



工作文件

危险物品专家组 (DGP)

第二十六次会议

2017年10月16日至27日, 蒙特利尔

议程项目6: 在可能的范围内, 解决空中航行委员会或专家组查明的非经常性的工作项目:

6.3: 缓解航空载运锂电池带来的风险 (工作卡DGP.003.01)

关于在客运航空器上载运锂电池的批准

(由A. Stubblefield提交)

摘要

本工作文件建议对《技术细则》特殊规定A201以及《技术细则》补篇 (Doc 9284号文件补篇) 第S-1部分第4章和第S-3部分第4章进行修订, 以便准许在始发国和运营人所在国主管当局批准的情况下通过客运航空器运输锂电池。

危险物品专家组的行动: 请危险物品专家组审议本工作文件附录A和附录B所示对特殊规定A201以及《技术细则》补篇第S-1部分第4章和第S-3部分第4章的拟议修订。

1. INTRODUCTION

1.1. In March 2016, the ICAO Council approved amendments to the 2015-2016 Edition of the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Technical Instructions, Doc 9284) which prohibit the transport of lithium ion batteries as cargo on passenger aircraft and incorporate additional requirements to mitigate risks posed by lithium batteries as cargo on cargo aircraft. These amendments became effective from 1 April 2016.

* 仅提供了摘要和附录的翻译。

1.2. The amendments approved by the ICAO Council included an amendment to existing Special Provision A201 that authorizes States concerned to grant an exemption from the prohibition to transport **lithium metal batteries** (UN3090) or **lithium ion batteries** (UN3480) on passenger aircraft in accordance with Part 1;1.1.3 of the Technical Instructions. The Council has also approved amendments to the Supplement to the Technical Instructions (Supplement, Doc 9284SU) to provide guidance for States on the transport of lithium batteries.

1.3. Special Provision A201 was introduced into the Technical Instructions in the 2015-2016 Edition of the Technical Instructions concurrent with the panel's decision to prohibit lithium metal batteries (UN 3090) from carriage as cargo on passenger carrying aircraft. Special Provision A201 provided an approval provision recognizing the potential need to transport lithium metal batteries in situations that were not limited to the strict conditions of Part 1;1.1.3, and that could be proven safe for transport under conditions specified by the States of Origin and Operator.

1.4. The proposed amendments in this working paper address concerns raised by stakeholders regarding impacts on the timely transport of certain lithium batteries when transportation by cargo aircraft is not an option. The intent of the paper is to provide an approval mechanism and guidance for the State of Origin and the State of the Operator in instances where other forms of transport (including cargo aircraft) are impracticable.

1.5. Recognizing that the goal of the Technical Instructions is to provide for the safe transport of dangerous goods by air, this working paper proposes to amend Special Provision A201 and make corresponding changes within the Supplement to recommend minimum criteria for use by the State of Origin and the State of the Operator when considering exemptions or approvals to authorize the transport of lithium batteries on passenger aircraft. Further, this working paper proposes revisions to the text of Special Provision A201 to provide specific quantity limitations, as no limitations are provided by the Dangerous Goods List in Table 3-1. These limits are designed to control the risk for passenger aircraft. This control is essential as we are proposing to establish an approval provision to allow an otherwise forbidden shipment aboard passenger aircraft. The specific quantity limits (Packing Instruction 965, Table 965-II and Packing Instruction 968, Table 968-II) were introduced in the approval process in Special Provision A201 due to the fact that the a) – e) risk mitigation criteria in Special Provision A3XX does not currently have any industry standards or testing procedures to validate the mitigation results, as is required for other dangerous goods packaging. Specific size and package limits are included to control the size and overall number of cells or batteries per package and promote consistency in the issuance of approvals. These amendments would maintain appropriate safety oversight should there be a need to transport lithium batteries on passenger aircraft while facilitating international transport.

1.6. In the current version of the Supplement, under Part S-1;4.1.4, minimum criteria are provided for consideration in a safety risk assessment to determine if an exemption to transport UN 3480 — **Lithium ion batteries** as cargo on passenger aircraft under Special Provision A201 would be appropriate. This working paper proposes to revise the text in S-1;4.1.4 to include both exemptions and approvals and include an allowance for both lithium metal and lithium ion batteries.

1.7. SAE International is leading an effort to develop an Aerospace Standard (AS) to specify minimum performance package standards that would support the safe shipment of lithium batteries as cargo on aircraft. This standard would provide a test method to demonstrate and document the mitigation of the potential hazards from lithium metal cells or batteries (UN 3090) and lithium ion cells or batteries (UN 3480) when transported as cargo on aircraft. The standard is expected to address the need to mitigate the hazards which might arise from a failure of an individual cell by containing the hazards within the package. Mitigating the consequences of a failure within the package is intended to prevent uncontrolled fire and pressure pulses that may compromise current fire suppression systems within the cargo

compartment. Although the standard is not yet complete, many of the principles outlined for consideration in the SAE effort are recommended for consideration as in proposed Special Provision A3XX. The proposed Special Provision A3XX is intended to apply control measures that will achieve a level of safety equivalent to that provided by the Technical Instructions. We are aware of packaging that can meet the proposed requirements in this working paper. Several packaging manufacturers presented their packages at ICAO on 24 October 2015, during but separate to the ICAO DGP/25 meeting.

2. ACTION BY THE DGP

2.1 The DGP is invited to agree to the revisions to the Technical Instructions and the Supplement as shown in Appendices A and B to this working paper.

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附录A

对《技术细则》第3部分的拟议修订

第3部分

危险物品表，特殊规定和限制数量与例外数量

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第3章

特殊规定

表 3-2 特殊规定

本细则 UN

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A201

相关国家可以根据第1部分1.1.3的规定，对禁止客运航空器运输锂金属或锂离子电池的规定予以豁免。在始发国和运营人所在国主管当局事先批准的情况下，各国可以根据上述当局制定的书面条件，准许在客运航空器上运输以下类型和数量的锂电池芯或电池：

- a) 锂金属电池芯或电池的数量（UN 3090）限于包装说明968表968-II的准运限额；和
- b) 锂离子电池芯或电池的数量（UN 3480）限于包装说明965表965-II的准运限额。

当始发国和运营人所在国之外的其他国家已通知国际民航组织，它们要求对于根据本项特殊规定装运的物品预先进行批准时，还必须酌情得到这些国家的批准。

如果不能根据本项特殊规定进行运输，有关国家可根据第1部分：1.1.3对关于禁止在客运航空器上运输锂金属或锂离子电池的规定批准予以豁免。

按照本特殊规定颁发豁免或批准文件的当局必须在3个月内通过向CSS@icao.int发送电子邮件，或通过向+1 514-954-6077发送传真，或通过向下列地址寄信，将批准文件的副本发送给货运安全科科长：

Chief, Cargo Safety Section
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montreal, Quebec
CANADA H3C 5H7

注：关于禁止运输锂电池的豁免或批准处理指南可参阅《技术细则》补篇第S-1;4部分和表S-3-1特殊规定A3XX。

附录B

对《技术细则》补篇第S-1部分的拟议修订

第S-1部分

概论

（《技术细则》第1部分的补充内容）

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第4章

为各国提供的关于将锂电池作为货物运输的指南

4.1 引言

4.1.1 锂电池具有热逸散的潜在可能性，这是一种连锁反应，会导致自身反复加热从而释放电池中存储的能量。一旦一个电池发生热逸散，它会产生足够的热量，诱发相邻电池的热逸散。热逸散的原因很多，如电池芯设计不良、电池芯生产缺陷和外部处置不当等。测试表明，热逸散可引起火灾和/或爆炸。

4.1.2 禁止在客机上作为货物运输UN 3090 — 锂金属电池已写入《技术细则》2015-2016版，依据是航空器货舱防火系统不能控制锂金属火情。最近的测试结果表明，涉及UN 3480 — 锂离子电池高密度包装件的火情可超出航空器货舱防火系统的能力。锂离子电池高密度包装件可能包含若干数量的电池或电池芯，有可能超过货舱防火系统的能力。这种可能性取决于若干变量，如电池或电池芯化学物质、尺寸、设计类型、数量和货舱构型。由于无法确定一个绝对安全的锂离子电池数量限制，并且缺乏减缓风险的包装标准，所以决定禁止在客机上作为货物运输UN 3480 — 锂离子电池。

4.1.3 目前正在制定基于性能的锂离子电池包装标准。预计在这一标准制定完成并确定了减缓风险所需的其他补充控制措施之后，将对《技术细则》进行修订，从而允许在客机上作为货物运输锂离子电池。

4.1.4 在根据特殊规定A201来考虑对在客机上作为货物运输UN 3480 — 锂离子电池或UN 3090 — 锂金属电池是否给予批准或豁免时，安全风险评估至少应包括以下标准：

- a) 运营人的能力；
- b) 航空器及其系统的整体能力；
- c) 包装和封装；
- d) 电池和电池芯的数量；
- e) 单元集装器的承载特点；
- f) 单独携带或混合携带的各类电池和电池芯的相关具体危害和安全风险；和
- g) 电池和电池芯的化学成分。

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第6章

特殊规定

针对危险物品增补表（表S-3-1）的条目，第7栏标出了适用的任何特殊规定。只要此种特殊规定未列于《技术细则》表3-2中，便列于下文表S-3-4中。

表S-3-4 特殊规定

补充特殊规定

- A3XX
- a) 在无法进行其他形式运输（包括货运航空器）的情况下，可以在始发国和运营人所在国当局事先批准的情况下，根据上述当局制定的书面条件，在客运航空器上运输锂电池芯或电池，前提是符合以下类型和数量要求：
- 1) 锂金属电池芯或电池的数量（UN 3090）限于包装说明 968 表 968-II 的准运限额；和
 - 2) 锂离子电池芯或电池的数量（UN 3480）限于包装说明 965 表 965-II 的准运限额。
- b) 在审议给予批准时至少应考虑及下列标准，以便在电池芯、电池或包装件一级缓解装有锂电池芯或电池的包装件发生过热、冒烟或失火事件所带来的风险：
- 1) 包装件外不允许存在火焰量；
 - 2) 包装件外表面温度不能超过可燃邻近包装材料或导致邻近包装件内电池或电池芯发生热逸散的温度值；
 - 3) 不能从包装件内掉出碎片，包装件必须保持结构完好；
 - 4) 散发的易燃蒸气数量必须低于下述气体量：在与空气混合且点燃时，可造成一个能使航空器货舱内过压板移位或造成航空器货舱衬板损坏的压力脉冲；和
 - 5) 当包装件或合成包装件受到外燃（例如五分钟燃油器火焰穿透性阻燃试验）或高温环境（例如烘箱热阻试验）时，包装件中装载的锂电池芯或电池不得产生热散逸。

关于上述标准 (b)1)至 5))的适当信息和文件，必须根据要求提供给签发批准的国家主管当局。

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