



WORKING PAPER

ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

**TOWARD SCIENCE-BASED IMPROVEMENTS IN CABIN SAFETY
OF LITHIUM BATTERIES**

(Presented by the Republic of Korea)

EXECUTIVE SUMMARY

Lithium batteries, including portable power banks, have become essential in modern air travel, but their associated fire risks have grown due to internal short circuits and other hazards. In January 2025, a cabin fire incident occurred on a flight in the Republic of Korea, believed to have been caused by a portable battery stored in an overhead bin. This underscores the urgent need for a proactive and coordinated global approach.

Following the incident, the Republic of Korea implemented enhanced cabin safety measures, including restrictions on battery quantity and watt-hour limits, prohibition of overhead storage, and insulation requirements. However, limitations remain, including environmental concerns, enforcement difficulties, and a lack of scientific international standards on the quantity and handling of spare batteries.

Action: The Assembly is invited to:

- a) recognize the increasing safety risk posed by lithium battery fires in the cabin environment;
- b) initiate discussions within ICAO to establish science-based international standards on the capacity and quantity of batteries carried in the cabin and storage of lithium batteries in the cabin;
- c) assess the feasibility of restricting overhead bin storage and inflight charging of power banks;
- d) promote international cooperation on best practices and incident reporting; and
- e) support awareness campaigns to educate passengers on safe battery use and carriage

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	
<i>References:</i>	Doc 9284, <i>Technical Instructions for the Safe Transport of Dangerous Goods by Air</i>

1. INTRODUCTION

1.1 Lithium batteries are widely used by air passengers to power essential devices. However, their potential to cause fires, particularly due to internal short circuits, has raised serious safety concerns. An incident in the Republic of Korea in January 2025 highlighted this issue, prompting immediate national-level countermeasures and underscoring the need for ICAO leadership in developing internationally harmonized safety protocols.

2. DISCUSSION

2.1 **Growing risk of lithium battery fires in the cabin**

2.1.1 The use of lithium batteries, especially in portable devices such as smartphones, tablets, laptops, and power banks, has become ubiquitous among air travellers. However, these devices also pose a fire risk due to the potential for thermal runaway, particularly when batteries are damaged, overcharged, or poorly manufactured. Notably, internal short circuits — which are not preventable through external insulation — have been identified as the root cause of several fire incidents.

2.1.2 In January 2025, an incident occurred on a domestic flight in the Republic of Korea where a fire broke out in the cabin shortly after boarding, likely due to a thermal runaway of a lithium-ion battery stored in an overhead bin. Although no fatalities occurred thanks to the quick response of the crew, the event resulted in serious and minor injuries and full loss of the aircraft. This incident highlighted the urgent need to re-evaluate current cabin safety procedures related to battery carriage.

2.2 **The Republic of Korea's immediate policy response**

2.2.1 Following the incident, the Republic of Korea took immediate action by enhancing its national policies and fully enforcing the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) provisions on dangerous goods carried by passengers and crew. The national measures implemented from March 2025 included:

- a) mandatory insulation of battery terminals using protective tape or original packaging;
- b) prohibition of storage in overhead bins;
- c) restriction on inflight charging of power banks;
- d) limitation on the quantity of spare batteries (e.g., up to 5 per person unless pre-approved); and
- e) passenger education through messaging and visual guidelines during booking, check-in, and boarding.

2.3 **Challenges observed during implementation**

2.3.1 Despite these proactive efforts, several limitations were observed:

- a) environmental concerns were raised over the use of disposable plastic bags for insulation. As an alternative, tape or protective packaging is being encouraged, but issues remain with compliance and consistency;
- b) passenger inconvenience and lack of clear understanding have hindered uniform compliance with insulation or storage instructions;
- c) enforcement gaps were evident, as cabin crew and ground staff have limited ability to verify battery count or storage location, especially in crowded boarding conditions; and
- d) scientific basis lacking for current quantity and watt-hour thresholds. Doc 9284 does not set a limit on the number of batteries per passenger, resulting in varied interpretations by Member States.

2.4

Need for international dialogue and Standards developments

2.4.1 To address these challenges, there is an urgent need for ICAO to take a leadership role in facilitating international discussions that aim to:

- a) review and assess existing ICAO provisions in light of increasing battery-related incidents;
- b) consider the feasibility of globally harmonized standards on the maximum quantity and capacity of batteries per passenger based on safety risk assessments;
- c) evaluate safety risks associated with overhead storage, in-flight charging, and other carriage practices;
- d) encourage data sharing and incident reporting among States and industry stakeholders; and
- e) promote passenger safety awareness through harmonized communication strategies.

2.4.2 The Republic of Korea believes that collaborative efforts led by ICAO, involving Member States and industry experts, will enable the global aviation community to better manage the evolving risks associated with lithium battery transport in passenger cabins, while also considering passenger convenience and technological realities.

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