Template No. CEMILAC_SYSGP_ACP_19 ACP for <LRU/SYSTEM Name> for <Platform Name>

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Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>			
			Issue	Revision	Date	
				Page	No: 2 of 11	

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.

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>				
			Issue	Revision	Date		
Page No: 3 of							

Revision Record Sheet

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Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>			
			Issue	Revision	Date	
	Page	No: 4 of 11				

Table of Contents

List of Appendices

List of Figures

List of Tables

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>			
			Issue	Revision	Date	
				Page	No: 5 of 11	

1.0 INTRODUCTION

1.1 Purpose

<Purpose for making this plan. For ex. To obtain CEMILAC certification for flight trials and service use induction of xxx store on military airborne platforms like xxx, xxx, xxx (scope of the certification>

1.2 Scope

<Scope of the plan to the project i.e. whether this plan is applicable to single CSCI, set of CSCIs, whole system or system of systems.>

- 1.3 Document Identification <Number, issue and release date>
- 1.4 Applicable Documents <References while making this document - specifications or standards or any other document or report>

2.0 SYSTEM OVERVIEW

2.1 System Description

<Top level functional description of system. Max 1-2 pages. Give overall details to understand the context of the software under certification.>

SI No	Software characteristic	Overall Information	Within the scope of current SCP (Y/N)
1	Name of the System		
2	Name of the LRU		
3	Number of processing elements in the LRU (DSP, μΡ, μC, SoC, FPGA, CPLD etc)		
4	Number CSCIs in each processor		
5	Name of CSCIs in each processor		
6	Criticality of each CSCI		
7	Complexity of each CSCI (Low/ Medium/ High)	<number level<br="" of="" top="">functionalities implemented, complexity of algorithms/ computations, no. of high- impact decisions made, etc can be used to estimate the complexity of CSCI></number>	
8	Implementation Language of each CSCI		
9	COTS components that are part of each CSCI	<libraries, bsp,="" opengl,<br="" rtos,="">auto-generated code etc></libraries,>	

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>			
			Issue Rev		sion	Date
					Page	No: 6 of 11

10	Standard compliance of each CSCI		
	Coding etc)		
11	Development agency for each CSCI		
12	IV & V agency for each CSCI		
13	Certification agency for each CSCI	<cemilac, dgca,="" msqaa,<="" td=""><td></td></cemilac,>	
		DGQA, NAQAS, foreign, etc may	
		be mentioned as applicable>	
14	Previously Developed software		
	components used in conjunction		
	with newly developed CSCIs		
15	Parameter Data Items	<config files,="" look="" tables,<="" td="" up=""><td></td></config>	
		Calibration data, adaptation data	
		etc>	
16	Field Loadable software		
17	User modifiable software		
18	IV&V Team constitution (as per		
	IMTAR-21, Subpart C6)		
19	Agency for integration of all the		
	CSCIs of the LRU/ system		

2.2 System Architecture

<Distribution of top level functionalities described in Sec 2.1, to programmable devices in the system – in software, FPGAs etc. This can be derived from SARAD.>

2.3 Processors

<Any special features that are being used by the software>

2.4 Hardware / Software Interfaces

<The types of interfaces using which software interacts with other components - like other CSCIs (Ex: shared memory, DPRAM etc), hardware (Ex: timer interrupts), external systems (Ex: MIL 1553B, ARIC, RS 422 etc), operator (Ex: touchscreen, brake pedal). All the data elements need not be listed. Top level information may be provided (For ex: health data, handshake, Air data, target data, Trigger press etc). Context diagram may also be given in place of textual description.>

2.5 System Safety Features

<Safety specific special provisions in the system, if any. For ex: Geo-lock for arming of warhead, provision for severance of dunking SONAR in case unable to retrieve, emergency hardware path for bypassing software processing, manual over-ride / take-over etc. These help in deciding importance of functions / outputs>

3.0 SOFTWARE OVERVIEW

3.1 Software Description

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>			
			Issue Revisi		sion	Date
					Page	No: 7 of 11

<Brief description of software under certification and major functionalities. Max 2-3 pages>

3.2 Safety and Partitioning (Resource Sharing, Redundancy, Fault Tolerance)

<The plan to mitigate risks, implement and verify safety requirements (For ex: multiple interlocks, fail-safe logics, containment of safety critical failures etc). If any ground software (test, diagnostics, maintenance, data loading/ milking etc) resides in the same memory space, how is the separation ensured?>

3.3 Technology

<The technology used in software development – OOPS, Model based, AI/ML etc>

3.4 Timing and Task Scheduling

<Real time transactions required - Major/ minor cycles, interrupts with priorities, how asynchronous transactions are responded to, how response times to external systems is ensured etc >

4.0 SOFTWARE LIFECYCLE

4.1 Processes and Activities

< Activities planned as part of software development, verification, certification, postdelivery maintenance, and re-certification. (For ex: Planning, Requirements gathering, Requirement review, Software architecture design, Software detailed design, Algorithm validation, testing at various rigs/ facilities etc.) Inputs, outputs and transition criteria for each process. Verification planned for each process. How changes to artefacts are ratified and released, how it is ensured that the plans are adhered to, How the development and verification stage completion are conveyed to certification authority, what are the IV&V activities for re-certification of modified software to ensure continued standard compliance etc >

4.2 Team Responsibilities

<Define the development team, V&V team and IV&V team (by departments or designations - not by name). IV&V team composition shall be as per Subpart C6 of IMTAR-21. Identify level of involvement of each team in the development/verification processes (a table similar to that in Sec 6.0 may be used). This should cover aspects like person(s) authorised to raise/ close issues, authenticate requirement/ design changes, point of contact for certification liaison etc. >

4.3 Agencies involved

<Agencies involved and their roles and responsibilities for activities other than shown in 4.2. For ex: a/c integration, flight trials, user trials, QA coverage, any outsourced development/ verification activity, any outsourced facility like tools/testing/modelling etc.>

4.4 Future Enhancement Plan

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>					
			Issue Re		Issue Revision		ion	Date
					Page	No: 8 of 11		

< Planned enhancement of functionalities or Foreseeable application/deployment of this software in other systems/ platform/environment, and corresponding delta certification that may be required. >

5.0 CERTIFICATION CONSIDERATIONS

5.1 Software criticality Level Determination

5.1.1 System Safety Assessment Results

<As per the SSA, the worst case failure mode(s) resulting in safety/ mission failure and the criticality attributed to the system>

5.1.2 Critical Software Functions

<Criticality classification of the software i.e. the extent of contribution by software towards the critical failures of the system. The software criticality may be same as system criticality or a level lower – with justifications. Different CSCIs may have different criticality levels ascribed to them>

5.2 Certification Basis

<Basis for certification of ab-initio software, COTS software, BSP, Drivers, OS, Bootloader, Tool qualification, auto generated code, previously developed software etc – For each of the categories, list the processes to be carried out and evidences to be submitted for certification (These can be referenced from Sec 4.1). Mention if any certification credits are to be read-across from similar systems based on software re-use. >

5.3 Stages of Certification

<In case stage-wise certification is sought for Software testing, integration, trials and deployment milestones. This should cover version baselining for system SOF/QT tests, rig integration clearance, a/c integration clearance, flight trial clearance, dummy drop, Carriage flight trials, open loop trials, simulated target, actual target, mission mode, safe mode, final production clearance etc. List out the IV&V activities/ certification credits (extent of reviews, analysis, testing etc) planned for each of the stages. For each stage, the proposed activities can be referenced from Section 4.1 >

SI.No	Stage of Certification	Activities to be complied	Artefacts submitted	to	be
	Rig Integration clearance	Planning review Requirement Review Design Review Code Walkthrough HLR based CSCI level/ HSI testing			
	A/c Integration clearance				
	Development flight clearance				
	Production/ Service use clearance				

Ex:

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>		
			Issue	Revision	Date
Page No: 9 of					No: 9 of 11

Change/ clearance	modifications	

For air launched weapons, the stages of clearance are - CFT, Dummy drop, instrumented store launch, RFT without warhead, RFT with warhead, Production clearance and change management.

6.0 Software Lifecycle Data

<Software Lifecycle Data planned for this project - Sample table attached. To be customised as per project requirements.

Note : The following three documents are the basis for determining Software criticality and software requirements. These shall be submitted before Plan for certification is finalised.

- 1. System/ Functional Requirement Document
- 2. System Architecture and Requirements Allocation Document (SARAD)
- 3. System Safety Assessment (SSA) report

SI	SDLC phase	Document Name CEMILAC leve		
NO			involvement*	
1	Planning	Software certification Plan	A	
2		Software Quality Assurance Plan	1	
3		Software Development Plan	1	
4		Software Verification Plan	A	
5		Software Config Mgmt Plan	1	
6	Requirements	Software Requirement Document	R	
7	analysis	Interface Control Document	Ι	
8	Design	Software Design Document	1	
9	Coding	Source Code	R	
		Code walkthrough report	R	
10	Testing	CSU level(unit) test plan/procedure	1	
		CSU/Unit Test Report (UTR)		
11		CSCI level Test cases and Procedures	R	
12		CSCI level Test Report	1	
13		Hardware Software Integration Test Procedure(HSITP		
14	Hardware Software Integration Test Report (HSITR)			
		 Tool Verification Procedure 		
		 Build Making & loading Procedure 		
		 BSP Validation Procedure 		
	RTOS Validation Procedure			
15	Tool Verification Report		1	
		BSP Validation Report		

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>		
			Issue	Revision	Date
				Page	e No: 10 of 11

16	All	Software Verification Report (including static and	1
		Dynamic analyses)	
17	All	Software Quality Assurance Report	I
17	All	Bi-directional Traceability Matrix	1
18	Certification	IV&V Recommendation	1
19	Certification	Software accomplishment summary (compliance to	А
		SCP)	
19	Certification	Version Description Document	А
20	Change	SPR, SCR, SCN, Impact analysis report	A (SCN)
	Management		

* A-Approval R-Review I- for information

7.0 ABBREVIATIONS

Prepared By	Checked By	Approved By	Doc No. <document number<="" th=""></document>		
			Issue	Revision	Date
Page No					No: 11 of 11