Lufthansa Systems

Lido/Navigation

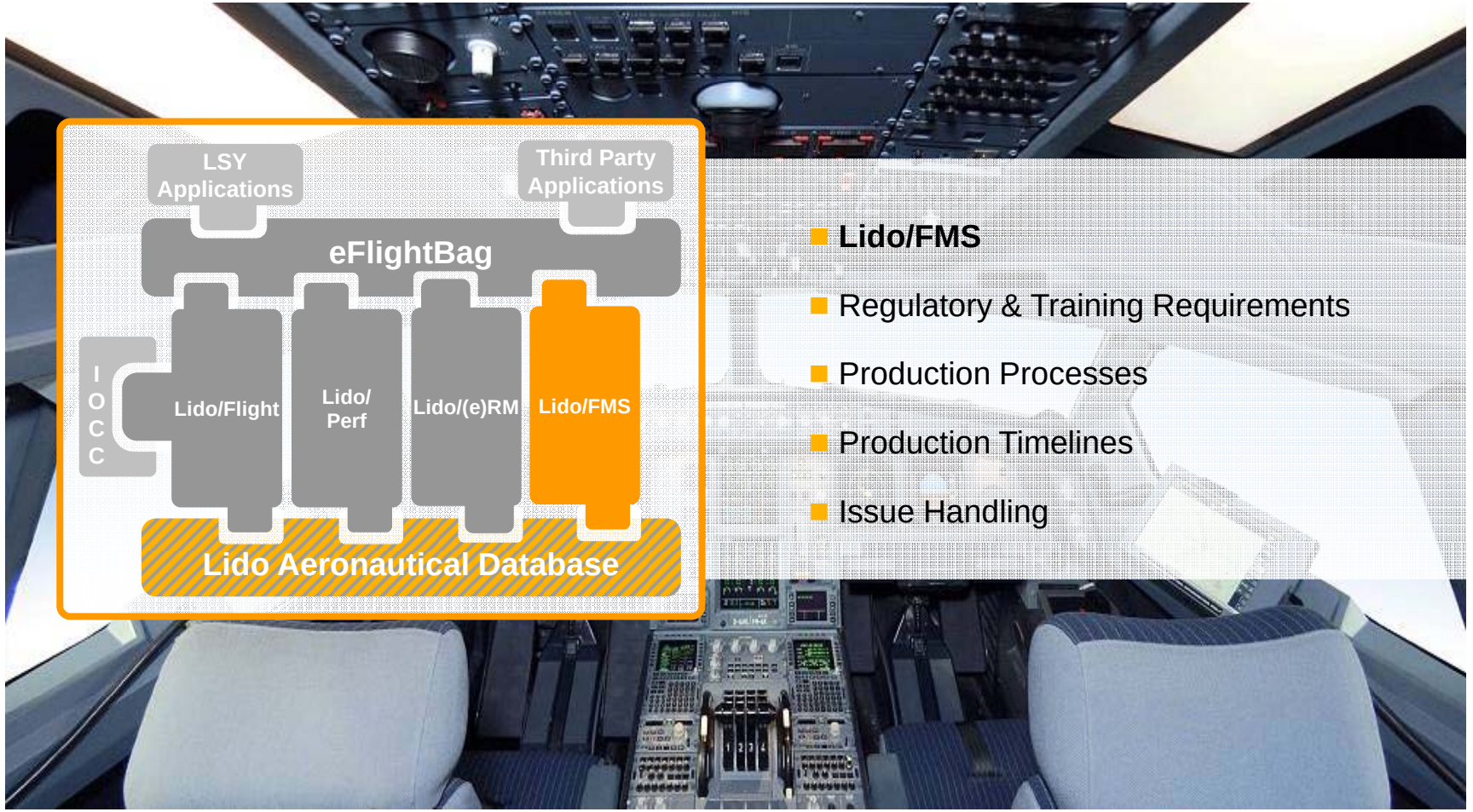
Enhance your navigation. Create success.

Lufthansa Systems

Lido/导航

强化导航，引领成功.

Agenda



- **Lido/FMS**
- Regulatory & Training Requirements
- Production Processes
- Production Timelines
- Issue Handling

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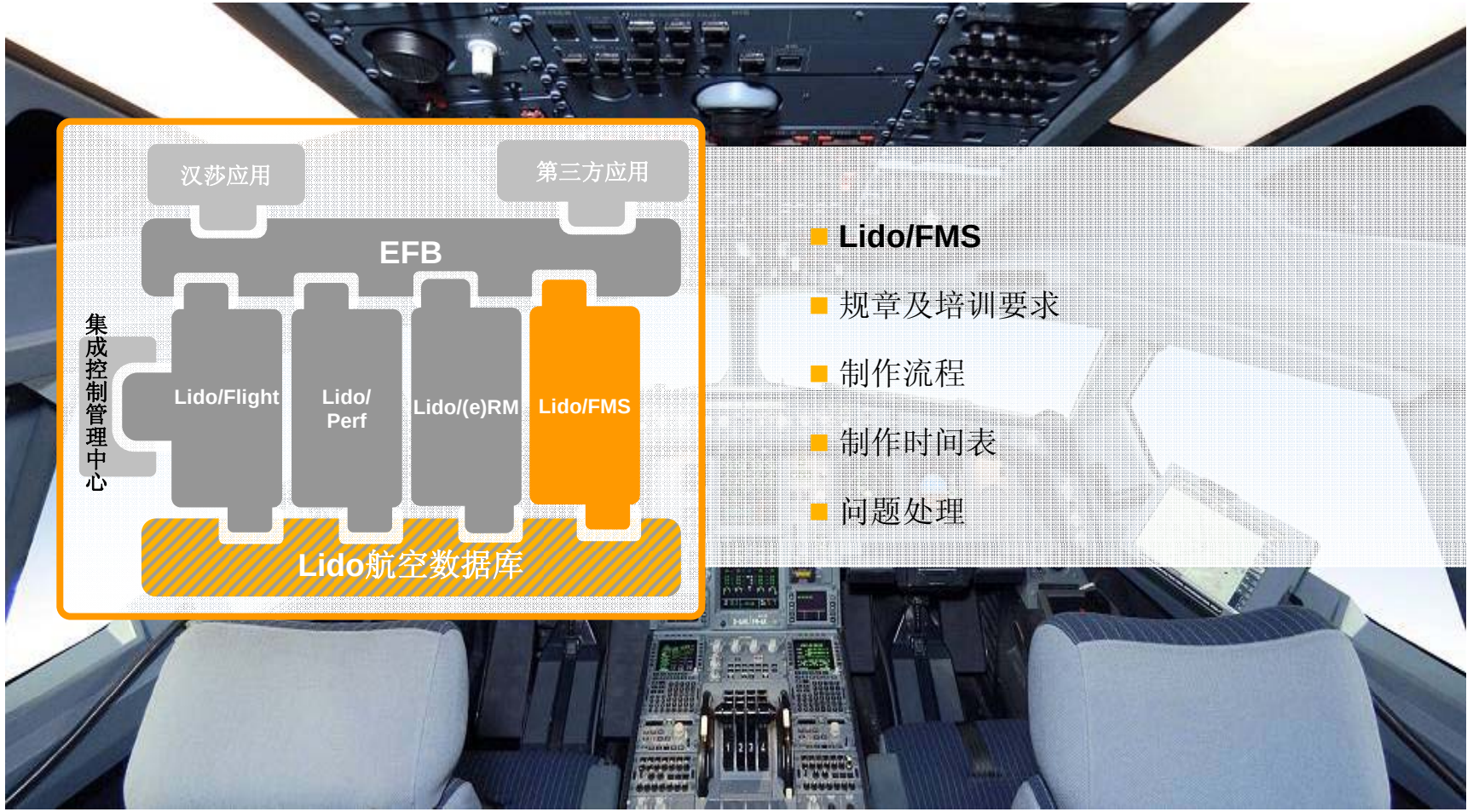
议程



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Functional description of Lido/FMS

Lufthansa Systems

Airline Operations Solutions

Lido FMS

NavigationData Services

Lido FMS creates value

- Time and cost efficiency: One partner for data, service and support
- Security: Continuous Internet access to customized information
- Reliable data: Complete aeronautical data coverage
- Worldwide service: 24h/7d expert service line for immediate help

Precise in-flight navigation is essential for flight safety – and cost control. More than 100 airlines worldwide successfully use the Lido Flight Management System (FMS) database.

FMS supplies comprehensive navigation data for cockpit systems and contains important route information including data pertinent to altitude and alternate airports. On the one hand, the FMS database provides all relevant information for the complex functioning of the autopilot and the guidance of the aircraft through the entire flight. On the other hand, the database also contains helpful specifications relating to, for example, the engine. This leads to fuel savings.

The Lido FMS Navigation Database Service (Lido FMS NavDB Service) provides the highest level of quality data that is maintained at the most exacting standards of accuracy and integrity in compliance with the standards described in EUROCAE ED-76/RTCA DO-200A. The production processes have been certified by EASA (European Aviation Safety Agency – LoA Type1) and audited successfully by major airlines operating with NavDBs from Lufthansa Systems.

The source from which the Lido FMS database is extracted is the Aeronautical Information Publication (AIP) of every country, published monthly by the respective civil aviation authorities. A complete aeronautical coverage consisting of all elements needed in aviation today has been included in the FMS database, covering, but not limited to, airport information, airways, terminal and enroute waypoints, navaids, holding and approach procedures, etc. This data, combined with information such as that pertaining to company routes and individual procedures, results in a specific database tailored to each customer's requirements.

Product Introduction

An aeronautical database consolidates and makes available all relevant navigational data, airway structures and flight procedures for flight operations. Its main use is as a processed FMS database file that delivers the necessary data input to an aircraft's flight management system during flight.Besides the data's use in the aircraft, the content is also used for operations of flight simulators and for flight planning tools.

Product Description

The EASA-certified navigation database supports nearly all FMS system types and covers all published commercial airports, Airfields, Helipads (+22'000) .The customer base of more than 160 airlines includes LH, LX, BA, AF, EK, TG. And various flight planning and sim. opperators

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Lido/FMS功能描述

Lufthansa Systems

Airline Operations Solutions

Lido FMS

NavigationData Services

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产品介绍

该款航空导航数据，为飞行运行整合了相关导航数据、航线和飞行程序，并使其可用。其主要作用是作为一种已处理的FMS数据库文件，能够为航空器在飞行过程中，为飞行管理系统提供必要的数据输入。除在航空器中使用外，该航空数据库也可用于飞机模拟机运行和飞行计划工具。

产品描述

通过EASA认证的导航数据库，支持几乎所有类型的FMS，涵盖所有已公布的商用机场，简易机场，直升机机场(+22’000)。产品客户群超过160家航空公司，其中包括汉莎航空、瑞士航空、英国航空、法航、阿联酋国际航空、泰国航空等，以及多家飞行计划和SIM运营商。

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Value Proposition / USPs Lido/FMS

USPs

- **Customer service**
  - 24/7 customer service: Assigned Customer Service Manager per customer
  - Online access to customer database; possibility to edit company data
- **Direct customer contact and product distribution**
  - Direct access to NavData producer / professional team of dedicated experts
  - Problems solved 24/7 without delay over direct contact
- **Airline operations experience**
  - Access to the instant feedback of thousands of pilots in worldwide flight operations. LSY staff has airline knowledge, FMS and consulting expertise of more than 160 airlines and their complex navigational requirements
- **Highest data quality**
  - Systematic data maintenance combined with seamless data traceability fulfils highest quality requirements for state of the art PRNAV (precision navigation).
  - Processes are compliant with EUROCAE ED-76/RTCA DO-200A, certified by EASA, and audited by major airlines.
- **Tailored product**
  - Operational flexibility and optimal use of FMS onboard storage capacity over individual data / airport coverage for each database.
- **Training classes** in FMS NavDB Handling and Management

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价值定位/独到之处 Lido/FMS

独到之处

- **客户服务**
  - 24小时客户服务: 客户经理一对一服务
  - 在线访问客户数据库; 可对公司数据进行编辑
- **直接客户联系和产品分发**
  - 可直接联系导航数据制作者、或者由专家组成的专业团队
  - 建立无延迟直接联系，24小时为客户解决问题
- **航空公司运行经验**
  - 可获得全球飞行运行数以千计的飞行员快速反馈信息。汉莎系统的工作人员掌握了航空公司知识、FMS知识、超过160家航空公司的咨询经验，以及这些公司复杂的导航要求。
- **最高级别的数据质量**
  - 集成无缝数据跟踪的系统化数据维护，可满足为目前PRNAV最高等级数据质量要求。
  - 加工处理符合EUROCAE ED-76/RTCA DO-200A, 通过了EASA认证，也通过了多家大航空公司的审核。
- **客户化产品**
  - 根据个别数据/机场覆盖，每一个数据库具备运行的灵活性，并且实现机载FMS存储容量的最佳利用。
  - 培训包含在FMS导航数据库的操作与管理中

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Trusted Provider for 200 + customers around the world

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Lufthansa Systems

深受全球200多家顾客信赖的供应商

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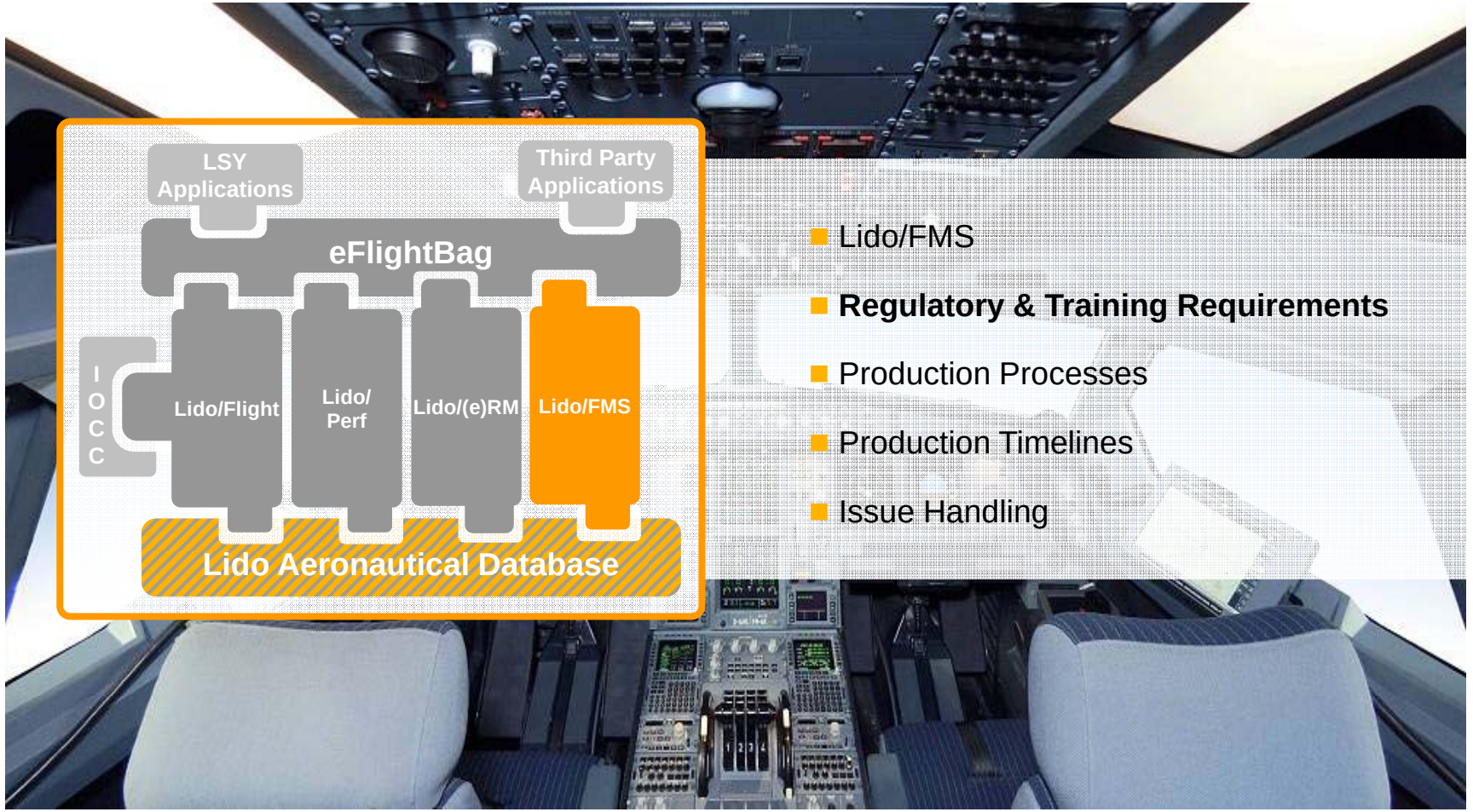
Lufthansa Systems

Agenda



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- Production Processes
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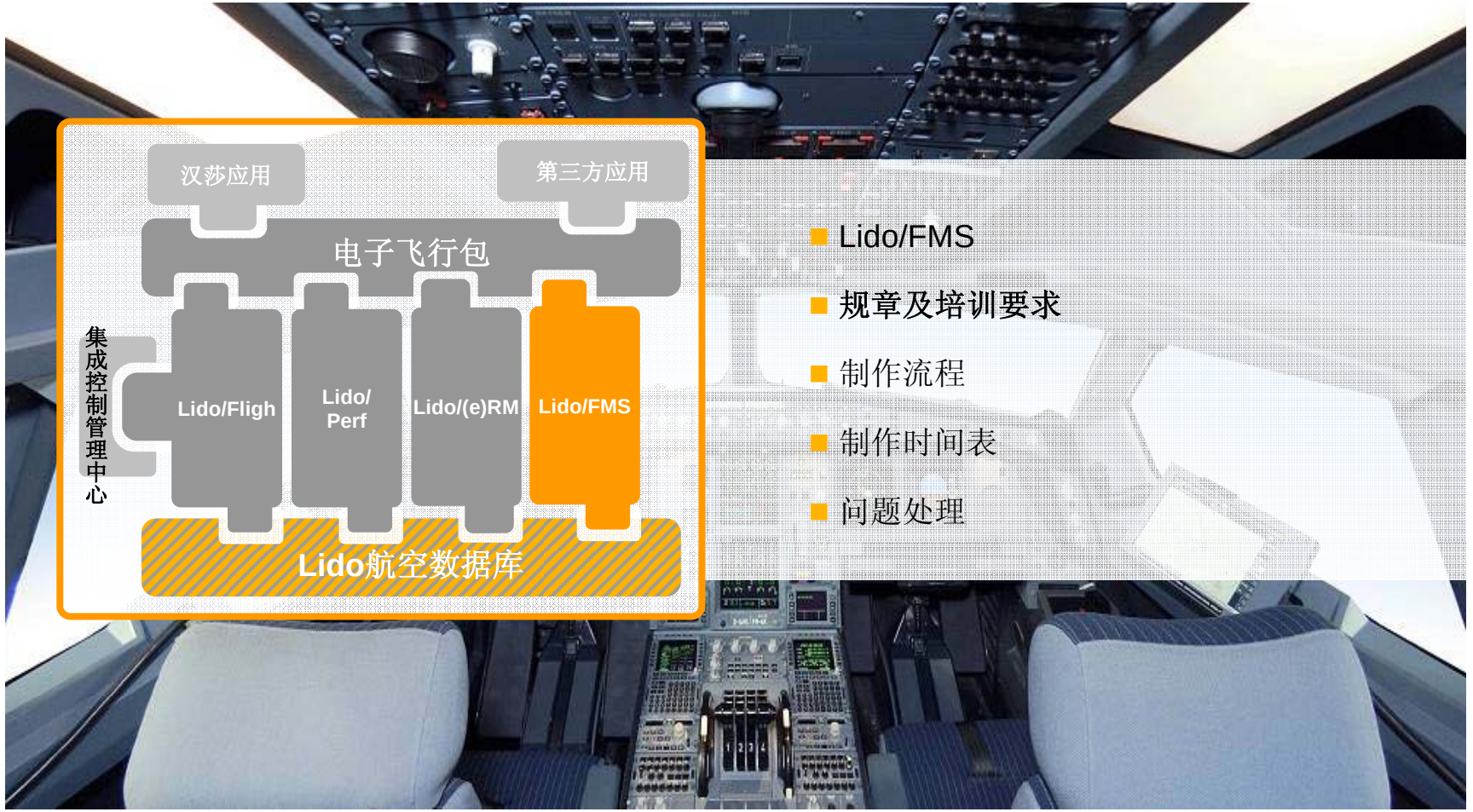
议程



- Lido/FMS
- 规章及培训要求
- 制作流程
- 制作时间表
- 问题处理

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Deliverables for a Letters of Acceptance (LoA Type 1)

- Internal Audit Plan
- Data Maintenance & Tool Qualification Plan
- Data Configuration Management Plan
- Navigation Database Disaster Recovery Plan
- Training Manual
- ARINC 424 Extract File Specifications
- FMS Database Personnel & Duties
- DO-201A Accuracy and Assurance Level Reference
- ED_76_DO_200A Change Process
- Glossary of Terms and Abbreviations
- Country FIR Description Codes
- Navigational Database Maintenance Manual
- Coding Practices
- Data Entity Capture and Maintenance
- Process Manual
- Data Quality Requirements Definition

European Aviation Safety Agency

LETTER OF ACCEPTANCE TYPE 1

REFERENCE: EASA.LOA.0003

The Agency has investigated

Lufthansa Systems FlightNav Inc

Stelzenstrasse 6-8
Air Center, 5th Floor
CH-8152 Glattbrugg
Switzerland

to the procedures defined in "Lufthansa Systems FlightNav Company Exposition",

which have been found to comply with

"CONDITIONS FOR THE ISSUANCE OF LETTERS OF ACCEPTANCE FOR NAVIGATION DATABASE SUPPLIERS BY THE AGENCY.

Published as OPINION OF THE EUROPEAN AVIATION SAFETY AGENCY Nr. 01/2005 dated 14 January 2005.

This Type 1 LOA does not authorise the supply of navigation databases directly to end users/operators.

CONDITIONS

1. This acceptance requires compliance with the procedures specified in the LOA Exposition; and
2. This acceptance is valid whilst the accepted Navigational Database Provider remains in compliance with the Conditions for the issuance of Letters of Acceptance for navigation database Suppliers by the Agency".(Further in this LOA referred to as "Conditions") and the documented Data Quality Requirements.

Date of original issue:	Date of this issue:	Signed:
2 August 2005	2 August 2005	For EASA Dr. N. Lohl

EASA LOA Nav. Database Suppliers – Sheet A

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可交付的接受函（LoA 1型）

- 内部审核计划
- 数据维护和工具认证计划
- 数据结构管理计划
- 导航数据库灾难性恢复计划
- 培训手册
- ARINC 424 提取文件规范
- FMS数据库人员及职责
- DO-201A 精度和置信等级标准
- ED_76、DO_200A 变更过程
- 术语和缩写
- 国家FIR描述代码
- 导航数据库维护手册
- 编码实践
- 数据整体获取及维护
- 过程手册
- 数据质量要求定义

European Aviation Safety Agency

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EASA LOA Nav. Database Suppliers – Sheet A

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General Staff Training & Qualification

- Safety assessment prior to enrollment
- Partnerships with selected universities
- Collaborations with aeronautical training institutions
- Accredited fulltime trainers in-house
- Modular training concepts for all staff
- Human factors training for all staff
- Training acknowledgement through examinations
- Long term human resource planning

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一般人员培训及资质

- 入职前的安全评估
- 建立与选定大学的伙伴关系
- 建立与航空培训机构的合作
- 认可的全职内部培训教员
- 针对全体职员的模块化培训概念
- 针对全体职员的人因培训
- 以考试来确认培训
- 长期人力资源规划

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Data Maintenance Training & Qualification

- FMS Training
  - Basic Aeronautical Training
  - Basic FMS Training
  - FMS Procedure Training
  - GPS/RNAV Training
  - Customer Handling Training
  - Internal FMS Quality Training
  - Internal Coach Training
- Simulator Training
- New Procedure Training
- Corrective Training
- Recurrent Training

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数据维护培训和资质

- FMS培训
  - 基础航空理论培训
  - 基础FMS培训
  - FMS 程序培训
  - GPS/RNAV 培训
  - 客户操作培训
  - 内部 FMS 质量培训
  - 内部教员培训
- 模拟器培训
- 新程序培训
- 矫正培训
- 复训

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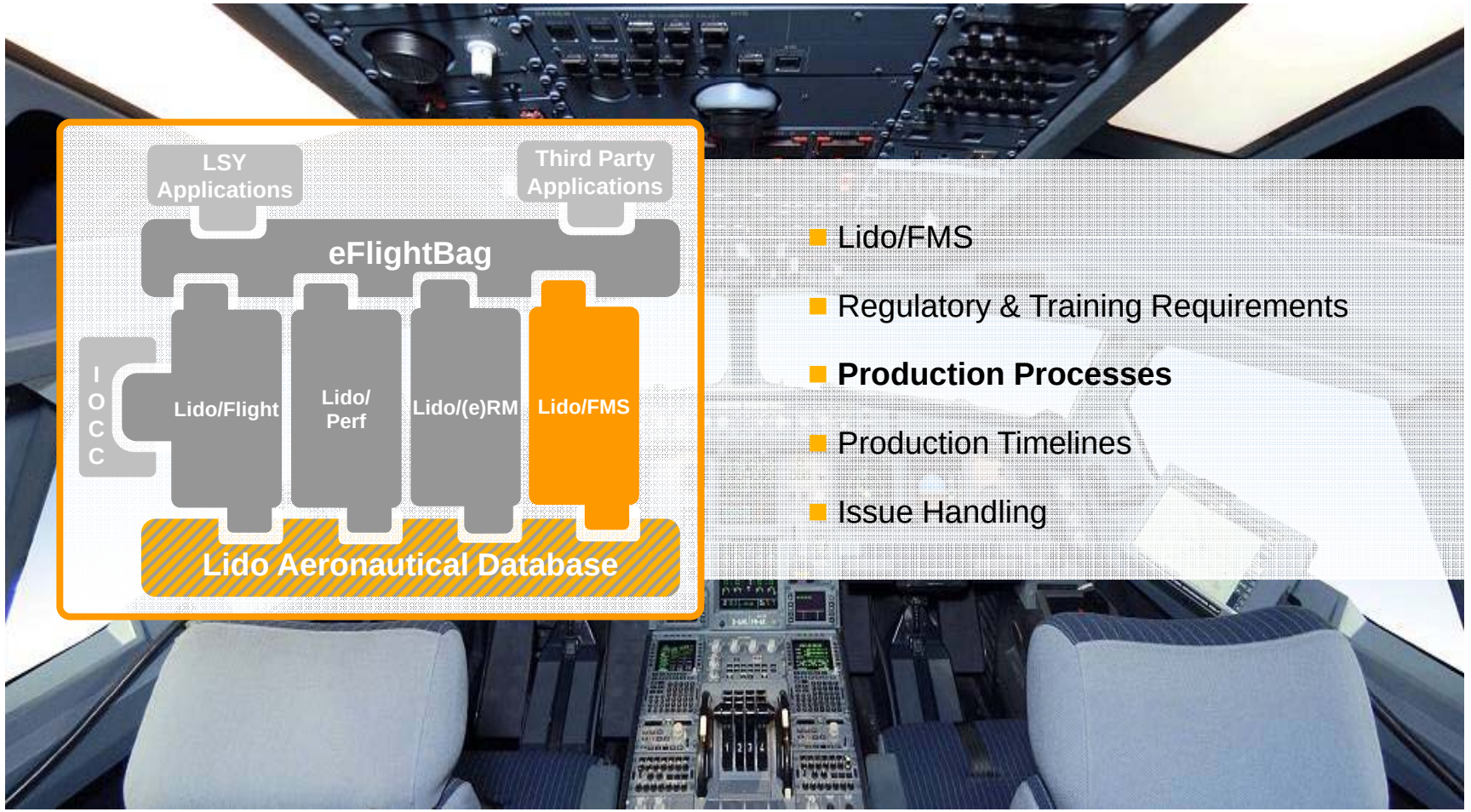
Agenda



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- Regulatory & Training Requirements
- **Production Processes**
- Production Timelines
- Issue Handling

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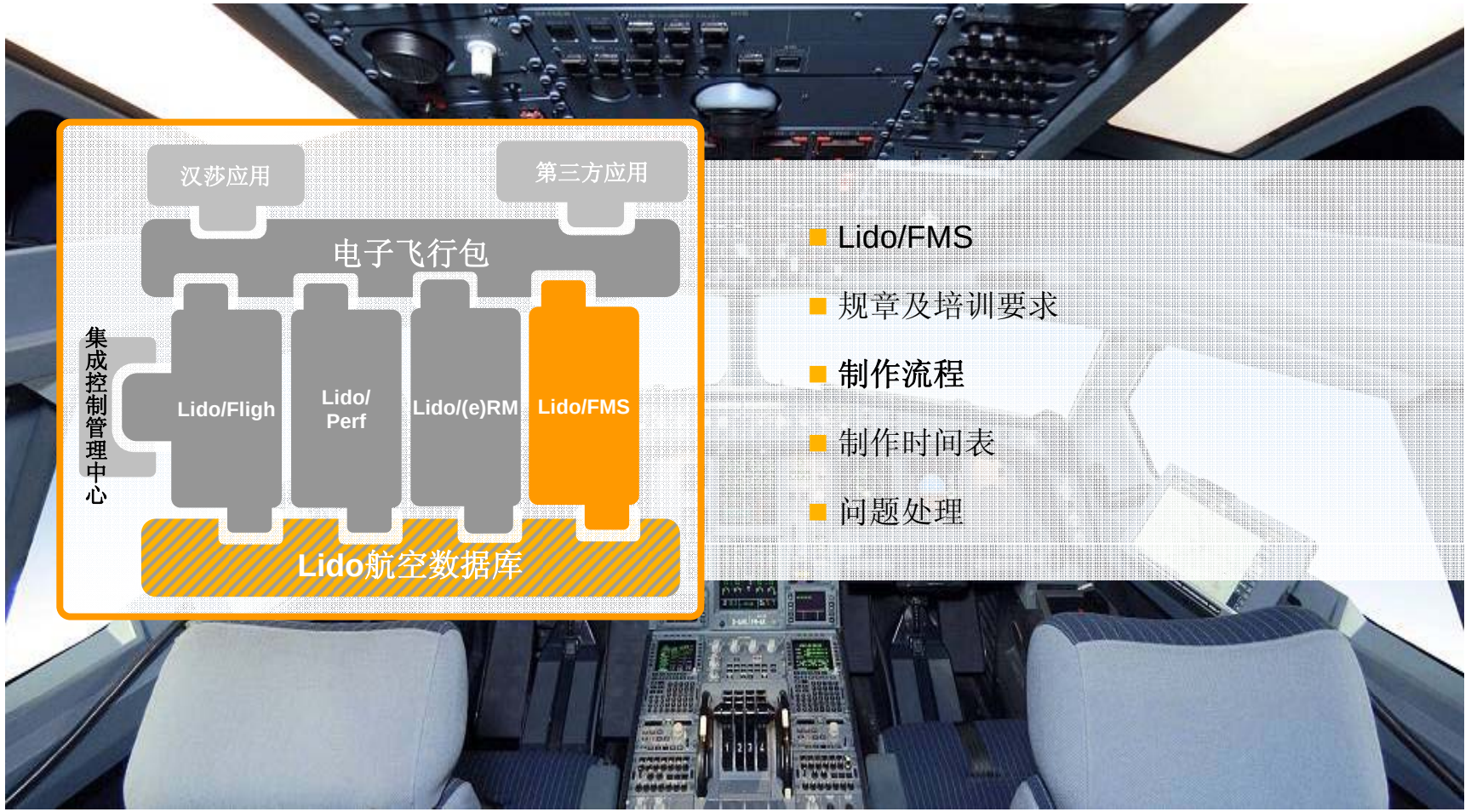
议程



- Lido/FMS
- 规章及培训要求
- 制作流程
- 制作时间表
- 问题处理

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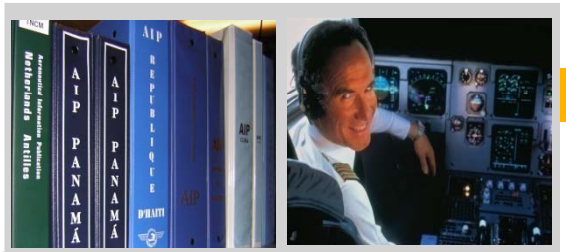
Lido/FMS Production Process Overview



Product Management

Quality Management

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Information Technology

OEMs
(DO 200A compliant)

Publication Completeness
- Clarify inconsistencies
- Track down missing documentation
- Review all notams

CS / AIS Source Control
- Track incoming official publications
- Take on customer requests and findings

Update DataBase
- Code Data
- Visualization QC
- Validation QC
- 5000+ auto Checks

Database Checks
- Weekly Prod. check
- Pre delivery check
- Run content check (completeness, correctness)

Delivery to OEMs
- Check and Packing
- Data Base validation feedback

Customer Delivery
- revise customer setup
- Inform ab. download
- FTP

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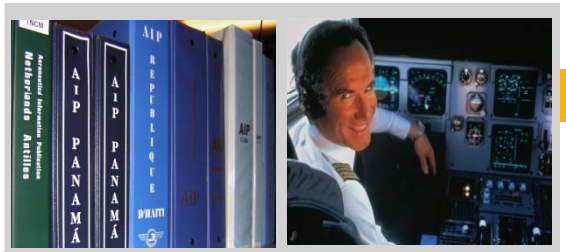
Lido/FMS 制作流程概况



产品管理

质量管理

汉莎系统

信息技术

OEM
(DO 200A
符合性)

CS /AIS 源控制

- 跟踪收到的官方出版物
- 处理顾客的要求和发现问题

出版物完整性

- 澄清不一致性内容
- 追查遗失的文件
- 回顾所有航行通告

更新数据库

- 代码数据
- 可视化质量控制
- 验证质量控制
- 超过5000次自检

数据库检查

- 每周性制作检查
- 交付前检查
- 运行内容检查 (完整性, 正确性)

交付给设备商

- 检查与包装
- 数据库验证反馈

客户交付

- 修订客户方案
- 通知相关下载
- 文本传输协议

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AIS Source Control

- AIP
- Different Sections (GEN, AD, ENR)
- 8260 Form, NFDDS etc.
- Amendment / supplement
- AIC
- Notam
- Paper and electronic

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航空信息服务（AIS）源控制

- 航空资料汇编（AIP）
- 不同章节(总则、 机场、航路)
- 8260 格式, NFDDS等
- 修订/ 补充
- 航空资料通报（AIC）
- 航行通告（NOTAM）
- 纸质和电子格式

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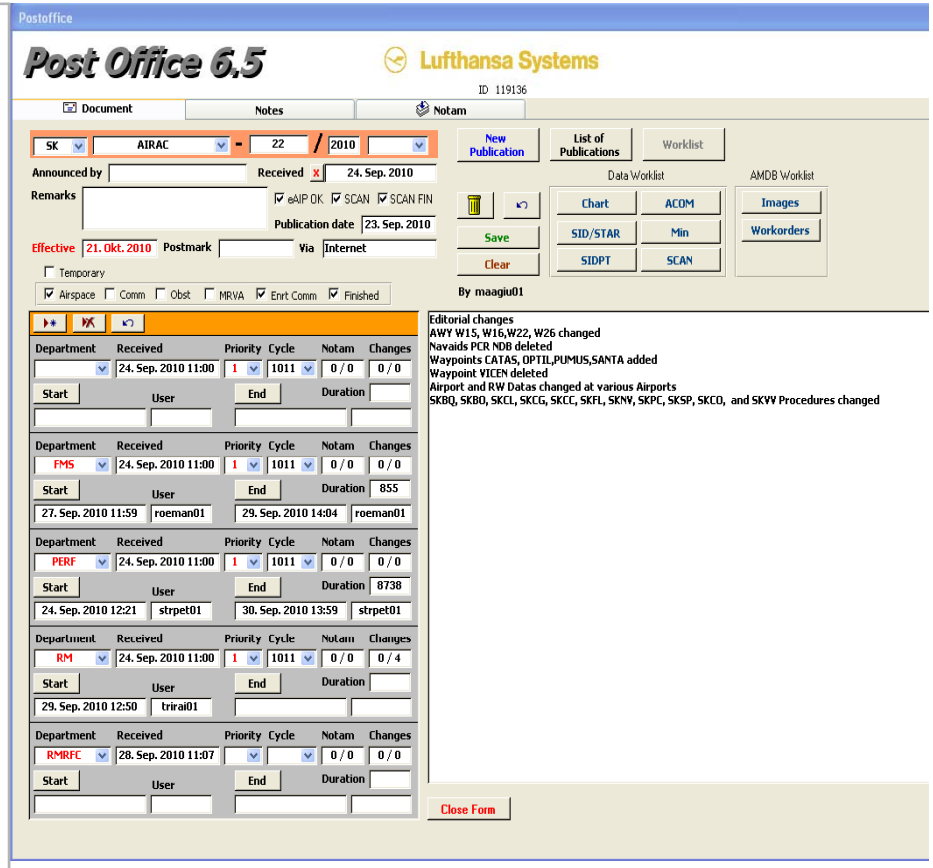
Publication Completeness

- Provides Configuration Management of AIP
- Supports tracking of AIP processing progress
- Detects late or missing AIP
- Supports the completeness and timeliness requirements for Nav Data
- Currently tracking more than 190 State AIP
- Generates work orders for Data Engineers



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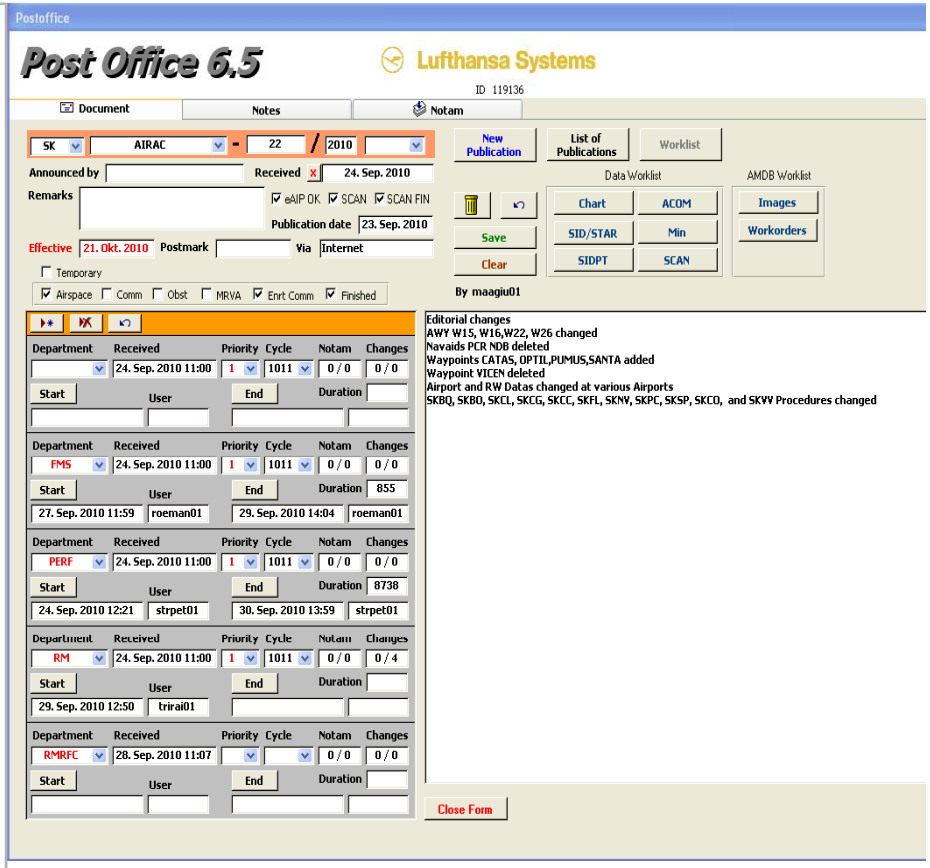
出版物完整性

- 提供AIP结构管理
- 支持AIP处理流程跟踪
- 查明晚到或者遗漏的AIP
- 满足导航数据库的完成性和时间表要求
- 目前跟踪超过190个国家的AIP
- 为数据工程师制定工作计划



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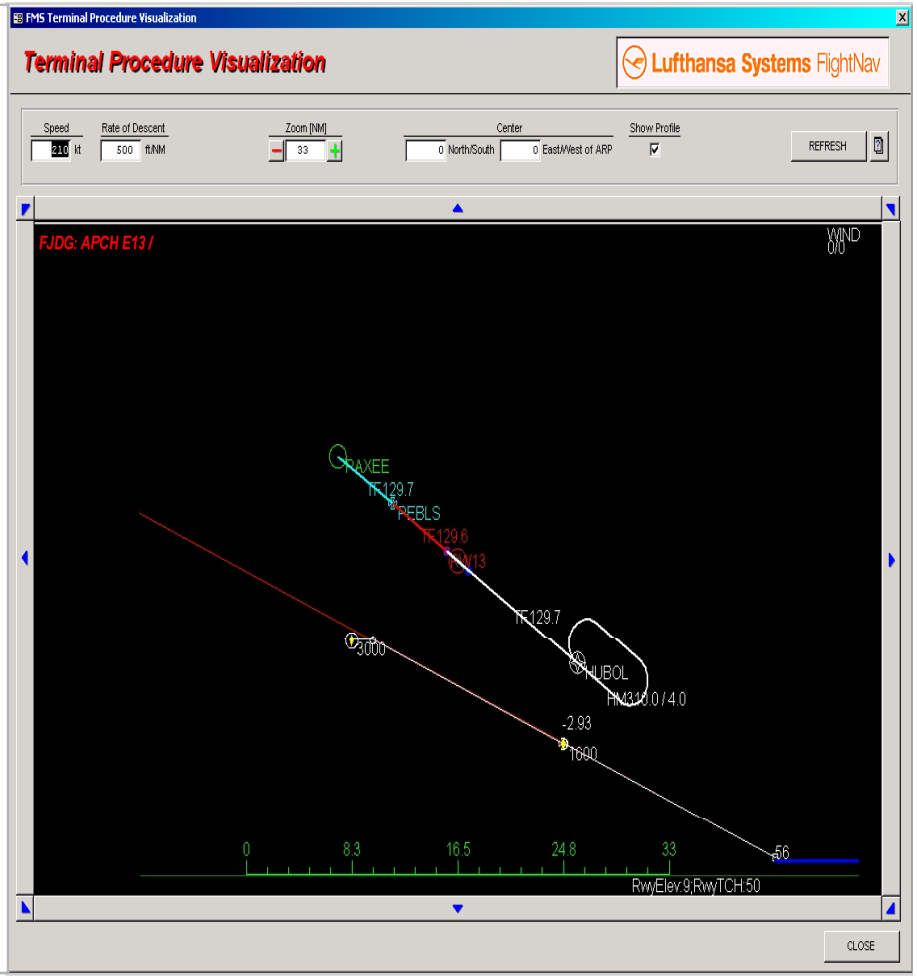
Update DataBase

- Check source correctness and completeness
- Resolve source conflicts
- Determine affected NavData Records
- Perform the data entry
- Resolve Nav Database conflicts
- FMS Application runs plausibility checks
- FMS Application ensures traceability and history



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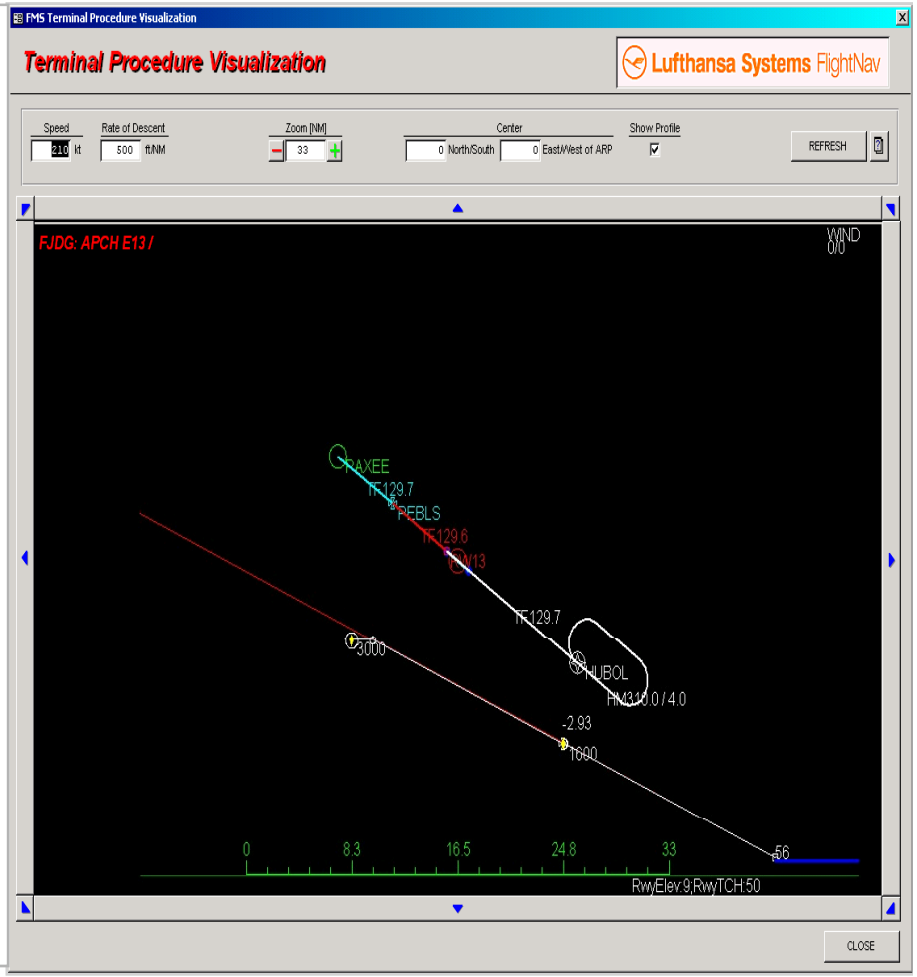
更新数据库

- 检查数据源的准确性和完整性
- 解决数据源中的冲突
- 明确受影响的数据库记录
- 执行数据输入
- 解决导航数据库冲突
- FMS应用运行真实性检查
- FMS应用保持追述性和历史记录



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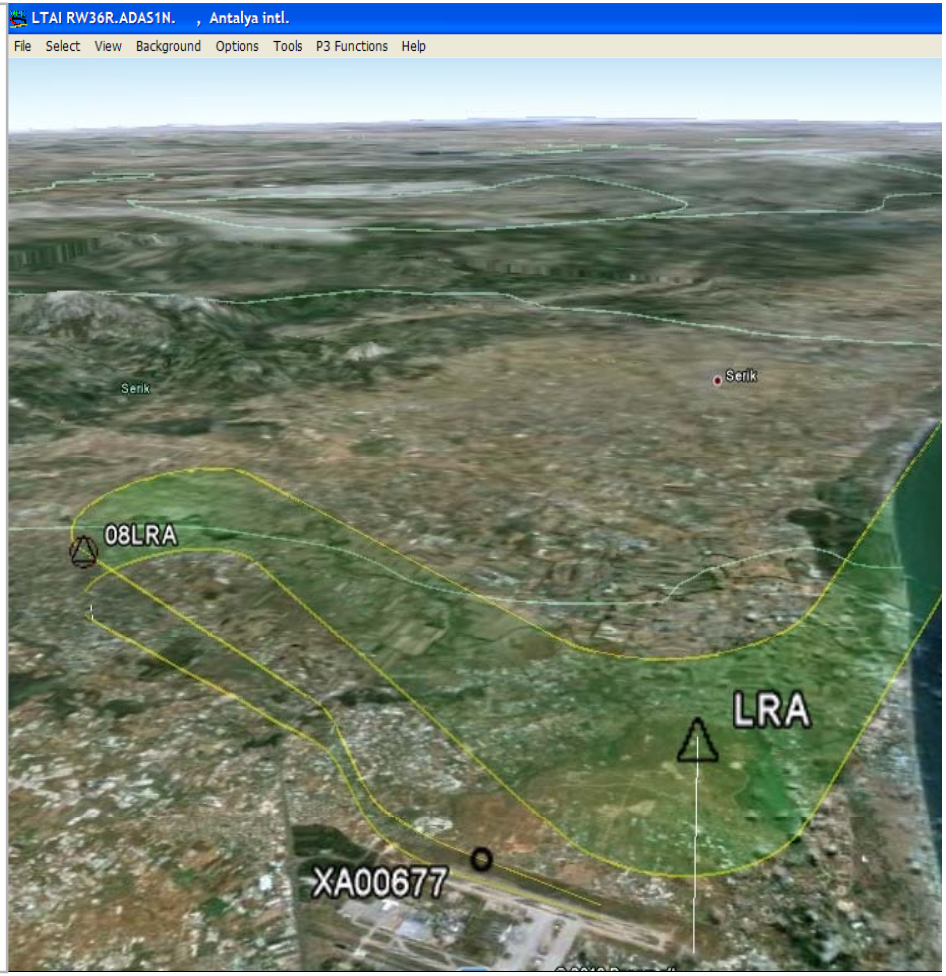
DataBase Checks

- Weekly Quality Check performed by the Director NavData Services and FMS Database Quality Engineers.
- External Visualization tool
- Batch Run Checks
- SQL Checks
- Runway Check
- Java Routes / Proc Checks
- Runway Crosscheck GE
- MSA-Check
- File Verification
- Data Base production and verification procedures are managed by the Cycle Run application ensuring consistency cycle per cycle



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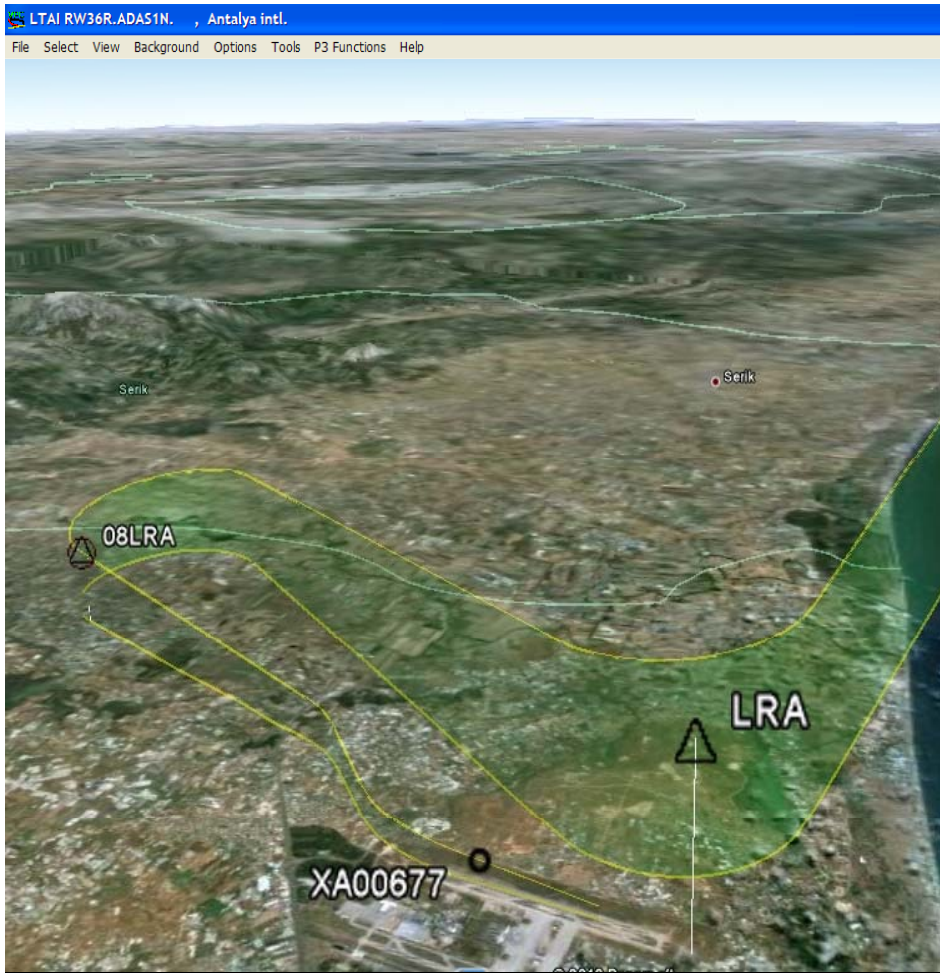
数据库检查

- 每周导航数据库服务主管和FMS 数据库质量工程师，都会进行质量检查
- 外部可视化工具
- 分批次运行检查
- 结构化查询语言(SQL)数据库检查
- 跑道检查
- Java 航路/程序检查
- 跑道交叉检查GE
- 最低安全高度（MSA）检查
- 文件核实
- 数据库制作和校验程序，都是由周期性运行应用软件来管理，以保证数据在每个周期里一致



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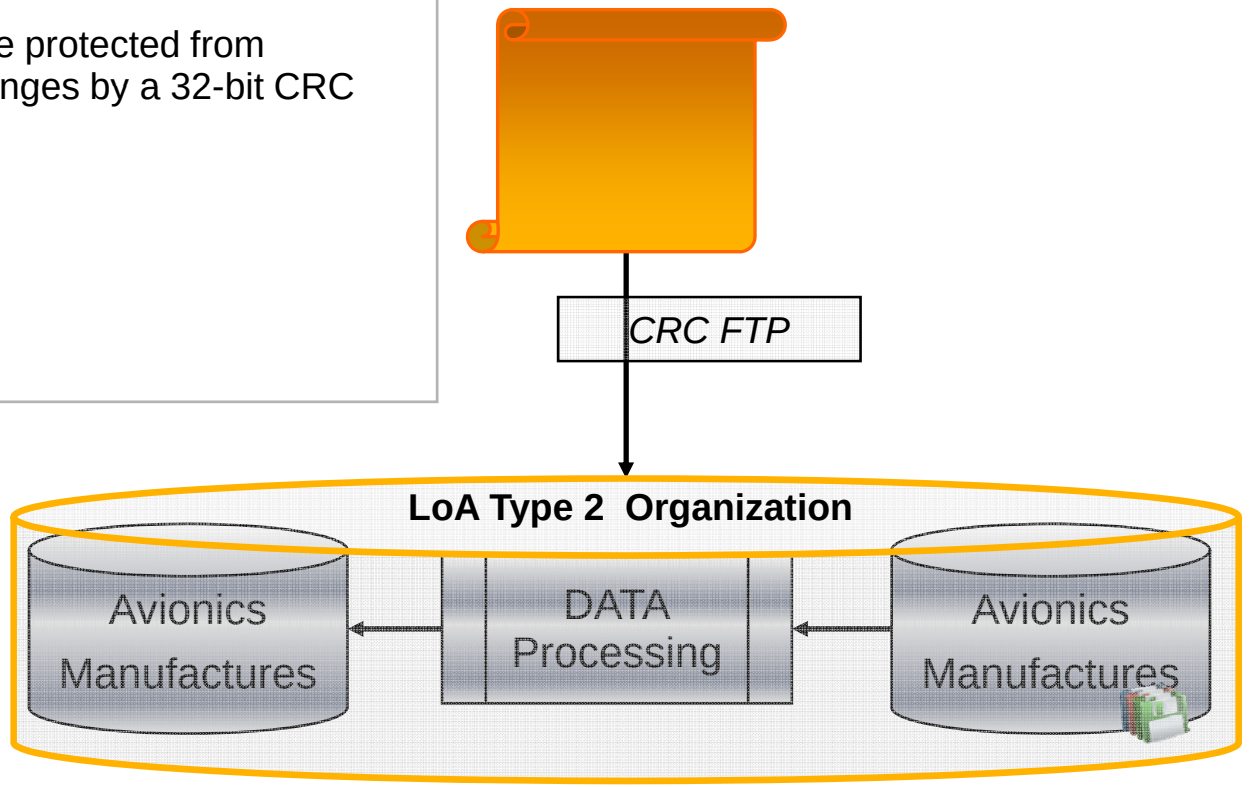
Delivery to OEM

- Generation of ARINC 424 File
- Each extracted data file is transferred electronic using a standard FTP tool
- The data files are protected from unintentional changes by a 32-bit CRC integrity check



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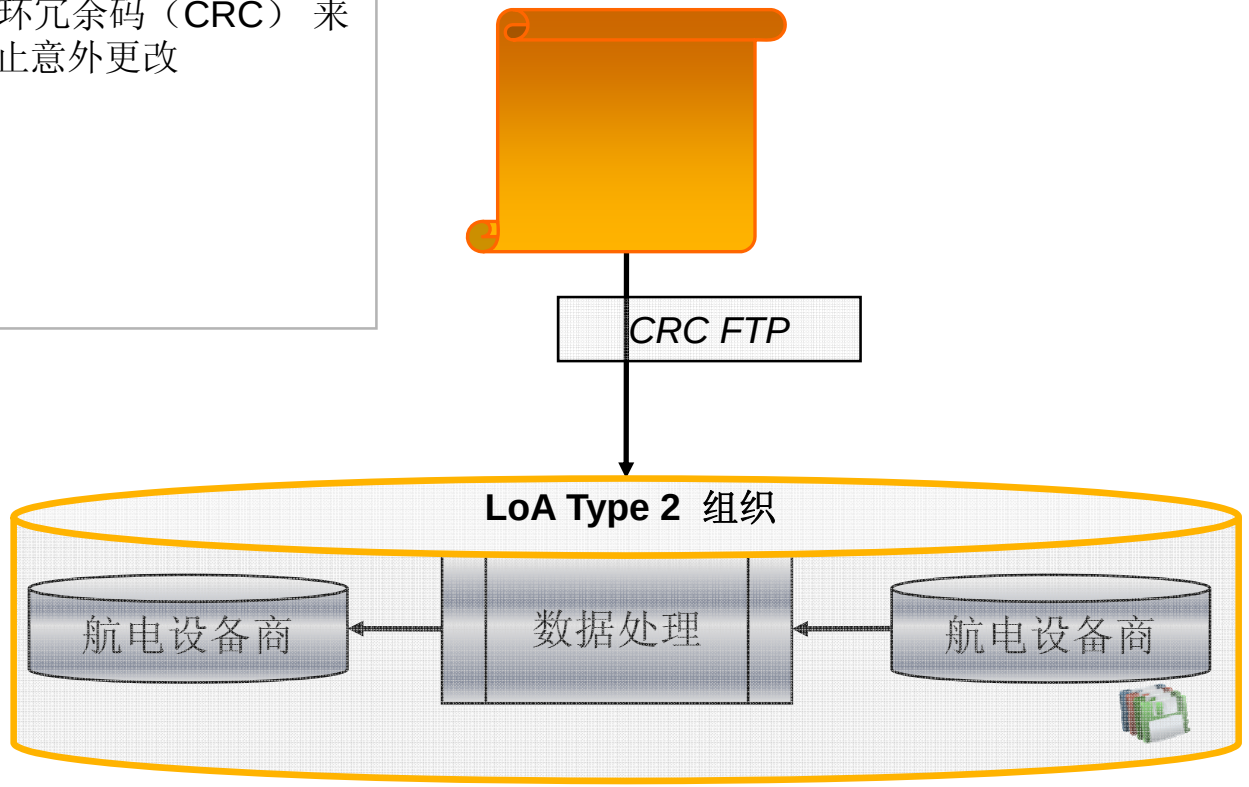
向OEM交付

- ARINC 424 文件生成
- 每一个提取的数据文件，都采用标准的文件传输协议（FTP) 工具来传输
- 数据文件采用32位循环冗余码（CRC） 来进行完整性校验，防止意外更改



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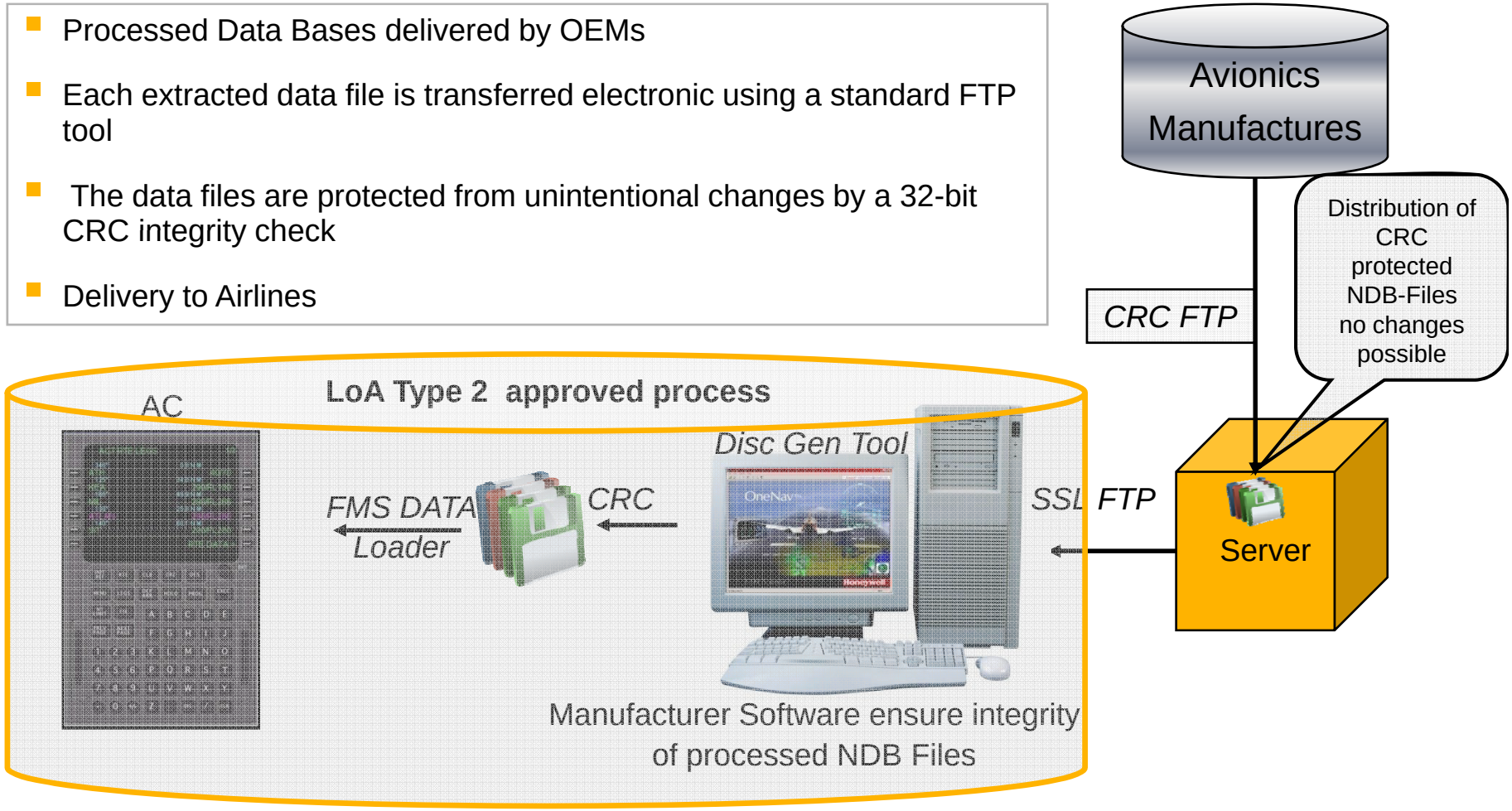
Customer Delivery

- Processed Data Bases delivered by OEMs
- Each extracted data file is transferred electronic using a standard FTP tool
- The data files are protected from unintentional changes by a 32-bit CRC integrity check
- Delivery to Airlines



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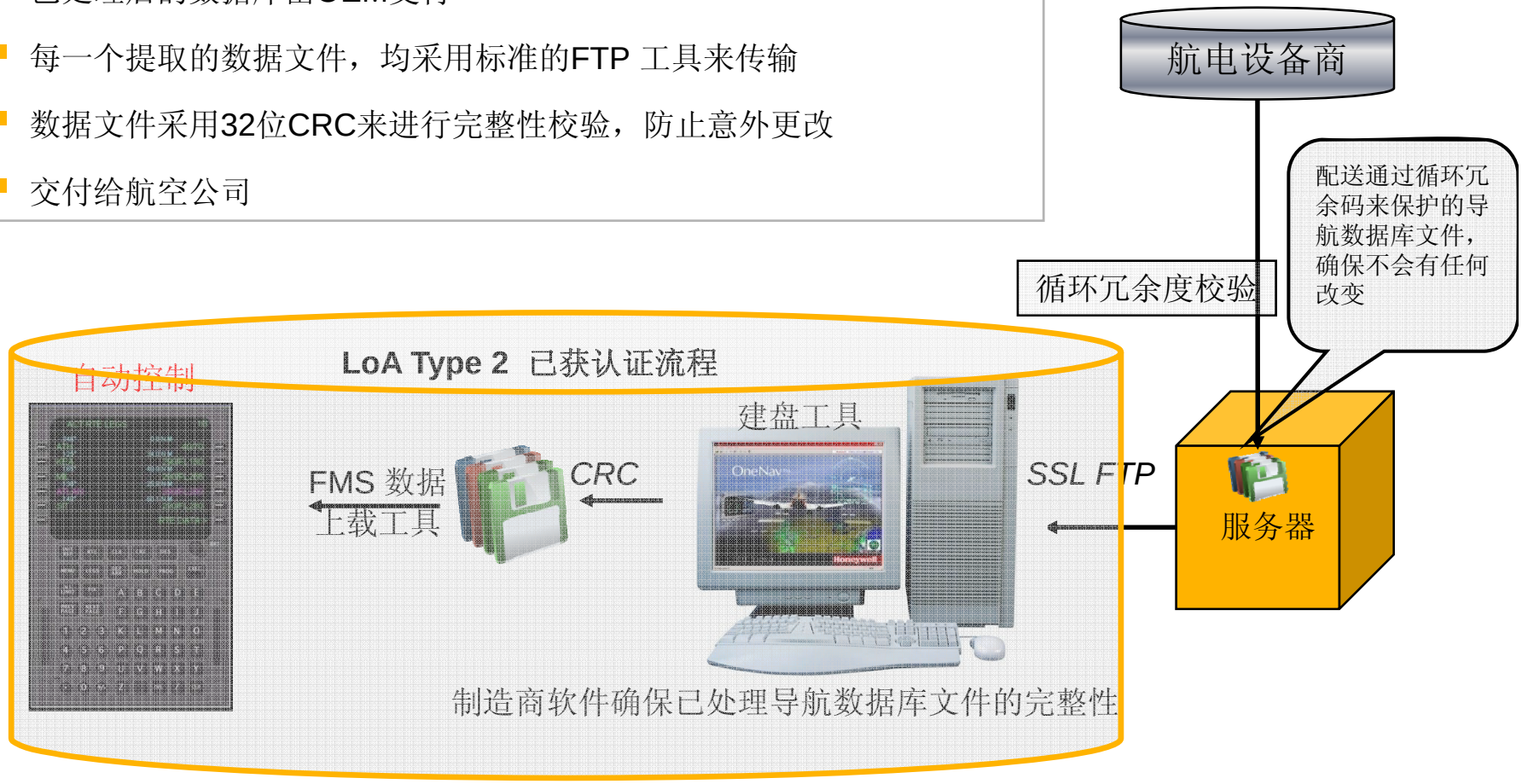
向客户交付

- 已处理后的数据库由OEM交付
- 每一个提取的数据文件，均采用标准的FTP 工具来传输
- 数据文件采用32位CRC来进行完整性校验，防止意外更改
- 交付给航空公司



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Total Quality Management (TQM)

1st level

A team of FMS professionals, trained & audited by internal and external experts.

2nd level

Worldwide AIP Monitoring → LSY Postoffice Tool ®

3rd level

Plausibility Check → LSY FMS Application ®

4th level

Validation / Double Checks

Four-Eye / Double-Signature policy for all editing of safety-relevant Database objects such as GPS-and RNAV-Procedures.

5th level

Ability to visualize procedures before and after processing.

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总质量管理

第一层次

拥有一批在FMS方面的专业人员，他们已接受公司内部和外来专家培训并通过审核

第二层次

全球范围内的AIP监控 → LSY Postoffice Tool ®

第三层次

真实性检查→ LSY FMS Application ®

第四层次
生效 / 双重检查

凡是涉及安全的数据库编辑，比如GPS和RNAV程序，均是双人/双签名制

第五层次

在处理前和处理后，都能对程序可视化

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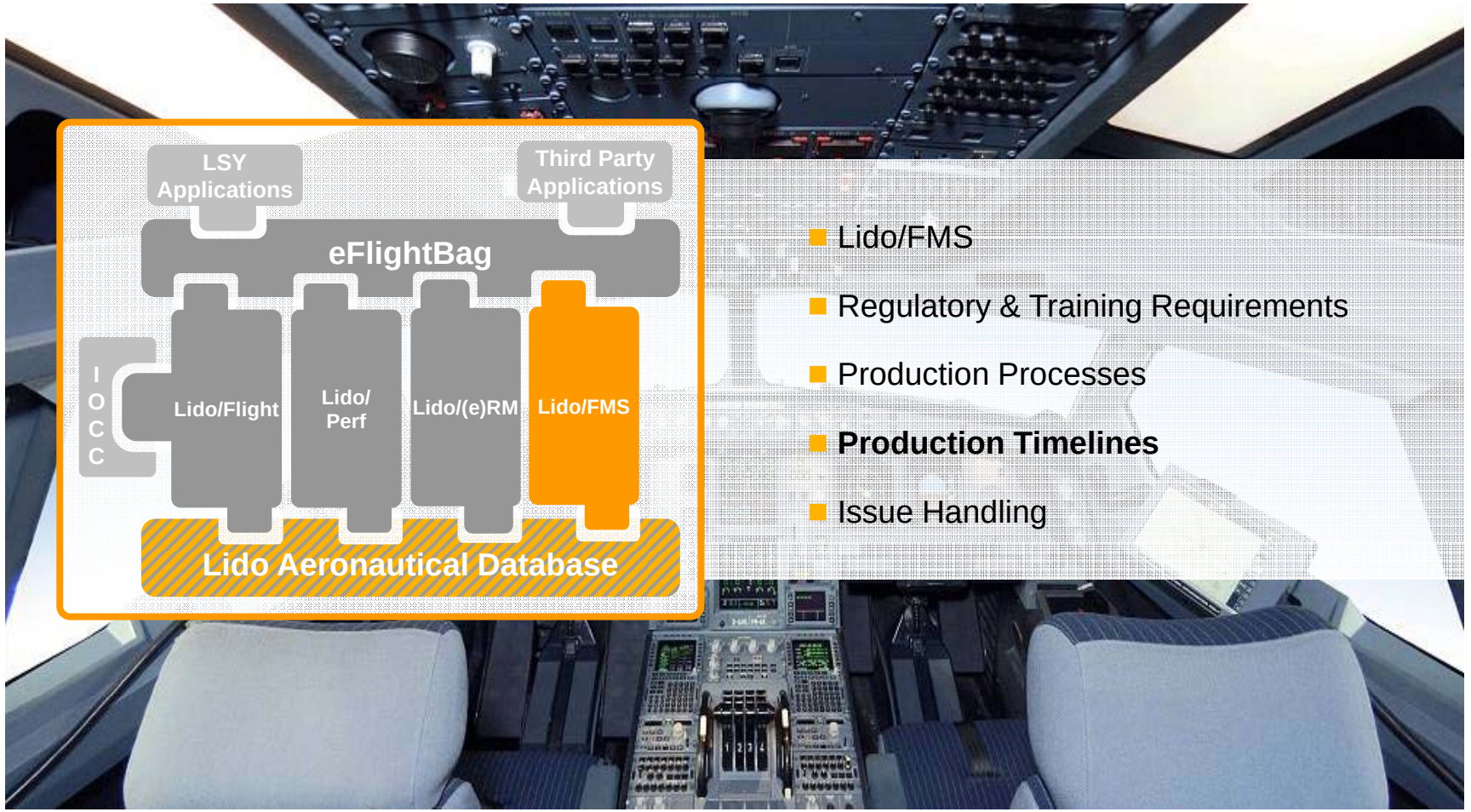
Agenda



- Lido/FMS
- Regulatory & Training Requirements
- Production Processes
- **Production Timelines**
- Issue Handling

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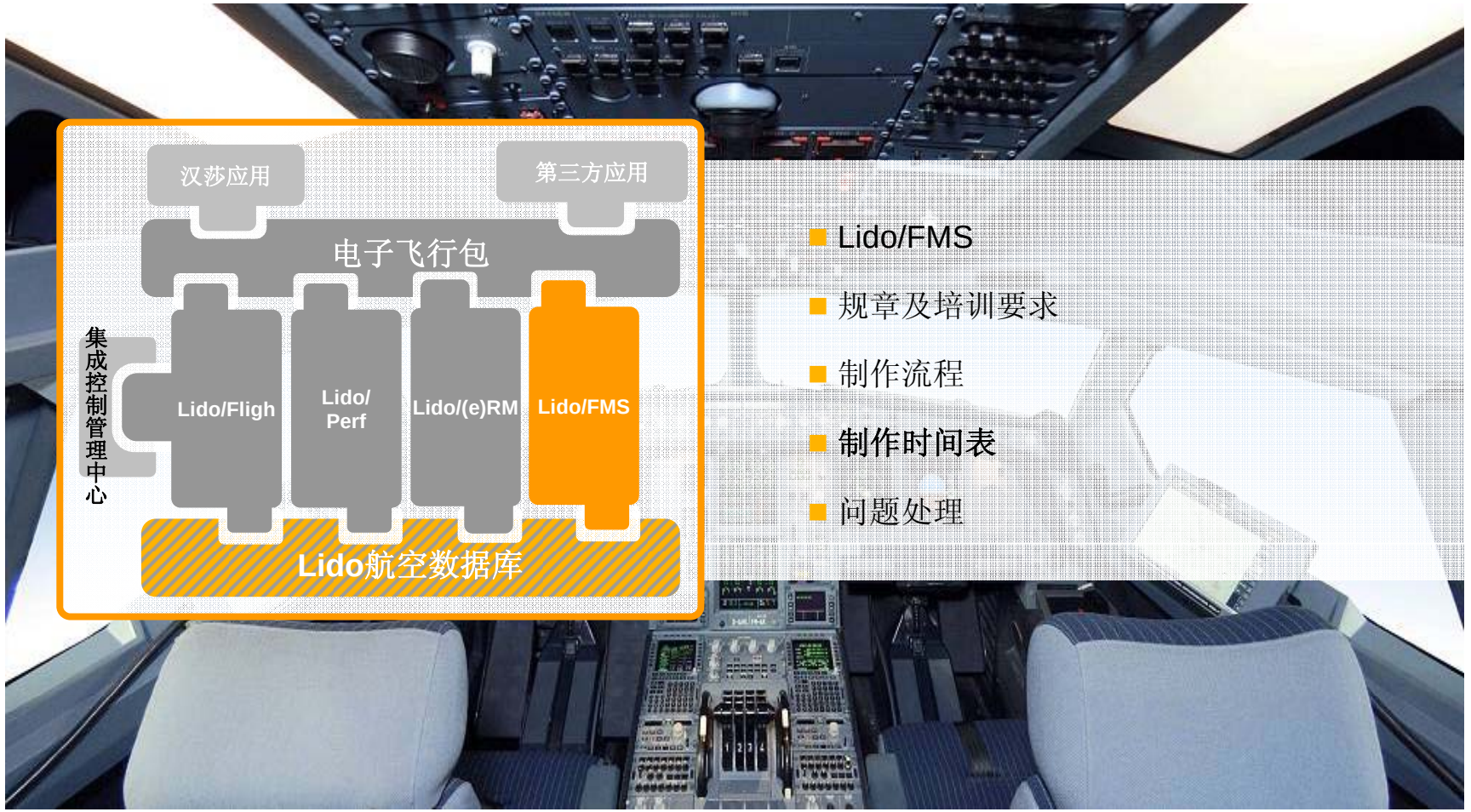
议程



- Lido/FMS
- 规章及培训要求
- 制作流程
- **制作时间表**
- 问题处理

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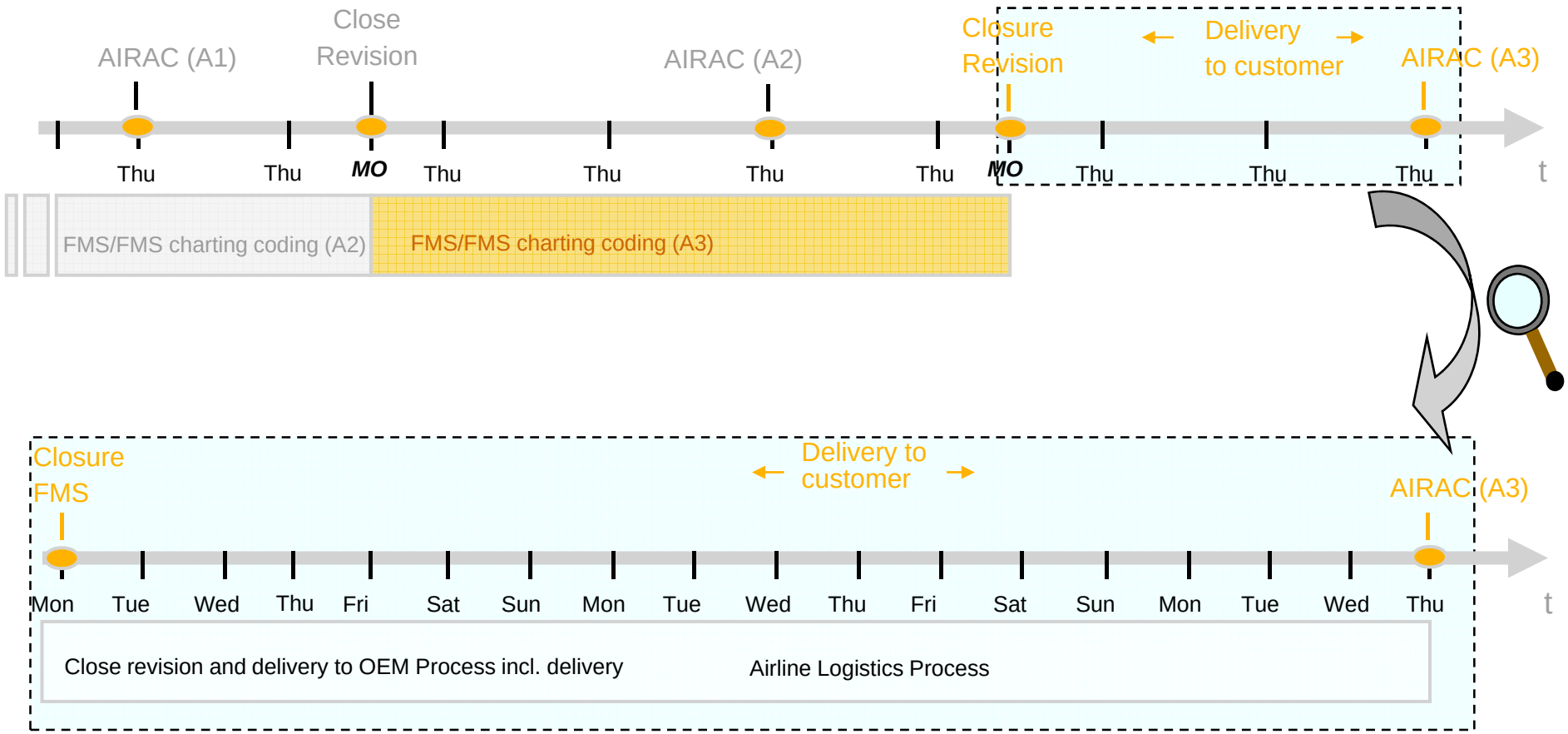
Production Timeline



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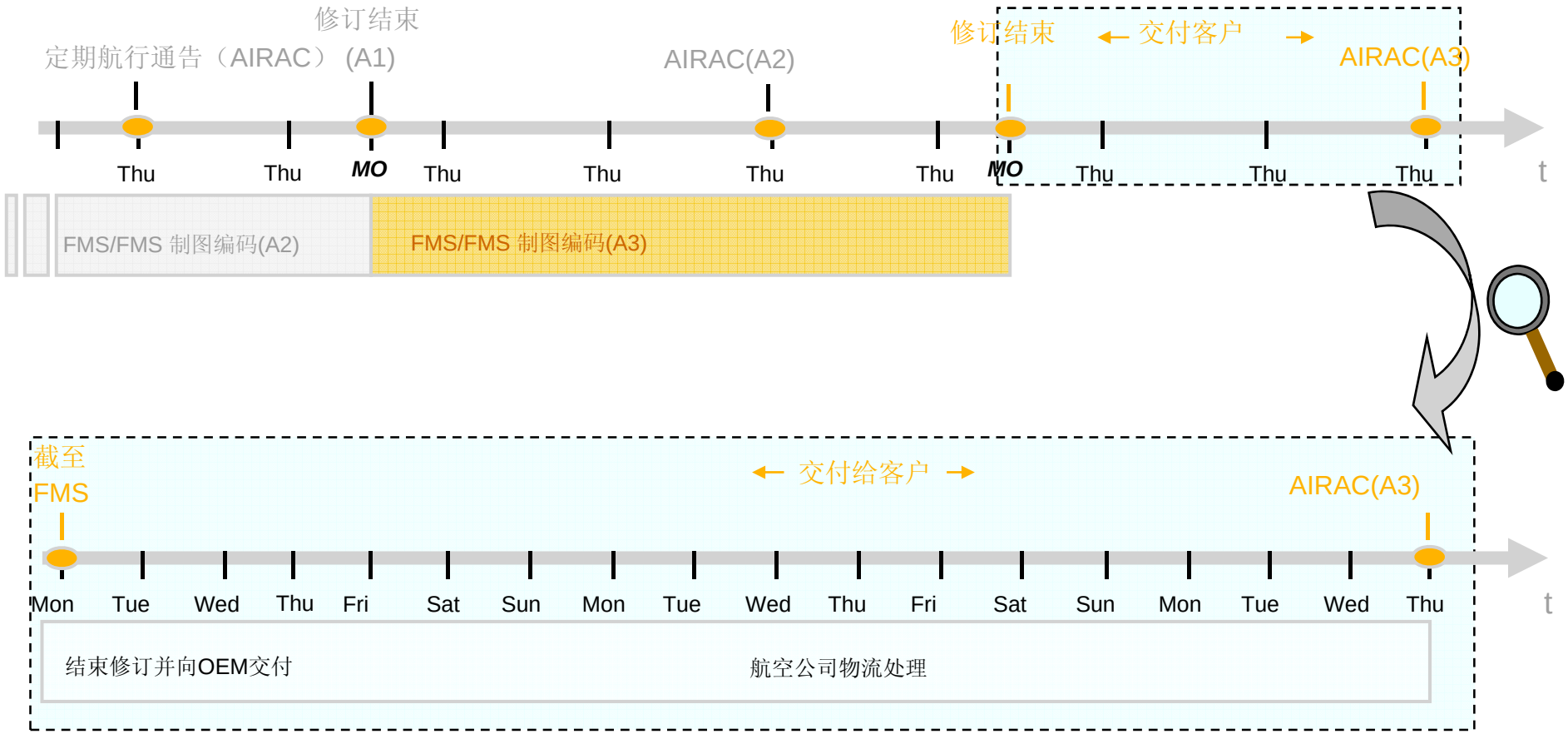
生产时间表



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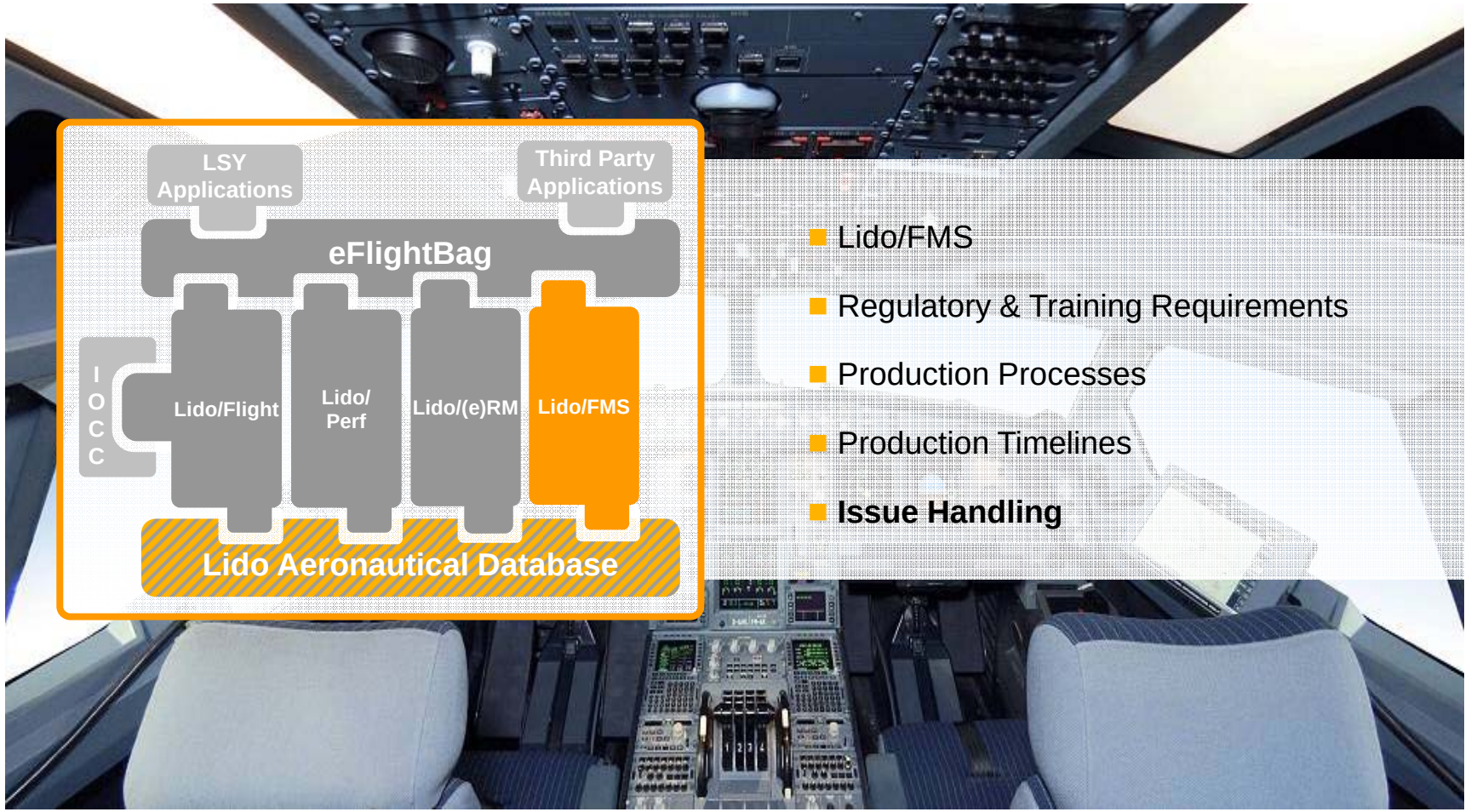
Agenda



- Lido/FMS
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- Production Timelines
- **Issue Handling**

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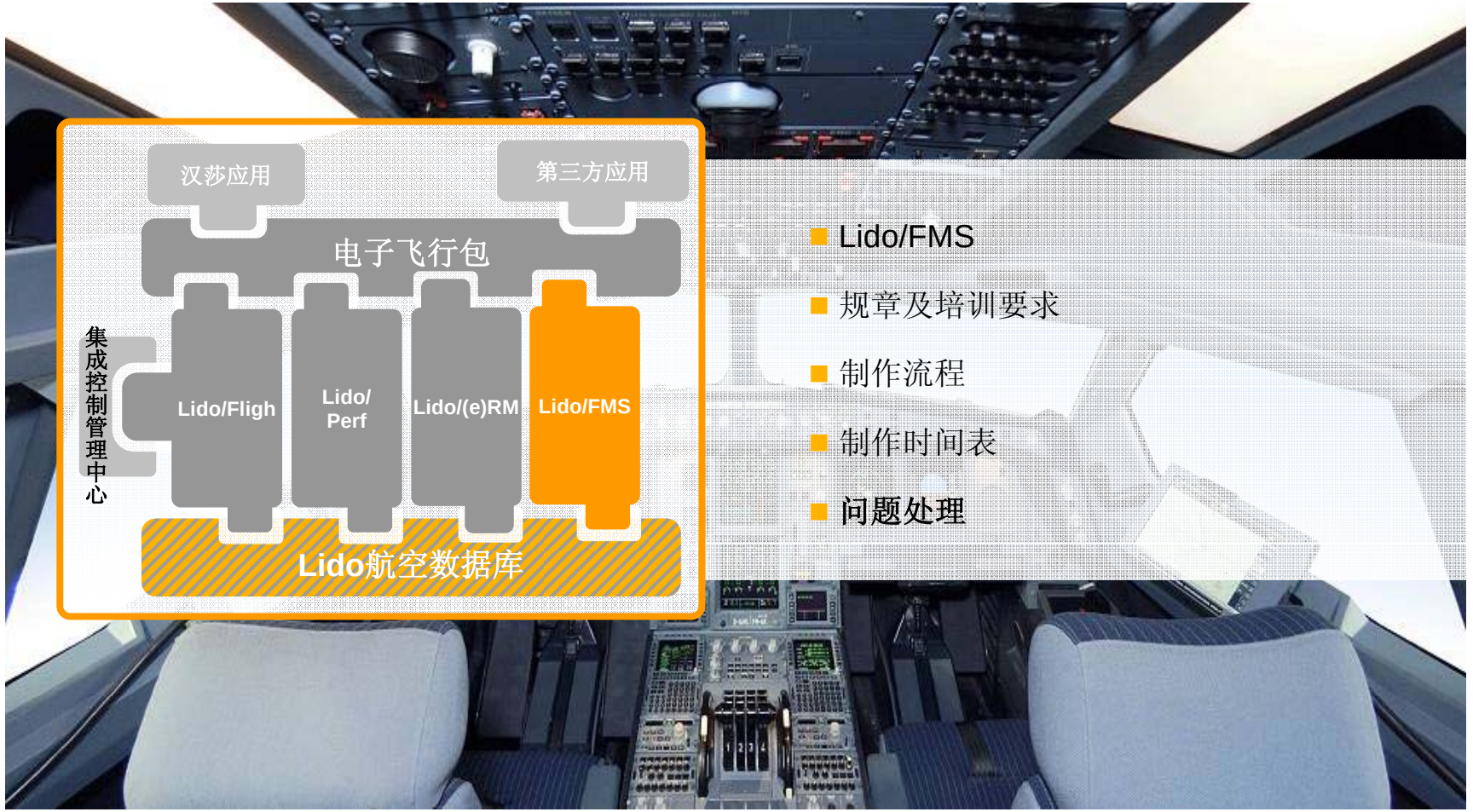
议程



- Lido/FMS
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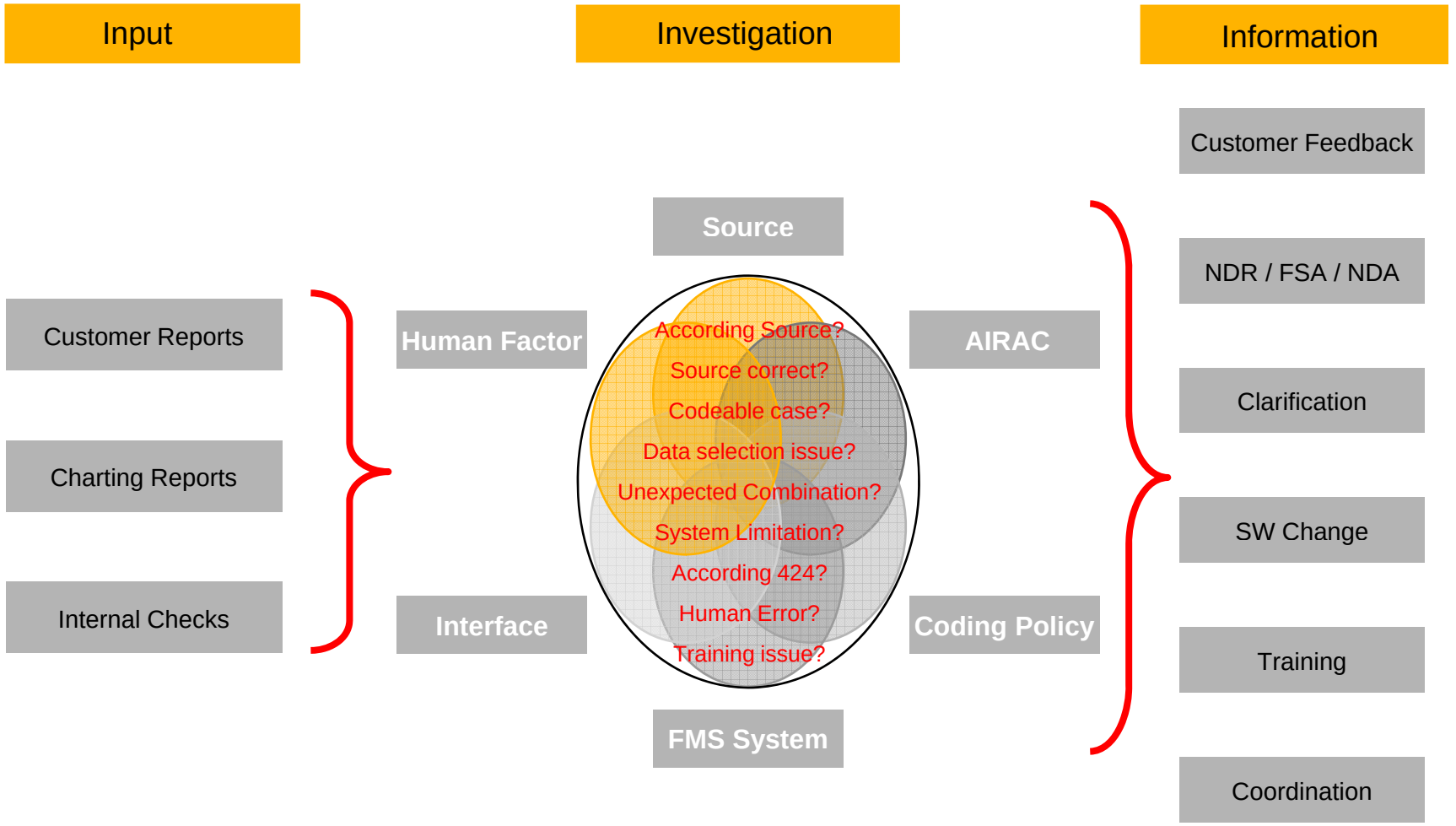
Issue Handling



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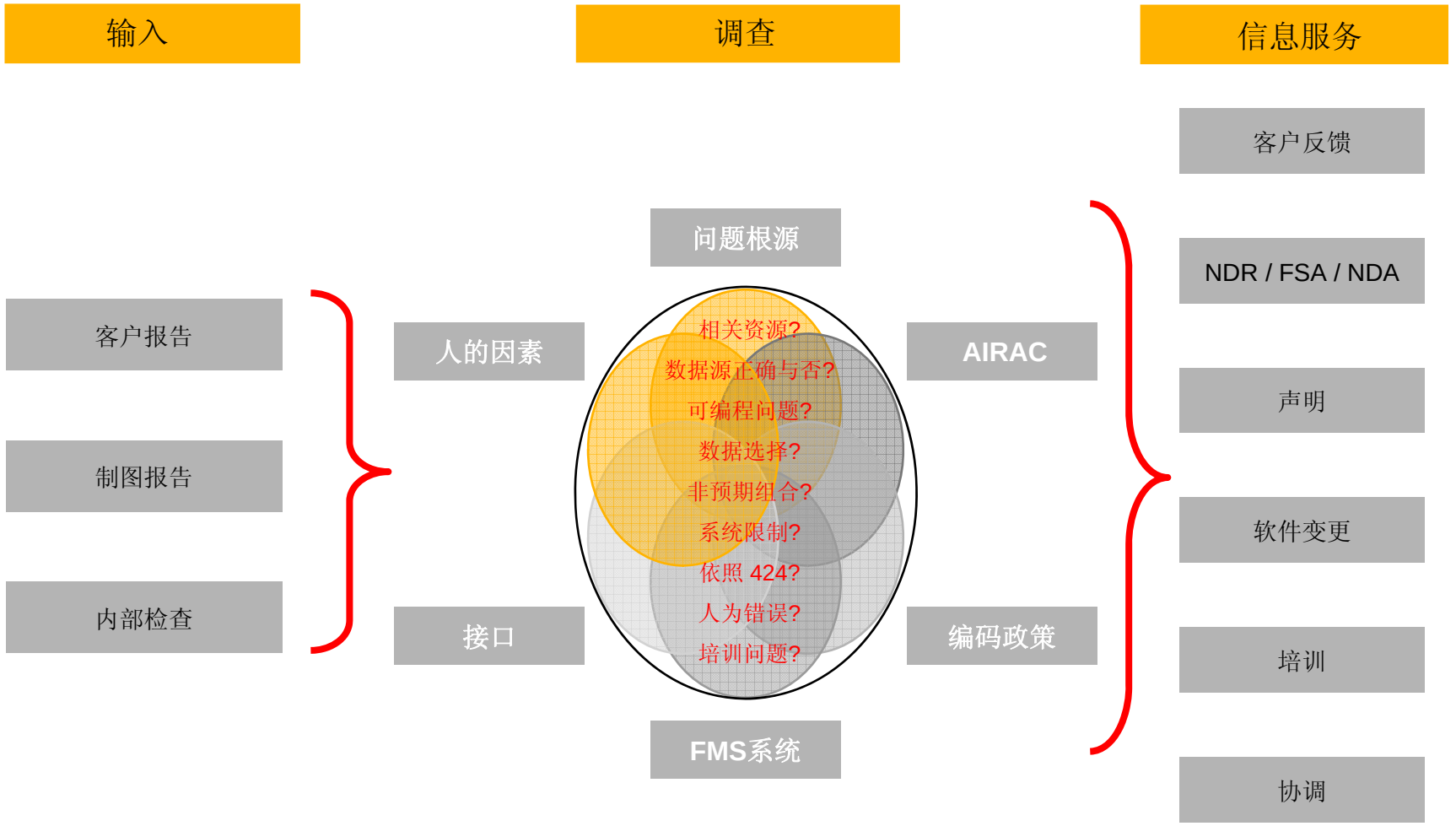
问题处理



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Thank You

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谢谢

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