International Civil Aviation Organization
Asia and Pacific Office

Twenty-third Meeting of the Asia Pacific Regional Aviation Safety Team (APRAST/23)

(Bangkok, Thailand, 7 to 11 April 2025)

Agenda Item 5: Presentations – State / Industry / ICAO

LITHIUM BATTERY AND E-CIGARETTE-RELATED CABIN FIRE RISKS – AN EMERGING SAFETY ISSUE IN THE REPUBLIC OF KOREA

(Presented by the Republic of Korea)

SUMMARY

This paper highlights the identification of lithium battery and e-cigarette related cabin fire risks as an emerging safety issue in the Republic of Korea (ROK). It summarizes a major incident in January 2025, relevant investigation findings, and the comprehensive mitigation measures introduced by the ROK government. The paper references relevant ICAO documents and encourages further regional discussion and information sharing.

1. INTRODUCTION

1.1 The Republic of Korea identified cabin fires caused by carry-on baggage batteries as an emerging risk and designated such occurrences as part of its national aviation safety performance indicators since 2020. However, due to the reduced flight operations during the COVID-19 pandemic, sufficient data was not collected for an accurate analysis. As flight operations gradually recovered, efforts to collect relevant safety data are ongoing, and the establishment of baseline safety performance indicators is currently being reviewed.

1.2 This Paper introduces the ROK's risk recognition, outlines the national mitigation measures implemented in response, and discusses the importance of regional information sharing.

2. DISCUSSION

2.1 Recent Accident Overview

2.1.1 On 28 January 2025 at approximately 22:13 local time, an Air Busan Airbus A321-200 (registration HL7763) operating flight BX391 from Busan (PUS) to Hong Kong (HKG) caught fire while stationed at Gimhae International Airport in Busan. The accident occurred shortly after boarding was completed and the aircraft's doors had been closed in preparation for pushback. Cabin crew discovered flames emanating from a rear overhead stowage compartment in the cabin (around seat 30L), prompting the captain to initiate an immediate emergency evacuation. All 176 persons on board (170 passengers and 6 crew) evacuated the aircraft using the emergency slides; three occupants sustained serious injuries and 24 suffered minor injuries during the evacuation. Despite prompt firefighting efforts, the aircraft was completely destroyed by the ensuing fire.

2.1.2 According to the forensic analysis by the National Forensic Service (NFS), the fire is believed to have been ignited by a short circuit within a lithium-ion battery. The NFS reported that no other significant factors contributed to the fire, as no unusual conditions were found in the area of the aircraft other than the overhead compartment where the battery was stowed. They also concluded that the fire was not caused by any issues related to the aircraft's internal facilities, and the possibility of ignition from such sources was deemed unlikely.

2.1.3 The Aviation and Railway Accident Investigation Board (ARAIB) will perform a comprehensive accident analysis ranging from fire identification, FDR/CVR data, air traffic control data, aircraft components to the passenger interview and witness testimonials of the ground crew to accurately determine the cause of the accident. While the investigation is still in progress and no final conclusions have been reached, this accident underscores the severe fire risk posed by lithium batteries in the aircraft cabin – a safety concern directly relevant to the topic under discussion.

2.2 **ROK's Response and Safety Enhancements**

2.2.1 In response to the cabin fire accident in January 2025 and recognizing the broader risk of lithium battery fires, the Republic of Korea developed and implemented enhanced standards for managing lithium-ion portable batteries and e-cigarettes onboard aircraft. Given that most airlines had already begun strengthening their battery management procedures, the ROK aimed to minimize confusion among travelers and improve management efficiency across airlines. To achieve this, a standardized management protocol was developed through consultation with airline operators and related experts. Following an extensive public awareness campaign, these enhanced safety measures came into effect on 1 March 2025. These measures strictly adhere to ICAO’s guidelines for the safe transport of dangerous goods by air, as detailed in ICAO Doc 9284 (Technical Instructions for the Safe Transport of Dangerous Goods by Air).

2.2.2 In line with these international provisions, spare lithium batteries and e-cigarettes are prohibited in checked baggage, battery terminals must be protected to prevent short circuit (e.g. by insulating tape on exposed terminals or placing each battery in a separate protective pouch), and ICAO-prescribed watt-hour limits are enforced for batteries. For example, batteries up to 100 Wh are allowed in carry-on baggage without special approval, batteries between 100 Wh and 160 Wh are limited to two units with airline approval, and any battery over 160 Wh is not permitted in passenger baggage.

2.2.3 In addition to implementing the above ICAO-aligned requirements, the ROK has introduced further safety enhancements to mitigate cabin fire risks. Notably, passengers are prohibited from stowing spare batteries or e-cigarettes in overhead compartments; instead, such items must be kept on the person or in seat pockets to allow immediate access and rapid response in the event of overheating or smoke incidents. Furthermore, each passenger is limited to carrying five (5) spare batteries onboard, with additional batteries requiring airline approval under special circumstances (e.g., medical devices). When airline approval is granted for batteries exceeding established limits, airlines affix an approval sticker to the battery, facilitating quicker and smoother verification during security checks.

2.2.4 Furthermore, if unauthorized portable batteries are suspected or if requested by the airline, additional inspections will be conducted by opening baggage to check for batteries that require airline approval. Any unauthorized batteries detected during this process will be immediately handed over to the respective airline for verification and appropriate handling. Monthly summaries of detected cases will be provided to airlines to enable internal corrective actions and enhance compliance with established battery carriage regulations.

2.3 In light of the recent increase in incidents and accidents in Korea, which have identified this issue as an emerging risk domestically, the ROK recognizes that this may also be considered an emerging risk in the APAC region. This recognition is further supported by trends in international air transport safety events. Given this, it is crucial to engage in regional discussions on safety analysis and

actions related to lithium battery and e-cigarette risks, and to foster a collaborative approach to effectively address this growing threat across the Region

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) note the information provided in this paper;

b) consider including the topic of “battery-related cabin fire risks” as a Focused Discussion item for the next APRAST/24 Meeting.

Attachment A: ROK Carry-On Safety Control Procedures (Korean, English, Chinese version)

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Attachment A: ROK Carry-On Safety Control Procedures

나와 우리의 안전을 위해, 알아두어야 할 상식!

보조배터리 및 전자담배 기내반입 절차

1 보조배터리 기내반입 기준

부치는 짐 불가능

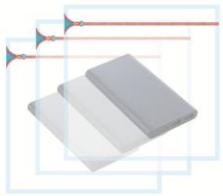
충전용량	수량	반입 조건			
		항공사 승인	스티커 부착	단락방지 조치	보관장소
100Wh(27,000mAh) 이하	1개 ~ 5개	불필요	불필요	필요	몸에 지니거나 좌석 앞주머니 (기내선반 금지)
	6개 ~	필요	필요	필요	
100Wh(27,000mAh) 초과 ~ 160Wh(43,000mAh) 이하	1개 ~ 2개	필요	필요	필요	
	3개 ~	반입불가			
160Wh(43,000mAh) 초과	반입불가				

[참고] 일반 보조배터리는 대부분 100Wh 이하 제품(20,000mAh, 3.7V 제품 기준 약 74Wh 용량)
3.7V 이외의 전압은 전류량(mAh) × 전압(V) ÷ 1,000 = 전력량(Wh) 으로 계산
주의. 보조배터리의 전압이 12V 일 경우, 전류량이 10,000mAh 라도 충전용량은 120Wh가 되기 때문에 반드시 배터리의 사양 확인 필요

* 전자담배는 몸에 지니고 기내 휴대 가능하나 부치는 짐(위탁수하물)으로는 반입 금지

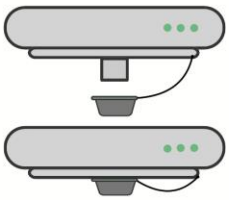
2 보조배터리 단락방지 조치 방법

다음 3가지 중에서 어느 하나의 방법으로 조치



① 비닐봉투, 보호용 파우치에 보관 (1개씩 분리 보관)

② 단자에 테이프 부착



③ 단자 보호용 캡 부착

3 보조배터리 기내반입 절차

5개 이하의 100Wh(27,000mAh) 이하 배터리는 항공사 승인 및 스티커 부착 제외

항공사 승인

수속카운터에서 승인 및 단락방지 조치 후 스티커 부착

보안 검색

승인 스티커 미부착 시 반입불가

기내 탑승

몸에 지니거나 좌석 앞주머니에 보관 (기내선반 보관 금지)

4 승객의 보조배터리 및 전자담배 기내 관리 및 대응 수칙

① 보관방법	몸에 지니거나 좌석 앞주머니에 보관하기 (기내선반 보관 금지)
② 사용방법	기내에서 사용하지 않는 경우에는 단락방지 상태를 유지하여 보관하기
③ 주의사항	외부 충격·압력을 가하지 않도록 주의하기 (보조배터리 및 전자담배 충전 금지)
④ 대응수칙	과열되거나 부풀어 오르면 즉시 승무원에게 알리기

국토교통부 TS 한국교통안전공단

For our safety, it's common sense to know!

Spare Battery & E-cigarette CARRY-ON PROCEDURES

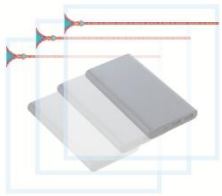
1 (RULES FOR) BATTERIES CARRIED ON BOARD — Prohibited in Checked Baggage

CHARGING CAPACITY	QUANTITY	REQUIREMENTS			
		APPROVAL (AIRLINE)	STICKER	INSULATION	STORAGE AREA
100Wh(27,000mAh) or less	1 ~ 5	N/A	N/A	Required	Keep it on your body or in the seat pocket (Not in overhead-bin)
	6 ~	Required	Required	Required	
100Wh(27,000mAh) over ~ 160Wh(43,000mAh) or less	1 ~ 2	Required	Required	Required	
	3 ~	Not allowed			
160Wh(43,000mAh) over		Not allowed			

[Note] Most spare batteries are 100Wh or less(approximately 74Wh capacity based on 20,000mAh, 3.7V)
Voltages other than 3.7V are calculated as Charge (Ah) x Voltage (V) = Energy (Wh)
Caution. If the voltage of the spare battery is 12V, the charging capacity will be 120Wh even if the current is 10,000mAh, so be sure to check the battery specifications.

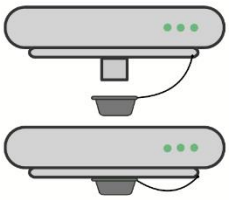
*** E-cigarettes can be carried on your body, but should not be kept in checked baggage**

2 METHOD OF INSULATION — By any of the following three methods



① Store in plastic bags or pouches (one by one)

② Attach with tape to the terminal



③ Protect it with a cap

3 CARRY-ON PROCEDURES

Stickers and approval are not required for batteries 100Wh(27,000mAh) (≤5 cells) or less

APPROVAL BY THE AIRLINE

~ 100Wh (6 units ~)

100Wh ~ 160Wh (~ 2 units)

Attach stickers after approval & insulation at the check-in counter

SECURITY SCREENNING

Not allowed without approval sticker

ON BOARD

Keep it on your body or in the seat pocket (Do not keep it in overhead-bin)

4 IN-FLIGHT MANAGEMENT & HANDLING GUIDELINES

① STORAGE	Keep it on your body or in the seat pocket (Do not use the overhead-bin)
② USE	Keep it insulated except for in-flight use
③ CAUTION	Be cautious of shock or pressurization (Do not charge batteries & E-cigarettes)
④ ACTION	Inform the crew immediately if it overheats or swells

Ministry of Land, Infrastructure and Transport

Korea Transportation Safety Authority

为了我们的飞行安全，必须了解的常识！

充电宝及电子烟
登机携带规定

1 充电宝登机携带标准

禁止托运

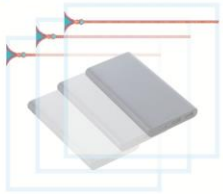
充电容量	数量	携带条件			
		航空公司批准	粘贴贴纸	短路预防措施	存放地点
100Wh(27,000mAh)以下	1个~ 5个	不需要	不需要	需要	随身携带或座椅前的椅袋（禁止放置于机舱行李架上）
	6个~	需要	需要	需要	
100Wh(27,000mAh)以上~ 160Wh(43,000mAh) 以下	1个~ 2个	需要	需要	需要	
	3个~	禁止携带			
160Wh(43,000mAh) 以上	禁止携带				

[参考]普通充电宝大部分为100Wh以下的产品(以20000mAh, 3.7V 产品为基准, 容量大约为74Wh）。
计算公式：电池容量(Ah）x 电压(v）= 电池电量(Wh)
注意：如果充电宝的电压为12V，即使电流量为10,000mAh，其充电容量也会达到120Wh，因此务必确认电池规格。

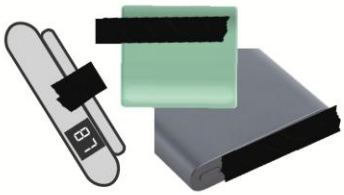
* 电子烟可以随身携带登机，但禁止放入托运行李。

2 充电宝防止短路措施方法

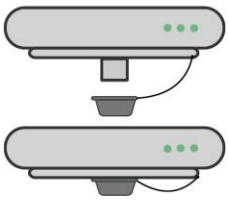
采取以下3种方法中任意一种



① 放置在塑料袋或保护袋中（每个单独放置）。



② 在接口处粘贴绝缘胶带。



③ 在接口处盖上保护盖。

3 充电宝机内携带流程

不足5个100Wh(27,000mAh) 以下的充电宝，无需航空公司确认及粘贴贴纸

在值机柜台进行确认并采取防短路措施后，粘贴贴纸。

未粘贴确认贴纸时不得携带登机。

随身携带或放置在座椅前的椅袋（禁止放置于机舱行李架上）。

4 乘客的充电宝及电子烟机内管理及应对守则

① 保管方法	随身携带或放置在座椅前的椅袋(禁止放置在机舱行李架上）。
② 使用方法	在机舱内不使用时，应采取防短路措施妥善存放。
③ 注意事项	注意避免外部冲击和挤压(禁止给充电宝和电子烟充电）。
④ 应对措施	异常发热或膨胀时，请立即通知空乘人员。

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— END —