



**WORKING PAPER**

**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**

**FUEL CELL VEHICLES – NO HAZARD**

(Presented by USFCC)

**SUMMARY**

Fuel cell vehicles, fuel cell engines, and flammable gas fuel cell powered equipment have been added to UN 3166 by the UNSCETDG. This paper proposes extending the allowances granted to new vehicles and engines to flammable gas vehicles which have been purged and pressurized with non-flammable gas or fluid to nullify the hazards of shipment.

**Action by the DGP:** The DGP is invited to consider revising Special Provision A70 as presented in the appendix.

**1. INTRODUCTION**

1.1 The DGP Working Group of the Whole Meeting in Auckland (DGP-WG09, 4 to 8 May 2009) discussed a proposal to add a new special provision that would allow flammable gas vehicles and engines on board passenger aircraft if they were purged, vented and filled with a non-flammable gas to nullify the hazard (DGP/22-WP/3, paragraph 3.2.9). Some members remarked that a new special provision was not necessary since a modification to Special Provision A70 could achieve the same result. Members also advised against using the term “quality assurance” since there could be confusion regarding what was being referenced.

1.2 This paper takes those recommendations into account and provides proposed modifications to Special Provision A70 such that flammable gas vehicles and engines that have been purged, vented and filled with a non-flammable gas to nullify the hazard are allowed to be shipped as if they were new.

1.3 This method of handling flammable gas vehicles is consistent with 4;1.1.15 and 5;1.6.1 of the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) that describes "steps such as cleaning, purging of vapours or refilling with a non-dangerous substance" that can be taken to nullify a hazard.

## 2. DISCUSSION

2.1 An option for shipment of flammable gas engines and equipment on passenger aircraft is proposed herein, with the provision that all traces of flammable gas be purged from the system. This will assure that no traces of flammable gas remain.

2.2 Industry experience with flammable gas vehicles indicates that although odorants from gas might remain after a tank is emptied; these odorants do not pose a flammability hazard.

2.3 Purging the flammable gas system a number of times will remove all traces of flammable gas from the system and the fuel tank.

2.4 As an additional step, a non-flammable gas or fluid must be used in order to nullify the hazard for shipment. This provides certainty that a flammable mixture will not be formed in the tank or in the system.

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## APPENDIX

### AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

#### Part 3

## DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

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### Chapter 3

#### SPECIAL PROVISIONS

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Table 3-2. Special provisions

TIs	UN
# A70	Internal combustion <u>or fuel cell</u> engines being shipped either separately or incorporated into a <u>vehicle</u> , machine or other apparatus, the fuel tank of which has never contained any fuel and the fuel system of which is completely empty of fuel, or that are powered by a fuel that does not meet the classification criteria for any class or division, and without batteries or other dangerous goods, are not subject to these Instructions. The words "not restricted" and the special provision number A70 must be provided on the air waybill when an air waybill is issued.  <u>In addition, flammable gas powered engines being shipped without batteries or other dangerous goods either separately or incorporated into a vehicle, machine or other apparatus that have contained fuel but have been flushed, purged and filled with a non-flammable gas or fluid to nullify the hazard are not subject to these Instructions. Evidence of this flushing, purging and safe filling having been done must be included with the transport documents. The words "not restricted" and the special provision number A70 must be provided on the air waybill when an air waybill is issued.</u>

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