**Task Directive**

**Issued by Air HQ to stakeholders**

* **Details of Design**
* **Technical Specifications of RE**
* **Structural /Aerodynamic/Electrical and Avionics Analysis**
* **Static & Dynamic Analysis – Buckling Shock, Random Vibration, Modal analysis, Fatigue Analysis**

Preliminary Design Documents (PDD)

System Requirements Specification

Feasibility Study

Mechanical feasibility of the store as per the guidelines stipulated in MIL-STDs by the Design Agency

Electrical feasibility: AC/DC power requirement & its availability is ensured from aircraft manual.

**End user requirements**

Technical Specifications

Document is prepared based on the details stipulated in ASR / ASQR / PSQR issued by the user:

On which platform CFE / Role Equipment (RE) to be integrated

Configuration of CFE store / RE with existing stores

Essential Physical parameters such as Dimensions / Weight / CG / Moment of Inertial of store / RE, Max / Min. ‘g’, IAS during C&H and Release, Max. / Min - AoA / AoS of the aircraft

**Issued by CEMILAC to all concerned RCMAs**

CEMILAC Work Share

**ASR/ASQR/PSQR**

**AIRWORTHINESS CERTIFICATION CRITERIA : EXTERNAL STORE INTEGRATION ON AIRCRAFT**

Document is to evolved by the designer from component to system level based on guidelines as per MIL-STD-1629 etc.

To be reviewed with all concerned

This document is to be revised as and when following aspects are investigated / reviewed during design / after sorties or trials

Limitations based on analysis

Defect Investigation based on flight trials

FMEA, FMECA, SSA

Aerodynamic Configuration

CFD analysis & validation

Wind tunnel data

Material selection

Captive load estimation (Inertia, Aerodynamic & landing)

Stress analysis

Thermal analysis

Fatigue Estimation (Theoretical and Testing)

Preliminary Design Review

(Aerodynamic, Structural & System)

Generation of Experimental Drawings

Estimation of Inertia & Aerodynamic loads

Weight & CG Estimation

Stress Analysis

Modal Analysis

GVT & Flutter analysis

Static load test

Random Vibration test

Shock test

Advanced Modification Information (AMI)

Pre-requisite is Form-33A { **IMTAR FORMS }**

Airworthiness Certification Plan

* **Document is prepared by the designer based on the details stipulated in ASR / ASQR / PSQR issued by the user.**
* **Role of each certification centre is defined in work share released by CEMILAC**

**Realization of prototype based on approved drawings, DAL & BOM**

Prototype Realization

RV1 – Thermal Cycle – RV2 (Pre & Post)

GVT & Flutter analysis

Static load test

Safety Of Flight Test (SOFT) / (LQT)

Random Vibration test

Shock Test

EMI /EMC

Integrated Design Review

Review of LQT/SOFT with all concerned

Structural /Aerodynamic/Electrical & Avionics Analysis

Formulation of Standard Operating Procedure (SOP)

**Document is to evolved by the designer containing component details and datasheets.**

Flight Test Instrumentation Scheme

**In consultation with designer & user based on analysis**

Flight Test Plan

Issued by User

Pre-flight Review Meetings (FRR & FSRB)

* FRR meeting with all the stakeholders to address pending issues if any
* FSRB meeting with all the stakeholders to review and ensuring the system safety before the flight trials

Issuance of Flight Clearance Certificate (FCC) for Carriage & Handling (Symmetric & Asymmetric configuration)

Post Flight Analysis (PFA)

**Results of Flight Trials are deliberated in PFA meeting with all the stakeholders to decide:**

* **Co-relation with analysis & flight data**
* **Go ahead for further trials**
* **PFA needs to be undertaken after each FTI sortie**

**Issuance of the FCC (Form 100) from the airworthiness certification authority to the designer of the store for its integration on the proposed fighter aircraft.**

Flight Trials

Post Flight Analysis (PFA)

**Results of Flight Trials are deliberated in PFA meeting with all the stakeholders to decide:**

* **Co-relation with analysis & flight data**
* **Go ahead for further trials**
* **PFA needs to be undertaken after each FTI sortie**

Issuance of Flight Clearance Certificate (FCC) for Live Release

Issuance of Flight Clearance Certificate (FCC) for Dummy Release

**Issuance of the FCC (Form 100) after PFA of every FCC ensuring objectives are met**

Issuance of Flight Clearance Certificate (FCC) for Avionics Missile

Design Change (if any)

* **Changes to the design, if envisaged gets reviewed & absorbed as Project Slips against provisionally approved drawings**
* Full Qualification testing builds on the limited QT by adding environmental tests like Rain test, Fungus test, Sand & Dust test & Experimental Fatigue test.
* Full QT is required to be undertaken for the issuance of provisional clearance for the store.

Full Qualification Testing (QT)

Local Modification Committee (LMC)

Ratification of the MOD

Generation of Production (N-series) Drawings

Provisional Clearance (PC)

* Pre-requisite Form-12 (Certificate of Design), satisfactory user trial report
* Provisional Clearance to be issued by RCMA valid for 2 years extension for additional 2 years is given until Full QT is done.
* After ratification of MOD in LMC
* Conversion of Experimental Drawings to Production Drawings

Type Approval (TA)

Pre-requisites Forms 29, 29A, 29B, 29C {**IMTAR FORMS}**

Compliance to Full QT

Issued by CEMILAC valid till 10 years

The type approval is issued after the Main Contractor submits the Type Record with all relevant documents, to the satisfaction of CEMILAC

Limited series production of the airborne store is undertaken after issuance of TA

**Clearance for Service Use (CSU)**