出國報告（出國類別：其他）

參加 Koito 航空座椅適航指令國際研討會議及執行長榮航空公司桃園-新加坡國際線駕駛艙航路查核出國報告書

服務機關：民用航空局
姓名職稱：陳玉成/技士
林衛民/約聘檢查員
派赴國家：新加坡
出國期間：99 年 10 月 20 日 －10 月 23 日
報告日期：100 年 1 月 7 日

列印

提 要 表

系統識別號：	C09904438
計畫名稱：	國際線駕駛艙、客艙航路查核
報告名稱：	參加Koito航空座椅適航指令國際研討會議及執行長榮航空公司桃園-新加坡國際線駕駛艙航路查核出國報告書
計畫主辦機關：	交通部民用航空局
出國人員：	姓名 / 服務機關 / 服務單位 / 職稱 / 官職等 / E-MAIL 信箱 陳玉成 交通部民用航空局 標準組 技士 薦任(派) 聯絡人ericchen@mail.caa.gov.tw 林衛民 交通部民用航空局 標準組 約聘人員 聘、雇
前往地區：	新加坡
參訪機關：	新加坡民航局
出國類別：	其他
出國期間：	民國99年10月20日 至 民國99年10月23日
報告日期：	民國100年01月07日
關鍵詞：	Koito，適航指令(AD)，航空座椅
報告書頁數：	78頁
報告內容摘要：	本局於99年10月20日及10月23日執行桃園-新加坡國際航線駕駛艙、客艙航路查核。 並於99年10月21日參加美國聯邦航空總署(FAA)、歐洲航空安全署(EASA)、日本民航局(JCAB)及Boeing公司、Airbus公司共同舉辦，針對日本小系工業株氏會社(Koito公司)所生產之航空座椅安全性之適航指令國際研討會議，廣泛研討並了解各受影響國家之民航主管機關及航空公司之意見，以完整掌握適航指令之後續執行重點及國內受影響機隊之改正方法。 同時於99年10月22日拜訪新加坡民航局(CAAS)相關官員，就符合Koito航空座椅適航指令所要求之測試方法、測試設施，以及航空公司機隊所安裝座椅之管控作法，進行研討並交換意見，以做我未來檢查航空公司Koito座椅適航指令符合性之工作參考。
電子全文檔：	C09904438_01.pdf
出國報告審核表：	C09904438_A.doc
限閱與否：	否
專責人員姓名：	陳碧雲
專責人員電話：	02-23496197

列印

參加Koito航空座椅適航指令國際研討會議及執行長榮航空公司桃園-新加坡國際線駕駛艙航路查核出國報告書

目　錄

頁次

壹、目的

由於日本小系工業株氏會社(Koito 公司)所生產之航空座椅，經由日本民航局(JCAB)檢查發現有適航性問題，將影響 Boeing 公司及 Airbus 公司已安裝 Koito 航空座椅之機隊，為此美國聯邦航空總署(FAA)、歐洲航空安全署(EASA)針對 Koito 航空座椅適航性問題，已研擬適航指令修正案(FAA AD NPRM 及 EASA PAD)，以改正可能之不安全情況。在正式發布適航指令前，FAA、EASA、JCAB 及 Boeing 公司、Airbus 公司訂於 99 年 10 月 21 日共同舉辦適航指令國際研討會議，以廣泛研討並蒐集各受影響國家之民航主管機關及航空公司之意見，本局亦於 99 年 10 月 5 日收到 FAA Transport Airplane Directorate Manager Mr. Ali Bahrami 之邀請函。鑑於國內有長榮航空 B777-300ER、A330 全機隊，以及中華航空 A340 全機隊皆受此適航指令之影響，故為能完整掌握適航指令之後續執行重點及國內受影響機隊之改正方法，故此次派適航檢查員林衛民及初始適航檢查陳玉成等二員參加此次適航指令國際研討會議。

由於新加坡航空之機隊亦受此次 Koito 公司航空座椅適航性問題之影響，因此亦安排於 99 年 10 月 22 日拜訪新加坡民航局(Civil Aviation Authority of Singapore, CAAS)相關官員，就符合 Koito 航空座椅適航

指令所要求之測試方法、測試設施，以及航空公司機隊所安裝座椅之管控作法，進行研討並交換意見，以做我未來檢查航空公司 Koito 座椅適航指令符合性之工作參考。

往返搭乘長榮航空桃園-新加坡航班，並於 99 年 10 月 20 日及 10 月 23 日兼施桃園-新加坡國際航線駕駛艙、客艙航路查核。

貳、出國行程經過摘要

一、本次行程安排如下：

10 月	10 月	10 月	10 月
20 日	21 日	22 日	23 日
台北－ 新加坡	新加坡	新加坡	新加坡－ 台北

二、出國行程：

99 年 10 月 20 日

- 執行長榮航空公司桃園-新加坡國際線駕駛艙航路查核

99 年 10 月 21 日

- 美國聯邦航空總署(FAA)適航指令簡報
- 日本民航局簡報(JCAB)適航指令簡報
- 歐洲航空安全署(EASA)適航指令簡報
- 問題研討(Q&A)
- 民航主管機關會議(Authorities Side Meeting)
- 結語(Closing Remarks)

99 年 10 月 22 日

- 拜訪新加坡民航局

99 年 10 月 23 日

- 執行長榮航空公司新加坡-桃園國際線駕駛艙航路查核

參、出國內容摘要

一、99 年 10 月 21 日 Koito 航空座椅適航指令國際研討會議

(一) 本局飛航標準組由適航檢查員林衛民及初始適航檢查陳玉成等二員參加 99 年 10 月 21 日於新加坡舉辦之 Koito 航空座椅適航指令國際研討會議，本次會議我國有長榮航空、華航機務部門及企畫部門派代表參加，其他參加之民航主管機關及相關航空公司人員共有百餘位，會議則以簡報及問答方式進行，美國聯邦航空總署(FAA)、日本民航局(JCAB)及歐洲航空安全署(EASA)簡報資料如附件 1, 2, 3。

(二) FAA AD 草案參考相關座椅動態測試及座椅墊防火測試立法時之生效年限，將此次 AD 所要求使用中座椅測試之執行年限分為三個階段。EASA AD 草案前三個階段則與 FAA AD 草案一致，但 EASA 另訂第四階段要求座椅汰換年限：

(1) 2 年：確認使用中座椅符合 FAR 25.561(b)(3)(ii) & (b)(3)(iii)靜態測試要求。

(2) 3 年：確認使用中座椅墊符合 FAR 25.853(c)防火測試要求。

(3) 6 年：確認使用中座椅符合 FAR 25.562(b)(2) & (c)(7)

動態測試要求。

(4) 10 年：EASA AD 要求即使座椅通過上述三項測試要求，但由於並未完全證明其他相關亦符合，且 EASA IR 21A.3B 要求對不安全之情況須要求符合期限(Compliance Time)，故訂此年限要求。

(三) 本次會議本局亦針對 FAA/EASA/JCAB 之分別簡報，於會議發言提出下列幾項問題，以下並同時說明所得之回覆：

(1) 詢問 JCAB 是否將發布 AD：JCAB 回應將不發布，惟將俟未來 FAA AD 及 EASA AD 發布後再予以引用。

(2) 提出此次 AD 除測試外如何執行符合性檢查(Conformity Inspection)為另一重要關鍵，FAA/EASA 應訂定如何執行之相關作法：FAA 表示將列入研討項目。

(3) 當飛機上座椅移除進行測試後，所導致飛機構型差異(載客數減少)，EASA 可與 JCAB 共同研擬因應對策：EASA 表示由於與 JCAB 無適航協議，且仍未看到 JCAB 重新驗證的相關數據，將待後續審視相關數據，再進一步研擬因應方式。

二、99 年 10 月 22 日拜訪新加坡民航局(CAAS)

本局亦於 10 月 22 日拜訪新加坡民航局(CAAS)適航/空勤司(Airworthiness/Flight Operations Division)副司長 Mr. Chew Choong Cheng，以及安全政策及執照司(Safety Policy & Licensing Division)主任 Mr. Sebastian Wang，對於新加坡民航局、適航/空勤司及安全政策及執照司組織架構有初步認識，並了解其對於 Koito AD 因應作法、DOA(Design Organization Approval)/POA(Production Organization Approval)發證/管理及檢查員訓練等相關作法。新加坡民航局組織架構及安全政策及執照司簡報資料如附件 4, 5。

三、執行長榮航空公司桃園-新加坡國際線駕駛艙航路查核摘要

(一) 99 年 10 月 20 日 BR225 B-16705 Captain 陳明德 FO 沈耿堯 CP 陳春玫

(1) 組員證照/飛機文件/飛航資料及文件/緊急裝備抽檢等檢查均無異常發現。

(2) 飛航組員各階段之操作均按標準作業程序執行，組員互動〈CRM〉良好。

(3) 航管通話順暢，溝通良好。

(4) 前/後艙之協調合作均按規範執行，客艙組員工作執行正常，無異常發現。

(二) 99 年 10 月 23 日 BR226 B-16710 Captain 陳隆興 FO 陳兆明 CP 白玉明

(1) 組員證照/飛機文件/飛航資料及文件/緊急裝備抽檢等檢查均無異常發現。

(2) 飛航組員各階段之操作均按標準作業程序執行，組員互動〈CRM〉良好。

(3) 航管通話順暢，溝通良好。

(4) 前/後艙之協調合作均按規範執行，客艙組員工作執行正常，無異常發現。

肆、心得與建議

一、研討會心得：

總結本次參與研討會議之心得為：

(一) 了解 FAA/EASA/JCAB 對於 AD 看法目前仍未臻一致，且彼此合作聯絡管道仍未上軌道。

(二) 此次有關日本 Koito 安全性之 AD 的發布在考慮公眾利益(Public Interest)下，有很大的機會將會發布，只是相關內容將待 FAA/EASA/JCAB 研議結果可能會再修訂，國內中華航空、長榮航空公司亦應即早準備因應。

(三) 了解與會航空公司對於 Koito 安全性之 AD 反應意見重點在於 AD 執行期限展延、缺少備份座椅/組件、AD 符合方法不足、原廠 Boeing 公司及 Airbus 公司技術協助等議題。

(註 1：Association of Asia Pacific Airlines (AAPA)針對航空公司關議題，已備妥相關建議文件，如附件 6，該文件將提交給 FAA 做為 Koito 安全性 AD 草案之 Comment)

(註 2：EASA 針對 Koito 安全性 AD 研討會議之會議紀錄，如附件 7)

(四) 建立與 FAA/EASA/JCAB 相關承辦官員之聯絡管道。

(五) 了解新加坡民航局對於 Koito 安全性之 AD 之發布作法，將以採用飛機原設計國 AD 為主，亦即 Boeing 飛機將採用 FAA AD，而 Airbus 飛機將採用 EASA AD，此點與本局研討看法相同。

(六) 建立與新加坡民航局適航、證照、安全政策及航務官員之聯絡管道。

二、建議事項：

(一) 與 FAA/EASA/JCAB 視需要保持聯繫，以掌握 AD 正式發布時機及相關修訂內容，使本局在該 AD 發布作業及航空公司符合方法之研擬能有所因應。

(二) 由於新加坡亦多曾進口相關航空零組件(如：餐車 Meal Cart 等)至我國，但礙於我國民航局與新加坡民航局尚未簽署相關適航驗證協議，因此相關產品仍需由新加坡航空零組件製造廠(如：Diethelm Keller Aviation 公司)向歐洲航空安全署取得相關驗證後(如：ETSO 或 Minor Design Change Approval)，方可進口我國使用。此次拜會新加坡民航局後，雙方對於進一步之適航合作，皆認為是非常正面且有幫助的，因此建議本局可開始與新加坡民航局探詢未來適航合作之方向與項目。

伍、附件

附件 1：美國聯邦航空總署(FAA)簡報資料

附件 2：日本民航局(JCAB)簡報資料

附件 3：歐洲航空安全署(EASA)簡報資料

附件 4：新加坡民航局組織架構

附件 5：新加坡民航局安全政策及執照司簡報資料

附件 6：AAPA 針對 Koito 安全性 AD 之 Comment 信函

附件 7：EASA 針對 Koito 安全性 AD 研討會議之會議紀錄

Koito Seats Information Meeting

21st October, 2010

Singapore

PAD/NPRM Comment Procedure

- This meeting does not substitute for the formal comment process against PAD and NPRM.
- We hope that the discussion will clarify your understanding of the issue and objectives but to formalise any questions you must submit a formal comment per the comment procedure so that all can be considered concurrently.

European Aviation Safety Agency | Federal Aviation Administration

Koito Seats Information Meeting 21st October, Singapore

- Background
- Level of Safety Determination
- Corrective Actions
- Data to Show Compliance
- Comments/Questions

European Aviation Safety Agency | Federal Aviation Administration

Background

- Towards the end of 2009, EASA/FAA became increasingly aware of allegations that the Koito seat company had been falsifying Certification Test results, and had not controlled production conformity, for an appreciable period.
- TC holders (Airbus, Boeing) and JCAB progressively added confirmation to these allegations 1stQ. 2010.
- Initiatives were started by JCAB, TC holders and EASA/FAA to determine scale of the issue.

- Background cont.
  - It became clear that unsafe conditions existed and thus mandatory action was needed.
  - EASA and FAA co-ordinated thoughts and close agreement was reached on an AD framework.
  - Regulatory differences however, prevented 100% alignment.

Level of Safety Determination

- Two Aspects
  - Performance requirements
  - Timing

(Performance dictates timing)

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Performance

- Problem: Define the unsafe condition.
- Three basic parameters: structural, flammability, injury.
- Basic safe performance requires structural integrity.
- Structural requirements have evolved over time.
  - "6g"⇨"9g"⇨"16g"
  - Each evolution meant to provide structural integrity in the event of an accident.

Slide 7

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Performance

- Therefore, the "16g" criteria are an evolution of the previous 9g criteria, based on data--Basic intent from the structural standpoint is the same.
- Fleet is mixed between 9g and 16g.
- Previous AD action to correct structural defects, for both 9g and 16g.
- **Seats must meet most basic structural requirement at their certification basis.**

Slide 8

Level of Safety: Performance

- Flammability requirements have also evolved.
- Most parts on seats have to meet the Bunsen burner test.
- Seat cushions have to meet a much more stringent oil burner test.
- Seat cushion requirements were made applicable to the existing fleet (3 year retrofit).

Level of Safety: Performance

- Remainder of seat parts generally accessible, and so not a major threat for in-flight fire.
- Materials are generally 'typical'
  - Bunsen burner performance may or may not indicate real-world performance.
  - Bunsen burner gradually being replaced with more threat-derived test methods.
- Cushion performance key for flammability safety determination.

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Performance

- Injury criteria have evolved from qualitative to add quantitative requirements.
- Many derivative airplanes have included structural requirements of later rules, but not all injury criteria.
- These criteria have not been retrofit.
- Therefore, safety determination based on historical criteria prohibiting sharp edges.

Slide 11

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Timing

- Three proposed compliance dates in FAA NPRM and Four in EASA PAD.
- Dates established based on several factors
  - Risk assessment (nature of the potential safety problem and likelihood it would manifest itself)
  - Prior regulatory actions
  - Practical considerations
  - Regulatory aspects

Slide 12

Level of Safety - "AD Phases"

- Phase 1: Initial timescale for showing that at least basic static strength and injury is OK.
- Phase 2: Slightly longer timescale for showing seat cushion flammability is OK.
- Phase 3: Medium timescale for showing "dynamic seats" meet basic "16g" requirements.
- Phase 4: EASA PAD only – Longer final phase-out timescale for seats that meet AD's prescribed minimum conditions (as above) but don't meet full cert requirements.

  (FAA NPRM allows indefinite service in these cases)

Level of Safety: Phase 1

- Static strength and injury compliance in 2 years
- Most basic requirements; noncompliance could even affect performance in turbulence
- Consistent with previous AD actions
- Risk analysis suggests it is generous

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Phase 2

- Seat Cushion flammability compliance within 3 years
- Matches original retrofit requirement, which applied to entire fleet (in US part 121 and 135, in Europe similar operational based applicability)
- Limited applicability of AD makes availability of replacement cushions less of a concern

Slide 15

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Phase 3

- Dynamic Seats only - compliance within 6 years to 16g structural requirement (no HIC, femur, 14g, lumbar, etc.)
- Six years correlates with original retrofit proposal
  - NPRM issued in 1988
  - Final Rule anticipated in 1989
  - Compliance date set for 1995
- Evidence of compliance with "16g" would also cover the Phase 1 structural requirement if shown in first 2 years

Slide 16

European Aviation Safety Agency

Federal Aviation Administration

Level of Safety: Phase 4 (EASA PAD only)

- EASA regulatory framework –
  An unsafe condition exists if ….
  (c) design features intended to minimise the effects of survivable accidents are not performing their intended function. (ref AMC 21A.3B(b))
- Phases 1 to 3 only require compliance showing to reduced scope of requirements.
- Whereas static and/or dynamic (e.g., HIC, femur, 14g, lumbar) are intended to minimise the effects of survivable accidents and therefore their compliance needs to be established.
- Seats must be shown to comply with the applicable cert basis or must be removed after ten years.

Slide 17

European Aviation Safety Agency

Federal Aviation Administration

Corrective Actions

- Proposals are written to require removal of non-compliant seats.
- Operator may elect to bring seats into compliance, rather than remove.
- However, in order to be approved, modifications must result in a fully compliant article per Part 21.
- Modifications that leave non-compliance, cannot be approved.
- The only exception is the replacement of seat cushions.

Slide 18

Corrective Actions

- Replacement of wear-out parts by after market parts (such as foodtrays, armrest covers) are not considered a "*modification*" and thus allowed.
- However such parts must meet all requirements applicable to them.

Data to Show Compliance

- Proposed ADs require compliance data, equivalent to certification data
  - Rationale to identify test articles
  - Quality of data – suitably experienced organisation to develop test plan, select/assess test lab, test article definition, etc.
- This would apply whether data already exist, or are generated specifically to meet the ADs

European Aviation Safety Agency

Federal Aviation Administration

Data to Show Compliance

- EASA and FAA have direct responsibility for only a limited portion of the affected fleet, i.e.,
  - European
  - US
- Data to show compliance for other Countries are the responsibility of those countries.
- As is normal, EASA and FAA would consult if asked by another authority.

Slide 21

European Aviation Safety Agency

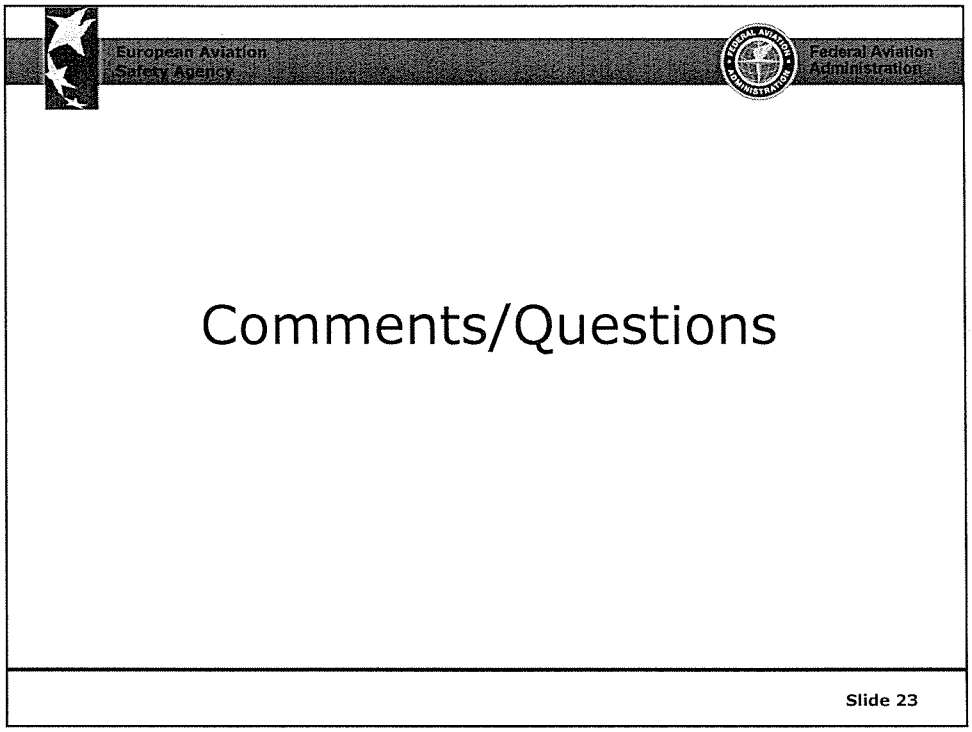
Federal Aviation Administration

Reminder

- This meeting does not substitute for the formal comment process against PAD and NPRM.
- We hope that the discussion will clarify your understanding of the issue and objectives but to formalise any questions you must submit a formal comment per the comment procedure so that all can be considered concurrently.

http://ad.easa.europa.eu/
http://federalregister.gov/a/2010-23936

Slide 22


European Aviation Safety Agency
Federal Aviation Administration
Comments/Questions
Slide 23

Problems relating to aircraft seats manufactured by Koito Industries

October 2010

FAA–EASA Seat AD Briefing

Japan Civil Aviation Bureau (JCAB)

About Koito

- One of the leading manufacturers of aircraft seats (BFE supplier) for large air transport airplanes.
- Currently, approx. 1,000 airplanes are in operation with approx. 150,000 Koito seats.
- For Boeing airplanes, most seats have FAA TSO Design Approval based on JCAB Specification Approval.
- For Airbus airplanes, seats are installed based on EASA TC (Airbus) and manufactured under POA (Koito). Some seats have FAA TSO by customer requirement.

Timeline of Events

- **Dec. 2008 - March 2009:** First whistle blower contacted the Japan Civil Aviation Bureau (JCAB), and reported discrepancy between material of production seats and material of the test articles for fire properties test. After the on-the-spot investigation, JCAB took enforcement actions against Koito . Koito issued Instructions for recovering the compliance with applicable safety standards to customer airlines concerned.

- **June 2009 - January 2010:** Second and third whistle blowers contacted the JCAB, and reported other discrepancies to JCAB. JCAB decided to start the review of the safety of all in-service seats. As a result of series of on-the-spot investigations by JCAB, additional record discrepancies and falsifications of dynamic, static and flammability testing on delivered seats were confirmed.
  JCAB contacted FAA and EASA on this issue to share information and coordinate the plan of actions.

- **Feb. 2010:** JCAB issued a letter of recommendation against Koito to take another enforcement actions. JCAB also informed the authorities of operators using Koito seats of its findings and actions.

The various wrong doings conducted by Koito

(Design Related)

1. Unauthorized Design Changes
   - No.1 – Falsification of HRR/SD test result
   - No 2 – Dwg overwriting by KU*
   - No 3 – Dwg overwriting without KU
   - No 4 – Unreported dwg revision
   - No 9 – Unsupported products not manufactured anymore
   - No 10 – Change direction by service letter
   - No 11 – Config change at the start of production, does not match as tested config.

2. Falsification of Certification Test Result
   - No 13 – Falsification of 16g test result
   - No 14 – Falsification of 9g test result
   - No 15 – Falsification of FBL test results
   - No 16 – Falsification of vertical/horizontal flammability test results
   - No 17 – Falsification of environmental test results

(Conformity Related)

3. Falsification of Inspection Records
   - No 5 – Falsification/modification of records
   - No 6 – Falsification of material certs
   - No 7 – Illegally reused QT seats
   - No 8 – Unreported material change by suppliers
   - No 12 – Falsification of weight of completed seats

*KU is a abbreviation of Koito Understanding.
Koito used KU to overwrite drawings without JCAB approval or notification.

Results of JCAB Investigation on Major Problems

- Drawings

  All drawings for the production were retained by Koito. They have been checked and all design changes made to each in-service seat model have been identified and analyzed.

- Suppliers

  1 There is no problem identified relating to metallic parts provided by suppliers.

  2 As a results of investigations of Koito and all suppliers of non-metallic parts and seat cushions, all materials actually used on Koito seats were identified.

Results of JCAB Investigation - continue -

- Conformity

  Tear down inspections of spare seats provided by customer airlines, which were manufactured during the period that Koito was under strongest pressure on its production line, were conducted to see if there are any significant differences from the production drawings caused by misconduct of inspections by Koito.

  The results show that there are no significant differences which may impact the plan to conduct dynamic/static tests on seats produced in accordance with the production drawing.

Results of JCAB Investigation - continue -

- Design (Falsification of Test Data)

  There are some raw test data stored in computers of Koito, which are different from the test data submitted for approvals.

  Therefore, it is necessary to conduct test and analysis to find out compliance status of each in-service seat model.

Process to Determine Compliance Status of In-Service Seat

Based on the results of the investigation, JCAB instructed Koito to conduct tests to confirm compliance status of in-service seat models.

Tests are conducted in the following manner.

Test Priority

- The tests start with Phase 1 (completed by the end of May 2010), and are followed by Phase 2 (to be completed before the end of year 2010).
- Categorization of Phase 1 and Phase 2 are determined based on a nature of each tests.

Process to Determine Compliance Status of In-Service Seat - continue -

Seats used for Dynamic/Static test and seat cushions used for FBL test

- In principle, seats and seat cushions for tests are newly manufactured in accordance with the newest production drawing for each model. If it is confirmed that there is the previous configuration which is more critical than the newest configuration, such configuration is to be used.

Process to Determine Compliance Status of In-Service Seat - continue -

100% reliability of confirmation process

- The parts conformity of the seats and seat cushions for tests are conducted by the JCAB.
- All tests are to be witnessed by the JCAB, when conducted at Koito's test facilities or are conducted and witnessed by reliable third parties.
- All process are closely scrutinized by the JCAB.
- Similarity analysis shall be in accordance with FAA AC25.562-1B for strength and FAR25.853 Appendix F Part I (b)(2), Part (a)(3) for Flammability and FBL.

Process to Determine Compliance Status of In-Service Seat - continue -

Dynamic Load Test

Phase 1

- All in-service seat models are categorized into 11 seat model groups. Dynamic Load Test is applied to 9 seat model groups.
- Select seat models by reviewing most critical value of interface load, lumber load and HIC in order to identify the order of test priority to conform each seat models.

Phase 2

- Any other models that do not belong to Phase 1 group.

Process to Determine Compliance Status of In-Service Seat - continue -

Static Load Test

Phase 1

- Seat models that dynamic test is not required is subject to test during Phase1.

Phase 2

- Any other models that do not belong to Phase 1 group.

Process to Determine Compliance Status of In-Service Seat - continue -

FBL

Phase 1

- Seat cushions that the previous test are suspicious are subject to test during Phase 1.

Phase 2

- Any other models that do not belong to Phase 1 group.

Process to Determine Compliance Status of In-Service Seat - continue -

Flammability Test

Phase 1

- Leather and textile, as well as the materials which have not been tested are subject to test during Phase 1.

Phase 2

- Any other models that do not belong to Phase 1 group.

JCAB Conclusion

- JCAB believes that all tests data obtained from Phase 1 and Phase 2 tests could be used for in-service seat models to show compliance with ADs proposed by FAA and EASA.
- Use of those test data will alleviate burdens on operators in compliance finding and taking necessary corrective actions, if any.
- Cooperation from aircraft manufactures (Boeing and Airbus) are essential in utilizing Koito data to show compliance with proposed ADs, because the technical analysis of the test data may be required.
- JCAB is ready to provide any help and assistance to the Authorities and operators affected by ADs.

Questions?

Production of spare parts for KOITO seats

EASA POA Section

Pre-conditions:

- Clearly define by EASA Certification Directorate which **design data are acceptable**
- Presented options are not applicable for **FAA TSO seats** (i.e. on Boeing aircraft) with not approved design by EASA

35

Option 1:

- Parts produced by KOITO after reinstallation of EASA POA
- Reinstallation of POA will require:
  - Confirmation by all related Design Approval Holder and EASA that the design data available at Koito is acceptable for new deliveries
  - Closure of all old findings
  - All applicable DO-PO arrangement are in place, up-to-date and confirmed to EASA as acceptable/valid by the design approval holder

36

Option 1:

- Reinstallation of POA will require (cont.):
  - Assessments of all nominated persons: Accountable Manager, other Responsible Mangers and Certifying Staff
  - Re-audit/assessment of the complete organisation at KOITO facilities
- Note: This could take couple of months

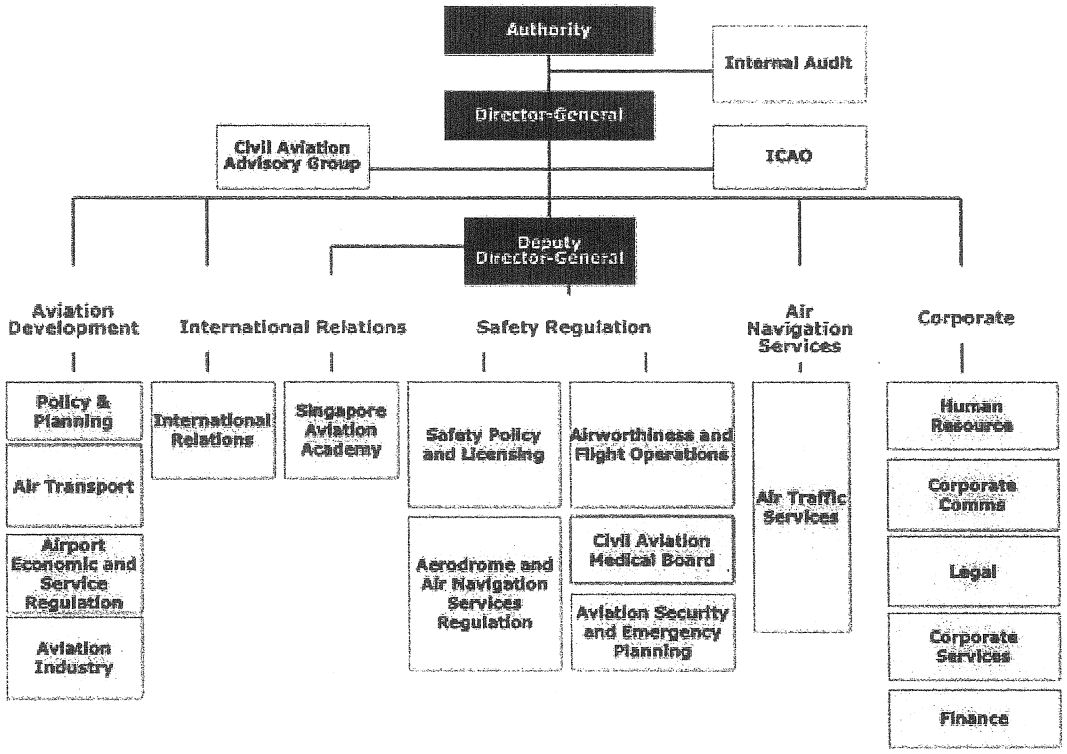
Option 2:

- Production by any Part 21 POA organisation under the arrangement with Design organisation
- The approved design data could be provided by the following Design organisation:
  - KOITO (for KOITO design)
  - TC Holder (for TC Holder design)
  - Other Approved Design Change Holder

Option 3:

- Production in KOITO under another POA Holder system (i.e. TC Holder POA with release of parts by TC Holder POA Certifying staff) under the arrangement with Design organisation

CAAS Organisation Chart (1 July 09)

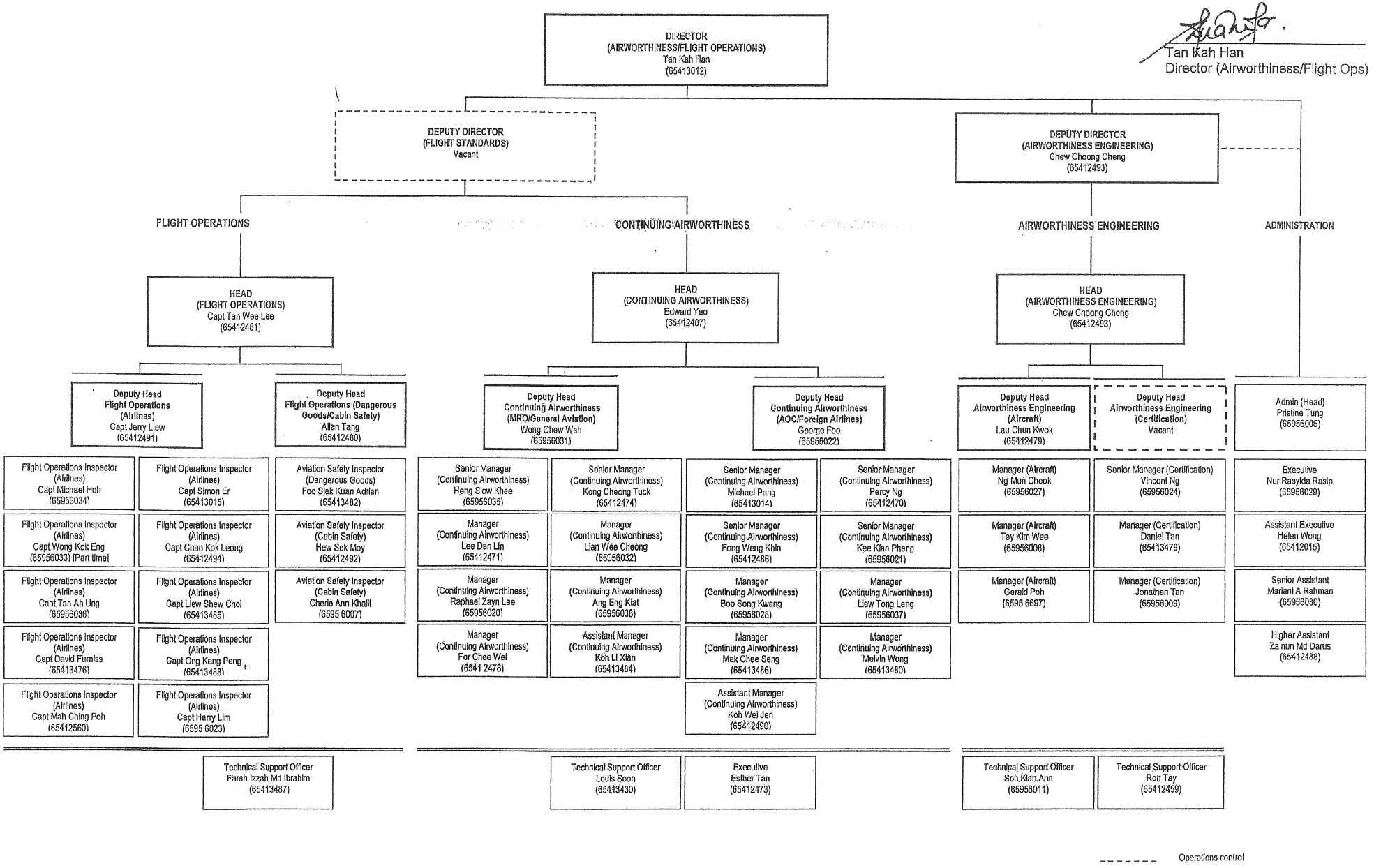


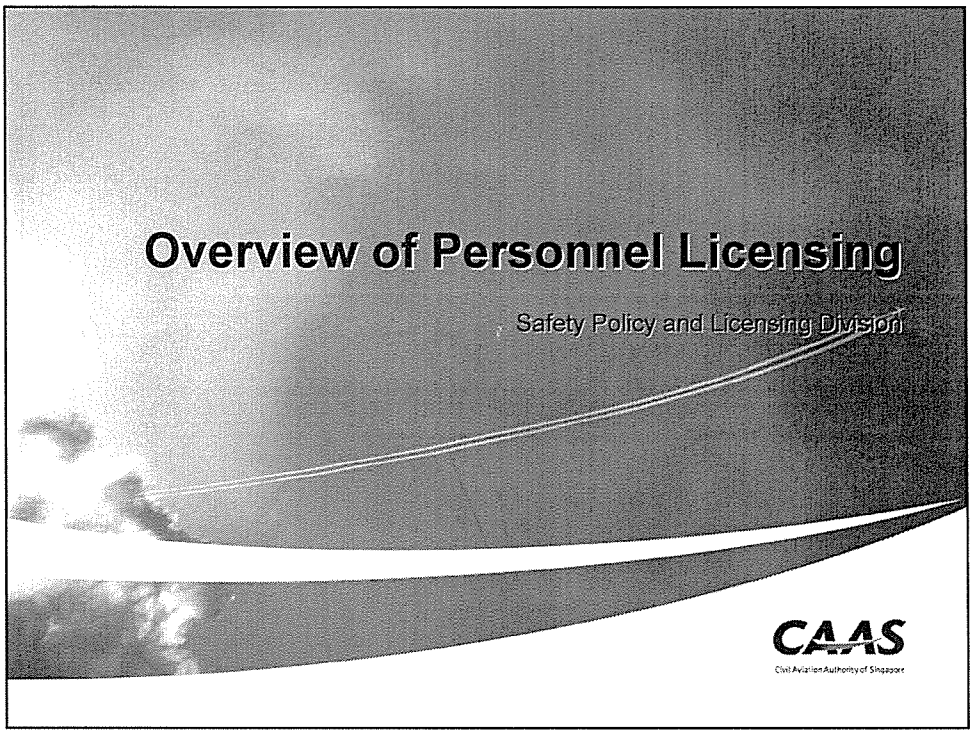
40

ORGANISATION CHART OF CAAS AIRWORTHINESS / FLIGHT OPERATIONS DIVISION

Effective 11 October 2010

Tan Kah Han
Director (Airworthiness/Flight Ops)





Outline

1. Industry Overview
2. Legislation and Regulations
3. Organisation
4. Functions of SPL Division (in relation to PEL) and CAMB
5. Technical Guidance & Tools
6. Staff Training
7. Approvals and Surveillance Activities
8. Resolution of Safety Concerns

Section 1

Industry Overview

CAAS

Approved Training Organisations

Maintenance Training Organisations (MTO)		
Basic Training Courses	Basic & Type Training Courses	Type Training Courses
Air Transport Training College	SIA ENGINEERING COMPANY	eurocopter
ST Aerospace	MIL-COM	HAECO
		ROYAL BRUNEI

CAAS

Approved Training Organisations

Aviation Training Organisations (ATO)	
Flying Training Organisation (FTO)	Type Rating Training Organisation (TRTO)
ST Aerospace	BOEING
ATC Training Organisation	
SINGAPORE AVIATION ACADEMY	

CAAS

Licences Issued

Licences	Number
Flight Crew Licences:	3355
• Airline Transport Pilot Licences	1413
• Commercial Pilot Licences	724
• Flight Engineer Licences	12
• Private Pilot Licences	188
• Student Pilot Licences	1018
Aircraft Maintenance Engineers	1803
Air Traffic Controller Licences	255
Senior Authorised Flight Examiners	12
Authorised Flight Examiners	135

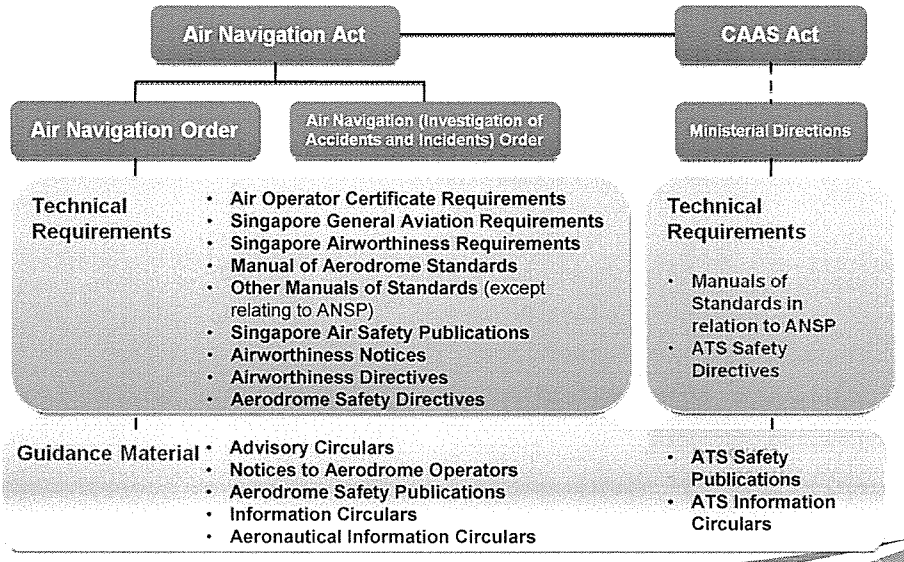
CAAS

Section 2

Legislation and Regulations

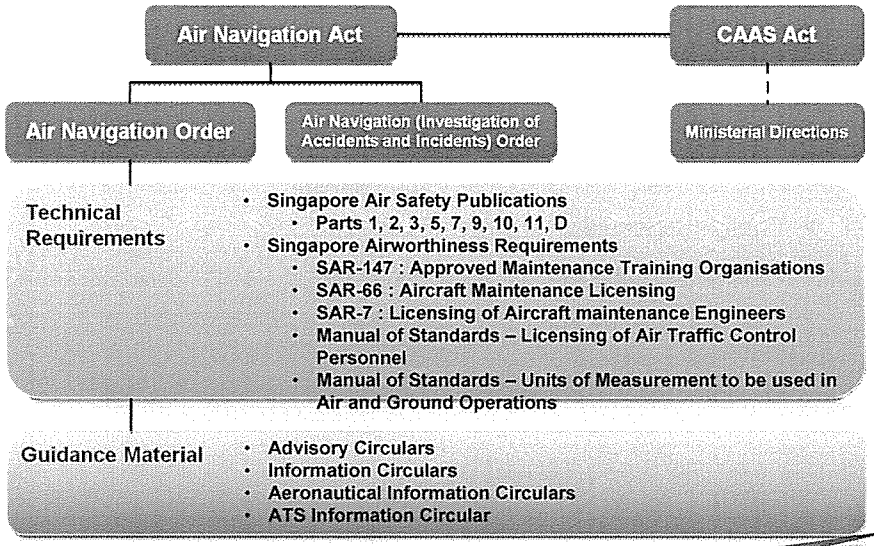
CAAS

Legislation and Regulations



CAAS

Legislation and Regulations



CAAS

Air Navigation Order

- The provisions applicable to PEL module are:

➢ Part III, para 11	–	Aircraft Maintenance Licence
➢ Part III, para 17A	–	Compliance with Singapore Airworthiness Requirements
➢ Part IV, para 20	–	Grant and Renewal of Licences to Members of Flight Crew
➢ Part VIII	–	Documents and Records
➢ Part IX, para 62A to 62G	–	Licensing of Air Traffic Controllers
➢ Part XI	–	General

CAAS

Air Navigation Order

- The provisions applicable to PEL are:

➢ Eighth Schedule	–	Flight Crew of Aircraft : Licences and Ratings
➢ Twelfth Schedule	–	Fees
➢ Thirteenth Schedule	–	Penalties
➢ Fourteenth Schedule	–	Medical Examination and Medical Fitness Requirements
➢ Seventeenth Schedule	–	Air Traffic Controller Ratings

CAAS

Technical Requirements

- Manual of Standards – Units of Measurement to be used in Air and Ground Operations (MOS-UOM)
- Aircraft Maintenance Engineers Licensing Requirements
  - ➢ Singapore Airworthiness Requirements (SAR)
    - ✓ SAR-7: Licensing of Aircraft Maintenance Engineers (Being phased out and superseded by SAR-66)
    - ✓ SAR-66 : Aircraft Maintenance Licensing

CAAS

Technical Requirements

- Flight Crew Licensing Requirements

  - Singapore Air Safety Publications
    - ✓ Part 1: Licensing of Student Pilots and Private Pilots
    - ✓ Part 2: Licensing of Professional Pilots
    - ✓ Part 3: Flying Instructor Ratings
    - ✓ Part 5: Licensing of Flight Engineers
    - ✓ Part 7: Authorised Flight Examiners
    - ✓ Part 9: Medical Requirements for Grant and Renewal of Flight Crew Licences and Air Traffic Controllers Licences
    - ✓ Part 11: Flight Simulation Training Devices (Aeroplane)
    - ✓ Part D: Definitions

Technical Requirements

- Approved Training Organisations

  - SAR-147 : Approved Maintenance Training Organisations

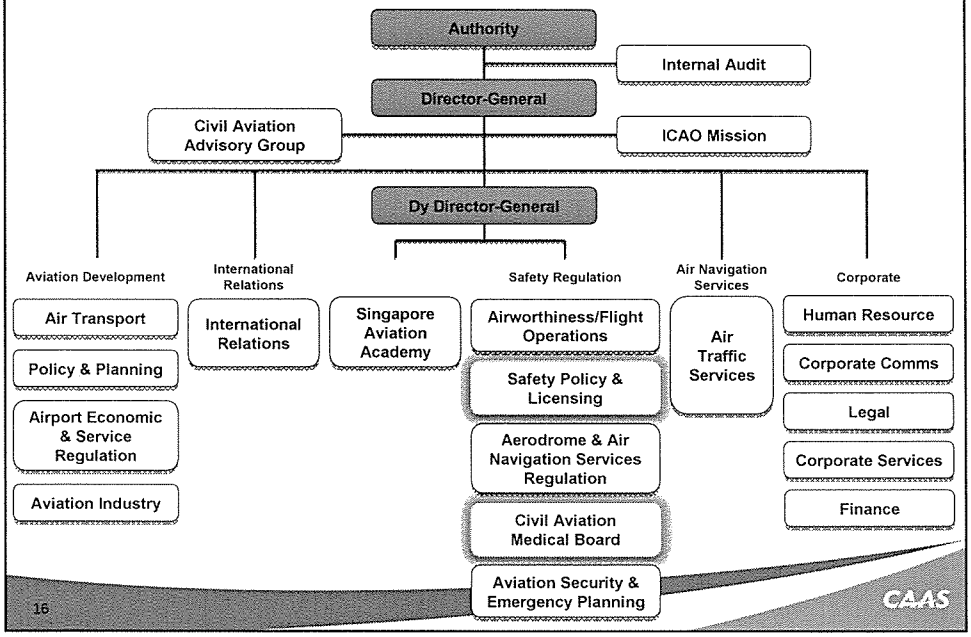
  - SASP 10: Approval of An Aviation Training Organisation

Section 3

Organisation

CAAS

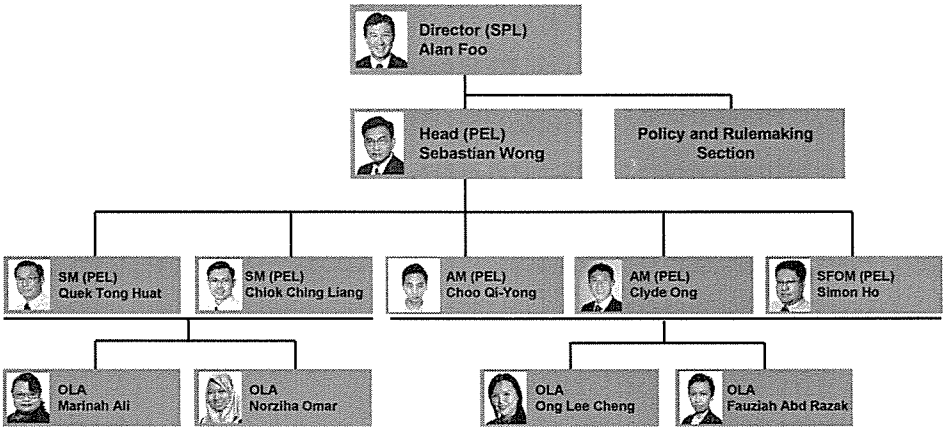
CAAS Organisation Structure



CAAS

Safety Policy & Licensing Division

Personnel Licensing Section



CAAS

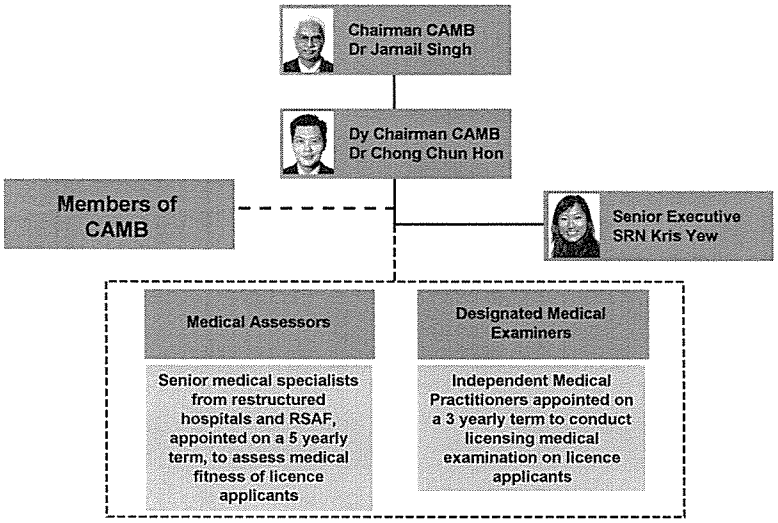
SPL Manpower Resources

(in relation to PEL)

	Current	Vacancy
Section Head	1	-
Aircraft Maintenance Engineer Licensing		
Managers	2	-
Operations and Licensing Assistants	2	-
Flight Crew Licensing		
Managers	3	-
Operations and Licensing Assistants	2	1
Total	10	1

CAAS

Civil Aviation Medical Board



CAAS

CAMB Manpower Resources

	Current	Vacancy
Chairman	1	-
Deputy Chairman	1	-
Senior Executive	1	-
Members of CAMB	52	NA
Medical Assessors	52	NA
Designated Medical Examiners (DMEs)	26	NA

CAAS

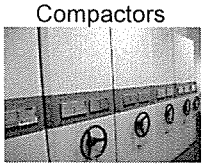
Licensing Section Office

Front Entrance

Reception Area

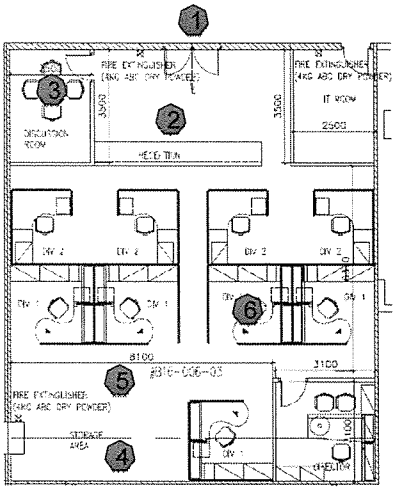
Discussion Room

Compactors



Equipment

Workstation



CAAS

Clinical Premises of CAMB

Administrative area

Medical Board Room

Medical Records Office

CAAS

Section 4

Functions of SPL Division (in relation to PEL) and CAMB

CAAS

Functions of SPL Division
(in relation to PEL)

- Implements ICAO Annex 1 SARPs in national legislation and regulations
- Develop guidance material in support of legislation and regulation
- Carries out the safety regulatory oversight of:
  - Aviation Training Organisation
  - Maintenance Training Organisation
  - Licensing of Flight Crew
  - Licensing of Aircraft Maintenance Engineers
  - Authorised Flight Examiners
  - Promotes safety in civil aircraft operations through licensing of qualified personnel

CAAS

Functions of CAMB

- Implements ICAO Annex 1 SARPs (pertaining to aeromedical requirements) in national legislation and regulations
- Develop guidance material in support of legislation and regulation
- Oversees:
  - Management of Licensing medical examination and assessment system
  - Appointment of Medical Assessors and Designated Medical Examiners (DMEs)
  - Monitoring and aeromedical disposition of licensees with medical incapacities
  - Promotes safety in civil aircraft operations through various CAMB activities involving licensees and organisations

CAAS

Section 5

Technical Guidance & Tools

CAAS

SRG Policies & Procedures

GENERAL

- Administrative Guidelines on SRG Procedures
- SRG eLibrary
- Technical Training Framework
- Delegation of Powers
- Coordination Procedures between CAAS & AAIB

REGULATORY FUNCTIONS

- Investigation of Accidents, Serious Incidents and Incidents Involving Aircraft
- Granting Exemptions
- Enforcement Policy and Procedures

LEGISLATION AND REGULATIONS

- Issues Register
- Rule Development Procedure
- Issue of Guidance Material

ICAO DOCUMENTS

- Handling of ICAO State Letters relating to Annex Amendments
- Filing of Differences to ICAO Annexes
- Review of Compliance to ICAO Standards and Recommended Practices

CAAS

Technical Guidance & Tools
(Internal)

- Safety Regulation Group (SRG) Procedures
  - To guide SRG officers in carrying out their work
  - Ensures consistency in the delivery of our safety oversight responsibilities
- Personnel Licensing Procedures (PELP)
  - Internal work procedures pertaining to respective operations
- Civil Aviation Medical Board (CAMB) Manual
  - Administrative framework and medical licensing procedures

CAAS

Technical Guidance & Tools (Internal)

No.	Personnel Licensing Procedures (PELP)
Section 1: General	
1	Roles & Responsibilities for Licensing Section
2	Manager (PEL) Training Programme
3	Operations & Licensing Assistant (OLA) Training Programme
4	Maintenance & Security of Records & Exam Paper
5	Enforcement Procedures for Licensing Section
6	Appealing Procedures on Licensing Matters
7	Appointment of Internal Ground Examiners
Section 2: Aircraft Maintenance Engineer Licensing	
1	Licensing – SAR-66 Aircraft Maintenance Engineer
2	Licensing – SAR-7 Aircraft Maintenance Engineer
3	Examinations – Aircraft Maintenance Engineers

CAAS

Technical Guidance & Tools (Internal)

No.	Personnel Licensing Procedures (PELP)
Section 3: Flight Crew Licensing	
1	Licensing – Pilots
2	Licensing – Military Pilots
3	Conversion of Foreign Flight Crew Licences
4	Validation of Foreign Pilot Licence
5	Examinations – Pilots
6	Appointment of External Ground Examiners
7	Language Proficiency Assessment
8	Authorised Flight Examiners & Senior Authorised Flight Examiners
9	Coordination of the AFE Flight Surveillance Check
10	Approval of Private Pilot Licence Flight Training Programme
11	Conduct of Private Pilot Licence Test

CAAS

Technical Guidance & Tools (Internal)

No.	Personnel Licensing Procedures (PELP)
Section 4: *(Reserved)*	
Section 5: Approved Training Organisation	
1	Approval of SAR-147 Maintenance Training Organisation
2	Approval of an Aviation Training Organisation
3	Approval for the use of FSTD

CAAS

Technical Guidance & Tools (Industry)

- **Technical guidance materials**
  - Advisory Circular
    - ✓ AC FCL-1(1) Conversion of Foreign Professional Pilot Licences
    - ✓ AC FCL-2(1) Language Proficiency Requirements
    - ✓ AC 66-1(0) Sample of SAR-66 Aircraft Maintenance Licence
    - ✓ AC 66-2(0) Guide to Compilation Schedule of Experience (SOE)
    - ✓ AC 66-3(0) SAR-7 Examination Credits and Bridging Examinations
    - ✓ AC 66-4(0) Index of Licence Limitations
    - ✓ AC 66-5(1) Aircraft Type Acceptable for Endorsement on a SAR-66 Aircraft Maintenance Licence
    - ✓ AC 66-6(0) Suggested Study Reference for SAR-66 Basic Knowledge Examinations
    - ✓ AC 66-7(1) Conversion from SAR-7 Licence to SAR-66 Licence
    - ✓ AC 66-8(2) SAR-7 Protected Rights and Certifications Authorisations
    - ✓ AC 66-9(0) Acceptance of Foreign Aircraft Maintenance Licence for SAR-145 Approved Maintenance Facilities Outside Singapore
    - ✓ AC 66-10(0) Conversion of Foreign Aircraft Maintenance Licences
    - ✓ AC 66-11(0) Revalidation of Expired Aircraft Maintenance Licence

CAAS

Technical Guidance & Tools
(Industry)

- **Technical guidance materials**

  - Aeronautical Information Circular
    - ✓ AIC 5/00 — Issue of Flight Crew Licence
    - ✓ AIC 7/00 — Flight Operations Officer / Flight Dispatcher (FOO/FD)
    - ✓ AIC 1/10 — Registration for Aviation English Competency Test in Year 2010
  - Airworthiness Notices
    - ✓ B11 — Recognition of the Republic of Singapore Air Force (RSAF) Qualified Senior Technician's Experience as Aeronautical Engineering Experience
    - ✓ B12 — Aircraft Maintenance Examination Credits for Graduates of Aeronautical Engineering Diploma Programmes Conducted by Singapore Polytechnic and Ngee Ann Polytechnic (Revised)

Section 6

Staff Training

Technical Training Framework

Basic Training

To equip officers with basic regulatory skills and knowledge

Comprises classroom training and OJT

To be completed within specified timeframe

Completion of certain fundamental basic training (classroom and OJT) before Authority card issued

Specialised Training

To equip officers with knowledge in specialised subjects

Recurrent Training

To keep knowledge current

Recurrent training once every 2 years

Training in soft skills are also provided under **Generic Training**

CAAS

Basic Training of PEL Officers

No	Area	Complete within (from time reported to unit)	Courses
1*	Singapore Aviation Regulatory Framework	3 months	Briefing provided by SPL and/or Legal
2*	Overview of ICAO Annexes	3 months	Briefing provided by SPL and/or Legal
3*	Job functions, scope and responsibilities	3 months	Briefing provided by individual DHs and/or SHs
4*	Auditing Skills	12 months	ISO 9001:2000 Internal Auditor Course Safety Audit and Lead Auditor Training Course (in accordance with ISO 19011)
5*	Basic Safety Oversight Inspector Course	12 months	Understanding of the 8 critical elements of safety oversight system
6*	CAAS Enforcement Policy	12 months	Briefing provided by Legal
7	Safety Management Systems	18 months	ICAO SMS Training Course Integrated SMS Course
8	State Safety Programme	18 months	ICAO SSP Course
9	Human Factors and Performance	24 months	SAR-147 organisations & courses at SAA
10	Accident and Incident Investigation	24 months	Course at SAA

*No. 1-6 are mandatory for issuance of the authority card.

CAAS

Specialised Training of PEL Officers

No	Area	Complete within (from time reported to unit)	Courses
1	Aircraft Type Training Course	24 months	SAR-147 Aircraft Type Course OEM Aircraft Type Course
2	Flight Simulator Evaluation Course	18 months	Training Technology International Course

CAAS

Section 7

Approvals and Surveillance Activities

CAAS

Approved Training Organisations

- Approved Training Organisations are authorised by the CAAS to conduct training for Pilots or Aircraft Maintenance Engineers

- Requirements for approval:
  - Organisation and Staffing
  - Procedures/Operations Manual
  - Facilities
  - Records
  - Evaluation and Checking
  - Quality Assurance System

Approved Training Organisations

- Initial grant of approval
  1. Receipt of Application
  2. Desktop audit (Evaluation of documents & manuals)
  3. On-site inspection (Demonstration of compliance)
  4. Compile audit report (including closure of findings)
  5. Issue certificate of approval

- Continuing Surveillance
  1. Implement annual surveillance plan
  2. Carrying out annual inspections
  3. Follow up action – ensure closure of findings in the audit

Section 8

Resolution of Safety Concerns

CAAS

Resolution of Safety Concerns

- Detecting safety concerns
  - Surveillance, i.e. audits and inspections
  - Complaints or reports from public or aviation personnel
  - Incident reports
  - Reviews of incidents, serious incidents and accidents
  - Monitoring of safety performance through SAIRS
- Monitoring and resolving safety concerns
  - Conducting regular meetings with operators and service providers to discuss and resolve safety issues
  - Issuing and monitoring the implementation of corrective actions with agreed timelines
  - Implementation of safety enhancements
  - Monitoring the implementation of safety recommendations
  - Conducting additional inspections for areas of greater concerm
  - Issuing safety directives

CAAS

Resolution of Safety Concerns

- Taking enforcement actions when necessary
  - Oral counselling / verbal warnings
  - Re-training, re-testing and re-examination
  - Letters of warning
  - Variation, suspension or revocation
  - Prosecution

CAAS

Thank you

CAAS

Civil Aviation Authority of Singapore

Enabling opportunities through aviation.

DRAFT VERSION

AAPA
ASSOCIATION OF ASIA PACIFIC AIRLINES

VIA Email

Association of Asia Pacific Airlines
(Reg. No. 587)
9/F Kompleks Antarabangsa
Jalan Sultan Ismail
50250 Kuala Lumpur
Malaysia
Tel +603 2145 5600
Fax +603 2145 2500
www.aapairlines.org

Our Ref: TD/E/2335/MET
Previous ref: TD/E/2332/MET

Yr Ref: Docket No. PAD 10-101

?? November 2010

Airworthiness Directive,
Safety Management & Research Section,
Certification Directorate,
EASA

Email: Ads@easa.europa.eu

Dear sir,

Subject: Comments on EASA Notification of a Proposal to issue an Airworthiness Directive PAD No 10-101

The Association of Asia Pacific Airlines (AAPA) appreciates this opportunity to submit further comments on the EASA Proposed Airworthiness Directive (PAD) 10-101, concerning Koito seats and seating systems.

The AAPA is the principal trade and service organization for the leading scheduled international air carriers in the Asia Pacific region[1]. Carriers in the Asia Pacific today, already carry a quarter of global passenger traffic, and 40% of global freight traffic. AAPA members' traffic represents more than 17% of the global passenger traffic and more than 30% of the global freight traffic.

First, and foremost, AAPA would like indicate it appreciates this opportunity to comment on the proposed AD and we trust our comments will be given due consideration.

[1] Royal Brunei Airlines, EVA Airways, China Airlines, Cathay Pacific Airways, Garuda Indonesia, Japan Airlines, Dragonair, Korean Air, Malaysia Airlines, All Nippon Airways, Asiana Airlines, Philippine Airlines, Singapore Airlines, Thai Airways International, Vietnam Airlines.

DRAFT VERSION

AAPA
ASSOCIATION OF ASIA PACIFIC AIRLINES

With 6 million passengers globally travelling safely on a daily basis it should not come as a surprise that the industry's number one priority of safety remains unchanged. Flying is undoubtedly the safest mode of travel. This is not by chance, but the result of the continuous efforts of a mature responsible aviation industry responding to lessons learnt from in-service difficulty reporting by operators or from the results of aircraft accident and incident investigations.

A. General:

On 22nd September 2010, the European Aviation Safety Agency (EASA) has issued a notice of a proposal to issue an Airworthiness Directive (PAD) No 10-101, affecting Koito Seats installed on Airbus, Boeing and McDonnell Douglas Corporation aircraft. EASA is seeking public comments before 17/11/2010.

Based on the comments below the AAPA is of the opinion that the PAD in the current format; will require operators to take actions beyond their normal level of responsibility and competence; provides compliance requirements that ignores operational constraints and historical safety data; makes pessimistic assumptions on the safety justification. In addition, the PAD ignores the economic and operational burden that will be faced by air carriers of which the majority impacted operate in Asia.

Notwithstanding, be assured airlines are supportive of Airworthiness Directives providing compliance requirements are justifiable, practical, cost-effective, and take into account realistic operational timeframes. We draw to the attention of EASA that as a consequence of the problems with Koito seats aircraft have been and are grounded. More importantly to resolve this situation air carriers have no suitable alternative pragmatic solution available, plus the situation has been compounded due to the lack of certified spares and the long lead-time of sourcing replacement seats from other seat manufacturers.

AAPA acknowledges the unique problem that regulators and operators are confronted with as a result of JCAB informing EASA and FAA of possible non-compliance issues with the Koito Seats.

At the Industry dialogue session, organised by the Boeing Company, 21st October 2010, Regent Hotel, Singapore, the FAA and EASA provided briefings on their proposed Airworthiness Directives to address Koito Seats. In addition, the JCAB presented new evidence on their compliance testing of Koito seats.

As reported by the Japanese Civil Aviation Bureau (JCAB) approximately 1000 aircraft are in operation using Koito seats with about 150,000 seats affected.

AAPA
ASSOCIATION OF ASIA PACIFIC AIRLINES

During the Singapore meeting, industry and regulators from the region expressed many concerns regarding the PAD justification timescales for compliance, the need for FAA, EASA and JCAB to meet, the capability and competence of operators to comply with various aspects of the EASA PAD, the lack of available spare parts and the potential for mixed standard fleets.

The AAPA observations on EASA PAD 10-110 are provided below as general and detailed comments.

B. General Comments:

1. Regulatory:

As noted in our earlier comments (Dated 29 October, our ref. TD/E/2332/MET) the AAPA requests that EASA extends the period of comments by a minimum of 90 days to enable EASA, FAA, JCAB and TC holders to meet and review new JCAB evidence with the objective to either halting the issuance of the AD or to discuss alternate methods of meeting EASA's safety objectives which should modify the compliance requirements operators must demonstrate to their National Aviation Authority (NAA). Due to the unique nature of the problem a further extension may be necessary to enable parties concerned to fully understand and confirm the efforts of the JCAB.

Going forward AAPA would urge EASA to provide a formal Regulatory Impact Assessment (RIA) on this rule making taking into account the global impact this AD will have.

2. Compliance:

Within 2 years after the effective date of the PAD it requires certain actions to be carried out by the air carrier. We consider that the proposed compliance time is inadequate as it ignores a number of constraints on the carrier to demonstrate compliance to the PAD. AAPA would argue that it is the responsibility of the JCAB and Koito Industries to demonstrate compliance to the design and certification requirements. AAPA would argue:

a) It is the responsibility of the primary design and certificating authority the JCAB, as the competent authority, with the support of Koito Industries, in collaboration with EASA and FAA to develop a plan of action to ensure compliance of in-service Koito seats.

b) The design and certification of passenger seats is not within the normal competence of air carriers.
c) Agencies capable of performing the testing of in-service seating are limited and may not have sufficient resources to support affected air carriers. Consequently delays can be expected.
d) Testing of in-service seats requires their removal which will leave empty spaces on the aircraft. The reason for this is that in the majority of cases air carriers do not hold in stock complete spare seats and Koito Industries is not allowed to provide replacement seats or spares.
e) Passenger seats are customised to air carrier requirements taking into account the level and type of customer service provided including in-flight entertainment systems. Seats are not interchangeable between air carriers.
f) The metallic passenger seat frame in principle remains unchanged in spite of air carrier seat customisation.
g) There is limited number of passenger seat providers. They are currently supporting new aircraft production and ongoing airline cabin upgrades. These providers do not necessarily have the resources or spare capacity to support requests from air carriers required to change their seats. Long lead-times can only be expected if air carriers look to change their seat providers
h) The PAD requires the air carrier to replace seats within the two year compliance period if they have failed the testing. In this event replacing passenger seats could take more than two years to be delivered. The lead-time for seats could be greater depending on the type of seats to be replaced.
i) On removing in service seats for testing purposes some regulators are of the opinion it is simple to reconfigure aircraft cabins and absorb the available space. For some authorities it would require air carriers to seek approval for a reconfiguration
j) Typically

On considering the abovementioned observations and comments it is evident that the testing and replacement of in-service is impractical and would impose a significant burden on carriers and additional costs We would therefore recommend EASA increase the proposed compliance time from 2 years to 5 years.

3. Japan Civil Aviation Bureau (JCAB)

JCAB are the primary certification and design authority for Koito seats. At the October FAA-EASA AD Briefing held in Singapore the JCAB reported on the status of their ongoing investigation into Koito seat design and certification discrepancies

Under the oversight of the JCAB, Koito has carried out extensive retesting of the impacted seat models to demonstrate that they are in compliance with certification design criteria.

As a consequence the JCAB have been able to confirm:

a) All production drawings were retained by Koito and checked for conformity. All design changes made to each in-service seat model have been identified, checked and analysed
b) No problems have been identified relating to the metallic parts provided by suppliers and used in the construction of Koito seats
c) All materials that were used on Koito seats have been identified
d) Tear down inspections have demonstrated that there were no significant differences.

Since the JCAB has confirmed that the production of metallic parts has not been compromised, therefore the dynamic / static tests performed on seats that were produced in accordance with the production drawings should also be accepted.

Going forward the JCAB has identified a plan of action to determine the compliance status of In-service seats which could satisfy certain requirements of the EASA PAD.

The AAPA strongly urges EASA to work with the JCAB/ TC holders / air carriers to evaluate and consider the new JCAB data to allow credit to be taken. Failure to do so would ignore the huge potential burden on air carriers the PAD would impose, requiring the removal of seats from in-service aircraft for testing, and national airworthiness authorities providing oversight. More importantly, it cannot be ignored that the evaluation and use of this crucial data could even negate the justification for issuing an AD.

4. Civil Aviation Authorities:

EASA and FAA are widely recognised by National Airworthiness Authorities as leading regulatory authorities especially in the areas of type certification and design. It is also well understood that the jurisdiction of EASA and FAA covers only those carriers operating aircraft on the register of the USA and countries within the European Union. Consequently, the provisions in the PAD are only applicable to those carriers. Nevertheless, in Asia it is common practice for the regions regulators to adopt either or both of an EASA and FAA Airworthiness Directive. However, some regulators may only apply an FAA AD to the Boeing fleet and the corresponding EASA AD to the Airbus fleet. The consequence of these scenarios is that you could have mixed fleets within the region

and the airline as a result of the lack of harmonisation on a common problem between an FAA and EASA AD.

JCAB as the competent certificating and design authority for Koito seats has not issued an Airworthiness Directive (AD) and the AAPA understands that none are intended for the time being. As mentioned above, the JCAB has identified a plan of action to determine the design compliance status for in-service seats. If accepted by EASA and FAA it is highly likely that it would significantly alleviate the burden on operators, requiring them to preferably carry out conformity checks of their in-service seats compared to approved production drawings.

At the October FAA-EASA AD Briefing held in Singapore Regional Airworthiness representatives in attendance at the recent FAA-EASA AD briefing on Koito seats 21 October 2010, The regions regulators clearing indicated that for them to provide effective oversight of their airlines impacted by the PAD they would expect comprehensive accomplishment instructions to be provided rather than the high level requirements currently proposed by the PAD.

5. Safety criteria:

AAPA questions the safety criteria used by EASA to establish the compliance dates of 2, 6 and 10 years.

With reference to the EASA Question and Answer summary we note that EASA has estimated the accident rate at $1.5 \cdot 10^{-7}$/ FH where seats play a significant role in reducing fatalities. In EASA's opinion this value is considered as optimistic whereas AAPA argues that the accident rate of $1.5 \cdot 10^{-7}$/ FH is not supported by available historical data and is therefore not realistic. AAPA considers that the following points support this argument:

a) Based on the Boeing statistical Summary of Commercial jet Airplane Accident (Worldwide Operations 1959 – 2009), July 2010, using this rate assumes that all hull loss without fatalities will become hull loss with fatalities.
b) Historical data does not support the EASA proposed accident rate as there are no reported seat failures which has resulted in increasing the number of fatalities in a major accident.
c) During the Singapore briefing it was mentioned the safety case takes into account the potential of seat failures resulting from high level turbulence events. No historical data supports this assumption.

d) On considering the reported findings of the JCAB and 16G test results stored on Koito computers it can be concluded that even non-compliant seats still offer a high level of protection.
e) Based on the pessimistic scenario in which the affected seats would have a reduction in performance of 10% compared to the certification requirement, there is no justification to assume this potential non-compliance will cause all hull loss accidents to result in an increase of fatalities.

AAPA fully supports the AEA opinion submitted in their comments to EASA on PAD 10-101 that an estimated catastrophe rate of $0.15 \cdot 10^{-7}$ is more realistic and would increase the PAD compliance times to 5, 15 and 25 years. Furthermore, AAPA is of the same opinion as AEA that once the JCAB has finalised its investigations on Koito seats and presented the results they will demonstrate a further reduction in risk and allow further extension of the compliance times.

Recognising that EASA is unable to automatically accept data generated under the oversight of JCAB due to the absence of a bilateral agreement this should not be considered or used an as an obstacle. As leading regulators we would hope that EASA and JCAB would make every effort to meet to discuss and review JCAB finding especially as this would assure passenger confidence and safety.

6. Spare parts

(To be covered in next draft)

C. Detailed Comments

1. [To be provided in next draft]

Finally, be advised that the AAPA fully supports and endorses the comments submitted on behalf of European carriers by the Association of European Airlines. In the event that EASA may have some questions of clarification or requests for additional information do not hesitate to contact the AAPA

Yours faithfully,

DRAFT VERSION

AAPA
ASSOCIATION OF ASIA PACIFIC AIRLINES

Martin Eran-Tasker
Technical General
Association of Asia Pacific Airlines

21

European Aviation Safety Agency

Koito Seats PAD

Question and Answer Summary

From the Briefing Sessions held in Köln on the 14th October and in Singapore on the 21st October below is a summary of the general questions raised.

1. If I know that airline X has the same seats as I do, will the FAA/EASA apply their data to me?

   FAA/EASA will take all reasonable steps to aid and promote the sharing of data between airlines in order to reduce the overall burden. However, as always, data supplied to EASA/FAA are considered proprietary and will not be used for any purpose other than that agreed by the person supplying it. EASA/FAA strongly encourages Airbus/Boeing to work with the Airlines to assist in the sharing of data.

2. I have the same seats as airline X, but they won't share their data with me. Didn't the AD say they had to?

   As with 1 above, EASA/FAA is not in a position to force airlines to agree to transmittal of data to any third party. However, we strongly encourage operators to work together to minimise the test burden.

3. It takes several actual seat cushions to make a test sample set. How many test sample sets do I need for the oil burner testing?

   In general the answer is 3 sets, just as required in the regulations. However this may be an area where the practicalities of test sample manufacture may cause EASA/FAA to agree that deviations to test criteria are appropriate (e.g. a reduced number of tests, compromises of test sample build, ...) in cases where the test results appear significantly better than is permitted by the regulations Airlines should present their particular case for consideration.

4. What if my seat fails a static test, but passes the dynamic test?

   This possibility has been considered. EASA/FAA believe it is a remote possibility. However in the event it occurs the particular circumstances will be reviewed and an appropriate course of action determined.

5. I've done modifications to my seats previously that required me to test them dynamically. Can I use that data to show compliance with the AD?

   Yes. The data must be presented to the Regulatory Authority for agreement.

72

6. I'm going to replace my seats in 7 years anyway, can I avoid having to test them?

   No. Acceptance for seats to remain in service for more than 2 years from the date of issue of the AD will only be on the basis of firm evidence that they possess a minimum level of crashworthiness/flammability performance. Airlines who believe they may be able to do this by methods other than those outlined in the AD will of course have the option to propose an AMOC to their Regulatory Authority

7. Can the data from my Airbus seats be used to substantiate the same model seat on my Boeing airplanes? (or vice versa)

   Yes, assuming the similarities between seats are agreed by EASA/FAA as being appropriate, and there are other data that show the installation itself, i.e., the seat track is capable of carrying the reaction loads. The most critical condition must be considered.

8. Will the FAA or EASA approve/review/comment on my compliance plan, even though I'm not a US (European) operator?

   FAA/EASA will try to support other Regulatory Authorities as they review compliance plans. Airlines only need to substantiate compliance to AD requirements to the Authority of the state in which their aircraft are registered. However, as data sharing is a (hopefully) likely outcome it may transpire that plans generated in regulatory area is also viewed by the authority of the other. This is unlikely though to result in additional comments/requirements.

9. How do I find out who has the same seat models I do, so we can maximize data sharing?

   This information should be available from the airframe manufacturer (and probably Koito).

10. What are the restrictions on the use of affected Koito seats before the AD becomes final?

    All seats currently in service are unaffected until the AD is issued. Applications for changed use of seats, e.g. installation on another aircraft, requiring a new finding of compliance, are unlikely to be accepted before the AD is issued.

11. Why didn't the NPRM include HIC (or any of the other compliance criteria not included)?

    This is one area where the EASA and FAA ADs differ. The EASA AD does require compliance to be shown to all compliance criteria after a period of maximum 10 years. This is because of regulatory issues which place difference onuses on EASA and the FAA for the removal of an Unsafe Condition.

12. The only seats I have passed all the tests conducted by Koito under JCAB supervision in the phase 1 program. Is that sufficient to meet the AD?

    EASA is unable to automatically accept data generated under the oversight of JCAB due to the absence of a bilateral agreement with this state. This data will be assessed by EASA in due course. At this point, we cannot commit to any specific use of these data.

13. I have taken 3 seat assemblies out of my aircraft (Boeing) to destructively test. This model was the critical seat for a family (Boeing and Airbus). I need to replace these seats. Can I install a seat from the family (currently only installed on Airbus) as I do not have any more seats of this model?

    Assuming the "Airbus" seats installation in the Boeing meets all normal airworthiness requirements, and the seats were shown to comply with the requirements in the AD, such an installation will be accepted. Each case will be assessed and an appropriate approval method found.

14. I am in the processes initiating an STC to install spare seats that I own, new LOPA for this model aircraft. It will not be initiated nor completed by the time the AD is published. If I test these seats (identified by model and serial number) to 25.261, 25.562, 25.853 can I install them?

    The AD does not allow such use of Koito seats. However, if it can be shown that the timescale of the project is such that the issuance of the AD and/or its contents could not have reasonably been foreseen at the time of the project go-ahead, EASA/FAA may be in a position to allow the STC. The AD will of course apply to the STC installed seats.

15. I have 100 seats that I bought used, same model, can I retest what I have to the TSO and put a mod tag and 8130 on it? I really want to sell these as spares to an airline.

    If the seats are shown to be fully compliant to the applicable requirements, no restrictions will apply.

16. If a non-seat cushion oil burner flammability issue is identified by Koito and a Service Bulletin is issued will I be required to incorporate it?

    EASA/FAA will assess such SBs on a case by case basis in regards to mandatory action.

17. I don't want to burn a used seat cushion as the flammability properties may have degraded, can I re-treat the article first?

    One of the problems with items of Koito manufacture is in regards to production conformity. This is why testing is required on in-service items. Modifying an item before test may therefore mask the fact that it was not made to the correct specification to start with. Therefore, such a re-treatment will not be acceptable.

18. Which approach has been used by EASA (and FAA) to determine the 2 years and 6 years compliance timeframes?

2 Years

This is the period within which operators must determine the most basic crashworthiness capabilities of their seats. Worst case is that the seats might not even meet "static" strength requirements.

A period of two years, from the issuance of the AD, is longer than has been applied to previous cases where crashworthiness aspects were in question.

Use of the numerical method described in Part 21, GM 21A.3B(d)(4) of also supports this.

Historic accident data suggests an accident rate of approx 1.5E-7/FH for accidents where seats play a significant role in reducing fatalities (either directly or by preventing injuries that would stop occupants from rapidly evacuating the aircraft).

Assuming a Catastrophic failure mode (multiple fatalities) and an aircraft life of 100,000 FH, this generates a compliance time of;

Tc=100,000x0.025E-7/1.5E-7 = 1666 FH

A period of two years is thus a generous allowance and has been chosen in order to allow for the practicalities of performing the required tests.

6 Years

This is for the specific case where a seat has only been shown to pass an abbreviated "static" strength test programme, but where it should comply with "dynamic" strength and injury criteria.

This time period was also chosen to align with previous mandatory action that was instigated as a result of problems where "dynamic" seats were found to only comply with "static" requirements.

It is also the same time period that was considered when a retrofit rule for dynamic seats was being considered.

In regards to a numerical approach, it is probably reasonable to assume that only a third of accidents where seat crashworthiness performance is critical do in fact need the higher level of protection afforded by "dynamic seats". This approach would equate to an increase in the compliance time by a factor of three, i.e. 6 years instead of 2 as above.

Again, it must be stressed that 6 years is thus a generous allowance, for the same reason as above.

75

19. Why does EASA feel the need to put a maximum 10 year limit on continued service of seats even if they successfully passed testing for the other compliance time limits set in the AD?

EASA has been unable to find a way to accept that seats which do not comply with appreciable parts of the applicable requirements remain in service indefinitely. Part 21, AMC 21A.3B(b) Unsafe Condition, paragraph (c), is part of the definition of an "Unsafe Condition", and reads;

> *"(c) Design features intended to minimise the effects of survivable accidents are not performing their intended function."*

The ten year limit in the AD applies to seats which have shown compliance to only an abbreviated (relative to the full set of applicable requirements) test programme. These seats will thus still be lacking proof of compliance to some requirements. After consideration of the requirements in question, EASA believes that the associated reduced level of safety still constitutes an Unsafe Condition which must be handled by setting an upper limit on continued service of seats.

The figure of ten years was determined by taking an extreme optimistic view on the same accident data as used above.

Assuming only one accident of those studied constituted a situation where occupant protection performance right up to the limit of that provided by the certification basis was essential, the accident rate to consider rate drops to 6.8E-9. Again, assuming a Catastrophic failure mode (multiple fatalities) and an aircraft life of 100,000 FH, this generates a compliance time of;

Tc=100,000x0.025E-7/6.8E-9 = 36765 FH

So, bearing in mind that this figure is the result of assuming only one accident was sufficiently severe to constitute a need for the full protection afforded by the certification basis, the choice of ten years is also to be seen as a generous allowance.

20. How can Spare parts be delivered/ installed with the current situation with regard to the Koito POA?

There are three possible solutions that comply with Part 21 requirements;

1. *Koito POA is re-instated, the action is with Koito to demonstrate to EASA that the open findings that lead to the suspension have been satisfactory resolved.*
2. *Airbus as the design approval holder could use another POA to manufacture spare parts to original design data.*
3. *Another 3rd part DOA could propose a modification to the seats to produce "new" spare parts.*

76

21. If I test my seats and they fail, am I allowed to modify them to pass one of the levels of testing defined in the AD and thus get allowance for them to remain in service for the associated time period?

No. If modifications are incorporated into Koito seats due to identified non-compliances to crashworthiness and/or flammability requirements, the seats must be made to be fully compliant to the applicable requirements.

However, modifications to Koito seats in order to solve spare parts problems with "wear out" items (such as arm caps, tray tables, ..., etc.) or for "cabin upgrade" reasons (e.g. new IFE, ...) may be acceptable.

22. If I successfully test my "dynamic" seat to only the static requirements of the AD (in order to get an allowance to stay in service for 6 years) may I later, within the six years, successfully test to the dynamic requirements of the AD and be given the allowance for the seats to stay in service for a further 4 years (i.e. a total of 10)?

Yes. This will be an acceptable action plan to cover the AD's requirements.

23. EASA PAD: shall the static lateral test be done with the loading of the aircraft certification basis or directly according to the last amendment of 25.561(b)(3)(iii)? PAD doesn't specify on the contrary of the NPRM.

The seats must be tested to the minimum requirements required by the defined Type Certification Basis of the a/c, or if installed post-delivery by the Certification Basis of the installation modification.

24. How should the oil burner tests be handled: trying to build and conform a test specimen from several cushions or testing directly the cushion and adapting the test set-up and the pass/fail criteria? For each solution, there are a lot of detailed questions.

This issue has been considered and as with FAQ 3 above, EASA/FAA is prepared to consider test sample build methods that might not fully meet normal standards and possibly test method variations where there is evidence that cushions are easily meeting requirements.

25. What should be the pass/fail criteria of the structure tests?

As required in normal certification testing.

26. How to check the conformity of the seat?

Seats taken from service for testing do not need to have extensive conformity testing performed. It must be ascertained that they are built to the drawing (part size, shape, basic material etc.) and have no other obvious oddities.

Post build modifications must be assessed for their impact on the intended test, this is only relevant if the seat tested is used as substantiation for other seat models in a group. Post build modifications will not invalidate the test of that particular seat model.

17

27. How to cope with the cabins on which seats have been removed for tests (as the PAD/NPRM stop short of allowing a full replacement seat to be manufactured)?

    This is an unavoidable consequence of the airworthiness problems resulting from the Koito seat situation. EASA/FAA will be open to discussions regarding any proposed solutions.

28. Spares: should spares be qualified or re-qualified before installation on the aircraft? Also what is EASA and FAA intent about spares that could be manufactured by Koito? Airlines will for sure request a playing field, so this needs to be discussed beforehand.

    Koito spares currently in stock may continue to be used. If new spares are available from Koito this will only be under a level of control that is acceptable, and thus it will be similarly acceptable to use them.

    This is based on the rationale that any such spares (either made before the need for mandatory action became clear, or more recently) will possess no worse airworthiness related parameters than those parts which are already (and remain, subject to AD limitations) in service.