



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Auckland, New Zealand, 4 to 8 May 2009

Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel
5.5: Carriage of dangerous goods on helicopters

THE CARRIAGE OF DANGEROUS GOODS BY HELICOPTERS

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SUMMARY

This paper introduces initial thoughts for consideration of introducing provisions for the carriage of dangerous goods by helicopters in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284).

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 At DGP-WG/08, WP/57 discussed the subject of the carriage of dangerous goods by helicopters. It was agreed that it would be desirable to develop provisions specific to helicopters and that a further paper would be presented at DGP-WG09.

1.2 Within the United Kingdom, although there are a relatively small number of helicopter operators that carry dangerous goods, the type of operations are diverse and include the following:

- a) Offshore oil and gas industry support; involving the carriage of passengers and dangerous goods to and from both manned and unmanned installations, including platforms and ships;
- b) Lighthouse/ship servicing; involving the carriage of maintenance personnel and associated dangerous goods to and from un-manned lighthouses;
- c) Military assistance; civilian helicopter operators are sub-contracted to carry out some troop and cargo movements;
- d) Civilian engineering and other projects; quarrying, forestry, farming and other work;

- e) Passenger ferry operations between the United Kingdom mainland and Islands;

1.3 It is recognized that other States may have similar operations to those above but may also have other types of operations that have unique problems associated with them. The appendix to this working paper has been produced to highlight the areas that it is felt should be considered when developing provisions specific to the carriage of dangerous goods by helicopters.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to:

2.2 The DGP-WG is invited to consider the subjects raised in Appendix 1 and give advice on those subjects so that a further working paper can be produced with specific proposals for the Dangerous Goods Panel Meeting (DGP/22) in October 2009. In particular, advice on the following areas is sought:

- a) The types of holds found on helicopters and their suitability for dangerous goods;
- b) The under-slinging of dangerous goods;
- c) The accessibility requirements for cargo aircraft only dangerous goods on helicopters;
- d) The emergency response provisions applicable to helicopter operations;
- e) The shipper's responsibilities that should apply to dangerous goods being carried from remote locations;
- f) The operator's responsibilities (acceptance of dangerous goods, loading, notification to the pilot-in-command and retention of documents) that should apply to dangerous goods being carried from remote locations; and
- g) The provisions for non-standard packagings such as air portable fuel containers.

APPENDIX

APPLICABILITY OF THE *TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR (DOC 9284)* TO HELICOPTERS

1. HOLD CLASSIFICATION CRITERIA AND THE CARRIAGE OF PASSENGERS

1.1 Part 7;2.1 of the Technical Instructions provides that dangerous goods may only be carried in a main deck cargo compartment of a passenger aircraft that meets the certification requirements for a Class B or C cargo compartment. The certification requirements specified are those for fixed-wing aircraft. The certification requirements for large rotorcraft are identical in the USA (CFR29) and in Europe (CS29). The standards for cargo and baggage compartments for large helicopters (CS 29.855) do not align to the standards for fixed wing aircraft as no reference to Class B & C is made and the criterion are somewhat different.

1.2 The *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481) states that helicopters are capable of carrying freight in main cabin, under-floor and rear compartments. The document indicates that the main cabin is considered a class A cargo compartment, but does not indicate classifications for rear (boot and tail) compartments.

1.3 Some helicopters are fitted with baggage compartment fire warning systems and/or sockets to the baggage compartment through which a fire extinguisher can be discharged in the event of fire. Helicopters without each of these or similar features would not appear to meet the fixed-wing certification requirements for a Class B or C cargo compartment.

1.4 In light of the different compartment certification requirements for rotorcraft, the United Kingdom CAA Dangerous Goods Office has not considered rear holds of helicopters to be main deck cargo holds and so the certification standards were not considered an obstacle to the unrestricted carriage of dangerous goods in such holds (in accordance with the Technical Instructions), but it is understood that other States take a different view on this.

- a) Should helicopter rear cargo and baggage compartments be considered ‘main deck’ compartments for the purposes of Part 7;2.1 of the Technical Instructions?
- b) Should Part 7;2.1 of the Technical Instructions (and Doc. 9481) refer to helicopter cargo and baggage compartments using the certification standards for large helicopters and if so, what criteria should apply to the carriage of dangerous goods and passengers?
- c) Under the conditions specified in S-7;2.2 of the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284su) to the Technical Instructions, the State of Origin may approve the carriage in main deck cargo holds of specific dangerous goods of Packing Group III. Should S-7;2.2 be expanded to allow inclusion of all ‘Passenger and Cargo Aircraft’ dangerous goods on helicopters carrying passengers?

- d) Class A compartments are those in which the presence of a fire would be easily discovered by a crew member while at his or her station and each part of the compartment is easily accessible in flight. Under floor holds of helicopters such as those of the Sikorsky S61N may be deemed Class A as whilst there are access points through which fire extinguishers can be deployed without opening the hold hatches there are no smoke detector or fire detector systems. It is somewhat academic that the compartment is under floor (rather than main deck) as the effect upon passengers in a fire situation is likely to be similar. Should Part 7;2.1 of the Technical Instructions (and Doc. 9481) restrict the types of dangerous goods permitted for carriage in helicopters with under floor holds not meeting the Class B or C certification requirements?

2. **EMERGENCY RESPONSE GUIDANCE FOR AIRCRAFT INCIDENTS INVOLVING DANGEROUS GOODS (DOC 9481)**

2.1 Certain procedures of Table 4-1 of Doc 9481 do not reflect helicopter operations. For example:

- a) Loss of pressurisation is not likely to be relevant as very few helicopters are pressurised
- b) No oxygen is carried for use by either passengers or crew
- c) The option to jettison an underslung load or eject cargo loaded in the cabin is not considered.

3. **UNDERSLUNG LOADS (USL)**

3.1 The Technical Instructions make no reference to underslung loads (USL). It is proposed that a note be added to the beginning of 7;2 of the Technical Instructions stating 'For the avoidance of doubt any reference in the Technical Instructions to the taking on board, loading onto or carriage of dangerous goods in or on an aircraft shall be interpreted as applying also to the placing, suspending or carriage of such goods beneath an aircraft unless the context makes it otherwise apparent'.

3.2 USL pose less of a hazard to the helicopter and crew because the loads are further removed from them. Furthermore, USL can be jettisoned immediately if required. Should provisions, requirements or guidance be established with respect to the following?

- a) Non-application of requirement for Cargo Aircraft Only (CAO) dangerous goods to be accessible in accordance with Part 7;2.4.1.1(c) of the Technical Instructions.
- b) Non-application of Part 7;2.1.1 of the Technical Instructions with regards to the prohibition of the carriage of dangerous goods bearing the "Cargo aircraft only" label underslung beneath a helicopter carrying passengers.
- c) Radio hazards (RADHAZ) where aircraft High Frequency (HF) radio transmissions may affect electrically initiated explosive devices (EED) or fuse mechanisms of weapon systems.

- d) Protection from rain and snow (e.g. fibreboard boxes)
- e) Extension of 7;4.6 in the Technical Instructions to include requirement to notify emergency services and authorities in the event of an unintended load release that includes dangerous goods.
- f) Magnetised material - displacement of load position relative to direct-reading magnetic compasses and master compass detector units due to the load trail angle.
- g) Radioactive material - displacement of load position relative to passengers due to the load trail angle.
- h) Lightning - because of the danger of a lightning strike, loads should not be lifted or dropped when electrical storms are known to be in the immediate area. Loading and unloading must never be attempted during a thunderstorm, as the probability of a lightning strike is fairly high.
- i) Dissipation of static electricity: A helicopter hovering near the ground can be regarded, for electrical purposes, as one plate of a capacitance; the ground being the other plate. In general, static electricity is most strongly induced in helicopters when the air is dry and dust laden. Contact with the ground; rig or ship allows any induced charge to be dissipated through the landing gear. Helicopter pneumatic tyres are made from electrically conducting rubber to ensure that helicopters with this type of landing gear make a good earth connection. This practice is impractical during underslung load operations and the ground handling team is responsible for the discharge of static electricity from the helicopter. For the purpose of attachment or removal of an item from the load beam of a helicopter primary or secondary hook, full static electricity discharge procedures must be carried out. This procedure also applies if for any reason the ground handling party has to contact the load before it has been lowered to the ground, or after it has been lowered to the ground and prior to carrying out the discharge procedure. For ground handlers who are required to assist with the manoeuvring of a load into position before load landing, the use of ropes (handling lines) in contact with the ground provide an additional safeguard. Instructions on helicopter load handling procedures must include the methods to be used by load handling teams and state that earthing poles must be used for all underslung load operations. Offloading or hooking up operations should only be undertaken after the helicopter has been electrically grounded. Earthing through the cargo itself should be avoided when explosive or flammable cargos are carried. Electrically initiated explosives should be rendered "safe" and/or screened in metal containers.

4. PACKAGING SPECIFICATION FOR AIR PORTABLE FUEL CONTAINERS (APFCS)

4.1 Air Portable Fuel Containers (APFCs) are used for the transfer of fuel, oil and other liquids. APFCs are in active service with the forces of the United Kingdom and other countries and disaster relief agencies. With a capacity of up to 430 gallons (1,955 litres), these fuel containers have been thoroughly proven in various parts of the world, helping to maintain fuel supply lines. APFCs are capable of being airlifted in fixed wing cargo aircraft. When empty, the containers are collapsible, which

allows for easier transportation. APFCs comprise a filament wound structure that is coated with a synthetic rubber formulation to bind each layer. The finished container is able to withstand a great deal of punishment, including multiple airdrops, including parachute drops and being towed behind vehicles. As civil helicopters are used in support of peacetime military and disaster relief operations, should the Technical Instructions include a package specification for underslung APFCs?

Note: it could be argued that States should address this issue domestically as international air transport is unlikely to be an issue.

5. **PACKING SPECIFICATION FOR INTERMEDIATE BULK CONTAINERS IBCS?**

5.1 As civil helicopters are used in support of peacetime military and disaster relief operations, should the Technical Instructions include a package specification for underslung IBCs?

Note: it could be argued that States should address this issue domestically as international air transport is unlikely to be an issue.

6. **LOADING OF DRY ICE**

6.1 Helicopter cargo compartments are generally unpressurized and have no air-conditioning connected with that of the cabin. What limits and/or unloading procedures should be established to protect ground-handling personnel from asphyxiation? (Also applies also to small aeroplanes).

7. **NORMALLY UNMANNED INSTALLATIONS (NUI)**

7.1.1 Helicopter operators serving the offshore oil and gas industry and offshore lighthouses are tasked with carrying personnel to Normally Unmanned Installations (NUI) for the purposes of conducting scheduled maintenance, sometimes using substances classified as dangerous goods. Qualified personnel can process passengers and dangerous goods destined for NUI in accordance with the Technical Instructions at the point of departure. However, there will be no such qualified personnel at the NUI when the passengers and any unused dangerous goods depart from the NUI (unless the workforce happens to include persons that have received dangerous goods training in light of other responsibilities, such as loading aircraft). With regards to dangerous goods cargo being returned, it is unlikely that facilities will exist at a NUI to enable the preparation of dangerous goods transport documents (shippers declarations) and the conduct of an acceptance check, retention of documents and making information regarding dangerous goods onboard available to the next scheduled arrival point may not be possible.

Note— It could be argued that States should address this issue domestically as international air transport is unlikely to be an issue.

8. OTHER AREAS THAT SHOULD BE CONSIDERED

- a) Single Pilot Ops (also applies to small aeroplanes)
- b) Is it realistic for helicopter crews to notify ATC when situations permit? In most circumstances, where a problem develops in-flight, a helicopter will make an emergency landing away from an airfield.
- c) Relevance of segregating incompatible dangerous goods carried in underslung loads – potential reaction may pose a hazard to the aircraft even when the load is underslung
- d) Persons offshore acting in capacity of both shipper and acceptance agent (may apply to small aeroplanes in other circumstances)
- e) Contractual assignment of ground handling responsibilities: Duty Holder offshore is the customer of the helicopter operator, but also acts as their ground-handling agent. In the fixed-wing world, most large operators and GHAs will be IATA members so we can be confident that suitable contracts are in place. (Also applies to operators of small aircraft, e.g. air taxi operators conducting ad-hoc charters (charter agreement and/or ground-handling request should assign responsibilities).

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