



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
WORKING GROUP MEETING (DGP-WG/25)**

Delhi, India, 21 to 25 April 2025

**Agenda Item 6: Dangerous goods provisions to support RPAS operations (Ref: Job Card
DGP.007.02)**

**DANGEROUS GOODS PROVISIONS TO SUPPORT REMOTELY PILOTED AIRCRAFT
SYSTEMS**

(Presented by the Rapporteur of the DGP Working Group on Remotely Piloted
Aircraft Systems (DGP-WG/RPAS) – M. Ranito)

SUMMARY

This working paper presents information on the efforts of the DGP Working Group on Remotely Piloted Aircraft Systems (RPAS) (DGP-WG/RPAS) in the development of dangerous goods provisions to support operations in remotely piloted aircraft systems.

Action by the DGP-WG is in paragraph 4.

1. INTRODUCTION

1.1 The Twenty-Eighth Meeting of the Dangerous Goods Panel (DGP/28) recommended a review of Annex 18 – *The Safe Transport of Dangerous Goods by Air* and the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) to determine amendments necessary to accommodate the safe transport of dangerous goods on remotely piloted aircraft (see Recommendation 6/2 contained in the DGP/28 Report).

1.2 During the panel's review of draft Standards and Recommended Practices (SARPs) for a new Annex 6 — *Operation of Aircraft, Part IV — International Operations – Remotely Piloted Aircraft Systems*, it was noted that the draft SARPs included provisions allowing for the transport of dangerous goods on remotely piloted aircraft (RPA), but Annex 18, the Technical Instructions and the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481) were perceived to not support such operations because they were developed before the introduction of remotely piloted aircraft systems (RPAS).

1.3 It was perceived that the dangerous goods documents included specific requirements and recommendations for the carriage of dangerous goods based on whether an aircraft is a passenger or cargo

aircraft, and a remotely piloted aircraft could be considered a cargo aircraft. However, it was deemed possible that the requirements for cargo aircraft established in the Technical Instructions might not be appropriate. The panel therefore concluded that a thorough review of Annex 18 and the Technical Instructions was necessary to determine how the documents could safely support the transport of dangerous goods on remotely piloted aircraft.

1.4 At the 2022 Working Group Meeting of the DGP (21 to 25 November 2022, Montréal) (DGP-WG/22), the DGP was invited to establish a small working group to review Annex 18 and the Technical Instructions to determine amendments necessary to accommodate the safe transport of dangerous goods on remotely piloted aircraft, and a job card was developed and later approved by the ANC as DGP.007.01 (see the appendix of this working paper).

1.5 This working paper should be read in conjunction with the following information papers:

- a) DGP-WG/25-IP/1, containing guidance for the carriage of dangerous goods transported by UA extracted from ICAO Advisory Circular AC-102-37 associated with Part 102 of the ICAO Model UAS Regulations;
- b) DGP-WG/25-IP/2, containing a presentation given by the Remotely Piloted Aircraft Systems Panel (RPASP) to inform DGP-WG/RPAS, at its second meeting held in April 2023, of some assumptions for the decision making on how the work should be progressed; and
- c) DGPWG/25-IP/3, containing:
 - 1) the recommendations made to the DGP Working Group on Annex 18 (DGP-WG/Annex 18) (Appendix A to DGPWG/25-IP/3);
 - 2) a working document developed by DGP-WG/RPAS to review the Technical Instructions including questions directed to the panel and recommendations from DGP-WG/RPAS for changes to the Technical Instructions (Appendix B to DGPWG/25-IP/3); and
 - 3) guidance material for States for inclusion in either the Supplement to the Technical Instructions or a separate document, as preferred by the panel (Appendix C to DGPWG/25-IP/3).

2. WORK OF DGP-WG/RPAS

2.1 DGP-WG/RPAS was formally established with the first meeting being held during DGPWG/22 to draft the terms of reference (see Appendix E to the DGP-WG/22 Report).

2.1.1 A review of Job Card DGP.007.01 with Actions 10277, 10278, 10279 and 10280 was conducted. It was noted that delivery dates were set for the fourth quarter of 2023, which seemed unrealistic, due to the starting date of the DGP-WG/RPAS (see the appendix to this working paper). It was agreed that these would need to be adjusted as work progressed.

Note. — The dates were subject to review by the ANC during its Review of The Air Navigation Work Programme in October 2024 and the timelines for delivery of Actions 10278 and 10279 10280 were extended to Q4 2025. Action 10277 was logged as completed.

2.1.2 At the first meeting it was also agreed that an initial approach to meeting frequency would be for virtual meetings to be held monthly, starting late January or February 2023, based on the availability of members and progress of the work required to be conducted. This would be subject to review. The rapporteur proposed that the meetings be structured into two meetings to be held on the same calendar day (UTC) to enable participation from the East hemisphere and to allow for participation of interested panel members or advisors from Asia, Australia and the Pacific region, without having to attend meetings at unsocial hours. The rapporteur took the task of coordinating this action.

2.1.3 Matters discussed that were thought relevant during the working group meetings included:

- a) suggestions for participants to bring into the agenda of the meetings what was being done domestically in each State to enable the carriage of dangerous goods by RPAS, as it could have relevance to highlight issues experienced by States in current RPAS operations; and
- b) that consideration be given on how the technical development of RPAS could impact the level of safety. At the current stage of RPAS operations, there were many unknown elements surrounding the future types of aircraft to be used in international operations, or of future operational areas where RPAS could be deployed. Assumptions would need to be made for the work to progress.

2.1.4 Discussions were also held on the need for a decision to be made on work methodology, i.e. either integrate RPAS operations into current provisions of the dangerous goods operating regulation (Technical Instructions) vs integrating carriage of dangerous goods into RPAS operations. The first option appeared to be the best approach, as it would allow for the use of a known and tested framework and align with the current structure, precluding the need for the development of separate specific regulations without the knowledge highlighted in the previous paragraph.

2.1.5 DGP-WG/RPAS had to make some assumptions on what type of aircraft should be considered, i.e.:

- a) whether RPAS operations would bring a completely new concept of aircraft, without it being equipped with some of the systems that we currently have in conventional aircraft;
- b) whether the aircraft being used were conversions of existing aircraft to operate without crew – although the requirements for international transport are that all aircraft are required to meet the certification requirements of Annex 8 — *Airworthiness of Aircraft*, there could be some systems such as pressurization, climatization or cargo compartment ventilation, which could potentially not be included in the aircraft design; and
- c) the potential for RPAS operations being conducted differently from conventional aircraft, where the limitations of the operational planning would not be determined by the existence of people on board, such as operational limitations due to severe turbulence conditions.

2.1.6 DGP-WG/RPAS members were requested to make themselves familiar with some documentation before the first meeting to enable the start of discussions. A package of documents would

be put together by the Secretariat, but initial familiarization with the following documentation would be necessary:

- a) the content of Annex 6, Part IV included in State letter 2022/70;
- b) ICAO UAS Model Regulation Part 102 and Advisory Circular 102-37 so that individual States could highlight where they had issues in implementation of this regulation, as applicable; and
- c) Technical Instructions, Part 7 to identify possible areas to which there could be issues for compliance by RPAS operators;

2.2 The working group was added to the ICAO MS Teams site where all working documents are stored, along with all meeting minutes and associated reference documents to be accessed by panel members, advisors or DGP-WG/RPAS participants.

2.3 A second face-to-face meeting took place during the 2023 DGP Working Group Meeting (15 to 19 May 2023, Rio de Janeiro, Brazil) (DGP-WG/23), and it was decided that between May and July 2023, the working group should prioritize the review of the current Annex 18 to identify the need for any changes to be introduced to support RPAS operations and to inform DGP-WG/Annex18 of any necessary Standards or Recommended Practices (SARPs) that should be included in the amendment to Annex 18 that DGP-WG/Annex 18 was developing ahead of its face-to-face meeting planned for August 2023 in Doha, Qatar. DGP-WG/25-IP/3 contains feedback provided to DGP-WG/Annex18 at the referenced meeting and decisions made with regard to the feedback and recommendations.

2.4 In order to establish a direction of work, during the initial stages of the review of the Technical Instructions, the following decisions were made:

- a) the Technical Instructions as they are, should apply in principle to all RPAS operations and implementing different rules for RPAS operations or deviations from the current provisions, should be avoided as much as possible;
- b) the capabilities of the RPAS should be considered when applying the Technical Instructions and possibly develop broad requirements to accommodate these capabilities;
- c) there was a suggestion made that a specific chapter in Part 7 (a new Chapter 8) could be introduced into the Technical Instructions, similar to Chapter 7 for helicopter operations or an alternative possibility would be to develop guidance material;
- d) RPAS needed to be brought into the discussion where necessary;
- e) the ICAO UAS Model Regulation 102, published in 2020, for which some guidance regarding transport of dangerous goods was produced, should be the starting point, which would then lead to a decision on what would need to be included in the Supplement to the Technical Instructions; and
- f) extending the provisions of the Technical Instructions should be considered to capture the specific category, due the potential of cross border operations in certain regions using smaller RPAS types which would not necessarily be subject to the certification standards contained in Annex 8. Operations in this RPAS category is

what regulators are currently enabling in domestic operations. This would align with the content of Annex 6, Part IV and enable States to be able to approve operations in particular scenarios in line with conventional aviation principles as described in DGP-WG/25-IP/2. It would also enable States to apply these operating regulations in domestic RPAS operations carrying dangerous goods.

2.5 A total of three face-to-face meetings and twenty-four virtual meetings (for each time zone) have been held since DGP-WG/RPAS was initiated. Minutes of all meetings have been recorded to document and justify decisions it made. The proposals and rationales contained in DGP-WG/25-IP/3 are the result of all the discussions held during the meetings and recorded in their minutes.

2.6 At the 2024 DGP Working Group Meeting (21 to 25 October 2024, Montréal) (DGP-WG/24), an update on the work of DGP-WG/RPAS was provided.

2.7 As conducted for the Technical Instructions, a review of the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284SU) has yet to be completed.

2.8 A review of *Guidance for Safe Operations Involving Aeroplane Cargo Compartments* (Doc 10102), which incorporates the cargo compartment safety risk assessment, may need to be conducted for RPAS operations, because Annex 6, Part IV captures both helicopter and fixed-wing aircraft operations.

2.9 A review of *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481) has yet to be conducted; however, there may be a need to draft a completely new document or alternatively, include a separate chapter for RPAS operations.

3. CONCLUSIONS

3.1 During the work conducted by DGP-WG/RPAS, the need for specific provisions inherent to RPAS operations to be addressed in a separate chapter in the Technical Instructions was discussed, similar to what currently happens with helicopters in Part 7;7 of the Technical Instructions.

3.2 A draft Chapter 8 to Part 7 is presented within Appendix B to DGP-WG/25-IP/3 for DGP-WG/25 to consider and comment upon.

3.3 Between DGP-WG/25 and DGP/30, final draft recommendations for changes will be developed to be introduced in the Technical Instructions in the next biennium, with the objective of these provisions being published in the 2027-2028 Editions of the Technical Instructions and its Supplement.

3.4 ICAO recommends that the Technical Instructions be adopted for domestic operations; however, the job card is only focused on international operations and certified aircraft.

3.5 The majority of States are currently enabling RPAS operations in non-certified aircraft (specific category) in the conduct of what is considered to be low- and medium-risk operations, which in some cases may involve the carriage of dangerous goods, including suspended loads, winch operations and dropping of packages for final delivery. DGP-WG/RPAS has taken the view that current agenda should also seek to address the scope of such operations and also develop guidance for States on what those States should be considering for an approval of such types of operations.

3.6 There may be a need to propose an update to the Job Card 007.01 to allow for the development of provisions to address these aspects

4. ACTION BY THE DGP-WG/25

4.1 The DGP-WG is invited to consider the report of the DGP-WG/RPAS contained in this working paper along with the information contained in DGP-WG/25-IP/1, DGP-WG/25-IP/2 and DGP-WG/25-IP/3.

4.2 DGP-WG/25 is invited to provide responses to the questions formulated in Appendix B to DGP-WG/25-IP/3 and provide comments/feedback on the proposed draft changes to the Technical Instructions contained in Appendix B to DGP-WG/25-IP/3 and draft guidance material proposed in Appendix C to DGP-WG25-IP/3 and provide comments and responses to questions.

4.3 For orientation on the way forward, DGP-WG/RPAS is seeking initial responses to the following questions during DGP-WG/25:

- a) does DGP-WG/25 agree with the view taken by DGP-WG/25 that Parts 2, 3, 4, 6 and 8 do not need to be changed to support RPAS operations?
- b) does DGP-WG/25 agree that there is a need for a new Chapter 8 in Part 7 of the Technical Instructions to support and address the specific conditions in which RPAS operations may be conducted in the near future?
- c) does DGP-WG/25 agree that the Technical Instructions should include provisions to enable the applicability of the Technical Instructions to RPAS other than certified RPAS, and for these to be adopted by States in domestic operations?
- d) does DGP-WG/25 agree that the Technical Instructions should apply to all UAS, which includes RPAS, or should it only apply to RPAS?

4.4 Panel members are invited to provide formal comments, feedback and suggestions to all the remaining questions contained in DGP-WG/25-IP/3 by 30 June 2025.

4.5 Based on the responses, feedback and suggestions, DGP-WG/RPAS will continue to work on the draft provisions with the objective of a proposal to be brought forward to DGP/30, for consideration and possible inclusion in the 2027-2028 Edition of the Technical Instructions, to follow on the applicability of Annex 6, Part IV.

APPENDIX

**ANC JOB CARD FOR DANGEROUS GOODS PROVISIONS TO SUPPORT REMOTELY
PILOTED AIRCRAFT SYSTEM OPERATIONS**

Source	DGP/28 Recommendation 6/2
Problem Statement	The Technical Instructions were developed before the introduction of RPAS and do not support draft Standards and Recommended Practices (SARPs) on the operation of remotely piloted aircraft currently proposed for Annex 6 — Operation of Aircraft as a new Part IV — International Operations — Remotely Piloted Aircraft Systems.
Specific Details	Draft SARPs endorsed by the eighteenth meeting of the Remotely Piloted Aircraft Systems Panel (RPASP/18) (25 to 29 October 2021) on the operation of remotely piloted aircraft developed for inclusion in Annex 6 — Operation of Aircraft as a new Part IV — International Operations — Remotely Piloted Aircraft Systems include provisions allowing for the transport of dangerous goods, but the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284) do not. The Technical Instructions include specific requirements and recommendations for the carriage of dangerous goods based on whether an aircraft is a passenger or cargo aircraft, as defined in that document. A remotely piloted aircraft could be a cargo aircraft based on this definition, but the requirements for cargo aircraft established in the Technical Instructions may not be appropriate. A thorough review of the Technical Instructions is necessary to determine how the document can safely accommodate the transport of dangerous goods on remotely piloted aircraft. This will result in consequential amendments to the Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284SU) and may result in consequential amendments to Annex 18.
Expected Benefits	Clarify States' responsibilities with respect to evaluating an operator's ability to manage the risks associated with dangerous goods on remotely piloted aircraft and provide operators with tools to manage the risks
Reference Documents	DGP-WG/20 Report, paragraph 3.6.4.1 DGP/28 Report, paragraph 6.4.1 Doc 9284SU, Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air Doc 9481, Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods
Deliverable Expert Group	Dangerous Goods Panel (DGP)

ID	Document Affected	Description of Amendment proposal or Action	Supporting Expert Group	Status	Expected Dates		
					Delivery Date	Effective	Applicability
10277	Actions	Identify need for amending dangerous goods provisions in the Technical Instructions and associated documents to accommodate dangerous goods operations on remotely piloted aircraft in alignment with Annex 6	RPASP FLTOPSP- SCGSWG	Completed	Q4 2022		Dec 2022
10280	Annex 18	Consequential amendments to Annex 18 to accommodate RPAS operations	FLTOPSP RPASP AIGP ADOP AIRP SMP AVSECP FALP	Re-scheduled	Q4 2025	Jun 2026	Nov 2026

ID	Document Affected	Description of Amendment proposal or Action	Supporting Expert Group	Status	Expected Dates		
					Delivery Date	Effective	Applicability
10278	Tech Ins for the ST of DG by Air (Doc 9284)	Recommendation for amendments to the Technical Instructions to accommodate RPAS operations	FLTOPSP RPASP AIGP ADOP AIRP SMP AVSECP FALP	Re-scheduled	Q4 2025	Jan 2027	Jan 2027
10279	Supplement to the Tech Instructions (Doc 9284SU)	Consequential amendments to the Supplement to the Technical Instructions to accommodate RPAS operations	FLTOPSP RPASP AIGP ADOP AIRP SMP AVSECP FALP	Re-scheduled	Q4 2025	Jan 2027	Jan 2027
Status: Approved		Priority: Medium	Initial Issue Date: 02 Feb 2022	Date Approved by ANC: 20 Feb 2024	Session / Meeting: 225-3		