

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

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Global harmonization of transport of dangerous goods regulations with the Model Regulations

Incident involving Catecholborane

Transmitted by the International Civil Aviation Organization (ICAO)

Introduction

1. The twenty-fifth meeting of the Dangerous Goods Panel (DGP/25) was held in Montréal from 19 to 30 October 2015. The panel made a final review of amendments proposed to the Technical Instructions in order to harmonize with the 19th revised edition of the UN Model Regulations and to address issues specific to air transport. The full report of DGP/25 including all amendments agreed can be downloaded from <http://www.icao.int/safety/DangerousGoods/Pages/DGP25.aspx>.

2. This information paper highlights issues raised in relation to an incident involving Catecholborane which led the DGP to recommend prohibiting transport of the substance by air unless prior approval was granted by appropriate State authorities. DGP/25 determined the issue needed further investigation by the Sub-Committee.

Background

3. DGP/25 was informed of an incident involving Catecholborane (also known as 1, 3, 2-Benzodioxaborole) which resulted in an industry recommendation to forbid transport of the substance by air unless transported in pressure receptacles and under cooled conditions. The incident occurred after transport of the substance from Asia to Europe was delayed for nine days as the result of extreme weather conditions with temperatures consistently above 33°C. After being stored for approximately two weeks at a low temperature at the destination, several bottles containing the substance exploded and caught fire. It was concluded that moist air entered the bottles during the long transit time under high temperatures causing a chemical reaction and pressure build up. Panel members suspected a classification problem, but whether this was due to shipper error or a limitation in the classification criteria in the regulations could not be determined. It was reported that several manufacturers had classified the substance the same way and that these were highly experienced, conscientious manufacturers. It was agreed that the issue needed to be brought to the attention of the UN Sub-Committee for further investigation.

Amendment to the Technical Instructions

4. The need for temperature control heightened the panel's concern of a potential threat to aviation safety, recognizing that there is no method to guarantee temperature control in an aircraft cargo compartment. The panel therefore recommended an amendment to the

2015-2016 Edition of the Technical Instructions which would permit transport of the substance by air only when approvals are granted by the appropriate State authorities. Since a specific entry for Catecholborane is not included in the dangerous goods list, a light type entry was recommended for inclusion in the Technical Instructions with a special provision prohibiting transport by air assigned to it. The addendum is currently being processed through ICAO's governing bodies for review and approval.

5. An extract from the DGP/25 Report on the subject is provided as an annex to this information paper. The working paper which brought the incident to the panel's attention contains more detailed information and can be downloaded from <http://www.icao.int/safety/DangerousGoods/Pages/DGP25WPs.aspx> (DGP/25-WP/47).

Conclusion

6. The Sub-Committee is invited to consider whether additional investigation is warranted, particularly with respect to whether the substance was incorrectly classified by the shipper and whether there are any gaps in the classification criteria which led to this. The issue will be raised formally at the next session of the Sub-Committee if deemed necessary.

Annex

Extract from the DGP/25 Report

2.3.6 Incident with Catecholborane (DGP/25-WP/47)

2.3.6.1 The meeting was informed of an incident involving catecholborane which was classified as a general entry under UN 2924 – **Flammable liquid, corrosive, n.o.s.** The product properties indicated that the substance decomposes to borane gas at a rate of two per cent per week at room temperature, that borane gas could ignite when in contact with moist air, and that Catecholborane could react violently with water. Transport of the substance from Asia to Europe was delayed for nine days as the result of a typhoon and the temperature had been consistently above 33°C. Four broken bottles were discovered after they arrived at their destination. The substance was stored after arrival for approximately two weeks at 8°C, but several bottles exploded and caught fire once they were picked up and prepared for another shipment. It was concluded that moist air entered the bottles during the long transit time under high temperatures causing a chemical reaction and pressure build up. The industry recommended that Catecholborane be forbidden for transport by air unless transported in pressure receptacles and under cooled conditions. No proposal for amending the Technical Instructions was provided, but the panel was invited to discuss the incident and recommend action if deemed necessary.

2.3.6.2 The presenter noted that she was aware of shippers who had only shipped the substance during winter months to ensure appropriate temperature control; this was of great concern recognizing that there was no method to guarantee temperature control in an aircraft cargo compartment. She also noted that several manufacturers had classified the substance the same way. There was general consensus that the substance should be forbidden for transport by air, although some cautioned against a hasty decision involving a single incident that did not occur in transport without more comprehensive information. Panel members suspected a classification problem, but whether this was due to shipper error or a limitation in the classification criteria in the regulations would need to be determined. While adding a new entry for catecholborane to Table 3-1 appeared to be a sensible solution, there were concerns that the substance could be one of a family of substances with the same properties. The need for temperature control only heightened these concerns. Although it was recognized that a comprehensive solution would require more information and further investigation by the UN Sub-Committee, the panel agreed that the status quo was not an option that could be taken based on the risks to safety what were already known. In the absence of a UN number assigned by the UNCOE and recognizing that the UN process would not be immediate, the panel recommended adding a light type entry in the Technical Instructions with a special provision assigned to it forbidding the substance for transport by air on both passenger and cargo aircraft. Transport on cargo aircraft would be possible with the approval of the State of Origin and State of the Operator. Recognizing the potential threat to safety, the panel recommended that the amendment be incorporated in the 2015-2016 Edition of the Technical Instructions by way of an addendum. The panel stressed the importance of disseminating the information quickly and as widely as possible. As such, the Secretariat would issue an electronic bulletin to States encouraging them to disseminate the information to industry, and industry participants on the panel would disseminate the information within their network of shippers.