

Major or Minor?



DESIGN/MANUFACTURING SEMINAR 2019

Major or Minor?



Major or Minor?



Major or Minor?



So What?



**Determines Level of Involvement in Approval Process by CAA
(Design Change)**

**Determines Level of Involvement of Inspection Authorisation holder
(Modification/Repair)**

Considering a number of changes

- Changes to Delegation – Scope of delegation (Finding of Compliance - FoC)
- Changes to Schedule One – iaw DO procedures/AC guidance
- Changes to AC43-9 – Major/Minor Mod/repair guidance
- Changes to AC146-1 – Major/Minor Design Change guidance, 337 Returns, DDH scope
- Changes to the “Major Modification Authorisation” Process – FoC
- Changes to AC21-7 STC – FoC
- Changes to Rules – Definitions, CPR

What's Wrong?

Signs of confusion everywhere :

Owners, operators

Maintainers, LAMEs, Part 145 AMOs

Designers

Even the CAA...

Even the FAA

FAA Order 8300.16 :

1-4. Scope.

a.Process. This order defines the process for the approval of technical data for major repairs and major alterations. This order does not provide guidance for making decisions on major or minor changes in type design.

b.Definitions. **The use of the terms “major” and “minor” are sometimes inappropriately applied or misunderstood.** A major change in type design can be approved only by an ACO as an amended type certificate (ATC) or Supplemental Type Certificate (STC). A major alteration requires the use of FAA-approved technical data. ...

Why?

Delegating Finding of Compliance for STCs

- More clarity on FoC scope – NOT a SoC/Technical scope
- Redundancy of “One-off Major Process” (100% FoC)?
- More clarity = more robustness = more consistency

Design Change vs Mod/Repair

- Part 21 vs Part 43

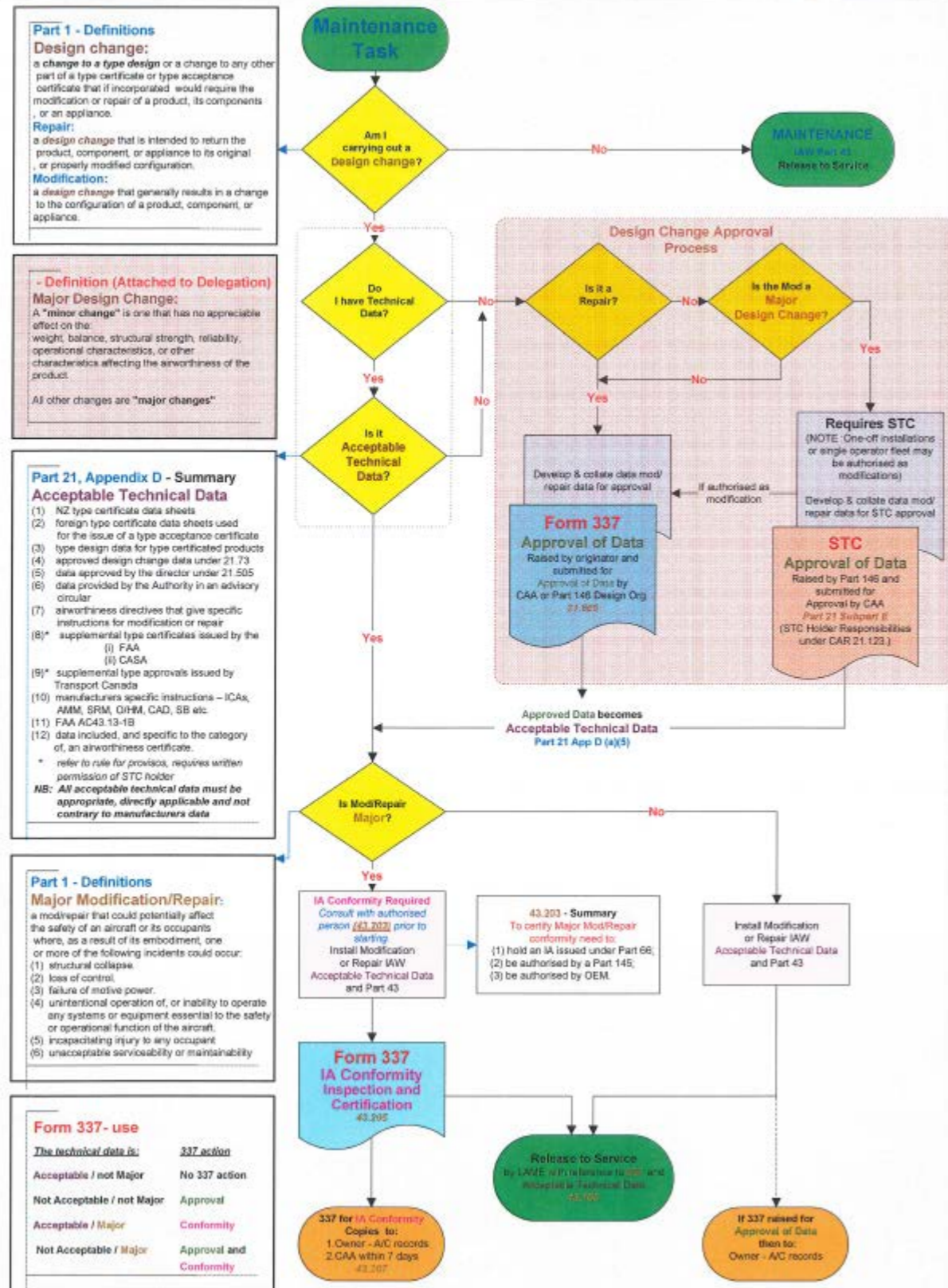
Major/Minor vs Major/Minor

- Who can decide what?
- What it means?

Major/Minor Design Change Classification procedure that works for the Part 146 FoC and SoC scope vs Schedule One

Reporting 337 returns – what information should be reported?

Modification / Repair Process

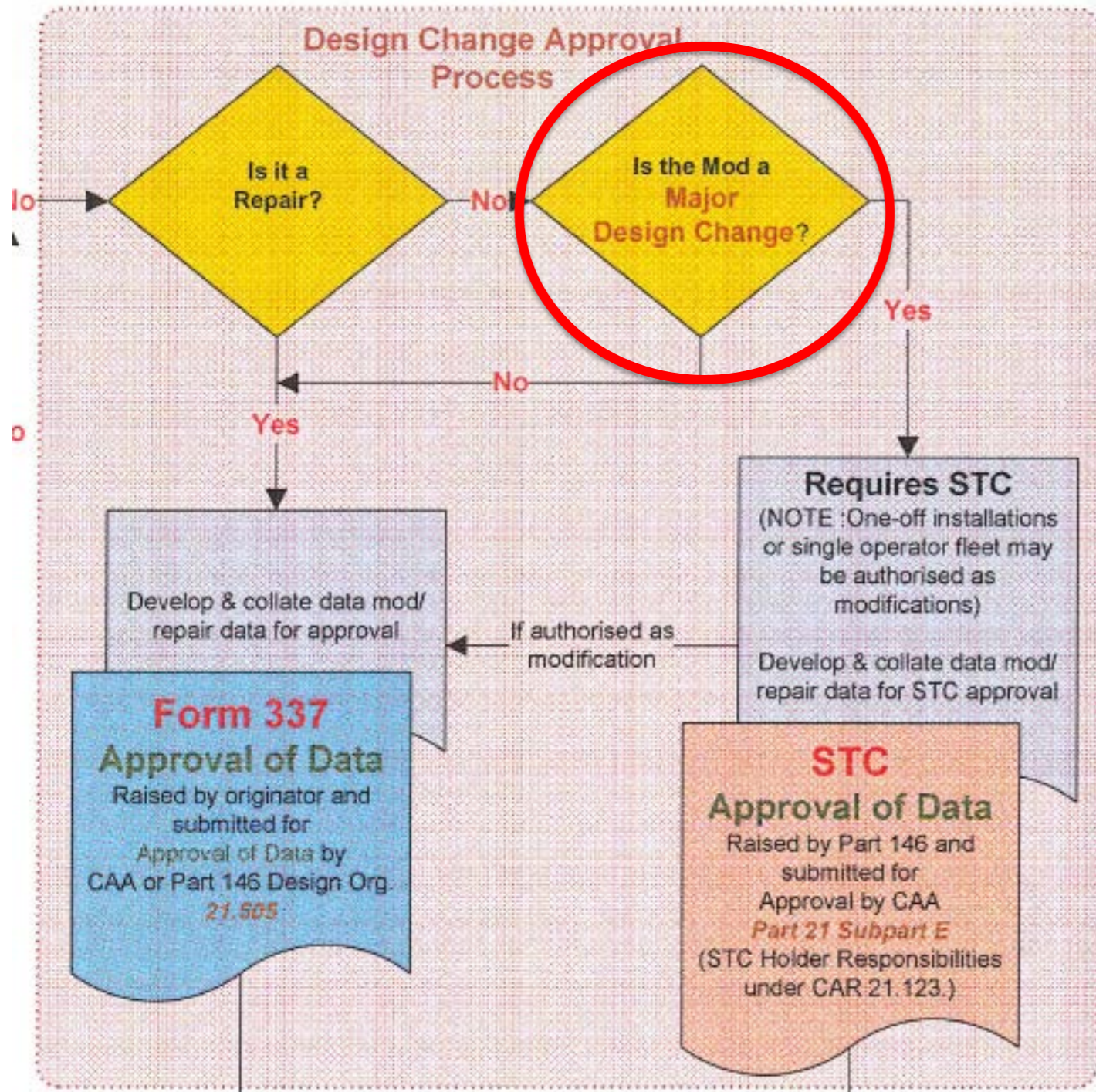


Rev 8 - March 2012

Informed by AC43-9

There are 2 Major/Minor determinations:

1. Part 21 context – Design Changes
2. Part 43 context – Embodiment of Mod/Repair



Major / Minor Design Change –

Part 21 context – Airworthiness Design Stds

Criteria per Schedule One – DDH

Why? **CAA LOI**

Minor - Approve data by DDH per CAR 21.505, **no direct CAA involvement in approval**

Major – Approved by CAA through STC (21 Subpart E)

x=Major.

Major so **must have CAA LOI**



- **Option 1 – STC**

- Determine Cert. Basis and present to CAA in PSCP
- **Negotiate LOI with CAA** (e.g. 75% FoC) in PSCP
- Agree PSCP with CAA
- Move to Compliance Phase
- CAA exposure = project
- AC21-7 outlines process

- Major, definitely Major

- **Option 2 – One-off Major Mod Auth.**

- Determine Cert. Basis and present it to CAA
- Ask for 100% FoC – **i.e. CAA no LOI**
- Present to CAA a certification plan
- Acceptable based on one tail number/one operator? Has the risk changed?
- CAA exposure = point-in-time

- **Same as Re-classifying as Minor?**

- Major, but not *really* Major

What's the real difference?

- Option 1 – STC
- Negotiate LOI with CAA (e.g. 75% FoC)
- Option 2 – One-off Major Mod Auth.
- Ask for 100% FoC – i.e. CAA no LOI

**Extent of Finding of Compliance (FoC) delegation
CAA Project vs point-in-time**

Schedule One

- Attached to the Design Delegation Holder's Instrument of Delegation
- Defines **Minor** Design Change (tests Minor)
- Provides guidance on Major Design Changes (tests Major)
- Examples of Major Design Changes per discipline (tests Major)
- Provides Classification Process (tests Major)
- Generally aligned with EASA AMC/GM to 21A.91

Schedule One

Definitions:

For the purposes of design delegation the following definitions apply:

1. A **major design change** means a change that is not a 'minor design change'.
2. A **minor design change** means a change that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product.

- Test criteria is minor – can it fit within minor?
- If can't prove it is minor, then its major.

Be careful:

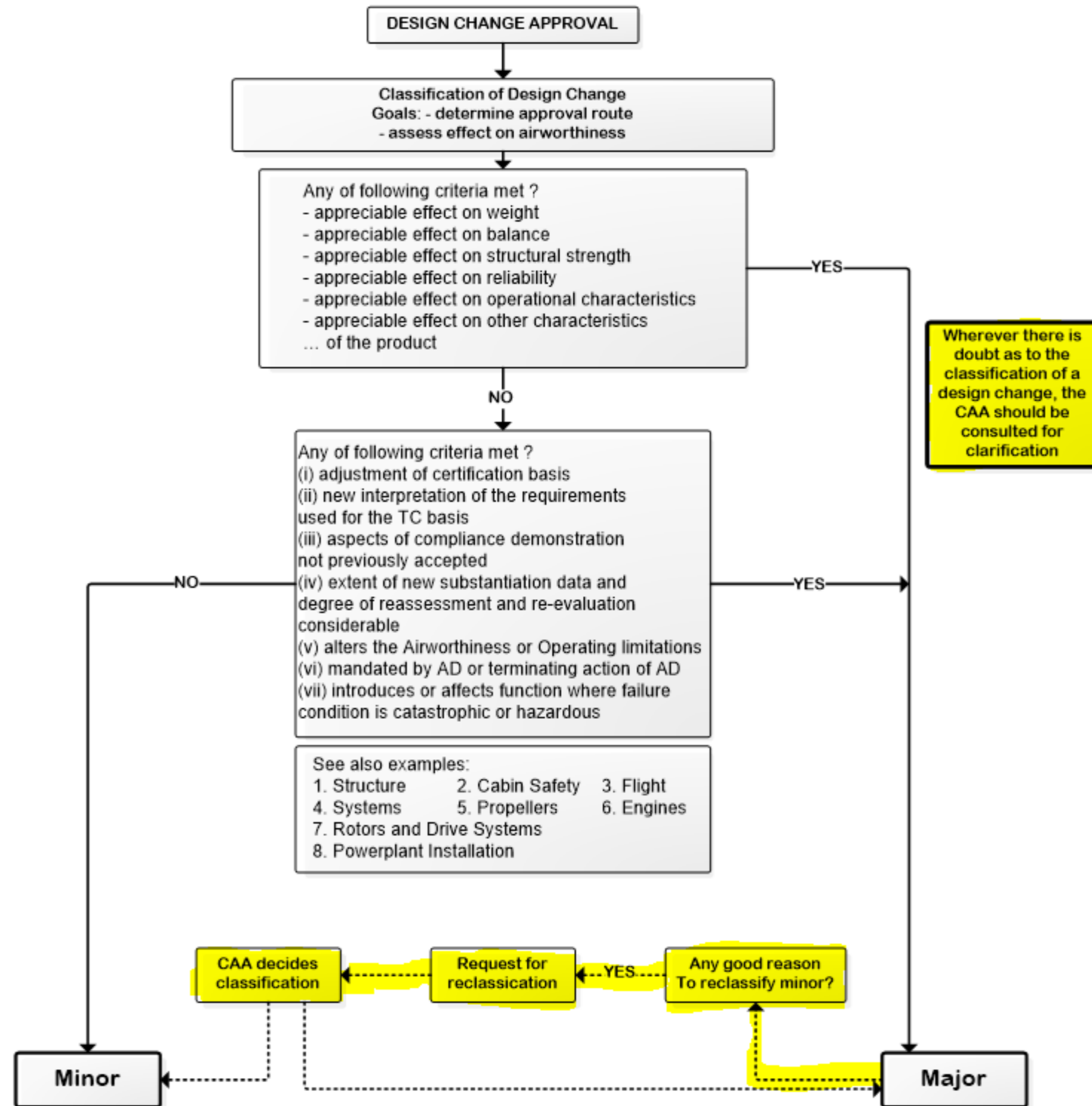
- if there is doubt, don't make it fit within minor.

Remember: Outcome is does CAA get involved in the approval process?

- Just ask...



Classification process

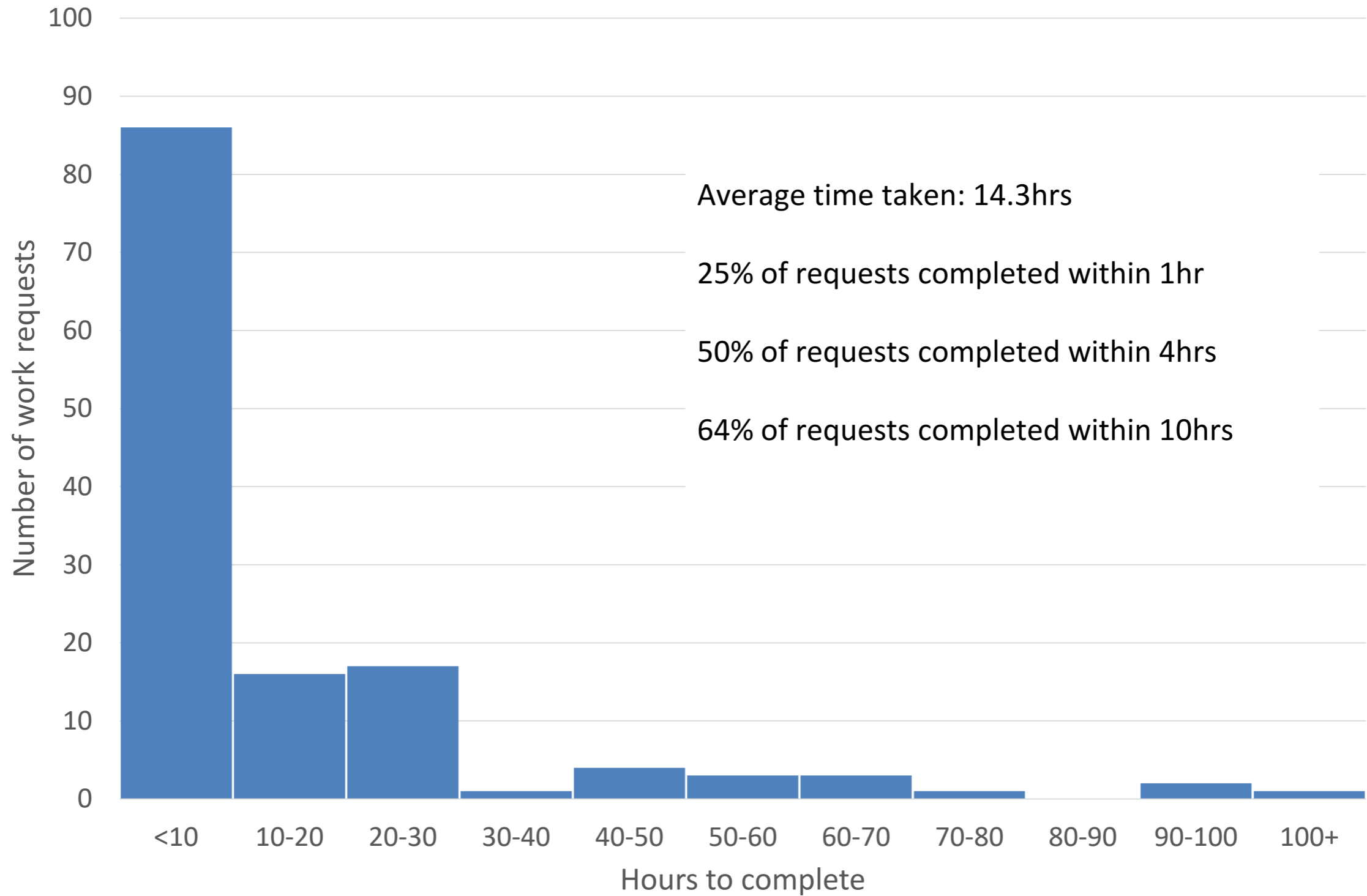


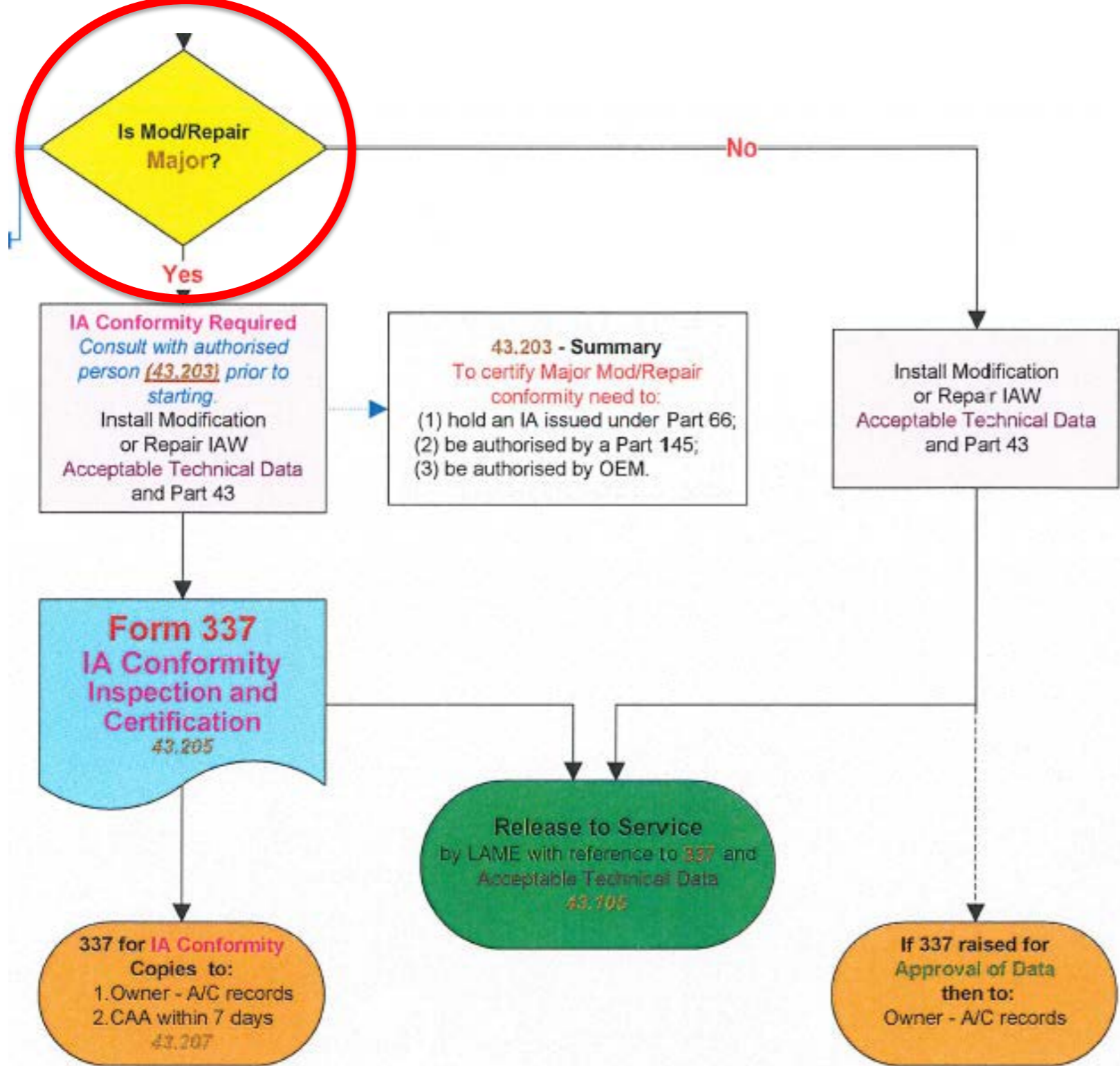
CPR – Changed Product Rule

A consideration for a **Major** Design Change only!!!

To determine whether the latest certification basis must be used, or original certification basis can be used, for a major design change.

Number of STC work requests by hours taken to complete





Major / Minor Mod/Repair –

**Part 43 context -
Embodiment**

Criteria per Part 1 – LAME

Why? IA LOI

**Minor - RTS by LAME per CAR
43.105**

**Major – Conformity by IA per
CAR 43.205**

Major Modification

Major modification means a modification that could potentially affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- 1) structural collapse:
- 2) loss of control:
- 3) failure of motive power:
- 4) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft:
- 5) incapacitating injury to any occupant:
- 6) unacceptable unserviceability or maintainability:

Major ~~Modification~~ Repair

Major ~~modification~~ repair means a ~~modification~~ repair that could potentially affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- 1) structural collapse:
- 2) loss of control:
- 3) failure of motive power:
- 4) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft:
- 5) incapacitating injury to any occupant:
- 6) unacceptable unserviceability or maintainability:

Modification

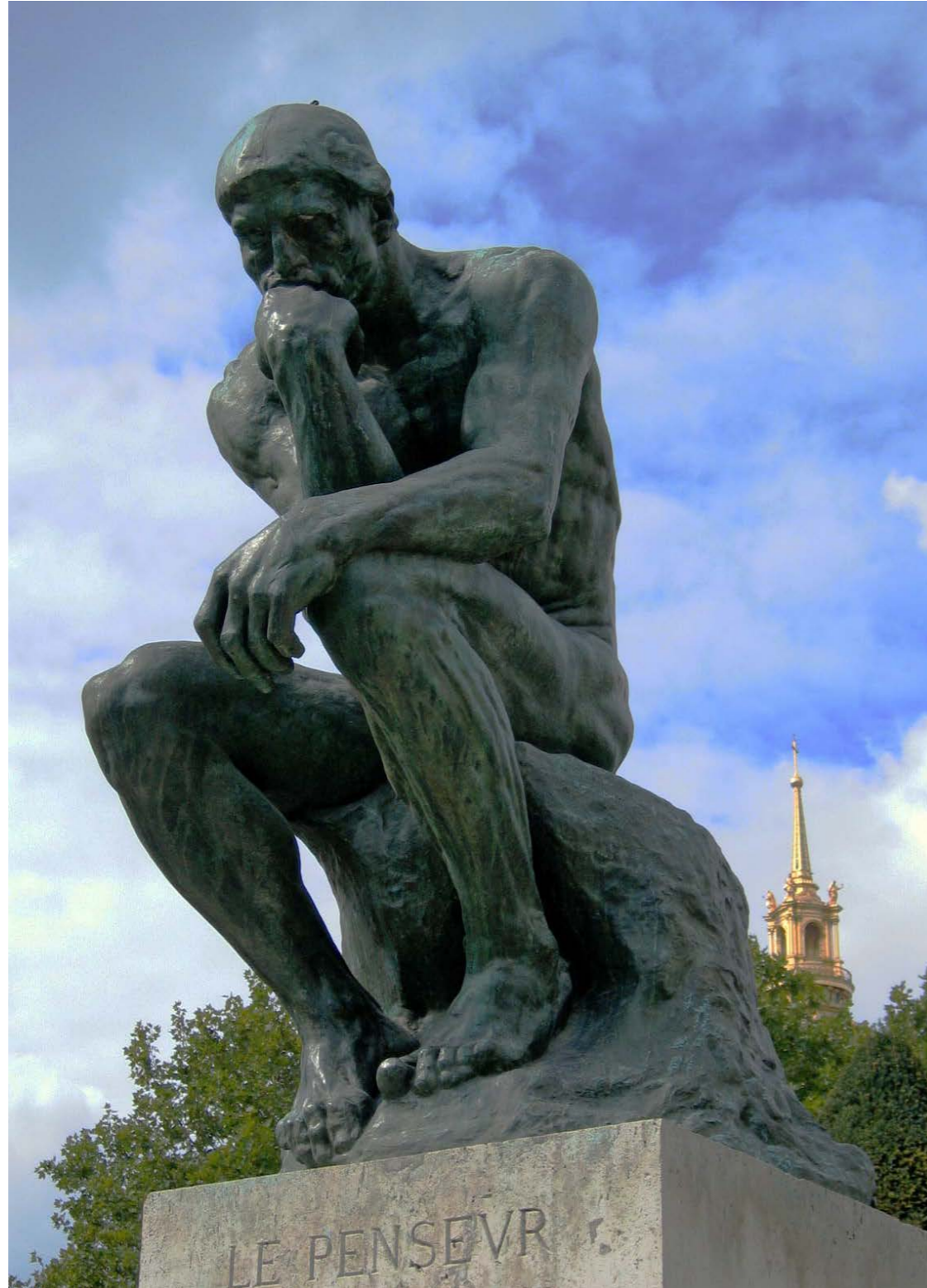
Modification means a **design change** that generally results in a **change** to the configuration of a product, component, or appliance:

Repair

Repair means a **design change** that is intended to **return** the product, component, or appliance to its original, or properly modified configuration:

Design Change

Design change means a **change** to a type design or a **change** to any other part of a type certificate or type acceptance certificate that if incorporated would require the **modification** or **repair** of a product, its components, or an appliance:



So...

If a Modification means a Design Change...

...and a Repair means a Design Change...

...and a Design Change would require a Modification or Repair...

...and I treat Repairs as Design Changes to be approved as Modifications per the Instrument of Delegation...

Modification or Alteration?

Major modification means a modification that could potentially affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- (1) structural collapse:
- (2) loss of control:
- (3) failure of motive power:
- (4) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft:
- (5) incapacitating injury to any occupant:
- (6) unacceptable unserviceability or maintainability:

Major alteration means an alteration not listed in the aircraft, aircraft engine, or propeller specifications—

- (1) That might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or
- (2) That is not done according to accepted practices or cannot be done by elementary operations.

Major or Minor?



NVIS re-qualification

FAA AC 26-2C - MG 16

“Due to the fundamental effect NVGs have on visual perception and the inherent characteristics of NVIS technology, modifications to the aircraft to make it NVIS-compliant should always be considered a major alteration”

- What about changes to existing approved configs?

EASA Certification Memo CM-FT-001:

Major/Minor based on....

- experience and knowledge of the specific organisation acquired in previous NVIS projects,
- type/model affected,
- extent and effect of the modification
- kind of NVIS technology applied, and
- NVIS approval.



RIGHT

WRONG

DEPENDS

Major or Minor?

Ask yourself if a pilot, engineer, passenger **or loved one** would expect CAA to have some oversight of this design change, or would they be comfortable knowing CAA directly wasn't involved in approving this?

