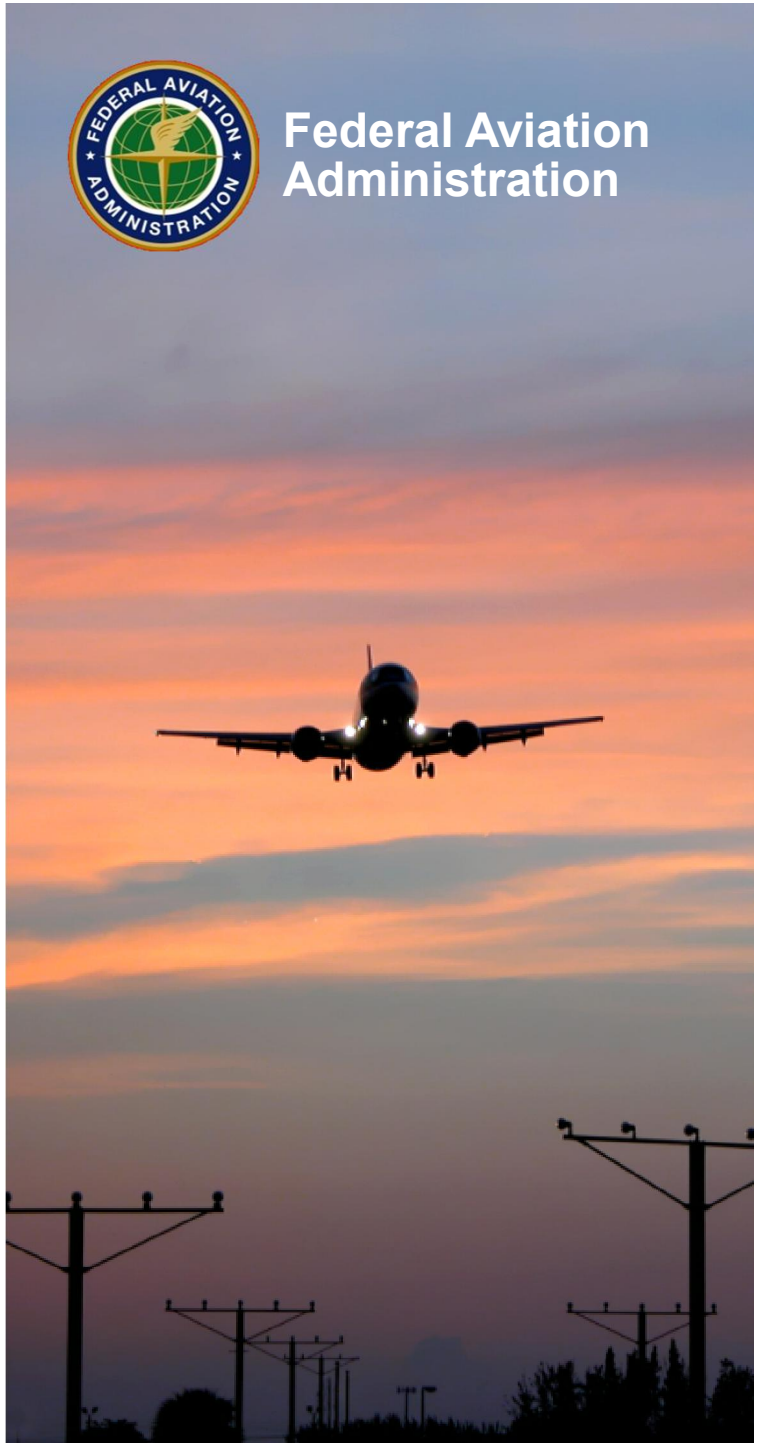
Gorham Conference 2017

FAA PMA Overview and Updates

Presented to: Conference Attendees

By: FAA AIR-110

Date: March 21, 2017



Bio

- **Who is Ian Lucas?**
  - I have been with the FAA for 4.5 years
    - Started with the Boston ACO as a Structures Engineer
  - Moved to FAA HQ (AIR-111) in April 2016
  - Transitioned to working the PMA Policy with Robert Sprayberry
  - Prior to the FAA:
    - US Army - Aviation Engineering Directorate
      - Structures and Materials Division
    - US Army - Redstone Test Center
      - Helicopter Flight and Ground Test

Topics

- **Air Transformation**
- **PMA Basics**
- **How did we get here?**
- **Metrics**
- **Current PMA Policy and Guidance**
- **International Acceptance**
- **New/Future Initiatives**
  - Streamlining eligibility expansions
  - 8110.42D Change 1
  - Special Projects

AIR Transformation Overview

AIR Transformation is a comprehensive approach to improve efficiency and effectiveness throughout the organization. One key component of Transformation focuses on improving the organization, as highlighted below. Additionally, AIR is committed to maintaining two-way communication with stakeholders throughout Transformation and implementing changes via a structured approach to change management.

•AIR Transformation

•Refresh certification strategy

- Ensure appropriate support of standards activities
- Minimize unnecessary involvement in critical path
- Implement risk-based systems oversight

•Invest in management systems to improve performance

- Measure performance with goals and targets
- Improve governance and operating norms
- Invest in new tools and infrastructure

•Improve organization and invest in our people

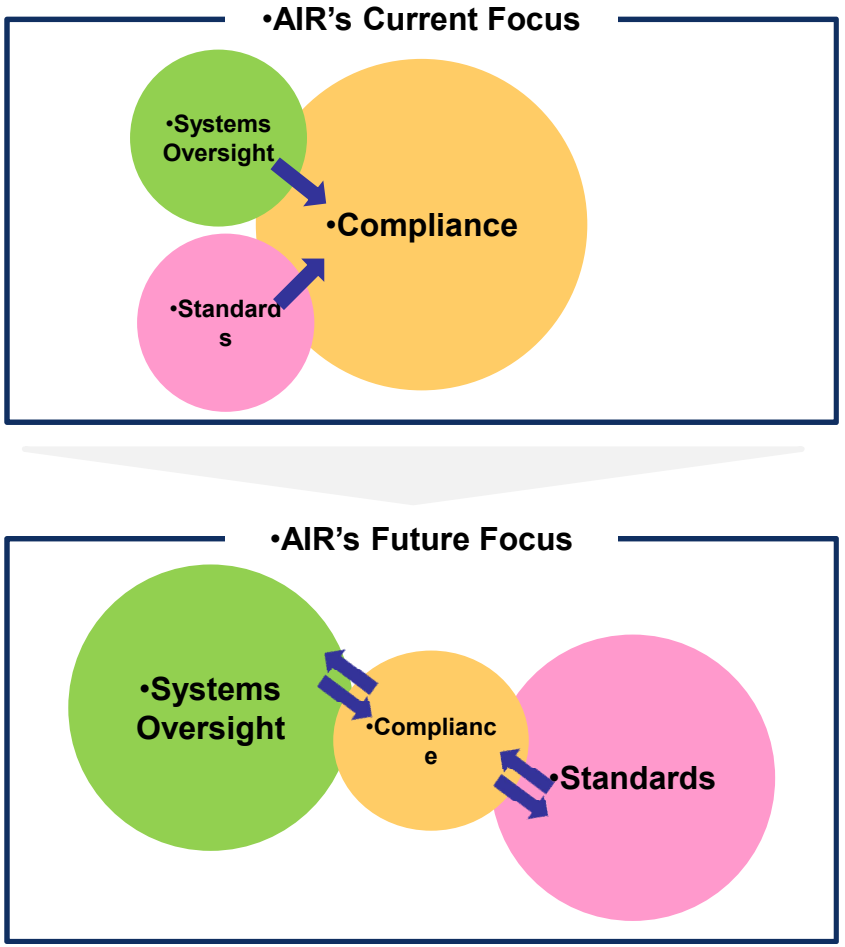
- Adapt organization to execute on certification strategy
- Invest in people and build skills to empower the workforce of the future

•Change management	▪ Help organization embrace holistic transformation by creating clear communication channels with our people
•Industry commitment	▪ Embrace systems safety with a compliance culture, engage FAA early on innovation, and work with FAA on performance management

AIR's Functional Organization

•The functional organization will streamline compliance activities and promote early and iterative actions between industry partners and AIR.

- **Helps AIR to move from a transactional model to a systems approach**
- **Better enables a shift in focus of AIR resources**
- **Encourages innovation through upfront engagement on new products and capabilities**
- **Uses early industry engagement and risk-based monitoring to promote a continued focus on safety outcomes and system reliance**
- **Streamlines existing processes and empowers the workforce through a focus on organizational performance**



Outcomes of Realignment

Realignment is the first visible move towards the functional organization, and as such will have a measurable impact on key stakeholders.

Intended Outcomes of Realignment

The following are intended outcomes of realignment:

1) ***Majority of Employees Functionally Aligned***: Most employees will be aligned under the same division as they will in the future.

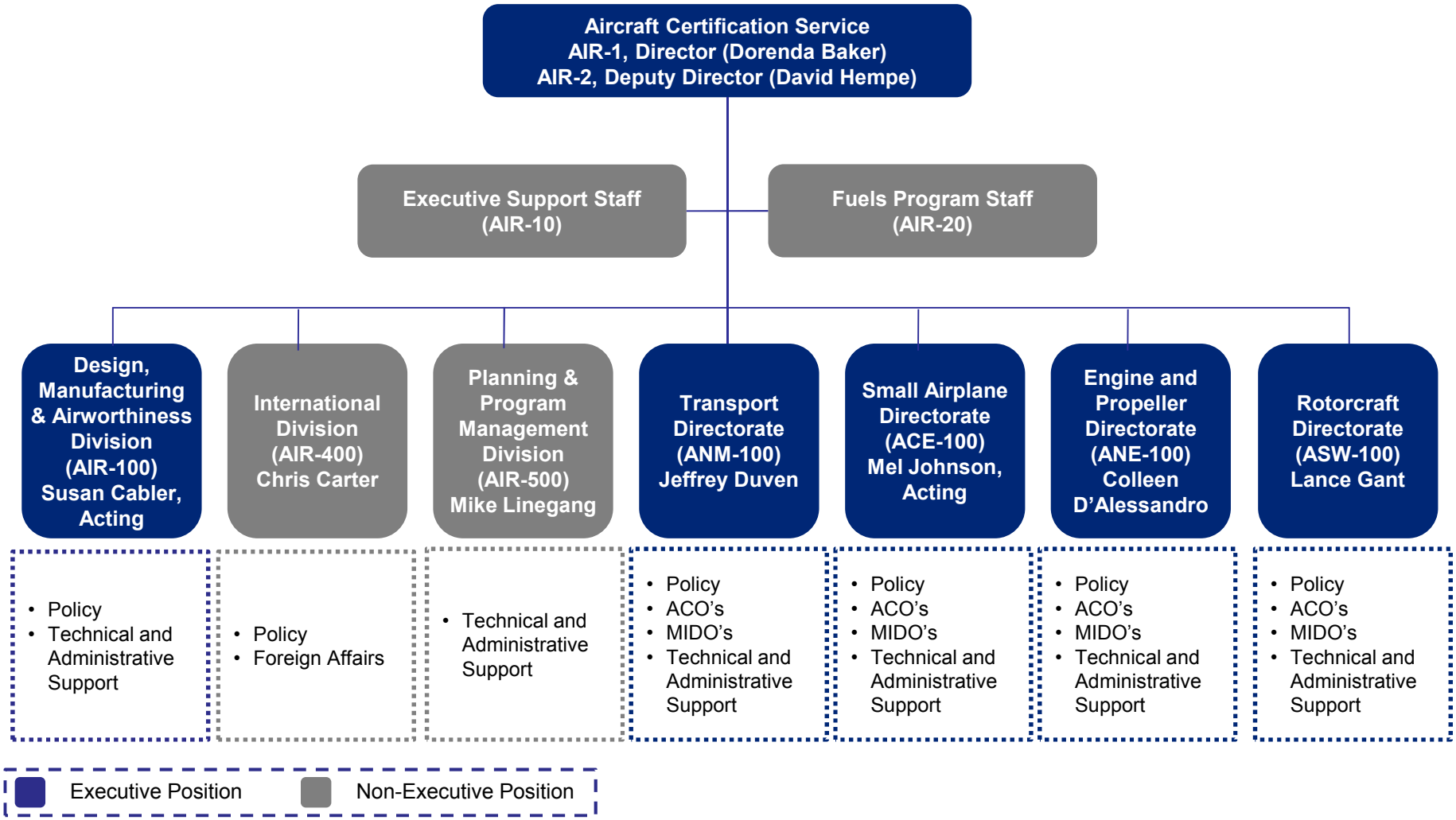
2) ***Minimal Disruption***: Employees will have the same job, perform the same functions, and continue to report to their same supervisors.

3) ***Temporary Manager Alignments***: Manager realignments are not meant as permanent future assignments and may change again as the functional organization is refined, finalized, and implemented.

4) ***Division Stand Up***: AIR's directorate structure ceases to exist after realignment.

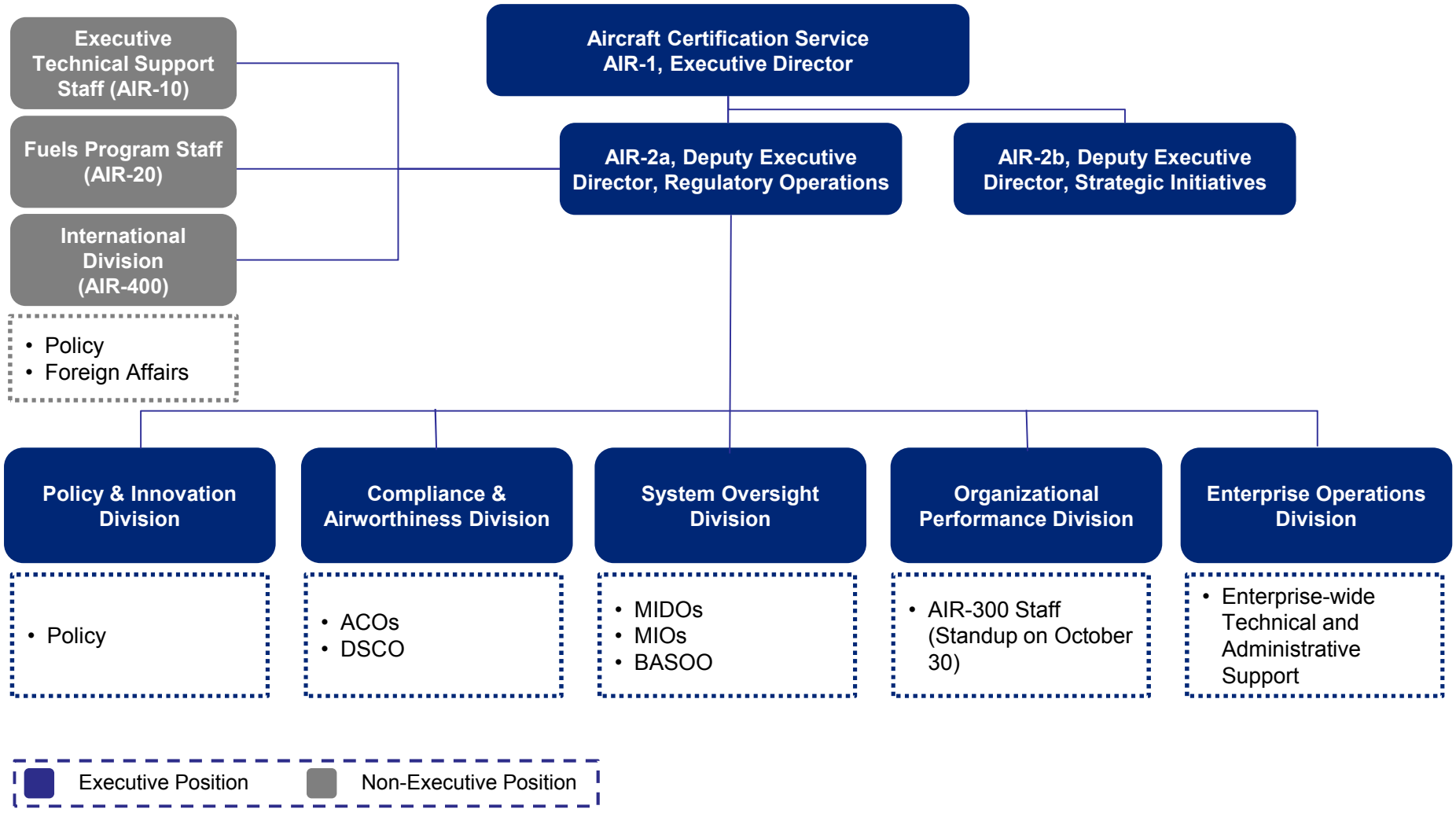
Current State AIR Organization and Executive Positions

AIR's current, product driven Directorate structure creates siloed organizations inhibiting AIR from achieving organizational-wide functional improvements.



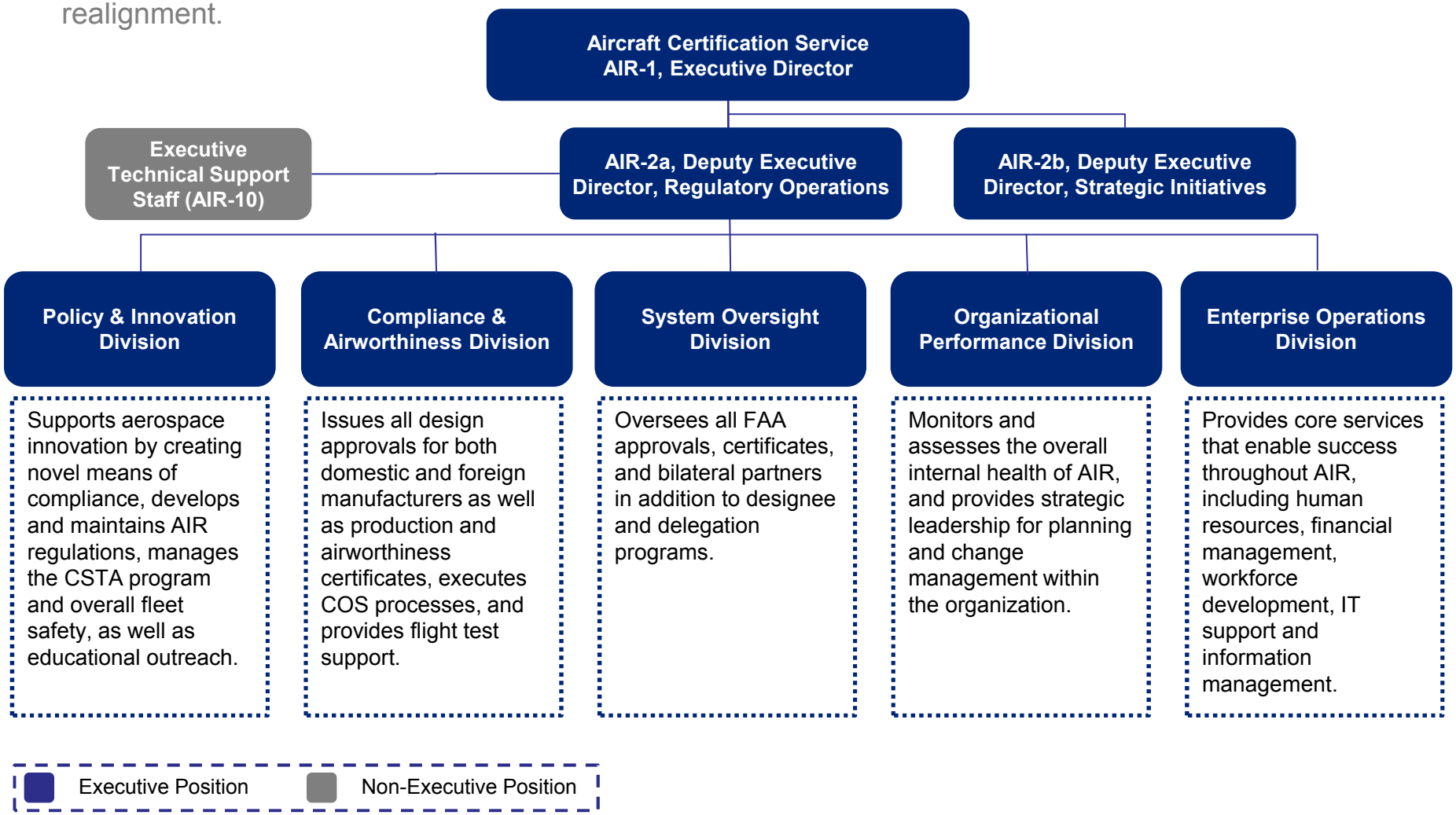
Proposed Realignment (Interim State)

AIR proposes an interim realignment of existing local offices to stand up the end state divisions.



Proposed Refinement (Functional Division End State)

AIR's high-level end state structure is depicted below. The initial detailed designs for each functional division will be refined and finalized, with pre-decisional involvement of union representatives, after realignment.



AIR Transformation Stakeholder Outreach

•In addition to managers and employees, AIR is engaging in outreach to inform key stakeholder groups about AIR Transformation and the benefits it will have on each group.

Stakeholder	Benefits of Transformation
Applicants and Approval Holders	• ***Streamlined Process*** - Early industry engagement coupled with risk-based system surveillance eliminates unnecessary barriers from FAA involvement during certification • ***Consistency and Standardization*** - Improves consistency and standardization by establishing single functional lines for certification, standards, and system oversight • ***Innovation*** - Fosters innovation by engaging applicants/industry early to understand new concepts and ensure a viable path to compliance • ***Agile and Adaptable*** - Provides agility and adaptability to meet the challenges of the dynamic global aviation industry • ***Metric Based*** - Establishes business practices for utilizing metrics to determine efficacy of Industry/FAA associated with compliance and time to market • **System Oversight -** Shifts focus from transactional compliance activities to system oversight and early involvement in standards development

AIR Transformation Stakeholder Outreach (1 of 2)

•In addition to managers and employees, AIR is engaging in outreach to inform key stakeholder groups about AIR Transformation and the benefits it will have on each group.

Stakeholder	Key Messages on the Benefits of Transformation
Applicants and Approval Holders	• ***Streamlined Process*** - Early industry engagement coupled with risk-based system surveillance eliminates unnecessary barriers from FAA involvement during certification • ***Consistency and Standardization*** - Improves consistency and standardization by establishing single functional lines for certification, standards, and system oversight • ***Innovation*** - Fosters innovation by engaging applicants/industry early to understand new concepts and ensure a viable path to compliance • ***Agile and Adaptable*** - Provides agility and adaptability to meet the challenges of the dynamic global aviation industry • ***Metric Based*** - Establishes business practices for utilizing metrics to determine efficacy of Industry/FAA associated with compliance and time to market
Congressional Staffers	• ***Increased System Oversight*** - Shift from transactional compliance activities to system oversight and early involvement in standards development • ***Consistency and Standardization*** - Improves consistency and standardization by establishing single functional lines for certification, standards, and system oversight • ***Innovation*** - Fosters innovation by engaging applicants/industry early to understand new concepts and ensure a viable path to compliance • ***Metric Based*** - Establishes business practices for utilizing metrics to determine efficacy of Industry/FAA associated with compliance and time to market

AIR Transformation Stakeholder Outreach (2 of 2)

•In addition to managers and employees, AIR is engaging in outreach to inform key stakeholder groups about AIR Transformation and the benefits it will have on each group.

Stakeholder	Key Messages on the Benefits of Transformation
Bilateral Partners	• ***Streamlined Validation:*** Thorough understanding of partner certification system and continuous maintenance of confidence supported by risk-based principles eliminates unnecessary barriers due to FAA involvement during validation • ***Safety Knowledge-Sharing and Harmonization***- Establishing single functional lines for certification, standards, and system oversight improves safety knowledge sharing and promotes harmonization of systems • ***Innovation*** - Fosters innovation by engaging applicants/industry/bilateral partners early to understand new concepts and ensure a viable path to compliance • ***Agile and Adaptable*** - Provides agility and adaptability to meet the challenges of the dynamic global aviation industry • ***Metric Based*** - Establishes business practices for utilizing metrics to determine efficacy, contributing to the continuous maintenance of confidence with bilateral partners in support of systems approach
Labor Unions	• ***Increased Opportunity*** - Replacing product-driven directorates with five functionally aligned divisions eliminates geographic borders and provides broader career options • ***Career Growth*** - Provides greater opportunity for career development across divisions • ***Equity*** - Creates enhanced equity of like job functions • ***Technical Expertise*** - Early industry engagement, focus on a risk-based approach, and increased emphasis on industry wide education promotes employee technical growth • ***Accountability*** - Embracing an accountability framework that clearly communicates industry responsibility for compliant, conforming and safe products • ***Metric Based*** - Establishes business practices for utilizing metrics to determine efficacy of Industry/FAA associated with compliance and time to market

What is a PMA?

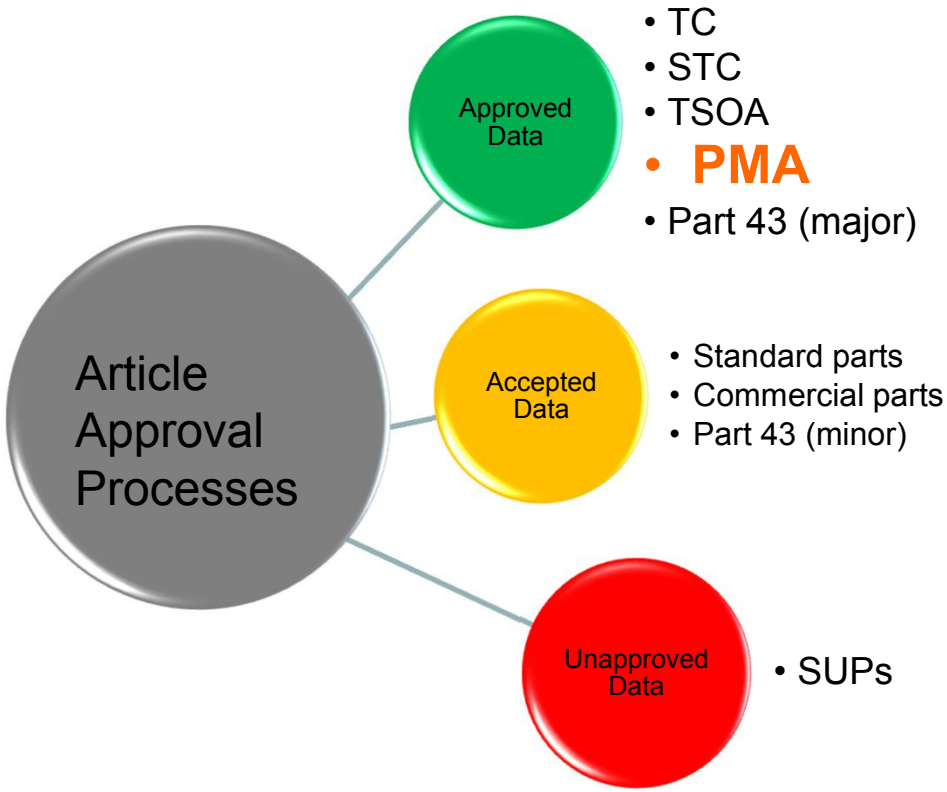
- **Replacement or Modification Article**
- **Combined design and production approval**
  - Aircraft Cert Offices (ACO) find design compliance
  - Manufacturing District Inspection Office (MIDO) approve the production
- **Only used for replacement or minor modification article**
  - Both must be a Minor Change to the Product per 14 CFR 21.93
- **4 Methods of compliance**
  - Test Reports and Computations
  - Identicality without a Licensing Agreement
  - Identicality with a Licensing Agreement
    - Approved Design - Application goes straight to MIDO
  - Supplemental Type Certificate
    - Approved Design - Application goes straight to MIDO

What is a PMA?, cont'd

- **FAA-PMA signifies an approved article under 14CFR 21.8(a) via 14CFR 21.303**
  - The article met the airworthiness requirements of its product (Comparative/General Analysis or Identicality)
    - Compliance Checklist with statement of compliance
      - Depending on Criticality, Regulations, MOC, etc Comparative analysis or testing to original part can be used to show compliance
    - Safety assessment and in-service history
    - Continued Operational Safety Plan and Maintenance Instructions
    - Identify and Show Product Installation Eligibility
  - Produced under a quality system where each article:
    - Conforms to its approved design
    - Is safe for installation on its eligible products as documented on the PMA supplement

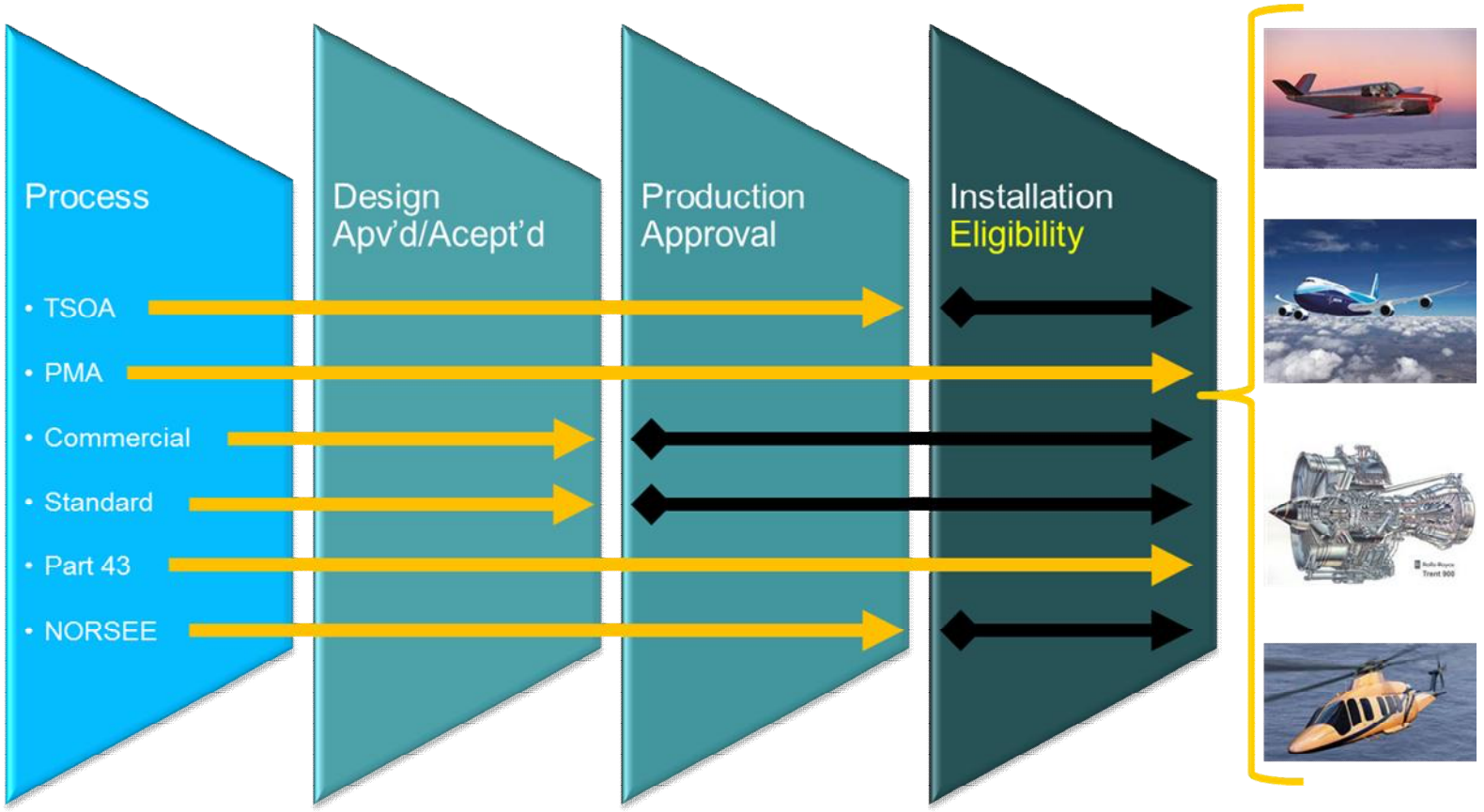
What is a PMA?, cont'd

- **Where does PMA "fit in"?**



What is a PMA?, cont'd

- **Where does PMA "fit in"?**



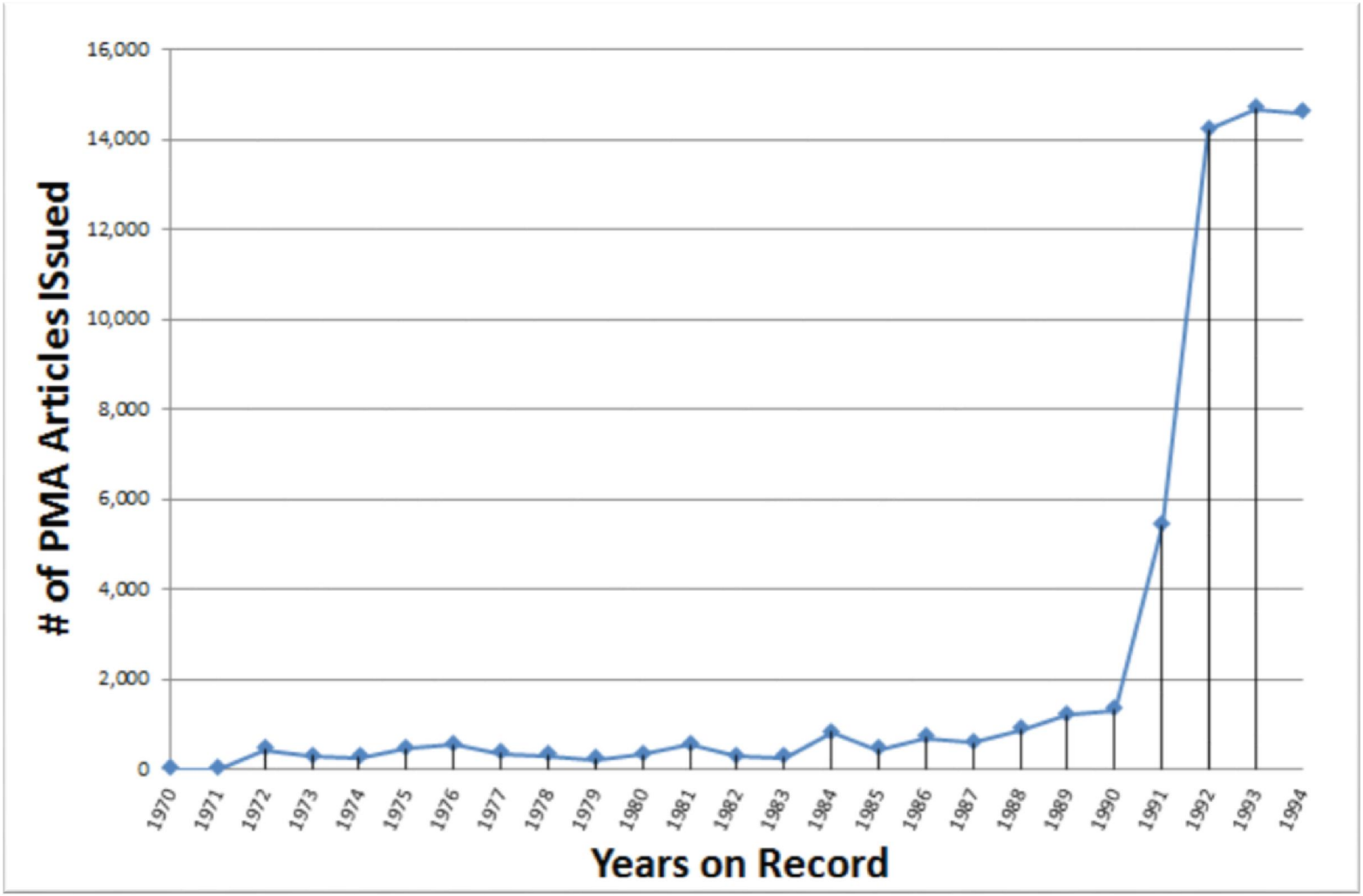
How did we get here?

- **Key events in PMA history**
  - July 1955: “PMA” began in with Civil Air Regulation (CAR) 1.55
  - 1965: 14 CFR part 21.303
    - Set the original basis for replacement and modification articles (called parts way back then)
    - 21.303 circa 1965 to 1972 was VERY descriptive
      - Contained many of the key steps in what would become known as the “PMA process"
  - 1972: 14 CFR part 21.303 is revised along with a large portion of part 21 in general
    - AC 21-303.1A becomes the first real “guidance” document issued for the FAA PMA process

How did we get here? Cont'd

- **Key events in PMA history**
  - 1984: The COMSIS Report, Phase 1
    - Introduce new legislation to promote innovation
    - Deregulation of the replacement part industry
    - Delegation of parts of the PMA approval process
  - 1988: The COMSIS Report, Phase 2
    - Deregulation introduced safety concerns
    - Standardization provided the best bang for the buck
  - 1995: 8110.42 is born
    - The result of years of planning and review
    - Established the four (4) methods of PMA

PMA Metrics


# of PMA Articles ISsued
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1970
1971
1972
1973
1974
1975
1976
1977
1978
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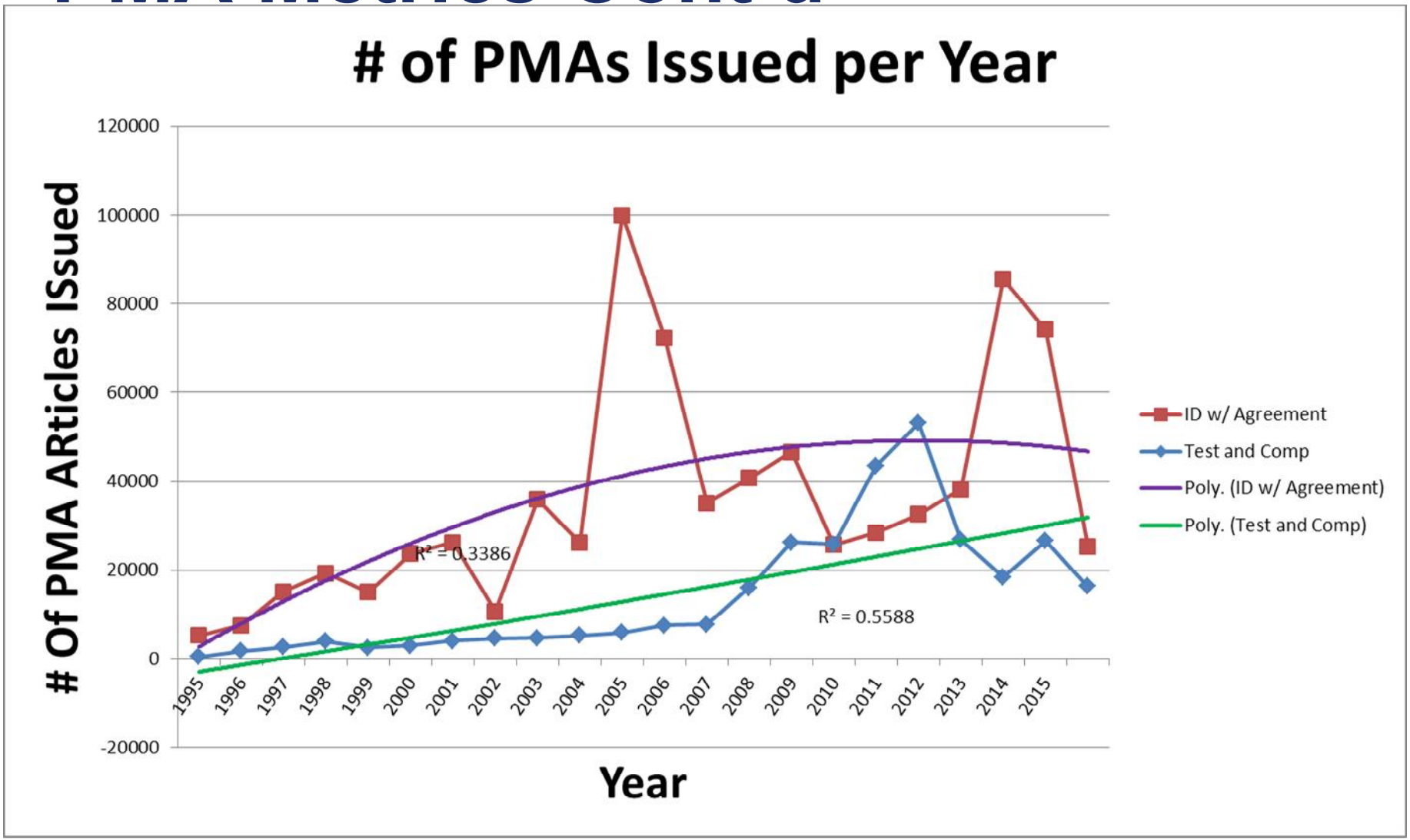
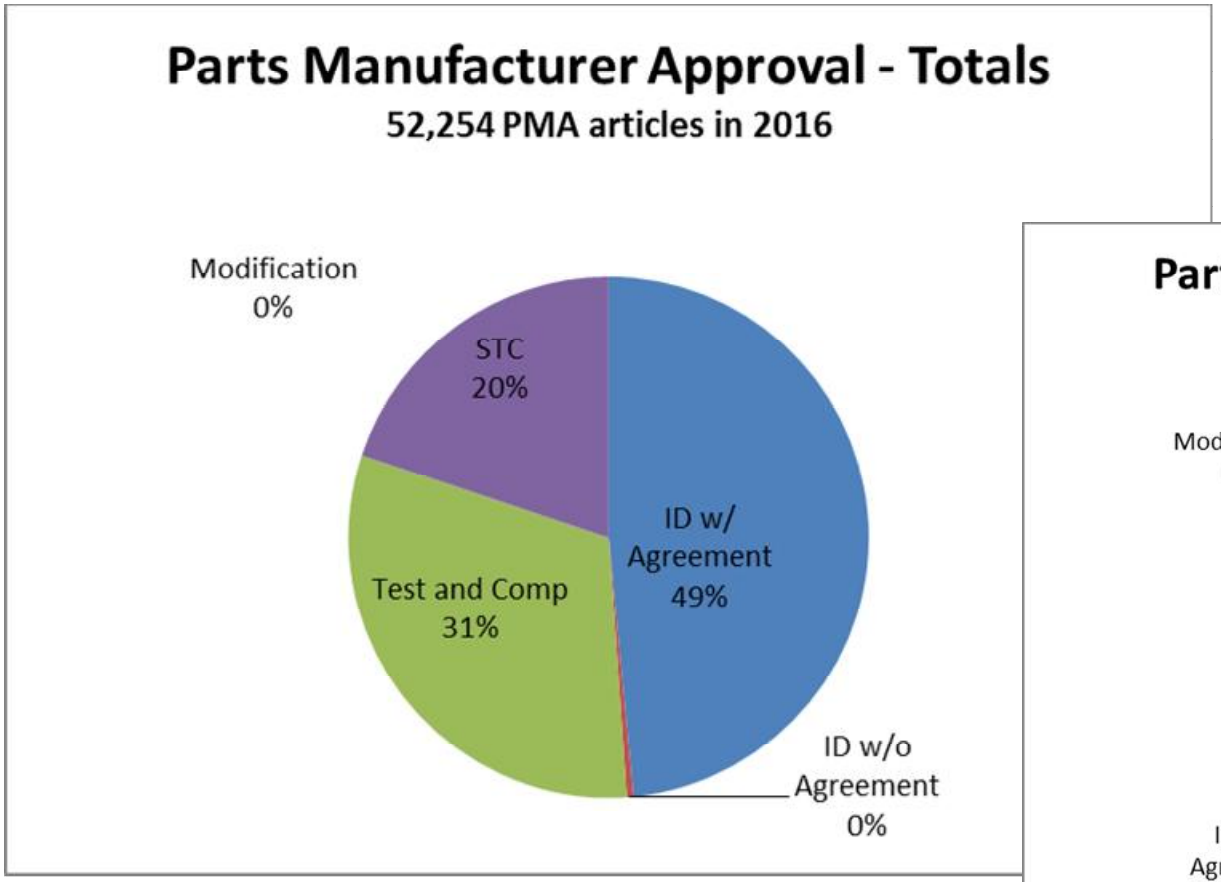
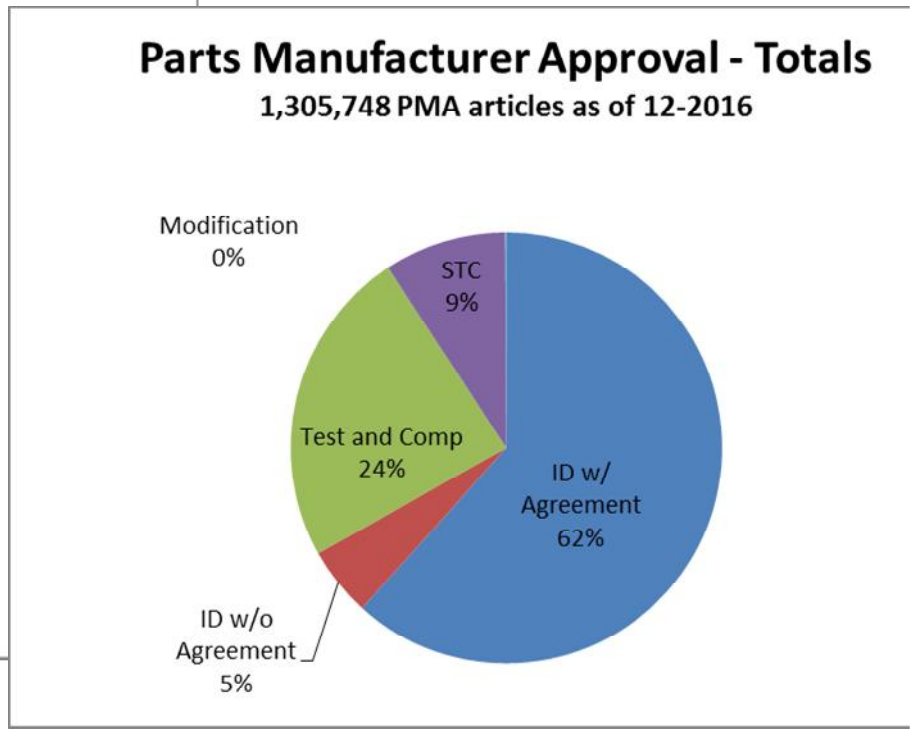
1994
Years on Record

PMA Metrics Cont'd

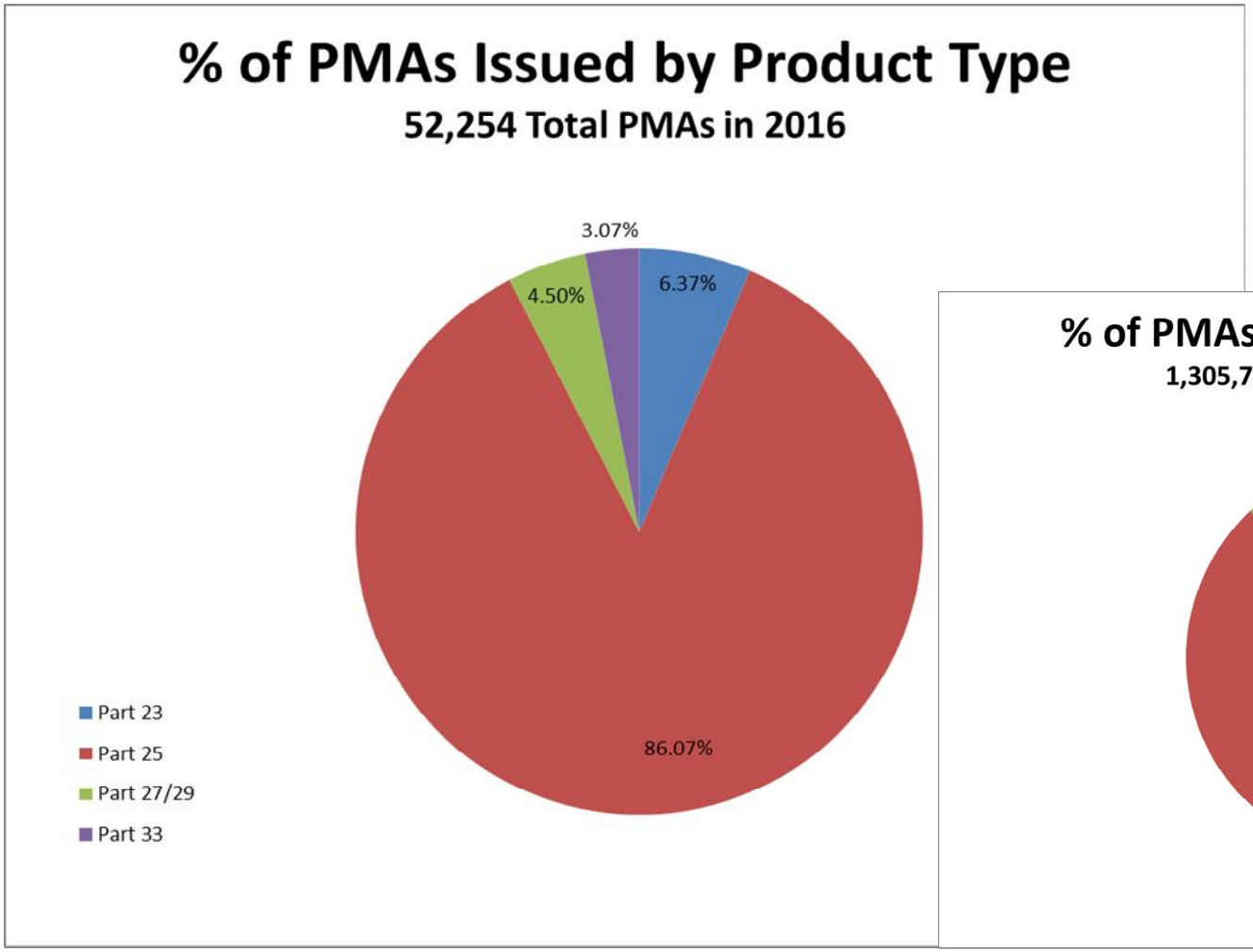


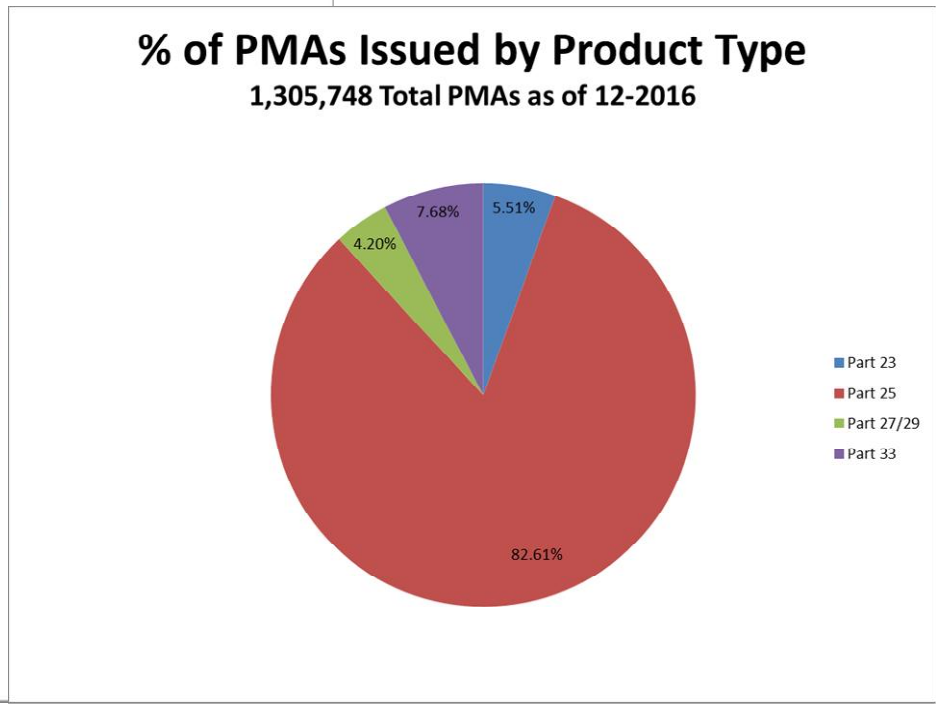
PMA Metrics Cont'd



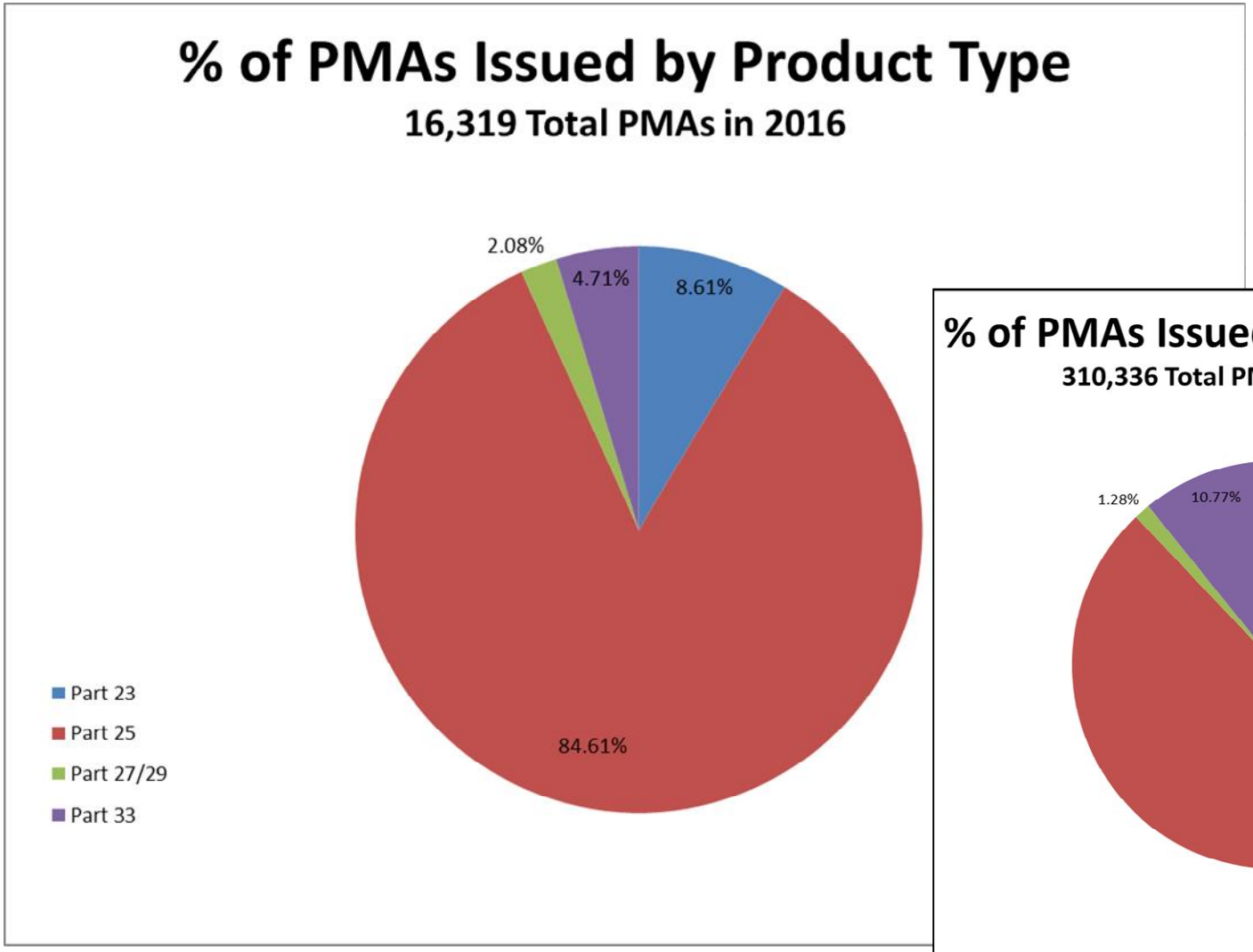


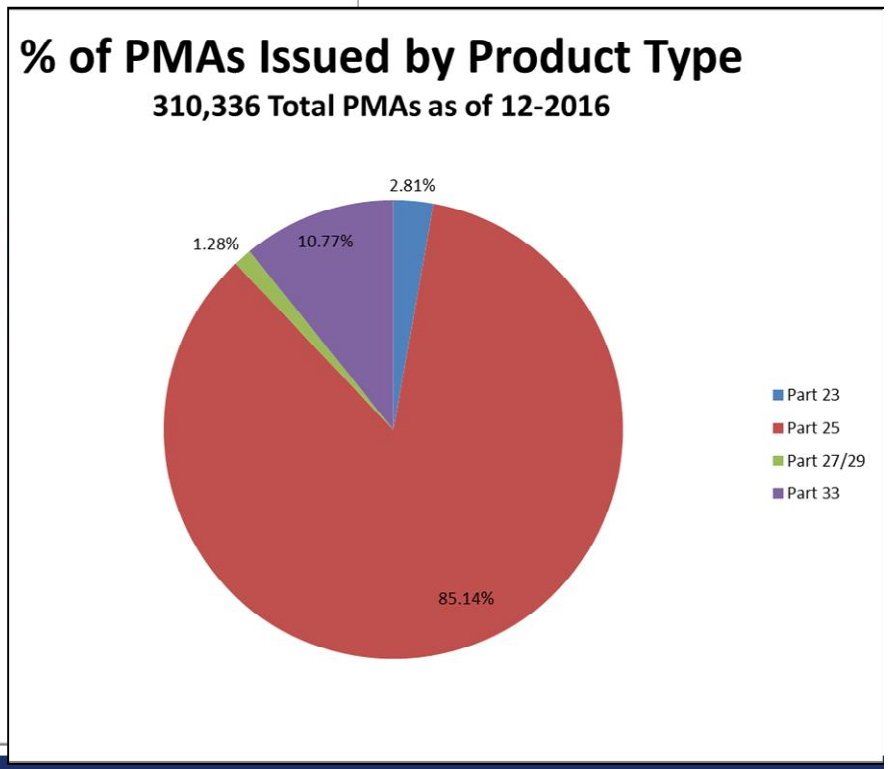
PMA Metrics Cont'd



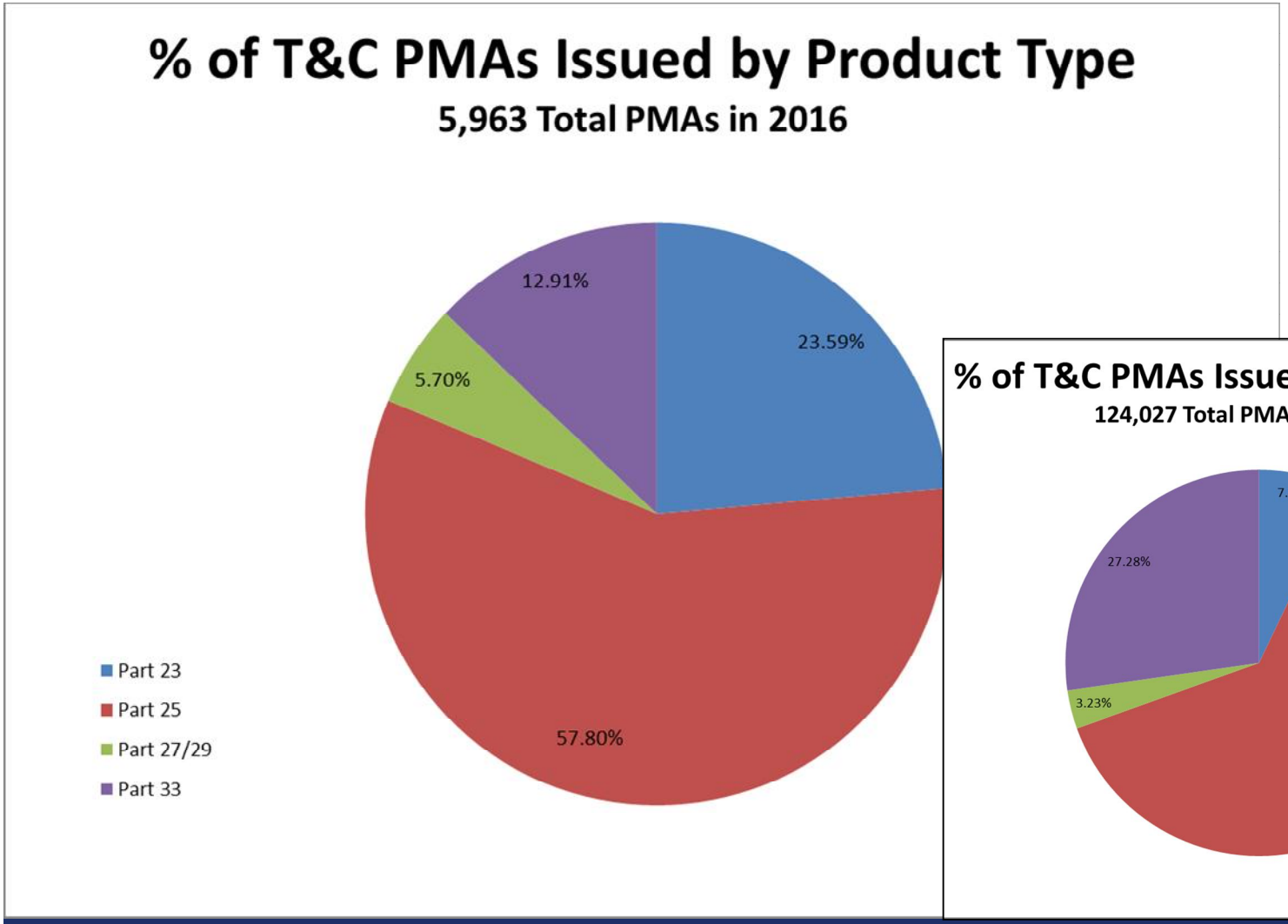


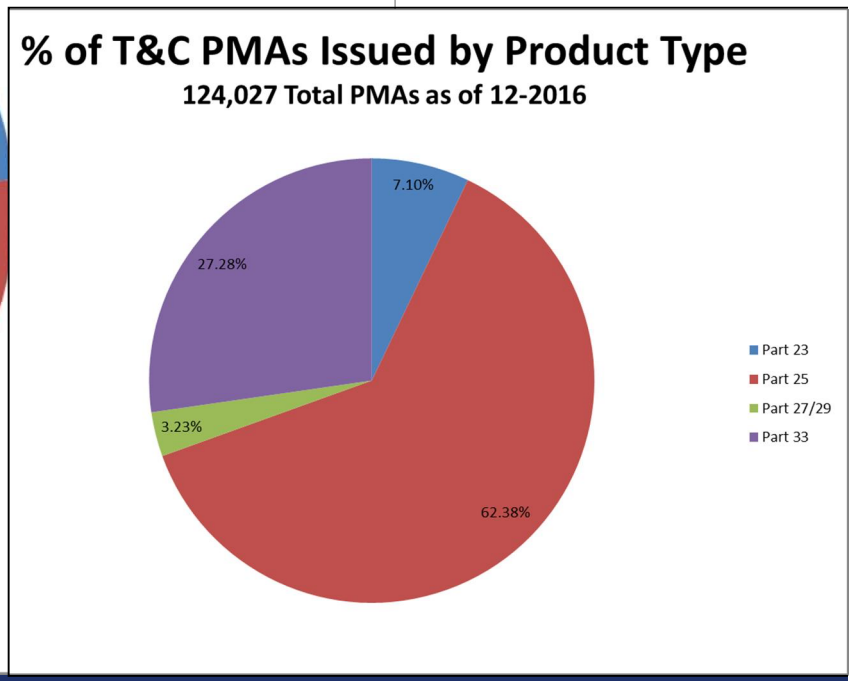
PMA Metrics Cont'd, T&C



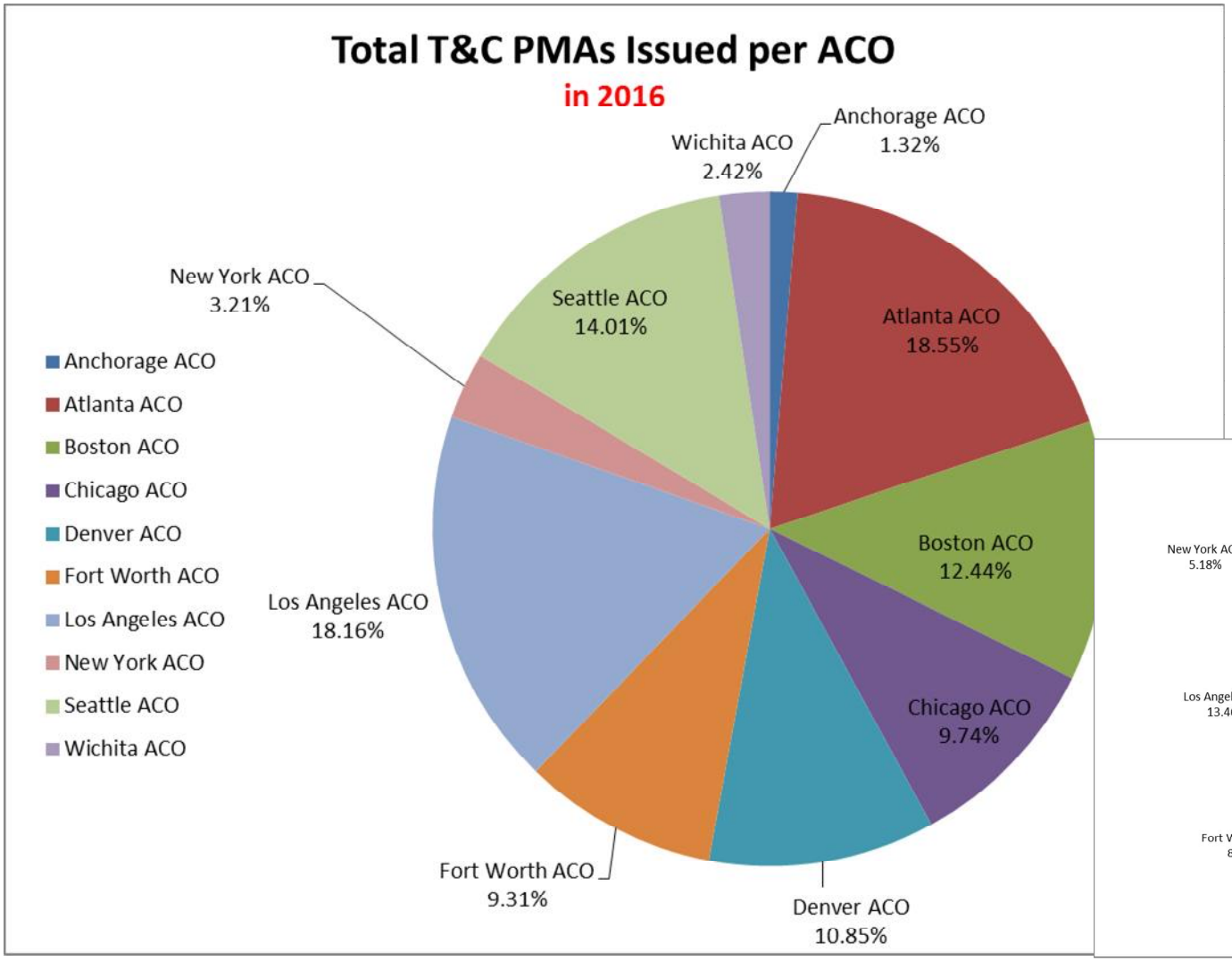


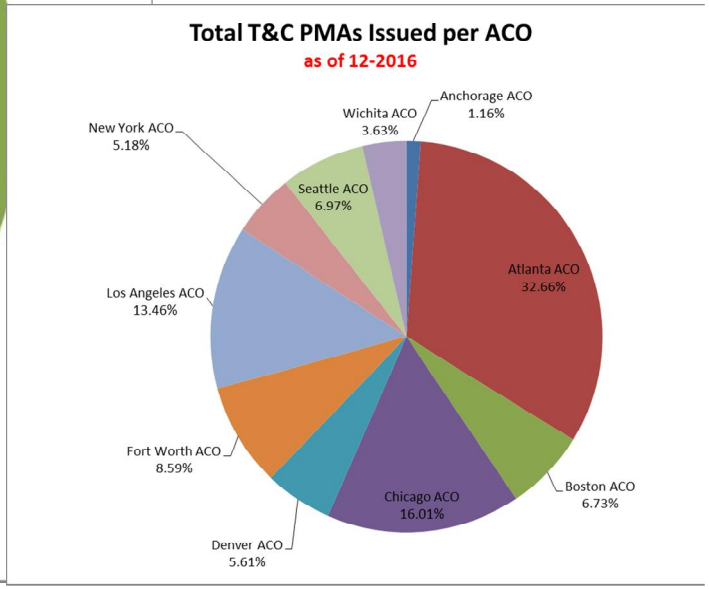
PMA Metrics Cont'd, T&C adjusted





PMA Metrics Cont'd





PMA Policy/Guidance

- **14 CFR 21, Subpart K**
  - Last updated 16 April, 2011
- **FAA Order 8110.42D**
  - Released 21 March, 2014
- **FAA Advisory Circular 21.303-4**
  - Released 21 March, 2014
- **FAA Order 8110.119**
  - Released 30 November, 2012
- **Production specific guidance**
  - FAA Order 8120.22 & FAA AC 21-43

PMA Policy/Guidance, Cont'd

- **Order 8110.42D**
  - Speaks to FAA Aircraft Certification Offices (ACOs) working projects
  - Only applies to PMA via Identicality without a licensing agreement or via Test & Comp
  - Tells them what is required for all PMA applications
  - Details the steps to finding compliance with the regulation in Subpart K.
  - Clarifies the "grey areas" and puts requirements in "plain language"
  - Provides examples for notification letters and draft supplements

PMA Policy/Guidance, Cont'd

- **AC 21.303-4**
  - Speaks to PMA applicants submitting projects to their regional ACOs
  - Only applies to PMA via Identicality without a licensing agreement or via Test & Comp
  - Mirrors Order 8110.42 but from the applicants point of view
  - Provides more detail in certain specifics needed to make an acceptable application for "showing" compliance
    - One way but not the only way
    - Sets the FAA's "expectations"

PMA Policy/Guidance, Cont'd

- **Order 8120.22 – Production Approval Procedures**
  - Relevant PMA information is in Chapter 4
    - Formerly Chapter 4 of Order 8110.42 back in Rev B
  - PMA via Identicality WITH a licensing agreement
    - Design approval flows down from the existing FAA type certificate data
  - PMA via STC
    - Design approval flows from the existing FAA STC data
  - Sets requirements for the PMA holder facilities and Quality System
    - Same requirements as any other FAA production approval holder

PMA Policy/Guidance, Cont'd

- **Order 8110.119**
  - Known as the Streamline PMA Process
  - Developed to utilize the applicant ONLY showings ideology within AIR
    - Recognizes MARPA Document 1100
    - Does NOT allow FAA designees into the process
    - Does NOT shortcut any current PMA requirements
    - No net-differences between PMAs approved via the streamline process or traditionally via 8110.42
  - Limited scope
    - Only applicable to qualified applicants
    - Only open to Non-Safety Significant (NSS) articles

PMA MOU

- **Agreement between a Company and ACO**
- **Focus PMA activities on "everyday" projects**
  - Varies drastically based on experience
- **Considered "ODA lite"**
- **MOUs must be a benefit <u>both</u> parties**
- **Meet applicant and industry needs**
  - Increases certification efficiency
- **Manage FAA PMA workload**

Applicant Showing Only for Shortened Path to a T&C PMA

FAA policy does provide a smoother path forward, IF:

- You can show that you understand the part and it's effect on the higher level assembly
- The part isn't critical to flight safety

FAA Policy AIR100-15-150-PM16

Guidance for Recognition and Use of Applicant Showings on Standard Certification Projects

Applicant Showing Only (ASO)

- **Company is still required to show compliance with all applicable regulations**
- **FAA uses discretionary authority to determine what they review**

  - May do an administrative review and follow up with an audit at a later date

- **ACO needs to be confident you can find compliance without their direct involvement**
- **Limits FAA 'touch points'**
- **FAA Policy AIR100-15-150-PM16**

Minor Mods and PMA

- **Policy Statement PS-AIR-21-1601**
  - Signed on Oct. 6th, 2016
  - Rev. D of the Order clarified the definition of a Modification Article as new to the product via a major or minor change
    - Historic precedence has allowed PMAs for mod articles outside the use of a STC (this is NOT new)
  - Onus of utilizing this guidance is on the applicant
    - NOT to be used to subvert a STC project
    - Will not be reliant on any comparative analysis but rather a general analysis only
    - Will NOT be applicable for most modification articles
    - Supplemental ICAs will almost always be required

New Initiatives, Con't

- **Streamline PMA Eligibility Expansion**
  - ~~DERs and DMIRs approve supplements~~
- **MOU template for eligibility expansion agreements**
  - Limited to same TCDS and certification basis
  - Moving beyond NSS articles and getting into "bread and butter" articles

International Acceptance and Expansion

- **What do the International Agreements say?**
  - Nearly ALL foreign CAAs accept FAA-PMA without further showings or validation
  - Many international manufacturers support and supply US TC holders with Licensing Agreement PMAs
- **Several bilateral partners are now working towards implementing their own versions of PMA regulations and guidance materials**
- **New trade missions taking place with FAA support**

International Acceptance

CURRENT BASAs

Argentina	Malaysia	Austria	Luxembourg
Australia	Mexico	Belgium	Malta
Brazil	New Zealand	Czech Republic	Netherlands
Canada	Norway*	Denmark	Poland
China	Russia	Finland	Portugal
India*	Singapore	France	Romania
Indonesia	South Africa*	Germany	Slovakia
Israel	Switzerland*	Ireland	Spain
Japan	Taiwan	Italy	Sweden
S. Korea		Lithuania	United Kingdom

EU

* Executive agreement only at this time

www.faa.gov/aircraft/air_cert/international/

Future Initiatives

- **8110.42D Change 1 – FY 2018**
  - Adjust for Air Transformation
  - Incorporate Policy Memos and Policy Statements
  - Add in section of PMA of TSOA articles
  - Add International Considerations
  - Clarify the section on selling Subcomponents of PMAs
  - Clarify Test and Comp MOC when MOC is in regulation
  - Clarify PMAs of materials or sealants/consumables in repairs processes
  - Method for surrendering a PMA
  - Clarify Eligibility Expectations

Future Initiatives

- **8110.42D Change 1 – FY 2018**
  - Clarify PMA of AD'd life limited part
  - Clarify T&C PMA based on a PMA part
  - Additional considerations for Identically w/o Licensing or T&C for life limited/critical parts
  - Use of "–XXX" suffix on PMA part number
  - "Kitting" PMA parts
- **Special Projects PS – FY 2017**
  - Clarify appropriate uses of Special Projects
  - A Cert project that is not a TC, STC, amended TC, amended STC, or PMA project under 14 CFR 21.8d
  - Should have viable future use on Article or Product

Conclusions

- **There has been a minimal amount of SDRs, SAIBs, or ADs written specifically for PMAs**
  - Industry reviews and corroborating FAA records show:
    - 23 ADs exist that apply *"exclusively"* to PMA articles
- **What is the FAA outlook on PMA?**
  - Expected to be steady and evolve over the coming years
    - PMA Policy and Guidance is in a constant state of review and advancement
    - PMA approvals are trending less towards engines and more towards other areas in recent years

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