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工 作 文 件

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危险物品专家组（DGP）

第二十三次会议

2011年10月11日至21日，蒙特利尔

议程项目5：在可能的范围内，解决空中航行委员会或专家组查明的非经常性的工作项目

议程项目5.1：审查关于运输锂电池的规定

锂电池标准

（由J. McLaughlin提交）

摘要

本文件建议对《技术细则》进行修订，以确保运输锂离子电池的条件遵守航空运输危险物品的既定原则。

说明：本件不代表美国政府的立场。它提出一个想法供审议。

危险物品专家组的行动：请危险物品专家组考虑这份工作文件第 1 段讨论的安全方面的考虑，并按照本工作文件附录所示删除第 II 节包装说明 965 和 968。这项修订将取消对小型锂离子电池和锂金属电池（即不在设备之中或与其运输的电池）的例外，并确保技术细则的基本要素适用于，1）托运人需要接受运输锂电池要求的培训；2）运营人需要在装载和在航空器上存放之前进行验收；和 3）向驾驶员通知航空器上存在有锂离子电池及其位置和数量。

1. INTRODUCTION

1.1.1 The risk presented by lithium batteries in air transportation has been frequently discussed at DGP working groups and panel meetings. Additional shipping descriptions specific to each battery type, amendments to quantity limits, the introduction of specific handling labels, and improved emergency response guidance have come about as a result of these discussions. However, the Technical Instructions continue to allow many lithium batteries to be transported as general cargo and without the safety benefits that the dangerous goods transportation safety system requires even for other common commodities such as paint and dry ice. Meanwhile, lithium batteries shipments are increasing in number,

batteries are increasing in energy density, and research continues to inform regulators of the significant risk of lithium batteries in air transportation.

1.2 There are numerous safety implications for transporting a commodity classified as an item of dangerous goods as general cargo and therefore outside of dangerous goods transportation safety system. One consequence of the current regulatory approach is that the pilot has no information on the quantity, location, and types of lithium batteries —- including "bulk" battery shipments onboard the aircraft. This omission is entirely inconsistent with safety principles. Lithium battery fires (regardless of the source or cause) burn hotter, propagate faster, and are more difficult to suppress than other cargo fires. Pilots in command of an aircraft are responsible to make the determination of the first suitable airport for landing and all available information that could affect the time between a controllable and uncontrollable incident should be made available for use in this decision making process. Likewise, emergency responders are also unaware of the full threat they may confront once an aircraft has landed.

1.3 Training has long been viewed as the cornerstone to safety. All requirements have to be applied correctly to be effective. For most dangerous goods, shippers and operators must be trained commensurate with their responsibilities. Recordkeeping of this training ensures that the training is current and the trained personnel are used for the appropriate functions. Compliance and understanding of the requirements are essential to safety. In many States, operator training programs are approved and monitored. Although Packing Instruction 965 and Packing Instruction 968 require any person preparing or offering cells or batteries in accordance with these packing instructions to receive instruction commensurate with their responsibilities, this requirement is not equivalent to the level of training, confirmation of completion, and documentation prescribed in Part 1;4 of the Technical Instructions. However, for many lithium batteries, training is not required — therefore a key element of the regulations essential to safety is omitted for a commodity that poses a more substantive risk than many other dangerous goods subject to the full scope of the Technical Instructions.

1.4 For the lithium battery shipments that this paper addresses, each package is currently required to have only the lithium battery handling label. This label has a graphic of batteries and a fragile indicator and indicates that if damaged may catch fire so if damaged not to load the package. It also must include an emergency response telephone number. There are significant problems with this label. One problem is that emergency response personnel are trained to respond to hazard class labels and UN numbers marked on packages. A second problem is that air operators are not required to perform an acceptance check and inspection because the cells and batteries are excepted, as the DGP has previously decided. Air operator personnel are trained to handle a package with a hazard class label with caution. Any damage found during inspection and acceptance would indicate the package should not continue in transportation. But the very people that handle the package are not required to read the handling label and never inspect the package for damage. In the mechanized environment that packages go through in the new small package environment many cargo carriers operate, the acceptance check is the means to prevent incidents and the remainder of the handling until the consignee receives the package will be mechanized. Electronic systems common to many operators allow packages in the general cargo system to come into human contact as little as two times. A third problem is that the shippers required to know to apply the label are not required to have dangerous goods training. This reduces the likelihood of compliance.

1.5 A fire associated with lithium batteries does not necessarily suggest that a fire was caused by lithium batteries. What is known is that lithium batteries, when in the presence of typical cargo fires, will exacerbate the hazard. This also underscores the need for pilots to have awareness of the presence, location, and quantity of lithium batteries. The incident history must be seen as precursors to catastrophic accidents and has prompted research by the Federal Aviation Administration (FAA). This research shows that a relatively small fire source is sufficient to heat lithium batteries to the point of thermal runaway and

current fire suppression systems may not be effective in suppressing a cargo fire involving lithium batteries. The severity of a fire involving lithium batteries will depend on such factors as the total number and type of batteries on board an aircraft and the batteries' proximity to one another. Thus many packages of closely packed batteries, such as a palletized unit, pose a substantial hazard.

1.6 Information papers will be submitted to provide the DGP with published research conducted by the FAA that characterize the unique risks and hazards that lithium batteries present in air transportation.

1.7 Currently, Packing Instructions 965 and 968 are applied to lithium ion and lithium metal batteries, respectively. Section II of those packing instructions provides for complete relief from all other provisions of the Technical Instructions when certain conditions defined in those sections are met. While these conditions limit the quantity of batteries per package, no limit is placed on the number of packages that may be consolidated within an overpack, palletized, transported in a single unit load device, or placed in a single aircraft cargo compartment. In addition, because such batteries are not declared as dangerous goods, operators are limited in the information received — for example, no dangerous goods declaration is required and no notification to the pilot in command is necessary. While the relief afforded may make sense for an individual battery or small numbers of such batteries, the lack of any limit beyond the individual package quantity allows for large quantities of batteries to be consolidated therefore increasing the risk in a fire situation — whether or not the fire is initiated by the batteries themselves or by an outside source.

2. 危险物品专家组的行动

2.1 请危险物品专家组考虑这份工作文件第 1 段讨论的安全方面的考虑，并按照本工作文件附录所示删除第 II 节包装说明 965 和 968。这项修订将取消对小型锂离子电池和锂金属电池（即不在设备之中或与其运输的电池）的例外，并确保技术细则的基本要素适用于，1）托运人需要接受运输锂电池要求的培训；2）运营人需要在装载和在航空器上存放之前进行验收；和 3）向驾驶员通知航空器上存在有锂离子电池及其位置和数量。

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附录

第 4 部分

包装说明

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包装说明 965

客机和货机运输 UN 3480

本条目适用于锂离子或锂聚合物电池。

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~~第 II 节~~

~~交运的锂离子电池芯和电池如果满足本节的要求，则不受本细则其他补充要求的限制。~~

~~锂离子电池芯和电池如果符合下列条件，则可交运：~~

~~1) 锂离子电池芯的瓦时额定值（见附录2的术语表）不超过20 Wh；~~

~~2) 锂离子电池的瓦时额定值不超过100 Wh；~~

~~必须在电池盒外壳上标明瓦时额定值，但在2009年1月1日之前制造的电池除外。~~

~~3) 每个电池芯或电池的所属类型证明满足《联合国试验和标准手册》第 III 部分 38.3 小节规定的每项试验的要求。~~

~~注：无论电池所含的电池芯是否经受了此类试验，电池必须接受这些试验。~~

~~一般要求~~

~~电池必须装在符合 4;1.1.1, 1.1.3.1 和 1.1.10 (但 1.1.10.1 除外) 规定的坚固外包装当中。~~

~~包装件内装物~~	~~包装件数量（第II节）~~	
	~~客机~~	~~货机~~
~~锂离子电池芯和电池~~	~~10 kg G~~	~~10 kg G~~

~~补充包装要求~~

~~电池芯和电池必须装在能够将电池芯或电池完全封装的内包装内，然后再放入坚固的外包装当中。~~
~~必须保护电池芯和电池防止发生短路。这包括防止在同一包装内与导电材料接触，导致发生短路。~~
~~每个包装件都必须能够承受从任何方向进行的1.2米跌落试验，而不会发生下列情况：~~
~~使其中所装的电池芯或电池受损；~~
~~使内装物移动，以致电池与电池(或电池芯与电池芯)互相接触；~~
~~内装物释出。~~
~~每个包装件必须贴有锂电池操作标签（图5-31）。~~
~~每批托运货物必须附带一份包括以下内容的文件：~~
~~标明包装件内装有锂离子电池芯或电池；~~
~~标明包装件必须小心轻放，如果包装件损坏，有着火的危险；~~
~~标明如包装件受到损坏，必须遵守的特别程序，包括检查和必要时重新包装；~~
~~了解其他情况的电话号码；和~~
~~如果使用航空货运单，则必须在货运单上写明“锂离子电池”、“不受限制”和“PI965”的字样。~~

~~为电池芯或电池进行运输准备或将其交付运输的人员，必须接受与其责任相符的关于这些要求的适当指示。~~

~~外包装~~

~~箱~~ ~~桶~~ ~~方桶~~

~~坚固的外包装~~

……

包装说明 968

客机和货机运输UN 3090

本条目适用于第 9 类的锂金属或锂合金电池（第 I 节）和须受技术细则的专门要求限制的锂金属或锂合金电池（第 II 节）。

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~~第II节~~

~~交运的锂金属或锂合金电池芯和电池如果满足本节的要求，则不受本细则其他补充要求的限制。~~

~~锂金属或锂合金电池芯和电池如果符合下列条件，则可交运：~~

~~1) 对于锂金属电池芯，锂含量不超过1克；~~
~~2) 对于锂金属或锂合金电池，合计锂含量不超过2克；~~
~~3) 每一电池芯或电池所属类型证明满足《联合国试验和标准手册》第III部分38.3小节规定的每项试验的要求。~~

~~注：无论电池所含的电池芯是否经受了此类试验，电池必须接受这些试验。~~

~~一般要求~~

~~电池必须装在符合4;1.1.1, 1.1.3.1和1.1.10 (但1.1.10.1除外) 规定的坚固外包装当中。~~

~~内装物~~	~~包装件数量（第II节）~~	
	~~客机~~	~~货机~~
~~锂金属电池芯和电池~~	~~2.5 kg G~~	~~2.5 kg G~~

~~补充包装要求~~

~~电池芯和电池必须装在能够将电池芯或电池完全封装的内包装内，然后再放入坚固的外包装当中。~~
~~必须保护电池芯和电池防止发生短路。这包括防止在同一包装内与导电材料接触，导致发生短路。~~
~~每个包装件都必须能够承受从任何方向进行的1.2米跌落试验，而不会发生下列情况：~~
~~使其中所装的电池芯或电池受损；~~
~~使内装物移动，以致电池与电池(或电池芯与电池芯)互相接触；~~
~~内装物释出。~~
~~每个包装件必须贴有锂电池操作标签（图5-31）。~~
~~每批托运货物必须附带一份包括以下内容的文件：~~
~~标明包装件内装有锂金属电池芯或电池；~~
~~标明包装件必须小心轻放，如果包装件损坏，有着火的危险；~~
~~标明如包装件受到损坏，必须遵守的特别程序，包括检查和必要时重新包装；~~
~~了解其他情况的电话号码；和~~
~~如果使用了航空货运单，货运单上必须写明“锂金属电池”、“不受限制”和“PI968”的字样。~~
~~为电池芯或电池进行运输准备或将其交付运输的人员，必须接受与其责任相符的关于这些要求的适当指示。~~

~~外包装~~

~~箱~~ ~~桶~~ ~~方桶~~

~~坚固的外包装~~

— 完 —