Annexure I

REQUEST FOR PROPOSAL (RFP) - CPRI Customer Portal

RFP: SELECTION OF SYSTEM INTEGRATOR FOR DESIGN, DEVELOPMENT, INTEGRATION, IMPLEMENTATION AND MAINTENANCE OF CPRI CUSTOMER PORTAL

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SECTION I: PROJECT OVERVIEW

The Central Power Research Institute (CPRI) is seeking a qualified System Integrator (SI) to design, develop, test, integrate, implement, demonstrate and train, maintain a secure, user – friendly, Customer Portal which works on web (compatible with latest browsers) and mobile apps.

Purpose: The overall objective of the Customer Portal is to serve as a comprehensive single-window interface that digitizes end-to-end customer interactions in the testing process—from initial enquiry, estimate generation, and PO submission to proforma invoicing, payment verification, sample tracking, test date booking, and final report downloading—minimizing manual communication and streamlining the entire testing workflow with CPRI.

SECTION II: SCOPE OF WORK & DETAILED FUNCTIONAL REQUIREMENTS

The customer portal shall integrate with CPRI's Laboratory Information Management System (LIMS), Integrated Financial Accounting System (iFAS), and Payment Portal to automate a comprehensive 18-step workflow, supported by following core functional modules.

- **Customer Onboarding & Enquiry:** Supports open portal (for unregistered customers) and closed portal (for registered customers), decision-tree guided enquiry submission,

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- **Estimate:** Auto-generation of estimates.
- **Test date Booking & Payments:** Features dynamic test date selection linked to LIMS master calendars, and support for domestic payments and international SWIFT transfers.
- **Sample Logistics & Gate Operations:** Tracks sample entry, RFID/barcode generation, Test sample location updates, Custom Duty Exemption Certificates (CDEC), and digital gate pass generation.
- **Testing, Reporting & Financial Closure:** Tracks real-time status of sample testing, Test report download, AI-enabled Digital Fingerprint based for report authenticity verification, and integrated tax invoicing.
- **Web & Mobile application**: The System Integrator shall deliver a full-stack, enterprise-grade web application and mobile application. The software architecture must strictly implement the 18 core operational steps outlined below.
- **Notification**: The system shall support portal notifications and configurable email notifications. Auto-reminders/notifications (email/SMS) at different stages of the process-flow should be triggered.
- **Dashboard**: Multi-level customizable dashboard for both Customer and CPRI officials shall be available for monitoring and tracking the entire work flow.
- **Query-Management module**: CPRI currently manages its entire customer workflow primarily via email, covering application submission, acknowledgments, document sharing, clarification requests, testing status updates, invoicing, payment confirmations, and the issuance of scanned test reports. The proposed portal must include an interactive query-management module that enables seamless, two-way communication (raising and responding to queries) between customers and CPRI, including the ability to share supporting documents.
- **Audit trail & Event Log**: All the correspondence and action taken during the entire process-flow must be recorded with time stamping and user identification.
- **AI Chatbot:** Integrate an AI virtual assistant to guide and support customers through every stage in the process flow.
- **Frequently Used Services**: The dashboard may include quick-access options such as New Test Request, Repeat Previous Request, Check Test Availability, Track Sample, Make Payment, Download Report, FAQs and Contact CPRI.
- **OCR-Based Log Sheet Extraction:** Automated data extraction from scanned paper log sheets using Optical Character Recognition (OCR) to minimize manual entry errors and accelerate processing.
- **Bulk Excel Upload:** Direct data ingestion capability supporting standard spreadsheet formats (Excel/CSV) for efficient batch uploads.
- **Interactive Tabular Data Entry:** A user-friendly, grid-based manual entry interface within the portal that replicates standard log sheet formats for direct data input.
- **Cryptographic Document Integrity Check:** Verification of digital test report copies using hash-based digital signatures or digital fingerprints to ensure authenticity and prevent tampering.
- **Role-Based Access Control (RBAC):** Secure login management supporting distinct user roles, including **Administrator, Head of Department (HoD), Test Engineer, Accounts personnel and Quality Engineer of CPRI and** corresponding personnel from CPRI Customers, for their responsibilities - with permission-restricted view/access

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- **Automated Template-Based Report Generation:** Dynamic generation of test reports by automatically mapping and linking ingested data fields to pre-defined document templates using placeholders.
- **Others**: Any functionality not explicitly listed but necessary for secure, reliable and maintainable operation, is required to be developed.

Deployment Architecture: On-premises

Project Duration (up to Go-Live): 24 weeks

Hyper-care: 6 months

AMC post Hyper-care: 3 years

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SECTION III: CORE 18-STEP FUNCTIONAL REQUIREMENT MATRIX

Step No.	Process Phase	Key Detailed Functional Requirements
1	**Customer Registration & On-boarding**	**Open Portal:** Unregistered customers submit queries, receive a unique Ticket Number, view preliminary estimates, Registration is directed through closed portal before placing the Purchase Order. **Closed Portal:** **Initial Registration:** If the company has a valid GSTIN/Tax ID/Registration Certificate and provides an official company/domain email address, the registration can be completed without CPRI's approval by verifying the OTP received on the registered email address of the company. If the company does not have a GSTIN/Tax ID/Registration Certificate and the registration is submitted using a non-domain email address, approval from CPRI Nodal officer(s) shall be mandatory before the registration is completed. **Login**: Existing/New customer login via Company GST/Tax ID/Registration Certificate + Registered Phone/ OTP. **Customer Manager**: A designated representative within the Customer/manufacturers organization responsible for overseeing fund allocation and managing permission access across multi-level hierarchies. They supervise employee groups belonging to diverse business units operating under a single GSTIN. In case of International customers/manufacturers, instead of GST, the registration/login process may be based on corresponding Tax ID/ TIN/ VAT/ Certificate of Incorporation/ Registration Certificate etc.
2	**Enquiry Submission**	**Guided decision-tree flow**: Select domestic/international customer/manufacturer → Select Product/Material →

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Step No.	Process Phase	Key Detailed Functional Requirements
		Select voltage/current class → View Applicable Standards → Select Standard → View Applicable Tests → Select Tests→Select Unit/Division/Lab of CPRI (in case multiple units/divisions/lab of CPRI perform the same tests). Customer also fills specific Annexure (nameplate details) and uploads General Arrangement (GA) drawings, datasheets, and photos. Enquiry form gets auto-generated. During the process, in case if customer enquiry is not falling under the guided decision-tree mentioned above, Customer fills the blank enquiry form and submits. The enquiries have to be automatically mapped to the email ids of the concerned Nodal officer(s) (Group Head/ Unit Head/HoD/Next level senior officer). Note 1: Customer should be able to begin the Guided decision-tree flow by starting either from the Product or the Standard or the Unit/Division/Lab. Also, if some tests as per a particular standard are missed out by the customer during the selection, the portal should prompt the customer about the missing tests, inform the necessary test sequence/ required pre & post-tests etc. and intimate whether the selected tests would comply the requirements for the specific standard and whether the selected tests are covered in the scope of ISO/IEC 17025. Note 2: International customers are defined as those enquiring about products manufactured or supplied outside of India. During the application process, Name and address of the OEM, the customer (the party paying CPRI), and the origin of dispatch needs to be obtained. International tariffs and corresponding procedures apply if any of these entities are located abroad. Note 3: After submission, in case customer wants to amend the enquiry, options should be available to amend the enquiry (linking it to the original enquiry), before or after commencement of the testing.

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Step No.	Process Phase	Key Detailed Functional Requirements
		Note 4: Smart Auto-Fill: Streamline enquiry submissions by automatically pre-populating fields using data from past submissions. Additionally, enable customers submitting multiple enquiries with similar specifications to easily duplicate previous enquiries, make quick edits, and submit them without starting from scratch. Note 5: AI-Driven Conversational Enquiry: AI chat-bot needs to be integrated to streamline the enquiry submission process. Instead of filling out traditional application forms, an option to be available for customers to interact naturally with the chat-bot to provide the required details. Furthermore, the chat-bot should be able to automatically extract and populate product-specific information by reading technical datasheets uploaded by the customer.
3	**Estimate Generation** **(LIMS/iFAS integration required)**	Based on the enquiry submission, Auto-generated estimates calculated from the Tariff Master are directed to Nodal Officer(s) for verification. If any discrepancy in the auto-generated estimate, the nodal officer(s) should be able to raise a ticket to the Administrator of the Tariff Master to resolve the discrepancy. Once the discrepancy is resolved, the nodal officer(s) verifies and approves the estimate. Final approved estimate to be available in customer portal for download along with standard CPRI Terms & Conditions (email/mobile notifications to be sent). Before approving the estimate, the nodal officer(s) may seek clarifications by communicating through the Query-Management module If the enquiry pertains to multiple labs, based on approval from multiple nodal officer(s), a consolidated estimate needs to be generated. **Automated Test Schedule**: The portal uses AI to analyze test durations (integrate with LIMS), generating a preliminary day-wise test schedule for the customer that is

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Step No.	Process Phase	Key Detailed Functional Requirements
		automatically included in the estimate.
4	**Estimate Acceptance & PO Upload**	Based on the estimate submitted by CPRI, Customer can accept/reject/offer comments. • If accepted, provision to upload Purchase Order/Letter of Intent shall be available. • If rejected, reason for rejection is sought and customer feedback is obtained. • If comments are provided, auto-email to be generated to the concerned nodal officer(s). Note: If customers request an estimate solely for internal budgeting purposes and choose not to proceed, a Terminate option must be available. Selecting this will stop any further auto-generated follow-up notifications. In case, customer wants any amendment in estimate, options should be available to submit an amended enquiry (linking it to the original enquiry), before or after commencement of the testing.
5	**Test Date Availability** **(LIMS/iFAS integration required)**	The portal should create and display a live lab test calendar, taking into account test duration (including setup/dismantle time) and test date availability. Customers can dynamically select and modify their preferred start date multiple times as needed based on the preliminary day-wise schedule provided in the estimate. The portal will automatically generate and display a revised day-wise schedule matching the available test dates. This live lab test calendar shall then be integrated with LIMS.
6	**Payment Processing** **(LIMS/iFAS/Payment portal integration required)**	**Domestic Transactions**: The customer portal will redirect customers to the CPRI Payment Portal to complete transactions. Payment confirmation and receipt will be automatically fetched back into the customer portal. **International transactions**: Customers receive bank mandate details for making SWIFT transfer, upload payment transfer proofs in the customer portal.

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Step No.	Process Phase	Key Detailed Functional Requirements
		Notification is sent to the CPRI Accounts Officer(s) for verification and confirmation. Note: Enable customers to add multiple proforma invoices to a single cart and process a consolidated payment. Before making payment, the customer shall mandatorily read and accept, CPRI terms and conditions for testing. Accounts ledger statement shall be available in the customer portal. (Seamless integration with Payment Portal and iFAS). Also, The portal should provide a simple view of payment status, outstanding amount, payment history and downloadable payment receipts, with integration of the existing payment system wherever applicable. It should also show for a particular sample testing, how much amount is blocked. If customer wants to move that amount to some other sample testing then customer should be able to raise request internally to the customer manager and gets re-allocated based on approval from CPRI nodal officer(s).
7	**Test Date Confirmation** **(LIMS integration required)**	The customer selects a start test date, and the portal generates a date-wise schedule aligned with available testing dates. Upon customer confirmation, these dates are temporarily blocked on the lab calendar, and a notification is sent to the designated nodal officer(s). Once mutually accepted, the schedule is officially booked in the calendar. In case of unforeseen circumstances such as facility maintenance, equipment breakdown, or staff unavailability, causing unavailability of the agreed test dates, the nodal officer can update the calendar. This triggers automated notifications to all affected customers scheduled during that period. Also, Test date rescheduling/cancellation request option to be available to the customer which needs to be mutually accepted by CPRI nodal officer(s). **Enforces mandatory delivery rules**: If samples are not submitted by customers 5 working days prior to the test start date, the test gets auto-reschedules to the next

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Step No.	Process Phase	Key Detailed Functional Requirements
		available date with intimation to customer and lab confirmation. Live lab test calendar needs to be updated and shall be integrated with LIMS.
8	**Customer Representative Presence & Visitor Management Process** **(LIMS integration required)**	**Customer representative presence during Testing**: Customers may request the presence of a representative during testing for test coordination, mounting, or witnessing. Alternatively, CPRI may notify the customer if their physical presence is explicitly required for these activities. **Domestic Personnel Nomination**: Domestic customers can nominate personnel by uploading their company ID card and identity verification details directly into the system. **Foreign Nationals & Visa Invitation:** For foreign nationals, the system automatically collects the required data from the customer and generates an "Invitation for Visa Purposes." This document is then directed to the CPRI Nodal Officer(s) for approval. **Visitor Pass Generation:** Visitor passes for pre-registered personnel are automatically generated and issued to the customer. (Note: This module needs to integrate with the swagatam.gov.in portal for visitor pass creation. Alternatively, a separate visitor management system can be developed and integrated with LIMS.)
9	**Material Entry & Pre-Arrival process** **(LIMS/iFAS integration required)**	**Domestic shipments:** The customer inputs sample dispatch details—including sample information, vehicle and driver contact details—and uploads necessary documents such as the delivery challan and packing list. **International shipments**: The customer requests a Custom Duty Exemption Certificate (CDEC) by entering the required details and uploading the invoice, packing list, Customs House Agent (CHA) authorization letter, and Bill of Lading/Air-Way Bill/Consignment Note. The

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Step No.	Process Phase	Key Detailed Functional Requirements
		system then automatically prepares the import documents using pre-loaded templates, which a nodal officer subsequently verifies, digitally approves or physically signs and uploads. **Mapping**: Additionally, sample details are auto-fetched from enquiry correspondence and mapped to the relevant estimate, purchase order, proforma invoice, payment confirmation, or test schedule to ensure samples are only dispatched to CPRI after payment is made. Since multiple samples can be dispatched together, the portal enables customers to link multiple estimate, Purchase Order, Proforma Invoice, payment confirmation, or test schedule documents accordingly. **e-way bill:** Finally, the customer seeks e-way bills, which designated CPRI nodal officers verify and upload.
10	**Gate Verification & Barcode Affixing** **(LIMS integration required)**	Security verifies incoming physical test samples, issues Material Entry Permit (MEP) and affixes a unique RFID/barcode. Barcode and material entry records auto-sync with the Customer Portal (integration with LIMS)
11	**Material Receipt at Lab** **(LIMS integration required)**	**Sample Receipt & MRN Generation**: Upon sample acceptance within the LIMS, a Material Receipt Note (MRN) is generated. Nodal officer(s) can update the sample status post-receipt and verification. This accommodates status exceptions such as non-working items, incomplete shipments, or other discrepancies.
12	**Real-Time Sample Tracking** **(LIMS integration required)**	Barcode and RFID scans upon laboratory entry and exit automatically update sample locations in real time within both the LIMS and the Customer Portal. Note 1: When sample testing happens at multiple laboratories within or across CPRI units, transfers are managed via internal forms (intra-unit) or sealed customer-transported shipments with gate passes and shared photographs (inter-unit). In such cases, the portal should feature digital tracking by uploading sealing details

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Step No.	Process Phase	Key Detailed Functional Requirements
		and photographs to ensure sample traceability. Additionally, the system shall allow receiving nodal officers to raise LIMS tickets for transit-damaged samples, which will then be marked as unsuitable for testing and communicated to the customer upon confirmation. Note 2: A visual status/timeline may be provided, such as: Request Submitted → Technical Review → Estimate/Purchase Order/Proforma Invoice → Payment → Sample Awaited → Sample Received → Test Scheduled → Testing in Progress → Report Under Preparation → Report Ready for download.
13	**Status of Testing** **(LIMS integration required)**	The testing status is updated in the portal as Completed, In Progress, Terminated, or Paused for Modifications. When samples are paused for modifications, they are redirected for rectification, resubmitted, and recoded before testing resumes and the portal is updated. Note: If drawing revisions are needed, CPRI's Unit/Division/Lab will request them. Customers can upload the revised drawings via the portal, which is shared across all concerned test labs.
14	**Tax Invoice** **(LIMS/iFAS integration required)**	The tax invoice generated by iFAS needs to be linked to the corresponding Purchase Order/Proforma Invoice and published to the customer portal.
15	**Customer Feedback** **(LIMS integration required)**	A structured feedback facility may be provided against a specific Job/Request, with acknowledgement and status tracking of the feedback. The feedback form should pop up when customer clicks to download the test report.
16	**Test Report** **(LIMS integration required)**	Preliminary Test report / Test report uploaded for customer. Comments on the test report. Finalization of Test report. Access and download the test report by customer with

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Step No.	Process Phase	Key Detailed Functional Requirements
		secured authentication. **Customer Report Repository**: To be provided where customers can securely access and download their previous test reports/certificates, with suitable filters and search facility.
17	**Test Sample Return Request** **(LIMS integration required)**	Customer enters retrieval details. International customers confirm original documents to auto-prepare re-export templates. Nodal officer processes email approval to bank for GR Waiver issuance and uploads confirmed waiver to portal. Upload the e-way bills (approved by Accounts Nodal Officer)
18	**Gate Pass Issue** **(LIMS integration required)**	LIMS creates digital Gate Pass / Delivery Challan authorizing sample dispatch or pickup upon verifying all compliance, financial, and report conditions

SECTION IV: REQUIREMENTS FOR EOI SUBMISSION

A. TECHNICAL INFORMATION

As part of the Expression of Interest (EoI), the service provider must provide a comprehensive, detailed technical solution covering (but not limited to) the following core domains:

1. Architecture & Design

- **System & Technical Architecture:** Overall system design, component breakdown, and structural blueprints.
- **Integration Requirements:** Architecture and protocols for third-party systems, APIs, and legacy data integration.
- **Architectural Principles & Standards:** Adherence to industry best practices, design patterns, and coding standards.

2. Data & Infrastructure

- **Database Topology:** Data modeling strategy, storage architecture, replication, scalability, and disaster recovery design.
- **Infrastructure & Hosting:** On-premises deployment architecture, resource provisioning, and scalability models.

3. Security, Compliance & Governance

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- **Data Sovereignty & Compliance:** Adherence to regional data residency laws, privacy regulations and industry standards.
- **Security Framework:** Identity and access management (IAM), encryption standards, vulnerability management, and threat mitigation.

4. Service Levels & Performance

- **Availability & Performance:** Uptime commitments, response time benchmarks, load handling, and high-availability strategies.
- **Service Level Agreements (SLAs):** Proposed SLA tiers for issue resolution, system availability, and support response times.

5. Operations & Usability

- **Operations & Patching:** Routine maintenance schedules, backup and recovery procedures, release management, and zero-downtime patching strategies.
- **Usability & Accessibility:** User experience standards, compliance with accessibility guidelines, and cross-platform responsiveness.

B. PRICE INFORMATION

As part of the Expression of Interest (EoI), the service provider must provide a comprehensive, detailed pricing covering (but not limited to) the following categories

1. Implementation & Professional Services (One-Time Costs)

Provide a milestone-based or phase-based cost breakdown for building and launching the customer portal:

- **Discovery & Solution Design:** Requirements finalization, technical architecture blueprint, and prototyping.
- **Core Development & Customization:** Coding, portal feature implementation, and core modules.
- **System Integration:** Middleware, API development, and integration with existing systems (LIMS, iFAS, payment portal)
- **Data Migration:** Extraction, transformation, cleansing, and migration of legacy customer data.
- **Testing & Quality Assurance:** Functional, performance, security, and User Acceptance Testing (UAT) support.
- **Deployment & Go-Live:** Infrastructure setup, production deployment, and go-live stabilization.
- **Hyper-care:** 6 months

2. Operations, Maintenance & Support (Recurring Costs)

Provide recurring costs on an **Annual basis (Year 1, Year 2, Year 3)**:

- **Application Maintenance & Support (AMC):** Post-go-live bug fixes, security patches, system monitoring, and tier-based support (L1/L2/L3 SLAs).
- **Hosting & Infrastructure Management:** On-premises server hosting fees, storage, bandwidth, and backup management
- **Software Licensing & Subscriptions:** Any recurring third-party licensing fees, SaaS tool integrations, or platform costs required to keep the portal running.
- **Change Requests:** for future enhancements or out-of-scope change requests:

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