

AIR-6C1 Outreach

Application of § 21.101

*Designation of Applicable
Regulations*



Federal Aviation
Administration



Outline

- **Regulation, Guidance and Order**
- **CPR process – General Considerations**
- **CPR process – Walk Through**
- **CPR Focals**

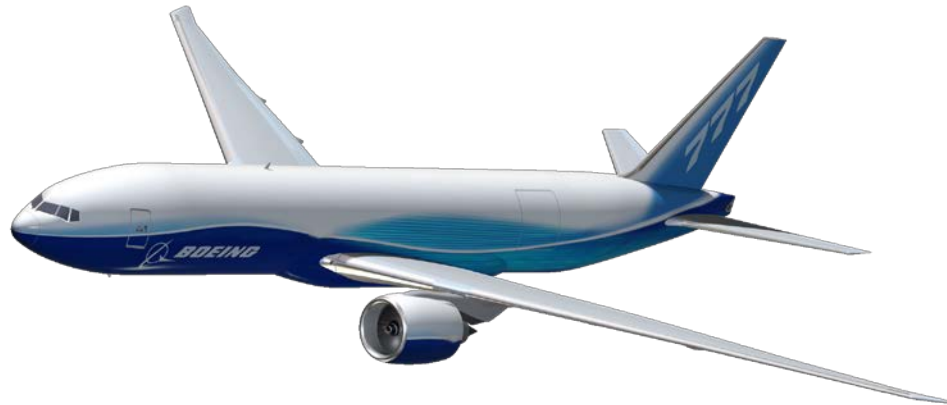


Regulation, Guidance and Order



Regulation

- **Section 21.101 “*Designation of applicable regulations*”**
 - Often referred to as the “Changed Product Rule” or CPR
 - Amended December 2012



Guidance

- **AC 21.101-1B “*Establishing the Certification Basis of Changed Aeronautical Products*”**
 - Details the process for establishing the certification basis under § 21.101
- **Revision - 1B Published March 11, 2016**
 - Harmonized with EASA, FAA, TCCA and ANAC



AC 21.101-1B Highlights

- **No fundamental change to policy, only clarification**
 - Guidance on many situations encountered since last revision
- **Updated the flow chart for CPR process**
- **Optional CPR Decision Record**



AC 21.101-1B Highlights (Concluded)

- **Appendices:**

- Updated classification of design changes tables (pre-determined examples by aeronautical products)
 - Substantial
 - Significant
 - Not Significant
- Application charts
- Determining the changed and affected areas
- Other guidance for affected areas
- Optional CPR Decision Record
- Examples of cert basis documentation



Order

- **Order 8110.48A, “How to Establish the Certification Basis for Changed Aeronautical Products”**
 - Procedures for the FAA Directorates, ACOs, delegated organizations, and designees
- **Revision A Published July 21, 2017**
 - In line with latest AC 21.101-1B



Order 8110.48A Highlights

- **No fundamental change to policy, only clarification**
 - Align with the harmonized AC
 - Direction on many situations encountered since last revision
- **Optional CPR Decision Record**
- **Appendices:**
 - Optional CPR Decision Record
 - Examples of cert basis documentation



Order 8110.48A Highlights (Continued)

- **Overview of §§ 21.19 and 21.101**
 - Section on § 21.101 added a discussion of each paragraph of § 21.101 rule
- **Roles and Responsibilities**
 - Prior revision had delegation of not significant decision to applicants (ref. Par 14)
 - Replaced delegation with references to the ODA and CPN order for details of any delegation (ref. Chapter 3, Par 3-1.c.(3))
 - Deviation memo AIR-600-17-6F0-DM11 released detailing delegation to bridge gap until ODA and CPN orders updated



Order 8110.48A Highlights (Continued)

- **Serial Numbers**

- Expanding the Effectivity or Eligibility of an Existing TC or STC to Include Additional Serial Numbers of the Same Model
 - Allows a means to administratively add serial numbers of the same model to an existing TC or STC



CPR Process – General Considerations



CPR Process – Key Elements

- Applies to major and minor type design changes
 - Minor changes are automatically considered not significant
- Applies to the change and areas affected by the change
 - Not to the entire product
- Top down approach to define the certification basis
 - Intent is to enhance safety by incorporating the latest requirements to the greatest extent practicable
 - Start with the latest amendment level and work “downward” based upon **CPR exceptions**



CPR Exceptions

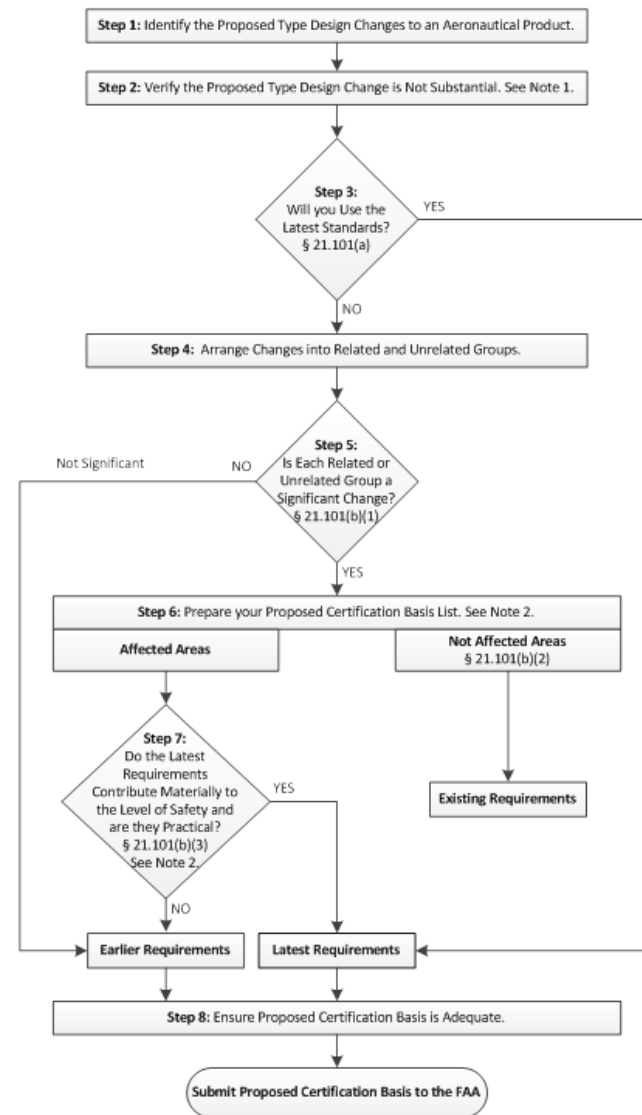
- **Not a significant change**
- **Not an area affected by the change**
- **Compliance to the latest regulation would:**
 - Not contribute materially to the level of safety or
 - Be impractical



CPR Process

8 Steps

Flowchart



Notes:

1. Changed products that are substantially changed do not follow this flowchart. Refer to § 21.19.
2. Process and propose each applicable requirement individually. If requirements are linked together, then they should be assessed together.



CPR Process – Walk Through Steps 1-8



Step 1- The Proposed Type Design Changes

- **Must have the following:**
 - Type design being changed – i.e., the baseline aircraft, engine, or propeller to be changed
 - Certification basis of the baseline aircraft, engine or propeller
 - High-level descriptors for the changes
 - Cumulative changes - of previous relevant changes



Baseline Aircraft, Engine or Propeller

- **A unique type design configuration**
 - An approved product configuration that can be manufactured at one time or may consist of multiple approvals over time (e.g., aircraft model with an approved STC incorporated)
 - Refer to: AC 21.101-1B, paragraph 5.3
 - Not a composite mix of modules or parts from different aircraft models



Cumulative Changes

- **In addition to the proposed changes, consider the cumulative effect of previous relevant design changes incorporated since the last time the certification basis was upgraded.**
 - Also, consider the amendment level of the certification basis used for these changes.



Cumulative Effect Example



An OEM builds a part 27 helicopter, the new model is designed to the basic (VFR only) requirements



Cumulative Effect Example



An STC applicant modifies the above aircraft with a 4 screen EFIS (maintains the VFR only limitation)



Cumulative Effect Example



A second STC applicant modifies the aircraft with new navigation and communication radio suite e.g.: dual GPS, dual VOR nav, dual VHF comm (maintains the VFR only limitation)



Cumulative Effect Example



A third STC applicant modifies the aircraft by installing an Autopilot / SAS system (maintains the VFR limitation)



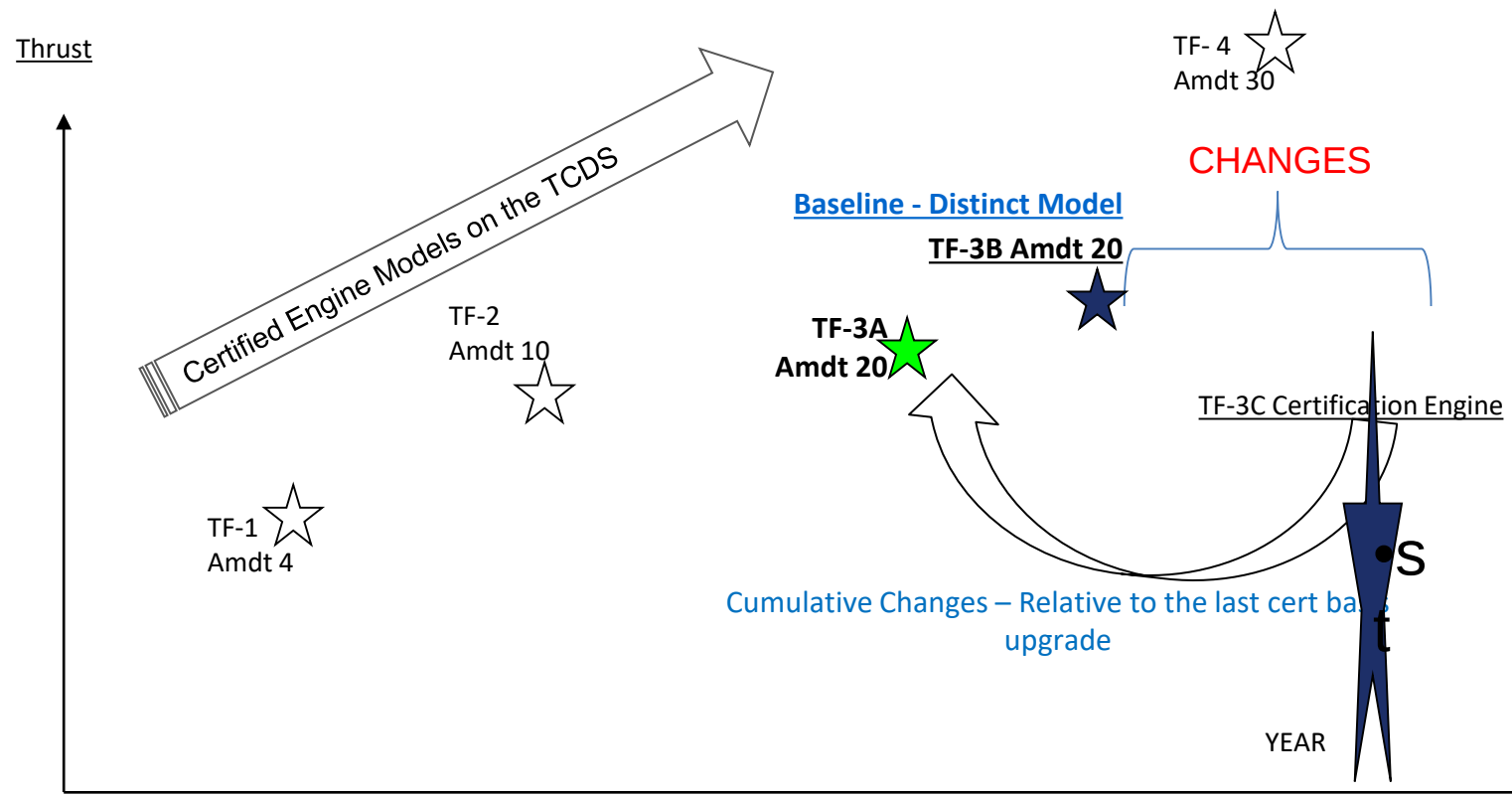
Cumulative Effect Example



A fourth STC applicant applies for an “umbrella STC” that requires all these afore mentioned STCs to be installed together, and seeks to remove the VFR only limitation.



Example



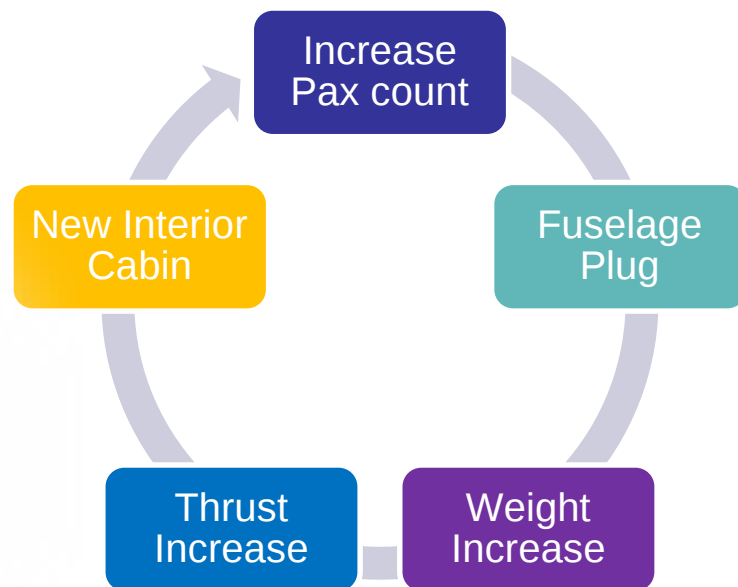
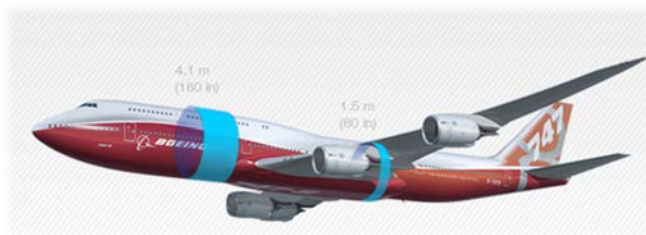
Steps 2 - 3

- **Step 2: Verify the change is not substantial**
 - **New TC under § 21.19**
 - The change is so extensive that a substantially complete investigation of compliance with the applicable regulations is required
 - Tables in AC 21.101-1B, Appendix A
- **Step 3: Determine if the applicant will use the latest standards**
 - No further classification (significant or not significant) and justification is needed



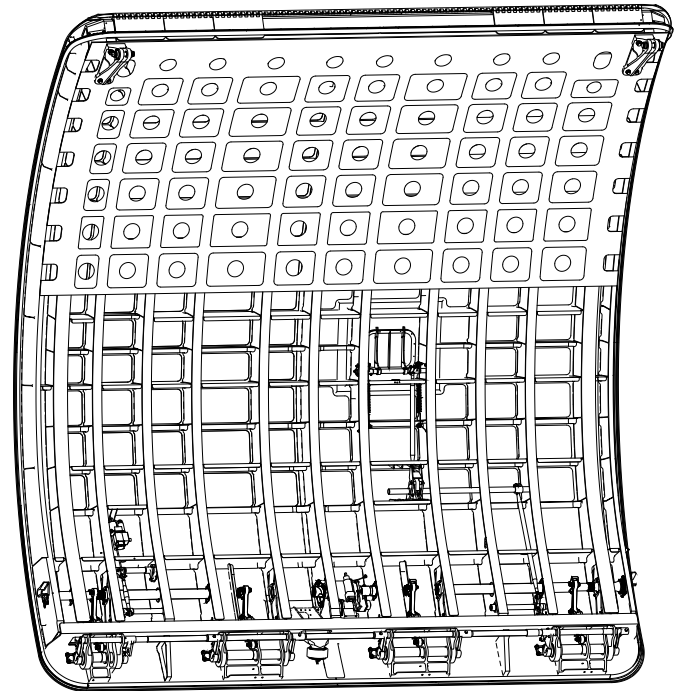
Step 4 – Related/Unrelated Changes

- Arrange changes Into Related and Unrelated groups
- **Related changes:**
 - Cannot exist without another
 - Are co-dependent
 - Are pre-requisite of another



Step 5 – Significant?

- Assess each related and unrelated group to determine if:
 - A significant change or
 - Not a significant change



Significant Changes - Criteria

- Product level changes
 - The changed product is distinct from its baseline product
- **Could result from**
 - An accumulation of changes or
 - A single significant change



Significant Changes – Criteria (continued)

- **Changes that meet one of the following criteria are automatically considered significant:**
 - General configuration is not retained
 - Principles of construction are not retained
 - Assumptions used for certification do not remain valid
- **AC 21.101-1B Appendix A contains examples of significant and not-significant changes**



Examples in AC 21.101-1B

- **Use the examples for significant and not-significant changes in AC 21.101-1B Appendix A**
- **If the specific case is not in Appendix A, use the examples in Appendix A as a guide**
 - Compare the changes in your project with those of similar type and magnitude



Step 6 – Proposed Certification Basis - Significant Change

- Amendment level in effect on the date of application for the change
- Earlier amendment but no earlier than the existing certification basis based on the exceptions in § 21.101(b)(3)



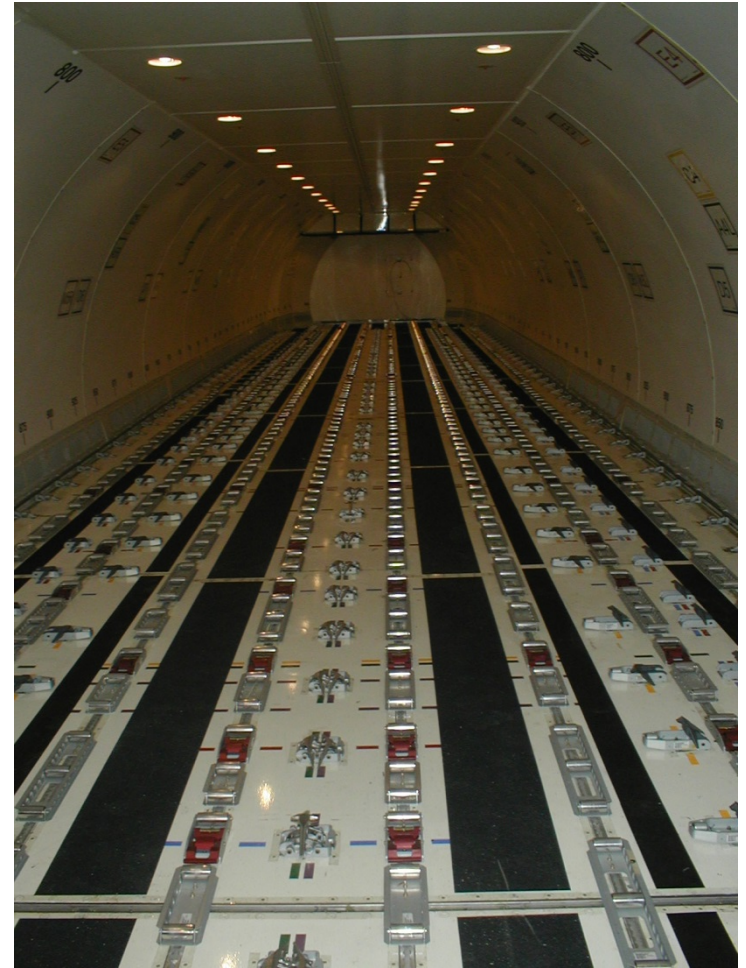
Step 6 – Proposed Certification Basis – Not Significant Change

- **Earlier amendments but not prior to the existing certification basis**
- **The applicant may propose an amendment level for each certification standard for the affected area**



Step 7 – Exceptions

- Do the latest requirements contribute materially to the level of safety and are they practical?
 - Applicant must provide justification
 - § 21.101(b)



Step 8 – Adequate Certification Basis

- **Ensure proposed certification basis is adequate**
 - Engines and propellers policy list memo
 - New design features for which older certification basis are not adequate
 - Examples: New powder metals or composite materials
- **If not adequate:**
 - Select a later amendment regulation - if exists or
 - Issue special condition



Appendix G - Decision Record

CHANGED PRODUCT RULE (CPR) DECISION RECORD	
TC/STC No.: Click here to enter text.	Project Number: Click here to enter text.
Step 1: Identify the proposed type design changes to the aeronautical product. (See paragraph 3.2 of AC 21.101-1B)	The proposed type design changes are identified here or in the following document(s): Click here to enter text.
Note: The Issue Paper process is used to track/document the decisions at Step 2 and Steps 5 through 8 as required.	
Step 2: Is the proposed type design change substantial? (See paragraph 3.3 of AC 21.101-1B)	☐ Yes New Type Certificate: Proceed to § 21.19. Section 21.101 does not apply. A G-1 issue paper will be used to establish and document the certification basis. ☐ No Proceed to Step 3.
Step 3: Will you use the latest standards? (See paragraph 3.4 of AC 21.101-1B)	☐ Yes Latest Requirements: Propose a certification basis using the standards in effect at the date of application. Proceed to Step 8. ☐ No Proceed to Step 4.
Step 4: Arrange changes into related and unrelated groups. (See paragraph 3.5 of AC 21.101-1B)	Note: For multiple groupings, continuation of this process should be split into separate decision records. Groupings may be rationalized and recorded in separate documents: Click here to enter text.
Step 5: Is each related or unrelated group a significant change? (See paragraph 3.6 of AC 21.101-1B)	☐ Yes Proceed to Step 6. ☐ No Earlier Requirements: Propose a certification basis using the standards in effect before the date of application but not earlier than the existing certification basis. Certification basis to be defined and documented as indicated (below). Proceed to Step 8.
Step 6: Prepare your Certification Basis List. (See paragraph 3.9 of AC 21.101-1B) Affected Areas:	The Affected Area(s) are detailed here or in the following Certification Basis List document number(s): Click here to enter text.
Not Affected Areas:	Process and propose each applicable requirement individually. Proceed to Step 7.
Step 7: Do the latest requirements contribute materially to the level of safety and are they practical? (See paragraph 3.10 of AC 21.101-1B)	☐ Yes Latest Requirements: Propose a certification basis using the standards in effect on the date of application. ☐ No Earlier Requirements: You may propose a certification basis using the standards in effect before the date of application but not earlier than the existing certification basis. Certification basis defined or documented as indicated below.
☐ Continuation Sheet(s) Attached	Note: Several standards may apply to each affected area, and the assessment may differ from standard to standard. Indicate "Yes" if compliance with any latest standard(s) is required. Indicate "No" only if earlier standards are proposed.
Note:	You may submit a proposal for the decision in Step 7; however, the FAA will make the final certification basis determination.
Step 8: Ensure the proposed certification basis is adequate. (See paragraph 3.11 of AC 21.101-1B)	If you deem that the certification basis is adequate, submit proposed certification basis to the FAA. If not, consult the FAA. A G-1 issue paper may be needed to document the certification basis.
Certification Basis:	The certification basis is detailed here or in the following document(s): Click here to enter text.
Based on the information provided above, I am proposing the certification basis with the following classification for the type design change. (check one)	
☐ Significant, pursuant to § 21.101.	☐ Not significant, pursuant to § 21.101.
Click here to enter text. Printed Name/Title	Click here to enter text. Signature
	Click here to enter text. Date

