**Issue/Rev No: 01/00**

**Date of Release: 8 Feb 2025**

 **COMPLIANCE MATRIX FOR AIRBORNE STORE**

**for <LRU/SYSTEM Name>**

**for**

 **<Platform Name>**

Template No.

 CEMILAC\_SYSGP \_CM\_03

|  |
| --- |
|  |
| <DESIGN AGENCYLOGO> | **Document No.** |  |
| **Issue No./** **Rev No. :** | <00X>/ | **Issue Date :** | <DD/MM/YYYY> |
| **Copy No. :**  | 01 of N | **No. of** **Pages :**  | < total no .of pages > |
| **Document Classification :** | 🞎 Secret 🞎 Confidential 🞎 Restricted 🞎 Unrestricted  |
| **Title:** | **Project/System :** |
| **COMPLIANCE MATRIX FOR AIRBORNE STORE** **for** **<LRU/SYSTEM Name>for <Platform name>** | < Project/System Name> |
| **LRU/System Part No.**  |
| <No.> |
| **Critical Level** |
| <A/B/C/D/E> |
|  | **Name & Designation** | **Signature** |
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| Reviewed By | <Project Leader Name>, <Designation> <Agency Name><AWG/QA HOD Name>, <Designation> <Agency Name> |  |
| Approved By | <Project Leader Name>, <Designation><Design Agency><Officer\_Name>, <Designation>RCMA <Name> |  |
|  **<Design Firm Name & Address>** |

**Disclaimer:**

This document is a guidance document. Applicable section / table rows may be considered. Any additional details may be added. Any not applicable section/ table rows may be deleted. The template is very general and vary with process to process followed by Development Agency. The document may be fine-tuned with the TAA for finalization.

**mpliance Checklist for Airborne Stores**

**System Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No.** | **Activity/ Document** | **Compliance** | **Remarks** |
| 1 | Concept of Utilization |  |  |
| 2 | FHA & SSA as per MIL-STD-882E and Common Cause Analysis as per ARP 4754A |  |  |
| 3 | Functional/ System Requirement Document |  |  |
| 4 | Inter-operability/ compatibility with co-located systems |  |  |
| 5 | Test rigs and Simulators availability & certification |  |  |

**Test Requirement Traceability Matrix**

|  |  |  |
| --- | --- | --- |
|  | **Means of Compliance** |  |
|  | **Requirement** | **Doc Ref (QTP/ACP/ Tech Spec/ MoM)** | **Review** | **Analysis** | **Simulation** | **Similarity** | **Product History** | **Inspection** | **Lab level Test** | **Rig / Aircraft level test** | **Flight test** | **Other** | **Compliance status** |
| Physical | Dimensions |  |  |  |  |  |  |  |  |  |  |  |  |
| Weight |  |  |  |  |  |  |  |  |  |  |  |  |
| Installation (Rack / Hard Mount) |  |  |  |  |  |  |  |  |  |  |  |  |
| Grounding/ shielding/ Bonding |  |  |  |  |  |  |  |  |  |  |  |  |
| Marking |  |  |  |  |  |  |  |  |  |  |  |  |
| Materials |  |  |  |  |  |  |  |  |  |  |  |  |
| Power Consumption |  |  |  |  |  |  |  |  |  |  |  |  |
| Connector pins |  |  |  |  |  |  |  |  |  |  |  |  |
| Insulation resistance |  |  |  |  |  |  |  |  |  |  |  |  |
| Leakage (Oil / Air / Nitrogen) |  |  |  |  |  |  |  |  |  |  |  |  |
| Environmental  | **Vibration**i) Sinusoidalii) Platform specificiii) Buffet iv) Acoustic Vibrationv) Gun Fire Vibration  |  |  |  |  |  |  |  |  |  |  |  |  |
| **High Temperature**i) Storageii) Operation |  |  |  |  |  |  |  |  |  |  |  |  |
| **Low Temperature**i) Storageii) Operation |  |  |  |  |  |  |  |  |  |  |  |  |
| Shock1. Functional
2. Crash Hazard
3. Transit Drop
4. Bench

 Handlingv) Safety Dropvi) Service Drop |  |  |  |  |  |  |  |  |  |  |  |  |
| Accelerationi) Structuralii) Functional |  |  |  |  |  |  |  |  |  |  |  |  |
| CATH |  |  |  |  |  |  |  |  |  |  |  |  |
| Humidity |  |  |  |  |  |  |  |  |  |  |  |  |
| Altitude |  |  |  |  |  |  |  |  |  |  |  |  |
| Fungus |  |  |  |  |  |  |  |  |  |  |  |  |
| Rain drip |  |  |  |  |  |  |  |  |  |  |  |  |
| Immersion |  |  |  |  |  |  |  |  |  |  |  |  |
| Salt fog |  |  |  |  |  |  |  |  |  |  |  |  |
| Sand and dust |  |  |  |  |  |  |  |  |  |  |  |  |
| Solar radiation |  |  |  |  |  |  |  |  |  |  |  |  |
| Fluid Contamination |  |  |  |  |  |  |  |  |  |  |  |  |
| Fire Resistance |  |  |  |  |  |  |  |  |  |  |  |  |
| Deep Sea Penetration |  |  |  |  |  |  |  |  |  |  |  |  |
| Acoustic Vibration |  |  |  |  |  |  |  |  |  |  |  |  |
| Pyroshock |  |  |  |  |  |  |  |  |  |  |  |  |
| Transit drop |  |  |  |  |  |  |  |  |  |  |  |  |
| Safety Drop |  |  |  |  |  |  |  |  |  |  |  |  |
| Service Drop |  |  |  |  |  |  |  |  |  |  |  |  |
| Bench handling |  |  |  |  |  |  |  |  |  |  |  |  |
| Tropical Exposure |  |  |  |  |  |  |  |  |  |  |  |  |
| Air Exposure |  |  |  |  |  |  |  |  |  |  |  |  |
| Bump |  |  |  |  |  |  |  |  |  |  |  |  |
| Gun fire vibration |  |  |  |  |  |  |  |  |  |  |  |  |
| Hail impact |  |  |  |  |  |  |  |  |  |  |  |  |
| Rain Drip / Blowing rain |  |  |  |  |  |  |  |  |  |  |  |  |
| Fast Cook Off |  |  |  |  |  |  |  |  |  |  |  |  |
| Slow Cook Off |  |  |  |  |  |  |  |  |  |  |  |  |
| Bullet Impact |  |  |  |  |  |  |  |  |  |  |  |  |
| Fragment Impact |  |  |  |  |  |  |  |  |  |  |  |  |
| Sympathetic Detonation |  |  |  |  |  |  |  |  |  |  |  |  |
| Power Supply | Distortion spectrum measurements |  |  |  |  |  |  |  |  |  |  |  |  |
| Power interruption (50 ms) |  |  |  |  |  |  |  |  |  |  |  |  |
| Emergency Operation (16V) |  |  |  |  |  |  |  |  |  |  |  |  |
| Engine ON operation (12V) |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Polarity reversal |  |  |  |  |  |  |  |  |  |  |  |  |
| Normal steady state (Voltage / Frequency) |  |  |  |  |  |  |  |  |  |  |  |  |
| Abnormal steady state (Voltage / Frequency) |  |  |  |  |  |  |  |  |  |  |  |  |
| Normal transients (Voltage / Frequency) |  |  |  |  |  |  |  |  |  |  |  |  |
| Abnormal transients (Voltage / Frequency) |  |  |  |  |  |  |  |  |  |  |  |  |
| Phase Sequence |  |  |  |  |  |  |  |  |  |  |  |  |
| Phase Unbalance |  |  |  |  |  |  |  |  |  |  |  |  |
| Input Distortion |  |  |  |  |  |  |  |  |  |  |  |  |
| Amplitude Modulation |  |  |  |  |  |  |  |  |  |  |  |  |
| Frequency Modulation  |  |  |  |  |  |  |  |  |  |  |  |  |
| EMI/EMC | RE101 |  |  |  |  |  |  |  |  |  |  |  |  |
| RE102 |  |  |  |  |  |  |  |  |  |  |  |  |
| RE103 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE101 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE102 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE106 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS101 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS103 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS104 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS105 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS109 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS114 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS115 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS116 |  |  |  |  |  |  |  |  |  |  |  |  |
| CS117 (ESD) |  |  |  |  |  |  |  |  |  |  |  |  |
| CS118 (Lightning) |  |  |  |  |  |  |  |  |  |  |  |  |
| RS101 |  |  |  |  |  |  |  |  |  |  |  |  |
| RS103 (xyz V/m) |  |  |  |  |  |  |  |  |  |  |  |  |
| RS105 |  |  |  |  |  |  |  |  |  |  |  |  |
| HERO |  |  |  |  |  |  |  |  |  |  |  |  |
| Design Validation | GVT |  |  |  |  |  |  |  |  |  |  |  |  |
| Flutter Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Pit Drop |  |  |  |  |  |  |  |  |  |  |  |  |
| Wind Tunnel  |  |  |  |  |  |  |  |  |  |  |  |  |
| Structural Load |  |  |  |  |  |  |  |  |  |  |  |  |
| Phase Checks |  |  |  |  |  |  |  |  |  |  |  |  |
| Sign Checks |  |  |  |  |  |  |  |  |  |  |  |  |
| Sensor In Loop |  |  |  |  |  |  |  |  |  |  |  |  |
| Hardware In Loop |  |  |  |  |  |  |  |  |  |  |  |  |
| Power Budget Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Derating Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| EMI/EMC Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Temperature Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Modal Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Signal Integrity Analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Optical design analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Technical Specification | External interface1 |  |  |  |  |  |  |  |  |  |  |  |  |
| External interface2 |  |  |  |  |  |  |  |  |  |  |  |  |
| External interface3 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Spec1 |  |  |  |  |  |  |  |  |  |  |  |  |
| Spec2 |  |  |  |  |  |  |  |  |  |  |  |  |
| Spec3 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parameter1 |  |  |  |  |  |  |  |  |  |  |  |  |
| Parameter2 |  |  |  |  |  |  |  |  |  |  |  |  |
| Parameter3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Parameter4 |  |  |  |  |  |  |  |  |  |  |  |  |
| Parameter5 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Maintenance requirement (Calibration, pressurisation etc) |  |  |  |  |  |  |  |  |  |  |  |  |
| Endurance / Duty cycle |  |  |  |  |  |  |  |  |  |  |  |  |
| MTBF |  |  |  |  |  |  |  |  |  |  |  |  |
| MTTR |  |  |  |  |  |  |  |  |  |  |  |  |
| Technical Life |  |  |  |  |  |  |  |  |  |  |  |  |
| Calendar Life |  |  |  |  |  |  |  |  |  |  |  |  |

**ACP Compliance:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Certification Milestone (Rig Int, A/c Int, DFT, User trials, Production, Modification etc)** | **ACP section** | **Compliance status** | **Waivers, if any (ref)** | **Remarks** |
|  |  |  |  |  |
|  |  |  |  |  |

**Note 1**: The above tables are indicative. The rows and columns that are not applicable to the project may be removed and any other relevant rows/ columns may be added as applicable to the project. All the tests/analyses/ certifications completed till date shall be indicated in the tables. Tables are to be prepared LRU-wise (indigenous and bought-out). For bought out items, the compliance as mentioned in the OEM documents shall be populated in the tables.

**Note 2**: All applicable rows as per QTP, Tech Spec and ACP shall be retained in the table even if the test/ analysis is currently not to be carried out and will be done in future.

**Software**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sl No** | **Activity/ Artefact** | **Latest updated Doc/Report avl?** | **IV&V status** | **Document approval status** | **Remarks** | **PSAC Ref.** |
| 1 | Software Certification Plan |  |  |  |  |  |
| 2 | Software Requirement Document |  |  |  |  |  |
| 3 | Software Requirement Review |  |  |  |  |  |
| 4 | Software Design Document |  |  |  |  |  |
| 5 | Software Design Review |  |  |  |  |  |
| 6 | Algorithm Validation |  |  |  |  |  |
| 7 | Source Code |  |  |  |  |  |
| 8 | Code walkthrough report |  |  |  |  |  |
| 9 | Software module/ CSCI/ HSI level Test cases  |  |  |  |  |  |
| 10 | Integration level test cases  |  |  |  |  |  |
| 11 | HILS test cases |  |  |  |  |  |
| 12 | Bidirectional Traceability Matrix |  |  |  |  |  |
| 13 | Static Analysis (memory, stack, bus load, coding standard, complexity, data/control coupling, sw & Hw architecture compatibility) |  |  |  |  |  |
| 14 | Dynamic analysis (WCET, timing, coverage, exception handling, run time errors) |  |  |  |  |  |
| 15 | Software Test Reports |  |  |  |  |  |
| 16 | Version Description Document |  |  |  |  |  |
| 17 | IV & V recommendations |  | NA |  |  |  |
| 18 | SPR, SCR, SCN |  |  |  |  |  |
| 19 | Test rig Software |  |  |  |  |  |

**FPGA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sl No** | **Activity/ Artefact** | **Latest updated Doc/Report avl?** | **IV&V status** | **Document approval status** | **Remarks** | **PHAC Ref** |
| 1 | Hardware Certification Plan |  |  |  |  |  |
| 2 | Hardware Requirement Document |  |  |  |  |  |
| 3 | Hardware Requirement Review |  |  |  |  |  |
| 4 | Hierarchical schematics, Block diagrams, Floor planning |  |  |  |  |  |
| 5 | Hardware Design Review |  |  |  |  |  |
| 6 | Algorithm Validation |  |  |  |  |  |
| 7 | VHDL Code, RTL code, Finite State machine |  |  |  |  |  |
| 8 | Code walkthrough report |  |  |  |  |  |
| 9 | In-circuit test cases  |  |  |  |  |  |
| 10 | Netlist, Synthesis report, Place and Route report |  |  |  |  |  |
| 11 | Elemental analysis/ Code coverage |  |  |  |  |  |
| 12 | Timing and clock skew analysis, Logic analysis, resource analysis |  |  |  |  |  |
| 13 | Functional failure path analysis, common mode failure analysis |  |  |  |  |  |
| 14 | Pin details with signal mapping |  |  |  |  |  |
| 15 | In target at speed Test Report |  |  |  |  |  |
| 16 | IV&V recommendations |  | NA |  |  |  |
| 17 | Version Description Document |  |  |  |  |  |
| 18 | PRs and CNs |  |  |  |  |  |
| 19 | Test rig software |  |  |  |  |  |