuel cell cartridge must not exceed: — for liquids 200 mL; — for solids 200 grams; — for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 mL for metal fuel cell or fuel cell cartridges; and — for hydrogen in metal hydride, the fuel cell or fuel cell cartridges must have a water capacity of 120 mL or less; d) each fuel cell and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, and must be marked with a manufacturer's certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge; e) fuel cell cartridges containing hydrogen in metal hydride must comply with the
Spare fuel cell cartridges	Yes	Yes	No	

	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
<i>Dangerous Goods</i>				requirements in Special Provision A162;
				<ul style="list-style-type: none"> f) no more than two spare fuel cell cartridges may be carried by a passenger; g) fuel cells containing fuel are permitted in carry-on baggage only; h) interaction between fuel cells and integrated batteries in a device must conform to IEC 62282-6-100 Ed. 1, including Amendment 1. Fuel cells whose sole function is to charge a battery in the device are not permitted; i) fuel cells must be of a type that will not charge batteries when the portable electronic device is not in use and must be durably marked by the manufacturer: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to so indicate; and j) in addition to the languages which may be required by the State of Origin for the markings specified above, English should be used.
Gases in cylinders and cartridges				
9) Cylinders of oxygen or air required for medical use	Yes	Yes	Yes	<ul style="list-style-type: none"> a) no more than 5 kg gross mass per cylinder; b) cylinders, valves and regulators, where fitted, must be protected from damage which could cause inadvertent release of the contents; c) advance arrangements recommended; and d) the pilot-in-command must be informed of the number of oxygen or air cylinders loaded on board the aircraft and their loading location(s).
10) Cartridges of Division 2.2 worn for the operation of mechanical limbs	Yes	Yes	No	Spare cartridges of a similar size are also allowed, if required, to ensure an adequate supply for the duration of the journey.
11) Cartridge of hydrocarbon gas contained in hair styling equipment	Yes	Yes	No	<ul style="list-style-type: none"> a) no more than one per person; b) the safety cover must be securely fitted over the heating element; and c) spare cartridges must not be carried.
12) Cartridges of Division 2.2 with no subsidiary hazard fitted into a self-inflating personal safety device such as a life-jacket or vest	Yes	Yes	Yes	<ul style="list-style-type: none"> a) no more than one personal safety device per person; b) the personal safety device must be packed in such a manner that it cannot be accidentally activated; c) must be for inflation purposes; d) no more than two cartridges are fitted into the device; and e) no more than two spare cartridges.
13) Cartridges of Division 2.2 with no subsidiary hazard for other than self-inflating personal safety device	Yes	Yes	Yes	<ul style="list-style-type: none"> a) no more than four cartridges per person; and b) the water capacity of each cartridge must not exceed 50 mL. <p><i>Note.— For carbon dioxide, a gas cartridge with a water capacity of 50 mL is equivalent to a 28 g cartridge.</i></p>

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
14) Cartridges and cylinders of Division 2.2 with no subsidiary hazard contained in an avalanche rescue backpack	Yes	Yes	Yes	a) no more than one avalanche rescue backpack per person;; b) the backpack must be packed in such a manner that it cannot be accidentally activated; c) may contain a pyrotechnic trigger mechanism which must not contain more than 200 mg net of Division 1.4S; and d) the airbags within the backpack must be fitted with pressure relief valves.
Radioactive material				
15) Radioisotopic cardiac pacemakers or other medical devices	n/a	Yes	No	Must be implanted into a person or fitted externally as the result of medical treatment.
Mercury				
16) Small medical or clinical thermometer which contains mercury	Yes	No	No	a) no more than one per person; and b) must be in its protective case.
Other dangerous goods				
17) Non-radioactive medicinal articles (including aerosols), toiletry articles (including aerosols) and aerosols in Division 2.2 with no subsidiary hazard	Yes	Yes	No	a) no more than 0.5 kg or 0.5 L total net quantity per single article; b) no more than 2 kg or 2 L total net quantity of all articles (e.g. four aerosol cans of 0.5 L each) per person; c) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and d) the release of gas must not cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of assigned duties.
18) Dry ice	Yes	Yes	Yes	a) no more than 2.5 kg per person; b) used to pack perishables that are not subject to these Instructions; c) the package must permit the release of carbon dioxide gas; and d) when carried as checked baggage, each package must be marked: <ul style="list-style-type: none"> i) "DRY ICE" or "CARBON DIOXIDE, SOLID"; and ii) the net weight of dry ice or an indication that the net weight is 2.5 kg or less.
19) Cartridges in Division 1.4S (UN 0012 or UN 0014 only)	Yes	No	Yes	a) no more than 5 kg gross mass per person; b) must be securely packaged; c) must not include ammunition with explosive or incendiary projectiles; and d) allowances for more than one person must not be combined into one or more packages.
20) Permeation devices	Yes	No	No	Instructions on how to package permeation devices for calibrating air quality monitoring equipment are found in Special Provision A41.

<i>Dangerous Goods</i>	<i>Location</i>		Approval of the operator(s) is required	<i>Restrictions</i>
	Checked baggage	Carry-on baggage		
21) Non-infectious specimens in flammable solutions	Yes	Yes	No	Instructions on how to package and mark specimens are found in Special Provision A180.
22) Refrigerated liquid nitrogen	Yes	Yes	No	Must be contained in insulated packagings (e.g. dry shippers) that would not allow the build-up of pressure and be fully absorbed in a porous material so that there is no free liquid that could be released from the packaging. Refer to Special Provision A152 for more information.
23) Dangerous goods incorporated in security-type equipment, such as attaché cases, cash boxes, cash bags, etc.	Yes	No	Yes	The security-type equipment must be equipped with an effective means of preventing accidental activation and the dangerous goods incorporated in the equipment must meet the conditions of Special Provision A178.

...

Insert new Table 8-2 as follows:

Table 8-2. Provisions for instruments carried by OPCW and government agencies

<i>Dangerous Goods</i>	<i>Location</i>		Approval of the operator(s) is required	<i>Restrictions</i>
	Checked baggage	Carry-on baggage		
1) Instruments containing radioactive material (i.e. chemical agent monitor (CAM) and/or rapid alarm and identification device monitor (RAID-M))	Yes	Yes	Yes	a) the instruments must not exceed the activity limits specified in Table 2-14 of these Instructions; b) must be securely packed; and c) must be carried by staff members of the Organization for the Prohibition of Chemical Weapons (OPCW) on official travel.
2) A mercurial barometer or mercurial thermometer	No	Yes	Yes	a) must be carried by a representative of a government weather bureau or similar official agency; b) must be packed in a strong outer packaging, having a sealed inner liner or a bag of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position; and c) the pilot-in-command must be informed of the barometer or thermometer.

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ATTACHMENT A**PROPOSED AMENDMENTS TO TABLE 3-1 — UN NUMBER ORDER**

The format for displaying the amendments to Table 3-1 is as follows:

Modified entries

- both the original and the modified entry are printed;
- both modified and non-modified fields are printed;
- the original entry is printed in a shaded box with an asterisk in the left margin;
- check boxes are printed above the field(s) which have been modified;
- the modified entry is shown without shading below the original entry; and
- the “≠” symbol is printed in the left margin.

Deleted entries

- deleted entries are displayed in a shaded box with an asterisk in the left margin;
- check boxes are shown above each field; and
- the “>” symbol is displayed in the left margin below the shaded box to indicate that the entry will be deleted.

New entries

New entries are shown without shading with the “+” symbol in the left margin

Table 3-1. Dangerous Goods List

Name	UN No.	Class or division	Sub-sidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
* Articles, explosive, n.o.s.*	0349	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Articles, explosive, n.o.s.*	0349	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
* Fuzes, detonating †	0367	1.4S		Explosive 1.4		<input checked="" type="checkbox"/>		E0	141	25 kg	141	100 kg
≠ Fuzes, detonating †	0367	1.4S		Explosive 1.4		A165		E0	141	25 kg	141	100 kg
* Components, explosive train, n.o.s.* †	0384	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Components, explosive train, n.o.s.* †	0384	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
* Substances, explosive, n.o.s.*	0481	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Substances, explosive, n.o.s.*	0481	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
* Ammonium nitrate based fertilizer	2067	5.1		Oxidizer		<input checked="" type="checkbox"/> A64 A79 A89	III	E1	559 Y546	25 kg 10 kg	563	100 kg
≠ Ammonium nitrate based fertilizer	2067	5.1		Oxidizer		A64 A79	III	E1	559 Y546	25 kg 10 kg	563	100 kg
* Ammonium nitrate based fertilizer	2071	9		Miscellaneous		<input checked="" type="checkbox"/> A89 A90	III	E1	958 Y958	200 kg 30 kg G	958	200 kg
≠ Ammonium nitrate based fertilizer	2071	9		Miscellaneous		A90	III	E1	958 Y958	200 kg 30 kg G	958	200 kg
* Asbestos, amphibole* (amosite, tremolite, actinolite, anthophyllite, crocidolite)†	2212	9				<input checked="" type="checkbox"/> A61			FORBIDDEN		FORBIDDEN	
≠ Asbestos, amphibole* (amosite, tremolite, actinolite, anthophyllite, crocidolite) †	2212	9				A2 A61			FORBIDDEN		FORBIDDEN	

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only		
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package	
1	2	3	4	5	6	7	8	9	10	11	12	13	
* Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A183 A201 A206			E0	FORBIDDEN		See 968	
≠ Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A183 A201 A206 A213			E0	FORBIDDEN		See 968	
* Lithium metal batteries contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A48 A88 A99 A154 A164 A181 A185 A206			E0	970	5 kg	970	35 kg
≠ Lithium metal batteries contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	A48 A88 A99 A154 A164 A181 A185 A206 A213			E0	970	5 kg	970	35 kg

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A181 A185 A206		E0	969	5 kg	969	35 kg
≠ Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A181 A185 A206 A213		E0	969	5 kg	969	35 kg
* Vehicle, flammable gas powered	3166	9		Miscellaneous		<input checked="" type="checkbox"/> A67 A70 A87 A118 A120 A134 A203 A207		E0	FORBIDDEN		951	No limit
≠ Vehicle, flammable gas powered	3166	9		Miscellaneous		A70 A87 A118 A120 A214		E0	FORBIDDEN		951	No limit
* Vehicle, flammable liquid powered	3166	9		Miscellaneous		<input checked="" type="checkbox"/> A67 A70 A87 A118 A120 A134 A203 A207		E0	950	No limit	950	No limit
≠ Vehicle, flammable liquid powered	3166	9		Miscellaneous		A70 A87 A118 A120 A214		E0	950	No limit	950	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
* Vehicle, fuel cell, flammable gas powered †	3166	9		Miscellaneous		<input checked="" type="checkbox"/> A67 A70 A87 A118 A120 A134 A176 A203 A207		E0	FORBIDDEN		951	No limit
≠ Vehicle, fuel cell, flammable gas powered †	3166	9		Miscellaneous		A70 A87 A118 A120 A176 A214		E0	FORBIDDEN		951	No limit
* Vehicle, fuel cell, flammable liquid powered †	3166	9		Miscellaneous		<input checked="" type="checkbox"/> A67 A70 A87 A118 A120 A134 A176 A203 A207		E0	950	No limit	950	No limit
≠ Vehicle, fuel cell, flammable liquid powered †	3166	9		Miscellaneous		A70 A87 A118 A120 A176 A214		E0	950	No limit	950	No limit
* Battery-powered equipment	3171	9		Miscellaneous		<input checked="" type="checkbox"/> A21 A67 A87 A94 A164 A182		E0	952	No limit	952	No limit
≠ Battery-powered equipment	3171	9		Miscellaneous		A67 A87 A94 A164 A182 A214		E0	952	No limit	952	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Battery-powered vehicle	3171	9		Miscellaneous		<input checked="" type="checkbox"/> A21 A67 A87 A94 A164		E0	952	No limit	952	No limit
≠ Battery-powered vehicle	3171	9		Miscellaneous		A67 A87 A94 A164 A214		E0	952	No limit	952	No limit
* <input checked="" type="checkbox"/> 2-Dimethylaminoethyl acrylate	3302	6.1		Toxic		<input checked="" type="checkbox"/>	II	E4	654 Y641	5 L 1 L	662	60 L
≠ 2-Dimethylaminoethyl acrylate, stabilized	3302	6.1		Toxic		A209	II	E4	654 Y641	5 L 1 L	662	60 L
* Chemical kit	3316	9		Miscellaneous		A44 A163	<input checked="" type="checkbox"/> II III	E0	960 Y960 960 Y960	<input checked="" type="checkbox"/> 10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg
≠ Chemical kit	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
* First aid kit	3316	9		Miscellaneous		A44 A163	<input checked="" type="checkbox"/> II III	E0 E0	960 Y960 960 Y960	<input checked="" type="checkbox"/> 10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg
≠ First aid kit	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
* Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A183 A201 A206		E0	FORBIDDEN		See 965	
≠ Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A183 A201 A206 A213		E0	FORBIDDEN		See 965	

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
* Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	<input checked="" type="checkbox"/> A48 A88 A99 A154 A164 A181 A185 A206		E0	967	5 kg	967	35 kg
≠ Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	A48 A88 A99 A154 A164 A181 A185 A206 A213		E0	967	5 kg	967	35 kg
* Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A181 A185 A206		E0	966	5 kg	966	35 kg
≠ Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A181 A185 A206 A213		E0	966	5 kg	966	35 kg
* Engine, internal combustion, flammable liquid powered	3528	3		Liquid flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	378	No limit	378	No limit
≠ Engine, internal combustion, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A208		E0	378	No limit	378	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Engine, fuel cell, flammable liquid powered †	3528	3		Liquid flammable		☑ A67 A70 A87 A176 A208		E0	378	No limit	378	No limit
≠ Engine, fuel cell, flammable liquid powered †	3528	3		Liquid flammable		A70 A87 A176 A208		E0	378	No limit	378	No limit
* Machinery, internal combustion, flammable liquid powered	3528	3		Liquid flammable		☑ A67 A70 A87 A208		E0	378	No limit	378	No limit
≠ Machinery, internal combustion, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A208		E0	378	No limit	378	No limit
* Machinery, fuel cell, flammable liquid powered	3528	3		Liquid flammable		☑ A67 A70 A87 A176 A208		E0	378	No limit	378	No limit
≠ Machinery, fuel cell, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A176 A208		E0	378	No limit	378	No limit
* Engine, internal combustion, flammable gas powered	3529	2.1		Gas flammable		☑ A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Engine, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0	FORBIDDEN		220	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Engine, fuel cell, flammable gas powered †	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Engine, fuel cell, flammable gas powered †	3529	2.1		Gas flammable		A70 A87 A176 A208		E0	FORBIDDEN		220	No limit
* Machinery, internal combustion, flammable gas powered	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Machinery, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0	FORBIDDEN		220	No limit
* Machinery, fuel cell, flammable gas powered	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Machinery, fuel cell, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A176 A208		E0	FORBIDDEN		220	No limit
+ Toxic solid, flammable, inorganic, n.o.s.*	3535	6.1	4.1	Toxic & Solid flammable			I II	E5 E4	665 668 Y644	1 kg 15 kg 1 kg	672 675	15 kg 50 kg
+ Lithium batteries installed in cargo transport unit lithium ion batteries or lithium metal batteries	3536	9							FORBIDDEN		FORBIDDEN	
+ Articles containing flammable gas, n.o.s.*	3537	2.1	See 2;06			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing non-flammable, non toxic gas, n.o.s.*	3538	2.2	See 2;06			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing toxic gas, n.o.s.*	3539	2.3	See 2;06						FORBIDDEN		FORBIDDEN	
+ Articles containing flammable liquid, n.o.s.*	3540	3	See 2;06			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing flammable solid, n.o.s.*	3541	4.1	See 2;06			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing a substance liable to spontaneous combustion, n.o.s.*	3542	4.2	See 2;06						FORBIDDEN		FORBIDDEN	
+ Articles containing a substance which emits flammable gas in contact with water, n.o.s.*	3543	4.3	See 2;06						FORBIDDEN		FORBIDDEN	

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
+ Articles containing oxidizing substance, n.o.s.*	3544	5.1	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing organic peroxide, n.o.s.*	3545	5.2	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing toxic substance, n.o.s.*	3546	6.1	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing corrosive substance, n.o.s.*	3547	8	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing miscellaneous dangerous goods, n.o.s.*	3548	9	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	

ATTACHMENT B**PROPOSED AMENDMENTS TO TABLE 3-1 — ALPHABETICAL ORDER**

The format for displaying the amendments to Table 3-1 is as follows:

Modified entries

- both the original and the modified entry are printed;
- both modified and non-modified fields are printed;
- the original entry is printed in a shaded box with an asterisk in the left margin;
- check boxes are printed above the field(s) which have been modified;
- the modified entry is shown without shading below the original entry; and
- the “≠” symbol is printed in the left margin.

Deleted entries

- deleted entries are displayed in a shaded box with an asterisk in the left margin;
- check boxes are shown above each field; and
- the “>” symbol is displayed in the left margin below the shaded box to indicate that the entry will be deleted.

New entries

New entries are shown without shading with the “+” symbol in the left margin.

Table 3-1. Dangerous Goods List

Name 1	UN No. 2	Class or division 3	Sub-sidiary hazard 4	Labels 5	State variations 6	Special provisions 7	UN packing group 8	Excepted quantity 9	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction 10	Max. net quantity per package 11	Packing instruction 12	Max. net quantity per package 13
* Ammonium nitrate based fertilizer	2067	5.1		Oxidizer		<input checked="" type="checkbox"/> A64 A79 A89	III	E1	559 Y546	25 kg 10 kg	563	100 kg
≠ Ammonium nitrate based fertilizer	2067	5.1		Oxidizer		A64 A79	III	E1	559 Y546	25 kg 10 kg	563	100 kg
* Ammonium nitrate based fertilizer	2071	9		Miscellaneous		<input checked="" type="checkbox"/> A89 A90	III	E1	958 Y958	200 kg 30 kg G	958	200 kg
≠ Ammonium nitrate based fertilizer	2071	9		Miscellaneous		A90	III	E1	958 Y958	200 kg 30 kg G	958	200 kg
+ Articles containing a substance liable to spontaneous combustion, n.o.s.*	3542	4.2	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing a substance which emits flammable gas in contact with water, n.o.s.*	3543	4.3	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing corrosive substance, n.o.s.*	3547	8	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing flammable gas, n.o.s.*	3537	2.1	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing flammable liquid, n.o.s.*	3540	3	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing flammable solid, n.o.s.*	3541	4.1	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing miscellaneous dangerous goods, n.o.s.*	3548	9	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing non-flammable, non toxic gas, n.o.s.*	3538	2.2	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
+ Articles containing organic peroxide, n.o.s.*	3545	5.2	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing oxidizing substance, n.o.s.*	3544	5.1	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing toxic gas, n.o.s.*	3539	2.3	See 2;0;6						FORBIDDEN		FORBIDDEN	
+ Articles containing toxic substance, n.o.s.*	3546	6.1	See 2;0;6			A2			FORBIDDEN		FORBIDDEN	
* Articles, explosive, n.o.s.*	0349	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Articles, explosive, n.o.s.*	0349	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
* Asbestos, amphibole* (amosite, tremolite, actinolite, anthophyllite, crocidolite)†	2212	9				<input checked="" type="checkbox"/> A61			FORBIDDEN		FORBIDDEN	
≠ Asbestos, amphibole* (amosite, tremolite, actinolite, anthophyllite, crocidolite) †	2212	9				A2 A61			FORBIDDEN		FORBIDDEN	

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Battery-powered equipment	3171	9		Miscellaneous		<input checked="" type="checkbox"/> A21 A67 A87 A94 A164 A182		E0	952	No limit	952	No limit
≠ Battery-powered equipment	3171	9		Miscellaneous		A67 A87 A94 A164 A182 A214		E0	952	No limit	952	No limit
* Battery-powered vehicle	3171	9		Miscellaneous		<input checked="" type="checkbox"/> A21 A67 A87 A94 A164		E0	952	No limit	952	No limit
≠ Battery-powered vehicle	3171	9		Miscellaneous		A67 A87 A94 A164 A214		E0	952	No limit	952	No limit
* Chemical kit	3316	9		Miscellaneous			<input checked="" type="checkbox"/> II	E0	960 Y960	<input checked="" type="checkbox"/> 10 kg 1 kg	960	10 kg
≠ Chemical kit	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
* Components, explosive train, n.o.s.* †	0384	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Components, explosive train, n.o.s.* †	0384	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
* 2-Dimethylaminoethyl acrylate	3302	6.1		Toxic		<input checked="" type="checkbox"/>	II	E4	654 Y641	5 L 1 L	662	60 L
≠ 2-Dimethylaminoethyl acrylate, stabilized	3302	6.1		Toxic		A209	II	E4	654 Y641	5 L 1 L	662	60 L

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Engine, fuel cell, flammable gas powered †	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN	220	No limit	
≠ Engine, fuel cell, flammable gas powered †	3529	2.1		Gas flammable		A70 A87 A176 A208		E0	FORBIDDEN	220	No limit	
* Engine, fuel cell, flammable liquid powered †	3528	3		Liquid flammable		<input checked="" type="checkbox"/> A67 A70 A87 A176 A208		E0	378	No limit	378	No limit
≠ Engine, fuel cell, flammable liquid powered †	3528	3		Liquid flammable		A70 A87 A176 A208		E0	378	No limit	378	No limit
* Engine, internal combustion, flammable gas powered	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN	220	No limit	
≠ Engine, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0	FORBIDDEN	220	No limit	
* Engine, internal combustion, flammable liquid powered	3528	3		Liquid flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	378	No limit	378	No limit
≠ Engine, internal combustion, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A208		E0	378	No limit	378	No limit
* First aid kit	3316	9		Miscellaneous		A44 A163	<input checked="" type="checkbox"/> II III	E0 E0	960 Y960 960 Y960	10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg
≠ First aid kit	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
* Fuzes, detonating †	0367	1.4S		Explosive 1.4		☑		E0	141	25 kg	141	100 kg
≠ Fuzes, detonating †	0367	1.4S		Explosive 1.4		A165		E0	141	25 kg	141	100 kg
+ Lithium batteries installed in cargo transport unit lithium ion batteries or lithium metal batteries	3536	9							FORBIDDEN		FORBIDDEN	
* Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	☑ A88 A99 A154 A164 A183 A201 A206		E0	FORBIDDEN		See 965	
≠ Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A183 A201 A206 A213		E0	FORBIDDEN		See 965	
* Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	☑ A48 A88 A99 A154 A164 A181 A185 A206		E0	967	5 kg	967	35 kg
≠ Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	A48 A88 A99 A154 A164 A181 A185 A206 A213		E0	967	5 kg	967	35 kg

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A181 A185 A206		E0	966	5 kg	966	35 kg
≠ Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A181 A185 A206 A213		E0	966	5 kg	966	35 kg
* Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A183 A201 A206		E0	FORBIDDEN		See 968	
≠ Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A183 A201 A206 A213		E0	FORBIDDEN		See 968	

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Lithium metal batteries contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A48 A88 A99 A154 A164 A181 A185 A206		E0	970	5 kg	970	35 kg
≠ Lithium metal batteries contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	A48 A88 A99 A154 A164 A181 A185 A206 A213		E0	970	5 kg	970	35 kg
* Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A181 A185 A206		E0	969	5 kg	969	35 kg
≠ Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A181 A185 A206 A213		E0	969	5 kg	969	35 kg
* Machinery, fuel cell, flammable gas powered	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Machinery, fuel cell, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A176 A208		E0	FORBIDDEN		220	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Machinery, fuel cell, flammable liquid powered	3528	3		Liquid flammable		<input checked="" type="checkbox"/> A67 A70 A87 A176 A208		E0	378	No limit	378	No limit
≠ Machinery, fuel cell, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A176 A208		E0	378	No limit	378	No limit
* Machinery, internal combustion, flammable gas powered	3529	2.1		Gas flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	FORBIDDEN		220	No limit
≠ Machinery, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0	FORBIDDEN		220	No limit
* Machinery, internal combustion, flammable liquid powered	3528	3		Liquid flammable		<input checked="" type="checkbox"/> A67 A70 A87 A208		E0	378	No limit	378	No limit
≠ Machinery, internal combustion, flammable liquid powered	3528	3		Liquid flammable		A70 A87 A208		E0	378	No limit	378	No limit
* Substances, explosive, n.o.s.*	0481	1.4S		Explosive 1.4		<input checked="" type="checkbox"/> A62		E0	101	25 kg	101	100 kg
≠ Substances, explosive, n.o.s.*	0481	1.4S		Explosive 1.4		A62 A165		E0	101	25 kg	101	100 kg
+ Toxic solid, flammable, inorganic, n.o.s.*	3535	6.1	4.1	Toxic & Solid flammable			I II	E5 E4	665 668 Y644	1 kg 15 kg 1 kg	672 675	15 kg 50 kg

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Vehicle, flammable gas powered	3166	9		Miscellaneous		☑ A67 A70 A87 A118 A120 A134 A203 A207		E0	FORBIDDEN		951	No limit
≠ Vehicle, flammable gas powered	3166	9		Miscellaneous		A70 A87 A118 A120 A214		E0	FORBIDDEN		951	No limit
* Vehicle, flammable liquid powered	3166	9		Miscellaneous		☑ A67 A70 A87 A118 A120 A134 A203 A207		E0	950	No limit	950	No limit
≠ Vehicle, flammable liquid powered	3166	9		Miscellaneous		A70 A87 A118 A120 A214		E0	950	No limit	950	No limit
* Vehicle, fuel cell, flammable gas powered †	3166	9		Miscellaneous		☑ A67 A70 A87 A118 A120 A134 A176 A203 A207		E0	FORBIDDEN		951	No limit
≠ Vehicle, fuel cell, flammable gas powered †	3166	9		Miscellaneous		A70 A87 A118 A120 A176 A214		E0	FORBIDDEN		951	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
* Vehicle, fuel cell, flammable liquid powered †	3166	9		Miscellaneous		<input checked="" type="checkbox"/> A67 A70 A87 A118 A120 A134 A176 A203 A207		E0	950	No limit	950	No limit
≠ Vehicle, fuel cell, flammable liquid powered †	3166	9		Miscellaneous		A70 A87 A118 A120 A176 A214		E0	950	No limit	950	No limit

APPENDIX B
AMENDMENT TO THE TRAINING PROVISIONS IN THE TECHNICAL INSTRUCTIONS
Part 1
GENERAL

...

DPG/26 (see paragraph 2.1.4 of this report)

The amendments below are based on Attachment 4, Chapter 1 to the 2017-2018 Edition of the Technical Instructions.

INTRODUCTORY NOTE

The objective of a dangerous goods training programme is to ensure that persons are competent to perform their assigned functions. An approach to achieving this objective is provided in Chapter 2 to Attachment 4.

Chapter 4
DANGEROUS GOODS TRAINING

Parts of this Chapter are affected by State Variations AE 2, BR 7, CA 11, HK 1; see Table A-1

Note.— The training provisions contained in Part 1:4 of the 2017-2018 Edition of the Instructions are provided in Attachment 4 and may be used until 31 December 2020.

4.1 GENERAL REQUIREMENTS ESTABLISHMENT OF DANGEROUS GOODS TRAINING PROGRAMMES

The following note has been moved from under 4.2.1:

Note.— A training programme includes elements such as design methodology, assessment, initial and recurrent training, instructor qualifications and competencies, training records and evaluation of the effectiveness of training.

~~DGP/25 discussed whether or not training requirements for entities involved in the transport of non-dangerous goods as cargo were within the scope of Annex 18 and the Technical Instructions. It was agreed that the scope was not clearly defined (see paragraph 1.2 of the DGP/25 Report). The following alternative provisions are therefore tentatively proposed and will be finalized based on the outcome of work to clarify the scope of Annex 18 (see DGP/25 Report on Agenda Item 1, paragraph 1.2).~~

~~[The employer must ensure that personnel are competent to perform any function described in these Instructions for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment.]~~

~~[The employer must ensure that personnel with responsibilities for the processing, acceptance or handling of cargo, mail or passengers or of checked and/or carry-on baggage are competent to perform the function for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment.]~~

~~— Note.— Guidance on developing a competency based approach to training is provided in Chapter 2 to Attachment 4.~~

~~4.2.4.1.1~~ The employer must establish and maintain a dangerous goods training programme for personnel performing any function described in these Instructions.

~~4.1.2~~ The employer must establish and maintain a dangerous goods training programme for personnel who may not perform any function described in these Instructions but do perform functions related to the movement of cargo, baggage, passengers, or mail. The aim of the programme is to ensure personnel are competent to perform functions aimed at preventing undeclared dangerous goods or dangerous goods not permitted from being carried on an aircraft.

~~4.2.4~~ *Note.*— Security personnel who are involved with the screening of passengers and crew and their baggage and cargo or mail ~~must~~ are required to be trained irrespective of whether the operator on which the passenger or cargo is to be transported carries dangerous goods as cargo.

~~4.2~~ TRAINING PROGRAMMES

~~4.2.1~~ The employer must establish and maintain a dangerous goods training programme.

~~Note.~~— A training programme includes elements such as design methodology, assessment, initial and recurrent training, instructor qualifications and competencies, training records and evaluation of the effectiveness of training.

~~4.2.2~~ ~~4.1.3~~ All operators must establish a dangerous goods training programme regardless of whether or not they are approved to transport dangerous goods as cargo.

~~4.2.6~~ ~~1.4~~ Training courses may be developed and delivered by or for the employer.

4.2 OBJECTIVE OF DANGEROUS GOODS TRAINING

~~4.2.3~~ ~~4.2.1~~ The employer must ensure that personnel are competent to perform any function for which they are responsible prior to performing any of these functions. ~~Personnel must be trained and assessed commensurate with the functions for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment commensurate with the functions for which they are responsible. Such training must include:~~

- ~~a)~~ general awareness/familiarization training — Personnel must be trained to be familiar with the general provisions;
- ~~b)~~ function-specific training — Personnel must be trained to perform any function for which they are responsible competently; and
- ~~c)~~ safety training — Personnel must be trained to recognize the hazards presented by dangerous goods, safe handling and emergency response procedures.

~~Note 1.~~— An approach to ensuring personnel are competent to perform any function for which they are responsible is provided in Guidance on a Competency-Based Approach to Dangerous Goods Training and Assessment (Circ xxxx).

The following is moved from under 4.2.6:

~~Note 2.~~— General information on the provisions for dangerous goods carried by passengers and crew (see Part 8) should be included in training courses, as appropriate.

~~4.2.2~~ Personnel who have received training but who are assigned to new functions must be assessed to determine their competence in respect of their new function. If competency is not demonstrated, appropriate additional training must be provided.

~~4.2.3~~ Personnel must be trained to recognize the hazards presented by dangerous goods, to safely handle them and to apply appropriate emergency response procedures.

~~Note.~~— In order to prevent the introduction of undeclared dangerous goods into air transport, any person, such as passenger or cargo reservation personnel and engineering personnel, who performs functions that may indirectly impact the movement of cargo, COMAT, baggage, passengers, or mail should also be trained.

~~4.2.4~~ Security personnel who are involved with the screening of passengers and crew and their baggage and cargo or mail must be trained irrespective of whether the operator on which the passenger or cargo is to be transported carries dangerous goods as cargo.

4.3 RECURRENT TRAINING AND ASSESSMENT

~~4.2.5~~ Personnel must receive recurrent training and assessment within 24 months of previous training and assessment to ensure that competency has been maintained. However, if recurrent training and assessment is completed within the final three months of validity of the previous training and assessment, the period of validity extends from the month on which the recurrent training and assessment was completed until 24 months from the expiry month of that previous training and assessment.

Note.— An example would be the following: If recurrent training is required by the end of May 2020, then any training occurring between March 2020 and end of May 2020 will result in a new recurrent training date of May 2022.

~~4.2.6~~ Training courses may be developed and delivered by or for the employer.

~~Note.— General information on the provisions for dangerous goods carried by passengers and crew (see Part 8) should be included in training courses, as appropriate.~~

4.4 TRAINING AND ASSESSMENT RECORDS

~~4.2.7.4.4.1~~ The employer must maintain a record of training and assessment for personnel.

~~4.2.7.4.4.2~~ The record of training and assessment must include:

- a) the individual's name;
- b) the most recent training and assessment completion month;
- c) a description, copy or reference to training and assessment materials used to meet the training and assessment requirements;
- d) the name and address of the organization providing the training and assessment; and
- e) evidence which shows that personnel have been assessed as competent.

~~4.2.7.4.4.3~~ Training and assessment records must be retained by the employer for a minimum period of 36 months from the most recent training and assessment completion month and must be made available upon request to personnel or the appropriate national authority.

4.5 APPROVAL OF TRAINING PROGRAMMES

~~4.2.8.4.5.1~~ Dangerous goods training programmes for operators must be approved by the appropriate authority of the State of the Operator in accordance with the provisions of Annex 6 — *Operation of Aircraft*.

~~4.2.9.4.5.2~~ Dangerous goods training programmes required for entities other than operators and designated postal operators should be approved as determined by the appropriate national authority.

Note.— See 4.7 for approval of training programmes for designated postal operators.

4.3.4.6 INSTRUCTOR QUALIFICATIONS AND COMPETENCIES

~~4.3.1.4.6.1~~ Unless otherwise provided for by the appropriate national authority, instructors of initial and recurrent dangerous goods training must demonstrate or be assessed as competent in instruction and the function(s) that they will instruct prior to delivering such training.

~~4.3.2.4.6.2~~ Instructors delivering initial and recurrent dangerous goods training must ~~at least every 24 months~~ deliver such courses at least every 24 months, or in the absence of this, attend recurrent training.

4.4.4.7 DESIGNATED POSTAL OPERATORS

~~4.4.4.4.7.1~~ Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter with which their various categories of staff should be familiar is indicated in Table 1-4.

4.4.24.7.2 Dangerous goods training programmes for designated postal operators must be subjected to review and approval by the civil aviation authority of the State where the mail was accepted by the designated postal operator.

Table 1-4. Content of training courses for staff of designated postal operators

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Designated postal operators</i>		
	<i>Categories of staff</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
General philosophy	x	x	x
Limitations	x	x	x
General requirements for shippers	x		
Classification	x		
List of dangerous goods	x		
Packing requirements	x		
Labelling and marking	x	x	x
Dangerous goods transport document and other relevant documentation	x	x	
Acceptance of the dangerous goods listed in 1;2.3.2	x		
Recognition of undeclared dangerous goods	x	x	x
Storage and loading procedures			x
Provisions for passengers and crew	x	x	x
Emergency procedures	x	x	x

CATEGORIES

- A — Staff of designated postal operators involved in accepting mail containing dangerous goods
 B — Staff of designated postal operators involved in processing mail (other than dangerous goods)
 C — Staff of designated postal operators involved in the handling, storage and loading of mail

Note.— Guidance on the aspects of training to be covered by staff of designated postal operators can be found in S-1;3.

Attachment 4

**~~PROPOSED NEW TRAINING PROVISIONS~~ EXTRACT FROM THE 2017-2018 EDITION OF THE TECHNICAL INSTRUCTIONS
(MAY BE USED IN PLACE OF THE PROVISIONS IN PART 1:4 UNTIL 31 DECEMBER 2020 ~~APPLICABLE FROM 1 JANUARY 2019)~~**

INTRODUCTORY CHAPTER**PROPOSED REVISIONS TO THE TRAINING PROVISIONS**

The training provisions are undergoing an extensive review by the Dangerous Goods Panel (DGP) which will result in revisions to Part 1.4 and the addition of new guidance material in an attachment to these Instructions. Proposed revisions to Part 1.4 are included as part of this attachment in this edition of the Instructions for the purpose of review and feedback to ICAO by relevant parties.

Chapter 1 of this attachment provides the proposed new training requirements which will replace the current Part 1.4 in the 2019-2020 Edition of these Instructions. Chapters 2 to 4 provide guidance material on implementing a competency based approach to training specific to dangerous goods and will remain in this attachment as Chapters 1 to 3 in the 2019-2020 Edition of the Technical Instructions.

The proposed revisions to Part 1.4 and the guidance material can also be found on the ICAO public website at www.icao.int/safety/DangerousGoods. Comments on the revised training provisions are welcome and should be submitted through that website by 31 March 2017. Based on comments received, further amendments to the proposed new provisions may be made by the DGP at its 26th meeting, which will be held during the fourth quarter of 2017.

INTRODUCTORY NOTE

The successful application of regulations concerning the transport of dangerous goods and the achievement of their objectives are greatly dependent on the appreciation by all individuals concerned of the hazards involved and on a detailed understanding of the regulations. This can only be achieved by properly planned and maintained initial and recurrent training programmes in the transport of dangerous goods for all persons concerned.

Chapter 4

TRAINING

*Parts of this Chapter are affected by State Variations AE 2, BR 7, CA 11, HK 1, VE 5, VE 6;
see Table A-1*

4.1 DANGEROUS GOODS TRAINING PROGRAMMES

4.1.1 Establishment and maintenance

Initial and recurrent dangerous goods training programmes must be established and maintained by or on behalf of:

- a) shippers of dangerous goods, including packers and persons or organizations undertaking the responsibilities of the shipper;
- b) operators;
- c) ground handling agencies which perform, on behalf of the operator, the act of accepting, handling, loading, unloading, transferring or other processing of cargo or mail;
- d) ground handling agencies located at an airport which perform, on behalf of the operator, the act of processing passengers;
- e) agencies, not located at an airport, which perform, on behalf of the operator, the act of checking in passengers;
- f) freight forwarders;
- g) agencies engaged in the security screening of passengers and crew and their baggage and/or cargo or mail; and
- h) designated postal operators.

4.1.2 Review and approval

4.1.2.1 Dangerous goods training programmes required by 4.1.1 b) must be subjected to review and approval by the appropriate authority of the State of the Operator.

4.1.2.2 Dangerous goods training programmes required by 4.1.1 h) must be subjected to review and approval by the civil aviation authority of the State where the mail was accepted by the designated postal operator.

4.1.2.3 Dangerous goods training programmes required by other than 4.1.1 b) and h) should be subjected to review and approval as determined by the appropriate national authority.

4.2 TRAINING CURRICULA

4.2.1 Personnel must be trained in the requirements commensurate with their responsibilities. Such training must include:

- a) general familiarization training — which must be aimed at providing familiarity with the general provisions;

- b) function-specific training — which must provide detailed training in the requirements applicable to the function for which that person is responsible; and
- c) safety training — which must cover the hazards presented by dangerous goods, safe handling and emergency response procedures.

4.2.2 Personnel identified in the categories specified in Table 1-4, 1-5 or 1-6 must be trained or training must be verified prior to the person performing any duty specified in Table 1-4, 1-5 or 1-6.

4.2.3 Recurrent training must be provided within 24 months of previous training to ensure knowledge is current. However, if recurrent training is completed within the final three months of validity of previous training, the period of validity extends from the month on which the recurrent training was completed until 24 months from the expiry month of that previous training.

4.2.4 A test to verify understanding must be provided following training. Confirmation that the test has been completed satisfactorily is required.

4.2.5 A record of training must be maintained which must include:

- a) the individual's name;
- b) the most recent training completion month;
- c) a description, copy or reference to training materials used to meet the training requirements;
- d) the name and address of the organization providing the training; and
- e) evidence which shows that a test has been completed satisfactorily.

Training records must be retained by the employer for a minimum period of 36 months from the most recent training completion month and must be made available upon request to the employee or appropriate national authority.

4.2.6 The subject matter relating to dangerous goods transport with which various categories of personnel should be familiar is indicated in Table 1-4.

4.2.7 Staff of operators not carrying dangerous goods as cargo or mail must be trained commensurate with their responsibilities. The subject matter with which their various categories of staff should be familiar is indicated in Table 1-5.

Note.— Security staff are required to be trained irrespective of whether the operator on which passengers or cargo are to be transported carries dangerous goods as cargo.

Table 1-4. Content of training courses

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Shippers and packers</i>		<i>Freight forwarders</i>			<i>Operators and ground handling agents</i>					<i>Security staff</i>	
	1	2	3	4	5	6	7	8	9	10	11	12
General philosophy	x	x	x	x	x	x	x	x	x	x	x	x
Limitations	x		x	x	x	x	x	x	x	x	x	x
General requirements for shippers	x		x			x						
Classification	x	x	x			x						x
List of dangerous goods	x	x	x			x				x		
Packing requirements	x	x	x			x						
Labelling and marking	x	x	x	x	x	x	x	x	x	x	x	x
Dangerous goods transport document and other relevant documentation	x		x	x		x	x					
Acceptance procedures						x						
Recognition of undeclared dangerous goods	x	x	x	x	x	x	x	x	x	x	x	x
Storage and loading procedures					x	x		x		x		
Pilots' notification						x		x		x		
Provisions for passengers and crew	x	x	x	x	x	x	x	x	x	x	x	x
Emergency procedures	x	x	x	x	x	x	x	x	x	x	x	x

CATEGORIES

- 1 — Shippers and persons undertaking the responsibilities of shippers
- 2 — Packers
- 3 — Staff of freight forwarders involved in processing dangerous goods
- 4 — Staff of freight forwarders involved in processing cargo or mail (other than dangerous goods)
- 5 — Staff of freight forwarders involved in the handling, storage and loading of cargo or mail
- 6 — Operator's and ground handling agent's staff accepting dangerous goods
- 7 — Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)
- 8 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail and baggage
- 9 — Passenger handling staff
- 10 — Flight crew members, loadmasters, load planners and flight operations officers/flight dispatchers
- 11 — Crew members (other than flight crew members)
- 12 — Security staff who are involved with the screening of passengers and crew and their baggage and cargo or mail, e.g. security screeners, their supervisors and staff involved in implementing security procedures

Table 1-5. Content of training courses for operators not carrying dangerous goods as cargo or mail

Contents	Categories of staff				
	13	14	15	16	17
General philosophy	X	X	X	X	X
Limitations	X	X	X	X	X
Labelling and marking	X	X	X	X	X
Dangerous goods transport document and other relevant documentation	X				
Recognition of undeclared dangerous goods	X	X	X	X	X
Provisions for passengers and crew	X	X	X	X	X
Emergency procedures	X	X	X	X	X

CATEGORIES

- 13 — Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)
 14 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail (other than dangerous goods) and baggage
 15 — Passenger handling staff
 16 — Flight crew members, loadmasters, load planners and flight operations officers/flight dispatchers
 17 — Crew members (other than flight crew members)

Note 1.— Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in Tables 1-4 and 1-5. For example, in respect of classification, staff involved in implementing security procedures (e.g. screeners and their supervisors) need only be trained in the general properties of dangerous goods.

Note 2.— The categories of personnel identified in Tables 1-4 and 1-5 are not all encompassing. Personnel employed by or interacting with the aviation industry in areas such as passenger and cargo reservation centres, and engineering and maintenance, except when acting in a capacity identified in Table 1-4 or 1-5, should be provided with dangerous goods training in accordance with 4.2.

4.2.8 Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter with which their various categories of staff should be familiar is indicated in Table 1-6.

4.3 INSTRUCTOR QUALIFICATIONS

4.3.1 Unless otherwise provided for by the appropriate national authority, instructors of initial and recurrent dangerous goods training programmes must have adequate instructional skills and have successfully completed a dangerous goods training programme in the applicable category, or Category 6, prior to delivering such a dangerous goods training programme.

4.3.2 Instructors delivering initial and recurrent dangerous goods training programmes must at least every 24 months deliver such courses, or in the absence of this attend recurrent training.

Table 1-6. Content of training courses for staff of designated postal operators

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Designated postal operators</i>		
	<i>Categories of staff</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
General philosophy	x	x	x
Limitations	x	x	x
General requirements for shippers	x		
Classification	x		
List of dangerous goods	x		
Packing requirements	x		
Labelling and marking	x	x	x
Dangerous goods transport document and other relevant documentation	x	x	
Acceptance of the dangerous goods listed in 1;2.3.2	x		
Recognition of undeclared dangerous goods	x	x	x
Storage and loading procedures			x
Provisions for passengers and crew	x	x	x
Emergency procedures	x	x	x

CATEGORIES

- A — Staff of designated postal operators involved in accepting mail containing dangerous goods
 B — Staff of designated postal operators involved in processing mail (other than dangerous goods)
 C — Staff of designated postal operators involved in the handling, storage and loading of mail

Note.— Guidance on the aspects of training to be covered by staff of designated postal operators can be found in S-1;3.

4.4 COMPETENCY-BASED TRAINING AND ASSESSMENT

Competency-based training and assessment should be used in accordance with the general provisions contained in Chapter 2 of the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868).

APPENDIX C**PROPOSED NEW GUIDANCE MATERIAL ON A COMPETENCY-BASED
APPROACH TO DANGEROUS GOODS TRAINING AND ASSESSMENT****GUIDANCE ON A COMPETENCY-BASED APPROACH TO
DANGEROUS GOODS TRAINING AND ASSESSMENT****Chapter 1****GENERAL****1.1 INTRODUCTION**

1.1.1 A safe and efficient air transport system is dependent on a competent workforce. ICAO has recognized that this can be achieved through the implementation of a competency-based approach to training and assessment. The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284, "Technical Instructions") require that employers ensure personnel are competent to perform any function for which they are responsible prior to performing them. A competency-based approach to training and assessment is an effective way to ensure this requirement is met.

1.1.2 This document provides guidance in implementing a competency-based approach to dangerous goods training and assessment for personnel involved in the transport of cargo, mail, passengers and baggage by air. The *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) contains greater detail on competency-based training and assessment.

1.2 COMPETENCY-BASED TRAINING AND ASSESSMENT

1.2.1 The goal of competency-based training and assessment is to produce a competent workforce by providing focused training. It does so by identifying key competencies that need to be achieved, determining the most effective way of achieving them and establishing valid and reliable assessment tools to evaluate their achievement.

1.2.2 A competency is defined by the PANS-TRG as a dimension of human performance that is used to reliably predict successful performance on the job. It is manifested and observed through behaviours that mobilize the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions. A competency framework with associated performance criteria provides a means of assessing whether trainees achieve the desired performance. A competency framework and associated task list for dangerous goods personnel is described in paragraph 1.7.

1.2.3 A critical feature of competency-based training is assessment to ensure training is efficient and effective in developing the skills, knowledge and attitudes required to perform the function competently.

Note.— Competency-based training and assessment is described in more detail in the PANS-TRG, Part I, Chapter 2.

1.3 BENEFITS OF COMPETENCY-BASED TRAINING AND ASSESSMENT FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

1.3.1 The main benefit of a competency-based approach to training and assessment is its potential to encourage and enable personnel to reach their highest level of capability while ensuring a basic level of competence as a minimum standard. It does this by:

- a) targeting specific training needs;
- b) supporting continuous learning and performance improvement;
- c) gearing towards learning rather than simply passing a test;
- d) ensuring the integration of knowledge, skills and attitudes needed to perform effectively; and
- e) establishing sufficient, well-trained and competent instructors.

1.3.2 Ensuring personnel are able to perform their functions competently is critical to any organization. A competent workforce reduces cost caused by poor performance or miscommunication of job expectations. An incompetent dangerous goods workforce could result in costs and delays in shipment. Even more critically, it could result in the introduction of safety risks. As an example, identifying, classifying, packing, marking, labelling and documenting dangerous goods for transport are critical to the safe transport of dangerous goods by air. The operator depends on these functions being performed competently by those preparing and offering a consignment for transport so that they are aware of the hazards posed and the required measures to mitigate them. If personnel performing these functions are not trained to competently perform them, unknown risks may be introduced into air transport. As another example, accepting dangerous goods for air transport requires an operator to verify that dangerous goods are properly prepared for transport through use of a checklist. If personnel accepting dangerous goods are not trained to competently perform this function, they may unnecessarily reject properly prepared shipments thereby delaying shipments and increasing costs to the shipper and the operator. Alternatively, personnel not trained to competently perform this function may accept improperly prepared shipments of dangerous goods into air transport thereby introducing risks to the aircraft and its occupants.

1.3.3 A competency-based approach to training and assessment ensures trainees know what they are expected to competently perform and evaluators know what performance to assess.

1.4 RELATIONSHIP BETWEEN COMPETENCY-BASED TRAINING AND ASSESSMENT AND SAFETY MANAGEMENT

1.4.1 Safety is ICAO's guiding and most fundamental strategic objective. Annex 19 to the Convention on International Civil Aviation — *Safety Management* contains Standards and Recommended Practices (SARPs) intended to assist States in managing aviation safety risks. The foundation of safety management is the implementation of a State safety programme (SSP) by States and safety management systems (SMS) by service providers. An operator's SMS addresses the aviation activities that are related to the safe operation of the aircraft in accordance with Annex 6, Part I or Part III. These aviation activities include the carriage of dangerous goods. Other entities in the dangerous goods transport chain should be encouraged to implement a similar safety system.

1.4.2 Implementing SMS requires that all personnel understand the safety philosophy and embrace a disciplined and standardized approach for SMS. Personnel need to know their roles and responsibilities with respect to dangerous goods and have the requisite competencies to perform their functions within the SMS. To ensure that personnel have the knowledge, skills and abilities to support SMS, training activities should follow the competency-based approach.

1.4.3 The "Swiss-Cheese" Model of accident causation proposes that complex aviation systems are extremely well defended by layers of defences making single-point failures rarely consequential in such systems (see paragraph 2.2 of the *Safety Management Manual (SMM)* (Doc 9859)). The model illustrates that accidents involve successive breaches of multiple system defences and that all accidents include a combination of both active conditions (actions or inactions that have an immediate adverse effect) and latent conditions (conditions that exist in the aviation system well before a damaging outcome is experienced). Doc 9859 identifies training as one of the three main groups of defences in aviation and identifies deficiencies in training as a latent condition.

1.5 FUNCTION-SPECIFIC TRAINING

1.5.1 The Technical Instructions state that personnel must be trained commensurate with the functions for which they are responsible. These responsibilities are determined by the specific functions personnel perform and not by their job titles. Concentrating on functions and responsibilities rather than a job title or description ensures that a person is competent to perform the function in compliance with the Technical Instructions. For example, entities such as ground handling companies and freight forwarders may need personnel to perform some functions that are typically performed by shippers or operators.

The ground handling and freight forwarder personnel would need to be trained to perform these functions competently regardless of their job title.

1.5.2 In smaller operations, personnel may perform many functions such as accepting dangerous goods and loading and securing dangerous goods on board an aircraft. They would need to be trained to perform all of these functions competently. In larger operations, personnel may only perform a small number of functions. They would only need to be trained to perform those specific functions competently.

1.5.3 The depth of training each person receives should be appropriate to the functions performed. This could range from a familiarization level to an expert level for certain personnel.

1.6 ROLES AND RESPONSIBILITIES IN A COMPETENCY-BASED APPROACH TO TRAINING

1.6.1 Employer

1.6.1.1 A training programme includes elements such as design methodology, initial and recurrent training, assessment, instructor qualifications and competencies, training records and evaluation of its effectiveness. Employers need to determine the purpose and objective of the competency-based training programme based on the functions for which their personnel are responsible. Employers should ensure that training is designed and developed to establish clear links among the competencies to be achieved, learning objectives, assessment methods, and course materials.

1.6.1.2 The employer must study the target population (future trainees) with a view to identifying the knowledge, skills and attitudes that they already possess, to collect information on preferred learning styles, and on the social and linguistic environments of prospective trainees. The target population may be a mixture of experienced and newly recruited personnel, groups differing in age, etc. All these components could have an impact on the design of the training. Employers must also consider the domestic and international regulatory requirements that apply to their operations.

1.6.1.3 Some employers may utilize third parties for assistance. This approach may be the most suitable for employers who do not have the resources to train their personnel in house. While utilizing third parties may be cost effective, whether or not the training needs are being addressed needs to be the deciding factor in selecting a third party and not costs alone. The potential for third parties to cater to the training needs of multiple employers and not address all required competencies needs to be taken into account. Employers remain responsible for ensuring its personnel are competent to perform their functions prior to performing them even if certain aspects of the training programme have been delegated to third parties.

1.6.1.4 Employers should liaise directly with the regulator to ensure that the latter's requirements are taken into account prior to proceeding with the development of competency-based training,

1.6.2 Instructor

In competency-based training, the instructor facilitates the trainee's progression towards the achievement of competencies. Instructors also collect information about the effectiveness of the training materials which supports continuous improvement. Examples of instructor competencies can be found in Part I, Chapter 3 of the PANS-TRG.

1.6.3 Trainee

In competency-based training, trainees are active participants in their learning process and the achievement of competencies as opposed to passive recipients of knowledge. The competency-based training programme provides them with a clear idea of their learning path towards competency through the training programme and beyond. The competency-based training should directly contribute to improving their performance on the job. Trainees' feedback is essential in ensuring that competency-based training is effective.

1.6.4 Regulator

1.6.4.1 There are important differences between the ways the regulator would oversee a traditional training programme versus a competency-based training programme. In a traditional training programme, the regulator may assess the course components and final test against knowledge elements and not on the competencies that need to be acquired. The fact that all knowledge components are addressed or appear to be included in a course and all trainees have passed the required test does not necessarily mean that they can competently perform their assigned functions.

1.6.4.2 Where competency-based training has been implemented, regulators should oversee the training programme to ensure that it actually produces personnel who can perform the functions for which they are responsible in a specific

operational setting and in compliance with the national regulatory framework. The *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284SU) provides guidance on overseeing dangerous goods training programmes.

1.7 DEVELOPING COMPETENCY-BASED TRAINING FOR DANGEROUS GOODS

1.7.1 ICAO framework and adapted competency model

The purpose of competency-based training and assessment is to train and assess the capacity of an individual to perform at the standard expected in an organizational workplace. Therefore, organizations electing to implement competency-based training and assessment should adapt the corresponding generic ICAO competency framework for dangerous goods personnel (Chapter 2, Table 2-1) to suit their context by developing an adapted competency model (Chapter 2, Table 2-2). The framework consists of competencies and their associated descriptions and observable behaviours and forms the basis from which an adapted competency model is derived. Employers implementing competency-based training and assessment should adapt this framework to reflect their specific requirements. An adapted competency model is an effective tool for defining successful job performance and provides a means of assessing whether trainees achieve the desired performance. The adapted competency model will include the final competency standards and conditions that need to be assessed in addition to the adapted competencies and their associated descriptions and observable behaviours.

1.7.2 Relationship between competencies and tasks

1.7.2.1 Traditional approaches to training development involve the decomposition of jobs into tasks. For each task there is a related objective, an assessment and associated elements in a training plan. A limitation of this approach is that each task must be taught and assessed. In complex systems or when jobs evolve rapidly, it may not be possible to teach and assess each task. Moreover, learners may demonstrate the ability to perform tasks in isolation without being competent in their job.

1.7.2.2 Competency-based training and assessment is based on the concept that competencies are transferable. In the design of a competency-based training and assessment programme, a limited number of competencies are defined. Typically, an activity will involve several competencies and competencies may apply across a variety of activities and contexts. In the design of training and assessments, tasks and activities are incorporated because they are good candidates for facilitating, developing or assessing a competency or competencies. Specific tasks may be used to develop specific competencies. Lack of specific competencies may be identified as root causes for the failure of a task.

1.7.2.3 A generic list of tasks typically performed by dangerous goods personnel is provided in Chapter 3. It consists of dangerous goods tasks and sub-tasks. A complementary flowchart is provided in Chapter 4. It illustrates the typical processes of performing these tasks. The employer should adapt this task list to reflect the specific tasks performed by its personnel.

1.7.3 Development and implementation of competency-based training and assessment programmes

1.7.3.1 Phase 1 — Training needs analysis

The first phase in the development and implementation of a competency-based training programme specific to an employer's environment and requirements is to conduct a training needs analysis. An employer conducts a training needs analysis to determine the results that the training needs to achieve and what resources exist to achieve these results. This critical step will ensure that the training fits the employer's purpose and is effective. A training specification is developed during this phase of development that details the requirements that need to be fulfilled when designing the training. This should include the purpose of the training along with its requirements, including operational, technical, regulatory and organizational. This phase also involves the development of the task list (see paragraph 1.7.2).

1.7.3.2 Phase 2 — Design local competency based training and assessment

The second phase in the development and implementation of a competency-based training and assessment programme is its design. This is done taking into account the training specifications identified in Phase 1 (see paragraph 1.7.3.1) and will involve:

- a) designing an adapted competency model that addresses the training specification identified in Phase 1 (see 1.7.3.1);
- b) designing an assessment plan that will be used to assess the competence of trainees;
- b) designing a training plan that will enable the development and delivery of the training course.

1.7.3.2.1 Designing the adapted competency model

The competency model for dangerous goods should be adapted from the generic ICAO competency framework provided in Chapter 2. This generic framework provides a set of competencies that are typically needed to perform the dangerous goods tasks identified in the generic task list provided in Chapter 3. The vast majority of adapted competency models will contain similar lists of competencies, but there may be a need to add or remove a competency depending on the employers' own operational and organizational environments. The generic framework also provides a comprehensive list of observable behaviours associated with each of the competencies. The appropriate observable behaviours should be selected from it and, if necessary, adapted.

1.7.3.2.2 Designing an assessment plan

1.7.3.2.2.1 The purpose of the assessment plan is to detail how competence is going to be determined. The assessment plan details the:

- a) the final competency standard associated with the final milestone;
- b) the interim competency standard associated with each milestone (if required);
- c) the list of assessments (formative and summative assessments, examinations, oral assessments, etc.) required for each of the milestone(s) that have been defined;
- d) when assessments should take place;
- e) the tools to be used to collect evidence during practical assessment.
- f) the pass marks for projects, examinations or oral assessments;
- g) if required, the minimum number of formative assessments to be undertaken prior to starting summative assessments; and
- h) the number of observations required to assess performance for the interim and final competency standards.

1.7.3.2.2.2 Additional administrative procedures may be necessary in the implementation of the assessment plan in relation to: who is authorized to perform a specific task or assessment, record keeping, actions to be taken if a trainee fails a competency assessment, etc.

1.7.3.2.2.3 Competency-based training requires assessment of the trainees' progress until they are competent to perform their assigned function. A trainee's assessment may be completed using a variety of tools including observation of job performance, tests or other practical exercises. In order for assessment tools to be effective, they must be valid and reliable both in terms of being an appropriate measure of the competency being assessed and of obtaining consistent results when administered by different instructors.

1.7.3.2.2.4 The assessment of personnel can be accomplished in a variety of ways. Some common examples to accomplish an assessment would be to utilize a written test, online test, oral test, observed practical exercises, online practical exercises and observation of on-the-job performance by fully trained personnel. An employer might choose to utilize one assessment method or a combination of multiple assessment methods, as long as the assessment confirms that personnel have acquired the necessary competencies to perform the assigned functions. The employer therefore establishes the assessment plan with all the specific details that would need to be accomplished to determine whether competence has been achieved by the trainee.

1.7.3.2.2.5 Employers electing to send personnel to third-party training providers also need to establish an assessment plan for ensuring that competence has been achieved by the trainee. The employer may incorporate the third-party provider's assessment into their established assessment plan. Even if the employer does not deliver any of the training themselves, they can still choose to assess the trainee in the workplace to ensure they can perform their assigned tasks competently and incorporate that process into their assessment plan.

1.7.3.2.3 Designing a training plan

1.7.3.2.3.1 The training plan details the:

- a) composition and structure of the course;
- b) syllabus;

- c) milestones (if required);
- d) modules, training events and their delivery sequence; and
- e) course schedule.

1.7.3.2.3.2 The training plan will be used by the training designer(s) to create the training and assessment materials.

1.7.3.2.4 Relationship between the adapted competency model and the assessment and training plans

1.7.3.2.4.1 The training specification developed in Phase 1 (see paragraph 1.7.3.1) serves as the common basis for the development of the adapted competency model and the training and assessment plans. The task list is generally used to aid the selection of the observable behaviours from the generic competency framework provided in Chapter 2. The operational, technical, regulatory and organizational requirements aid the development of the conditions and standards that will apply to the competencies and observable behaviours.

1.7.3.2.4.2 The same task list and requirements are used to develop the training plan. The training plan is used to prepare the trainee to undertake assessment to determine if they are competent in accordance with the adapted competency model. The adapted competency model and the training plan are used to develop the assessment plan.

1.7.3.2.4.3 The syllabus in the training plan is composed of training objectives derived from tasks and sub-tasks as well as the underlying knowledge, skills and attitudes necessary to perform them. The knowledge, skills and attitudes are determined on the basis of the task list in conjunction with operational, technical, regulatory and organizational requirements. Chapter 5 provides a generic task/knowledge matrix tool that can be used as a tool to map out the knowledge that is necessary to perform specific tasks. Tasks corresponding to the list provided in Chapter 3 are listed across the columns of the table and subject matter (knowledge) is listed down the rows. The employer should indicate what knowledge is needed for a particular task within the organization with a check mark at the point at which the task element and the knowledge element intersect. To facilitate this process, some knowledge components have been blacked out if they are considered to be completely irrelevant to specific tasks. The level of knowledge and/or skills necessary will differ depending on the task. For example, the person accepting dangerous goods will not require the same level of knowledge and/or skills related to classification as someone who is classifying dangerous goods.

1.7.3.2.4.4 When assessing whether competence has been achieved, the adapted competency model, not the syllabus, is referenced. Consequently, the performance criteria are used to assess if competence has been achieved and the tasks/sub-tasks that are carried out by the trainee are the “vehicle” for enabling the assessment to be conducted.

1.7.3.3 Phase 3 — Develop the training and assessment materials

The third phase in the development and implementation of a competency-based training and assessment programme is the development of the training and assessment materials. Development is based on the adapted competency model and the training and assessment plans. Training and assessment materials include but are not limited to training notes, exercise briefings, practical exercises, case studies, presentations, video clips, self-test quizzes, examinations, assessments and assessment tools.

1.7.3.4 Phase 4 — Conduct the course in accordance with the training and assessment plans

The fourth phase in the development and implementation of a competency-based training and assessment programme is conducting the course in accordance with the training and assessment plans. This involves delivering the training; monitoring the progress of the trainees; providing timely and continuous feedback on their performance; diagnosing deficiencies in the training and addressing them in a timely manner; and carrying out assessments according to the assessment plan. The goal of this phase is a competent employee.

1.7.3.5 Phase 5 — Evaluate the course including the training and assessment plans

The employer is responsible for ensuring the effectiveness of the training programme. At the end of a period of training, feedback on performance on the job from trainees, instructors, assessors and employers should be gathered to determine the effectiveness of the training and assessment in supporting the progression of learning towards competence in the workplace. Evaluation of the training should be based on valid and reliable evidence such as course results, trainee feedback, instructor feedback, audit reports, and occurrence reports. This evaluation may lead to changes or improvements being made to the competency based training and assessment design.

Chapter 2

GENERIC COMPETENCY FRAMEWORK FOR DANGEROUS GOODS PERSONNEL AND TEMPLATE FOR ADAPTED COMPETENCY MODEL

This chapter contains a generic ICAO competency framework for dangerous goods personnel (Table 2-1) and a template for an adapted competency model (Table 2-2). These are described in Chapter 1, paragraph 1.7. Employers implementing competency-based training and assessment should adapt the framework in Table 2-1 into a competency model based on their specific requirements. The adapted competency model should include the elements shown in Table 2-2.

Table 2-1. Generic ICAO competency framework for dangerous goods personnel

<i>Generic competency</i>	<i>Description</i>	<i>Observable behaviour</i>
Application of procedures and compliance with regulations	Identifies and applies appropriate procedures in accordance with published operating instructions and in compliance with applicable regulations	Identifies where to find procedures and regulations
		Follows relevant procedures in a timely manner
		Complies with applicable regulations
		Applies relevant procedural knowledge
Communication	Communicates through appropriate means in the work environment, in both normal and non-normal situations	Ensures the recipient is ready and able to receive information
		Selects appropriately what, when, how and with whom to communicate
		Conveys messages clearly, accurately and concisely
		Confirms that the recipient correctly understands important information
		Listens actively and demonstrates understanding when receiving information
		Asks relevant and effective questions
		Completes accurate reports as required by operating procedures
		Announces deviations from normal or intended conditions
		Correctly uses and interprets non-verbal communication
Leadership, teamwork and self-management	Demonstrates effective leadership, team working and self-management	Encourages team participation and open communication
		Demonstrates initiative and provides direction when required
		Engages others in planning
		Considers inputs from others
		Gives and receives feedback constructively
		Addresses and resolves conflicts and disagreements in a constructive manner
		Exercises decisive leadership
		Admits mistakes and takes responsibility for own performance, detecting and resolving own errors
		Carries out instructions when directed and applies effective intervention strategies when necessary
		Confidently intervenes when important for safety
		Self-evaluates the effectiveness of actions

<i>Generic competency</i>	<i>Description</i>	<i>Observable behaviour</i>
Problem solving and decision making	Identifies problem precursors and resolves actual problems using decision making techniques, in a timely manner	Seeks accurate and adequate information from appropriate sources
		Identifies and verifies what and why things have gone wrong
		Employ(s) proper problem-solving strategies
		Perseveres in working through problems while prioritizing safety
		Uses appropriate and timely decision-making techniques
		Sets priorities appropriately
		Identifies and considers options as appropriate
		Monitors, reviews, and adapts decisions as required
		Identifies, assesses and manages risks and threats to safety effectively
		Adapts when faced with situations where no guidance or procedure exists
		When an event conducive to startle is encountered, recognizes and manages the situation
Workload Management	Maintain available workload capacity by prioritizing and distributing tasks using appropriate resources	Exercises self-control in all situations
		Plans, prioritizes and schedules tasks effectively
		Manages time efficiently when carrying out tasks
		Offers and gives assistance, delegates when necessary
		Seeks and accepts assistance, when appropriate
		Monitors, reviews and cross-checks actions conscientiously
		Verifies that tasks are completed to the expected outcome
		Manages and recovers from interruptions, distractions, variations and failures effectively while performing tasks

Table 2-2. Template for an adapted competency model

<i>Adapted competency</i>	<i>Description</i>	<i>Performance criteria</i>		
		<i>Observable behaviour</i>	<i>Competency assessment</i>	
<i>Adapted competency 1</i>	Description 1	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		
<i>Adapted competency 2</i>	Description 2	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		
<i>Adapted competency 3</i>	Description 3	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		

Chapter 3

DANGEROUS GOODS TASK LIST

This chapter contains a generic list of tasks typically performed by dangerous goods personnel (Table 3-1) as described in Chapter 1, paragraph 1.7. The employer should adapt this task list to reflect the specific tasks performed by its personnel.

Table 3-1. Generic dangerous goods task list

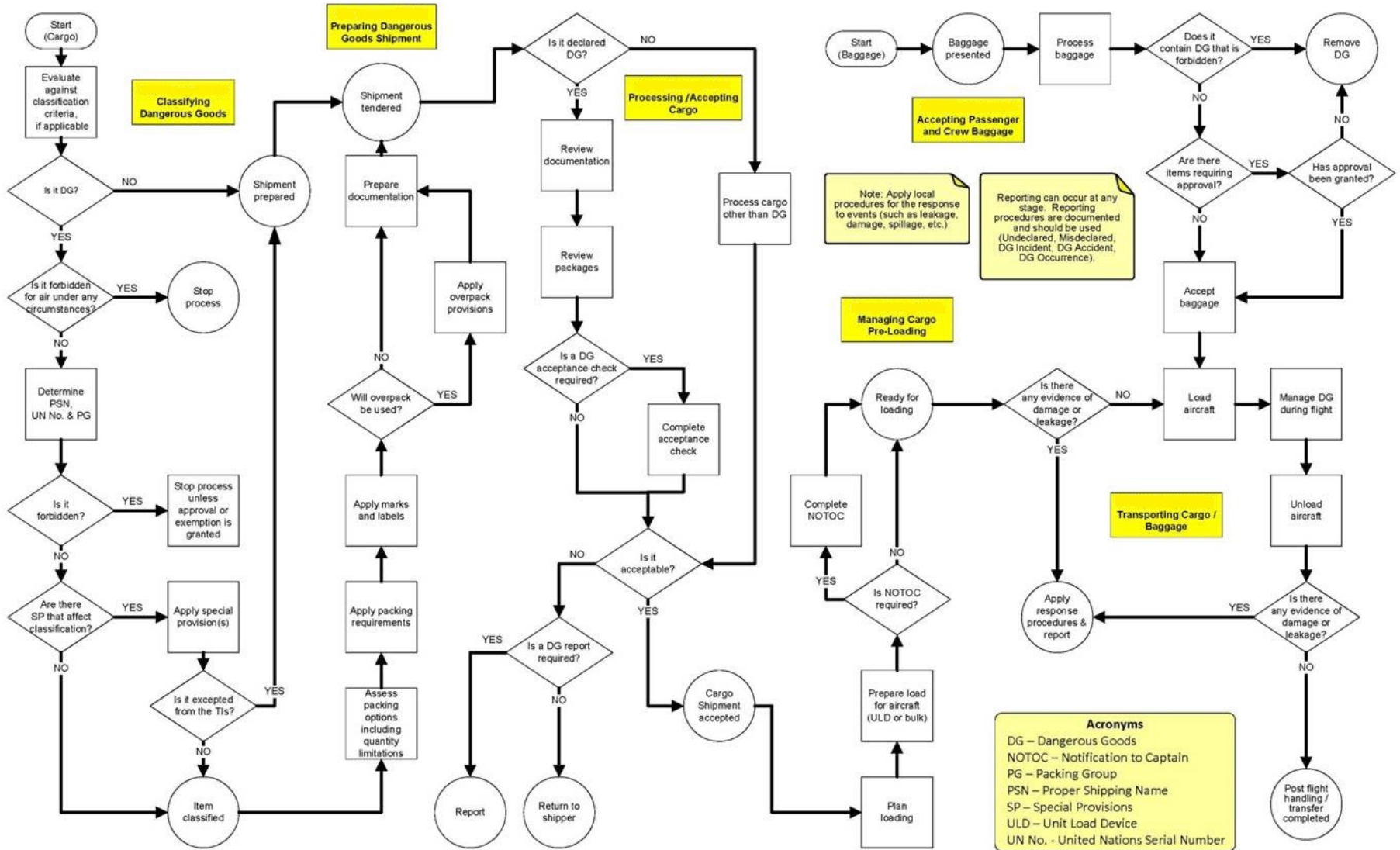
1	Classifying dangerous goods		
	1.1	Evaluate substance or article against classification criteria	
		1.1.1	Determine if it is dangerous goods
		1.1.2	Determine if it is forbidden under any circumstances
	1.2	Determine dangerous goods description	
		1.2.1	Determine class or division
		1.2.2	Determine packing group
		1.2.3	Determine proper shipping name and UN number
		1.2.4	Determine if it is forbidden unless approval or exemption is granted
	1.3	Review special provisions	
		1.3.1	Assess if special provision(s) is applicable
		1.3.2	Apply special provision(s)
	2	Preparing dangerous goods shipment	
2.1		Assess packing options including quantity limitations	
		2.1.1	Consider limitations (de minimis quantities, excepted quantities, limited quantities, passenger aircraft, cargo aircraft only, special provisions, dangerous goods in the mail)
		2.1.2	Consider State and operator variations
		2.1.3	Determine if all-packed-in-one can be used
		2.1.4	Select how dangerous goods will be shipped based on limitations and variations
2.2		Apply packing requirements	
		2.2.1	Consider constraints of packing instructions
		2.2.2	Select appropriate packaging materials (absorbent, cushioning, etc.)
		2.2.3	Assemble package
		2.2.4	Comply with the packaging test report when UN specification packaging is required
2.3		Apply marks and labels	
		2.3.1	Determine applicable marks
		2.3.2	Apply marks
		2.3.3	Determine applicable labels
		2.3.4	Apply labels
2.4		Assess use of overpack	
		2.4.1	Determine if overpack can be used
		2.4.2	Apply marks if necessary
		2.4.3	Apply labels if necessary

	2.5	Prepare documentation
	2.5.1	Complete the dangerous goods transport document
	2.5.2	Complete other transport documents (e.g. air waybill)
	2.5.3	Include other required documentation (approvals/exemptions, etc.)
	2.5.4	Retain copies of documents as required
3	Processing/accepting cargo	
	3.1	Review documentation
	3.1.1	Verify dangerous goods transport document
	3.1.2	Verify other transport documents (e.g. air waybill)
	3.1.3	Verify other documents (exemptions, approvals, etc.)
	3.1.4	Verify State/operator variations
	3.2	Review package(s)
	3.2.1	Verify marks
	3.2.2	Verify labels
	3.2.3	Verify package type
	3.2.4	Verify package conditions
	3.2.5	Verify State/operator variations
	3.3	Complete acceptance procedures
	3.3.1	Complete acceptance checklist
	3.3.2	Provide shipment information for load planning
	3.3.3	Retain documents as required
	3.4	Process/accept cargo other than dangerous goods
	3.4.1	Check documentation for indications of undeclared dangerous goods
	3.4.2	Check packages for indications of undeclared dangerous goods
	4	Managing cargo pre-loading
4.1		Plan loading
4.1.1		Determine stowage requirements
4.1.2		Determine segregation, separation, aircraft/compartment limitations
4.2		Prepare load for aircraft
4.2.1		Check packages for indications of undeclared dangerous goods
4.2.2		Check for damage and/or leakage
4.2.3		Apply stowage requirements (e.g. segregation, separation, orientation)
4.2.4		Apply ULD tags when applicable
4.2.5		Transport cargo to aircraft
4.3		Issue NOTOC
4.3.1		Enter required information
4.3.2		Verify conformance with load plan
4.3.3	Transmit to loading personnel	

5	Accepting passenger and crew baggage	
	5.1	Process baggage
	5.1.1	Identify forbidden dangerous goods
	5.1.2	Apply approval requirements
	5.2	Accept baggage
	5.2.1	Apply operator requirements
	5.2.2	Verify passenger baggage requirements
	5.2.3	Advise pilot-in-command
6	Transporting cargo/baggage	
	6.1	Load aircraft
	6.1.1	Transport cargo/baggage to aircraft
	6.1.2	Check packages for indications of undeclared dangerous goods
	6.1.3	Check for damage and/or leakage
	6.1.4	Apply stowage requirements (e.g. segregation, separation, orientation, securing and protecting from damage)
	6.1.5	Verify that NOTOC reflects against aircraft load
	6.1.6	Verify passenger baggage requirements
	6.1.7	Inform pilot-in-command and flight operations officer/flight dispatcher
	6.2	Manage dangerous goods pre and during flight
	6.2.1	Detect presence of dangerous goods not permitted in baggage
	6.2.2	Interpret NOTOC
	6.2.3	Apply procedures in the event of an emergency
	6.2.4	Inform flight operations officer/flight dispatcher/air traffic control in the event of an emergency
	6.2.5	Inform emergency services of the dangerous goods on board in the event of an emergency
	6.3	Unload aircraft
	6.3.1	Apply specific unloading considerations
	6.3.2	Check packages for indications of undeclared dangerous goods
	6.3.3	Check for damage and/or leakage
	6.3.4	Transport cargo/baggage to facility/terminal
7	Collecting safety data	
	7.1	Report dangerous goods accidents
	7.2	Report dangerous goods incidents
	7.3	Report undeclared/misdeclared dangerous goods
	7.4	Report dangerous goods occurrences

Chapter 4

DANGEROUS GOODS FUNCTIONS — PROCESS FLOWCHART



Dangerous goods knowledge	Dangerous goods tasks																							
	1. Classifying dangerous goods			2. Preparing dangerous goods shipment					3. Processing/ accepting cargo				4. Managing cargo pre-loading			5. Accepting passenger and crew baggage		6. Transporting cargo/baggage			7. Collecting safety data			
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2	6.1	6.2	6.3	7.1	7.2	7.3	7.4
Requirements for the construction, testing and approval of packages for radioactive material and for the approval of such material																								
Acceptance procedures																								
Storage and loading																								
Inspection and decontamination																								
Provision of information																								
Provisions concerning passengers and crew																								
Provisions to aid recognition of undeclared dangerous goods																								
Helicopter operations																								
Provisions for dangerous goods carried by passengers or crew																								

Tasks

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Classifying dangerous goods <ol style="list-style-type: none"> 1.1 — Evaluate substance or article against classification criteria 1.2 — Determine dangerous goods description 1.3 — Review special provisions 2. Preparing dangerous goods shipment <ol style="list-style-type: none"> 2.1 — Assess packing options including quantity limitations 2.2 — Apply packing requirements 2.3 — Apply marks and labels 2.4 — Assess use of overpack 2.5 — Prepare documentation 3. Processing/accepting cargo <ol style="list-style-type: none"> 3.1 — Review documentation 3.2 — Review package(s) 3.3 — Complete acceptance procedures 3.4 — Process/accept cargo other than dangerous goods | <ol style="list-style-type: none"> 4. Managing cargo pre-loading <ol style="list-style-type: none"> 4.1 — Plan loading 4.2 — Prepare load for aircraft 4.3 — Issue NOTOC 5. Accepting passenger and crew baggage <ol style="list-style-type: none"> 5.1 — Process baggage 5.2 — Accept baggage 6. Transporting cargo/baggage <ol style="list-style-type: none"> 6.1 — Load aircraft 6.2 — Manage dangerous goods pre and during flight 6.3 — Unload aircraft 7. Collecting safety data <ol style="list-style-type: none"> 7.1 — Report dangerous goods accidents 7.2 — Report dangerous goods incidents 7.3 — Report undeclared/misdeclared dangerous goods 7.4 — Report dangerous goods occurrences |
|---|--|

Chapter 6

ADAPTED TASK LISTS FOR CERTAIN WELL-DEFINED ROLES

A. INTRODUCTION

The examples below indicate the tasks from the task list provided in Chapter 3 that personnel responsible for certain well-defined functions would typically perform and for which training and assessment would therefore be required. Personnel would need to have relevant knowledge to competently perform these tasks. The task/knowledge matrix tool provided in Chapter 5 may be used as a guide for determining what knowledge is needed for a given task. The examples in this chapter and the task/knowledge tool provided in Chapter 5 may be used for designing training programmes. However, they should not be considered as mandatory. Additional training and assessment may be required for personnel assigned additional responsibilities and less training and assessment may be required for personnel assigned less responsibilities to those presented in these lists. The employer is responsible for ensuring employees are competent to perform the functions for which they are responsible and must therefore ensure that training programmes are designed to accomplish this. Dangerous goods training programmes are subject to State approval in accordance with national regulations, policies and procedures.

B. PERSONNEL RESPONSIBLE FOR PREPARATION OF DANGEROUS GOODS CONSIGNMENTS

Training and assessment for personnel preparing dangerous goods consignments for transport may be tailored to address only those classes, divisions or even UN numbers that they prepare for transport. Training and assessment may also be limited to address only the specific tasks personnel perform. For example, where personnel are only responsible for the packing, marking and labelling of packages and overpacks, training and assessment may be tailored to address just those tasks. Personnel would need to have relevant knowledge to competently perform these functions. The task/knowledge matrix tool provided in Chapter 5 may be used as a guide for determining what knowledge is needed. The following are tasks personnel responsible for preparation of dangerous goods consignments typically perform and for which training and assessment would therefore be required:

1 Classifying dangerous goods

- 1.1 Evaluate substance or article against classification criteria
 - 1.1.1 Determine if it is dangerous goods
 - 1.1.2 Determine if it is forbidden under any circumstances
- 1.2 Determine dangerous goods description
 - 1.2.1 Determine class or division
 - 1.2.2 Determine packing group
 - 1.2.3 Determine proper shipping name and UN number
 - 1.2.4 Determine if it is forbidden unless approval or exemption is granted
- 1.3 Review special provisions
 - 1.3.1 Assess if special provision(s) is applicable
 - 1.3.2 Apply special provision(s)

2 Preparing dangerous goods shipment

- 2.1 Assess packing options including quantity limitations
 - 2.1.1 Consider limitations (de minimis quantities, excepted quantities, limited quantities, passenger aircraft, cargo aircraft only, special provisions, dangerous goods in the mail)
 - 2.1.2 Consider State and operator variations
 - 2.1.3 Determine if all-packed-in-one can be used
 - 2.1.4 Select how dangerous goods will be shipped based on limitations and variations
- 2.2 Apply packing requirements
 - 2.2.1 Consider constraints of packing instructions
 - 2.2.2 Select appropriate packaging materials (absorbent, cushioning, etc.)
 - 2.2.3 Assemble package
 - 2.2.4 Comply with the packaging test report when UN specification packaging is required
- 2.3 Apply marks and labels
 - 2.3.1 Determine applicable marks
 - 2.3.2 Apply marks
 - 2.3.3 Determine applicable labels
 - 2.3.4 Apply labels

- 2.4 Assess use of overpack
 - 2.4.1 Determine if overpack can be used
 - 2.4.2 Apply marks if necessary
 - 2.4.3 Apply labels if necessary
- 2.5 Prepare documentation
 - 2.5.1 Complete the dangerous goods transport document
 - 2.5.2 Complete other transport documents (e.g. air waybill)
 - 2.5.3 Include other required documentation (approvals/exemptions, etc.)
 - 2.5.4 Retain copies of documents as required

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

C. PERSONS RESPONSIBLE FOR PROCESSING OR ACCEPTING GOODS PRESENTED AS GENERAL CARGO

Personnel responsible for processing goods presented as general cargo [should/must] be competent to perform tasks aimed at preventing undeclared dangerous goods from being loaded on an aircraft. They may work for freight forwarders, ground handling agents or operators. Personnel would need to have relevant knowledge to competently perform these tasks. The task/knowledge matrix tool provided in Chapter 5 may be used as a guide for determining what knowledge is needed. They may need additional knowledge and be capable of performing at a more advanced skill level depending on the actual responsibilities assigned. The following are tasks aimed at preventing undeclared dangerous goods from being loaded on aircraft such personnel would typically perform and for which training and assessment may be required.

3 Processing/accepting cargo

- 3.4 Process/accept cargo other than dangerous goods
 - 3.4.1 Check documentation for indications of undeclared dangerous goods
 - 3.4.2 Check packages for indications of undeclared dangerous goods

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

D. PERSONNEL RESPONSIBLE FOR PROCESSING OR ACCEPTING DANGEROUS GOODS CONSIGNMENTS

The following are tasks personnel responsible for processing or accepting dangerous goods consignments typically perform and for which training and assessment would therefore be required:

3 Processing/accepting cargo

- 3.1 Review documentation
 - 3.1.1 Verify air waybill
 - 3.1.2 Verify dangerous goods transport document
 - 3.1.3 Verify other documents (exemptions, approvals, etc.)
 - 3.1.4 Verify State/operator variations
- 3.2 Review package(s)
 - 3.2.1 Verify marks
 - 3.2.2 Verify labels
 - 3.2.3 Verify package type
 - 3.2.4 Verify package conditions
 - 3.2.5 Verify State/operator variations
- 3.3 Complete acceptance procedures
 - 3.3.1 Complete acceptance checklist
 - 3.3.2 Provide shipment information for load planning
 - 3.3.3 Retain documents as required

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

E. PERSONS RESPONSIBLE FOR HANDLING CARGO IN A WAREHOUSE, LOADING AND UNLOADING UNIT LOAD DEVICES AND LOADING AND UNLOADING AIRCRAFT CARGO COMPARTMENTS

The following are tasks personnel responsible for handling cargo in a warehouse, loading and unloading unit load devices and loading and unloading passenger baggage and aircraft cargo compartments typically perform and for which training and assessment would therefore be required:

4 Managing cargo pre-loading

- 4.2 Prepare load for aircraft
 - 4.2.1 Check packages for indications of undeclared dangerous goods
 - 4.2.2 Check for damage and/or leakage
 - 4.2.3 Apply stowage requirements (e.g. segregation, separation, orientation)
 - 4.2.4 Apply ULD tags when applicable
 - 4.2.5 Transport cargo to aircraft

6 Transporting cargo/baggage

- 6.1 Load aircraft
 - 6.1.1 Transport cargo/baggage to aircraft
 - 6.1.2 Check packages for indications of undeclared dangerous goods
 - 6.1.3 Check for damage and/or leakage
 - 6.1.4 Apply stowage requirements (e.g. segregation, separation, orientation, securing and protecting from damage)
 - 6.1.5 Verify that NOTOC reflects against aircraft load
 - 6.1.6 Verify passenger baggage requirements
 - 6.1.7 Inform pilot-in-command and flight operations officer/flight dispatcher
- 6.3 Unload aircraft
 - 6.3.1 Apply specific unloading considerations
 - 6.3.2 Check packages for indications of undeclared dangerous goods
 - 6.3.3 Check for damage and/or leakage

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

F. PERSONS RESPONSIBLE FOR ACCEPTING PASSENGER AND CREW BAGGAGE, MANAGING AIRCRAFT BOARDING AREAS AND OTHER TASKS INVOLVING DIRECT PASSENGER CONTACT AT AN AIRPORT

The following are tasks personnel responsible for accepting passenger and crew baggage, managing aircraft boarding areas and other functions involving direct passenger contact at an airport typically perform and for which training and assessment would therefore be required.

5 Accepting passenger and crew baggage

- 5.1 Process baggage
 - 5.1.1 Identify forbidden dangerous goods
 - 5.1.2 Apply approval requirements
- 5.2 Accept baggage
 - 5.2.1 Apply operator requirements
 - 5.2.2 Verify passenger baggage requirements
 - 5.2.3 Advise pilot-in-command

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

G. PERSONNEL RESPONSIBLE FOR THE PLANNING OF AIRCRAFT LOADING

The following are tasks personnel responsible for planning of aircraft loading (passengers, baggage, mail and cargo) would typically perform and for which training and assessment would therefore be required:

4 Managing cargo pre-loading

- 4.1 Plan loading
 - 4.1.1 Determine stowage requirements
 - 4.1.2 Determine segregation, separation, aircraft/compartment limitations
- 4.3 Issue NOTOC
 - 4.3.1 Enter required information
 - 4.3.2 Verify conformance with load plan
 - 4.3.3 Transmit to loading personnel

H. FLIGHT CREW

The following are tasks the flight crew would typically perform and for which training and assessment would therefore be required:

6 Transporting cargo/baggage

- 6.2 Manage dangerous goods pre and during flight
 - 6.2.1 Detect presence of dangerous goods not permitted in baggage
 - 6.2.2 Interpret NOTOC
 - 6.2.3 Apply procedures in the event of an emergency
 - 6.2.4 Inform flight operations officer/flight dispatcher/air traffic control in the event of an emergency
 - 6.2.5 Inform emergency services of the dangerous goods on board in the event of an emergency

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

I. FLIGHT OPERATIONS OFFICERS AND FLIGHT DISPATCHERS

The following are tasks flight operations officers and flight dispatchers would typically perform and for which training and assessment would therefore be required:

6 Transporting cargo/baggage

- 6.2 Manage dangerous goods during and flight
 - 6.2.1 Detect presence of dangerous goods not permitted in baggage
 - 6.2.2 Interpret NOTOC
 - 6.2.3 Apply procedures in the event of an emergency
 - 6.2.4 Inform flight operations officer/flight dispatcher/air traffic control in the event of an emergency
 - 6.2.5 Inform emergency services of the dangerous goods on board in the event of an emergency

J. CABIN CREW

The following are tasks the cabin crew would typically perform and for which training and assessment would therefore be required:

5 Accepting passenger and crew baggage

- 5.2 Accept baggage
 - 5.2.1 Apply operator requirements
 - 5.2.2 Verify passenger baggage requirements
 - 5.2.3 Advise pilot-in-command

6. Transporting cargo/baggage

- 6.2 Manage dangerous goods pre and flight
 - 6.2.1 Detect presence of dangerous goods not permitted in baggage
 - 6.2.2 Interpret NOTOC
 - 6.2.3 Apply procedures in the event of an emergency
 - 6.2.4 Inform flight operations officer/flight dispatcher/air traffic control in the event of an emergency
 - 6.2.5 Inform emergency services of the dangerous goods on board in the event of an emergency

7 Collecting safety data

- 7.1 Report dangerous goods accidents
- 7.2 Report dangerous goods incidents
- 7.3 Report undeclared/misdeclared dangerous goods
- 7.4 Report dangerous goods occurrences

K. PERSONNEL RESPONSIBLE FOR THE SCREENING PASSENGERS AND CREW AND THEIR BAGGAGE, CARGO AND MAIL

The following are tasks that personnel responsible for the screening passengers and crew and their baggage, cargo and mail would typically perform and for which training and assessment would therefore be required:

3 Processing/accepting cargo

- 3.4 Process/accept cargo other than dangerous goods
 - 3.4.2 Check packages for indications of undeclared dangerous goods

5 Accepting passenger and crew baggage

- 5.1 Process baggage
 - 5.1.1 Identify forbidden dangerous goods

APPENDIX D

**DRAFT JOB CARD FOR ACCESSIBILITY REQUIREMENTS FOR
DANGEROUS GOODS PERMITTED ONLY ON CARGO AIRCRAFT**

Title	Accessibility requirements for cargo aircraft		Reference:	DGP.006.01		
Source	DGP/26					
Problem Statement	Accessibility requirements for cargo aircraft in the Technical Instructions leave room for interpretation and are potentially misaligned with operation and airworthiness requirements					
Specific Details (including impact statements)	<p>Specific loading requirements for packages or overpacks of dangerous goods bearing the “Cargo aircraft only” label are included in Part 7;2.4.1of the Technical Instructions. This provision applies to packages or overpacks of dangerous goods which need to be loaded for carriage by a cargo aircraft in either a Class C aircraft cargo compartment, in a unit load device equipped with a fire detection/suppression system equivalent to that required by the certification requirements of a Class C aircraft cargo compartment, or accessible to a crew member or other authorized person so that they could handle and separate the packages or overpacks from other cargo in the event of an emergency. There are inconsistent interpretations as to what is meant by “handle”, “separate” and “accessible” and a lack of data to demonstrate whether or not accessibility is effective emergency response. Furthermore, current FAR/CS 25 design regulations do not take accessibility as a form of emergency response into account for Class E compartments, e.g.:</p> <ul style="list-style-type: none"> a) The ability to identify and respond to a threat is dependent on adequate visibility, but there are no design requirements for aircraft systems to eliminate smoke from the compartment for this purpose; b) standard side-by-side loading configurations and loading levels may not leave enough space for adequate access; c) two-man crew in the cockpit requirements would not allow for a crew member to leave the cockpit to respond to an emergency; d) access to packages or overpacks in a ULD would be difficult and may affect successful emergency response; e) hand-held fire extinguishers do not have the capacity to extinguish a fire involving high volume cargo <p>Accessibility is a measure referred to as justification for allowing dangerous goods on cargo aircraft which are not permitted on passenger aircraft. Coordination between airworthiness, operations and dangerous goods experts is needed to ensure this justification is still valid. The assumptions underlying cargo accessibility requirements therefore need to be reviewed and modified as necessary.</p>					
Expected Benefit	Appropriate emergency response procedures					
Reference Documents	DGP/26 Report (paragraph 2.7.3 under the Report on Agenda Item 2)					Attachments
Primary Expert Group:	DGP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates:		
				Expert Group	Effective	Applicability
	Technical Instructions	Amendment to cargo aircraft provisions	AIRP FLTOPSP			
	Annex 6?					
	Annex 8?					
Initial Issue Date:		Date approved by ANC:		Session/Meeting:		

البند ٣ من جدول الأعمال: إعداد توصيات لتعديل الإضافة للتعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (DOC 9284SU) لإدخالها في طبعة ٢٠١٩ - ٢٠٢٠.

١-٣ مشروع التعديلات على التعليمات الفنية بحيث تتوافق مع
توصيات الأمم المتحدة (DGP/26-WP/19)

١-١-٣ استعرض الاجتماع التعديلات على الإضافة إلى التعليمات الفنية كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩). وتعكس هذه التعديلات أيضاً الاقتراحات التي وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة في اجتماعه (DGP-WG/17). وقد وافقوا عليها، مع مراعاة ما يلي:

(أ) اقترح DGP-WG/17 أن مدخلات الأمم المتحدة الجديدة للمواد، غير المحددة على نحو آخر ينبغي منع نقلها بطريق الجو في الظروف العادية ما لم تمنح الموافقة دولة المنشأ ودولة المشغل وفقاً للحكم الخاص A2. ولوحظ أنه وفقاً لتوصيات الأمم المتحدة، كانت توجد حاجة لموافقة السلطة المختصة من أجل نقل ما يلي:

- UN 3539 — المواد المحتوية على غاز سام، غير المحددة على نحو آخر؛
 - و UN 3542 — المواد المحتوية على مادة قابلة للاحتراق التلقائي، غير المحددة على نحو آخر؛
 - و UN 3543 — المواد المحتوية على مادة ينبعث منها غاز قابل للاحتراق عند تلامسه مع الماء، غير المحددة على نحو آخر؛
 - و UN 3544 — المواد المحتوية على مادة مؤكسدة، غير المحددة على نحو آخر؛
 - و UN 3545 — المواد المحتوية على بيروكسيدات عضوية، غير المحددة على نحو آخر.
- لذلك وافق فريق الخبراء على السماح فقط بنقل هذه المواد بطريق الجو من خلال عملية الإعفاء.

(ب) تم تقديم حكم خاص جديد (الحكم الخاص A332) يسمح بنقل UN3363 — بضائع خطرة في جهاز أو بضائع خطرة في آلات عندما تكون كمية البضائع الخطرة قد فاقت الحدود المسموح بها في تعليمات التعبئة ٩٦٢ مع الوفاء بالحدود المنشأة في توصيات الأمم المتحدة بموافقة دولة المنشأ ودولة المشغل. وأضيف الحكم نتيجة لإدخال قيود الأمم المتحدة الجديدة للسلع التي تحتوي على بضائع خطرة، غير محددة على نحو آخر.

(ج) حكم خاص جديد (الحكم الخاص A333) يسمح بنقل سلع تحتوي على بضائع خطرة، غير محددة على نحو آخر من درجات أو أقسام معينة فقط من خلال عملية الإعفاء أضيفت إلى الجزء S-3;6 من أجل التوافق مع توصيات الأمم المتحدة.

(د) تعليمات تعبئة جديدة لقيود الأمم المتحدة الجديدة لسلع تحتوي على بضائع خطرة غير محددة على نحو آخر تم تطويرها. ووافق فريق الخبراء على إضافة تعليمات تعبئة منفصلة مخصصة للجميع.

٢-٣ رقم تعليمات التعبئة للبضائع الخطرة التي يتم نقلها بموجب موافقة أو إعفاء (DGP/26-WP/34)

١-٢-٣ تم اقتراح تعديل للتوجيهات لمعالجة الإعفاءات والموافقات المقدمة في المرفق (١) للفصل الأول من الجزء S-1 مع التوصية بما يلي:

(أ) تحتوي وثيقة الإعفاء أو الموافقة على رقم تعليمات التعبئة الذي يتعين إظهاره بواسطة الشاحن على وثيقة نقل البضائع الخطرة؛

(ب) تُقدم نسخة من تعليمات التعبئة بأكملها مع الإعفاء أو الموافقة عندما يكون واحد فقط يحتوي عليه الإضافة للتعليمات الفنية وليس التعليمات الفنية.

اقترح أن المشغل لا يكون دائماً قادراً على أن يستكمل بطريقة صحيحة التحقق عند القبول بدون تعليمات التعبئة.

٢-٢-٣ في حين كان ثمة تعاطف مع القصد، لم يكن يوجد دعم للاقتراح. وكان المقصود بالإضافة الإرشاد وكانت تقدم إرشادات التعبئة كأساس لإعداد موافقات أو إعفاءات. وقد تحتوي موافقة أو إعفاء على مزيد من المتطلبات العديدة أكثر مما تحتوي عليه تعليمات التعبئة. وكانت ثمة اقتراحات لجعل المعلومات في الإضافة متوافرة على نطاق أوسع. وشجّع فريق الخبراء بقوة الأمانة على السماح بالدخول في الشبكة مجاناً إلى الإضافة في الماضي. وسيسهل هذا الامتثال عن طريق جعل المعلومات سهلة الوصول إليها.

٣-٢-٣ سينظر المقترح في التعليقات التي تم الإدلاء بها من أجل اقتراح مستقبلي محتمل.

٣-٣ التوصية

١-٣-٣ في ضوء المناقشات الأنفة الذكر، أصدر الاجتماع التوصية التالية:

التوصية ١/٣ - تعديل الإضافة للتعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (DOC 9284SU) لإدخالها في طبعة

٢٠١٩ - ٢٠٢٠

تُعدّل الإضافة إلى التعليمات الفنية على النحو المشار إليه في المرفق بالتقرير بشأن هذا البند من جدول الأعمال.

APPENDIX

PROPOSED AMENDMENTS TO THE SUPPLEMENT TO THE
TECHNICAL INSTRUCTIONS

Part S-1

GENERAL

(ADDITIONAL INFORMATION
FOR PART 1 OF THE
TECHNICAL INSTRUCTIONS)

...

Chapter 4

GUIDANCE TO STATES ON THE TRANSPORT OF
LITHIUM BATTERIES AS CARGO

4.1 INTRODUCTION

4.1.1 Lithium batteries have the potential to create thermal runaway, a chain reaction which leads to repeated self-heating and the release of a battery's stored energy. Once one battery experiences thermal runaway, it can generate enough heat to trigger thermal runaway in adjacent batteries. Thermal runaway can occur for a number of reasons, including poor cell design, cell manufacturing flaws and external abuse. It has been demonstrated through testing that thermal runaway can result in fire and/or explosion.

4.1.2 A prohibition on the transport of UN 3090 — **Lithium metal batteries** as cargo on passenger aircraft was introduced into the 2015-2016 Edition of the Technical Instructions with the knowledge that aircraft cargo fire protection systems could not control a lithium metal fire. More recent test results demonstrate that a fire involving high-density packages of UN 3480 — **Lithium ion batteries** may exceed the capability of aircraft cargo fire protection systems. High-density packages of lithium ion batteries may consist of any number of batteries or cells having the potential to overwhelm cargo compartment fire protection features. The potential is dependent on a number of variables including the battery or cell chemistry, size, design type, quantities and the cargo compartment configuration. The inability to determine an absolute safe quantity limit for lithium ion batteries and the absence of a packaging standard to mitigate the risks has led to the decision to introduce a prohibition on the transport of UN 3480 — **Lithium ion batteries** as cargo on passenger aircraft.

4.1.3 Development of a performance-based packaging standard for lithium ion batteries is currently under way. It is anticipated that once this standard is completed and any additional controls necessary to mitigate risks are established, an amendment to the Technical Instructions will be made to allow for their transport as cargo on passenger aircraft.

DGP/26 (see paragraph 6.3.8 under Agenda Item 6 of this report):

4.1.4 At a minimum, the following criteria should be identified as part of a safety risk assessment when considering whether or not to grant an **approval or an exemption** to transport UN 3480 — **Lithium ion batteries** or UN 3090 — **Lithium metal batteries** as cargo on passenger aircraft under Special Provision A201:

- a) capabilities of the operator;
- b) overall capability of the aircraft and its systems;
- c) packing and packaging;
- d) quantity of batteries and cells;
- e) containment characteristics of unit load devices;
- f) specific hazards and safety risks associated with each battery and cell type to be carried alone or in combination; and
- g) chemical composition of the batteries and cells.

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Part S-3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND QUANTITY LIMITATIONS

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Chapter 6

SPECIAL PROVISIONS

...

Table S-3-4. Special Provisions

Supplementary special provisions

...

UN Model Regulations, Chapter 3.3, Special Provision 271 (see ST/SG/AC.10/44/Add.1)

A317 Lactose or glucose or similar materials, may be used as a phlegmatizer provided that the substance contains not less than 90 per cent, by mass, of phlegmatizer. The appropriate national authority may authorize these mixtures to be classified in Division 4.1 on the basis of a Series 6(c) test on at least three packages as prepared for transport. Mixtures containing at least 98 per cent, by mass, of phlegmatizer are not subject to these Instructions. Packages containing mixtures with not less than 90 per cent, by mass, of phlegmatizer need not bear a "Toxic" subsidiary-risk hazard label.

...

See paragraph 3.1.1 b) of this report:

A332 This entry only applies to machinery or apparatus containing dangerous goods as a residue or as an integral element of the machinery or apparatus. It must not be used for machinery or apparatus for which a proper shipping name already exists in Table 3-1 of the Technical Instructions.

Where the quantity of dangerous goods contained as an integral element in machinery or apparatus exceeds the limits permitted by Packing Instruction 962 in the Technical Instructions, the machinery or apparatus may contain dangerous goods up to the limits permitted by Special Provision 301 of the UN Model Regulations.

See paragraph 3.1.1 c) of this report:

A333 Articles containing dangerous goods of Division 2.3, 4.2, 4.3, 5.1, 5.2 or Division 6.1 for substances of inhalation toxicity of Packing Group I and articles containing more than one of the hazards listed in Part 2, Introductory Chapter, 4.1 b), c), or d) may only be transported under an exemption.

DGP/26 (see paragraph 6.3.8 under Agenda Item 6 of this report):

- A334
- a) In instances where other forms of transport (including cargo aircraft) is impracticable, lithium cells or batteries may be transported on passenger aircraft with the prior approval of the authority of the State of Origin, the State of the Operator and the State of Destination under the written conditions established by those authorities, provided that the following types and quantities are met:
- 1) quantities of lithium metal cells or batteries (UN 3090) are limited to the allowance permitted in Table 968-II of Packing Instruction 968; and
 - 2) quantities of lithium ion cells or batteries (UN 3480) are limited to the allowance permitted in Table 965-II of Packing Instruction 965.
- b) When considering an approval, at a minimum, the following criteria should be considered to mitigate risks posed by a lithium cell or battery heat, smoke or fire event inside a package at the cell, battery or package level:
- 1) no amount of flame is allowed outside the package;
 - 2) the external surface temperature of the package cannot exceed the amount that would ignite adjacent packing material or cause batteries or cells in adjacent packages to go into thermal runaway;
 - 3) no fragments can exit the package and the package must maintain structural integrity;
 - 4) the quantity of flammable vapour emitted must be less than the amount of gas that when mixed with air and ignited could cause a pressure pulse that could dislodge the overpressure panels of the aircraft cargo compartment or damage the aircraft cargo compartment liners; and
 - 5) when the package or overpack is exposed to an external fire (e.g. five-minute oil burner flame penetration resistance test) or elevated temperature environment (e.g. oven thermal resistance test), any hazardous effects caused by thermal runaway of the lithium cell or battery must be contained within the package.
- Adequate information and documentation on the above criteria (b)1) through 5)) must be provided to the appropriate authority of the State issuing the approval upon request.

...

Part S-4

PACKING INSTRUCTIONS

...

Chapter 4

CLASS 2 — GASES

See paragraph 3.1.1 d) of this report:

Packing Instruction 221

Cargo aircraft only for UN 3537 and UN 3538 only

General requirements

Part 4:1.1.1, 4:1.1.3, 4:1.1.12 and 4:2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3:4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>
<u>UN 3537 Articles containing flammable gas, n.o.s.*</u>	<u>150 kg</u>
<u>UN 3538 Articles containing non-flammable, non toxic gas, n.o.s.*</u>	<u>150 kg</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Receptacles containing gases within articles must meet the requirements of 4:4.1 and 6:5 of the Technical Instructions as appropriate or be capable of providing an equivalent level of protection as provided for in Packing Instruction 200 or 219.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)Boxes

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Other metal (4N)
 Plastics (4H1, 4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

...

Chapter 5**CLASS 3 — FLAMMABLE LIQUIDS**

See paragraph 3.1.1 d) of this report:

Packing Instruction 379

Cargo aircraft only for UN 3540 only

General requirements

Part 4:1.1.1, 4:1.1.3, 4:1.1.12 and 4:2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3:4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>
UN 3540 Articles containing flammable liquid, n.o.s.*	60 L

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles must be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.
- Receptacles must be packed with their closures correctly oriented. The receptacles must in addition conform to the internal pressure test provisions of 6:4.5 of the Technical Instructions.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)Boxes

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Other metal (4N)
 Plastics (4H1, 4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

Chapter 6

**CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES
 LIABLE TO SPONTANEOUS COMBUSTION;
 SUBSTANCES WHICH, IN CONTACT WITH WATER,
 EMIT FLAMMABLE GASES**

...

See paragraph 3.1.1 d) of this report:

Packing Instruction 400

Cargo aircraft only for UN 3541 only

General requirements

Part 4:1.1.1, 4:1.1.3, 4:1.1.12 and 4:2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3:4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>
<u>UN 3541 Articles containing flammable solid, n.o.s.*</u>	<u>50 kg</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles must be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

...

Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

...

See paragraph 3.1.1 d) of this report:

Packing Instruction 600

Cargo aircraft only for UN 3546 only

General requirements

Part 4:1.1.1, 4:1.1.3, 4:1.1.12 and 4:2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3:4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>	
	<u>Liquid</u>	<u>Solid</u>
<u>UN 3546 Articles containing toxic substance, n.o.s.*</u>	<u>60 L</u>	<u>100 kg</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles containing liquids or solids within articles must be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.
- Receptacles containing liquids with closures must be packed with their closures correctly oriented. The receptacles must in addition conform to the internal pressure test provisions of 6:4.5 of the Technical Instructions.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

...

Chapter 10**CLASS 8 — CORROSIVES**

See paragraph 3.1.1 d) of this report:

Packing Instruction 877

Cargo aircraft only for UN 3547 only

General requirements

Part 4:1.1.1, 4:1.1.3, 4:1.1.12 and 4:2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3:4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>	
	<u>Liquid</u>	<u>Solid</u>
<u>UN 3547 Articles containing corrosive substance, n.o.s.*</u>	<u>30 L</u>	<u>50 kg</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles containing liquids or solids within articles must be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.
- Receptacles containing liquids with closures must be packed with their closures correctly oriented. The receptacles must in addition conform to the internal pressure test provisions of 6:4.5 of the Technical Instructions.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Receptacles containing gases within articles must meet the requirements of 4:4.1 and 6:5 of the Technical Instructions as appropriate or be capable of providing an equivalent level of protection as provided for in Packing Instruction 200 or 219.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

Chapter 11**CLASS 9 — MISCELLANEOUS DANGEROUS GOODS**

UN Model Regulations, Chapter 4.1.4.1, packing instruction P910 (see ST/SG/AC.10/44/Add.1) and paragraph 3.1.1 of this report:

Packing Instruction 910

Cargo aircraft only

Introduction

This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 production runs consisting of not more than 100 cells ~~and~~ or batteries and to pre-production prototypes of cells ~~and~~ or batteries when these prototypes are transported for testing.

General requirements

Part 4, Chapter 1 requirements must be met.

Packing Instruction 910

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet the Packing Group I performance requirements.
- Cells and batteries must be protected against short circuit. Protection against short circuits includes, but is not limited to:
 - individual protection of the battery terminals;
 - inner packaging to prevent contact between cells and batteries;
 - batteries with recessed terminals designed to protect against short circuits; or
 - the use of an electrically non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.

Cells and batteries, including when packed with equipment

- 1) Batteries and cells, including equipment, of different sizes, shapes or masses must be packaged in an outer packaging of a tested design type listed below provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;
- 2) Each cell or battery must be individually packed in an inner packaging and placed inside an outer packaging;
- 3) Each inner packaging must be completely surrounded by sufficient non-combustible and electrically non-conductive thermal insulation material to protect against a dangerous evolution of heat;
- 4) Appropriate measures must be taken to minimize the effects of vibration and shocks and prevent movement of the cells or batteries within the package that may lead to damage and a dangerous condition during transport. Cushioning material that is non-combustible and electrically non-conductive may be used to meet this requirement;
- 5) Non-combustibility must be assessed according to a standard recognized in the State where the packaging is designed or manufactured;
- 6) A cell or battery with a net mass of more than 30 kg must be limited to one cell or battery per outer packaging.

Cells and batteries contained in equipment

- 1) Equipment of different sizes, shapes or masses must be packed in an outer packaging of a tested design type listed below provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;
- 2) The equipment must be constructed or packaged in such a manner as to prevent accidental operation during transport;
- 3) Appropriate measures must be taken to minimize the effects of vibration and shocks and prevent movement of the equipment within the package that may lead to damage and a dangerous condition during transport. When cushioning material is used to meet this requirement it must be non-combustible and electrically non-conductive; and
- 4) Non-combustibility must be assessed according to a standard recognized in the State where the packaging is designed or manufactured.

Equipment or batteries not subject to Part 6 of these Instructions

Lithium batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be packed in strong outer packagings or protective enclosures not subject to the requirements of Part 6 of these Instructions under conditions specified by the appropriate national authority. Additional conditions that may be considered in the approval process include, but are not limited to:

- 1) The equipment or the battery must be strong enough to withstand the shocks and loadings normally encountered during transport, including trans-shipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet for subsequent manual or mechanical handling; and
- 2) The equipment or the battery must be fixed in cradles or crates or other handling devices in such a way that it will not become loose during normal conditions of transport.

Packing Instruction 910

OUTER PACKAGINGS

Boxes

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Other metal (4N)
 Plywood (4D)
 Reconstituted wood (4F)
 Plastics (4H1, 4H2)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

...

See paragraph 3.1.1 d) of this report:

Packing Instruction 973

Cargo aircraft only for UN 3548 only

General requirements

Part 4;1.1.1, 4;1.1.3, 4;1.1.12 and 4;2 requirements must be met.

This entry applies to articles which do not have an existing proper shipping name and which contain only dangerous goods permitted under Part 3;4.1.2 of the Technical Instructions, and exceed both the quantity limits for UN 3363 as prescribed in Special Provision A107 and the quantity limits permitted by Special Provision 301 of the UN Model Regulations.

The following table provides the recommended maximum quantities of individual substances contained in a single article.

<u>UN number and name</u>	<u>Net quantity per package</u>
<u>UN 3548 Articles containing miscellaneous dangerous goods, n.o.s.*</u>	<u>As indicated for the substance in Table 3-1 of the Technical Instructions</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Receptacles containing liquids or solids within articles must be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.
- Receptacles containing liquids with closures must be packed with their closures correctly oriented. The receptacles must in addition conform to the internal pressure test provisions of 6:4.5 of the Technical Instructions.
- Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials must be properly secured, and any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging.
- Receptacles containing gases within articles must meet the requirements of 4:4.1 and 6:5 of the Technical Instructions as appropriate or be capable of providing an equivalent level of protection as provided for in Packing Instruction 200 or 219.
- Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport.
- Articles must be packed to prevent movement and inadvertent operation during normal conditions of transport.

ROBUST ARTICLES

Robust articles may alternatively be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings must meet achieve a level of protection that is at least equivalent to that provided by Part 6:1 of the Technical Instructions. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained. In such cases the additional requirement related to Packing Group II performance requirements and the requirement for UN specification outer packagings do not apply.

Note.— See Part S-5:2.1 for labelling requirements.

OUTER PACKAGINGS (see 6:3.1)*Boxes*

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

...

Part S-5

STATE'S RESPONSIBILITIES WITH RESPECT TO SHIPPERS

(ADDITIONAL INFORMATION FOR PART 5 OF THE TECHNICAL INSTRUCTIONS)

...

UN Model Regulations, 5.2.2.1.13 (see ST/SG/AC.10/44/Add.1) and DGP-WG/17 (see paragraph 3.2.2.1.3 of DGP/26-WP/3) and DGP/26 (see paragraph 3.1.1 d) of this report):

Chapter 2

LABELLING

2.1 Labels for articles containing dangerous goods transported as UN Nos. 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 and 3548

2.1.1 Packages containing dangerous goods in articles and dangerous goods in articles transported unpackaged must bear labels according to 5.3.1.1 of the Technical Instructions reflecting the hazards established according to Part 2, Introductory Chapter, paragraph 6 of the Technical Instructions. If the article contains one or more lithium batteries with, for lithium metal batteries, an aggregate lithium content of 2 g or less, and for lithium ion batteries, a Watt-hour rating of 100 Wh or less, the lithium battery mark (Figure 5-3 of the Technical Instructions) must be affixed to the package or unpackaged article. If the article contains one or more lithium batteries with, for lithium metal batteries, an aggregate lithium content of more than 2 g and for lithium ion batteries, a Watt-hour rating of more than 100 Wh, the lithium battery label (Figure 5-26 of the Technical Instructions) must be affixed to the package or unpackaged article.

2.1.2 When it is required to ensure articles containing liquid dangerous goods remain in their intended orientation, orientation marks meeting the requirements of 4.1.1.13 must be affixed and visible on at least two opposite vertical sides of the package or of the unpackaged article where possible, with the arrows pointing in the correct upright direction.

ATTACHMENT

PROPOSED AMENDMENTS TO TABLE S-3-1

Table S-3-1. Supplementary Dangerous Goods List - DRAFT

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
A												
+ Articles containing a substance liable to spontaneous combustion, n.o.s.*	3542	4.2	See 2;0.6	Spontaneous combustion		A333			FORBIDDEN		FORBIDDEN	
+ Articles containing a substance which emits flammable gas in contact with water, n.o.s.*	3543	4.3	See 2;0.6	Danger if wet		A333			FORBIDDEN		FORBIDDEN	
+ Articles containing corrosive substance, n.o.s.*	3547	8	See 2;0.6	Corrosive		A2 A333			FORBIDDEN		See 877	
+ Articles containing flammable gas, n.o.s.*	3537	2.1	See 2;0.6	Gas flammable		A2 A333			FORBIDDEN		221	150 kg
+ Articles containing flammable liquid, n.o.s.*	3540	3	See 2;0.6	Liquid flammable		A2 A333			FORBIDDEN		378	60 L
+ Articles containing flammable solid, n.o.s.*	3541	4.1	See 2;0.6	Solid flammable		A2 A333			FORBIDDEN		400	50 kg
+ Articles containing miscellaneous dangerous goods, n.o.s.*	3548	9	See 2;0.6	Miscellaneous		A2 A333			FORBIDDEN		See 973	
+ Articles containing non-flammable, non toxic gas, n.o.s.*	3538	2.2	See 2;0.6	Gas non-flammable		A2 A333			FORBIDDEN		221	150 kg
+ Articles containing organic peroxide, n.o.s.*	3545	5.2	See 2;0.6	Organic peroxide		A333			FORBIDDEN		FORBIDDEN	
+ Articles containing oxidizing substance, n.o.s.*	3544	5.1	See 2;0.6	Oxidizer		A333			FORBIDDEN		FORBIDDEN	
+ Articles containing toxic gas, n.o.s.*	3539	2.3	See 2;0.6	Gas toxic		A333			FORBIDDEN		FORBIDDEN	
+ Articles containing toxic substance, n.o.s.*	3546	6.1	See 2;0.6	Toxic		A2 A333			FORBIDDEN		See 600	
≠ Asbestos, amphibole* (amosite, tremolite, actinolite, anthophyllite, crocidolite) †	2212	9		Miscellaneous		A2 A61	II		FORBIDDEN		958	200 kg
E												
≠ Engine, fuel cell, flammable gas powered †	3529	2.1		Gas flammable		A70 A87 A176 A208		E0	FORBIDDEN		220	No limit
≠ Engine, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0	FORBIDDEN		220	No limit

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft only	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
									10	11	12	13
L												
+ Lithium batteries installed in cargo transport unit lithium ion batteries or lithium metal batteries	3536	9		Miscellaneous						FORBIDDEN		FORBIDDEN
≠ Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A183 A201 A206 A213 A331 A334		E0		FORBIDDEN		See 965
≠ Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A183 A201 A206 A213 A334		E0		FORBIDDEN		See 968
M												
≠ Machinery, fuel cell, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A176 A208		E0		FORBIDDEN	220	No limit
≠ Machinery, internal combustion, flammable gas powered	3529	2.1		Gas flammable		A70 A87 A208		E0		FORBIDDEN	220	No limit
V												
≠ Vehicle, flammable gas powered	3166	9		Miscellaneous		A70 A87 A118 A120 A214		E0		FORBIDDEN	951	No limit
≠ Vehicle, fuel cell, flammable gas powered †	3166	9		Miscellaneous		A70 A87 A118 A120 A176 A214		E0		FORBIDDEN	951	No limit

البند ٤ من جدول الأعمال: إعداد توصيات لتعديل وثيقة إرشادات التعامل مع حالات الطوارئ المرتبطة بحوادث الطائرات الناتجة عن البضائع الخطرة (DOC 9481) لإدراجها في طبعة ٢٠١٩ - ٢٠٢٠.

١-٤ مشروع التعديلات على إرشادات الطوارئ لمعالجة الأحداث الناتجة عن البضائع الخطرة على متن الطائرات لمواءمتها مع توصيات الأمم المتحدة (DGP/26-WP/20)

١-٤-١ استعرض الاجتماع التعديلات المقترح إدخالها على وثيقة إرشادات التعامل مع حالات الطوارئ المرتبطة بحوادث الطائرات الناتجة عن البضائع الخطرة (Doc 9481) كي تعكس القرارات الصادرة عن لجنة الخبراء التابعة للأمم المتحدة في دورتها الثامنة (جنيف، ٢٠١٦/١٢/٩)، وكذلك عكست هذه التعديلات اقتراحات وافق عليها الفريق العامل التابع لفريق خبراء البضائع الخطرة (DGP-WG/17). وقد اتفق على هذه التعديلات.

٢-١-٤ أُضيف رقم تصنيف جديد "١٢" وحُصص لقيود بطاريات الليثيوم (UN 3091 و 3091 و 3480 و 3481) لتُحدد على نحو أفضل خصائص خطرها الكامن للحرارة الخطرة وتطور الدخان وتوليد الغازات المتفجرة. أما حرف التصنيف "Z"، الذي سبق تخصيصه لقيود معدن الليثيوم، فقد خصص لقيود أيون الليثيوم (انظر الفقرة ٣-٥-٣ من تقرير DGP-WG/16 الذي يحتوي عليه (DGP/26-WG/2). وتم الاتفاق على أن هذا الرمز للتصنيف (12FZ) ينبغي تخصيصه للقيود الجديدة لـ UN 3536 — بطاريات الليثيوم المركبة في وحدة نقل البضائع.

٣-١-٤ أُضيف اثنا عشر قيداً جديداً للبنود التي تحتوي على بضائع خطيرة، غير محددة على نحو آخر، أُضيفت إلى قائمة البضائع الخطر، وخصص لكل منها خطر أولي مختلف. ولم تخصص مخاطر فرعية، لكن قدمت إشارة إلى أحكام جديدة لتحديد الخطر الفرعي في عمود المخاطر الفرعية للجدول ٣-١ من التعليمات الفنية. وتم الاتفاق على تخصيص حرف التصنيف "L" لتلك التي لم يخصص لها حرف آخر. وأضيفت فقرة جديدة إلى القسم ٤ تنصح بأن رمز التصنيف المخصص للبنود كان يستند إلى خطرها الأولي وأن حرف التصنيف قد يحتاج إلى تغييره على نحو يتوقف على أي خطر فرعي يشكله (أخطار فرعية يشكلها) البند المحدد الذي يحتوي على بضائع خطيرة.

٤-١-٤ تمت الموافقة على التعديلات.

٢-٤ أحكام للبضائع الخطرة التي يحملها الركاب أو طاقم الطائرة (DGP/24-WP/50)

١-٢-٤ تم إعداد هيكل تنظيمي للمساعدة في اختيار قائمة مراجعة كاستجابة ملائمة للوقائع في المقصورة التي يحتوي عليها القسم ٣ من الوثيقة Doc 9481. وجرى الاحتجاج بأن تقسيم القوائم إلى تلك المتعلقة بأجهزة إلكترونية محمولة وتلك المتعلقة ببضائع خطيرة أخرى نتجت عنه ست قوائم مراجعة مختلفة وأنه من الصعب تحديد أي قائمة هي الأفضل انطباقاً على واقعة معينة. وكان اختيار القائمة الملائمة سريعاً ضرورياً خلال واقعة.

٢-٢-٤ المجموعة المعنية بسلامة مقصورة الركاب (ICSG)، التي ساهمت في إعادة نظر سابقة في القسم ٣، كانت مجتمعة في الوقت ذاته الذي اجتمع فيه DGP/26 ووافقت على أن تعيد النظر في الاقتراح. وأحاط أمين تلك المجموعة فريق الخبراء علماً بإعادة النظر هذه. وأكد على أن الاستجابة للوقائع في المقصورة حرج من حيث الوقت ولذلك فإن طاقم المقصورة يؤدي إجراءات الاستجابة للطوارئ من خلال الذاكرة وليس من خلال استخدام الهياكل التنظيمية أو قوائم المراجعة. وفي الحقيقة، فإن المادة في القسم ٣ استخدمت لبناء إجراءات وليس قوائم مراجعة. واقترح أن ينظر فريق الخبراء في إعادة تسمية القسم ليصبح اسمه "الإجراءات لوقائع البضائع الخطرة". واعترف بأن المادة في القسم ٣ كانت مفيدة للتدريب وعمليات استخلاص المعلومات بعد الطوارئ، ويمكن أن يساعد هيكل تنظيمي في هذا الصدد. ولاحظ أن المجموعة المعنية بسلامة

مقصورة الركاب كان لها نهج لإعداد الهياكل التنظيمية وقد يسرّها أن تعيد النظر في الهيكل التنظيمي المقترح لمواءمته مع منهجيتهم. ولم تكن ثمة اعتراضات على هذا النهج. ولاحظ خبير في صلاحية الطائرات للطيران أن الصانعين يزودون المشغّلين بإجراءات طاقم المقصورة لأحداث الدخان والحريق داخل المقصورة وتساءل عما إذا كانت أو لم تكن المادة في القسم ٣، التي تناولت البضائع الخطرة بشكل محدد، قد أدرجت في هذه الإجراءات. وتم تأكيد أنها أدرجت فيها.

٣-٢-٤ تمت الموافقة على أن هيكلًا تنظيمياً مراجعاً أعدته ICSG سيُدمج في القسم ٣ من الوثيقة Doc 9481، ريثما يتم استعراض يجريه فريق خبراء البضائع الخطرة عن طريق المراسلة.

٣-٤ التوصية

١-٣-٤ في ضوء المناقشات الآتية الذكر، أصدر الاجتماع التوصية التالية:

التوصية ١/٤ - تعديل وثيقة إرشادات التعامل مع حالات الطوارئ المرتبطة بحوادث الطائرات الناتجة عن البضائع الخطرة (DOC 9481) لإدراجها في طبعة ٢٠١٩ - ٢٠٢٠.

تُعَدّل وثيقة إرشادات التعامل مع حالات الطوارئ المرتبطة بحوادث الطائرات الناتجة عن البضائع الخطرة (DOC 9481) على النحو المشار إليه في مرفق التقرير بشأن هذا البند من جدول الأعمال.

المرفق

التعديلات المقترحة إدخالها على إرشادات الطوارئ لمعالجة
الأحداث الناتجة عن البضائع الخطرة على متن الطائرات

...

القسم ٤

بيان التصنيف
وقائمة البضائع الخطرة مع
الأرقام المرجعية للتصنيف

...

٣-٤ قائمة رقمية بالبضائع الخطرة مع رموز التصنيف

قائمة أسماء الشحن الصحيحة المستخدمة للبضائع الخطرة، المرتبة في الترتيب الرقمي لرقم تحديد هوية الأمم المتحدة المرتبط به، مبيّنة في الجدول ٣-٤. ولكل قيد يُبيّن رمز تصنيف وهذا ينبغي استخدامه للعثور على التصنيف المناسب على بيان تصنيف تصديّ الطائرات للطوارئ.

في حالات قليلة، بجانب رقم الأمم المتحدة، يجب أيضاً استخدام الفئة أو الشعبة أو مجموعة التعبئة أو يجب أيضاً استخدام المخاطر الإضافية لتحديد رمز التصنيف الصحيح. وحيث يكون هذا ضرورياً، فإن الفئات أو الشعب الممكنة أو مجموعات التعبئة أو المخاطر الإضافية تُعطى تحت رقم الأمم المتحدة ويمكن اختيار رمز التصنيف ذات الصلة. وهذه التفاصيل الإضافية مبيّنة على استمارة إبلاغ قائد الطائرة.

حيث يمكن استخدام أسماء شحن صحيحة بديلة مع نفس رقم الأمم المتحدة، تُبيّن كل هذه مفصولة بخطوط مائلة.

تلك البضائع الخطرة التي لم يُخصص لها بعد رقم تعريف الأمم المتحدة ترد بالقائمة أولاً.

انظر الفقرة ٣-١-٤ من هذا التقرير:

٤-٤ رموز التصنيف للبند التي تحتوي على مواد خطرة غير محددة على نحو آخر

رموز التصنيف المخصصة للبند أدناه تستند إلى خطرها الأولي. وقد يحتاج حرف التصنيف إلى تغييره إذا كان يوجد أيضاً خطر فرعي (أخطار فرعية) للنظر فيه (فيها). والأخطار الفرعية، عند انطباقها، يتم تخصيصها وفقاً للجزء ٢-٠٤٢ من التعليمات الفنية.

- UN 3538 البنود المحتوية على غاز غير قابل للاحتراق وغير سام، *n.o.s.
- UN 3539 البنود المحتوية على غاز سام، *n.o.s.
- UN 3540 البنود المحتوية على سائل قابل للاحتراق، *n.o.s.
- UN 3541 البنود المحتوية على مادة صلبة قابلة للاحتراق، *n.o.s.
- UN 3542 البنود المحتوية على مادة قابلة للاحتراق التلقائي، *n.o.s.
- UN 3543 البنود المحتوية على مادة ينبغي منها غاز قابل للاحتراق عند تلامسه بالماء، *n.o.s.
- UN 3544 البنود المحتوية على مادة مؤكسدة، *n.o.s.
- UN 3545 البنود المحتوية على بيروكسيد عضوي، *n.o.s.
- UN 3546 البنود المحتوية على مادة سامة، *n.o.s.
- UN 3547 البنود المحتوية على مادة أكالة، *n.o.s.
- UN 3548 البنود المحتوية على بضائع خطرة متنوعة، *n.o.s.

الجدول ٤-١ تصنيف الاستجابة لطوارئ الطائرات						
رقم التصنيف	الخطر الكامن	الخطر على الطائرة	الخطر على الركاب	إجراء التصنيف أو التسرب	إجراء مكافحة الحريق	اعتبارات إضافية
...
DGP-WG/17 (انظر الفقرة ٣-٤-١ من DGP/26-WP/3):						
٩	لا خطر كامن عام	حسب ما يبيّنه حرف التصنيف	حسب ما يبيّنه حرف التصنيف	استخدم ١٠٠٪ أوكسيجين؛ قم بتشغيل وحافظ على التهوية القصوى إذا كان "A" هو حرف التصنيف	جميع العوامل حسب التوافر	لا شيء
١٠	غاز قابل للاحتراق، خطر حريق عالي إذا وجد أي مصدر إشعال	نار و/أو انفجار	دخان وأبخرة وحرارة، وكما يدل عليه حرف التصنيف	استخدم ١٠٠٪ أوكسيجين؛ قم بتشغيل وحافظ على التهوية القصوى ممنوع التدخين، الحد الأدنى من الكهرباء	جميع العوامل حسب التوافر	فقدان الضغط المفاجئ ممكن
١١	المواد المعدية قد تؤثر على البشر أو الحيوانات إذا استنشقت أو امتصت من خلال الغشاء المخاطي أو جرح مفتوح	التلوث بمواد معدية	العدوى المتأخرة للبشر أو الحيوانات	لا تلمس. الحد الأدنى لإعادة الدورة والتنفس في المنطقة المتأثرة	جميع الوكلاء وفقاً للتوافر. لا ماء على حرف التصنيف "Y"	استدع شخصاً مؤهلاً لاستقبال الطائرة

الجدول ٤-١ تصنيف الاستجابة لطوارئ الطائرات						
...						
رقم التصنيف	الخطر الكامن	الخطر على الطائرة	الخطر على الركاب	إجراء التصنيف أو التسرب	إجراء مكافحة الحريق	اعتبارات إضافية
	...					
DGP-WG/16 (انظر الفقرة ٣-٥-٣ من DGP/26-WP/2) و DGP-WG/17 (انظر الفقرة ٣-٤-٣ من DGP/26-WP/3):						
١٢	<u>النار والحرارة والدخان والبخار السام والقابل للالتهاب</u>	<u>النار و/أو الانفجار</u>	<u>الدخان، الأبخرة، الحرارة</u>	<u>استخدم ١٠٠٪ أوكسيجين؛ ابدأ وحافظ على التهوية القصوى</u>	<u>جميع العوامل وفقاً للتوافر. استخدم الماء إذا توافر</u>	<u>الفقدان المفاجئ الممكن للضغط؛ انظر في الهبوط فوراً</u>
	...					

...

(DGP-WG/16 (انظر الفقرة ٣-٥-٣ من DGP/26-WP/2)

عدّل الجدولين ٤-٢ و ٤-٣ على النحو المبين:

رقم الأمم المتحدة	رقم التصنيف	الاسم الرسمي لأغراض الشحن
3090	9FZ12FZ	بطاريات معدن الليثيوم
3091	9FZ12FZ	بطاريات معدن الليثيوم التي تحتوي عليها المعدات
3091	9FZ12FZ	بطاريات معدن الليثيوم المعبأة مع معدات
3480	9F12FZ	بطاريات أيونات الليثيوم
3481	9F12FZ	بطاريات أيونات الليثيوم التي تحتوي عليها المعدات
3481	9F12FZ	بطاريات أيونات الليثيوم المعبأة مع معدات

اللوائح التنظيمية النموذجية للأمم المتحدة، قائمة البضائع الخطرة (انظر ST/SG/AC.10/44/Add.1) و DGP-WG/17 (انظر الفقرة ٣-٤-٣ من DGP/26-WP/3) والفقرة ٤-١ من هذا التقرير:

رقم الأمم المتحدة	رقم التصنيف	الاسم الرسمي لأغراض الشحن
<u>3535</u>	<u>6F</u>	<u>الصلب السمي، القابل للالتهاب العضوي، * n.o.s.</u>
<u>3536</u>	<u>12FZ</u>	<u>بطاريات الليثيوم المثبتة في وحدة نقل البضائع، * n.o.s.</u>
<u>3537</u>	<u>10L</u>	<u>البنود المحتوية على غاز قابل للالتهاب، * n.o.s.</u>
<u>3538</u>	<u>2L</u>	<u>البنود المحتوية على غاز غير قابل للالتهاب وغير سام، * n.o.s.</u>
<u>3539</u>	<u>2P</u>	<u>البنود المحتوية على غاز سام، * n.o.s.</u>
<u>3540</u>	<u>3L</u>	<u>البنود المحتوية على سائل قابل للالتهاب، * n.o.s.</u>
<u>3541</u>	<u>3L</u>	<u>البنود المحتوية على مادة صلبة قابلة للالتهاب، * n.o.s.</u>
<u>3542</u>	<u>4L</u>	<u>البنود المحتوية على مادة قابلة للاحتراق التلقائي، * n.o.s.</u>
<u>3543</u>	<u>4W</u>	<u>البنود المحتوية على مادة ينبعث منها غاز قابل للالتهاب عند تلامسه بالماء، * n.o.s.</u>
<u>3544</u>	<u>5L</u>	<u>البنود المحتوية على مادة مؤكسدة، * n.o.s.</u>
<u>3545</u>	<u>5L</u>	<u>البنود المحتوية على بيروكسيد عضوي، * n.o.s.</u>
<u>3546</u>	<u>6L</u>	<u>البنود المحتوية على مادة سامة، * n.o.s.</u>
<u>3547</u>	<u>8L</u>	<u>البنود المحتوية على مادة أكالة، * n.o.s.</u>
<u>3548</u>	<u>9L</u>	<u>البنود المحتوية على بضائع خطرة متنوعة، * n.o.s.</u>

البند رقم ٥ من جدول الأعمال: مواعنة المواد الإرشادية لفريق خبراء البضائع الخطرة للمساعدة في إعداد التعليمات الفنية والوثائق الداعمة مع الأحكام المنقحة بشأن البضائع الخطرة

١-٥ مواد إرشادية لفريق خبراء البضائع الخطرة للمساعدة في إعداد التعليمات الفنية والوثائق الداعمة (DGP/26-IP/7)

١-١-١-٢ المواد الإرشادية للمساعدة في إعداد التعليمات الفنية والوثائق الداعمة أعدّها فريق خبراء البضائع الخطرة ولكن لم يتم تحديثها في بعض الوقت. وتضمنت الوثيقة الإرشادية مبادئ عامة مستخدمة في إعداد وثائق البضائع الخطرة والإرشاد من أجل تقرير كيفية إدخال تغييرات عليها.

٢-١-١-٢ وأشير إلى الوثيقة عند مناقشة استثناء من المبادئ المطبقة لمتطلبات إمكانية الدخول على متن طائرة البضائع فقط. وتم الاتفاق على أنه ينبغي إضافة تفسير للوثيقة الإرشادية لفريق خبراء البضائع الخطرة (انظر الفقرة ٢-٧-٢ تحت البند ٢ من جدول الأعمال لهذا التقرير).

٣-١-١-٢ اتفق الاجتماع على أن استعراضاً تاماً للوثيقة كان ضرورياً. واجتمع فريق عمل لمقارنة الوثيقة بالأحكام الحالية. وسيستمر عملهم من خلال المراسلة. وستُنشر الوثيقة بموقع الإيكاو لعامة الجمهور على الإنترنت للبضائع الخطرة. وتمت الموافقة على أن الحفاظ على هذه الوثيقة ينبغي أن يصبح ممارسة ثابتة لفريق الخبراء.

البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدتها لجنة الملاحة الجوية أو فريق الخبراء:

١-٦: تنسيق أمن الطيران/البضائع الخطرة (بطاقة الأعمال رقم DGP.001.01)

١-١-٦ تقرير الاجتماع الثاني لمجموعة سلامة الشحن (DGP/26-IP/1) (CSG)

١-١-٦-٦ قَدَّم الأمين تقرير الاجتماع الثاني لمجموعة سلامة الشحن (CSG/2). وقد أنشئت مجموعة سلامة الشحن لمعالجة تأثير السلامة المحتمل من التدابير الأمنية التي نفذتها مختلف الدول الأعضاء والتي تحظر نقل أجهزة إلكترونية نقالة معينة (PEDs) في مقصورات الطائرات أثناء الرحلات الجوية فوق طرق معينة. وكانت المجموعة تتألف من خبراء في مجالات عمليات الطيران والبضائع الخطرة وصلاحيات الطائرات للطيران والمطارات وإدارة السلامة والأمن والتسهيلات.

١-١-٦-٢ عُقد اجتماع تمهيدي لمجموعة سلامة الشحن من ١ إلى ٢٠١٧/٦/٢ لوضع اختصاصات وبرنامج عمل. وانعقد الاجتماع الثاني لمجموعة سلامة الشحن في باريس، فرنسا من ١٩ إلى ٢٠١٧/٧/٢١. وكُلِّفت مجموعة سلامة الشحن/٢ بتقييم قدرات الطائرات الحالية وتحديد أخطار السلامة التي يشكلها نقل الأجهزة الإلكترونية المحمولة في الأمتعة المسجلة وتقييم مخاطر السلامة المرتبطة بذلك. وقُدِّمت إلى الاجتماع الاستنتاجات التي استخلصتها إدارة الطيران الاتحادية (FAA) ووكالة السلامة الجوية الأوروبية (EASA) بشأن احتمال حدوث اشتعال نار في مقصورة البضائع لطائرة ركاب ينبغي وضع جميع الأجهزة الإلكترونية المحمولة الضخمة هناك واختبار النتائج لما أجرته إدارة الطيران الاتحادية لتقييم الأخطار المحتملة من حمل الحواسيب المحمولة وغيرها من الأجهزة الإلكترونية المحمولة الضخمة الأخرى في تسرب حراري في الأمتعة المسجلة. وكانت من بين استنتاجاتها ما يلي:

- (أ) قد تكون ثمة زيادة محتملة عشرة أضعاف في خطر حرائق البضائع إذا أُخذت الأجهزة الإلكترونية المحمولة من المقصورة إلى الأماكن المخصصة لشحنة الطائرة من البضائع. واستند هذا إلى تحليلين منفصلين للبيانات لتقارير متوافرة بواسطة إدارة الطيران الاتحادية للولايات المتحدة ووكالة السلامة الجوية الأوروبية عقب استعراض لتصميمات طائرات وحوادث حريق؛
- (ب) ينبغي عدم السماح بالأجهزة الإلكترونية المحمولة في الأمتعة المسجلة في مخزن بضائع الطائرة على أساس أن هذا ستعجم عنه زيادة غير مقبولة في خطر الحريق لسبب وحيد هو أن النار الناتجة عن ذلك قد لا تتم السيطرة عليها. واعترفت المجموعة بأن تدابير التخفيف الإضافية يمكن أن يتخذها المشغلون إذا كان نقل الأجهزة الإلكترونية المحمولة تحت سيطرتهم المباشرة؛
- (ج) الجمع بين الأجهزة الإلكترونية المحمولة وبضائع خطرة أخرى يمكن أن ينتج عنه انفجار قبل أن يمكن تفريغ الهالون بقدر كاف في مقصورة بالدرجة C، ولن تقدم حماية في مقصورة من الدرجة D لحدث مماثل؛
- (د) وكان من المطلوب المزيد من البيانات الشاملة بغية إعادة تقييم احتمال النار في البضائع.

٣-١-١-٦ أعدت مجموعة سلامة الشحن/٢ تسع توصيات، كانت الخمسة الأولى منها موجهة إلى فريق خبراء البضائع الخطرة:

- (أ) ينبغي أن يعدّل فريق خبراء البضائع الخطرة التعليمات الفنية لكي يجوز نقل الأجهزة الإلكترونية المحمولة في الأمتعة المحمولة فقط ما لم يكن ذلك بموافقة المشغل؛
- (ب) أن يستعرض فريق خبراء البضائع الخطرة البنود المسموح بحملها للمسافرين في الأمتعة المسجلة وإثبات إذا كانت توليفات معينة ينبغي منعها؛
- (ج) أن يقوم فريق خبراء البضائع الخطرة بالاشتراك مع صناعة صانعي البطاريات بوضع تعريف واضح لما تعنيه الأجهزة الإلكترونية المحمولة؛
- (د) أن يستعرض فريق خبراء صلاحية الطائرات للطيران وفريق خبراء عمليات الطيران وفريق خبراء البضائع الخطرة مسألة وضع المشغلين أجهزة إلكترونية محمولة مشحونة في المقصورة ليستخدما الركاب انتفاعاً بأحكام التعليمات الفنية بدلاً عن السعي للحصول على موافقة الشهادة على صلاحية الطائرة للطيران؛
- (هـ) أن تواصل صناعة إنتاج البطاريات بحثها في مخاطر بطارية الليثيوم ولهذا تقديم المعلومات إلى فريق خبراء صلاحية الطائرات للطيران وفريق خبراء البضائع الخطرة؛
- (و) أن يُطلب من المجلس التنسيقي الدولي لاتحادات صناعات الطيران والفضاء تقديم افتراضات يستخدمها صانعو الطائرات عند حساب احتمال الحريق لـ 1E-7 لكل ساعة طيران وأن يوفّر هذا لفريق خبراء صلاحية الطائرات للطيران؛
- (ز) أن يُطلب من المجلس التنسيقي الدولي لاتحادات صناعات الطيران والفضاء واتحاد النقل الجوي الدولي تقديم بيانات بشأن عدد الطائرات المزوّدة بفراغات لشحن البضائع من الدرجة D، وأن يُطلب من الدول أن تقدم بيانات بشأن عدد مثل هذه الطائرات المسجلة في دولها وأن يقدّم هذا إلى فريق خبراء صلاحية الطائرات للطيران؛
- (ح) أن يُطلب من المجلس التنسيقي الدولي لاتحادات صناعات الطيران والفضاء والإيالات والدول تقديم: (١) بيانات بشأن عدد الأجهزة الإلكترونية المحمولة التي تُنقل؛ و (٢) معلومات عن جميع الحوادث والوقائع التي شملت أجهزة إلكترونية محمولة؛ وأن يقدّم هذا إلى فريق خبراء إدارة السلامة وفريق خبراء البضائع الخطرة وفريق خبراء صلاحية الطائرات للطيران وفريق خبراء عمليات الطيران – المجموعة الفرعية لسلامة البضائع؛
- (ط) أن ينضم أعضاء فريق خبراء إدارة السلامة إلى المجموعة الفرعية لسلامة البضائع لكي يتم توفير خبرة ملائمة لتلك المجموعة عند وضع إرشادات بشأن تقديرات الخطر عند نقل أشياء في الفراغ المخصص لنقل الأمتعة والبضائع في الطائرة.

البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدتها لجنة الملاحة الجوية أو فريق الخبراء:

٢-٦: الحوادث والوقائع الناجمة عن البضائع الخطرة ونظام الإبلاغ (بطاقة الأعمال رقم

(DGP.002.01)

١-٢-٦ تقرير مجموعة العمل بشأن الإبلاغ (DGP/26-IP/6)

١-١-٢-٦ بدأ العمل على إعداد نظام للإبلاغ عن وقائع البضائع الخطرة، بناء على طلب لجنة الملاحة الجوية، عقب الاجتماع الثالث والعشرين لفريق خبراء البضائع الخطرة وفريق العمل الجامع الأول لفريق خبراء البضائع الخطرة المعني باجتماع بطاريات الليثيوم (مونتريال، ٦ إلى ١٠/٢/٢٠١٢). وقد أوصت مجموعة العمل المعنية ببطاريات الليثيوم بالإبلاغ عن الوقائع المشتركة فيها بطاريات ليثيوم للإيكاو ونشرها بموقع متاح للجمهور على الإنترنت. وكان من المعترف به أن مثل هذه المعلومات يمكن استخدامها كأداة للتعرف على العوامل المسببة والثغرات المحتملة في اللوائح. وبعد ذلك سألت لجنة الملاحة الجوية الأمانة لتتظّر في وضع نظام للإبلاغ عن وقائع البضائع الخطرة ليمتد فيما وراء بطاريات الليثيوم إلى جميع وقائع البضائع الخطرة وحددت خلال استعراضها لتقرير DGP/25 أن النظام ينبغي أن يكون أداة موجهة للإدارة لتحديد الثغرات في الأنظمة.

١-١-٢-٦ أنشأ فريق خبراء البضائع الخطرة مجموعة عمل لفريق الخبراء بشأن الإبلاغ (فريق الخبراء - مجموعة العمل/الإبلاغ) لإحراز تقدم في العمل. وأقرت مجموعة عمل فريق الخبراء/الإبلاغ بالكمية الضخمة من البيانات التي يمكن على سبيل الاحتمال جمعها من نظام الإبلاغ العالمي، والحاجة لتحليل الواسع لإنتاج معلومات مفيدة لتحديد المسائل المحتملة للسلامة ذات الصلة بالبضائع الخطرة والموارد الفعلية التي ستشأ الحاجة إليها للقيام بذلك وتساءلت عما إذا كان وضع نظام عالمي فعال ممكناً. واختتمت المجموعة بأن أفضل نهج سيكون التركيز على تطوير الأحكام ودعم المواد الإرشادية التي سوف تتيح تطوير نظم فعالة داخل كل دولة وإضافة طلب من الدول لإبلاغ الإيكاو متى ما حددت من خلال نظمها لتحليل البيانات مسائل سلامة ذات صلة بالبضائع الخطرة يجوز أن يكون لها تأثير على السلامة العالمية.

٢-١-١-٢-٦ وضعت مجموعة عمل فريق الخبراء للإبلاغ تعديلات للملحق الثامن عشر لدعم هذا الهدف في حين تُحقّق المحاذاة مع الملحق التاسع عشر - إدارة السلامة ومع الملحق الثالث عشر - التحقيق في حوادث ووقائع الطيران. وقامت أيضاً بإعداد تعديلات تبعية للتعليمات الفنية. وتمت محاذاة المصطلحات للإبلاغ وأحكام الامتثال مع الأحكام الحالية في الملحق التاسع عشر. والفصل ٥ بإضافته مراجع إلى الملحق التاسع عشر عوضاً عن تكرار الأحكام المطلوبة بالفعل لذلك الملحق. وكُرّرت أحكام الملحق التاسع عشر في حالات كانت فيها حاجة لمزيد من الوضوح أو حيث الكيانات غير المشغّلين في حاجة لمعالجتها. واختتمت المجموعة بأن هذا النهج سيقوّي الارتباط بين البضائع الخطرة والمسؤوليات عن مراقبة إدارة السلامة.

٢-١-٢-٦ وضعت مجموعة عمل فريق خبراء البضائع الخطرة للإبلاغ مشروع مواد إرشادية أولية بشأن الإبلاغ عن البضائع الخطرة وتحقيقات البضائع الخطرة. ولم يتم بعد التوصل إلى استنتاج بشأن أين ينبغي أن يكون مكان المادة الإرشادية. وسيُنظر في إدراجها كمرفق للملحق الثامن عشر أو كفصل في إضافة للتعليمات الفنية، مع ملاحظة أن درجة عالية من البروز لكيانات أخرى غير سلطات الدول سيحتاج لأخذها في الحسبان بالنسبة لبعض المواد الإرشادية.

٣-١-٢-٦ ستستمر مجموعة عمل فريق الخبراء للإبلاغ في تنقيح التعديلات للملحق الثامن عشر واستكمال المادة الإرشادية خلال فترة العامين التالية بهدف عرض حزمة وضعت في شكلها النهائي إلى الاجتماع السابع والعشرين لفريق خبراء البضائع الخطرة.

البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدتها لجنة الملاحه الجوية أو فريق الخبراء:

٣-٦: التخفيف من المخاطر الناجمة عن نقل بطاريات الليثيوم عن طريق الجو (بطاقة الأعمال رقم

(DGP.003.01)

١-٣-٦ عدد بطاريات الليثيوم الاحتياطية المحمولة مع الأجهزة (DGP/26-WP/22)

١-١-٣-٦ اقترح تعديل لتعليمات التعبئة لبطاريات أيون الليثيوم ومعدن الليثيوم المعبأة مع المعدات (تعليمات التعبئة ٩٦٦ و ٩٦٩) لإيضاح مقصد الحد المطبق على عدد البطاريات الاحتياطية المسموح به في عبوة. واقترح تعديل مماثل في DGP-WG/17، وعلى الرغم من أن مجموعة العمل وافقت على أن مقصد الحكم كان هو السماح بمجموعتين من البطاريات الاحتياطية، ظلت الصيغة المقترحة غامضة (انظر الفقرة ٣-٥-٣-٨ من تقرير DGP-WG/17 الذي تحتوي عليه DGP/26-WP/3). وحاول التعديل المقترح على DGP/26 إزالة أي غموض بالإحالة على وجه التحديد إلى "مجموعتين احتياطيتين" من الخلايا أو البطاريات وحدد ما هو مقصود بمجموعة.

٢-١-٣-٦ لوحظ أن تعليماً التعبئة ٩٦٦ و ٩٦٩ يضعان حدوداً على الكتلة ولكن ليس كثافة طاقة البطاريات أو الخلايا. وكان ثمة قلق آثاره احتمال زيادة ضعفين في كثافة الطاقة في العبوة التي سمح بها هذا الحكم قانونياً. وكانت هناك حالات معروفة لشاحنين يستخدمون هذا النص للتحايل على حظر لنقل بطاريات الليثيوم بطريق الجو. وعلى الرغم من مشاعر القلق التي لوحظت، كان هذا يُعتبر مسألة منفصلة عن الواحدة التي عالجها التعديل. ولم يدخل التعديل أي أحكام جديدة، فقد اكتفى بإيضاح ما هو مسموح به بالفعل.

٣-١-٣-٦ تمت الموافقة على التعديل، بشرط الاستعاضة عن عبارة "appropriate number" بعبارة "the number required".

٢-٣-٦ توضيح المعلومات الموجهة لقائد الطائرة (DGP/26-WP/23)

١-٢-٣-٦ كان الجزء ٣-١-٤؛٧ يتيح نسخة مكثفة أكثر من معلومات البضائع الخطرة المطلوب تقديمها إلى قائد الطائرة من أجل Lithium metal batteries — UN 3090 و Lithium ion batteries — UN 3480. واقترح أنه ينبغي إدراج المطار الذي ستُفَرَّغ فيه العبوة (العبوات) في هذه النسخة المكثفة. وتمت الموافقة على تعديل للفقرة ٣-١-٤؛٧.

٣-٣-٦ نطاق تطبيق أحكام القسم ١ (أ) (DGP/26-WP/28) والاختيار ما بين

القسمين ١ (أ) و ١ (ب) لبطاريات الليثيوم (DGP/26-WP/29)

١-٣-٣-٦ ما إذا كان أم لم يكن النص التمهيدي لتعليمي التعبئة ٩٦٥ و ٩٦٨ للقسم ١ (أ) يمكن تفسيره بأنه يعني أن الشاحنين لن يُسمح لهم بتعبئة خلاياهم أو بطارياتهم وفقاً لمتطلبات القسم ١ (أ) إذا كان تقييم الواط ساعة أو المحتوى المعدني لليثيوم لم يتجاوز الحدود المقررة لذلك القسم التي سبقت مناقشتها في DGP-WG/16 (انظر الفقرة ٣-٥-٣-١٢ من التقرير DGP-WG/16 الذي تحتوي عليه DGP/26-WP/2) و DGP-WG/17 (انظر الفقرة ٣-٥-٣-٣ من التقرير DGP-WG/17 الذي تحتوي عليه DGP/26-WP/3). ووافقت مجموعات العمل على أن القصد لم يكن استبعاد أي شخص من تطبيق متطلبات أكثر صرامة وأن شذوذاً أدخل دون قصد ينبغي إيضاحه بغية إزالة أي غموض. واقترحت تعديلات، لكن لم يمكن الاتفاق على الصيغة المستخدمة.

٢-٣-٣-٦ جرى النظر في تعديلات منقحة في DGP/26، لكن كلاً منها أدخل مسائل شاذة أخرى.

٤-٣-٦ الشاحنات المتحركة (DGP/26-WP/45)

١-٤-٣-٦ أوصت DGP-WG/17 بتعديل لأحكام الركاب التي تحظر البطاريات الإضافية والشاحنات المتحركة من إعادة ملئها أو من توصيلها كهربائياً أو التزويد بالطاقة لجهاز خارجي. وحثّ على الحاجة للتعديل عدد من الوقائع التي اشتركت فيها شاحنات متحركة في المقصورة، والحقيقة أن صناعتها واستخدامها كانا يتزايدان (انظر الفقرة ٣-٥-٣-٧ من تقرير DGP-WG/17 الوارد في DGP/26-WG/3). واعتقدت DGP-WG/17 أن التعديل وقرّ تحسينات للسلامة بززت الإدراج في طبعة ٢٠١٧-٢٠١٨ من التعليمات الفنية كضمانة. ونظرت لجنة الملاحة الجوية في توصية مجموعة العمل و، على الرغم من عدد الأسئلة بشأن توافر البيانات وتفسير الأحكام المقترحة التي أثّرت، وافقت على توصية المجلس بها. وعقب استعراض اللجنة لكن قبل استعراض المجلس، جرى الإبلاغ عن صعوبات تبعية بالنسبة لبعض المشغلين إذا اعتمد التعديل. وكان هؤلاء المشغلين يستخدمون الشاحنات المتحركة كترود ثانوي أو طارئ بالطاقة من أجل حقائب إلكترونية للرحلات الجوية (EFBs) وأجهزة أخرى تُستخدم خلال الطيران من خلال استخدام استثناء المشغل في الجزء ٢٤١-٢-١ (د). وقد افترض أنه بسبب أن هذا الاستثناء يتطلب بطاريات للوفاء بأحكام دخول PEDs في الجدول ٨-١، ولن يعود يُسمح للمشغل باستخدام الشاحنات المتحركة خلال الطيران إذا تم اعتماد التعديل. وقررت لجنة الملاحة الجوية أنه ينبغي سحب التعديل للسماح بوقت لفريق الخبراء لإعادة النظر على أفضل وجه في كيفية معالجة المخاطر المطروحة.

٢-٤-٣-٦ تساءل بعض أعضاء فريق الخبراء، خلال المناقشة في DGP-WG/17، عما إذا كانت الإشارة إلى أحكام الركاب في استثناءات المشغل أو حتى شمول استثناءات المشغل في التعليمات الفنية على الإطلاق ملائم. وطلبت لجنة الملاحة الجوية من فريق الخبراء أخذ هذا في الحسبان عند النظر في كيفية معالجة المخاطر التي تشكلها الشاحنات المتحركة. أما مجموعة سلامة الشحنة، المكلفة بمهمة معالجة تأثير السلامة لطلب حمل أجهزة إلكترونية محمولة في الأمتعة المسجلة، فقد أوصت بأن يأخذ هذا في الحسبان فريق خبراء صلاحية الطائرات للطيران وفريق خبراء عمليات الطيران وفريق خبراء البضائع الخطرة وكذلك ما إذا كان ينبغي أخذ الاستثناءات في الاعتبار خلال ترخيص الصلاحية للطيران (انظر الفقرة ٦-١-١ من هذا التقرير).

٣-٤-٣-٦ استناداً لما تقدم، وافق فريق خبراء البضائع الخطرة على أنه ينبغي أن تُنشأ مجموعة عمل للنظر في أفضل كيفية للتخفيف من المخاطر الماثلة، مع مراعاة التغذية المرتدة التي تقدمها لجنة الملاحة الجوية، والنظر فيما إذا كانت التعليمات الفنية أكثر مكان ملائم للاستثناءات الجارية للمشغل التي يحتوي عليها الجزء ٢٤١-٢-٢. وأوصى بتقديم بطاقة المهمة بشأن الموضوع إلى لجنة الملاحة الجوية للموافقة (انظر الفقرة ٦-٣-١٢ من هذا التقرير).

٥-٣-٦ الشروط الخاصة بالأمتعة المزودة بالشواحن المحمولة (DGP/26-WP/33)

١-١-٥-٣-٦ كانت أنواع جديدة من الأمتعة المعروفة باسم "الأمتعة الذكية" في السوق وذات سمات فنية عالية مثل تتبع الموقع وشحن البطارية والوزن الرقمي مصممة لجعل السفر أسهل. وأدمجت بطاريات الليثيوم ولوحات الناقل التسلسلي العام والشاحنات المتحركة والنظام العالمي لتحديد الموقع وتكنولوجيا أخرى في الأمتعة. واقترح أن المسافرين الذين يحملون مثل هذه الأمتعة سيحتاجون للامتثال لأحكام للأجهزة الإلكترونية المحمولة في الجدول ٨-١ (البند ٢٠). غير أنه كانت هناك شواغل من أن الأمتعة المحتوية على شواحن متحركة سيتم تسجيلها، على الرغم من حقيقة أن التعليمات الفنية طلبت مواد غرضها الأساسي هو توفير طاقة لجهاز آخر يتعين حمله كبطاريات احتياطية ولذلك سيُفصر على المقصورة. ولذلك اقترح تعديل

لأحكام الأجهزة الإلكترونية المحمولة يتطلب إزالة الشاحن المتنقل من الأمتعة المزمع تسجيلها وحملها في المقصورة وفقاً لأحكام للبطاريات الاحتياطية. ولضمان أن هذا يمكن القيام به، شمل التعديل توصيات لتصميم الأمتعة بطريقة تسمح للمستعمل بإزالة الشاحن المتنقل وبأن يؤشّر بالدرجة بالواط- ساعة.

٦-٣-٥-١-٢ تمت الموافقة على تعديل منقح، بشرط أن يُعكس في الجزء ٨ المعاد تشكيل بنيته من التعليمات (انظر الفقرة ٢-٨-٢ في إطار البند ٢ من جدول الأعمال لهذا التقرير).

٦-٣-٦ الأجهزة الإلكترونية التي يحملها الركاب وأفراد الطاقم (DGP/26-WP/43)،
نقل الأجهزة الإلكترونية المحمولة المملوكة للركاب والطاقم (DGP/26-
WP/37) والمخاطر التي تشكلها مجموعات البضائع الخطرة المسموح بها
التي تحتوي عليها أمتعة مسجلة (DGP/26-WP/38) وتعريف الأجهزة
الإلكترونية المحمولة (DGP/26-WP/46)

٦-٣-٦-١ أجرى فرع السلامة من الحريق بإدارة الطيران الاتحادية المركز الفني وليام ج. هيويز (الفني لإدارة الطيران الاتحادية) اختباراً لتقييم المخاطر المحتملة من حمل حواسيب محمولة وأجهزة إلكترونية محمولة ضخمة أخرى في تسرب حراري في أمتعة مسجلة. ودفعت للحاجة للاختبار شواغل أن التدابير الأمنية المنشأة في مارس ٢٠١٧ بحظر حمل أجهزة إلكترونية محمولة كبيرة في المقصورة (انظر الفقرة ٦-١-١ من هذا التقرير) قد يكون لها تأثير لاحق على السلامة بسبب الزيادة غير المتوقعة في عدد الأجهزة الإلكترونية المحمولة المزودة بالطاقم من بطاريات الليثيوم في مقصورة البضائع التي قد تنتج عن ذلك. وكانت ثمة حاجة لإجراء تقييم للخطر.

٦-٣-٦-٢ كان هناك نقص في البيانات بصدد احتمال دخول جهاز إلكتروني محمول التسرب الحراري في مقصورة بضائع وعدم وجود بيانات محددة بصدد عدد الأجهزة الإلكترونية المحمولة الضخمة التي كان الركاب يحملونها في الأمتعة المسجلة، على الرغم من أنه يعتقد أن معظم الركاب كانوا يحملون أجهزة إلكترونية محمولة في المقصورة. ولوحظ أن مجموعة سلامة المقصورة قد أوصت بأن تجمع الإيكاو بيانات من الدول والمنظمات الدولية، لكن حتى يتم جمع البيانات الملائمة، سيكون من المستحيل إجراء تحليل دقيق. وكان يوجد أيضاً قليل من بيانات البحوث المتوفرة بشأن السلوك والآثار والمخاطر المرتبطة بوضع الأجهزة الإلكترونية المحمولة في الأمتعة المسجلة. واستطاع المركز الفني لإدارة الطيران الاتحادية جمع بيانات بحوث في هذا الصدد.

٦-٣-٦-٣ أجريت عشرة اختبارات. ولكل اختبار، تم وضع حاسوب محمول مشحون تماماً في حقيبة ووضع سخان مقابل خلية أيون ليثيوم في بطارية الحاسوب المحمول لإجباره على القيام بتسرب حراري. وكانت الحقائق مماثلة بأدوات أخرى لكن لم تشمل بضائع خطرة أخرى بالنسبة لخمسة حوتها الاختبارات. وفي جميع تلك الاختبارات إلا واحد، تم احتواء النار وانطفأت تلقائياً في نهاية الأمر. وفي ذلك الاختبار الوحيد، أحرقت النار الحقيبة واستهلكتها تماماً. وبالنسبة للاختبارات الخمسة المتبقية، أضيفت إلى الحقيبة مع الحاسوب المحمول بضائع خطرة أخرى سُمح للركاب والطاقم بحملها. وتضمن أحد تلك الاختبارات علبة أيروسول. وفي غضون ٤٠ ثانية بعد بدء التسرب الحراري، حدث نمو النار بسرعة وانفجار العلبة. واستنتج أن كتم نظام النار لا يمكن أن يستغني عن الهالون بسرعة تكفي لبلوغ تركيز كاف لإطفاء النار ومنع الانفجار. أما الاختبارات الأربعة المتبقية، فقد نتجت جميعها عن انفجار العلبة أو الزجاجة المحتوية على البضائع الخطرة فأدى ذلك إلى نار كبيرة. وكان الاستنتاج هو أن الأجهزة الإلكترونية المحمولة الكبيرة في الأمتعة المختلطة بأيروسول يمكن أن ينتج عنها انفجار ونار قد يعجز نظام إطفاء نار البضائع في الطائرة في مقصورات البضائع بالدرجة C عن تدبيرها وأن الخطر في مقصورات البضائع التي لا توفر نفس مستوى الحماية الذي توفره الدرجة C سيكون حتى أكبر.

٤-٦-٣-٦ قُدمت إلى مجموعة سلامة الشحن نتائج الاختبارات التي أجراها المركز الفني لإدارة الطيران الاتحادية (CSG)، انظر الفقرة ٦-١-١ من هذا التقرير). واستعرضت مجموعة سلامة الشحن، في اجتماعها الثاني (CSG/2)، باريس، ١٩ إلى ٢١/٧/٢٠١٧) هذه النتائج وأعدت توصية لفريق خبراء البضائع الخطرة بتعديل التعليمات الفنية لجعل الأجهزة الإلكترونية المحمولة مقصورة على الأمتعة المحمولة ما لم يوافق المشغل على حملها في الأمتعة المسجلة. وأوصت CSG/2 أيضاً بأن يقوم فريق خبراء البضائع الخطرة، بالاشتراك مع صناعة البطاريات، بوضع تعريف واضح لما يعنيه جهاز إلكتروني محمول. وسيسمح هذا بالاتساق عند إجراء عمليات تقييم للخطر على السلامة وتنفيذ تدابير مخففة. ولاحظ الأمين أن تقرير CSG/2 قد استعرضته لجنة الملاحة الجوية لكن لا يزال يتعين أن يستعرضه المجلس. ووافقت كلتا الهيئتين، توجهاً للكفاءة، أنه ينبغي تكليف فريق الخبراء بمهمة معالجة التوصيات قبل استعراض المجلس. ولاحظ الأمين أيضاً أن لجنة الملاحة الجوية استنتجت أن فريق الخبراء ينبغي أن يُطلب منه تقييم الحاجة إلى وإمكانية منع الأجهزة الإلكترونية المحمولة في الأمتعة المسجلة عوضاً عن التركيز على تعديل التعليمات الفنية وأن هذا قد أيده المجلس.

٥-٦-٣-٦ تم تقديم اقتراح منفصل إلى فريق الخبراء لتقييد الأجهزة الإلكترونية المحمولة الضخمة التي تحتوي على خلايا أو بطاريات معدن ليثيوم أو أيون ليثيوم وذلك باقتصارها على الأمتعة اليدوية، ما لم يقر المشغل بمنح موافقة لأن يحملها راكب في الأمتعة المسجلة. وعرف التعديل الأجهزة الإلكترونية المحمولة الضخمة بوصفها الحاسوب المحمول أو اللوح أو جهاز مماثل أكبر من هاتف خلوي أو هاتف ذكي. وعلى الرغم من أن ثمة افتقار للبيانات ليتم تقييم بدقة لاحتمال حادث تسرب حراري يتضمن أجهزة إلكترونية محمولة في الأمتعة المسجلة، اقترح أن احتمال أن يؤدي هذا إلى حدث كارثي لا يمكن تجاهله. وتم النظر في تدابير تخفيف بديلة، لكن استنتج أن التدبير القابل للتطبيق الوحيد قد يكون هو طلب حمل الأجهزة الإلكترونية المحمولة الضخمة في المقصورة.

٦-٦-٣-٦ لم تعتبر أغلبية أعضاء فريق الخبراء الاقتراحات ناضجة بقدر كاف لاعتمادها. وكان من رأيهم أن ثمة حاجة للمزيد من التحليل فيما يتعلق باحتمال وقوع حادث في مقصورة الأمتعة وتساءلوا عما إذا كانت الاستنتاجات لا تزال صحيحة، نظراً لأن التدابير الأمنية التي دفعت إلى الحاجة للتحليل لم تعد موجودة. وتساءلوا أيضاً بشأن إمكانية القيام بتنفيذ حظر للأجهزة الإلكترونية المحمولة من الأمتعة المسجلة وإدارة عمليات الموافقة على حملها في الأمتعة المسجلة. ورأى أعضاء آخرون إمكانية وقوع حادث كارثي، حتى إذا كان الاحتمال بعيداً، كان يحتم التصرف الفوري. واعتقدوا أيضاً أن واقعة أن مجموعة سلامة الشحن طوّرت توصياتها من خلال توافق الآراء كانت تعني أن ثمة حاجة لاتخاذ إجراء. واعترفوا بأنه توجد صعوبات تشغيلية ستحتاج إلى التغلب عليها، لكنهم اعتقدوا أن هذا يمكن تحقيقه بإرشاد إضافي. ولم يكن بالمثل توافق آراء بشأن ما إذا كانت توجد أو لا توجد حاجة لتعريف الأجهزة الإلكترونية المحمولة بوضوح. واعتقد البعض أن التعريف كان غير متصل بالموضوع إذ أن الأخطار من البطاريات كانت هي مصدر القلق. واعتقد آخرون أنه من الضروري للأغراض الإحصائية ولضمان فهم مشترك من جانب المنظمين والصناعة والركاب والطاقم.

٧-٦-٣-٦ اعترافاً بأن المجلس سيستعرض تقرير مجموعة سلامة الشحن/٢ في المستقبل القريب، تقرر الانتظار لإرشاد من المجلس بشأن الطريق إلى الأمام. وإذا قرر المجلس أن ثمة حاجة لاتخاذ إجراء قبل فترة العامين المقبلة، اقترحت الأمانة العامة أن اختصاصات لمجموعة عمل يمكن إعدادها في ذلك الوقت.

٨-٦-٣-٦ على الرغم من الافتقار لتوافق الآراء بشأن أنه يجب أو لا يجب اقتصار الأجهزة الإلكترونية المحمولة على المقصورة، لا يوجد خلاف بشأن أنه ينبغي اتخاذ تدابير لإيصال الخطر وللوصية بطرائق بسيطة للتخفيف منه. وأبلغ بعض أعضاء فريق الخبراء بأنهم اتخذوا بالفعل تدابير لإعلام المشغلين ولتشجيع الركاب على حمل أجهزتهم الإلكترونية المحمولة في

المقصورة، لإخراج البطاريات قبل وضع الجهاز الإلكتروني المحمول في الأمتعة المقصود تسجيلها، أو ضمان أن الأجهزة الإلكترونية المحمولة لم تُعبأ بالقرب من الأيروسولات.

٦-٣-٦-٩ تُقدم في المرفق (ج) للتقرير بشأن هذا البند من جدول الأعمال قائمة مفصلة بالحجج التشغيلية ضد جعل الأجهزة الإلكترونية المحمولة الضخمة مقتصرة على الأمتعة اليدوية وقائمة تشغيلية بالصعوبات التي قد تحول دون التنفيذ الفعال لحظر وقائمة بالحجج المؤيدة لحظر.

٦-٣-٧ التشغيل غير المقصود للسجائر الإلكترونية التي حملها الركاب وأفراد الطاقم (DGP/26-WP/42)

٦-٣-٧-١ أُدرجت في طبعة ٢٠١٥-٢٠١٦ من التعليمات الفنية كضمانة أحكام تحظر على الركاب والطاقم حمل سجائر إلكترونية مزودة بالطاقة من بطارية في الأمتعة المسجلة وإعادة شحن الأجهزة في المقصورة وتُطلب حماية البطاريات الاحتياطية من الدائرة القصيرة. ودفعت إلى الحاجة للضمانة شواغل السلامة بعد الإبلاغ عن عدة وقائع تضمنت سجائر إلكترونية مفرطة في السخونة نتيجة للتشغيل غير المقصود لعامل تسخينها فنتج عن ذلك حريق في الأمتعة المسجلة. وعلى الرغم من تدابير السلامة الإضافية التي أُدخلت، لازالت تحدث وقائع تشمل الحرارة والدخان والنار من السجائر الإلكترونية إذ أن إحدى الدول أبلغت عن عشر وقائع موثقة منذ أن أصبحت قابلة للتطبيق. وكان يُشتبه في جميع الوقائع في التشغيل غير المقصود لأجهزة التدخين الإلكترونية المحمولة. ولوحظ أنه بمجرد التشغيل، فإن القوة من البطارية كانت قادرة على تزويد ملف تسخين بالطاقة وهو، إذا زُوّد بالطاقة لأكثر من ثوان معدودة، يتسبب في التسخين المفرط للجهاز والدخان واشتعال النار المحتمل ومن المحتمل أن يدفع البطارية عادة إيون ليثيوم إلى انطلاق حراري بسرعة خاطفة. ولذلك اقترح تعديل لأحكام الركاب يتطلب أن يتخذ الركاب أو الطاقم تدابير فعالة لمنع التشغيل غير المقصود لعنصر التسخين بينما يكون الشخص على متن الطائرة.

٦-٣-٧-٢ تمت الموافقة على التعديل، بشرط إجراء بعض التعديلات التحريرية وأن ينعكس ذلك في الباب الثامن المعاد تشكيل بنيته من التعليمات (انظر الفقرة ٢-٨-٢ بمقتضى البند ٢ من جدول الأعمال لهذا التقرير).

٦-٣-٨ الحصول على الموافقة بشأن نقل بطاريات الليثيوم على متن طائرات الركاب (DGP/26-WP/44)

٦-٣-٨-١ بمقتضى Lithium metal batteries — UN 3090 و Lithium ion batteries — UN 3480 مُنع نقل بطاريات الليثيوم المعدنية وبطاريات إيون الليثيوم كبضائع على متن طائرات الركاب منذ ٢٠١٥/١/١ و ٢٠١٦/٤/١ على التوالي. وحُصص الحكم الخاص A201 لكلا القيدتين مما سمح للدول المعنية بمنح إعفاء من المنع وفقاً للجزء ١-١٤١-٣ وطلب من السلطات إفادة الإيكاو عند إصدارها لهم. وقُدمت إرشادات لمعالجة مثل هذه الإعفاءات في الجزء S-I:4 من الإضافة.

٦-٣-٨-٢ أُثير أن الصعوبات في نقل بطاريات ليثيوم معينة في الوقت المناسب عندما لم يكن النقل بطائرة بضائع خياراً. واقترح أن أساليب لنقل هذه البطاريات بأمان قد أنشئت وأن موافقة الدول بخلاف دولة المنشأ ودولة المشغل غير ضرورية. ولذلك اقترح تعديل للحكم الخاص A201 يسمح بنقل إما بطاريات إيون الليثيوم أو بطاريات الليثيوم المعدنية على متن طائرات الركاب بموافقة دولة المنشأ ودولة المشغل بكميات لا تتجاوز تلك المسموح بها وفقاً للقسم ٢ من تعليمات التعبئة ٩٦٥ أو ٩٦٨. واقترح أيضاً حكم خاص جديد مخصص لـ UN 3090 و UN 3480 للشمول في الإضافة للتعليمات الفنية التي شملت تدابير سيطرة لتحقيق مستوى من السلامة مساو لذلك الذي تنص عليه التعليمات الفنية. وكانت التدابير تهدف إلى التخفيف من عواقب فشل بطارية ليثيوم داخل الغلاف بحيث تُمنع النار التي لا سيطرة عليها ونبضات الضغط التي يمكن أن

تفقد نظام إطفاء حريق البضائع. ولوحظ أن العديد من المبادئ المستخدمة بواسطة لجنة بطاريات الليثيوم SAE (انظر الفقرة ٤-٧ تحت البند رقم ٧ من هذا التقرير) استُخدمت في إعداد الحكم الخاص الجديد المقترح.

٣-٨-٣-٦ لاحظ عدة أعضاء في فريق الخبراء أن نقل بطاريات الليثيوم على متن طائرات الركاب كان يستحيل فعلياً القيام به بسبب الصعوبات في الحصول على إعفاءات من جميع الدول المعنية، وخاصة من الدول التي تطير فوقها الطائرات، وأن ثمة حاجة ماسة لإرشادات للدول التي قد تسمح بعملية موافقة. ولاحظ الأمين أنه لم تكن ثمة إخطارات للإيكاو من الدول التي أصدرت إعفاءات وفقاً للحكم الخاص A201 وتساءل عما إذا كان هذا قد يدل على أنه لم تكن ثمة حاجة. واقترح أن السبب في عدم وجود إخطارات كان هو لأن السعي للحصول عليها كان يُعتبر جهداً عقيماً، ويجد الشاحنون طرقاً أخرى لنقل البطاريات على متن طائرات الركاب، ولا يكون ذلك قانونياً دائماً. ومن شأن السماح بالنقل من خلال عملية موافقة من شأنه أن يوفر آلية قانونية لنقلها بسلامة.

٤-٨-٣-٦ أُجري عدد من التنقيحات للاقتراح الأصلي استجابة لما أثير من مشاعر القلق:

(أ) موافقة من سلطة دولة المقصد ستكون مطلوبة بالإضافة إلى دولتي المنشأ والمشغل. وكانت ثمة حالات كانت فيها دولة المنشأ والمشغل هي نفسها. وطلب دولة المقصد سيضمن مشاركة دولتين على الأقل؛

(ب) بما أن الإشارة إلى الخلايا أو البطاريات مخصصة للدرجة ٩ فقد أضيفت لإيضاح أن الاستثناءات من تنظيم كامل لم تكن مسموحاً بها؛

(ج) متطلبات وثيقة نقل البضائع الخطرة أضيفت إلى الحكم الخاص A201؛

(د) النص الخاص الجديد المدرج في الإضافة جعل استخدامها مقتصرًا على الحالات التي تكون فيها الأشكال الأخرى من النقل غير عملية. وقد أضيف التحديد إلى الحكم الخاص A201 في التعليمات الفنية نظراً لأنه قُصد به أن يكون من المتطلبات الإلزامية ويحتاج الشاحن لأن يكون واعياً به قبل البحث عن موافقة من الدول؛

(هـ) جرى تنقيح معايير الأداء لاختبار حريق خارجي يتضمنه الحكم الخاص الجديد في المرفق وذلك لطلب أي آثار خطيرة سببها التسرب الحراري لإدراجها داخل الرزمة عوضاً عن طلب عدم بدء التسرب الحراري.

٥-٨-٣-٦ تمت الموافقة على التعديل بصيغته المنقحة.

٩-٣-٦ حكم خاص A154 (DGP/26-WP/47)

١-٩-٣-٦ لوحظ أن الحكم الخاص A154، الذي خُصص لجميع قيود بطاريات الليثيوم في الجدول ٣-١، لم يكن محاذاً للحكم الخاص المناظر في اللائحة التنظيمية النموذجية للأمم المتحدة (SP 376) واقترح أن التعليمات الفنية أقل تقييداً. وكلا الأحكام الخاصة حظرت البطاريات التالفة أو المعيبة من النقل. غير أن اللائحة التنظيمية النموذجية وقّرت إرشادات بشأن كيفية تحديد هذا وشملت خلايا أو بطاريات لا يمكن تشخيصها بوصفها تالفة أو معيبة قبل النقل. وأشارت التعليمات الفنية إلى البطاريات المعروفة بواسطة الصانع بأنها معيبة لأسباب تتعلق بالسلامة وقدمت تلك المعادة إلى الصانع لأسباب تتعلق بالسلامة بوصفها المثال الوحيد. واقترح أن تقديم هذا المثال الواحد يمكن أن يؤدي لتفسير أن الحكم الخاص ينطبق فقط على

البطاريات التي حددها الصانع بوصفها معيبة. ولذلك اقترح تعديل يحاذي الحكم الخاص A154 بالنص الخاص SP 376 من اللائحة التنظيمية النموذجية للأمم المتحدة.

٢-٩-٣-٦ جرى الإبلاغ عن أن الأحكام في توصيات الأمم المتحدة سببت ارتباكاً وكانت الجهود تُبذل لإيضاح قصدهم. واقترح أن التعديلات المقترحة للتعليمات الفنية سابقة لأوانها. غير أنه تم الاتفاق على أن الفجوة التي جعلت التعليمات الفنية من المحتمل أن تكون أقل تقييداً في حاجة إلى معالجة. وتمت الموافقة على اقتراح منقح حافظ على النص الخاص الحالي A154 مع إدراج إشارة إلى الخلايا أو البطاريات التي لا يمكن تشخيصها بوصفها تالفة أو معيبة قبل النقل.

١٠-٣-٦ قيد جديد بقائمة البضائع الخطرة من أجل "بطاريات الليثيوم المركبة في وحدة لنقل البضائع" (UN 3526) (DGP/26-WP/48)

١-١٠-٣-٦ نظر DGP-WP/17 في القيد الجديد الذي أضافته اللجنة الفرعية للأمم المتحدة إلى قائمة البضائع الخطرة من أجل UN 3536 — بطاريات الليثيوم المركبة في وحدة لنقل البضائع. وهذه الوحدات لنقل البضائع كانت ضخمة للغاية ويمكن أن تستوعب كميات هامة من البطاريات القوية المركبة فيها. وفي حين كان لا يُصدّق أنه قد توجد أي حاجة لنقل هذه بطريق الجو على أساس منتظم، اقترح أنه قد توجد حاجة لنقلها على أساس استثنائي. ولذلك أوصي بمنعها بالنسبة للنقل الجوي في ظروف عادية لكن يوضع حكم خاص لكي يُسمح بنقلها في ظروف معينة بموافقة دولة المنشأ ودولة المشغل.

٢-١٠-٣-٦ نظر DGP/26 في مواد إرشادية مقترحة لإدراج إضافة إلى التعليمات الفنية من خلال حكم خاص جديد. واقترح أيضاً حكم خاص جديد للإدراج في التعليمات الفنية يحد من النظر في موافقة على بطاريات إيون الليثيوم أو معدن الليثيوم التي تُركب في وحدة نقل للبضائع من أجل الغرض الوحيد المتمثل في توفير قوة خارجية والبطاريات المطلوبة خضعت لمتطلبات الجزء ١-٣-٩٤٢.

٣-١٠-٣-٦ كانت المادة المقترحة للإضافة تستند إلى نص في حكم خاص للأمم المتحدة مخصص لـ UN 3536 (SP 389) وحكم إضافي يحد من بطاريات إيون الليثيوم إلى حالة شحن لا تزيد على ٣٠ في المئة تمت إضافتها. ولوحظ أنه في بعض الحالات، مثل الكوارث الطبيعية، قد يكون من المستحيل شحن الوحدات بمجرد الوصول. ولذلك تم النص على حكم للموافقة على نقل بحالة شحن أعلى. وشملت أيضاً توصية بتركيب أنظمة إطفاء للنار تظل مشغلة خلال النقل.

٤-١٠-٣-٦ لوحظ خلال المناقشة أن مدخل الأمم المتحدة شمل بطاريات معدن الليثيوم وتساءل عما إذا كان ضرورياً. ورئي أن حالة شحن مخفضة لبطاريات إيون الليثيوم يرى أنها فائدة كبيرة للسلامة، لكن هذا لم يكن ذي صلة ببطاريات معدن الليثيوم. وأبلغ ممثل لصناعة البطاريات أن حالة الشحن المخفضة قد تكون ذات صلة بالنسبة لبعض بطاريات معدن الليثيوم، نظراً لأنه كانت توجد حركة في اتجاه بطاريات معدن الليثيوم القابلة لإعادة الشحن. وعلى أي حال، فإن البطاريات المركبة في وحدات نقل البضائع في ذلك الوقت كانت إيون ليثيوم، وعليه قد يكون من المقبول جعل الأحكام مقتصرة على إيون الليثيوم.

٥-١٠-٣-٦ كانت ثمة حجج مؤيدة ومعارضة لإنشاء حد لحالة الشحن بنسبة ٣٠ في المئة. واعتقد البعض أن هذا ينبغي أن يُترك للسلطات المصدرة لقرارات الموافقة، مع الاعتراف بأن الوصول إلى المقصد بحالات شحن أعلى قد يكون ضرورياً أحياناً. وحذر آخرون من أن حالة ٣٠ في المئة من الشحن قد لا تكون مأمونة لجميع البطاريات وأن الصانع فقط سيعرف الحالة التي قد لا يكون فيها انتشار.

٦-١٠-٣-٦ شمل الحكم الخاص الجديد المقترح توصية لنظام إطفاء الحرائق الذي قد يُركب في وحدة نقل البضائع ليظل نشطاً خلال النقل. واقترح أن هذا ينبغي أن يكون متطلباً، على الرغم من أنه أثبتت مخاوف من التفاعل السلبي المحتمل بين نظام ناشط والنظم المعتمدة للطائرة.

٦-٣-١٠-٧ قُدم اقتراح منفتح أزال الإشارة إلى بطاريات معدن الليثيوم وحدّ حالة الشحن لأدنى حالة ممكنة عملياً بدون تجاوز ٣٠ في المئة من سعة البطارية المقدّرة، و، إذا تم تركيب أجهزة إطفاء الحريق في وحدة نقل البضائع، طُلب أن تظل ناشطة خلال النقل.

٦-٣-١٠-٨ في حين أن بعض الأعضاء أيّدوا الاقتراح، اعتقد آخرون أن المخاطر على النقل الجوي لم تحدد بالكامل. واستندت المادة على ما توفيره في توصيات الأمم المتحدة، لكن توجد مخاطر محتملة قد لا تكون عاملاً لنقل سطحي كان في حاجة لمراعاته بالنسبة للنقل الجوي. وشملت هذه آثار تخفيض الضغط على جهاز الحاوية المركب لإطفاء الحريق والتفاعل بين أنظمة الحاوية وأنظمة الطائرة، مثل تلك الضرورية لاكتشاف الدخان وإطفاء النار. وقد يكون من الصعب الفهم تماماً للمخاطر بدون امتلاك معلومات تمثيلية لنظم إطفاء الحريق. وفي ظروف معينة، فإن استخدام نظام إطفاء الحريق يمكن أن يؤدي حتى إلى نتيجة أسوأ على مستوى الطائرة. واقترح أن الإرشاد للدول يجب أن يكون قائماً على الأداء وقد يكون معتمداً على مدخل من فريق خبراء صلاحية الطائرات للطيران وفريق خبراء عمليات الطيران.

٦-٣-١٠-٩ في حين كان ثمة تعاطف مع هذه المشاغل، فإن الأعضاء الذين أيّدوا الاقتراح لاحظوا أنه لهذه الأسباب هم يوصون بحظر ما لم تمنح الدول المعنية الموافقة على النقل على متن طائرات البضائع. واعتبر هؤلاء الأعضاء المواد الإرشادية خط أساس يمكن انطلاقاً منه أن تحدد دولة المشغل ودولة المنشأ أساليب مأمونة للنقل. ولم يعتقدوا أن من الضروري التشاور مع فريق خبراء صلاحية الطائرات للطيران أو فريق خبراء عمليات الطيران، إذ أنهم يعتقدون أن الأمر سيكون متروكاً للدول للنظر في مجالات الخبرة المطلوبة عند التفكير في إصدار الموافقات.

٦-٣-١٠-١٠ على أساس أنه لا يوجد توافق آراء، تم سحب التعديل. وتم الاتفاق على منع UN 3536 — **Lithium batteries installed in cargo transport unit** على متن طائرة ما لم تمنح إعفاء دول المنشأ والمشغل والعبور والطيران العابر والمقصد وفقاً للجزء ١-١-٣ من التعليمات الفنية.

٦-٣-١١ اختبار السقوط ١,٢ متر لعبوات بطاريات الليثيوم (DGP/26-WP/51)

٦-٣-١١-١ التعديلات على القسم ٢ من **Lithium ion batteries packed with equipment** — Packing Instructions 966 و **Lithium metal batteries packed with equipment** — 969 اقترحت لإيضاح أن عبوة تجزئة قد تكون خاضعة لاختبار السقوط ١,٢ متر. ولوحظ أن بعض الشاحنين أخضعوا عبوات التجزئة لاختبار السقوط وطبقوا العلامات القابلة للتطبيق والبطاقات عليها، ثم وضعوها في غلاف خارجي. وعامل آخرون عبوات التجزئة كتعبئة داخلية ووضعوها في تعبئة خارجية وأخضعوا العبوة الكاملة لاختبار السقوط. ودُعي فريق الخبراء للنظر فيما إذا كان السيناريو هان كلاهما يوفران نفس المستوى من السلامة وإذا كان الأمر كذلك، الموافقة على تعديل لإيضاح هذا.

٦-٣-١١-٢ لم يُحظ التعديل بالتأييد. ولم يعتقد أعضاء فريق الخبراء أن النص المقترح كان ضرورياً نظراً لأن السيناريوهات الموصوفة كانت قد غطتها بالفعل التعليمات الفنية. وتعبئة "التجزئة" كانت اصطلاحاً غير معرّف، ولا تفعل الإشارة إليه سوى مزيد من الالتباس.

٦-٣-١٢ التوصيات

٦-٣-١٢-١ في ضوء المناقشات الواردة أعلاه، أعد الاجتماع التوصيات التالية:

التوصية ١/٦ — نقل البضائع الخطرة بواسطة الركاب والطاقم والمشغل

أن تُستعرض الأحكام لحمل الركاب والطاقم بضائع خطرة على متن الطائرة بهدف ما يلي:

(أ) ضمان أن التدابير للتخفيف من المخاطر الماثلة فعالة ويمكن تنفيذها عملياً بواسطة المشغلين والركاب والطاقم مع مراعاة المخاطر المحددة التي يشكلها استخدام الأجهزة الإلكترونية المحمولة أثناء الطيران؛

(ب) تقييم العلاقة بين الاستثناءات للبضائع الخطرة للمشغل والأحكام للركاب والطاقم لتفادي سوء التفسير والعواقب غير المقصودة؛

على النحو الموصوف في مشروع بطاقة الأعمال التي يحتوي عليها المرفق (ج) بالتقرير بشأن هذا البند من جدول الأعمال.

التوصية ٢/٦ — التعديل لأحكام بطاريات الليثيوم لإدماجها في طبعة ٢٠١٩-٢٠٢٠ من التعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (Doc 9284)

تعديل الأحكام المتصلة ببطاريات الليثيوم في التعليمات الفنية على النحو المبين في المرفق (أ) بالتقرير بشأن هذا البند من جدول الأعمال.

التوصية ٣/٦ — التعديل لأحكام بطاريات الليثيوم لإدماجها في طبعة ٢٠١٩-٢٠٢٠ من الإضافة للتعليمات الفنية للنقل الآمن للبضائع الخطرة بطريق الجو (Doc 9284SU)

تعديل الأحكام المتصلة ببطاريات الليثيوم في التعليمات الفنية على النحو المبين في المرفق (ب) بالتقرير بشأن هذا البند من جدول الأعمال.

البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدّتها لجنة الملاحة الجوية أو فريق الخبراء:

٤-٦: نطاق الملحق الثامن عشر (بطاقة الأعمال رقم DGP.004.01)

١-٤-٦ مشروع التعديلات على الملحق الثامن عشر (DGP/26-WP/10)

والأخطار الناجمة عن البضائع الخطرة غير المُصرَّح بها — التعديل

المقترح إدخاله على الملحق الثامن عشر (DGP/26-WP/41)

١-١-٤-٦ الاقتراح

١-١-٤-٦-١-١ اقتُرح تعديل للفصل العاشر من الملحق الثامن عشر بقصد ضمان أن الاقتضاء لإنشاء برامج تدريبية تُطبَّق على الكيانات التي لا يشملها نطاق الملحق الثامن عشر والتي لم يكن من المقصود أن تتناول البضائع الخطرة (مثل متعهدي الشحن الذين يناولون البضائع العامة). وقد نوقش في الأصل في DGP-WG/17. وأيدت أغلبية أعضاء فريق الخبراء بقوة التعديل في ذلك الاجتماع، ولم يؤيده عدد كاد أن يكون مساوياً.

٢-١-٤-٦ الخلفية

١-٢-١-٤-٦ تم إعداد التعديل متابعة للمناقشات بشأن ما إذا كانت أو لم تكن للدول سلطة مراقبة للكيانات التي لا تعتمز معالجة البضائع الخطرة بطريق الجو (انظر الفقرة ٢-١ من تقرير DGP/25 والفقرة ٢-١-٢-٣ من تقرير DGP-WG/17 والفقرة ١-٤-١-٢-٥ في إطار البند ٢ من جدول الأعمال لهذا التقرير). وكان القصد بالتعديل مخاطبة جميع الكيانات التي تعالج البضائع، لكن مركز المناقشات كان متعهدو الشحن. وعلى الرغم من أن أحكام التدريب الحالية في التعليمات الفنية تطلبت تدريب متعهدي الشحن على معالجة ومناولة البضائع العامة من خلال تطبيق الجدولين ١-٤ و ١-٥، لم يفسر بعض أعضاء فريق الخبراء هذه الأحكام على أنها إلزامية نظراً لأن الجداول قُصد بها أن تكون إرشاداً. وليس لدى هؤلاء الأعضاء سلطة إشراف على الكيانات التي لا تؤدي أي وظائف موصوفة في التعليمات الفنية. وكان موقف المكتب القانوني للإيكاو في DGP/25 هو أن التدريب لمتعهدي الشحن الذين لا يتناولون البضائع الخطرة كان موصى به لكن ليس إلزامياً عن طريق الملحق الثامن عشر (انظر الفقرة ٢-١ من تقرير DGP/25).

٢-٢-١-٤-٦ تشاورت الإدارة القانونية مرة أخرى من أجل النصح فيما يتعلق بإمكانية تنفيذ التعديل المقترح في DGP-WG/17، وظل موقفهم بلا تغيير. وأُرسل خطاب إلى الدول بعد DGP/25 لطلب معلومات محددة تتعلق بمدى مراقبة السلطة لمتعهدي الشحن. وبيّنت ست وثلاثون من إحدى وستين دولة رَدّت أن إدارة الطيران المدني (CAA) لها سلطة مراقبة لمتعهدي الشحن وهم يتناولون شحنات غير البضائع الخطرة داخل دولتهم، وأفادت ست وعشرون دولة بأن برامج التدريب لمثل هذه الكيانات كانت تخضع لموافقة إدارة الطيران المدني.

٣-١-٤-٦ الحجج المؤيدة للتعديل

١-٣-١-٤-٦ أولئك الذين أيدوا التعديل شجّعهم أنه كانت توجد مراقبة الدولة لمتعهدي الشحن في أغلبية الدول التي رَدّت على الدراسة الاستقصائية. ولم تر أي سبب لعدم اعتمادها، إذ أنها لم تعتبر أنه توجد أي مسؤوليات جديدة تم إدخالها. أما التدريب لمتعهدي الشحن والكيانات الأخرى التي تتناول البضائع العامة فقد تم إدخاله بوعي في طبعة ٢٠٠٥-٢٠٠٦ من التعليمات الفنية مع الاعتراف بأنهم لعبوا دوراً رئيسياً في منع البضائع الخطرة غير المعلنة من دخول مسار البضائع. ومن شأن تعديل الملحق أن يجعل مسؤوليات الدول عن المراقبة فيما يتعلق بهذا واضحة. والأعضاء الذين أيدوا التعديل اعتقدوا أن

٦-٤-١-٦-٦ تعديلات إضافية

٦-٤-١-٦-٦ على الرغم من اختلافات الرأي بين أعضاء فريق الخبراء بشأن ما كان ممكناً قانوناً، اتفق الجميع على أن خطر دخول البضائع الخطرة غير المعلنة مجرى النقل الجوي كان في حاجة لتخفيفه. إلا أن الأحكام الوحيدة في الملحق الثامن عشر المتعلقة بالبضائع غير المعلنة كانت أن على الدول أن تضع إجراءات للتحقيق وتجميع المعلومات المتعلقة بأمثلة لبضائع خطرة غير معلنة أو معلنة خطأ في البضائع. ولم تكن ثمة أي اقتضاءات لأن تضمن الدول وجود تدابير للتخفيف في مواجهة هذا الخطر. وبيان ما تحتاج إليه مخاطر السلامة تحتاج لمعالجة كان رئيسياً لتحديد ما تحتاج إليه تدابير التخفيف لتنفيذها. ولذلك اقترح تعديل منفصل للملحق الثامن عشر يتطلب أن تتخذ الدول تدابير تهدف إلى منع البضائع الخطرة غير المعلنة من دخول مجرى النقل الجوي. وتتاول التعديل البضائع الخطرة غير المعلنة المدخلة كبضائع أو كبضائع خطرة يحملها الركاب والطاقم. وكان مقصوداً بالأحكام أن تكون متطلبات عالية المستوى لكي تتيح للدول والمشغلين المرونة لتحديد أي التدابير ستخفف فعلياً من المخاطر وفقاً لمعالم خطرها وضمن بيئاتها التنظيمية والتشغيلية.

٦-٤-١-٦-٦ كان ثمة دعم لهذا التعديل من حيث المبدأ، على الرغم من أن بعض الأعضاء لم يصدقوا أنه ضروري. واعتقد البعض أن الحاجة لتخفيف المخاطر التي تشكلها البضائع الخطرة غير المعلنة كانت واضحة من خلال أحكام الإبلاغ عن البضائع الخطرة. ورأى آخرون من الضروري إظهار نية الأحكام بصراحة، والتعديل المقترح فعل ذلك. وكان هناك قلق من أن التعديل يضع كثيراً للغاية من المسؤولية على عاتق المشغل، نظراً لأن الصياغة تعني ضمناً أن أي مشغل مطلوب منه منع البضائع الخطرة المعلنة من نقلها، لكن مراجعة للصياغة خففت من هذه المخاوف. وتمت الموافقة على التعديل، مع الاعتراف بأن الدول قد تحتاج لإرشاد. وستنشأ مجموعة عمل لإعداد المادة.

٦-٤-١-٧ الاستنتاج

٦-٤-١-٧-٦ لم يمكن التوصل إلى توافق آراء بشأن التعديل لأحكام التدريب في الفصل العاشر. وتم اتخاذ قرار خلال المناقشات بشأن أحكام التدريب الجديدة في التعليمات الفنية عن طريق رفع الأيدي (انظر الفقرة ٦-٤-١-٢-٢ تحت البند ٢ من جدول الأعمال لهذا التقرير). وأيدت أغلبية متطلباً إلزامياً، على الرغم من أن العديد من الأعضاء لم يفعلوا ذلك.

٦-٤-٢ التوصيات

٦-٤-٢-١ في ضوء ما سبق من مناقشات، أعد الاجتماع التوصيات التالية:

التوصيات بشأن القواعد القياسية والتوصيات والإجراءات	التوصية ٤/٦ — تعديل أحكام التدريب والامتنال في الملحق الثامن عشر أن يتم السعي من أجل تعليقات الدول على تعديل مقترح للملحق الثامن عشر يتعلق بالتدريب والامتنال على النحو المعروض في المرفق بالتقرير بشأن البند ١ من جدول الأعمال.
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البند ٦ من جدول الأعمال: القيام، إن أمكن، ببحث بنود الأعمال غير المتكررة التي حدّتها لجنة الملاحة الجوية أو فريق الخبراء:

٥-٦: إيضاح مسؤوليات الدولة عن المراقبة في الملحق الثامن عشر (بطاقة الأعمال رقم (DGP.005.01)

١-٥-٦ إنشاء مجموعة عمل بشأن إيضاح مسؤوليات الدول عن المراقبة في الملحق الثامن عشر

١-١-٥-٦ حددت مجموعة عمل فريق خبراء البضائع الخطرة بشأن الإبلاغ (انظر الفقرة ١-٢-٦ تحت البند ٦ من جدول أعمال هذا التقرير) أن ثمة حاجة لتحسين الأحكام في الملحق الثامن عشر لجعلها تحدد بوضوح مسؤوليات الدول فيما يتعلق بالنقل الآمن للبضائع الخطرة بطريق الجو. ووافقت لجنة الملاحة الجوية على بطاقة الأعمال رقم DGP.005.01 بالمهمة الأولية التي تتمثل في تحديد الترابطات بين الملحق الثامن عشر والملحق الأخرى.

٢-٥-٦ أنشئت مجموعة عمل واجتمعت خلال الاجتماع. ووضعت خطة عالية المستوى لاستكمال العمل. وسيُنجز العمل من خلال اجتماعات افتراضية شهرية بهدف تقديم حزمة نهائية إلى الاجتماع السابع والعشرين لفريق خبراء البضائع الخطرة.

APPENDIX A

**PROPOSED AMENDMENTS TO PROVISIONS RELATED TO
LITHIUM BATTERIES IN THE TECHNICAL INSTRUCTIONS FOR
THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR**

Part 3

...

Chapter 1

GENERAL

...

Chapter 3

SPECIAL PROVISIONS

...

Table 3-2. Special provisions

TIs UN

...

DGP/26 (see paragraph 6.3.9 of this report)

A154 Lithium batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons or cells or batteries that cannot be diagnosed as damaged or defective prior to transport).

...

DGP/26 (see paragraph 6.3.8 of this report)

A201 ~~States concerned may grant an exemption from the prohibition to transport lithium metal or lithium ion batteries on passenger aircraft in accordance with Part 1;1.1.3.~~ In instances where other forms of transport (including cargo aircraft) is impracticable, lithium cells or batteries may be transported as Class 9 (UN 3480 or UN 3090) on passenger aircraft with the prior approval of the authority of the State of Origin, the State of the Operator and the State of Destination under the written conditions established by those authorities, provided that the following types and quantities are met:

a) quantities of lithium metal cells or batteries (UN 3090) are limited to the allowance permitted in Table 968-II of Packing Instruction 968; and

b) quantities of lithium ion cells or batteries (UN 3480) are limited to the allowance permitted in Table 965-II of Packing Instruction 965.

When States, other than the State of Origin, the State of the Operator or State of Destination have notified ICAO that they require prior approval of shipments made under this special provision, approval must also be obtained from these States, as appropriate.

The requirements of Part 5 for Class 9 (UN 3090 or UN 3480) lithium metal and lithium ion batteries apply. A copy of the document of approval including the quantity limitations must accompany the consignment. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

If transport in accordance with this special provision is not possible, States concerned may grant an exemption from the prohibition to transport lithium metal or lithium ion batteries on passenger aircraft in accordance with Part 1;1.1.3.

Authorities issuing exemptions or approvals in accordance with this special provision must provide a copy to the Chief of the Cargo Safety Section within three months via email at CSS@icao.int, via facsimile at +1 514-954-6077 or via post to the following address:

TIs UN

Chief, Cargo Safety Section
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Quebec
CANADA H3C 5H7

Note.— Guidance for the processing of exemptions or approvals from the prohibition to transport lithium batteries may be found in Part S-1;4 and Table S-3-1, Special Provision A334 of the Supplement to the Technical Instructions.

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Part 4**PACKING INSTRUCTIONS**

...

Chapter 3**CLASS 1 — EXPLOSIVES**

...

Packing Instruction 965

Cargo aircraft only for UN 3480

1. Introduction

This entry applies to lithium ion or lithium polymer batteries. This packing instruction is structured as follows:

- Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
- Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. SECTION IA

Each cell or battery must meet ~~all~~ the provisions of 2:9.3.

Packing Instruction 965

IA.1 General requirements

- Part 4;1 requirements must be met.
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.

Note.— Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-IA

<i>UN number and proper shipping name</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3480 Lithium ion batteries	Forbidden	35 kg

IA.2 Additional requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Lithium ion cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).
- Lithium ion batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

IA.3 Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

Packing Instruction 965

IB. SECTION IB

Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.

Lithium ion cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number "965" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5;4 apply.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ **and g)** and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;

IB.1 General requirements

- Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.

Note. — *Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.*

Table 965-IB

<i>Contents</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium ion cells and batteries	Forbidden	10 kg

Packing Instruction 965

IB.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).

~~*Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.*~~

IB.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 965

II. SECTION II

Lithium ion cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);
- Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

-
- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
 - Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);
 - Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);
 - Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
 - Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
 - Paragraphs 1 and 2 of this packing instruction.
-

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009.

II.1 General requirements

- Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity.

Note.— Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-II

<i>Contents</i>	<i>Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh</i>	<i>Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh</i>	<i>Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh</i>
1	2	3	4
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

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II.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- ~~Cells and batteries must not be packed in the same outer packaging with other dangerous goods.~~

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.

~~Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.~~

- A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.
- The words “lithium ion batteries, in compliance with Section II of PI965” — cargo aircraft only” or “lithium ion batteries, in compliance with Section II of PI965 — CAO” must be placed on the air waybill, when an air waybill is used.
- Packages and overpacks of lithium ion batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 965

II.4 Overpacks

Not more than one package prepared in accordance with this section may be placed into an overpack.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

Packages prepared in accordance with this section must not be placed into an overpack with packages containing substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

Note.— For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.

Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

1. Introduction

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

I.1 General requirements

Part 4;1 requirements must be met.

Packing Instruction 966

<i>UN number and proper shipping name</i>	<i>Package quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3481 Lithium ion batteries packed with equipment	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 Additional requirements

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a packaging that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spare~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

II. SECTION II

Lithium ion cells and batteries packed with equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~ and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;

Packing Instruction 966

- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 — the Watt-hour rating must be marked on the outside case except for those batteries manufactured before 1 January 2009.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	Package quantity (Section II)	
	Passenger	Cargo
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

- Lithium ion cells and batteries must:
 - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong rigid outer packaging.

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number **required** for the equipment's operation, plus two ~~spare~~ **spare sets**. **A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.**
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- The words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Where a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment that meet the limits for lithium cells or batteries of Section II, the following additional requirements apply:
 - the shipper must ensure that all applicable parts of both packing instructions are met. The total mass of lithium batteries contained in any package must not exceed 5 kg;
 - the words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Packing Instruction 966

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

Packing Instruction 967

Passenger and cargo aircraft for UN 3481 (contained in equipment) only

1. Introduction

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

I.1 General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Packing Instruction 967

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3481 Lithium ion batteries contained in equipment	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 Additional requirements

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

- The equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 Outer packagings

DGP-WG/16 (see paragraph 3.5.3.1.3 of DGP/26-WP/2) (incorporated in the 2017-2018 Edition of the Technical Instructions through Addendum/Corrigendum No. 1) (Steel, although not included in of DGP/26-WP/2, was also added under “boxes”):

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

Strong outer packagings

II. SECTION II

Lithium ion cells and batteries contained in equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and~~ e) and g) and the following:

- 1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
- 2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
 - the Watt-hour rating must be marked on the outside of the battery case except for those batteries

Packing Instruction 967

manufactured before 1 January 2009.

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3). The package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - This requirement does not apply to:
 - packages containing only button cell batteries installed in equipment (including circuit boards); and
 - packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- Where a consignment includes packages bearing the lithium battery mark, the words "lithium ion batteries, in compliance with Section II of P1967" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ **reproduced** on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high**.

Packing Instruction 968

Cargo aircraft only for UN 3090

1. Introduction

This entry applies to lithium metal or lithium alloy batteries. This packing instruction is structured as follows:

- Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
- Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and
- Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN Manual of Tests and Criteria is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. SECTION IA

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

IA.1 General requirements

Part 4;1 requirements must be met.

Table 968-IA

<i>UN number and proper shipping name</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
UN 3090 Lithium metal batteries	Forbidden	35 kg

IA.2 Additional requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Lithium metal cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).
- Lithium metal batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.

IA.3 Outer packagings*Boxes*

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Other metal (4N)
 Plastics (4H1, 4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

IB. SECTION IB

Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968-II, are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.

Lithium metal cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number "968" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5;4 apply.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e)~~, f) (if applicable) and g) and the following:

- 1) for lithium metal cells, the lithium content is not more than 1 g;
- 2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g.

IB.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-IB

<i>Contents</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium metal cells and batteries	Forbidden	2.5 kg

IB.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with electrically conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).

Note. The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

IB.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II. SECTION II

Lithium metal or lithium alloy cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);
- Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

- Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);
- Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);
- Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e, f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-II

<i>Contents</i>	<i>Lithium metal cells and/or batteries with a lithium content not more than 0.3 g</i>	<i>Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g</i>	<i>Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.

II.2 Additional requirements

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

- Cells and batteries must not be packed in the same outer packaging with other dangerous goods.

 UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.

Note.— The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.
- The words "lithium metal batteries, in compliance with Section II of PI968 — cargo aircraft only" or "lithium metal batteries, in compliance with Section II of PI968 — CAO" must be placed on the air waybill, when an air waybill is used.
- Packages and overpacks of lithium metal batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

Not more than one package prepared in accordance with this section may be placed into an overpack.

DGP-WG/17 (see paragraph 3.5.3.1 of DGP/26-WP/3):

Packages prepared in accordance with this section must not be placed into an overpack with packages containing substances and articles of Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).

 UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be ~~affixed~~ **reproduced** on the outside of the overpack and the overpack must be marked with the word "Overpack" **in lettering of at least 12 mm high.**

Note.— For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.

Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

1. Introduction

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN Manual of Tests and Criteria is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

I.1 General requirements

Part 4;1 requirements must be met.

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3091 Lithium metal batteries packed with equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 Additional requirements

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a packaging that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/26 (see paragraph 6.3.1 of report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spare~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
 - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer

Packing Instruction 969

rigid metal packaging surrounded by cushioning material that is non-combustible and non-conductive and placed inside an outer packaging.

I.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

II. SECTION II

Lithium metal or lithium alloy cells and batteries packed with equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

— Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

— ~~Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);~~

— Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);

— Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and

— Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e), f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

— Lithium metal cells ~~or~~ **and** batteries must:

- be placed in inner packagings that completely enclose the cell or battery, then placed in a strong rigid outer packaging; or
- be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong rigid outer packaging.

UN Model Regulations, Chapter 3.3, Special Provision 188 (d) (see ST/SG/AC.10/44/Add.1)

- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with **electrically** conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Packing Instruction 969

DGP/26 (see paragraph 6.3.1 of this report):

- The number of cells or batteries in each package must not exceed the ~~appropriate~~ number required for the equipment's operation, plus two ~~spares~~ spare sets. A "set" of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
- Each package must be marked with the appropriate lithium battery mark (Figure 5-3).
 - the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- The words "lithium metal batteries, in compliance with Section II of PI969" must be placed on the air waybill, when an air waybill is used.
- Where a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment that meet the limits for lithium cells or batteries of Section II, the following additional requirements apply:
 - the shipper must ensure that all applicable parts of both packing instructions are met. The total mass of lithium batteries contained in any package must not exceed 5 kg;
 - the words "lithium metal batteries, in compliance with Section II of PI969" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

1. Introduction

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. SECTION I

Each cell or battery must meet ~~all~~ the provisions of 2;9.3.

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

I.1 General requirements

Equipment must be packed in strong ~~rigid~~ outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name	Package quantity (Section I)	
	Passenger	Cargo
UN 3091 Lithium metal batteries contained in equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP-WG/16 (see paragraph 3.5.3.11 of DGP/26-WP/2):

- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- The quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

Packing Instruction 970

I.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

II. SECTION II

Error discovered and corrected through Addendum/Corrigendum No. 1 to 2017-2018 Edition):

Lithium metal or lithium alloy cells and batteries contained ~~with~~ in equipment, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

— Part 1;2.3 (General — Transport of dangerous goods by post);

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2) (incorporated in 2017-2018 Edition through Addendum/Corrigendum No. 1):

— Part 5;2.4.16 (Shipper's responsibilities — Special marking requirements for lithium batteries);

— Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);

— Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and

— Paragraphs 1 and 2 of this packing instruction.

DGP/26 (see paragraph 2.4.1.2 d) of this report):

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) ~~and e), f) (if applicable) and g)~~ and the following:

- 1) for a lithium metal cell, the lithium content is not more than 1 g;
- 2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 General requirements

DGP-WG/16 (see paragraph 3.5.3.10 of DGP/26-WP/2)

Equipment ~~containing batteries~~ must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	Package quantity (Section II)	
	Passenger	Cargo
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

II.2 Additional requirements

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong rigid outer packagings constructed of suitable material of adequate

Packing Instruction 970

strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.

- Each package must be marked with the appropriate lithium battery mark (Figure 5-3). The package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.
 - This requirement does not apply to:
 - packages containing only button cell batteries installed in equipment (including circuit boards); and
 - packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment.

Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

- Where a consignment includes packages bearing the lithium battery mark, the words "lithium metal batteries, in compliance with Section II of PI970" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

II.4 Overpacks

UN Model Regulations, Chapter 3.3, Special Provision 188 f) (see ST/SG/AC.10/44/Add.1)

When packages are placed in an overpack, the lithium battery mark (Figure 5-3) required by this packing instruction must either be clearly visible or the mark must be ~~affixed~~ reproduced on the outside of the overpack and the overpack must be marked with the word "Overpack" in lettering of at least 12 mm high.

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Part 7

OPERATOR’S RESPONSIBILITIES

...

Chapter 2

STORAGE AND LOADING

...

2.2 INCOMPATIBLE DANGEROUS GOODS

2.2.1 Segregation

...

DGP/26 (see paragraph 2.7.1.2 a) under Agenda Item 2 of this report):

2.2.1.2 Packages and overpacks containing lithium ion batteries prepared in accordance with Section IA or Section IB of Packing Instruction 965 and packages and overpacks containing lithium metal batteries prepared in accordance with Section IA or Section IB of Packing Instruction 968 must not be stowed on an aircraft next to, or in a position that would allow interaction with packages or overpacks containing dangerous goods which bear a Class 1, other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1 hazard label. To maintain acceptable segregation between packages and overpacks, the segregation requirements shown in Table 7-1 must be followed. The segregation requirements apply based on all hazard labels applied on the package or overpack, irrespective of whether the hazard is the primary or subsidiary hazard.

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DGP-WG/17 (see paragraphs 3.2.7.1 and 3.5.3.1 of DGP/26-WP/3):

Table 7-1. Segregation between packages

Hazard label	Class or division											
	1	2.1	2.2, 2.3	3	4.1	4.2	4.3	5.1	5.2	8	⁹ see 2.2.1.2	
1	Note 1	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
2.1	Note 2	—	=	—	=	—	—	—	—	—	—	x
2.2, 2.3	Note 2	=	=	=	=	=	=	=	=	=	=	=
3	Note 2	—	=	—	=	—	—	x	—	—	—	x
4.1	Note 2	=	=	=	=	=	=	=	=	=	=	x
4.2	Note 2	—	=	—	=	—	—	x	—	—	—	=
4.3	Note 2	—	=	—	=	—	—	—	—	x	—	=
5.1	Note 2	—	=	x	=	x	—	—	—	—	—	x
5.2	Note 2	—	=	—	=	—	—	—	—	—	—	=
8	Note 2	—	=	—	=	—	x	—	—	—	—	=
⁹ see 2.2.1.2	Note 2	x	=	x	x	=	=	x	=	=	=	=

An “x” at the intersection of a row and column indicates that packages containing these classes of dangerous goods may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents. Thus, a package containing Class 3 dangerous goods may not be stowed next to or in contact with a package containing Division 5.1 dangerous goods.

Note 1.— See 2.2.2.2 through ~~2.2.2.5~~ 2.2.2.4.

Note 2.— This class or division must not be stowed together with explosives other than those in Division 1.4, Compatibility Group S.

Note 3.— Packages containing dangerous goods with multiple hazards in the class or divisions which require segregation in accordance with Table 7-1 need not be segregated from other packages bearing the same UN number.

Note 4.— UN 3528, Engines, internal combustion, flammable liquid powered, Engines, fuel cell, flammable liquid powered, Machinery internal combustion, flammable liquid powered and Machinery, fuel cell, flammable liquid powered need not be segregated from packages containing dangerous goods in Division 5.1.

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Chapter 4

PROVISION OF INFORMATION

...

4.1 INFORMATION TO THE PILOT-IN-COMMAND

...

DGP/26 (see paragraph 6.3.2 of this report):

4.1.3 For UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**), the information required by 4.1.1 may be replaced by the UN number, proper shipping name, class, total quantity at each specific loading location, the aerodrome at which the package(s) is to be unloaded and whether the package must be carried on cargo aircraft only. UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**) carried under a State exemption must meet all of the requirements of 4.1.

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Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

Chapter 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

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Table 8-1. Provisions for dangerous goods carried by passengers or crew

Table 8-1 was restructured under Agenda Item 2 of this report (see paragraph 2.8.2). Amendments to lithium battery provisions in Table 8-1 proposed below are incorporated in the new format

Replace Table 8-1 with the following:

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
Batteries				
1) Lithium batteries (including portable electronic devices)	Yes (except for g)	Yes	(see c) and d)	<ul style="list-style-type: none"> a) each battery must be of a type which meets the requirements of each test in the <i>UN Manual of Tests and Criteria</i>, Part III, subsection 38.3; b) each battery must not exceed the following: <ul style="list-style-type: none"> — for lithium metal batteries, a lithium content of 2 grams; or — for lithium ion batteries, a Watt-hour rating of 100 Wh; c) each battery may exceed 100 Wh but not exceed 160 Wh Watt-hour rating for lithium ion with the approval of the operator; d) each battery may exceed 2 grams but not exceed 8 grams lithium content for lithium metal for portable medical electronic devices with the approval of the operator; e) batteries contained in portable electronic devices should be carried as carry-on baggage; however, if carried as checked baggage: <ul style="list-style-type: none"> — measures must be taken to prevent unintentional activation and to protect the devices from damage; and — the devices must be completely switched off (not in sleep or hibernation mode); f) batteries and heating elements must be isolated in portable electronic devices capable of generating extreme heat, which could cause a fire if activated, by removal of the heating element, battery or other components;

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
				g) spare batteries, including power banks: <ul style="list-style-type: none"> — must be carried as carry-on baggage; and — must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); <hr/> DGP/26 (see paragraph 6.3.5 of this report): <hr/> h) baggage equipped with a lithium battery(ies) must be carried as carry-on baggage unless the battery(ies) is removed from the baggage, in which case the battery(ies) must be carried in accordance with g); i) no more than two spare batteries meeting the requirements of c) or d) may be carried per person.

...

3) Battery-powered portable electronic smoking devices (e.g. e-cigarettes, e-cigs, ecigars, e-pipes, personal vaporizers, electronic nicotine delivery systems)	No	Yes	No	a) if powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g); b) the devices and/or batteries must not be recharged on board the aircraft; and <hr/> DGP/26 (see paragraph 6.3.7 of this report): <hr/> c) measures must be taken to prevent unintentional activation of the heating element while on board the aircraft.
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Flame and fuel sources

DGP-WG/17 (see paragraph 3.5.3.6 of DGP/26-W/3):

5) Cigarette lighter Small packet of safety matches	No	(see b))	No	a) no more than one per person; b) must be carried on the person; c) must not contain unabsorbed liquid fuel (other than liquefied gas); and d) if cigarette lighter is powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g) and 3) b) and c).
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APPENDIX B**PROPOSED AMENDMENTS TO PROVISIONS RELATED TO
LITHIUM BATTERIES IN THE SUPPLEMENT TO THE TECHNICAL
INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS
GOODS BY AIR****Part S-1****GENERAL****(ADDITIONAL INFORMATION
FOR PART 1 OF THE
TECHNICAL INSTRUCTIONS)**

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Chapter 4**GUIDANCE TO STATES ON THE TRANSPORT OF
LITHIUM BATTERIES AS CARGO****4.1 INTRODUCTION**

4.1.1 Lithium batteries have the potential to create thermal runaway, a chain reaction which leads to repeated self-heating and the release of a battery's stored energy. Once one battery experiences thermal runaway, it can generate enough heat to trigger thermal runaway in adjacent batteries. Thermal runaway can occur for a number of reasons, including poor cell design, cell manufacturing flaws and external abuse. It has been demonstrated through testing that thermal runaway can result in fire and/or explosion.

4.1.2 A prohibition on the transport of UN 3090 — **Lithium metal batteries** as cargo on passenger aircraft was introduced into the 2015-2016 Edition of the Technical Instructions with the knowledge that aircraft cargo fire protection systems could not control a lithium metal fire. More recent test results demonstrate that a fire involving high-density packages of UN 3480 — **Lithium ion batteries** may exceed the capability of aircraft cargo fire protection systems. High-density packages of lithium ion batteries may consist of any number of batteries or cells having the potential to overwhelm cargo compartment fire protection features. The potential is dependent on a number of variables including the battery or cell chemistry, size, design type, quantities and the cargo compartment configuration. The inability to determine an absolute safe quantity limit for lithium ion batteries and the absence of a packaging standard to mitigate the risks has led to the decision to introduce a prohibition on the transport of UN 3480 — **Lithium ion batteries** as cargo on passenger aircraft.

4.1.3 Development of a performance-based packaging standard for lithium ion batteries is currently under way. It is anticipated that once this standard is completed and any additional controls necessary to mitigate risks are established, an amendment to the Technical Instructions will be made to allow for their transport as cargo on passenger aircraft.

DGP/26 (see paragraph 6.3.8 of this report)

4.1.4 At a minimum, the following criteria should be identified as part of a safety risk assessment when considering whether or not to grant an **approval or an exemption** to transport UN 3480 — **Lithium ion batteries** **or UN 3090 — Lithium metal batteries** as cargo on passenger aircraft under Special Provision A201:

- a) capabilities of the operator;
- b) overall capability of the aircraft and its systems;
- c) packing and packaging;
- d) quantity of batteries and cells;

- e) containment characteristics of unit load devices;
- f) specific hazards and safety risks associated with each battery and cell type to be carried alone or in combination; and
- g) chemical composition of the batteries and cells.

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Part S-3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND QUANTITY LIMITATIONS

...

Chapter 4

SUPPLEMENTARY DANGEROUS GOODS LIST

Classes 3 to 9

Table S-3-1. Supplementary Dangerous Goods List (Classes 3 to 9)

DGP/26 (see paragraph 6.3.8 of this report)

Name	UN No.	Class or division	Subsidiary hazard	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
...												
Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous — Lithium batteries	US 3	A88 A99 A154 A164 A183 A201 A206 A331 <u>A334</u>		E0	FORBIDDEN		See 965	
Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous — Lithium batteries	US 2 US 3	A88 A99 A154 A164 A183 A201 A206 <u>A334</u>		E0	FORBIDDEN		See 965	
...												

...

Chapter 6

SPECIAL PROVISIONS

Against the entries in the Supplementary Dangerous Goods List (Table S-3-1), column 7 shows any special provisions that are applicable. Where these special provisions have not been listed in Table 3-2 of the Technical Instructions, they are listed in Table S-3-4 below.

Table S-3-4. Special Provisions

Supplementary special provisions

DGP/26 (see paragraph 6.3.8 of this report)

- A334
- a) In instances where other forms of transport (including cargo aircraft) is impracticable, lithium cells or batteries may be transported on passenger aircraft with the prior approval of the authority of the State of Origin, the State of the Operator and the State of Destination under the written conditions established by those authorities, provided that the following types and quantities are met:
- 1) quantities of lithium metal cells or batteries (UN 3090) are limited to the allowance permitted in Table 968-II of Packing Instruction 968; and
 - 2) quantities of lithium ion cells or batteries (UN 3480) are limited to the allowance permitted in Table 965-II of Packing Instruction 965.
- b) When considering an approval, at a minimum, the following criteria should be considered to mitigate risks posed by a lithium cell or battery heat, smoke or fire event inside a package at the cell, battery or package level:
- 1) no amount of flame is allowed outside the package;
 - 2) the external surface temperature of the package cannot exceed the amount that would ignite adjacent packing material or cause batteries or cells in adjacent packages to go into thermal runaway;
 - 3) no fragments can exit the package and the package must maintain structural integrity;
 - 4) the quantity of flammable vapour emitted must be less than the amount of gas that when mixed with air and ignited could cause a pressure pulse that could dislodge the overpressure panels of the aircraft cargo compartment or damage the aircraft cargo compartment liners; and
 - 5) when the package or overpack is exposed to an external fire (e.g. five-minute oil burner flame penetration resistance test) or elevated temperature environment (e.g. oven thermal resistance test), any hazardous effects caused by thermal runaway of the lithium cell or battery must be contained within the package.
- Adequate information and documentation on the above criteria (b)1) through 5)) must be provided to the appropriate authority of the State issuing the approval upon request.

...

APPENDIX C

**DRAFT JOB CARD FOR BATTERIES AND ELECTRONIC DEVICES
CARRIED BY PASSENGERS, CREW AND THE OPERATOR**

Title	Lithium battery-powered portable electronic devices and spare lithium batteries carried and/or used by passengers and crew [and the operator]	Reference:	DGP.008.01
Source	DGP/26, ANC		
Problem Statement	Current measures to [mitigate the risks] posed by portable electronic devices and spare lithium batteries (including power banks) carried by passengers, crew [and the operator] may not be effective or feasible to implement		
Specific Details (including impact statements)	<p>Measures to [mitigate against the risks] posed by lithium batteries carried and/or used by passengers and crew include requirements that may not be clear or realistic for operators and passengers to implement. These include:</p> <ul style="list-style-type: none"> a) requirements for the batteries to have been tested in accordance with the UN <i>Manual of Tests and Criteria</i>; b) limits on the energy density (i.e. Watt hour rating for lithium ion and lithium content for lithium metal); c) requirements for batteries to be protected so as to prevent short circuits; d) lack of specification as to what is meant by operator approval; d) requirements for heating elements to be isolated in portable electronic devices capable of generating extreme heat; and e) requirements for the carriage of battery-powered mobility aids, which could conflict rights of passengers with restricted mobility . <p>These measures also had an impact on the operator's use of electronic devices during flight, which are excepted from the Technical Instructions provided they comply with the provisions for passengers and crew to carry them.</p> <p>The ANC, during its review of a proposed amendment related to power banks which was later withdrawn because it conflicted with these operator exceptions, tasked the panel with:</p> <ul style="list-style-type: none"> a) developing meaningful criteria that passengers and staff could realistically apply when carrying PEDs; a) clarifying language used with respect to exceptions for dangerous goods of the operator in Part 1:2.2 to avoid misinterpretation and unintended consequences; b) considering the effects of power bank provisions on operators providing them for use by passengers during flight; c) considering manufacturing requirements and the feasibility of requiring batteries carried by passengers or crew to be subject to UN testing requirements; and d) developing meaningful guidance for States, operational staff and passengers on criteria for carriage of devices on board an aircraft. <p>The Commission further emphasized that the panel should consider that devices be:</p> <ul style="list-style-type: none"> a) professionally manufactured, preferably indicating a trademark and model number; b) in good repair and free from damage; c) used in accordance with manufacturer's instructions when carried on the aircraft; d) switched off completely if carried but not in use (not hibernation); and 		

	e) meaningfully labelled with information on watt and amp hours.					
Expected Benefit	Effective safety measures to mitigate against the risks posed by portable electronic devices spare and lithium batteries (including power banks) carried by passengers, crew and the operator which are realistic for operators and passengers to implement					
Reference Documents	DGP/26 Report (paragraphs 6.3.4, 2.8.3), ANC 205-3, 205-4, 205-5 Technical Instructions (Part 1:2.2 and Part 8)					Attachments
Primary Expert Group:	DGP, FLTOPSP, ARIP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates:		
				Expert Group	Effective	Applicability
	Technical Instructions	Amendment to passenger provisions	FLTOPSP			
	Technical Instructions	Amendment to exceptions for dangerous goods of the operator	AIRP			
	Annex 6?					
	Annex 8?					
	Annex 18?					
Initial Issue Date:		Date approved by ANC:		Session/Meeting:		

المرفق (د)

القيود على حمل الأجهزة الإلكترونية المحمولة الضخمة بواسطة الركاب والطاقم

العقبات التشغيلية و/أو الحجب ضد حظر الأجهزة الإلكترونية المحمولة الضخمة في الأمتعة المسجلة

- يتعين أخذ إمكان الحدوث في الحسبان، وعدم وجود دليل على خطر هام.
- لا دليل على وقائع خطيرة تتضمن أجهزة إلكترونية محمولة في الأمتعة المسجلة.
- ينبغي الاحتياج للمزيد من البيانات بشأن الحوادث والوقائع قبل أن يمكن التوصل إلى قرار.
- من الصعب إن لم يكن من المستحيل الحصول على بيانات صالحة ويمكن الاعتماد عليها في إطار وقت قصير.
- استهدفت البطاريات الكبيرة على وجه التحديد للتدابير الأمنية بسبب احتمال وضع أجهزة متفجرة ارتجالية داخل أجهزة إلكترونية محمولة ضخمة. وتطبيق تدابير سلامة تستهدف الأجهزة الإلكترونية المحمولة الضخمة فقط ليس منطقياً لأن الأجهزة الإلكترونية المحمولة الأصغر يمكن أن تحتوي على بطاريات عالية الكثافة.
- الجهاز الإلكتروني المحمول "الضخم" قابل للتفسير.
- التدابير الأمنية التي تتطلب أن يضع الركاب الأجهزة الإلكترونية المحمولة في الأمتعة المسجلة أمكن القيام بها. ومطالبة الركاب بإخراج الأجهزة الإلكترونية المحمولة من الأمتعة المسجلة إلى الأمتعة المحمولة لا يمكن القيام بها دائماً.
- لا يوجد نهج قياسي لضمان الامتثال، ولذلك فإن الوضع الراهن سيكون هو الحال في كثير من الأحيان.
- يشير التعديل المقترح إلى موافقة المشغل، لكنه لا يوضح إذا كانت هذه موافقة شاملة لجميع الركاب بواسطة مشغل منفرد أو إذا لم تكن كذلك على أساس كل راكب وماذا يتوقع من المشغل؟ وإذا كان على أساس الراكب، قد يكون من المستحيل على المشغلين التعامل مع الوضع ويتوقف ذلك على الأعداد التي تطلب الموافقة.
- استهدف اختبار إدارة الطيران الاتحادية الحواسيب المحمولة. وأي جهاز يمكن أن يصاب بتسرب حراري لديه بعض الاحتمال للحريق. وعادة ما تُحمل الحواسيب المحمولة داخل المقصورة، ويتم تسجيل الكثير منها داخل الأمتعة (مثل مكبرات الصوت المحمولة والماسحات والأدوات الكهربائية). والخطر هو بطارية، بصرف النظر عما يحتوي عليها.
- قد يعتزم الركاب مواصلة السير ثم يُطلب منهم التحقق عند وصولهم للبوابة.
- بعض الأجهزة الإلكترونية المحمولة محظورة في المقصورة بسبب الخطر الأمني (مثل الأدوات الكهربائية).
- بعض المعدات الضخمة المزودة بالطاقة ببطارية الليثيوم كبيرة للغاية بالنسبة للمقصورة، مثل الطائرات بلا طيارين ومعدات آلات التصوير المهنية.
- ينبغي النظر في طلب بيان تكاليف مخفض.

- التعقيدات المتعلقة بالنقل المشترك.
- لا يخاطب موظفي مشغّل المخاطر وهم يضعون الأمتعة في مقصورة البضائع على متن طائرة بضائع.
- التعريف للجهاز الإلكتروني المحمول غير ضروري، فهو معرّف في التعليمات الفنية.

حجج مؤيدة لحظر الأجهزة الإلكترونية المحمولة الضخمة في الأمتعة المسجلة

- يظهر الاختبار الاحتمال لوقوع حدث كارثي، لا يمكن الحفاظ على الوضع الراهن.
- البيانات المتوافرة تظهر وجود خطر.
- احتمال الخطر على السلامة قد يكون بعيداً، لكن شدة خطر السلامة قد تكون كارثية.
- مبادئ إدارة السلامة تتطلب اتخاذ إجراء.
- يمكن التغلب على الصعوبات التشغيلية من خلال الإرشاد (بما في ذلك إجراءات استجابة الطوارئ والقدرات في المقصورة).
- توصية مجموعة سلامة الشحن تم التوصل إليها من خلال توافق الآراء، ثمة حاجة لاتخاذ إجراء، عالج المسائل التشغيلية.
- عدد الوقائع الإبلاغ عنه ناقص.
- الحظر البسيط للأجهزة الإلكترونية المحمولة في الأمتعة المسجلة يسهل فهمه. توجد توصية بالفعل. الأساليب الأخرى أكثر تعقيداً وتجعل عدم الامتثال محتملاً أكثر.
- الأجهزة الإلكترونية المحمولة "الصغيرة" يمكن أن تحتوي على بطاريات أعلى كثافة، لكن يصعب على الركاب الفهم. ويوجد عموماً ترابط بين الحجم والخطر. ووضع حجم مثل أكبر من هاتف ذكي يسهل على الركاب فهمه، يمكن تنفيذه واقعياً.
- أوصت مجموعة سلامة الشحن بوضع تعريف للأجهزة الإلكترونية المحمولة. هذا يمكن أن يعالج شواغل متصلة بحجم البطارية وكثافة الطاقة.
- لا ينبغي الإبقاء على الوضع الراهن استناداً إلى افتراض أن الركاب يحملون حواسيب محمولة في المقصورة، الحاجة للنظر في جميع الاحتمالات.
- المتطلبات الفنية مثل حالة الشحن المخفضة لا يمكن تنفيذها واقعياً.
- توجد حاجة لاتخاذ إجراء حتى إذا لم يكن حظراً من الأمتعة المسجلة. إعلام الدول/المشغلين/الركاب بالخطر والإرشاد بشأن الكيفية التي يمكن بها التخفيف منه.

البند ٧ من جدول الأعمال: الأعمال الأخرى**١-٧ الموافقة على تقارير الفريق العامل
(DGP/26-WP/2 And DGP/26-WP/3)**

١-١-٧ استعرض الاجتماع الأجزاء السردية من تقارير اجتماعي الفريق العامل التابع لفريق خبراء البضائع الخطرة: DGP-WG/16 (مونتريال، من ١٠/١٧ إلى ١٠/٢١) و DGP-WG/17 (مونتريال، من ٤/٢٤ إلى ٤/٢٨/٢٠١٧). وتمت الموافقة على الأجزاء السردية دون إبداء تعليق. واستعرضت الأفرقة العاملة التعديلات المقترحة في ورقة العمل DGP/25-WPs/10 (انظر التقرير عن البند ١ من جدول الأعمال) وورقات العمل DGP/25-WPs/11, 12, 13, 14, 15, 16, 17, 18 (انظر التقرير عن البند ٢ من جدول الأعمال)، وورقة العمل 20 (انظر التقرير عن البند ٤ من جدول الأعمال) التي كانت تحتوي على التعديلات الموحدة.

٢-٧ الشواغل التي أثارها الأعضاء فيما يتعلق بالحاجة إلى توافق الآراء

١-٢-٧ طُرح سؤال للأمانة فيما يتعلق بالحاجة لتوافق الآراء. وفي حين يوجد اعتراف بأن توافق الآراء ينبغي أن يكون هدفاً لمسائل أوسع نطاقاً، فإن فريق خبراء البضائع الخطرة كان فريق خبراء فني تضمن مناقشات بشأن أحكام تفصيلية للغاية في التعليمات الفنية. وبعض هذه التفاصيل كثيراً ما كانت صغرى لكنها مسائل فنية ضرورية. وكان ثمة قلق لأنه إذا تم الالتزام الصارم بالحاجة إلى توافق الآراء، سيكون هناك تخفيض في الفعالية. واقتُرح أن الفريق قد استخدم نهج "تصويت" لقرارات في الماضي بدون أي آثار ضارة. وجرى التساؤل عما إذا كان الالتزام الصارم بالحاجة إلى توافق الآراء كان ما توقعته لجنة الملاحه الجوية.

٢-٢-٧ اعترفت الأمانة بأن تحقيق توافق الآراء كثيراً ما كان صعباً ووافقت على أن "التصويت" على مسائل فنية صغرى كان مقبولاً، ومن الأفضل إذا تحققت أغلبية واضحة. وأخذت علماً بأن تركيز لجنة الملاحه الجوية على الحاجة لتوافق الآراء قد نما بعد DGP/25 عندما كانت القرارات المتعلقة ببطاريات الليثيوم يتم التوصل إليها بدون توافق آراء. وقبلت لجنة الملاحه الجوية توصية فريق الخبراء بعدم حظر نقل بطاريات إيون الليثيوم على متن طائرات الركاب ولكن تعيّن بعد ذلك إلغاء قرارها بالاستناد إلى معلومات مرتدة من فرق خبراء أخرى توصلت إلى توافق الآراء.

٣-٢-٧ شددت لجنة الملاحه الجوية على أن الأحكام المأمونة والمستقرة كانت تعتمد على جميع الشواغل التي تعالج. وأشارت الأمانة إلى إصدار فريق الخبراء قرارات عن طريق "تصويت" كنهج لحل مشكلة. واقترحت أن فريق الخبراء في حاجة لأن يصبح أكثر اعتياداً على النظر في نهج معدلة أو بديلة للتوصل إلى توافق آراء أكبر. ولاحظت أن مسألة توافق الآراء يمكن إثارتها خلال استخلاص المعلومات الذي سيعطى للجنة الملاحه الجوية في أواخر اجتماع فريق الخبراء.

٣-٧ عروض**١-٣-٧ فريق خبراء عمليات الطيران (FLTOPSP) المجموعة الفرعية لسلامة البضائع (CSSG)**

١-١-٣-٧ قدّم أمين فريق خبراء عمليات الطيران (FLTOPSP) المجموعة الفرعية لسلامة البضائع (CSSG) إحاطة إلى فريق الخبراء بشأن حالة بطاقة أعمال لجنة الملاحه الجوية FLTOPSP.043.01 — تخفيف المخاطر التي يشكلها نقل البضائع جواً. وكانت المجموعة تتألف من ثمانية عشر عضواً من فريق خبراء عمليات الطيران وفريق خبراء البضائع الخطرة وفريق خبراء صلاحية الطائرات للطيران (AIRP). وعملت المجموعة عن طريق المراسلة واجتماعات افتراضية تحدد مواعيدها

بانتظام. وكان تركيزها هو وضع قواعد رفيعة المستوى لأحكام تقديرات الخطر على السلامة لنقل البضائع لإدراجها في الملحق السادس وقد بدأت مؤخراً في وضع مواد إرشادية مساندة. وكان التاريخ المستهدف للتطبيق هو نوفمبر ٢٠٢٠.

٧-٣-٢ بطاقات الأعمال ذات الصلة بفريق خبراء صلاحية الطائرات للطيران/فريق خبراء البضائع الخطرة

٧-٣-٢-١ قدّمت أمانة فريق خبراء صلاحية الطائرات للطيران معلومات إلى فريق الخبراء بشأن وضع بطاقتي أعمال لجنة الملاحة الجوية AIRP.011.01 — أحكام إطفاء حريق مقصورة البضائع و AIRP.012.01 — السيطرة على مخاطر الإشعاع الكهرومغناطيسي التي يشكلها نقل الأجهزة المزوّدة بالطاقة ببطاريات في الأمتعة والبضائع والبريد التي تصبح ناشطة عندما تكون داخل مقصورة الشحن بالطائرة. ولاحظت أن الاجتماع الخامس لفريق خبراء صلاحية الطائرات للطيران (AIRP/5) سينعقد من ٦ إلى ١٠/١١/٢٠١٧.

بطاقة أعمال لجنة الملاحة الجوية AIRP.011.01 — أحكام إطفاء نار مقصورة الشحن

٧-٣-٢-٢ دفعت المناقشات المتصلة ببطاريات الليثيوم إلى الحاجة إلى النظر في قدرات أنظمة إطفاء الحريق في مقصورة الشحن إذ أنها متصلة بالبضائع الخطرة. ويتطلب الملحق الثامن — صلاحية الطائرات للطيران أن تراعى آثار انفجار أو جهاز حارق أو بضائع خطيرة في تصميم أنظمة إطفاء النار في تصميم مقصورة الشحن في الطائرات الكبيرة. وبعد مزيد من الاستعراض، وافق فريق خبراء صلاحية الطائرات للطيران على أن هذا المعيار يستحيل الامتثال له تماماً نظراً لأنه يوجد الكثير من المتغيرات غير المعروفة خلال مرحلة تصميم الطائرة لا يمكن تحديدها كميّاً. أما قوانين التصميم المعاصرة فقد تناولت بوضوح التهديد من متفجرات أو أجهزة حارقة محددة بدقة لكن لم تعتبر صراحة التهديد من بضائع خطيرة كالشحنة. واختتم فريق خبراء صلاحية الطائرات للطيران بأن ثمة حاجة إلى نهج متعدد التخصصات يشمل على خبراء صلاحية الطائرات للطيران وعمليات الطيران والبضائع الخطرة لتعيين حدود بين معايير تصميم الأداء الأدنى والعمليات والمخاطر التي تشكلها البضائع الخطرة.

AIRP.012.01 — السيطرة على مخاطر الإشعاع الكهربي المغناطيسي التي

يشكلها حمل الأجهزة التي تستمد الطاقة من البطاريات في الأمتعة والبضائع والبريد التي تنشأ عندما تكون داخل مقصورة الشحن بالطائرة.

٧-٣-٢-٣ حثّ عضو في فريق خبراء البضائع الخطرة على الحاجة إلى تحليل السيطرة على التدخل الكهرومغناطيسي المحتمل في أنظمة الطائرة من الأجهزة الإلكترونية المقرونة أو المحتوى عليها في البضائع وأجهزة وحدة التحميل (انظر الفقرة ٢-١-٨-٢ في البند ٢ من جدول أعمال هذا التقرير). ونقل واستخدام أجهزة إلكترونية محمولة (PED) على متن طائرة خلال الطيران بواسطة ركاب سبق أن خاطبتهم تماماً السلطات التنظيمية ومن خلال إرشادات شاملة قدمتها الإيكاو من خلال *the Guidelines for the Expanded Use of Portable Electronic Devices* (Cir. 340, AN/198). غير أن الزيادة الكبيرة في عدد الأجهزة الإلكترونية المحمولة التي تحتوي عليها أو تُربط بها بنود من الأمتعة وكذلك تُربط بوحدات التحميل في الطائرة (ULD) نجمت عنه الحاجة إلى تحليل السيطرة على مثل هذه المخاطر للتدخل ولوضع أحكام عند الضرورة.

٧-٣-٢-٤ العمل في بطاقات الأعمال ذات الصلة بفريق خبراء صلاحية الطائرات للطيران/فريق خبراء البضائع الخطرة سيبدأ AIRP/5 الذي سينعقد من ٦ إلى ١٠/١١/٢٠١٧. وستخطر الأمانة فريق خبراء البضائع الخطرة بنتائجه.

٤-٧ حالة لجنة أداء تعبئة بطاريات الليثيوم SAE G-27

١-٤-٧ قدم الرئيس المشارك للجنة أداء تعبئة بطاريات الليثيوم SAE G-27 تحديثاً بشأن وضع المعيار. وسيتم استعراض مشروع معيار رابع في اجتماع حضوري للجنة G-27 من ١٣ إلى ١٧/١١/٢٠١٧. وكانت متوقعة نسخة نهائية من المعيار لإكمالها بحلول نهاية ٢٠١٧ وعملية الموافقة الرسمية (التصويت) كانت من المتوقع أن تبدأ في ٢٠١٨. وتم تزويد فريق الخبراء بفكرة عامة عن مضمون مشروع المعيار. ولم يتناول المشروع التهديد بحريق خارجي على عبوات من بطاريات الليثيوم. وقد أنشئت مجموعة فرعية للنظر في التهديد. وكانت ثمة آراء مختلطة بشأن كل من G-27 الكامل والمجموعة الفرعية بالنسبة لما إذا كان أو لم يكن ثمة حاجة للتهديد لكي يؤخذ في الحسبان. وكان رأي أن جودة العبوة وفرت حماية إضافية واحتمال مشاركة بطاريات الليثيوم في حريق خارجي ضعيف للغاية، ولم يكن في احتياج لأخذه في الحسبان. وكان الرأي الآخر أن مبادئ إدارة السلامة فيما يتعلق بمخاطر الطيران المطلوب التخفيف منها إذا كانت نتيجة حدث يمكن أن تكون كارثية، حتى إذا كان احتمال الحدوث مستبعداً. وسيقدم تقرير من مجموعة الحريق الخارجية إلى لجنة G-27 بأكملها. وسيطلب من اللجنة النظر في شمول متطلبات أداء داخل المعيار أو وضع وثيقة منفصلة.

٢-٤-٧ التنسيق مع جهات معنية مختلفة عديدة وتحقيق توافق الآراء داخل مجموعة كبيرة كان عملية صعبة. وكان جدول زمني متفائل هو إكمال المعيار خلال الربع الثاني من عام ٢٠١٨.

٥-٧ الاختبار الأولي للقاعدة القياسية للتعبئة SAE G-27

١-٥-٧ قدم ممثل من PRBA – The Rechargeable Battery Association إلى الاجتماع نظرة عامة للاختبار الأولي الذي يُجرى وفقاً للقاعدة القياسية للتعبئة G-27. وقدم نظرة عامة لتطورات التعبئة.

٦-٧ النقل الآمن للأجهزة الإلكترونية المحمولة على متن طائرات الركاب

١-٦-٧ قدم ممثل من فرع السلامة من الحريق التابع لإدارة الطيران الاتحادية ملخصاً للنتائج من اختبارات سابقة أجريت على أجهزة إلكترونية محمولة تستمد طاقتها من بطاريات ليثيوم في الأمتعة. وقد وُصفت هذه الاختبارات خلال المناقشة بشأن اقتراح لحظر الأجهزة الإلكترونية المحمولة الضخمة من الأمتعة المسجلة (انظر الفقرة ٦-٣-٦ في إطار البند ٦ من جدول الأعمال لهذا التقرير).