CIVIL AVIATION AUTHORITY OF NEW ZEALAND

Product Certification Team Update

2017 Design Delegation Holders' Seminar

Jason Ashworth

Team Leader Product Certification

May 2017

Agenda

- Recent Regulatory Changes
- Common Audit Issues / Trends
- Instructions for Continued Airworthiness
- Aircraft Flight Manuals / Supplements
- CAA337 vs STC
- STCs – Planning & Embodiment

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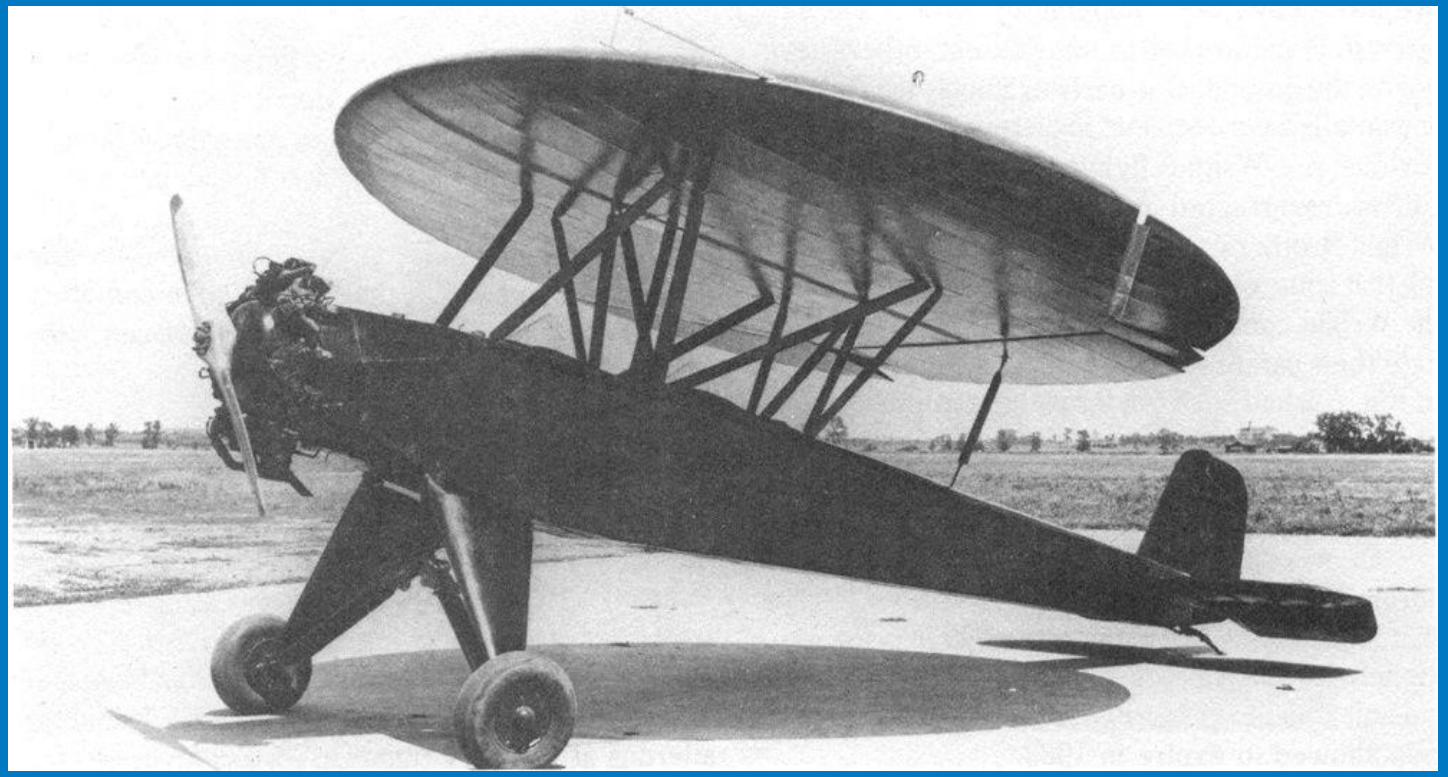
Recent Regulatory Changes



Recent Regulatory Changes

- Clarification and clean up of terms and definitions – e.g. “Design Change” vs “Modification” – Pete Sutherland
- Part 21 – Changed Product Rule – Pete Sutherland
- Part 21 – Appendix D Acceptable Technical Data
  - State of Design STC included but still linked to TAC
  - TAC of engines/props under STC
- Part 146/148 and AC refresh on the cards
- New FAR 23 effective in August – David Gill

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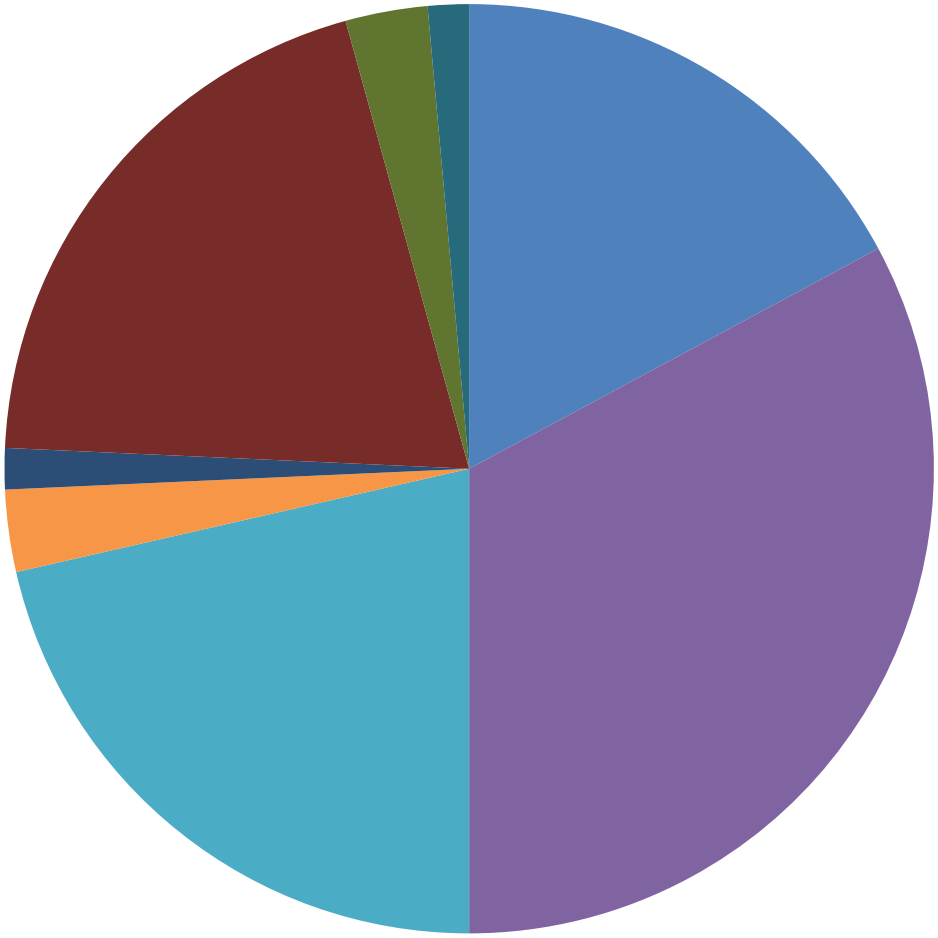
Common Audit Issues / Trends

Common Audit Issues / Trends

Part 146 Findings by Rule Part

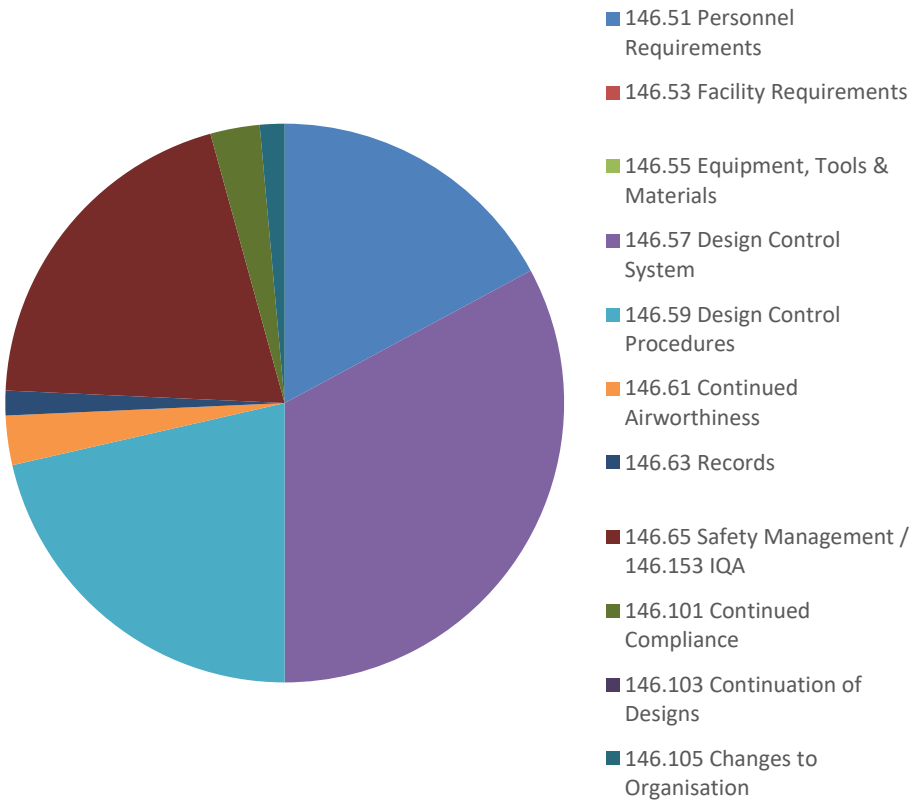
01 Jan 2015 to 23 Apr 2017



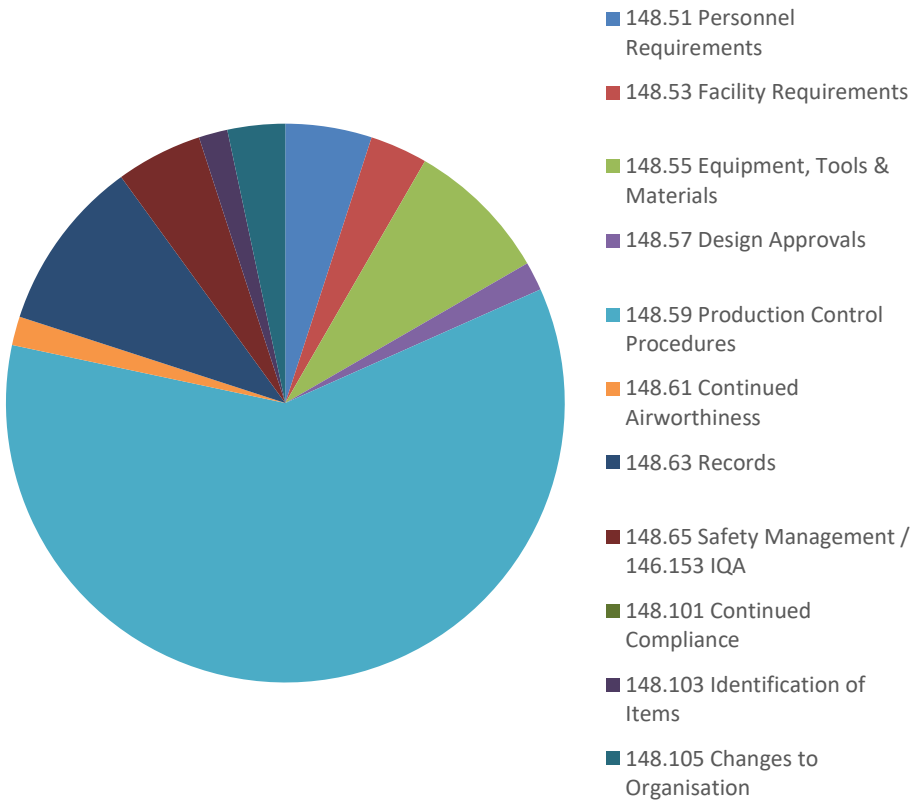
- 146.51 Personnel Requirements
- 146.53 Facility Requirements
- 146.55 Equipment, Tools & Materials
- 146.57 Design Control System
- 146.59 Design Control Procedures
- 146.61 Continued Airworthiness
- 146.63 Records
- 146.65 Safety Management / 146.153 IQA
- 146.101 Continued Compliance
- 146.103 Continuation of Designs

Common Audit Issues / Trends

Part 146 Findings by Rule Part

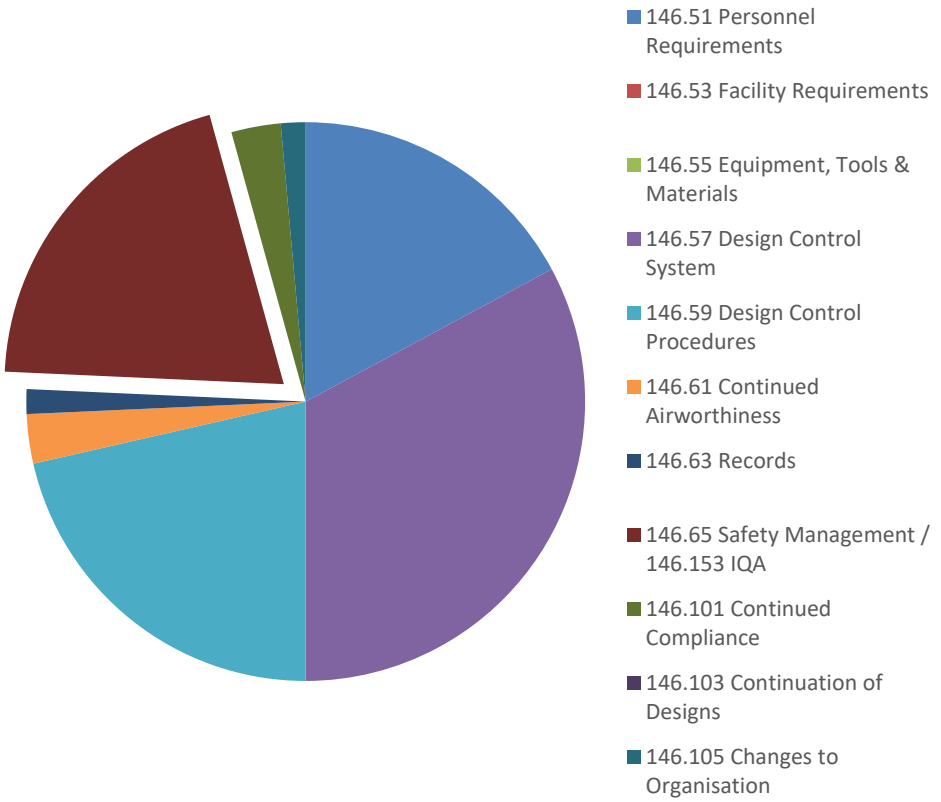


Part 148 Findings by Rule Part



Common Audit Issues / Trends

Part 146 Findings by Rule Part



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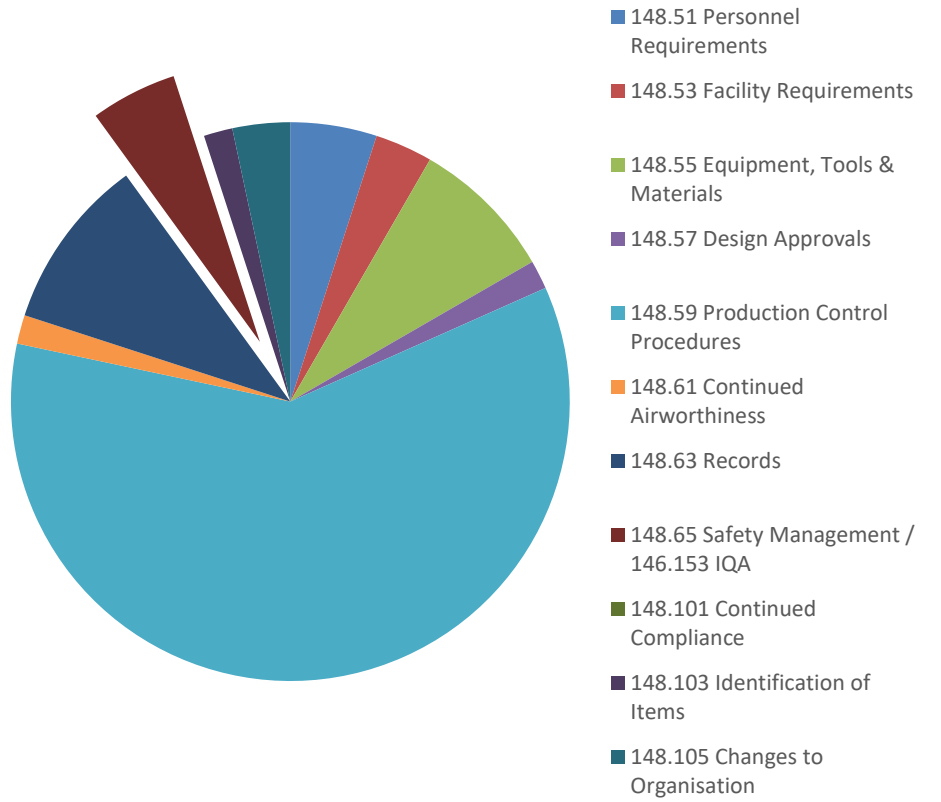
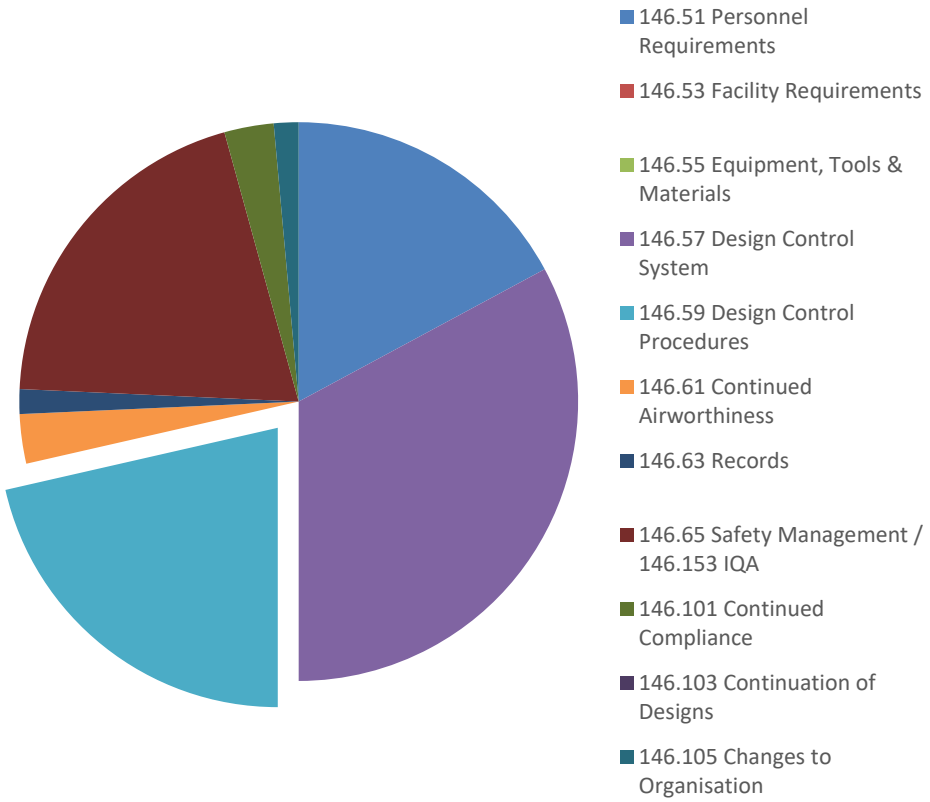


Common Audit Issues / Trends

Part 146 Findings by Rule Part



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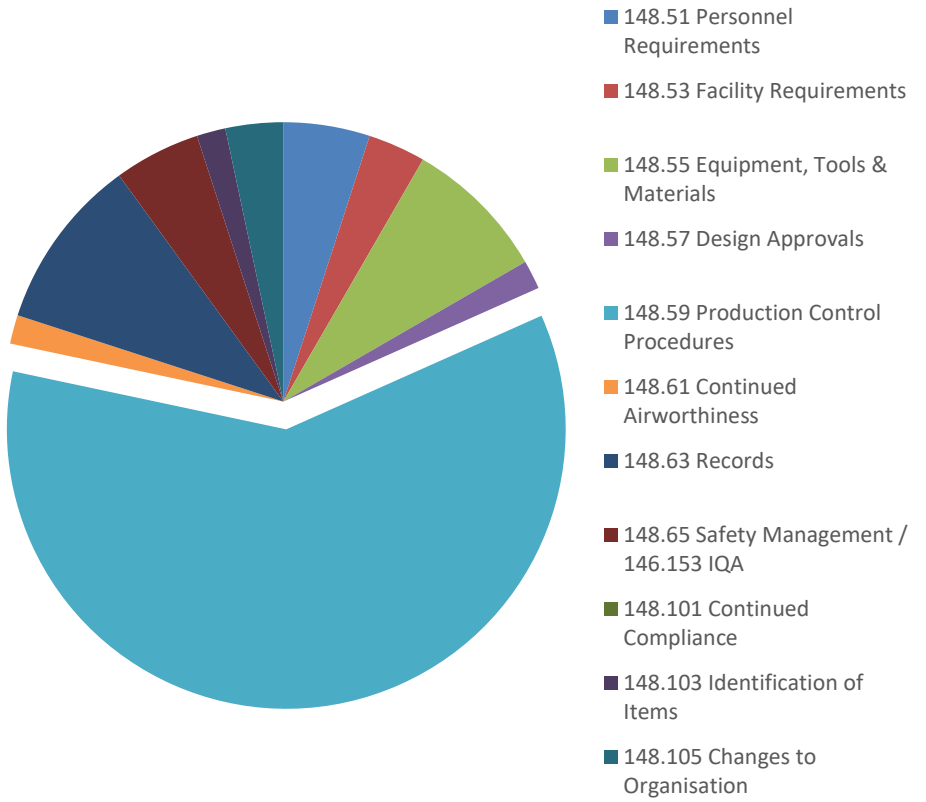

Common Audit Issues / Trends

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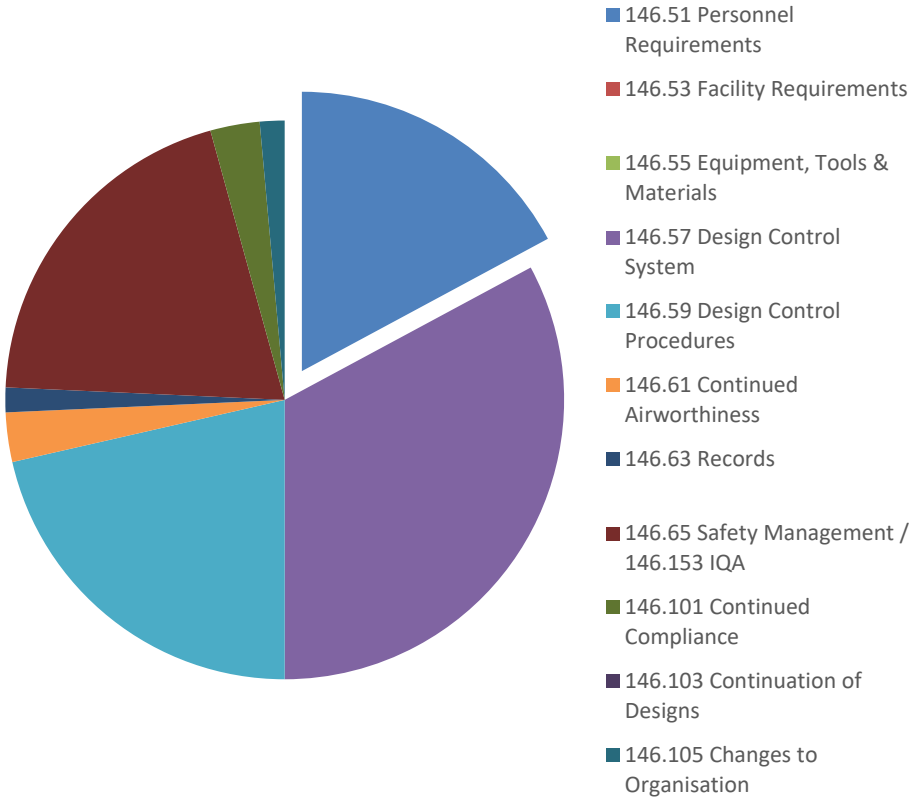
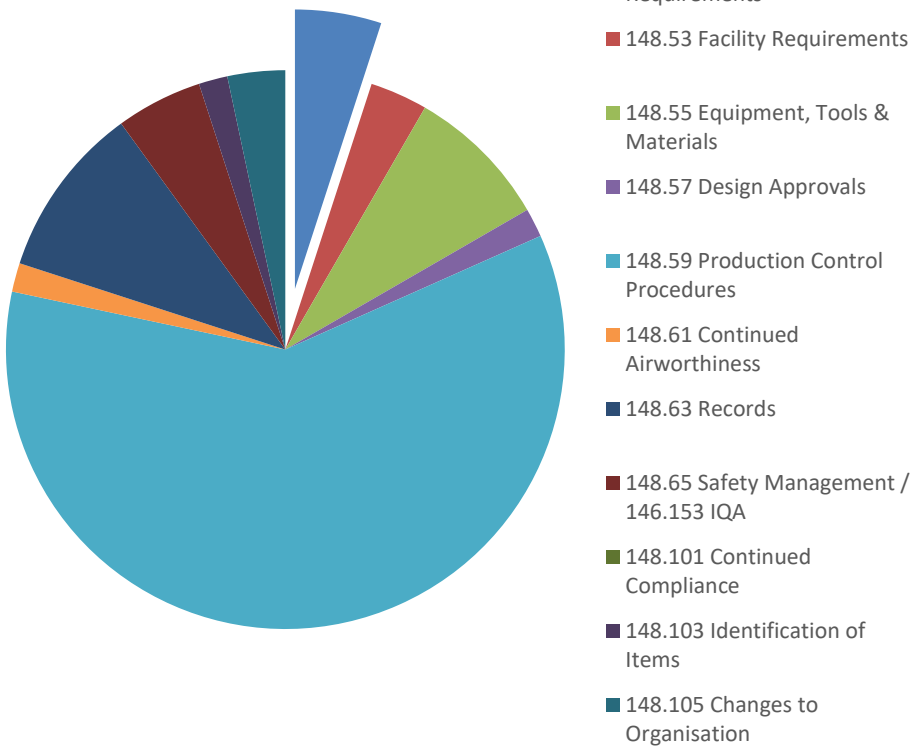


Part 148 Findings by Rule Part



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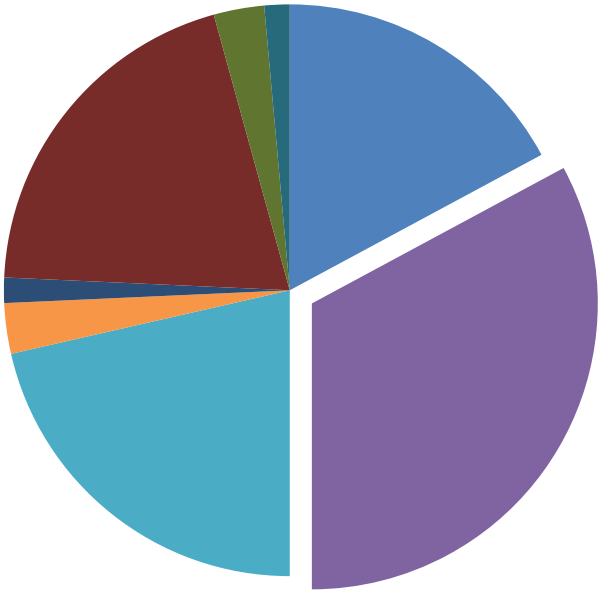
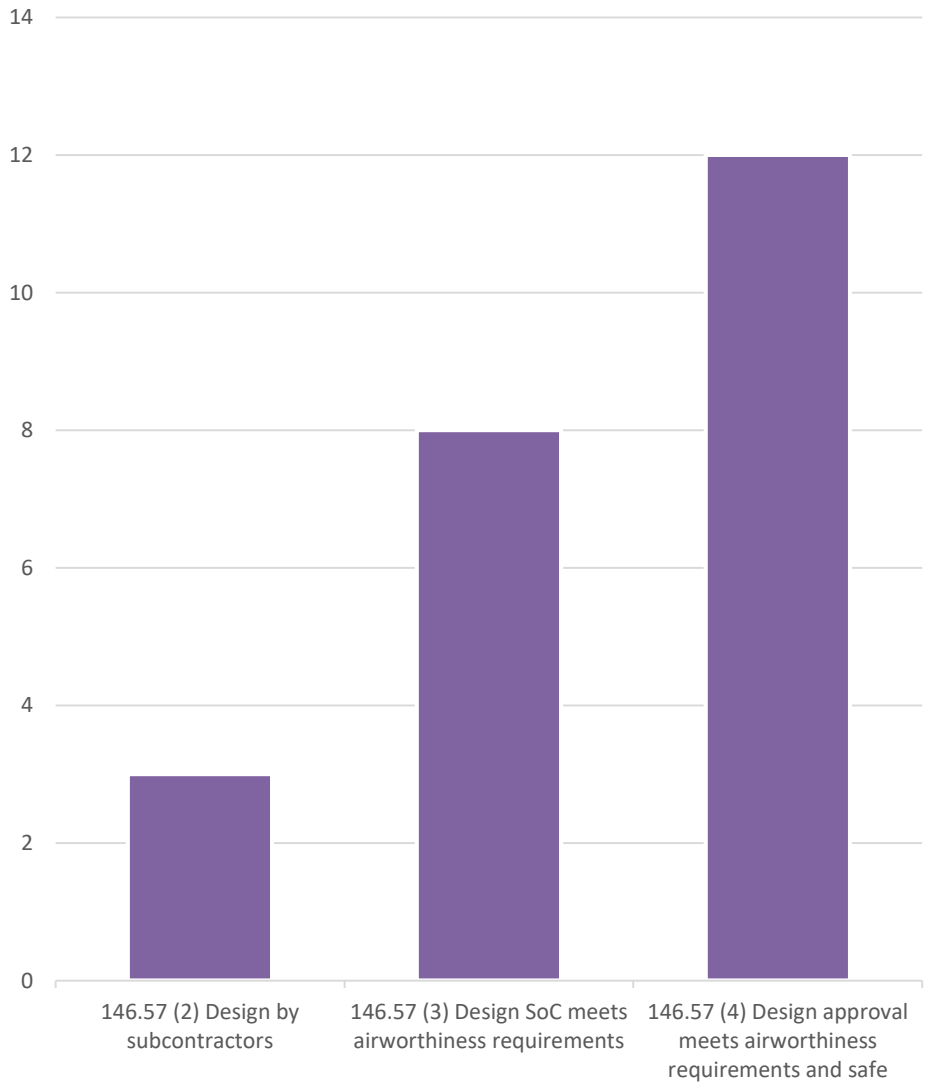
Part 146 Findings by Rule Part



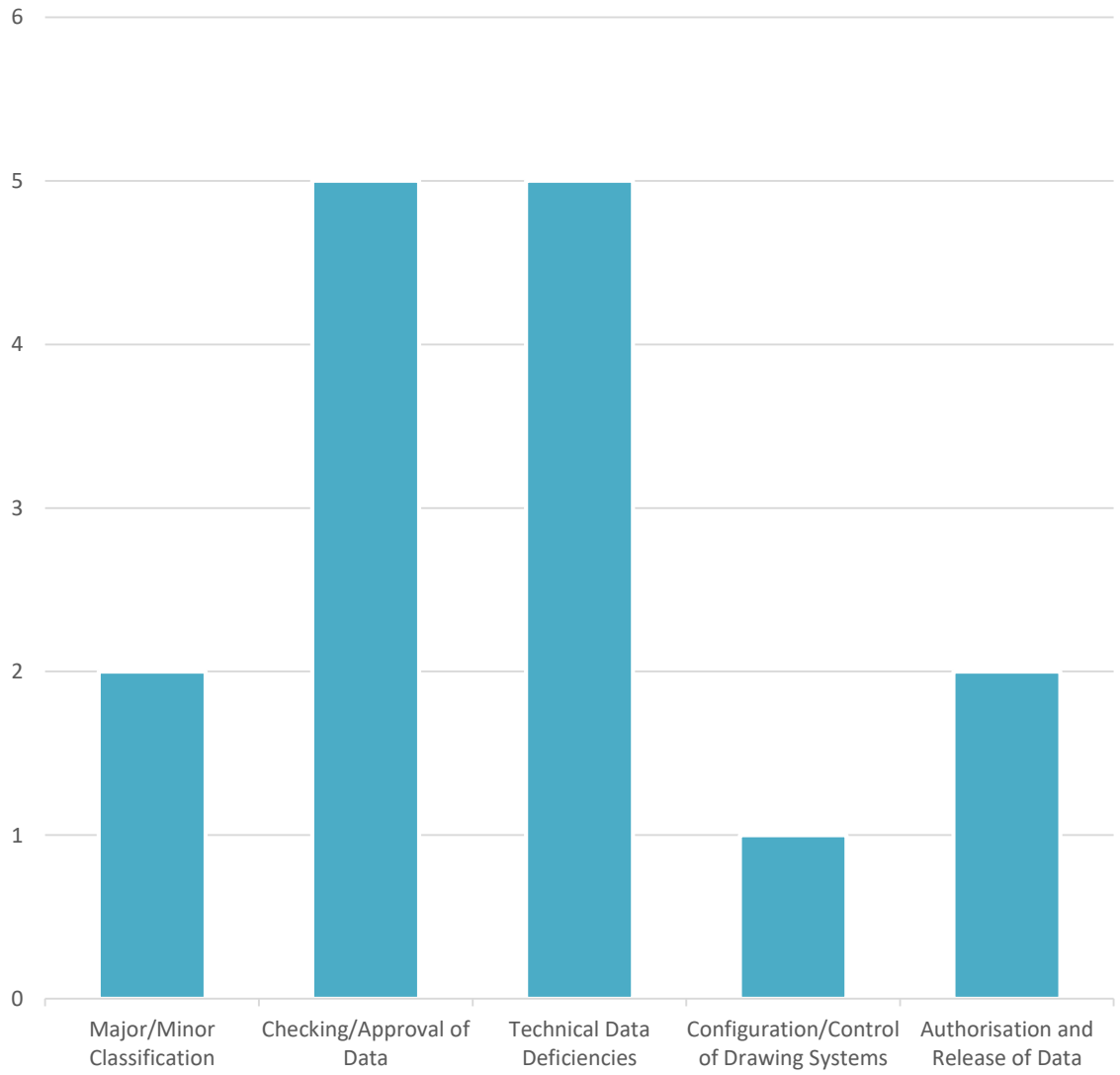
146.57 Design Control System



Common Audit Issues / Trends

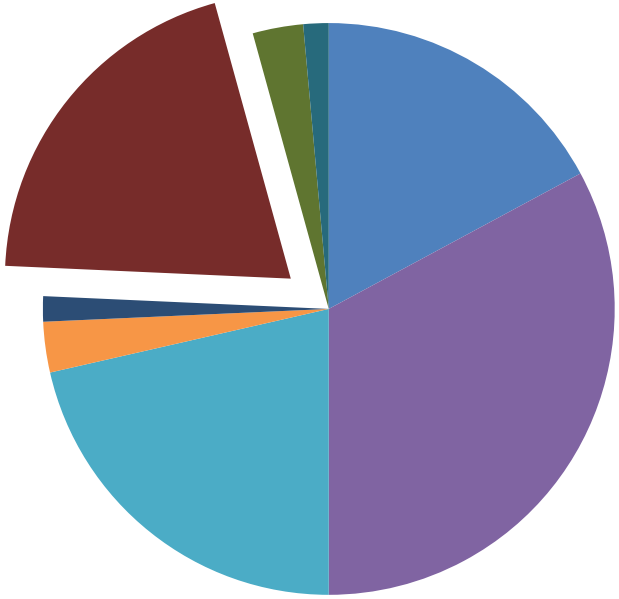
Part 146 Findings by Rule Part

146.59 Design Control Procedures

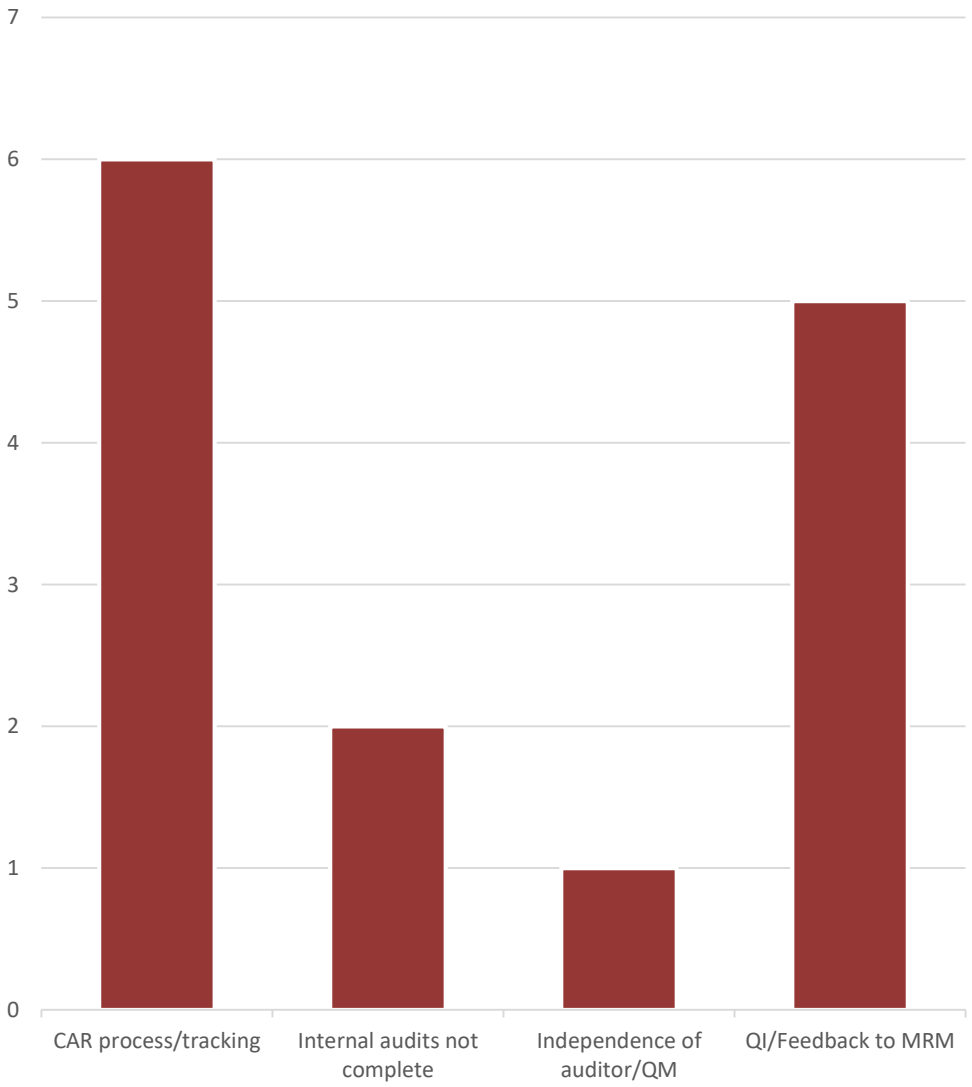


Common Audit Issues / Trends

Part 146 Findings by Rule Part



146.65 Safety Management / 146.153 IQA



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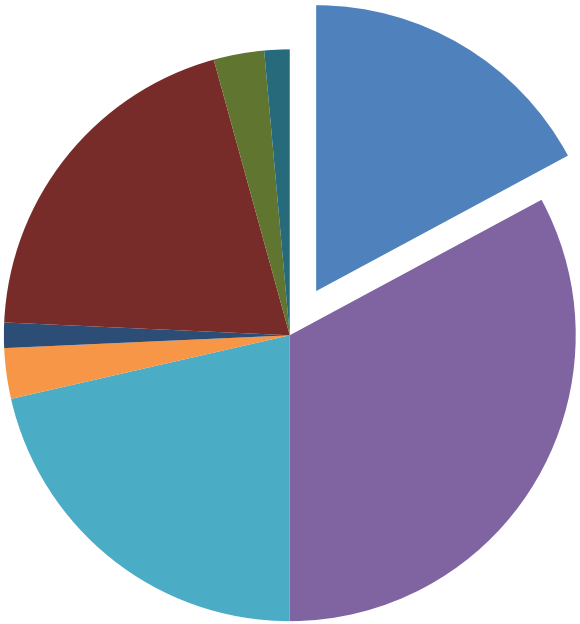
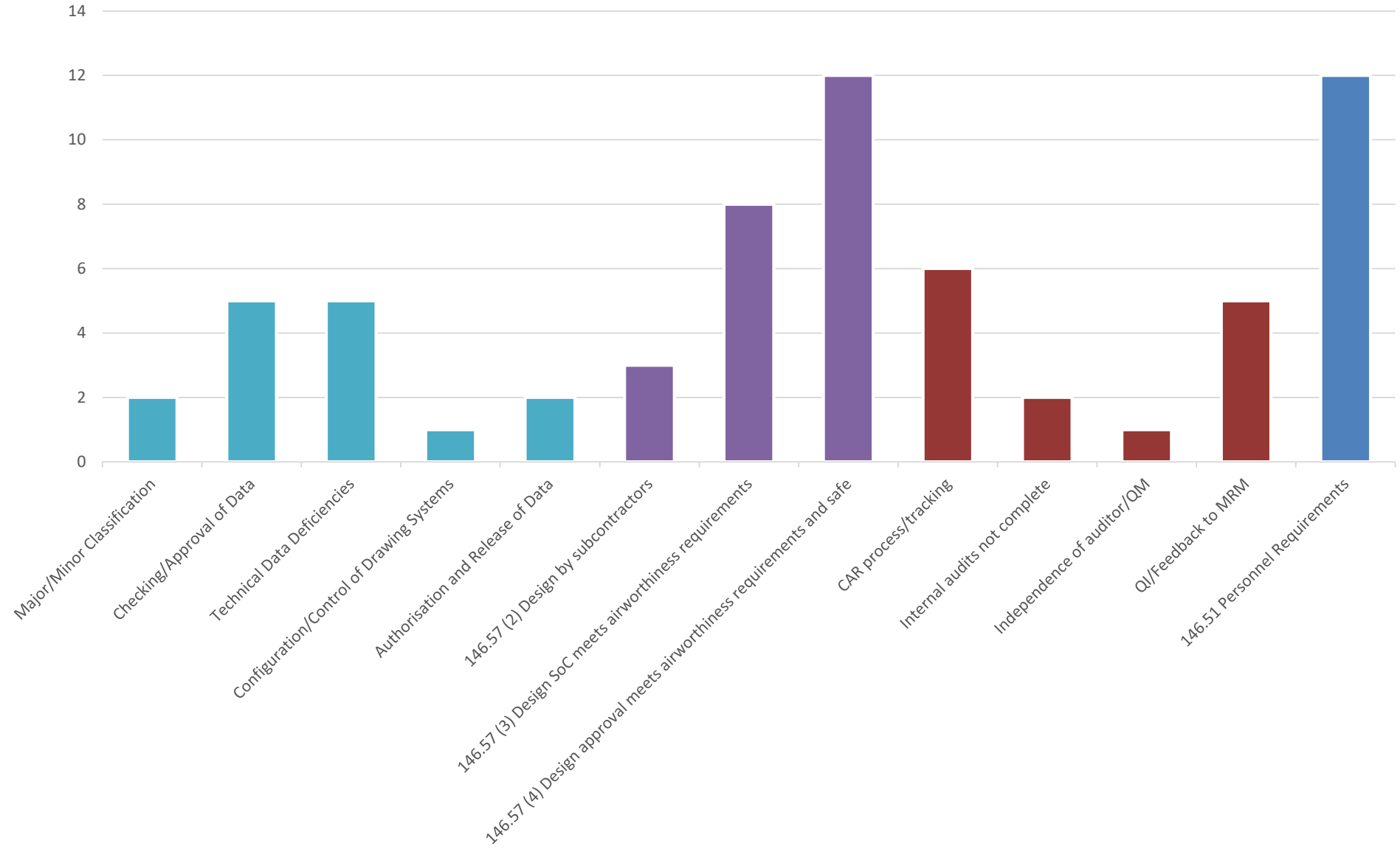


All personnel requirements findings were against authorisation/assessment of personnel, that is 146.51(b)

Common Audit Issues / Trends



Common Audit Issues / Trends

Part 19F

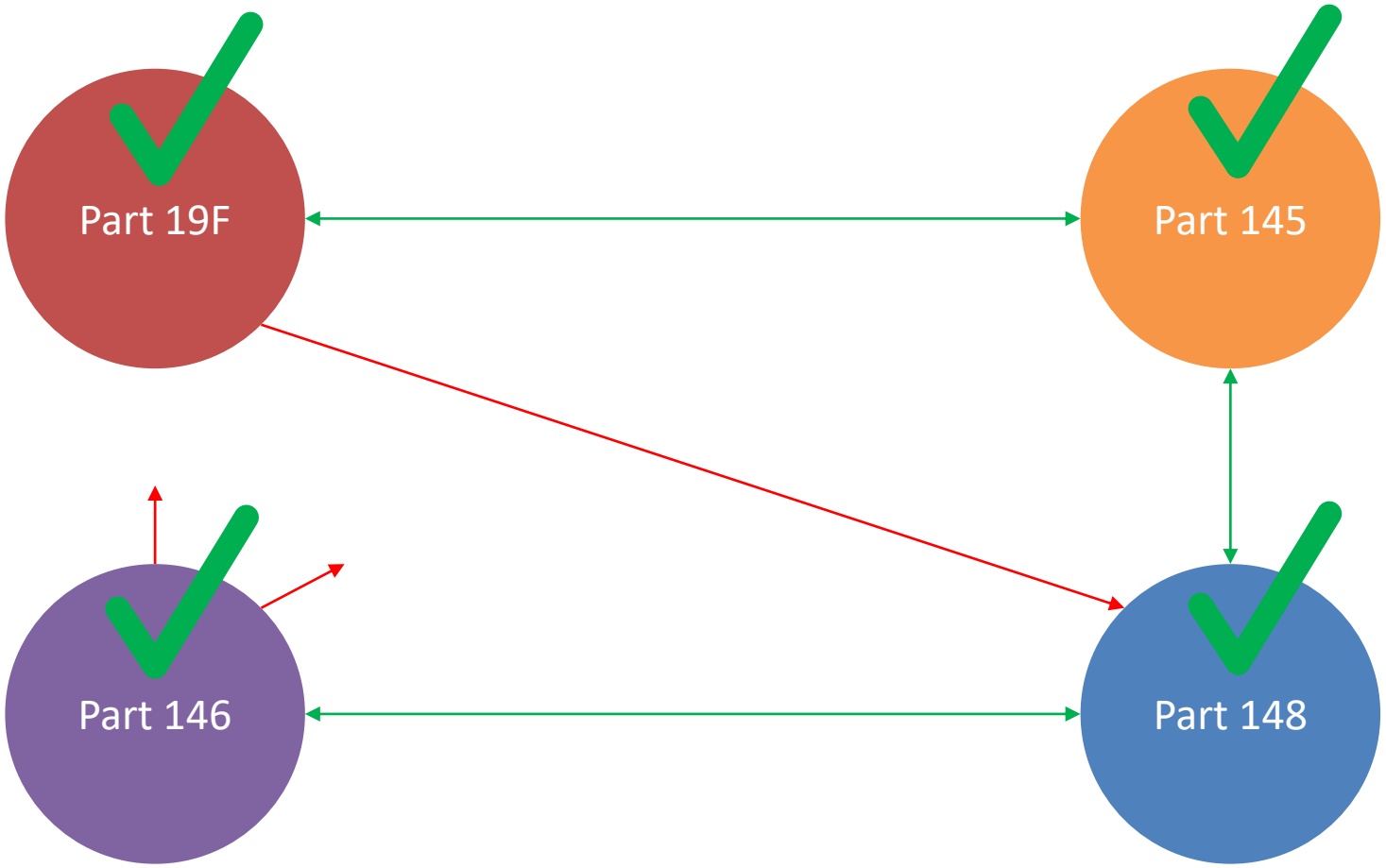
Part 145

Part 146

Part 148

Common Audit Issues / Trends

Common Audit Issues / Trends



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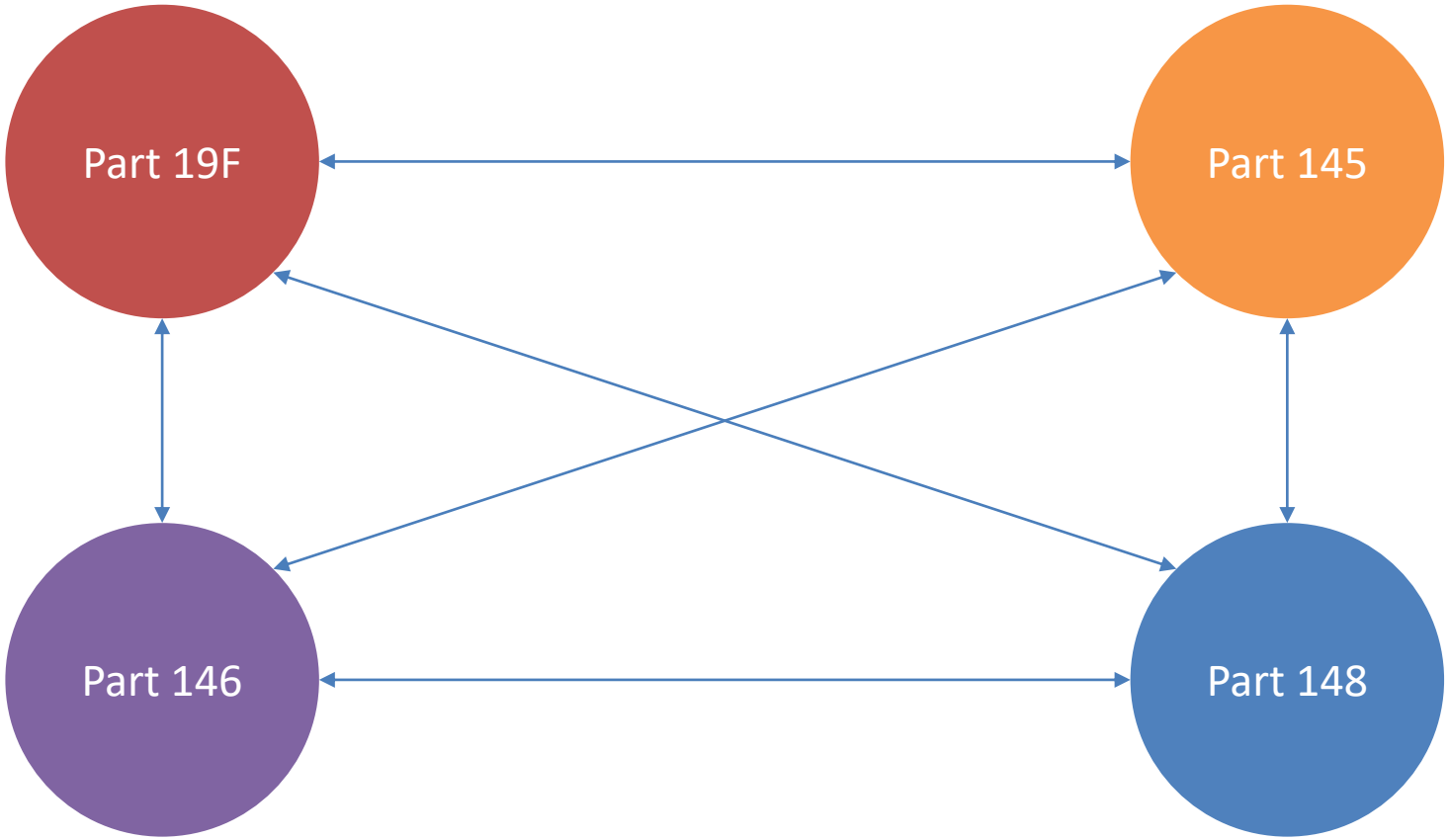

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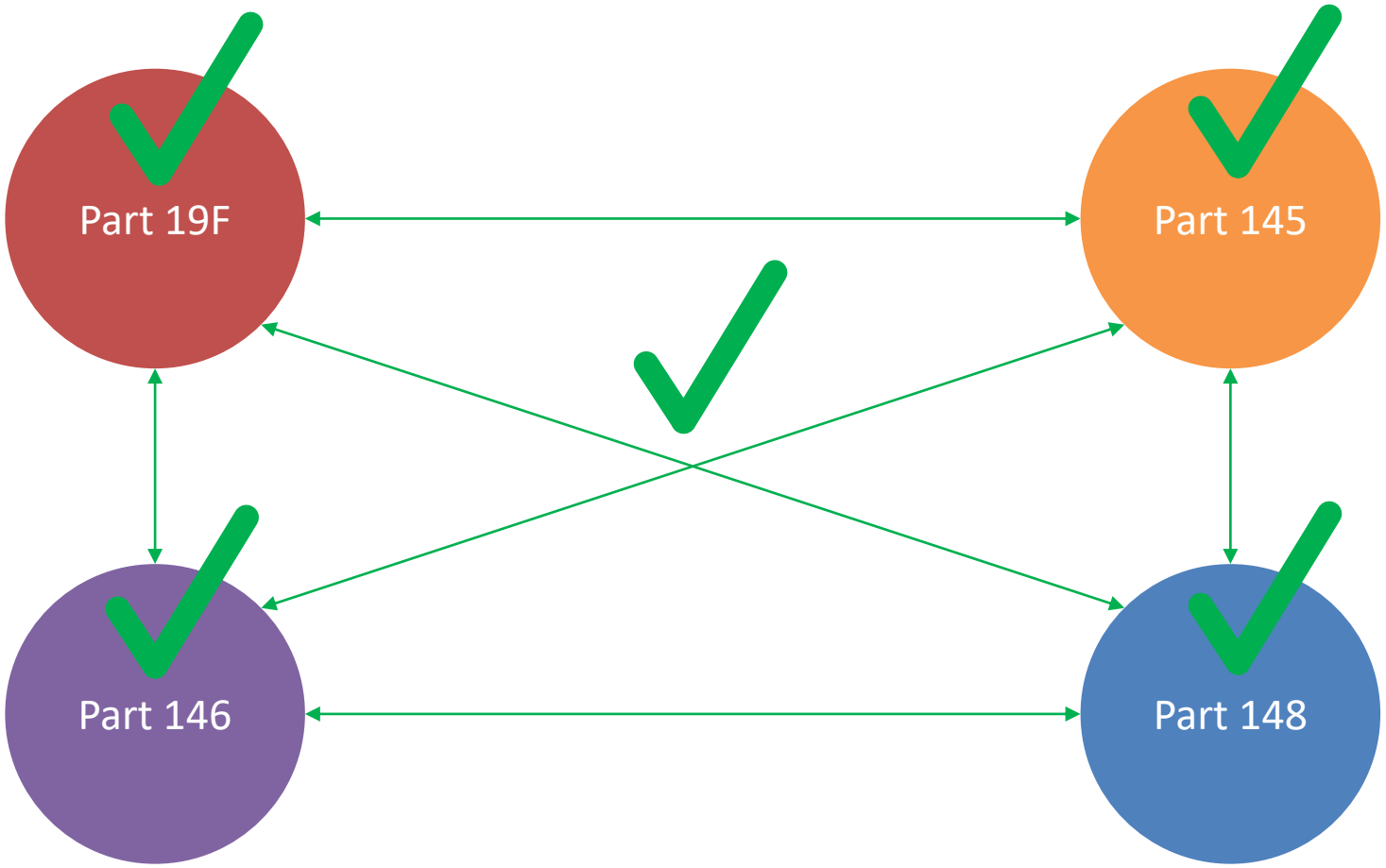

Common Audit Issues / Trends

"Reality is frequently inaccurate."

— Douglas Adams

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Instructions for Continued Airworthiness

ICAs

- Requirement called up from FAR 2X.1529
- Refers to FAR 2X Appendix XYZ – Instructions for Continued Airworthiness
- *"The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document."*
- *"This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required for type certification."*

ICAs

- Airworthiness Limitations section is CAA approved.
- CAA approved includes approval by DDH (e.g. Under CAA337 action)
- By definition – if the design change requires an ICA to cover changes/new Airworthiness Limitations, the design change is **MAJOR**.

ICAs

All new ICAs should be developed in accordance with FAA Order 8110.54A, regardless of FAR 2X.1529 amendment level of product affected.

ICAs should clearly distinguish the approved sections from unapproved sections.

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Aircraft Flight Manuals / Supplements

AFMSs

- Requirement called up from FAR 2X.15YY

- *"Approved information. (1) Except as provided in paragraph … of this section, each part of the Airplane Flight Manual containing information prescribed in §§2X.1583 through 2X.1589 must be approved, segregated, identified and clearly distinguished from each unapproved part of that Airplane Flight Manual."*

- *Only §§2X.1583 through 2X.1589 are approved –*
  - *§§2X.1583 – Operating Limitations*
  - *§§2X.1585 – Operating Procedures*
  - *§§2X.1587 – Performance Information*
  - *§§2X.1589 – Loading Information [Not in FAR 25]*

AFMSs

- These AFM/AFMS sections are CAA approved.
- CAA approved includes approval by DDH (e.g. Under CAA337 action)
- By definition – if the design change requires an AFMS to cover changes/new sections of Limitations, Procedures, Performance or Loading Information, the design change is MAJOR.

AFMSs

All new AFM/AFMSs should be developed in accordance with latest amendment level of 2X.15YY, regardless of FAR 2X.15YY amendment level of product affected.

All AFM/AFMs should clearly distinguish the approved sections from unapproved sections.

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CAA337 vs STC

CAA337 vs STC

CAA337 Dual Purpose –

1. Part 21 Approval of Data (Design Approval)

2. Part 43 Embodiment of Modification (Installation and Inspection)

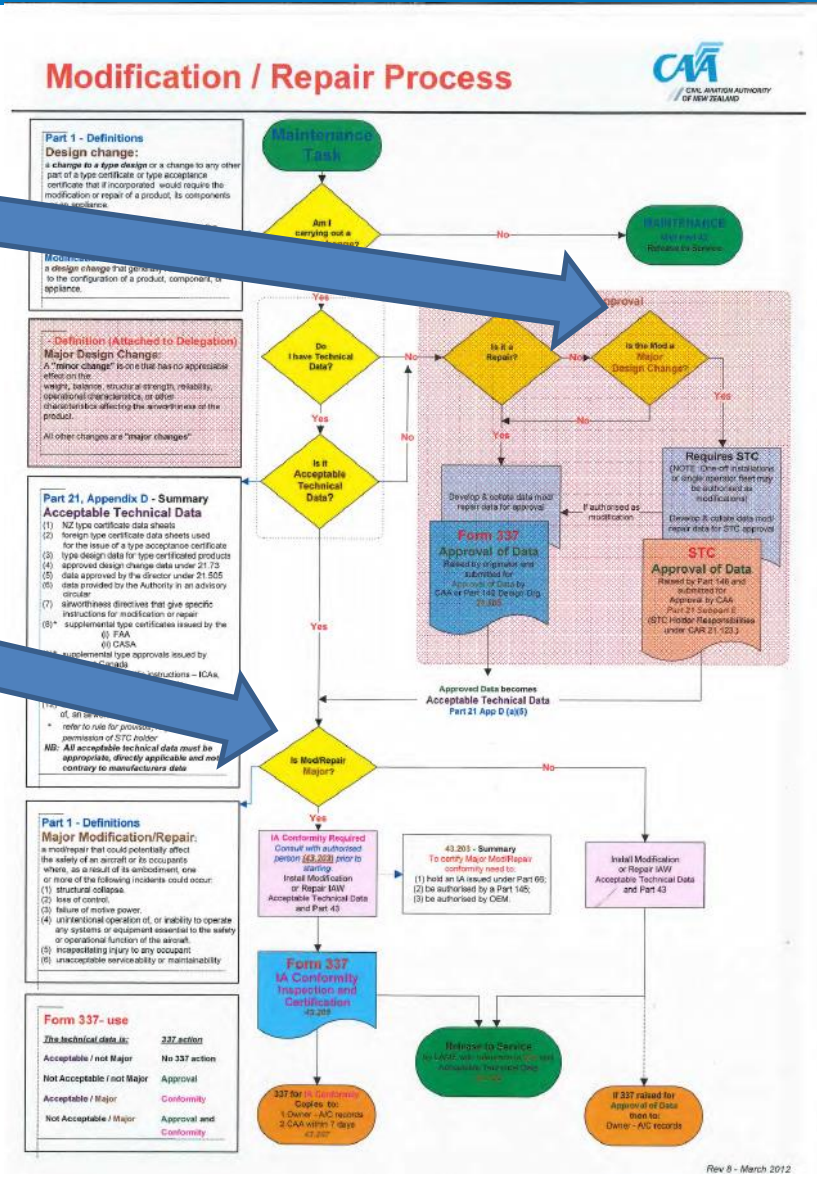
- AC43-9 currently tries to deal with both the Part 21 and Part 43 issues.

- Each Purpose has a Major/Minor Decision Point, but the considerations are different and the outputs from each decision are different

CAA337 vs STC

1. Design Change Classification – DDH/CAA
   - Major Design Change
   - Minor Design Change

2. Modification Classification – IA/DDH/CAA
   - Major Modification
   - Minor Modification



Design Change [Part 21] Decision

- Criteria: **Schedule 1**
  - Consequences of the design change failure on the aircraft?
  - If there is a missed or latent design deficiency, what are the potential effects on the aircraft?
  - There is other useful information aligned with intent of Schedule 1, e.g. EASA FAQ Avionics Classification Tables:
    1. https://www.easa.europa.eu/system/files/dfu/Rotorcraft%20Avionics%20FAQ%20list%20Change%20Classification_final%2019Dec2016.pdf
    2. https://www.easa.europa.eu/system/files/dfu/FAQ_change_classification.pdf

CAA337 vs STC

- The following are **NOT** considerations:
  - Has the DDH approved/have experience with this type of design change before? – This is a **delegation scope** issue.
  - Is this a transfer of an already approved Major Modification from one tail number to another? – This is a modification **embodiment** (Part 43) issue.
  - Is a complex or simple engineering assessment required? – This is a Part 146 **Class A/B** issue.
  - Is this a complex or simple installation task? This is a modification **embodiment** (Part 43) issue.

CAA337 vs STC

- **Outputs** of Design Change Decision?
  - Major – 146 supplies Statement of Compliance (SoC) but CAA approves the data (again, CAA can mean DDH for “one-off”).
  - Major Design Change means CAA involvement in the design approval process
  - Minor – CAA approval not required (146/DDH approval without direct CAA involvement)

CAA337 vs STC

- The approver (CAA/DDH) is **NOT** the entity responsible for demonstrating compliance to the airworthiness requirements. They make the finding of compliance.

- The entity signing the SoC is responsible for demonstrating compliance to the airworthiness requirements.

- Therefore, the SoC is the link to the entity responsible for initial, as well as continued, airworthiness compliance.

Major/Minor Modification [Part 43] Decision

- **Criteria: AC43-9 Appendix A**
  - If installed/embodied incorrectly/poorly, what are the effects on the aircraft?

- **Outputs** of this decision:
  - Do I need to involve an IA Holder for the Installation Conformity?

- **Major** – Conformity inspection by an IA Holder is required.

- **Minor** – Conformity can be conducted under a Release to Service

CAA337 vs STC

- DDH determines Modification Classification based on failure consequences
- If Minor, IA can make Major based on installation complexity, but cannot reduce Major to Minor without consulting CAA.

CAA337 vs STC

Major – CAA337 “one-off” authorisation by DDH, or CAA STC?

- CAA337 “one-off” Major is effectively the same as a “serialised” STC.
- Approval function is delegated to DDH
- CAA would expect the same level of rigour applied as a STC, save for the reproducibility aspect.
- Does not relieve compliance or conformity requirements

CAA337 vs STC

- **Considerations:**
  - Serial production, commercial or export potential – i.e. likely to be further demand? **148 => STC**
  - Manufacturer/fabricator suitability & complexity of manufacturing process – **Part 148 versus Part 145/43**
  - Unlikely to be further demand – safety benefits outweigh commercial potential **=> 337**
  - Transient or temporary solution or need for a "quick fix" **=> 337**

CAA337 vs STC

- Complex engineering assessments required **=> STC**
- New, novel design likely requiring SC **=> STC**
- ELOS, exemption required **=> STC**
- Affects AD compliance (terminating action, AMOC, replacement part of part subject to AD) => already identified safety concern area (AD) **=> STC**

CAA337 vs STC

- AC 43-9 – considering improvement and clarification regarding Design Change Classification and Modification/Embodiment Classification.

- AC 43-9 – considering splitting into Part 21 and Part 43 Chapters (different audience)

- CAA337 Form – DDH record on Major Modification Classification (Part 43 - IA)?

- “One-off” Major Modification Authorisation Process – Design Change. Expectations (e.g. “PSCP-lite”) and guidelines (e.g. AC21-X ?)

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STCs – Planning and Embodiment

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- PSCP Purpose – Refer to AC21-8 (Rev 1 Sept 2016) – Pete Sutherland presentation on TC
  - Project Plan
  - Scope
  - Timeline
  - Resources
  - Delegation – who is showing compliance, who is finding compliance? Witnessing, approving, conformity, inspections – **help us help you**
  - CAA and 146/DDH negotiation and agreement on process going forward

STCs – Planning and Embodiment

- Documentation control
    - Highlight changes from previous versions – **help us help you**
- Minor Changes to STC are same as Minor Changes to TC – does not specifically require STC amendment, but should be rolled-up in STC amendment later (e.g. at surveillance).
- Major Changes to STC are same as Major Changes to TC – STC (amendment)

STCs – Planning and Embodiment

- Conformity –
  - Partial Embodiment of a STC/Mod means it does not conform in full to the applicable design data (unless the STC/Mod explicitly covers the configuration(s) to be embodied.
  - Deviations to a STC/Mod may require another design change (minor or major)
  - If more than 1 installed configuration/option is foreseen, define all approved configurations **or** make the installer aware that an additional design change approval is necessary if compliance is not fully demonstrated.

STCs – Planning and Embodiment

"We demand rigidly defined areas of doubt and uncertainty!"

— Douglas Adams