DANGEROUS GOODS PANEL (DGP)

TWENTY-SECOND MEETING

Montréal, 5 to 16 October 2009

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2011-2012 Edition

REQUIREMENTS FOR MAGNETIZED MATERIALS

(Presented by the Dangerous Goods Advisory Council)

SUMMARY

This paper provides information supporting DGAC's proposal concerning magnetized material in DGP/22-WP/42 and comments on DGP/22-WP/58.

1. DGAC provides the attached revised appendix to DGP/22-WP/42.

2. DGAC also notes that an Airbus service letter dated 3 November 2005 covering A300B2/B4, A310, A300-600, A318, A319, A320, A321, A330, A340, A340-500/600 and A380 aircraft states:

> "the magnetized material [i.e. ICAO regulated magnetized materials] may be loaded in all cargo compartments: Forward lower deck cargo compartments, Aft lower deck cargo compartment and Bulk lower deck cargo compartment."

2.1 In summary this means that ICAO regulated materials may be loaded anywhere on Airbus aircraft, calling into question the need to treat ICAO regulated levels of magnetized material as dangerous goods in that no special loading considerations are needed. Their reasoning:

> "the magnetized material may be loaded in all cargo compartments: Forward lower deck cargo compartments, Aft lower deck cargo compartment and Bulk lower deck cargo compartment."

2.2 DGAC will have a copy of the complete service letter available at the meeting. In addition it is noted that Boeing is a member of DGAC and has supported DGAC's efforts.

3. DGAC also notes that DGP/22-WP/58 states:

> "a compass deviation would be difficult to detect, as the magnetic compass is used to set other aircraft components on small aircraft."

3.1 In this respect the FAA Manager, Avionics Systems notes in relation to gyroscopic compasses said to require calibration using standby compass readings:

> "For the manual ones [i.e., manually calibrated gyro compasses], you have to keep setting the gyro with heading from a regular compass, typically every 15 minutes. For obvious reasons, that is a pretty obsolete and undesirable technology in transport aircraft, and **was replaced many decades ago for in-production aircraft**."

3.2 A US regulatory notice dated September 24, 1984 (available at http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/49fr__1984/49fr-37438.pdf) suggests that the aircraft IFALPA refers to are aircraft built before 1955. DGAC will have this file available at the meeting.

4. DGAC also notes that DGP/22-WP/58 states:

> "IFALPA disagrees that a compass swing is an accepted procedure to investigate compass deviations following loading; a compass swing is an involved and lengthy maintenance procedure not normally accomplished during routine operations."

4.1 In this respect DGAC notes that FAA Advisory Circular dated 19 March 1987 (available at http://rgl.faa.gov/Regulatory_and_Guidance_Library%5CrgAdvisoryCircular.nsf/list/AC%20121-28/$FILE/AC121-28.pdf) in relation to older aircraft (i.e., those manufactured before 1955) states:

> "If the aircraft being used does not have the magnetic compass master unit in a remote location and amply distant from the cargo hold, **it is recommended that a special aircraft swing and compass calibration be made** after loading and prior to operation."

4.2 DGAC will have the complete advisory available at the meeting.

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APPENDIX

EXAMPLES OF IT EQUIPMENT THAT MEET ICAO MAGNETIZED MATERIAL CRITERIA

Description	Max Gauss @ 2.1 M	Max Compass D @ 2.1M	Max Gauss @ 4.6 M	Max Compass D @ 4.6M	Packaged Product Dimension	Packaged Gross Mass		
SERVER	0.0028	0.7	0.0004	0.152381	1295 mm X 818 mm X 2209 mm	332 kg		
SERVER	0.0074	1.85	0.0018	0.685714	1630 mm X 1030 mm X 1984 mm	867 kg		
SERVER	0.0024	0.6	0.001	0.380952	1860 mm X 1030 mm X 2210 mm	1176 kg		
SERVER	0.0032	0.8	0.00148	0.56381	1607 mm X 937 mm X 2299 mm	1000 kg		
STORAGE SERVER	0.0025	0.625	0.001	0.380952	1100 mm X 655 mm X 1790 mm	923 kg		
STORAGE SERVER	0.0048	1.2	0.0006	0.228571	1575 mm X 1065 mm X 1985 mm	1234 kg		
TAPE LIBRARY	0.0035	0.875	0.0003	0.114286	1803 mm X 1041 mm X 2000 mm	633 kg		
TAPE LIBRARY	0.0024	0.6	0.0004	0.152381	2209 mm X 1041 mm X 1978 mm	632 kg		
TAPE CONTROLER	0.0029	0.725	0.0004	0.152381	1765 mm X 1041 mm X 1978 mm	545 kg		
SERVER	0.0058	1.45	0.00154	0.586667	1295 mm X 912 mm X 2215 mm	475 kg		
SERVER	0.0026	0.65	0.0004	0.152381	1168 mm X 787 mm X 2025 mm	1318 kg		
SERVER	0.0058	1.45	0.00084	0.32	1447 mm X 1079 mm X 2250 mm	325 kg		
SERVER	0.004	1	0.001	0.380952	1444 mm X 965 mm X 2125 mm	1012 kg		
SERVER	0.0028	0.7	0.0004	0.152381	1295 mm X 818 mm X 2209 mm	332 kg		
SERVER	0.0071	1.775	0.0006	0.228571	1200 mm X 723 mm X 2159 mm	167 kg		
SERVER	0.0054	1.35	0.00043	0.16381	1625 mm X 1016 mm X 2219 mm	1025 kg		
SERVER	0.0076	1.9	0.0004	0.152381	1219 mm X 762 mm X 1447 mm	113 kg		
MAINFRAME #1	0.006	1.5	0.00103	0.392381	2921 mm X 2426 mm X 2959 mm	5756.7KG		
FACTORY INTERFACE	0.00836	2.09	0.00139	0.529524	2901 mm X 2146 mm X 2959 mm	1906.8KG		
MAINFRAME #2	0.00532	1.33	0.0005	0.190476	3620 mm X 2134 mm X 1956 mm	3373.2KG		
PROCESS CHAMBER # 1	0.00385	0.9625	0.0004	0.152381	1486 mm X 1219 mm X 1962 mm	801.3KG		
EQUIPMENT RACK #1	0.01832	4.58	0.00239	0.910476	1219 mm X 1200 mm X 2470 mm	862.6KG		
PROCESS CHAMBER #2	0.00299	0.7475	0.00035	0.133333	1334 mm X 1219 mm X 1556 mm	460.8KG		
LOAD CENTER	0.01119	2.7975	0.00155	0.590476	1829 mm X 1334 mm X 2470 mm	1493KG		
PUMP COMPRESSOR	0.006	1.5	0.00078	0.297143	1054 mm X 1016 mm X 2165 mm	503KG		
MECHANICAL CRANE	0.00333	0.8325	0.00038	0.144762	1219 mm X 914 mm X 1346 mm	224.7KG		
ELECTRICAL AC RACK #1	0.00585	1.4625	0.0005	0.190476	1327 mm X 1200 mm X 2267 mm	641KG		
EQUIPMENT RACK #2	0.0028	0.7	0.00028	0.106667	1226 mm X 914 mm X 1454 mm	435.8		
MAINFRAME #3	0.02241	5.6025	0.00382	1.455238	3620 mm X 2419 mm X 2953 mm	4687KG		
UPPER FRAME	0.0023	0.575	0.00044	0.167619	1219 mm X 1200 mm X 2470 mm	1234KG		
REMOTE FRAME	0.00865	2.1625	0.000105	0.04	1930 mm X 1187 mm X 2673 mm	919.4KG		
ELECTRICAL RACK #2	0.01195	2.9875	0.00178	0.678095	2032 mm X 1048 mm X 2470 mm	1060.1		
CRYO COMPRESSOR #2	0.006	1.5	0.00098	0.37333	813 mm X 762 mm X 1048 mm	170.3KG		
TRANSFORMER	0.0023	0.575	0.00035	0.13333	813 mm X 622 mm X 997 mm	163.4KG		
lower gauss - 0.002 gauss equivalent to 0.5 degree deflection at 2.1 M						0.002	0.5	0.001
upper gauss - 0.00525 equivalent to a 2 degree deflection at 4.6 m						0.00525	2	

Observations:	(1) These items would not normally be transported on small aircraft. They have considerable mass. For example, the Cessna Caravan 208B commonly used in the US for cargo air transport has a payload of approximately 900 kg. Those items that could fit on such an aircraft would likely be stowed in the center of the cargo area for stability reasons. This would provide ample distance between the compass and the item. (2) Most of these items have relatively low magnetic strength readings, even within the limits in the ICAO TI. The mainframe with a mass of 4687 KG would likely need to be located in the center of the cargo area for stability purposes, even on a large aircraft. (3) The equipment described above would generally not fit on small aircraft due to cargo door size limitations.

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