

भारत सरकार/Government of India
अंतरिक्ष विभाग/Department of Space
यू.आर. राव उपग्रह केंद्र /U.R.RAO SATELLITE CENTRE
एच.ए.एल. एयरपोर्ट रोड, विमानापुरा डाक/HAL Airport Road, Vimanapura Post,
बेंगलूरु/BENGALURU – 560 017

Ref No.: ISIP 2026-0-68574

14.07.2026

अंतरक्रियात्मक स्वचालित परीक्षण क्रियाविधि प्रणाली के लिए इच्छा की अभिव्यक्ति

(ई ओ आई) के लिए आमंत्रण- के संबंध में।

Invitation for Expression of Interest [Eoi]

for Interactive Automated Test Procedure System -Reg

यू.आर.राव उपग्रह केंद्र (यू.आर.एस.सी), (पूर्व में इसरो उपग्रह केन्द्र के रूप में जाना जाता था) सभी भारतीय उपग्रहों की अभिकल्पना, विकास, संविर्चन तथा परीक्षण के लिए भारत सरकार के अंतरिक्ष विभाग के तहत भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) का अग्रणी केंद्र है। वर्तमान में यू आर एस सी स्वदेशी भागीदारों जो तकनीकी रूप से सक्षम सॉफ्टवेयर विकास संगठन, जिनके पास प्रासंगिक विशेषज्ञता हो, जैसे कि सॉफ्टवेयर, इंजीनियरिंग सॉफ्टवेयर, वर्कफ़्लो ऑटोमेशन सिस्टम, डेटाबेस-आधारित एप्लिकेशन, या इसी तरह के सॉफ्टवेयर सिस्टम हो उनको आमंत्रित दे रहा है।

U. R. Rao Satellite Centre [URSC] (Formerly known as ISRO Satellite Centre), of Indian Space Research Organization [ISRO] under Department of Space, Government of India is responsible for Design, Development, Fabrication and Testing of all Indian made Satellites. URSC is currently inviting indigenous Industry Partners for technically competent software development organizations with relevant expertise software, engineering software, workflow automation systems, database-driven applications, or similar software systems.

यह प्रस्ताव विशेषतः केवल उन भारतीय उद्योगों से इच्छा की अभिव्यक्ति प्राप्त करने के लिए है जिनके पास तकनीकी अवसंरचना और क्षमता है और जो तकनीकी रूप से सक्षम सॉफ्टवेयर विकास संगठन हैं, जिनके पास प्रासंगिक विशेषज्ञता है, जैसे कि सॉफ्टवेयर, इंजीनियरिंग सॉफ्टवेयर, वर्कफ़्लो ऑटोमेशन सिस्टम, डेटाबेस-आधारित एप्लिकेशन, या इसी तरह के सॉफ्टवेयर सिस्टम है। वे विक्रेता जो "इंटरैक्टिव ऑटोमेटेड टेस्ट प्रोसीजर सिस्टम" के लिए योग्यता प्राप्त करने और उसे प्रदान करने में रुचि रखते हैं, वे इसमें भाग ले सकते हैं। "इंटरैक्टिव ऑटोमेटेड टेस्ट प्रोसीजर सिस्टम" की आवश्यकताएं इस दस्तावेज़ के परिशिष्ट में संलग्न हैं।

This proposal is to invite Expression of Interest exclusively from Indian industries having technical infrastructure and capability for technically competent software development organizations with relevant expertise software, engineering software, workflow automation systems, database-driven applications, or similar software systems. Those vendors who are interested to qualify & deliver the acceptable Interactive Automated Test Procedure System may respond to this enquiry. The requirements of Interactive Automated Test Procedure System are attached as Annexure to this document.

"इस संबंध में, यूआरएससी भारतीय उद्योगों/विक्रेताओं से इच्छा की अभिव्यक्ति (ईओआई) आमंत्रित करता है, जिनके पास या जो इंटरैक्टिव ऑटोमेटेड टेस्ट प्रोसीजर सिस्टम के पूर्ण पैमाने पर सॉफ्टवेयर विकास की सुविधा है, और जो यूआरएससी को स्वीकार्य सॉफ्टवेयर विकास और इंटरैक्टिव ऑटोमेटेड टेस्ट प्रोसीजर सिस्टम सॉफ्टवेयर के कार्यान्वयन की सुविधा प्रदान कर सकते हैं।"

In this regard, URSC invites the Expression of Interest [EOI] from Indian Industries/Vendors who have or are in the process of establishing full-fledged software development of Interactive Automated Test Procedure System and deliver the acceptable software development and realization of Interactive Automated Test Procedure System Software to URSC.

ई ओ आई का मूल्यांकन बोलीकर्ताओं के अनुभव, कार्यक्षेत्र की जानकारी, सुविधा अवसंरचना, प्रस्तावित कार्यप्रणाली एवं कार्य योजना, कुशल जनशक्ति और उद्योग की वित्तीय सुदृढ़ता के आधार पर किया जाएगा।

The EOI will be evaluated on the basis of bidder's experience, understanding of scope of work, facility infrastructure, proposed methodology and work plan, skilled manpower and the financial strength of the industry.

यू.आर.एस.सी आवश्यकता पड़ने पर ई.ओ.आई. की प्रक्रिया रद्द करने या अतिरिक्त सूचनाएँ/ब्यौरे मांगने के लिए इसे पुनः जारी करने का अधिकार रखता है।

URSC reserves the right to cancel/re-issue the process of EOI if the necessity so arises or to seek further information/details.

किसी भी प्रकार की भ्रष्ट या कपटपूर्ण गतिविधियों में लिप्त पाई गई कंपनियों/फर्मों को निविदा प्रक्रिया में भाग लेने से रोक दिया जाएगा और उनके ई ओ आई दस्तावेज़ पर विचार नहीं किया जाएगा।

Companies/Firms, if found to have indulged in any corrupt or fraudulent practices, will be debarred taking part in the Tendering process and their EOI Document will not be taken up for consideration.

इच्छा की अभिव्यक्ति के साथ-साथ आपूर्तिकर्ताओं/फर्मों को निम्नलिखित जानकारी भी विस्तार से प्रस्तुत करनी चाहिए:

Along with "Expression of Interest" Suppliers/ Firm[s] should furnish the following information also in detail:

1. कंपनियों का पंजीकृत पता के साथ, फोन, फैक्स, ई मेल, वेब आदि।

Registered address of the Companies with Phone, Fax, Email, Web, etc.

2. कंपनी/संगठन की स्थिति (स्वामित्व/साझेदारी/निजी/सार्वजनिक लिमिटेड आदि) के साथ मालिक, भागीदारों, निदेशक मंडल आदि के नाम और पता।

Company/Organization Status (Proprietary/Partnership/Private/Public Ltd. etc.) with Name and Address of Proprietor, Partners, Board of Directors, etc.

3. सहयोगी: (ए) भारतीय (बी) विदेशी।

Associates: (a) Indian (b) Foreign.

4. पिछले 3 वर्षों के दौरान प्रमुख ग्राहकों के पूर्ण पता और उनके संपर्क व्यक्ति की सूची।

List of Major Customers during the last 3 Years with full address and their Contact Persons.

5. स्वामित्व वाली/उपलब्ध अवसंरचना सुविधाओं का विवरण।

Details of Infrastructure Facilities owned / available.

6. कंपनी के प्रमुख शेयरधारकों के नाम और पते तथा उनकी शेयर पूंजी का प्रतिशत।

Names and addresses of the major Shareholders of the Company and the percentage of their share capital.

7. नवीनतम वार्षिक रिपोर्ट की प्रति के साथ पिछले 3 वित्तीय वर्षों के लिए पूंजी और कारोबार।

Capital and Turnover for the preceding 3 Financial Years with copy of latest Annual Report.

8. उपलब्ध वित्तीय क्षमता /क्रेडिट सुविधाएं।

Financial Capacity/Credit facilities available.

9. बैंकों का नाम , पता व खाता विवरण।

Name and Address of Bankers and Bank details

10. व्यापार संघ जिससे उद्योग जुड़ा/ जुड़े हैं।

Trade Association to which Industry/ies belong to.

11. संस्था/बिक्री/माल व सेवा कर पंजीकरण संख्या।

Establishment/Sales/Goods & Service Tax Registration Number.

12. व्यापार का प्रकार।

Nature of Business

13. कर्मचारियों की संख्या सहित संगठन की संरचना।

Organization structure along with no. of employees.

14. बैंकों द्वारा जारी फर्म की सॉल्वेंसी/वित्तीय क्षमता।

Solvency/Financial capacity of the Firm issued by their Bankers.

15. उद्योगों की अन्य कोई प्रासंगिक जानकारीयाँ।

Any other information the Industry/ies consider relevant.

16. सामर्थ्य और कमियों के क्षेत्रों को स्पष्टतः प्रकट करते हुए कंपनी/कंपनियों के प्रोफाइल

The Profile of the Company/ies clearly bringing out the areas of Strength and Weakness.

17. ई ओ आई में भाग लेने के लिए तकनीकी और संगठनात्मक सामर्थ्य का स्व-मूल्यांकन।

Self-Assessment on Technical and Organizational Competence to take part in the EOI.

18. ई ओ आई में उल्लिखित प्रत्युत्तर प्रपत्र

Response forms as mentioned in the Eoi.

ईओआई प्रतिक्रिया को पूरा करना /Completion of the EOI Response:

- a) ईओआई दस्तावेजों के सभी अनुदेशों: निबंधन और शर्तों: प्रपत्रों: आवश्यकताओं और अन्य सूचनाओं का सावधानीपूर्वक अध्ययन करने की कंपनी/ फर्म को सलाह दी जाती है। ईओआई दस्तावेजों का सावधानीपूर्वक अध्ययन और जांच के बाद इसके निहितार्थों को पूरी तरह समझ कर ईओआई प्रस्तुत करना पड़ेगा।

The Company/Firms are advised to study all the instructions; Terms and Conditions; Forms; Requirements and other information in the EOI documents carefully. The submission of EOI shall be deemed to have been done after a careful study and examination of the EOI documents with full understanding of its implications.

- b) इस ई ओ आई का जवाब सभी मामलों में पूर्ण और संपूर्ण होना चाहिए। ई ओ आई दस्तावेज द्वारा आवश्यक सभी जानकारी प्रस्तुत करने में विफलता या ईओआई दस्तावेजों के हर पहलू के प्रति

पर्याप्त रूप से उत्तरदायी न होने वाला प्रस्ताव प्रस्तुत करना, कंपनी/फर्म के जोखिम पर होगा और इसके परिणामस्वरूप दस्तावेज को अस्वीकार किया जा सकता है।

The response to this EOI should be full and complete in all respect. Failure to furnish all the information required by the EOI document or submission of proposal not substantially responsive to the EOI documents to every aspect will be at the risk of the Company/Firms and may result in rejection of the document.

- c) प्रस्तुत किए गए ईओआई के सभी पृष्ठों पर क्रमांक होनी चाहिए और अधिकृत हस्ताक्षरकर्ता द्वारा हस्ताक्षरित होना चाहिए।

All the pages of the EOI submitted must be numbered and signed by the authorized signatory.

- d) ई ओ आई के संबंध में प्रचार करना सख्त वर्जित है और एजेंसी द्वारा प्रस्तुत किए गए ऐसे प्रचारित ईओआई को अस्वीकार किया जा सकता है।

Canvassing in connection with the EOI be strictly prohibited and such canvassed EOI submitted by the Agency are liable to be rejected.

क्रियाकलापों को अच्छी तरह समझने और यदि कोई संदेह हो तो उसका निवारण करने हेतु यू आर राव उपग्रह केन्द्र द्वारा एक पूर्व ई ओ आई बैठक का आयोजन किया जाएगा। तदुपरांत, आरएफपी में मांगे गए विवरण के साथ विक्रेताओं को इच्छा की अभिव्यक्ति की प्रतिक्रिया प्रस्तुत करना होगा।

A Pre-Eoi meeting will be arranged by U.R. Rao Satellite Centre, Bengaluru in order to have a better understanding of the activities involved, clarify doubts, if any. Subsequently, the vendor(s) shall submit the response to Expression of Interest along with the details sought in RFP.

विनिर्दिष्ट दिनांक के पहले पूर्व बोली बैठक में भाग लेने वाले प्रतिनिधियों के विवरण सुरक्षा स्वीकृति का प्रबंध करने हेतु तालिका – 1 में विनिर्दिष्ट संपर्क व्यक्ति को कृपया उपलब्ध करें। विक्रेता के प्रतिनिधि को पूर्व ई – ओ आई बैठक में भाग लेने हेतु “प्राधिकार पत्र” लाना होगा। बोली लगाने वाले/कंपनी/संगठन से सदस्य प्रतिनिधि की संख्या अत्यधिक केवल दो (2) (एक तकनीकी तथा एक वित्तीय) तक सीमित होना चाहिए।

Interested Vendor[s] may please provide the details of the representative[s] taking part in the Pre-Eoi meeting well in advance prior to dates specified in Table-1 to the Focal Point in order to arrange for Security clearance. Vendor[s] representative shall carry an “Authorization Letter” for attending the Pre-Eoi meeting. Member Representative shall be limited to maximum of two (2) per bidder/ company/ organization.

विक्रेता द्वारा पूर्व ई ओ आई पूछताछ, पूर्व बैठक की दिनांक के 05 दिन पहले psa_f@ursc.gov.in को एक प्रति अंकित करते हुए यू आर एस सी की ई मेल आई डी priyanka@ursc.gov.in पर पहुँचना चाहिए।

कृपया नोट करें कि किसी भी परिस्थिति में, पूर्व ई ओ आई के लिए पूर्वन/स्थगन के अनुरोध पर विचार नहीं किया जाएगा।

Pre-EOI Queries from vendor [s] shall reach URSC 5 days prior to date of Pre-EOI meeting to e-mail ID: priyanka@ursc.gov.in marking a copy to psf@ursc.gov.in. Please note that request for "Pre-ponement/postponement of Pre-EOI meeting" will not be entertained under any circumstances.

उपरोक्त सभी जानकारी के साथ इच्छा की अभिव्यक्ति नीचे दिए गए पते पर, उपरोक्त संदर्भ संख्या का उल्लेख करते हुए, नियत तिथि और समय तक पहुंच जानी चाहिए।

"Expression of Interest" with all the above information shall reach the address given below, quoting the above Reference Number on or before the due date & time.

वरिष्ठ प्रधान, क्रय व भंडार/Sr. Head, Purchase & Stores

यू आर राव उपग्रह केंद्र/U R Rao Satellite Centre

एचएएल एयरपोर्ट रोड/HAL Airport Road

विमानपुरा पोस्ट, बेंगलुरु / Vimanapura Post, Bengaluru-560 017

कर्नाटक, भारत/Karnataka, India

कृपया ई ओ आई बैठक संख्या का उल्लेख करते हुए अपने स्पष्टीकरण psf@ursc.gov.in को अंकित करते हुए priyanka@ursc.gov.in मेल पर भेजें। पूर्व ई ओ आई बैठक में भाग लेने हेतु अनुरोध **24.07.2026 (Friday) 16:00** बजे IST या उससे पहले यहाँ उल्लिखित ई-मेल पर पहुँच जाना चाहिए। तथापि ई ओ आई का जवाब (हार्डकॉपी) केवल ऊपर उल्लिखित डाक पते पर ही भेजा जाएगा। ई मेल व फैक्स कोटेशन स्वीकार्य नहीं हैं। नियत तिथि और समय के बाद प्राप्त कोटेशन स्वीकार्य नहीं हैं।

Please address your clarifications quoting the EOI number to e-mail: priyanka@ursc.gov.in marking a copy to psf@ursc.gov.in. Request for participation in Pre-EOI meeting shall reach on or before **24.07.2026 (Friday) 16:00** Hrs IST to the e-mail ids mentioned herein. However, response to EOI (hardcopy) shall be sent to above mentioned postal address only. E-mail & Fax quotations are not acceptable. Quotation received after due date & time are not acceptable.

तालिका /Table 1:

ई ओ आई विवरण की प्रस्तुति Submission of EOI Details	
स्पष्टीकरण प्रस्तुत करने की अंतिम तिथि Last date of submission of clarification	24/7/2026 16:00 Hrs IST
प्री-ईओआई बैठक (सम्मेलन कक्ष, स्वागत कक्ष, यू आर एस सी में): Pre-EOI meeting (at DD ENCLAVE CONFERENCE HALL, URSC)	27/7/2026 14:00 Hrs IST
ईओआई प्रस्तुत करने की अंतिम तिथि Last date for submission of EOI	20.08.2026 14:00 Hrs IST
ई ओ आई की खुलने की तिथि Opening date of EOI	20.08.2026 14:30 Hrs IST

उपरोक्त सभी जानकारी के साथ इच्छा की अभिव्यक्ति **20.08.2026 @14:00 Hrs** बजे **IST** तक या उससे पहले उपरोक्त संदर्भ संख्या का उल्लेख करते हुए, नीचे अधोहस्ताक्षरी को पहुँच जानी चाहिए। यह प्रस्ताव पूर्व-ईओआई अर्हता के रूप में आरंभ किया गया है। यूआरएससी बिना कोई कारण बताए सभी या किसी भी ऐसी इच्छा की अभिव्यक्ति को स्वीकार या अस्वीकार करने का अधिकार सुरक्षित रखता है।

“Expression of Interest” with all the above information shall reach the undersigned, Quoting above Reference Number on or before **20.08.2026 @14:00 Hrs IST**. This proposal is initiated as a Pre-EOI Qualification. URSC reserves the right to accept or reject all or any such “Expression of Interest” without assigning any reasons what so ever.

इस ई ओ आई के लिए यदि कोई शुद्धिपत्र/अनुशेष हो तो इसे हमारे वेबसाइट www.isro.gov.in पर डाला जाएगा।

Addendum/Corrigendum, if any, to this EoI, shall be hosted at our website, www.isro.gov.in

डिस्क्लाइमर: इस आमंत्रण के अंग्रेजी और हिन्दी अनुवाद में विसंगति या असंगति यदि हो तो अंग्रेजी पाठ को सही माना जाएगा।

Disclaimer: The English version shall always prevail in case of any discrepancy or inconsistency between English and Hindi version of this Invitation.

Sd/-

व. प्रधान, क्रय व भंडार /Sr. Head, Purchase & Stores

INTERACTIVE AUTOMATED TEST PROCEDURE (IATP) SYSTEM

Expression of Interest (EOI) July 2026

**U R RAO SATELLITE CENTRE (URSC)
Department of Space, Government of India,
HAL Airport Road, Vimanapura Post, Bengaluru – 560017**

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Acronyms and Abbreviations

The following acronyms and abbreviations used in this document shall have the meanings assigned below. These definitions shall apply throughout the document unless explicitly stated otherwise.

Acronym	Description
IATP	Interactive Automated Test Procedure Generation
MDB	Microsoft Access Database File
TM	Telemetry
TC	Telecommand
CDB	Command Database
UUT	Unit Under Test
GUI	Graphical User Interface
DOCX	Microsoft Word Document Format
PDF	Portable Document Format
URSC	U R Rao Satellite Centre
STEC	Special Technical Evaluation Committee
SDP	Software Development Plan
SRS	Software Requirement Specification
SDD	Software Design Description
API	Application Programming Interface
RFP	Request for Proposal
PO	Purchase Order
LD	Liquidated Damages
AMC	Annual Maintenance Contract
POC	Proof of Concept
OWASP	Open Web Application Security Project
RTN	Return
GND	Ground
SGRP	Signal Ground Reference Point
MIL-STD-1553	Military Standard 1553 Communication Bus
RB	Raw Bus
EID	Electrical Identification
OS	Operating System
EOI	Expression of Interest

INTERACTIVE AUTOMATED TEST PROCEDURE (IATP) SYSTEM

1 Introduction

U R Rao Satellite Centre (URSC), Bengaluru, is responsible for the design, development, realization, integration, testing, and deployment of satellite systems for scientific, technological, operational, and national missions.

The Assembly, Integration and Testing (AIT) activities of spacecraft require preparation and execution of a large number of subsystem test procedures during various phases of spacecraft realization. These procedures are generated using engineering databases, telemetry databases, telecommand databases, and subsystem-specific test procedure templates. The current process involves significant engineering effort for validation, updating, and generation of test procedures.

To improve efficiency, standardization, traceability, and quality of spacecraft testing activities, URSC intends to realize an Interactive Automated Test Procedure (IATP) System. The proposed software shall automate the generation and validation of subsystem test procedures using engineering databases and standardized templates while retaining necessary user interaction and engineering control.

This Expression of Interest (EOI) is intended to identify technically competent software development organizations with relevant expertise in enterprise software, engineering software, workflow automation systems, database-driven applications, or similar software systems. The EOI process shall assess the technical capability of interested organizations through evaluation of Proof of Concept (PoC) demonstration prior to issuance of a detailed Request for Proposal (RFP).

2 Objective

The objective of this EOI is to invite interested software development organizations to participate in the realization of the Interactive Automated Test Procedure (IATP) System for spacecraft AIT activities.

The EOI aims to:

1. Assess the technical capability, experience, and organizational competence of interested vendors.
2. Evaluate practical implementation capability through a Proof of Concept (PoC) demonstration.
3. Shortlist technically qualified vendors for participation in the subsequent Request for Proposal (RFP) process.

3 System & Functional Requirements of the Proposed IATP System

Provide a comprehensive, server-based graphical application that enables the automated generation of satellite subsystem test procedures using structured data inputs (MDB, TM, TC files) and versioned standard templates with user interactivity and embedded validation logic at every procedural phase.

The templates are generic templates used in a project. The number of templates might increase as per project requirements and the IATP software must be capable to generate any test procedure if a template is provided.

Application Deployment Architecture

1. The IATP application shall be deployed on a **centralized Linux-based application server** within the organizational network.
2. Users shall access the application through **web browsers from client machines over the network**.
3. The client systems used for accessing the application shall be **Windows-based user machines with Windows 11 or above**, equipped with supported web browsers such as **Google Chrome, Microsoft Edge, or Mozilla Firefox**.

3.1 Technical Requirements

Parameter	Specification
Application Model	Linux Server-hosted application with browser-based graphical user interface (GUI).
Supported Input Formats	Microsoft Access Database (.mdb) – Access 2003 and above, Microsoft Excel Workbook (.xlsx) – Excel 2007 and above for TM and TC files, Microsoft Word Document (.docx) – Word 2007 and above for Subsystem Test Procedure Templates
Output Format	Microsoft Word Document (.docx) – Word 2007 and above, and PDF format with preservation of table structures, formatting, headers, and section hierarchy
Browser Compatibility	Shall be operable on Google Chrome, Microsoft Edge, and Mozilla Firefox browsers supporting latest stable versions and last two major releases available at the time of deployment
System Requirements	Final system configuration, server specifications, and technology stack shall be finalized during SRS phase in consultation with the vendor.
Backup & Recovery	The system shall support automated backup of configuration, alias repository, generated procedures, and user session data.

The vendor shall size and recommend server hardware, storage, and network configuration to ensure stable performance for a minimum of 50 concurrent users.

3.2 Application Security& Data Confidentiality

The IATP system shall comply with secure coding practices and adhere to OWASP guidelines.

The application shall be protected against common web vulnerabilities.

All MDB, TM, TC files, subsystem templates and generated test procedures shall be treated as confidential.

Vendor shall not share source code and test data to third party and all details are IPs of URSC. Non-Disclosure Agreement (NDA) as specified in Terms and conditions are applicable.

The vendor shall not copy or store project data outside authorized environments

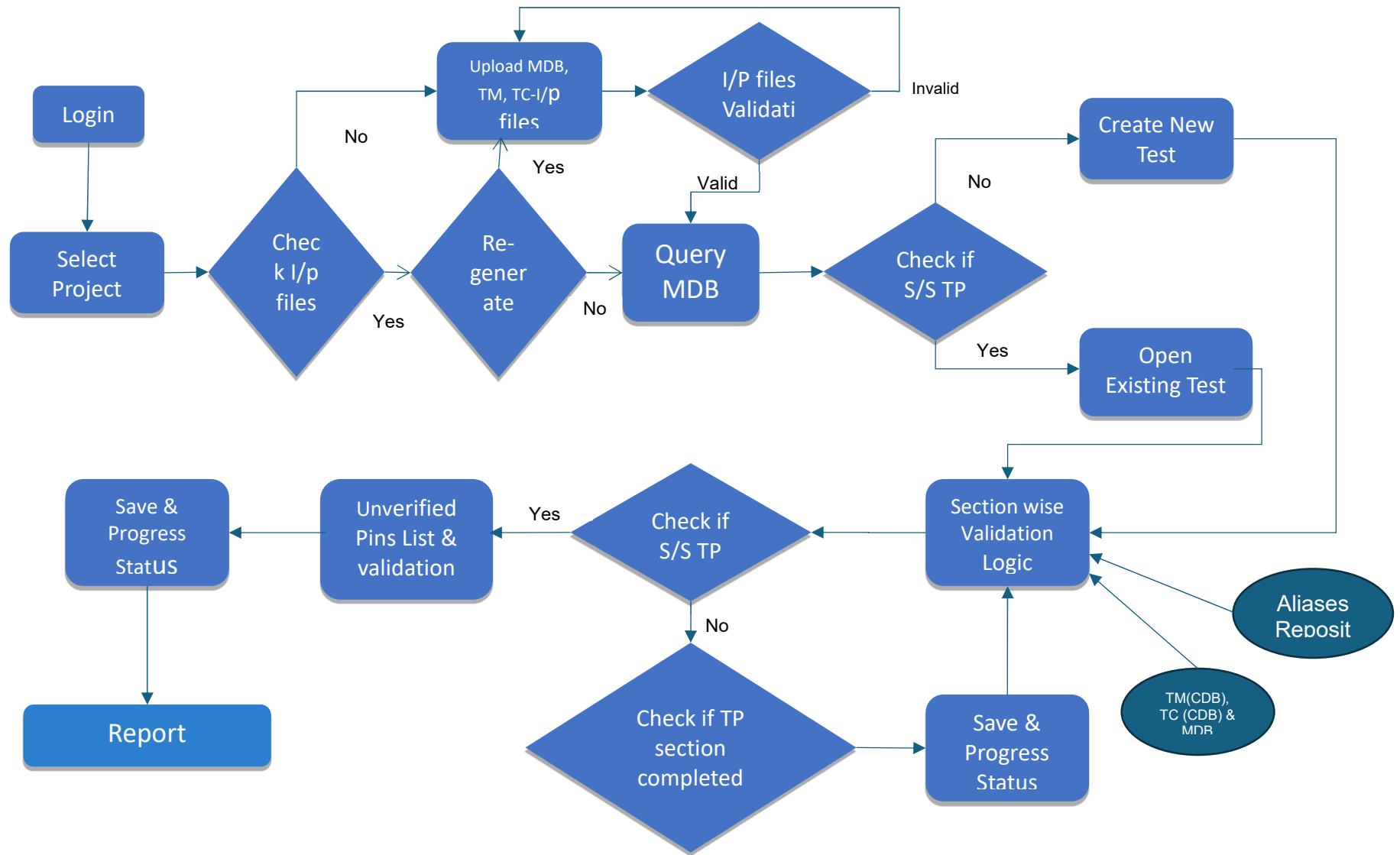
3.3 Interactive Automated Test Procedure Generation Workflow

1. The user shall begin by entering the **Spacecraft Name**.
2. If the spacecraft does not already exist in the system, the user shall be prompted to upload MDB, TM, and TC input files. (**As per Section 4.4**)
If the spacecraft already exists, the system shall prompt the user to either:
 - Use previously stored input files, or
 - Upload updated input file(s) (MDB and/or TM and/or TC).
3. Upon successful upload, the system shall **query the MDB** to identify all **subsystems and associated Unit IDs** available for the spacecraft.
4. The user shall select the **subsystem** for which the test procedure is to be generated.
5. **Upon subsystem selection, the system shall determine the test procedure status as follows:**
 - If a completed test procedure exists:
 - Prompt for regeneration only if input files have been updated; otherwise notify that the procedure is already generated.
 - If a partially completed test procedure exists:
 - Prompt for regeneration if input files have been updated; otherwise resume from the last saved state.
 - If no test procedure exists:
 - Navigate to the central template repository and prompt the user to select the required subsystem template and version.

6. At each section (Receive Inspection, Passive Checks, Pre-Power, Power-On, Functional), when a table is encountered, the system shall perform logic-based validation checks as defined in **Section 4.5** and prompt the user via GUI to verify, modify, or confirm the data.
7. Upon completion of validation across all sections, the system shall generate an Unverified Pins Table and prompt the user to either confirm intentional exclusion or include the pin in an appropriate section.
8. The system shall maintain and track **section-wise progress** for the selected subsystem and version. (**As per Section 4.6**)
9. The system shall Show color-coded tabs to indicate completion status of each section of test procedure.
10. For each spacecraft, the system shall also maintain a **summary status** indicating:
 - Number of test procedures generated,
 - Number of procedures in progress,
11. The system shall maintain comprehensive logs for each test procedures defined in **Section 4.9**

This workflow ensures structured selection, traceability, and progress management across spacecraft, subsystems, and test procedure versions.

IATP FLOW CHART:



4 Features of the Proposed IATP System

4.1 Web based Client Server system

Web-based system to be built for IATP system with following capacity.

1. Server shall be Linux based server
2. Final system configuration, server specifications, and technology stack shall be finalized during SRS phase in consultation with the vendor.
3. Storage management systems shall be provided by URSC
4. Database size for one project with all generated test procedure & input files shall be around 100 MB/project
 - (a) Input Files: ~20mb
 - (i) MDB: ~10mb(max)
 - (ii) TM: ~5mb(max)
 - (iii) TC: ~5mb(max)
 - (b) Test Procedures: ~70mb
 - (c) Log data: ~10mb
5. 20 projects & 50 users simultaneous handling
6. Security and Access privileges along with User credential at server/Application Level shall be integrated.
7. Maintenance of servers & storage systems provided by URSC will be done by URSC.
8. Software shall provide options to system administrators to backup/restore data.

4.2 Authentication and Access Control

The system shall implement:

- 1) Secure login mechanism
- 2) Role-based access control (RBAC)
 - a) Basic login system with roles:
 - i) **Admin:**
 - (1) Create New project or Approve request for project creations
 - (2) Assign PM/DPD for the respective project.
 - (3) Can upload/edit templates, manage user access.
 - (4) Approve request for new templates.
 - (5) Manage Database repository
 - ii) **Section Head (SH) / Division Head (DH):**
 - (1) Access a view-only dashboard to monitor project progress.
 - (2) View status of test procedure generation across spacecraft and subsystems.
 - (3) Review summary statistics such as procedures completed, in progress, and pending.

iii) **PM/DPD:**

- (1) Request for project creation
- (2) Assign their team members for project test procedure activities
- (3) Can generate procedures & upload new templates.
- (4) Approve request for new templates by team members.

iv) **Engineer:**

- (1) Can generate procedures.
- (2) Upload new templates and raise request for approval.

4.3 Inputs to the IATP System

The Interactive Automated Test Procedure (IATP) system operates based on structured and authoritative engineering input data.

The following inputs shall be provided to the IATP system:

A. **MDB Database File (.mdb)**

The MDB file shall be treated as the **primary electrical authority** for all routing, pin, and connectivity validation.

The MDB contains multiple database tables. The primary tables of interest for IATP are described in detailed @ Annexure A Section1.1

B. **Telecommand (TC) CDB Excel File (.xlsx)**

The TC Excel file shall be treated as the authoritative source for telecommand definitions.

The TC file is a Microsoft Excel workbook.

It contains multiple **sheets**. The primary sheets of interest for IATP are described in detailed @ Annexure A Section1.2

C. **Telemetry (TM) CDB Excel File (.xlsx)**

The TM Excel file shall be treated as the authoritative source for telemetry channel definitions.

The TM file is also a Microsoft Excel workbook with multiple sheets.

It contains telemetry channel definitions. The primary sheets of interest for IATP are described in detailed @ Annexure A Section1.3

D. **Subsystem Test Procedure Template (DOCX)**

Each subsystem shall have an approved, version-controlled test procedure template.

The template defines:

1. Section structure
2. Table formats
3. Expected values
4. Execution order

The IATP system shall generate procedures strictly based on the template structure and shall not alter template-defined sequence or intent. The detailed general structure of test procedure is described in detailed @ Annexure A Section1.4

Each of these inputs serves a specific purpose in ensuring correctness, traceability, and consistency of the generated test procedures.

4.4 Input File Storage, Reuse, Regeneration and Traceability

4.4.1 Spacecraft-Level Input File Repository

- 1) For each spacecraft, the IATP system shall store the uploaded input files:
 - a) MDB database file (.mdb)
 - b) TC CDB Excel file (.xlsx)
 - c) TM CDB Excel file (.xlsx)
- 2) These files shall be stored under the spacecraft repository and associated with the spacecraft identifier and upload timestamp.
- 3) The system shall maintain the latest “active” set of input files for each spacecraft, while retaining previous versions for traceability.

4.4.2 Input File Reuse Prompt

- 1) Each time a user selects/logs into a spacecraft context, the system shall prompt:
 - a) “Use existing MDB/TM/TC input files for this spacecraft?” (**Yes/No**)
- 2) If **yes**, the system shall proceed using the currently active input set.
- 3) If **no**, the system shall allow the user to upload a new/updated MDB/TM/TC set and mark it as the active input set for subsequent operations.

4.4.3 Input and Template Traceability in Generated Test Procedure

- 1) Upon generation/export of a test procedure, the system shall embed a dedicated **Traceability / Configuration** section in the generated DOCX containing at minimum:
 - a) Spacecraft name
 - b) Subsystem and version
 - c) Template identifier (template name/path/version) used for generation
 - d) MDB filename and version (or checksum/hash) used
 - e) TM filename and version (or checksum/hash) used

- f) TC filename and version (or checksum/hash) used
- g) Date/time of generation
- h) User identifier who generated the document

4.5 Validation Logics Rules for Each section of Test Procedure

For each spacecraft, subsystem, and subsystem version selected by the user, the IATP system shall load the corresponding **complete test procedure template**, which contains multiple test sections (e.g., Receive Inspection, Passive Checks, Pre-Power Checks, Power-On Checks, and Functional Checks).

The system shall create a **new test procedure document** by copying the selected template. All validations, user interactions, updates, and data population **only to the generated test procedure**.

Manual to Automated Section Mapping

Each section of the test procedure Receive Inspection, Passive Checks, Pre-Power Checks, Power-On Checks, and Functional Checks is initially generated from standard templates, but validated using logic rules.

The following rules shall apply across all test procedure sections, including Receive Inspection, Passive Checks, Pre-Power Checks, Power-On Checks, and Functional Checks. Detailed validation logic for each section is elaborated in the respective section-specific clauses.

4.5.1 Receive Inspection checks

The receive inspection checks shall verify the physical integrity and correctness of subsystem connector interfaces and ensure that the hardware configuration matches the documented harness data before any electrical testing is performed.

The detailed validation logic rules and their implementation are described will be a part of RFP.

4.5.2 Passive Checks

The passive checks shall verify electrical isolation, continuity, and internal wiring integrity of subsystem units without applying power, covering the following checks:

Package Side

- 1) Continuity checks between various return paths of each card within the subsystem
- 2) Isolation between primary and secondary returns (Bus Return, Ground, Chassis)
- 3) Resistance measurements of heaters and thermistors and their isolation with respect to chassis
- 4) MIL-STD-1553 bus isolation checks
- 5) Any additional subsystem-specific isolation checks with respect to chassis

Harness Side

- 1) Harness continuity path verification and SGRP checks
- 2) MIL-STD-1553 isolation checks on harness interfaces

The detailed validation logic rules and their implementation will be a part of RFP.

4.5.3 Pre-Power Checks

The Pre-Power Checks section shall verify correctness of signal routing, command and telemetry readiness, and power line integrity prior to application of electrical power to the subsystem under test. These checks shall include, but are not limited to:

- 1) Open-Ended Raw Bus Checks
- 2) Open-Ended Secondary Voltage Checks
- 3) Open-Ended Telecommand Checks
- 4) Simulated Checks (Telemetry and/or Resistive Simulation)

The detailed validation logic rules and their implementation are described @ Annexure –A Section 4

4.5.4 Power-On Checks and Functional Checks

Power-On and Functional Checks validate the subsystem's active behavior under powered conditions, including command execution, power distribution, current validation, and telemetry response.

These checks confirm:

- 1) Correct signal routing under powered conditions
- 2) Successful telecommand execution
- 3) Proper telemetry acquisition
- 4) Hardware functional readiness

The detailed validation logic rules and their implementation will be a part of RFP.

4.5.5 Unverified Pins Checks

Upon completion of validation across all sections, the system shall generate an **Unverified Pins Table**.

The system shall prompt the user to either confirm intentional exclusion or include the pin in an appropriate section.

The detailed validation logic rules and their implementation will be a part of RFP.

4.6 Progress Monitoring and Status Management

4.6.1 Section-Wise Progress Tracking

The system shall maintain and track section-wise progress for the selected spacecraft, subsystem, and version.

- 1) Each test procedure section (e.g., Receive Inspection, Passive Checks, Pre-Power, Power-On, Functional Checks) shall have an independent completion state.
- 2) The system shall record whether a section is:
 - a) Not Started
 - b) In Progress
 - c) Completed
- 3) Section completion status shall be stored and retrievable during Save-and-Resume operations.

4.6.2 Visual Status Indication

The system shall provide visual indicators to represent section-wise completion status.

- 1) Color-coded tabs shall be displayed for each section of the test procedure.
- 2) The color scheme shall clearly indicate:
 - a) Not Started
 - b) In Progress
 - c) Completed
- 3) Visual indicators shall update dynamically based on validation and user confirmation status.

4.6.3 Spacecraft-Level Summary Dashboard

For each spacecraft, the system shall maintain an aggregated summary view.
The summary shall indicate:

- 1) Total number of test procedures generated.
- 2) Number of completed test procedures.
- 3) Number of test procedures currently in progress.
- 4) Associated subsystem and version details.

This summary view shall enable management-level monitoring of overall test procedure coverage and progress for the spacecraft.

4.7 Template Management and Test Procedure Repository Structure

The IATP system shall implement a structured Template Management and Test Procedure Repository mechanism to ensure traceability, version control, reuse capability, and controlled generation of test procedures.

4.8 Alias Repository

- 1) The IATP system shall maintain a **root-level Approved Alias Repository** to store user-approved mappings for recurring mismatches encountered during validation.
- 2) The repository shall support alias mappings for:
 - a) Signal descriptions (Template ↔ MDB),
 - b) Telecommand (TC) mnemonics (Template ↔ TC Excel),
 - c) Telemetry (TM) mnemonics (Template ↔ TM Excel).
- 3) The detailed alias repository logic rules and their implementation are described @ Annexure –A Section 2.8

4.9 Logging, Audit and Traceability

- 1) The system shall maintain a complete audit trail for each generated test procedure.
- 2) The logs shall capture:
 - a) Spacecraft name
 - b) Subsystem and template version used
 - c) MDB, TM, and TC file names and versions (or checksums)
 - d) Date and time of generation or regeneration
 - e) User identifier
- 3) The system shall also log:
 - a) All validation results
 - b) All user confirmations and modifications
 - c) Alias additions
 - d) Regeneration-triggered updates
- 4) All logs shall be stored in the spacecraft-specific repository and shall be retrievable for later technical review or audit purposes.
- 5) The system shall ensure that no modification to a generated test procedure occurs without corresponding log entry.

4.10 Configuration Change Impact Analysis and Controlled Regeneration

- 1) If the user uploads a new or updated input file (MDB, TM, or TC), either individually or as a complete set, the system shall treat the newly uploaded file(s) as the updated active configuration for that spacecraft.
- 2) The system shall support partial updates, meaning:

- a) The user may update only one input file (e.g., MDB only), while the remaining input files (TM and/or TC) continue to use the previously active versions.
- 3) Upon initiation of regeneration for an existing test procedure, the system shall perform a configuration comparison between:
 - a) The input file versions originally used to generate the procedure, and
 - b) The currently active input file versions.
- 4) The system shall perform impact analysis to identify changes relevant to the generated procedure, including but not limited to:
 - a) Pin description changes
 - b) Connectivity changes (Source/Destination updates)
 - c) Patch path modifications
 - d) Addition, deletion, or modification of TC/TM mnemonics
- 5) Only affected rows and sections shall be re-validated in accordance with the Unified Validation Rules defined in Annexure-A.
- 6) Where differences result in mismatches:
 - a) The impacted rows shall be flagged.
 - b) The user shall be prompted for review and confirmation.
 - c) Updates shall be applied only after user approval.
- 7) The system shall preserve:
 - a) Template-defined section sequence
 - b) Row ordering
 - c) Previously validated rows that are unaffected by the updated input file(s).
- 8) The regenerated procedure shall maintain configuration traceability linking:
 - a) Original input file versions
 - b) Updated input file versions
 - c) Date/time of regeneration
 - d) User performing the action User Documentation and Online Help (IATP)

4.10.1 User Manual

The vendor shall provide a comprehensive User Manual, for the IATP system covering the following:

- a) Software deployment and installation procedure
- b) Configuration of global and project-level settings
- c) Template management (addition, modification, version handling)
- d) Input file upload and validation (MDB, TM, TC files)
- e) Section-wise workflow execution (Inspection, Passive, Pre-Power, Power-On, Functional)
- f) Validation rule configuration (if configurable)
- g) User role definition and access control
- h) Save-and-resume functionality
- i) Document export procedure (DOCX/PDF)
- j) Error handling and troubleshooting
- k) Bug reporting and rectification procedure

The User Manual shall include:

- 1) Step-by-step usage instructions
- 2) Screenshots of GUI workflows
- 3) Explanation of validation prompts
- 4) Administrative and configuration procedures

The manual shall be supplied in both soft copy and hard copy formats.

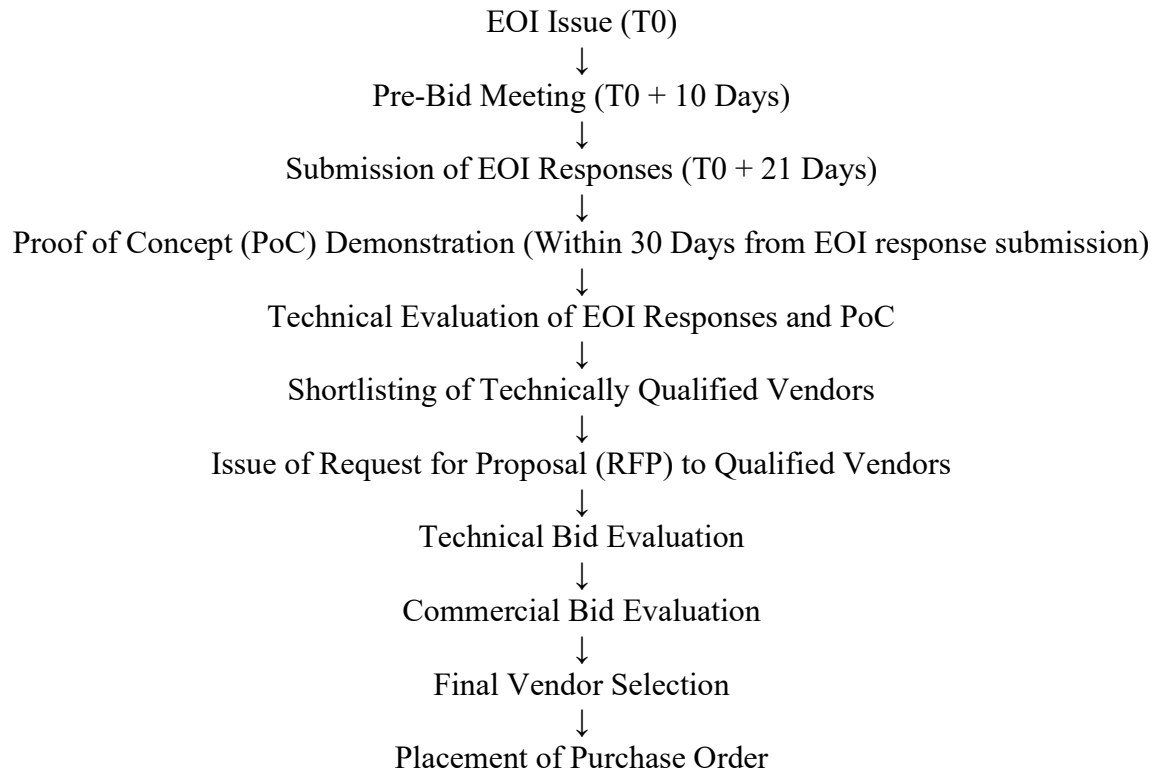
4.10.2 Online Help System

The IATP software shall include an integrated Online Help module that:

- 1) Provides contextual guidance during procedure generation
- 2) Explains validation prompts and user decisions
- 3) Covers all workflow sections and configuration steps
- 4) Includes illustrative examples

Additionally: Videos and/or animation clips demonstrating section-wise execution shall be included in the online help.

5 Procedure for Finalizing Contract



5.1 Stage 1 – Pre bid Meeting and issue of all required documents for POC

Interested vendors shall submit Form F: Non-disclosure agreement for Data sets, as defined in section 11, during pre-bid meeting. All required document for POC as defined in section 7.8 will be sent to identified emails within 3 days of Prebid meeting.

5.2 Stage 2 – Submission of EOI Response

Interested vendors shall submit an EOI response containing company profile, relevant experience, quality certifications, manpower details as per forms @ Section 11 and filled Compliance details @ Section 09.

5.3 Stage 3 – Proof of Concept (PoC) Evaluation

Vendors shall demonstrate the PoC within 30 Days from EOI response submission, as specified @ Section 7 using datasets provided by URSC.

5.4 Stage 4 – Issue of Detailed RFP

The detailed RFP shall be issued only to the EOI qualified vendors as per the evaluation matrix @Section 10 for submission of technical and commercial bids.

Indicative Commercial and Contractual Framework

The following information is provided for guidance of participating vendors. Detailed commercial and contractual terms shall be specified in the Request for Proposal (RFP) to be issued to vendors.

1. Only vendors who successfully qualify in the EOI evaluation process- Proof of Concept (PoC) demonstration, shall be invited to participate in the subsequent RFP process.
2. Commercial bids of only technically qualified and PoC-qualified vendors shall be considered during the RFP stage.
3. The detailed commercial, payment, warranty, and contractual terms shall be specified in the Request for Proposal (RFP) to be issued to qualified vendors.
4. Vendors may note that the proposed IATP software is envisaged to be developed over an indicative period of approximately twelve months from the date of award of work. The final payment mechanism and contractual milestones shall be defined in the RFP.
5. Warranty support and post-warranty AMC requirements shall be specified in the RFP.
6. URSC reserves the right to modify the commercial and contractual framework during the RFP stage based on organizational and procurement requirements.

6 Documents to be submitted with EOI Response

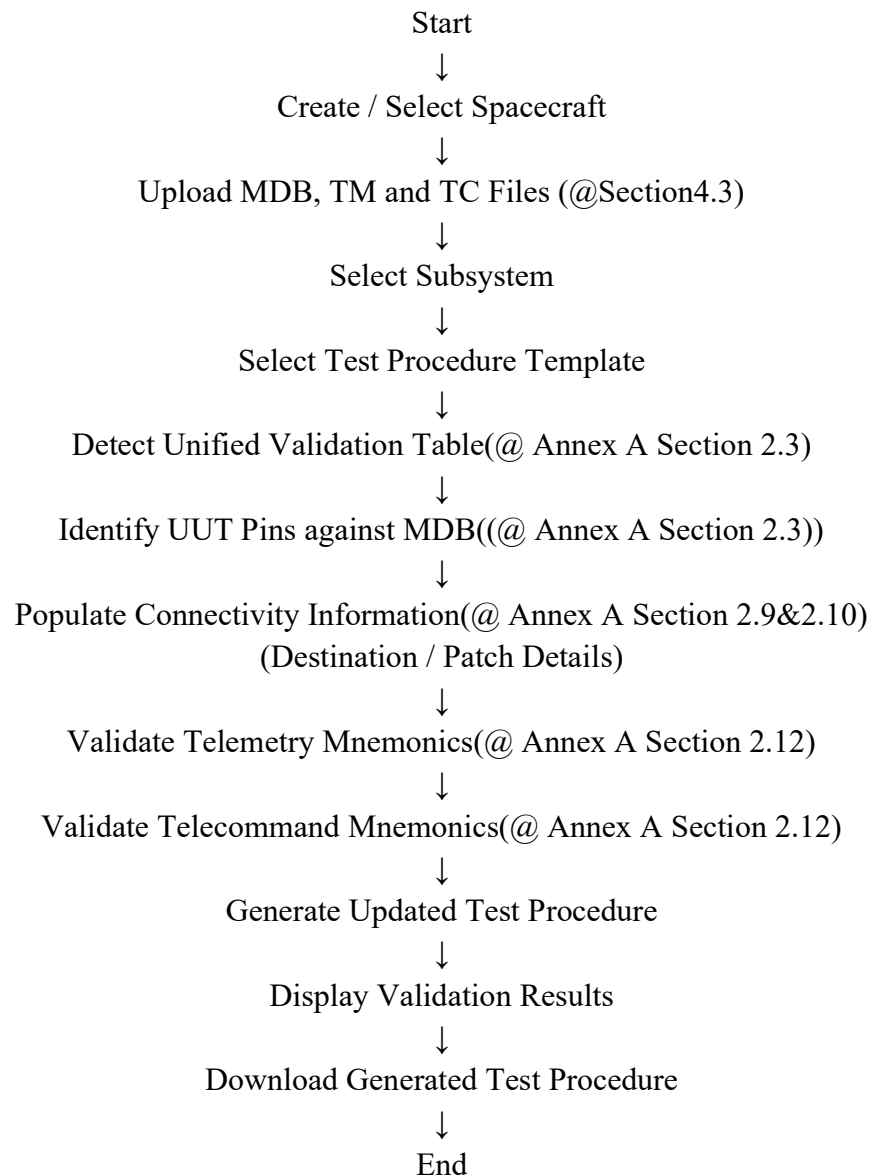
Interested vendors shall submit their EOI response containing the following documents and duly filled response forms as specified in **Section 11**, along with the filled compliance matrix as specified in **Section 09**.

1. **Organization Profile (Form A):** Details of company background, year of establishment, registered office address, local office details (if any), core business areas, and organizational strength.
2. **Relevant Software Development Experience (Form B):** Details of similar software projects executed during the last five years, including project scope, customer details, technologies used, project status, and supporting documentary evidence.
3. **Technical Manpower Capability (Form C):** Details of technical manpower available for execution of the proposed IATP software, including qualifications, expertise, and relevant experience.
4. **Quality Certification Documents (Form D):** Copies of valid quality certifications such as ISO 9001:2015, AS9100D, or any other relevant certifications.
5. **Non-Blacklisting Declaration:** A self-declaration stating that the organization has not been blacklisted by any Government Department, Public Sector Undertaking, Defence Organization, or Government Agency.
6. **PoC Participation and Confidentiality Undertaking (Form E):** A signed undertaking confirming participation in the Proof of Concept (PoC), compliance with the PoC schedule, and adherence to confidentiality requirements for all datasets, templates, documents, and technical information provided by URSC.

7 Proof of Concept (PoC) Requirements and Demonstration Methodology

The objective of the PoC is to assess the vendor's capability to implement core functionalities of the proposed IATP system, including template parsing, engineering data validation, and generation of a validated test procedure document. The PoC shall demonstrate the ability of the proposed software to process engineering input files and perform validation based on the rules defined in **Section 4.3 & 4.5.3 (Inputs and Validation Rules- Pre-Power Checks)**.

7.1 PoC Application Workflow



The PoC module shall demonstrate the following capabilities:

7.2 Input File Acceptance

The PoC system shall accept the following input files:

- 1) MDB database file (.mdb)
- 2) Telecommand Excel file (.xlsx)
- 3) Telemetry Excel file (.xlsx)
- 4) One sample test procedure template (.docx) containing a unified validation table.

7.3 Template Processing

The system shall:

- 1) Detect the unified validation table present in the provided template.
- 2) Extract rows of the validation table for processing.

7.4 Validation Demonstration

The PoC shall demonstrate basic validation logic including:

- 1) Validation of UUT connector pins against the MDB database.
- 2) Auto-population of Destination fields using MDB connectivity mapping.
- 3) Auto-population of Patch fields using MDB routing information.
- 4) Validation of Telecommand (TC) mnemonics against the TC Excel file.
- 5) Validation of Telemetry (TM) mnemonics against the TM Excel file.

The validation logic implemented in the PoC shall follow the processing rules described in **Section 4.5**

7.5 Output Generation

Based on the validated table, the system shall:

- 1) Generate a new test procedure document.
- 2) Preserve the template structure.
- 3) Update validated rows with populated connectivity information.

7.6 User Interaction

The PoC demonstration shall include basic GUI interaction allowing the user to:

- 1) Upload input files
- 2) Initiate validation
- 3) Review populated table fields
- 4) Generate the updated test procedure document

7.7 PoC Demonstration Environment

The Proof of Concept (PoC) shall be demonstrated as a web-based application running on a local server hosted and configured by the vendor.

The vendor shall be responsible for providing and bringing all hardware, software, licenses, peripherals, networking equipment, and any other infrastructure required for successful demonstration of the PoC.

The PoC demonstration shall be conducted at URSC, Bengaluru. The date, time, venue, and demonstration schedule shall be communicated by URSC to the participating vendors after completion of the PoC development period.

The PoC demonstration shall be completed within 40 days from the date of issue of the EOI.

During the demonstration, the vendor shall showcase the functionality of the proposed solution using the datasets provided by URSC and demonstrate compliance with the PoC requirements specified in this EOI.

7.8 POC Data Provision & Issue

The sample input datasets and template required for the Proof-of-Concept demonstration shall be provided by URSC, to the vendors who submit Form-F: non-disclosure agreement for data sets as defined in

The datasets shall include:

- 1) Sample MDB database file (.mdb)
- 2) Sample Telecommand (TC) Excel file (.xlsx)
- 3) Sample Telemetry (TM) Excel file (.xlsx)
- 4) Sample test procedure template containing a unified validation table

8 General Terms and Conditions

- 1) Submission of an EOI response does not guarantee shortlisting for PoC, issuance of RFP, or award of any contract.
- 2) URSC reserves the right to accept, reject, shortlist, or disqualify any EOI response at any stage of evaluation without assigning any reason thereof.
- 3) URSC reserves the right to modify, suspend, cancel, or withdraw the EOI process at any stage without incurring any obligation or liability to participating vendors.
- 4) URSC reserves the right to conduct technical discussions, presentations, or clarification meetings with interested vendors at any stage of the EOI evaluation process, if deemed necessary.
- 5) The decision of URSC regarding evaluation, shortlisting, PoC assessment, and issuance of RFP shall be final and binding on all participating vendors.
- 6) All costs associated with preparation and submission of EOI responses, participation in technical discussions, and Proof of Concept (PoC) demonstration shall be borne entirely by the vendor. URSC shall not be liable for reimbursement of any such costs.
- 7) Any software licenses, development tools, utilities, frameworks, or infrastructure required for realization of the PoC shall be arranged by the vendor at their own cost.
- 8) Vendors shall maintain confidentiality of all information, datasets, templates, documents, and technical details provided by URSC during the EOI and PoC evaluation process.
- 9) Vendors shall not copy, reproduce, distribute, disclose, or use any information supplied by URSC for purposes other than participation in this EOI.
- 10) The PoC developed by the vendor shall be used solely for technical evaluation purposes and shall not be construed as acceptance of the proposed solution by URSC.
- 11) URSC may seek additional technical information, presentations, demonstrations, clarifications, or supporting documents from vendors during the evaluation process.
- 12) Vendors shall ensure that all information furnished in the EOI response is complete, accurate, and verifiable. Any misrepresentation or submission of false information may lead to disqualification.
- 13) Qualified vendors shall participate in the subsequent RFP process, if invited by URSC.

9 Compliance Matrix – To be Filled by Vendor

Note: The compliance to the below-mentioned tables is mandatory.

9.1 General Compliance Matrix

Sl. No.	Compliance Terms	Compliance (Yes/No)	Remarks
1)	Acceptance of System & Functional Requirements as per Section 3		
2)	Acceptance to implement the Features of the IATP System as per Section 4		
3)	Acceptance to Procedure of Finalizing contract as per Section 5		
4)	Acceptance of Submission of EOI Response Documents as per Section 6		
5)	Acceptance of Proof of Concept (PoC) Requirements as per Section 7		
6)	Acceptance of the General Terms & Conditions as per Section 8		
7)	Acceptance to submit compliance matrix as per Section 9		
8)	Acceptance to Vendor Evaluation Process as per Section 10		
9)	Acceptance to Submit a self-undertaking as a proof for compliance to POC participation and Confidentiality as per FORM-E of section 11		

9.2 Proof of Concept (PoC) Compliance Matrix

Sl. No.	PoC Compliance Requirement	Compliance (Yes/No)	Remarks
1	Acceptance of PoC requirements as specified in Section 7		
2	Acceptance to bear the cost of software licenses, if required, for development and demonstration of the PoC		
3	Capability of processing MDB (.mdb), TM (.xlsx), TC (.xlsx), and Template (.docx) input files		
4	Capability of detecting and processing the Unified Validation Table from subsystem templates		
5	Capability of validating UUT pins against MDB database information		
6	Capability of auto-populating Destination and Patch information from MDB connectivity data		
7	Capability of validating Telemetry (TM) and Telecommand (TC) mnemonics against database files		
8	Capability of generating updated subsystem test procedure documents		
9	Capability of demonstrating the PoC as per the work flow mentioned in section 7.1		
10	Commitment to complete the PoC demonstration within the timeline specified in Section 5		
11	Commitment to maintain confidentiality of all datasets, templates, documents, and information provided by URSC		

10 Technical Evaluation Matrix

The following table indicates the weightage of marks assigned for evaluation of vendors interested in realization of the Interactive Automated Test Procedure (IATP) System.

The evaluation shall be carried out based on the EOI response documents and Proof of Concept (PoC) demonstration.

Vendors securing a minimum score of 65 marks out of 100 shall be considered technically qualified and may be qualified for issuance of the detailed RFP.

Sl. No.	Evaluation Criteria	Marks	Response Form
A	Organization Profile and Company Capability • 3–5 years (5 Marks) • 5–10 years (8 Marks) • >10 years (10 Marks)	10	Form A
B	Relevant Software Development Experience • Enterprise / Database Driven Applications (2 Marks) • Workflow Automation / Document Management Systems (3 Marks) • Aerospace / Scientific Software Applications (5 Marks)	10	Form B
C	Technical Manpower Capability • 0 – 50 (3 Marks) or 50–100 (5 Marks) or • More than 100 (10 Marks)	10	Form C
D	Quality Certifications • ISO 9001:2015 (3 Marks) • AS9100D (7 Marks)	10	Form D

Sl. No.	Evaluation Criteria	Marks	Response Form
E	Proof of Concept (PoC) Demonstration • MDB Processing and Validation (5 Marks) • TM & TC Processing and Validation (5 Marks) • Template Parsing and Unified Validation Table Detection (5 Marks) • Auto-population of Connectivity Information (5 Marks) • Test Procedure Generation and GUI Demonstration on local server (40 Marks)	60	PoC Evaluation
	Total Marks	100	

11 Response Forms

Form A – Organization Profile and Company Capability

The vendor shall provide the following details:

Sl. No.	Particulars	Vendor Response
1	Name of Organization	
2	Year of Establishment	
3	Number of Years in Software Development Business	
4	Type of Organization (Private Limited/Public Limited/Partnership/Proprietorship/Others)	
5	Registered Office Address	
6	Corporate Website	

Supporting Documents (Mandatory):

1. Certificate of Incorporation / Registration.
2. GST Registration Certificate.

Form B – Relevant Software Development Experience

Provide details of a maximum of five software projects executed during the last five years relevant to enterprise applications, engineering software, workflow automation systems, document management systems, database-driven applications, aerospace software, scientific software, or similar software systems.

Sl. No.	Project Name	Customer	Project Category*	Status (Completed/Ongoing)	Work Order Available (Yes/No)
1					
2					
3					
4					
5					

*Project Category:

- Enterprise / Database Driven Application
- Workflow Automation / Document Management System
- Aerospace / Scientific Software Application

Supporting Documents (Mandatory):

1. Copy of Work Order / Purchase Order / Contract Agreement.

Supporting Documents (Optional):

1. Completion Certificate.
2. Customer Acceptance Certificate.
3. Customer Reference Letter.

Form C – Technical Manpower Capability

Provide details of software development manpower currently available on the rolls of the organization.

Sl. No.	Particulars	Vendor Response
1	Total Number of Employees engaged in Software Development Activities	

Supporting Documents (Mandatory):

Self-certified declaration on company letterhead signed by the authorized signatory confirming the total number of software development personnel currently employed by the organization.

Form D – Quality Certifications

Provide details of quality certifications currently held by the organization.

Sl. No.	Certification	Available (Yes/No)	Validity Period
1	ISO 9001:2015		
2	AS9100D		

Supporting Documents (Mandatory):

1. Copies of valid certification certificates.

Form E – PoC Participation and Confidentiality Undertaking

(To be submitted on Company Letterhead)

Vendor Name: _____

Sl. No.	Declaration	Compliance (Yes/No)
1	We have understood the PoC requirements specified in this EOI.	
2	We agree to participate in the PoC evaluation process.	
3	We agree to complete the PoC demonstration within the stipulated timeline specified by URSC.	
4	We agree to maintain confidentiality of all datasets, templates, documents, and information supplied by URSC.	
5	We agree not to copy, reproduce, distribute, disclose, or use the supplied information for any purpose other than participation in this EOI.	
6	We understand that successful completion of the PoC does not constitute award of work by URSC.	
7	We agree to participate in the subsequent RFP process if shortlisted by URSC.	

We hereby certify that the information furnished above is true and correct to the best of our knowledge and belief. We further agree to comply with all requirements specified in this EOI.

Signature of Authorized Signatory: _____

Name: _____

Designation: _____

Date: _____

Company Seal

Form F – Non disclosure agreement for Data sets

(To be submitted on Company Letterhead)

Vendor Name: _____

Sl. No.	Declaration	Compliance (Yes/No)
1.	We are interested to receive all the required document to demonstrate the POC.	
2.	We agree to maintain confidentiality of all datasets, templates, documents, and information supplied by URSC.	
3.	We agree not to copy, reproduce, distribute, disclose, or use the supplied information for any purpose other than participation in this EOI.	

Name and contact details of the Authorized person to receive the document:

Email ID for receiving the document: _____

Signature of Authorized Signatory: _____

Name: _____

Designation: _____

Date: _____

Company Seal

Annexure- A

This Annexure defines the detailed implementation logic, validation framework, and processing rules governing the Interactive Automated Test Procedure (IATP) System. It elaborates the structured input data, template handling philosophy, and section-wise validation mechanisms applicable to all generated test procedures.

The objective of this Annexure is to provide clear technical guidance to the vendor regarding how the system shall interpret templates, validate data against authoritative sources (MDB, TC, TM files), and generate controlled, deterministic outputs without inference beyond defined rules.

While different subsystems may contain variations in internal test sections, the overall testing philosophy, validation hierarchy, and template-driven generation approach described herein shall remain uniformly applicable across all test procedures.

1 Description of Input Files

1.1 MDB Database File (Microsoft Access database – .mdb)

The MDB file is a **Microsoft Access relational database**, not a spreadsheet. It contains structured **tables**, not sheets.

The MDB file shall be treated as the **primary electrical authority** for all routing, pin, and connectivity validation.

MDB Structure

The MDB contains multiple database tables. The primary tables of interest for IATP are:

1. Connector List Table

This table contains:

- a) Connector Name
- b) Connector Type / Polarity
- c) Subsystem
- d) Unit ID
- e) Panel / Interface mapping

Used For:

- a) Receive Inspection validation
- b) UUT identification
- c) Connector existence validation
- d) Connector polarity validation

2. Pin Details Table

This is the most critical table for IATP validation.

It typically contains:

- a) Connector name
- b) Pin number
- c) Signal name
- d) Signal description
- e) Destination connector
- f) Destination pin
- g) Patch1 / Patch2 / Patch3
- h) Wire details
- i) Gauge
- j) Attributes

Used For:

- a) UUT pin validation
- b) Signal description validation
- c) Connectivity mapping (Source ↔ Destination)
- d) Patch auto-population
- e) Live/Return identification
- f) Multi-crimp handling.

This table is the primary source of truth for:

- a) Electrical path definition
- b) Routing verification
- c) Opposite endpoint determination

The IATP system shall access MDB tables using database queries and shall not treat MDB as a spreadsheet. The MDB file shall remain read-only and shall not be modified by the IATP system.

Microsoft Access

Security Warning: Certain content in the database has been disabled.

Tables

PinDetails

PinNo	Signal	Amplitude	Destination	FunlDescrip	Integration	Wire	Gauge	Patch1	Patch2	Patch3	ForeColour	BackColour	Attribute	DT	Note	F1
10-OHM-2M.01	-	-	DRCHOP2M-P	10 OHM LIVE-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2M.02	-	-	DRCHOP2M-P	10 OHM LIVE-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2M.03	-	-	DRCHOP2M-P	10 OHM RTN-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2M.04	-	-	DRCHOP2M-P	10 OHM RTN-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2R.01	-	-	DRCHOP2R-P	10 OHM LIVE-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2R.02	-	-	DRCHOP2R-P	10 OHM LIVE-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2R.03	-	-	DRCHOP2R-P	10 OHM RTN-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-2R.04	-	-	DRCHOP2R-P	10 OHM RTN-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4M.01	-	-	DRCHOP4M-P	10 OHM LIVE-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4M.02	-	-	DRCHOP4M-P	10 OHM LIVE-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4M.03	-	-	DRCHOP4M-P	10 OHM RTN-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4M.04	-	-	DRCHOP4M-P	10 OHM RTN-1	-	O-M	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4R.01	-	-	DRCHOP4R-P	10 OHM LIVE-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4R.02	-	-	DRCHOP4R-P	10 OHM LIVE-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4R.03	-	-	DRCHOP4R-P	10 OHM RTN-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
10-OHM-4R.04	-	-	DRCHOP4R-P	10 OHM RTN-1	-	O-R	24	-	-	-	1	16777215	0	-	-	-
1553A.02	PUL	6V-19V	WDE1003.06	Bus A live	-	1553P	24E	-	-	-	1	16777215	0	-	-	-
1553A.03	PUL	6V-19V	WDE2003.01	Bus A live	-	1553P	24F	-	-	-	1	16777215	0	-	-	-
1553A.04	PUL	6V-19V	WDE2003.06	Bus A Return	-	1553P	24F	-	-	-	1	16777215	0	-	-	-
1553A.05	PUL	6V-19V	WDE3003.01	Bus A live	-	1553P	24T	-	-	-	1	16777215	0	-	-	-
1553A.06	PUL	6V-19V	WDE3003.06	Bus A Return	-	1553P	24T	-	-	-	1	16777215	0	-	-	-
1553A.07	PUL	6V-19V	WDE4003.01	Bus A live	-	1553P	24G	-	-	-	1	16777215	0	-	-	-
1553A.08	PUL	6V-19V	WDE4003.06	Bus A Return	-	1553P	24G	-	-	-	1	16777215	0	-	-	-
1553A.09	PULSE	18V	CPE1005.01	MIL1553B BUS	-	1553P	24A	-	-	-	1	16777215	0	-	-	-
1553A.10	PULSE	18V	CPE1005.06	MIL1553B BUS	-	1553P	24A	-	-	-	1	16777215	0	-	-	-
1553A.11	PULSE	18V	CPE1008.06	MIL1553B BUS	-	1553P	24B	-	-	-	1	16777215	0	-	-	-
1553A.12	PULSE	18V	CPE1008.01	MIL1553B BUS	-	1553P	24B	-	-	-	1	16777215	0	-	-	-
1553A.13	DC	21Vp-p	K02X.01	CHA Inner core	-	1553P	24R	-	-	-	1	16777215	0	-	-	-
1553A.14	DC	21Vp-p	K02X.02	CHA Outer Cor	-	1553P	24R	-	-	-	1	16777215	0	-	-	-
1553A.15	DC	0V	K02X.03	SHIELD	-	OX-P	24	-	-	-	1	16777215	0	-	-	-
1553A.16	DC	21Vp-p	K02Y.01	CHA Inner core	-	1553P	24U	-	-	-	1	16777215	0	-	-	-
1553A.17	DC	21Vp-p	K02Y.02	CHA Outer Cor	-	1553P	24U	-	-	-	1	16777215	0	-	-	-
1553A.18	DC	0V	K02Y.03	SHIELD	-	OX-P	24	-	-	-	1	16777215	0	-	-	-
1553A.19	DC	21Vp-p	K02Z.01	CHA Inner core	-	1553P	24V	-	-	-	1	16777215	0	-	-	-
1553A.20	DC	21Vp-p	K02Z.02	CHA Outer Cor	-	1553P	24V	-	-	-	1	16777215	0	-	-	-

Record: 1 of 13251

Microsoft Access

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Tables

ConnectorList

ConnectorID	NoOfPins	ConnectorT	Polarity	Subsystem	SubID	UnitDescrip	UnitID	Panel	Note	Ag
10-OHM-2M	4	RER	Unknown	TEMPORARY C	TEMPORARY	RER-EP02	RER-EP02	EP02 IN	-	-
10-OHM-2R	4	RER	Unknown	TEMPORARY C	TEMPORARY	RER-EP02	RER-EP02	EP02 IN	-	-
10-OHM-4M	4	RER	Unknown	TEMPORARY C	TEMPORARY	RER-EP04	RER-EP04	EP04 IN	-	-
10-OHM-4R	4	RER	Unknown	TEMPORARY C	TEMPORARY	RER-EP04	RER-EP04	EP04 IN	-	-
1553A	78	DSUB	Plug	TEMPORARY C	TEMPORARY	1553A	1553A	TEMP	-	-
1553B	78	DSUB	Plug	TEMPORARY C	TEMPORARY	1553B	1553B	TEMP	-	-
50ISCVO	50	DSUB	Plug	AIT	AIT	AIT- SOLAR BYI AIT-SABC	DP01 OUT	-	-	-
AIT-TM	9	DSUB	Socket	AIT	AIT	AIT-TMTC	DP01 OUT	-	-	-
AIT-TM	9	DSUB	Plug	AIT	AIT	AIT-TM EID	DP01 OUT	-	-	-
AIT-TM	9	DSUB	Plug	AIT	AIT	AIT-TMTC	DP01 OUT	-	-	-
ANVPWS101	50	DSUB-ITT	Plug	POWER	POWER	MAIN FRAME F ARP	DP02 IN	-	-	-
ANVPWS201	50	DSUB-ITT	Plug	POWER	POWER	MAIN FRAME F ARP	DP02 IN	-	-	-
BAT-C1	61	CIRCULAR	Socket	BATTERY	BATTERY	BATTERY	EP03 IN	-	-	-
BAT-C2	61	CIRCULAR	Plug	BATTERY	BATTERY	BATTERY	EP03 IN	-	-	-
BAT-NEG-FC	61	CIRCULAR	Plug	AIT	AIT	AIT-LAMBDA	DP01 OUT	-	-	-
BMU1301	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1302	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1303	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1304	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1305	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1306	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1307	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1308	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1309	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1310	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1311	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1312	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1313	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1314	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1315	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1316	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1317	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1318	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1319	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1320	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1321	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1322	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1323	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1324	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1325	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1326	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1327	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1328	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1329	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1330	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1331	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1332	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1333	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1334	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1335	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1336	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1337	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1338	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1339	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1340	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1341	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1342	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1343	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1344	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1345	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1346	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1347	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1348	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1349	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1350	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1351	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1352	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1353	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1354	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1355	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1356	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1357	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1358	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1359	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1360	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1361	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1362	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1363	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1364	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1365	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1366	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1367	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1368	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1369	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1370	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1371	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1372	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1373	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1374	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1375	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1376	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1377	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1378	15	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-
BMU1379	9	DSUB	Plug	OB	OB	ZENERCARD	DP01 OUT	-	-	-

The TC file shall be provided in Microsoft Excel format (.xlsx) and may contain multiple sheets. Each sheet may define telecommand-related information; however, the primary sheet of interest for the IATP system shall be:

BASE_CMD_INFO

This sheet contains telecommand definitions applicable across subsystems.

Columns of Interest (BASE_CMD_INFO Sheet)

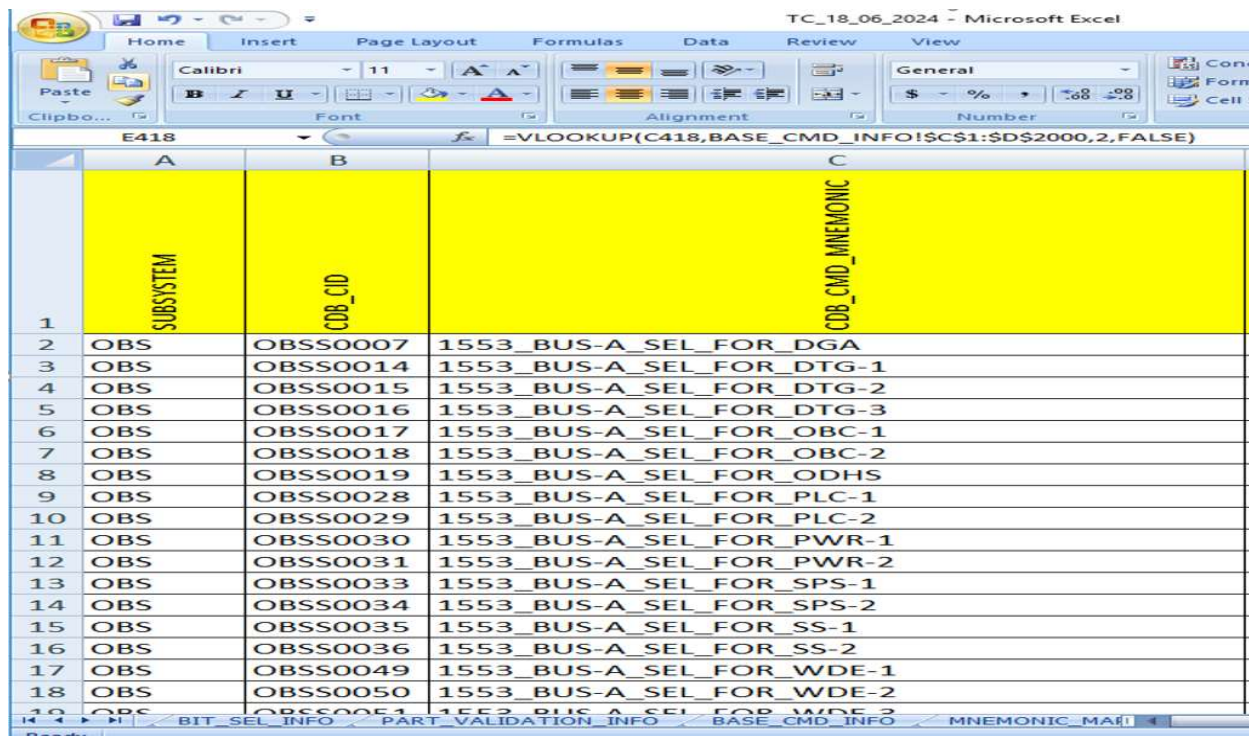
The primary column of interest in the BASE_CMD_INFO sheet shall be:

CDB_CMD_Mnemonic – Telecommand mnemonic identifier.

The IATP system shall:

- Validate telecommand mnemonics referenced in test procedure templates against the CDB_CMD_Mnemonic column of the BASE_CMD_INFO sheet.
- Search across the relevant sheet to confirm mnemonic existence.
- Suggest nearest possible mnemonic matches using similarity comparison if an exact match is not found.
- Require user confirmation for any non-exact match.

The TC Excel file shall remain strictly read-only and shall not be modified by the IATP system under any circumstances



	A	B	C
	SUBSYSTEM	CDB_CID	CDB_CMD_MNEMONIC
1			
2	OBS	OBSS0007	1553_BUS-A_SEL_FOR_DGA
3	OBS	OBSS0014	1553_BUS-A_SEL_FOR_DTG-1
4	OBS	OBSS0015	1553_BUS-A_SEL_FOR_DTG-2
5	OBS	OBSS0016	1553_BUS-A_SEL_FOR_DTG-3
6	OBS	OBSS0017	1553_BUS-A_SEL_FOR_OBC-1
7	OBS	OBSS0018	1553_BUS-A_SEL_FOR_OBC-2
8	OBS	OBSS0019	1553_BUS-A_SEL_FOR_ODHS
9	OBS	OBSS0028	1553_BUS-A_SEL_FOR_PLC-1
10	OBS	OBSS0029	1553_BUS-A_SEL_FOR_PLC-2
11	OBS	OBSS0030	1553_BUS-A_SEL_FOR_PWR-1
12	OBS	OBSS0031	1553_BUS-A_SEL_FOR_PWR-2
13	OBS	OBSS0033	1553_BUS-A_SEL_FOR_SPS-1
14	OBS	OBSS0034	1553_BUS-A_SEL_FOR_SPS-2
15	OBS	OBSS0035	1553_BUS-A_SEL_FOR_SS-1
16	OBS	OBSS0036	1553_BUS-A_SEL_FOR_SS-2
17	OBS	OBSS0049	1553_BUS-A_SEL_FOR_WDE-1
18	OBS	OBSS0050	1553_BUS-A_SEL_FOR_WDE-2

	A1	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	SLNO.	SUBSYSTEM	CDB_PID_NO	CDB_NAME/ID/NO	DESCRIPTION	TYPE	PROCESSING TYPE NO OF WORDS	CHANNEL NO.	FRAME NO.	START BIT	END BIT	SAMPLING RATE	DWELL ADDRESS	RANGE	RES./AT1	OFFSET (Adj)	UNIT	REMARKS	
1	RWH	RWH10001	RW.1_PWR_STS	RW.1 ON-OFF status	B	9	1	180	2	6	6	0	641D					STS	
2	RWH	RWH10002	RW.1_RBUS_MON	WDE1 RB MON	D	15	2	190,19	1	0,0	0,0	7,7	6,0	+100	2.992000000E-02	2.500000000E-01	V		
3	RWH	RWH10003	RW.1_CUR	RW.1 Current Monitoring	D	15	2	144,14	5	0,0	0,0	7,7	2,0	+8	1.808000000E-03	0.000000000E+00	A		
4	RWH	RWH10005	RW.1_ROT_N_DIR	RW.1 Rotation Direction	B	9	1	180	2	7	7	0	641D				STS		
5	RWH	RWH10006	RW.1_DEC_STS_RW	RW.1 DEC	B	9	1	180	2	4	4	0	641D				STS		
6	RWH	RWH10007	RW.1_EST_FRIC	RW.1 Estimated Friction	D	16	2	136,13	7	4,4	0,0	7,7	4,0	+2000	4.577000000E-02	0.000000000E+00	gcm	Unit : gcm	
7	RWH	RWH10008	WDE.1_15V_MON	WDE.1-15V monitoring	D	15	2	194,19	5	0,0	0,0	7,7	6,0	+20	7.020000000E-03	3.000000000E-01	V		
8	RWH	RWH10014	RW.1_CMDD_TCS	WDE 1 COMMANDED TCS MON	D	16	2	152,15	3	0,0	0,0	7,7	2,0	+4000	9.155000000E-02	0.000000000E+00	gcm	Unit : gcm	
9	RWH	RWH10017	RW.1_DC-DC_TEMP	RW.1 DCDC temp	A	15	2	196,19	7	0,0	0,0	7,7	6,0	+150	3.500000000E-02	1.230000000E+02	Deg	A_3 - COUNT-3 - A_2 - COUNT-A_1 - COUNT - A_0	
10	RWH	RWH10018	RW.1_BRDGE_SUPPLY_MON	WDE.1 H Bridge Supply Mo1	D	15	2	198,19	9	0,0	0,0	7,7	6,0	+100	2.992000000E-02	2.500000000E-01	V		
11	RWH	RWH10019	RW.1_CUR_CNTRL_OIP	WDE.1 Currnt Cntrlr o-p	D	16	2	146,14	7	2,2	0,0	7,7	6,0	+200	1.627000000E-02	0.000000000E+00	%	Unit : %	

1.4 Subsystem Test Procedure Template (DOCX)

Each subsystem shall have an approved, version-controlled test procedure template.

The template defines:

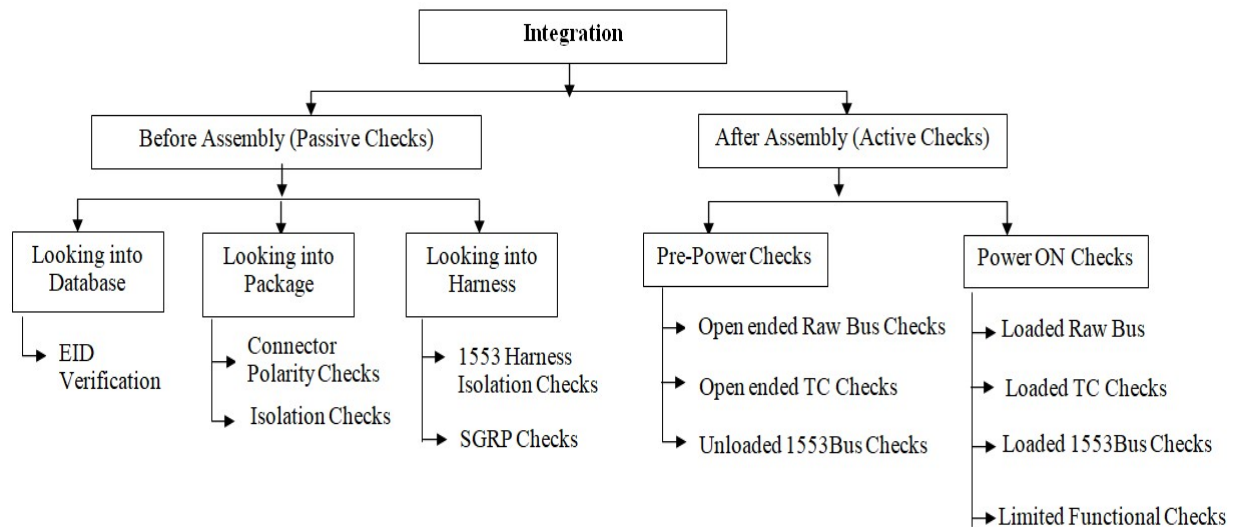
- 1) Section structure
- 2) Table formats
- 3) Expected values
- 4) Execution order

The IATP system shall generate procedures strictly based on the template structure and shall not alter template-defined sequence or intent.

1.4.1 General Structure of Test Procedures

Although the detailed content of a test procedure may vary depending on subsystem type and mission requirements, procedures generally consist of the following logical sections:

1. Receive Inspection
2. Passive Checks
3. Pre-Power Checks
4. Power-On Checks
5. Functional Checks



Test Procedure Sections

Not all test procedures are required to contain all sections. Certain subsystems may:

- a) Omit specific sections where not applicable
- b) Include additional subsystem-specific checks
- c) Modify internal content based on subsystem design

However, the overall testing philosophy shall remain consistent.

1.4.2 List of Templates per project

The above-mentioned templates are generic templates used in a project. The number of templates might increase as per project requirements and the IATP software must be capable to generate any test procedure if a template is provided.

2 General Rules Applicable to All Test Procedure Sections

For each spacecraft, subsystem, and subsystem version selected by the user, the IATP system shall load the corresponding **complete test procedure template**, which contains multiple test sections (e.g., Receive Inspection, Passive Checks, Pre-Power Checks, Power-On Checks, Functional Checks).

The system shall create a **new test procedure document** by copying the selected template. All validations, user interactions, update, and data population described in Annexure-A apply **only to the generated test procedure**.

The original templates shall remain immutable and shall not be modified by the system during procedure generation.

The following rules shall apply uniformly across all test procedure sections, including Receive Inspection, Passive Checks, Pre-Power Checks, Power-On Checks, and Functional Checks. Detailed validation logic for each section is elaborated in the respective section-specific clauses.

2.1 Template Authority and Content Handling Rule

- 1) The subsystem test procedure template shall be treated as the primary structural authority.
- 2) Only the structured tables defined within each section shall be extracted and subjected to validation logic.
- 3) All non-table content within the template, including:
 - a) Text paragraphs,
 - b) Instructions,
 - c) Notes,
 - d) Images,
 - e) Diagrams,
 - f) Headers and formatting,
 - i) shall be automatically copied from the template into the generated test procedure without modification.

- 4) At each section:
 - a) The system shall display the copied text to the user.
 - b) The user shall be required to confirm the content before proceeding.
 - c) An option shall be provided to edit the copied text if required.
- 5) Section order, row order, table structure, and expected values defined in the template shall not be altered unless explicitly modified by the user.

2.2 Authoritative Data Sources Rule

The system shall operate strictly based on the following input files:

- a) MDB file – authority for connectors, pins, signal descriptions, routing paths, and patch mapping.
- b) TC CDB Excel file – authority for tele-command mnemonics.
- c) TM CDB Excel file – authority for telemetry mnemonics.

The system shall not infer, generate, or assume data not present in these files.

All input files shall remain read-only.

2.3 Unified Validation Table

All checks shall be represented using a unified table format. The typical columns include:

SL. NO	TC CDB MNEMONIC	TM CDB MNEMONIC	DESCRIPTION	SOURCE	PATCH	DESTINATION	EXP	OBS	REMARKS

- 1) Not all templates are required to include all columns. The system shall operate using only the columns present in the template.
- 2) The physical order of columns in the template shall not be assumed to follow any fixed sequence. Column identification and validation shall be performed based on column headers, not positional order.
- 3) If any additional column(s) are present in the template table beyond the standard unified columns, such columns shall:
 - a) Be copied exactly into the generated test procedure.
 - b) Not be altered, recalculated, or restructured by the system.
 - c) Be retained during row-wise validation and updates of other columns.
 - (1) This requirement ensures preservation of template-specific information such as notes, isolation values, remarks, or subsystem-specific parameters embedded within the table.

The system shall apply the following authority hierarchy:

- 1) Template
 - a) Defines row existence
 - b) Defines check intent
 - c) Defines expected values (Exp.)
 - d) Defines subsection grouping
- 2) MDB (Harness Database)
 - a) Source of truth for pin existence
 - b) Source of truth for signal descriptions
 - c) Source of truth for connectivity mapping
 - d) Source for patch/intermediate connection mapping
- 3) TC Excel and TM Excel Files
 - a) Used solely to verify mnemonic existence
 - b) Used to provide nearest match suggestions
 - c) Shall not override template-defined routing or expected values

Note: Receive inspection Checks and Isolation Checks (part of package side passive check) differ for the above unified validation table; hence their logics are mentioned separately in their sections (Section 5 & 6) itself.

2.4 Table Encounter and Row-wise Processing Rule

Once a table is encountered within any test procedure section, the IATP system shall process the table strictly in a **row-wise, top-to-bottom sequence**.

Table Encounter Rule

- 1) Whenever a table is encountered in any section of the test procedure, the IATP system shall:
 - a) Treat the table as a structured validation unit.
 - b) Initiate processing from the **first data row** of the table.
 - c) Process each row sequentially in a **top-to-bottom order**.

Row-wise Processing Constraint

- 1) Each row shall be:
 - a) Fully validated and resolved before proceeding to the next row.
 - b) Independently flagged, updated, or accepted based on validation outcome.
- 2) Validation state of one row shall **not affect** the processing of subsequent rows unless explicitly defined in the template.

2.5 UUT Identification Rule

- 1) The Unit Under Test (UUT) shall be identified based on the subsystem selected by the user at the start of the procedure generation workflow.

- 2) Upon subsystem selection, the IATP system shall **query the MDB database** to identify all unit identifiers (Unit IDs) associated with the selected UUT.
- 3) If **a single Unit ID** exists for the selected UUT in the MDB:
 - a) The system shall automatically select the Unit ID for further processing.
- 4) If multiple Unit IDs exist for the selected UUT in the MDB:
 - a) The system shall prompt the user with the list of available Unit IDs.
 - b) The user shall be provided with options to:
 - i) Select **all** Unit IDs, or
 - ii) Select **one or more specific** Unit IDs required for the current test procedure.
- 5) Only the **user-confirmed Unit ID(s)** shall be considered as valid UUTs for:
 - a) Pin validation,
 - b) Connectivity validation,
 - c) Patch population, and
 - d) Subsequent test procedure section processing.
- 6) The system shall not assume or auto-select Unit IDs in case of ambiguity without explicit user confirmation.

2.6 UUT pin Validation Rule

- 1) All connectors, pins, signal descriptions, mnemonics, and routing paths referenced in template tables shall be validated against the respective authoritative input file.
- 2) Once UUT ID is identified as per section 3.5, the system shall:
 - a) Validate the UUT pin description against MDB i.e. The MDB description(s) shall be compared against the table Description field using similarity matching.
 - b) If mismatch occurs:
 - i) The row shall be flagged.
 - ii) The user shall review and correct the pin and/or description.
 - iii) Connectivity validation and patch population shall not proceed until resolved.

2.7 Similarity Matching Rule

- 1) Signal description comparison between template and MDB shall be performed using a similarity-based matching mechanism.
- 2) The similarity threshold shall be configurable and finalized during SRS approval.
- 3) The system shall display the similarity score when a mismatch is detected.
- 4) Exact match shall always be accepted without prompt.
- 5) Below-threshold matches shall trigger user review and confirmation.
- 6) The system shall not auto-accept matches below the configured threshold.

2.8 Alias Repository Rule

- 1) The IATP system shall maintain a **root-level Approved Alias Repository** to store user-approved mappings for recurring mismatches encountered during validation.
- 2) The repository shall support alias mappings for:
 - a) Signal descriptions (Template ↔ MDB),
 - b) Telecommand (TC) mnemonics (Template ↔ TC Excel),

- c) Telemetry (TM) mnemonics (Template ↔ TM Excel).
- 3) When a mismatch is detected during description or mnemonic validation, and the user explicitly confirms the mismatch as acceptable, the system shall provide an option to **“Store as Approved Alias.”**
- 4) Each alias record shall capture:
 - a) Template value,
 - b) Corresponding authoritative value (MDB / TC / TM),
 - c) Subsystem or project context (if applicable),
 - d) Date and time,
 - e) User identifier.
- 5) During subsequent validations, the system shall:
 - a) Perform standard similarity comparison,
 - b) Check the Approved Alias Repository,
 - c) Display a notification if a previously approved alias exists.
- 6) Alias mappings shall be presented as suggestions only and shall not be automatically applied without user visibility and confirmation.
- 7) The system shall provide a configurable option to enable or disable alias-based suggestions at global and/or project level.
- 8) The Approved Alias Repository shall:
 - a) Be maintained at the main root level,
 - b) Remain independent of MDB, TC, and TM input files,
 - c) Not modify any authoritative data source,
 - d) Be auditable and accessible only to authorized users.

Intra-Procedure Awareness

- 1) If an alias is approved by the user in one section of the current test procedure generation, and the same mismatch appears again in a subsequent section, the system shall indicate that the mapping was previously accepted in the current procedure and present it as a suggested option.
- 2) The system shall not automatically apply the alias and shall require user visibility and confirmation.

2.9 Connectivity and Opposite Endpoint Update Rule

After successful UUT pin validation:

- 1. The system shall query the MDB to retrieve the complete connectivity mapping for the validated UUT pin.
- 2. The corresponding opposite endpoint shall be determined strictly from the MDB connectivity definition.
- 3. The opposite endpoint column (Source or Destination, as applicable) shall be updated in the generated test procedure.

4. The system shall not assume that the “Source” column represents the starting point. The UUT pin may exist in either the Source or Destination column, and routing validation shall be performed accordingly

2.10 Patch Population

If a Patch column exists:

- 1) Patch values shall be derived from MDB connectivity mapping.
- 2) If multiple patches exist:
 - a) All patches shall be written in the same Patch cell.
 - b) Each patch shall appear on a separate line.
 - c) Order shall reflect path sequence from UUT to opposite endpoint.

Patch values shall not be populated until routing validation is successful.

2.11 Expected and Observed Fields

- 1) Expected (Exp.) values shall be copied exactly as defined in the approved template.
- 2) The system shall not infer, derive, modify, normalize, or auto-calculate any expected values under any circumstance.
- 3) Observed (Obs.) fields shall remain blank at the time of test procedure generation.
- 4) Observed values are intended to be entered manually by the executing engineer during actual test execution.
- 5) Variations in expected value formats (e.g., voltage, current, pulse width, resistance, logical state) shall be preserved without transformation.

2.12 Mnemonic Validation

- 1) If Telecommand (TC) or Telemetry (TM) mnemonic columns are present in the template table, the system shall validate the mnemonic entries against the corresponding authoritative Excel file.
- 2) For TC mnemonics:
 - a) The system shall search across **all sheets** of the TC CDB Excel file.
- 3) For TM mnemonics:
 - a) The system shall search across **all sheets** of the TM CDB Excel file.
- 4) If an exact match is not found:
 - a) The system shall present the nearest possible mnemonic matches based on similarity comparison.
 - b) The user shall confirm or correct the mnemonic.

2.13 Column Presence Determination and Row Processing Rule

The system shall first determine which columns are present in the template table and apply validation logic only to those columns.

Mnemonic Handling:

- 1) If only TC and/or TM mnemonic columns are present (and no pin fields are provided), only mnemonic validation shall be performed.
- 2) No routing, connectivity, or patch validation shall be triggered in the absence of pin references.

Pin-Based Processing:

- 1) If either **Source or Destination** pin is present:
 - a) That pin shall be treated as the UUT endpoint.
 - b) The system shall validate that pin against the MDB.
 - c) Upon successful validation, the corresponding opposite endpoint shall be automatically populated from MDB connectivity.
 - d) Patch information shall be populated (if the Patch column exists) as per routing rules.
- 2) If only Source and Destination pins are present:
 - a) The system shall validate connectivity consistency against MDB.
 - b) If mismatch exists, the row shall be flagged for user confirmation.

Row Skipping Rule:

- 1) If only the Description field is populated and all other actionable fields are blank or NA, the row shall be skipped.
- 2) If at least one valid pin reference (Source or Destination or mnemonic) exists, the row shall be processed.

2.14 Multi UUT Pin Handling

If the UUT endpoint contains multiple pins separated by commas, the following rules shall apply.

2.14.1 Default Live/Return Rule (Ordered Interpretation)

If:

- 1) Only a single description is provided, and
- 2) The template does not explicitly define positional descriptions,

then the pins shall be interpreted as a **Live/Return pair**.

The ordered interpretation shall be:

- 1) The first listed pin shall be treated as **LIVE**.
- 2) The second listed pin shall be treated as **RETURN (RTN)**.

Validation shall confirm that:

- 1) The first pin corresponds to a LIVE classification in the MDB.
- 2) The second pin corresponds to a RETURN classification.
- 3) Both pins belong to the same base signal family.

Accepted return aliases include: RTN, Rtn, Return.

The system shall not auto-swap pin order. The template-defined order shall be treated as authoritative.

If validation fails, the row shall be flagged for user review.

2.14.2 Explicit Positional Description Mapping

If the Description field contains multiple comma-separated descriptions and the number of descriptions equals the number of pins:

- 1) The first pin shall be validated against the first description.
- 2) The second pin shall be validated against the second description.
- 3) Positional comparison shall strictly follow the order defined in the template.

This positional rule shall override the Default Live/Return Rule.

If positional validation fails, the row shall be flagged for user review.

2.14.3 Multi-Pin Continuity Groups (More Than Two Pins)

If more than two pins are listed, or if the continuity group represents a shared electrical net:

- 1) Validation shall be performed at the **net level**, not at the individual pin mapping level.
- 2) A comma-separated pin list shall represent a single electrical continuity group.
- 3) The Description field shall apply to the entire group.

Example:

SNO	Connector	Description	EXP	OBS
1	OBS8030.04, 06, 08, 18	CMD RTN / HEATER RTN	SHORT	

For such groups:

- Each pin shall be internally expanded for MDB validation.
- The system shall retrieve the MDB description for each pin.
- All pins shall logically belong to the same electrical function or return category based on similarity comparison.

If the template description contains multiple comma-separated terms:

- These shall be treated as acceptable aliases for the group.
- Each MDB description shall match at least one of the listed terms.
- No one-to-one positional mapping shall be enforced.

If any pin does not logically correspond to the defined group description:

- The entire continuity group shall be flagged.
- The user shall be prompted to review, update, accept, or remove the affected pin.

2.15 Multiple Crimp Handling Rule (Uniform Processing)

- 1) In the MDB database, multiple crimp terminations of a single physical pin may be represented using “*” notation (e.g., ...01, ...01*1, ...01*2).
- 2) **Irrespective of whether the template references:**
 - a) a base pin (e.g., ...01), or
 - b) a specific crimp variant (e.g., ...01*2),
 - i) The system shall follow the **same validation workflow**.
- 3) The system shall:
 - a) Query the MDB to retrieve **all crimp variants** associated with the base pin.
 - b) Extract for each crimp variant:
 - (1) Signal description,
 - (2) Opposite endpoint connectivity,
 - (3) Patch / routing information.
 - c) Compare the retrieved crimp data against the template row context using similarity and consistency checks.
 - d) Present the **nearest matching crimp variant(s)** to the user.
 - e) Require explicit user confirmation to apply the selected crimp mapping for that row.

No crimp mapping shall be applied automatically without user confirmation.

2.16 Unverified Pins Table Rule

- 1) Upon completion of validation across all sections, the system shall generate an **Unverified Pins Table** for the selected UUT(s).
- 2) The system shall:
 - a) Retrieve all pins belonging to the selected UUT(s) from the MDB.
 - b) The UUT pins with destination /destination /another end Not-connected (NC) or connected to same UUT shall be ignored.
 - c) Compare this remaining list against all pins referenced in the generated test procedure.
 - d) Identify pins that exist in MDB but are not referenced in any section.
- 3) For each unverified pin, the table shall display:
 - a) Connector name
 - b) Pin number (including crimp variants, if any)
 - c) Signal description (from MDB)
 - d) Connectivity endpoint(s)
 - e) Patch path(s)
 - f) Suggested nearest matching TC mnemonic (if applicable)
 - g) Suggested nearest matching TM mnemonic (if applicable)
- 4) Nearest mnemonic suggestions shall be derived using similarity comparison across all sheets of the respective Excel file.
- 5) The system shall:
 - a) Prompt the user to either confirm intentional exclusion or include the pin in an appropriate section.
 - b) Not automatically create validation rows for unverified pins.

The Unverified Pins Table shall be included in the final generated test procedure document for traceability and coverage review.

2.17 Annexure Implementation Note”

“The vendor shall implement the system exactly as described. Section-specific logic shall be implemented without violating the General Rules. If any ambiguity arises due to template variation, the system shall prompt the user and log the decision rather than applying assumptions.”

3 Unified Validation Table – General Workflow

- 1) Table Encounter (Ref: 2.4)
 - a) Each table encountered in any section shall be treated as a structured validation unit and processed row-wise from top to bottom.
- 2) Column Presence Determination (Ref: 2.13)
 - a) The system shall identify available columns and activate only the applicable validation rules for the current table.
- 3) UUT Identification (Ref: 2.5)
 - a) The selected subsystem's Unit ID(s) shall be confirmed from the MDB prior to row validation.
- 4) UUT Pin Validation (Ref: 2.6 & 2.7)
 - a) Pins and associated descriptions shall be validated against MDB using similarity-based comparison before routing logic is applied.
 - b) Multi UUT Pin Handling & Multiple Crimp Handling (Ref: 2.14 & 2.15).
 - c) Alias repository shall be checked before mismatch prompt (Ref: 2.8).
- 5) Connectivity & Opposite Endpoint Update (Ref: 2.9)
 - a) The system shall retrieve MDB connectivity mapping and update the corresponding Source/Destination column accordingly.
- 6) Patch Population (Ref: 2.10)
 - a) If a Patch column exists, routing paths shall be populated from MDB only after successful connectivity validation.
- 7) Mnemonic Validation (Ref: 2.12)
 - a) TC/TM mnemonics shall be validated against respective Excel files, with nearest-match suggestions where required
 - b) Alias repository shall be checked before mismatch prompt (Ref: 2.8).
- 8) Expected & Observed Handling (Ref: 2.11)
 - a) Expected values shall be preserved exactly as defined in the template, and Observed fields shall remain blank.
- 9) Post-Validation Coverage Check (Ref: 2.16)
 - a) Upon completion of all sections, the system shall generate the Unverified Pins Table for coverage verification.

4 Pre-Power Checks

4.1 Objective

The Pre-Power Checks section shall verify correctness of signal routing, command and telemetry readiness, and power line integrity prior to application of electrical power to the subsystem under test.

These checks shall include, but are not limited to:

- 1) Open-Ended Raw Bus Checks
- 2) Open-Ended Secondary Voltage Checks
- 3) Open-Ended Telecommand Checks
- 4) Simulated Checks (Telemetry and/or Resistive Simulation)

Each subsection may contain one or more validation tables.

All such tables shall be processed using the unified validation rules defined in this section.

4.2 Manual Process (Reference)

During manual execution, engineers:

- 1) Identify powered signal paths using the MDB file.
- 2) Search TC Excel for telecommand codes using signal descriptions.
- 3) Search TM Excel for telemetry channels.
- 4) Populate procedure with command codes, power values, and telemetry channel identifiers.
- 5) Record observed voltage, current, and telemetry values during test execution.

4.3 IATP Template-Based Process

Validation Flow for Pre-Power checks:

Pre-Power checks shall follow the Unified Validation Table – General Workflow (Section 3) and applicable General Rules defined in Section 2.

Note: Highlighted columns in the sample templates give below are to be filled by the IATP system, filled are show here just for reference of how the IATP system final output is expected.

4.4 Sample template for Open ended telecommand

Sl. No.	TC CDB Mnemonic	Description	Source	Patch	Destination	Exp.	Obs.
1.	DEP_M_ARM	DEP FIRE Main ARM Command	OBS8027.21	DP22MS51.06	PW5101.39	5V/64ms	
2.	DEP_M_DIASARM	DEP FIRE Main DIASARM	OBS8029.50	DP22MS51.07	PW5101.40	5V/64ms	
3.	DEP_ENA_R.	DEP Enable Redt.	OBS8127.40	DP22RS71.04	PW5201.23	5V/64ms	

4.5 Sample template for Simulations Telemetry

Sl. No.	Telemetry CDB Mnemonic	Description	Source	Patch	Destination	Exp.	Obs.
1.	ANT_ELEX-M_STS	ANT Electronics-M On/Off sts	OBS8014.07	EP12MS52.28	ANT1001.03	0,0	
2.	ANT_M_PWM_STS	ANT Main PWM false sts	OBS8014.08	EP12MS52.33	ANT1003.54	0,0	
3.	ANT_ELEX-R_STS	ANT Electronics-R On/Off sts	OBS8114.07	EP12RS72.26	ANT2001.03	0,0	

4.6 Sample template for Open ended raw bus

Sl. No.	Description	Source	Patch	Destination	Exp.	Obs.
1.	BUS LIVE TO CON-11	PE1032.19,41	EP43MP11.06,15 EP23MP11.06,15	OBS8001.01,02	37V	
2.	BUS LIVE TO CON-12	PE1038.03,12	EP43RP31.20,29 EP23RP31.20,29	OBS8003.01,02	37V	
3.	BUS LIVE TO CON-21 Line-1	PE1037.19,41	EP43RP31.05,14 EP23RP31.05,14	OBS8101.01,02	37V	

