वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्
Council of Scientific & Industrial Research
राष्ट्रीय वांतरिक्ष प्रयोगशालाएं
National Aerospace Laboratories

CSIR - NAL Estd. 1959
ISO 9001 : 2015
Certified Organization

INVITATION FOR BIDS/NIT

Tender No. NAL/PUR/ALD/114/20-Y **Dated: 20-Aug-2020**

CSIR- National Aerospace Laboratories (NAL), Bengaluru, India is one of the premier laboratories under Council of Scientific and Industrial Research (CSIR), an autonomous body under Department of Scientific and Industrial Research, Government of India, New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organization. It is internationally known for its excellence in Scientific Research in Aerospace Engineering.

The Director, CSIR-NAL invites online quotation for procurement of the following item(s) for day to day research work.

Sl.No.	Description of Items	Unit	Quantity
1	**Generation of requirement specification and architecture definition of smart secondary solid state distribution system. Please refer Annexure for detailed specification and scope of work.**	**No**	**01**

Single / Double Bid	**Single**
Bid Security (EMD) (in INR)	**Bid Security Declaration should be enclosed with quotation.**
Performance Security	**Nil**

01. Tender Documents may be downloaded from Central Public Procurement Portal https://www.etenders.gov.in. Aspiring Bidders who have not enrolled/ registered in e- procurement should enroll/ register before participating through the website https://www.etenders.gov.in. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission'.

02. Tenderers can access tender documents on the website (For searching in the NIC site https://www.etenders.gov.in, kindly go to Tender Search option, select tender type and select ' Council of Scientific and Industrial Research' in organization tab and select NAL-Bengaluru-CSIR in department type Thereafter, Click on "Search" button to view all CSIR-NAL, Bengaluru tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website https://www/etenders.gov.in as per the schedule given in the next page.

03. Either the Indian Agent on behalf of the Foreign principal or the Foreign principal can bid directly in a tender but not both. However, the offer of the Indian Agent should also accompany the authorization letter from their principal. To maintain sanctity of tendering system, one Indian Agent cannot represent two different Foreign principals in one tender.

04. Unsolicited / conditional / unsigned tenders (Quotations) **shall not** be considered. Quotations received after the due date and time **shall be summarily rejected.**

05. The Bidder shall comply the terms and conditions of the tender, failing which, the offer shall be liable for rejection.

06. The Director, CSIR- National Aerospace Laboratories., Bengaluru reserves the right to accept any or all the tenders either in part or in full or to split the order without assigning any reasons there for.

Raman Kumar
(Section Officer S&P)

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CSIR-National Aerospace Laboratories, Bengaluru-560 017, INDIA

SCHEDULE CUM CRITICIAL DATE SHEET

1	Name of Organization	CSIR-National Aerospace Laboratories, Bengaluru	
2	Tender Reference No	NAL/PUR/ALD/114/20-Y dated: 20-Aug-2020	
3	Tender Type (Open/Limited/EOI/Auction/Single)	Open Tender	
4	Type/Form of Contract (Work / Supply / Auction / Service / Buy / Empanelment / Sell)	Supply	
5	No of Covers (One/Two/Three/Four)	One	
6	Tender Category (Services/Good/Works)	Goods	
7	Allow Resubmission (Only in online mode within scheduled period)	Yes	
8	Allow Withdrawal (Only in online mode within scheduled period)	Yes	
9	Allow Offline Submission	No	
10	Work Item Title	Generation of requirement specification and architecture definition of smart secondary solid state distribution system	
11	Work Description	Generation of requirement specification and architecture definition of smart secondary solid state distribution system	
12	Delivery Schedule	180 days from the date of purchase order	
13	Product Category (Civil Works / Electrical Works / Fleet Management / Computer Systems)	R & D Equipment	
14	Is Multi Currency Allowed	No	
15	a) Tender Publishing Date -	20-Aug-2020	1800 Hrs
	b) Document Download Start Date-	20-Aug-2020	1800 Hrs
	c) Bid Submission Start Date-	20-Aug-2020	1800 Hrs
	d) Bid Submission End Date-	10-Sep-2020	1000 Hrs
	e) Bid Opening Date-	11-Sep-2020	1100 Hrs
16	Bid Validity Days	90 days	
17	Address for communication	Stores and Purchase Officer CSIR-National Aerospace Laboratories, HAL Airport Road, Kodihalli, Bengaluru - 560017	
18	Inviting Officer	Director, CSIR-NAL	
19	Contact No	25086040, 25086041	
20	E-mail Address	purchasek@nal.res.in	
21	Detailed specification of item	Refer Invitation for bids / NIT	
22	Tender Terms & Conditions & Instruction for online bid submission	The prospective bidders are requested to refer to the Standard Tender Document available on NAL Internet **(www.nal.res.in)** under the icon Tender-Purchase before formulating and submitting their bids	

SCOPE OF WORK FOR DEVELOPMENT OF SOW FOR SECONDARY POWER DISTRIBUTION UNIT FOR SARAS MK II

1. The Secondary Power Distribution Unit (SPDU) is a secondary power control and load management unit designed to be used in 28V DC applications. The secondary power distribution unit will receive power from primary power distribution unit (PPDU) and distribute power to various loads through electronic circuit breaker of SPDUs of appropriate rating. Secondary Power Distribution Unit can provide a key safety feature of over current and arc-fault protection for both wiring and loads, as opposed to the wire-only protection offered by thermal breakers. Besides the ability to directly replace the Circuit Breaker Panel (CBP) and relay junction box, thus freeing up cockpit area. The Secondary Power Distribution will house the required solid-state circuit breaker, bus bars, terminal blocks, connectors and microcontroller. NAL is in the process of finalizing the secondary power distributions system for Saras MK II. NAL is looking to partners in the industry with established expertise in Aerospace domain especially in the field of Solid State Secondary Power Distribution Systems (SPDU). NAL intends to outsource the design and development and qualification of the SPDUto a capable partner. For this, a comprehensive SOW is first required to be prepared. This document outlines the scope of work to be carried out by the Vendor for the development of SOW for Secondary Power Distribution Unit (SPDU) for SARAS MKII.

2. The vendor is required to undertake following activities as part of scope of work:

   a. Study and analyze various 28VDC buses (from PPDU to Secondary Power Distribution Unit) and the various loads in Secondary Power distribution of SARAS MK II ,suggest the optimum architecture to reduce weight, cabling requirements which supports the flexibility to accommodate different 28VDC bus power inputs, the number of Solid State Power Controllers (SSPC) and their wide ratings. The number of loads connected to SPDUs will be approx. 250 Nos. The ratings of loads will be in the range of 0.1 A to 30A. This activity will be done in collaboration with NAL.
   b. Leverage the usage of solid state technology and suggest to NAL the most optimum configuration, which is highly configurable, rugged, modular keeping in mind the SARAS MK II aircraft requirements.
   c. Modern Technology which enhance the safety features like lightning protection, short circuit, Ground Fault predictions to be studied and any additional measures need to be to make the aircraft safe free from any type of malfunctionsis to be suggested in the SOW.
   d. The SOW should clearly define the advanced convenience and safety features like remote load power control, load power monitoring, automatic load shedding, control through discrete signals via communication channels and other prognostic and diagnostic maintenance activities.
   e. The vendor should identify a technology so as to have a minimum life of atleast 15 to 20 years and should be highly safe, reliable and easily maintainable over the aircraft's life and build this requirement criteria into the SOW.

f. Solid State Ground Fault Interrupt scheme to be identified and limits build for vendors to quote.

g. List the electrical features of each SPDU with all inputs, outputs and loads. Prepare high level ICD (Interface Control Drawing) for the identification of the power input, output and other signals.

h. Mention the relevant design criteria acceptable worldwide for civil aircrafts. Example: the design shall comply with DO 254 DAL B & DO 178 DAL A and shall be qualified as per DO 160G.

i. The vendor should draw the specifications of the SPDU to include modern technologies like highly programmable trip curves to replicate the behavior of the Thermal breakers and relaysper channel, monitoring and control requirements and solid state switch limitations if any.

j. Specifications of the required Housekeeping power Supply have to be defined.

k. Specifications of mechanical design and thermal Analysis to be included.

l. Define the cooling requirements of each SPDU based on pressurized / unpressurised chamber operations, define the data bus requirements for monitoring at a remote location.

m. The vendor should draw the qualification test requirements for such kind of SPDU for Saras MK II

n. The vendor should list to the extent feasible all the power quality checks to be carried out in ground test rig simulating all test conditions that the SPDU should be subjected to under all possible operations / conditions prior installation onboard aircraft for trials.

o. The vendor whilst making the SOW should keep in mind that during the course of the aircraft, loads may change and accordingly build this requirement in the SOW.

p. Vendor should list the details for following aspect in SOW
   i. Development Process and Reviews
   ii. Documentation to be submitted
   iii. Configuration Management
   iv. Deliverables
   v. Schedule
   vi. Project Communication and Technical Coordination Meetings (TCMs)
   vii. Vendor and NAL Responsibility
   viii. Warranty

3. **NAL responsibility.** NAL shall facilitate all necessary details to the vendor which will aid in the preparation of detailed SOW document:
   a) Load details : Total list of loads, Input DC bus type, Type/name/description/function of load, the nominal rating of load, existing CB rating in load channel, Segregation of load with w.r.t. Left and Right wing , approx. location of each load in aircraft, whether the load is in series with CB only or combination of CB and Relay
   b) Interface Control Document/Electrical interface specification document of the overall Secondary Power distribution section.

4. **Timeframe.** The vendor has to submit the SOW document within 6-8weeks from date of issue of PO.

5. **Project Progress**. The Vendor shall continuously interact with NAL during the course of the development of the SOW and keep updating the progress at regular intervals. The frequency of the interaction shall be decided and communicated to vendor. The vendor should submit weekly progress report to NAL.

6. **Acceptance Criteria**. The vendor should also make a suitable presentation and justify that the requirements in the SOW meets the overall aircraft requirements. NAL will issue an acceptance letter for the work to be deemed completed.

7. **Payment Terms**. All payment shall be made on satisfactory completion of the stated work and within 30 days of submission of invoice.

BID-SECURING DECLARATION FORM

Date: _____

Bid No. _____

To (insert complete name and address of the purchaser)

I/We. The undersigned, declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

(a)	have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
(b)	having been notified of the acceptance of our Bid by the purchaser during the period of bid validity (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown)
in the capacity of (insert legal capacity of person signing the Bid Securing Declaration).

Name: (insert complete name of person signing he Bid Securing Declaration)

Duly authorized to sign the bid for an on behalf of: (insert complete name of Bidder)

Dated on _____ day of _____(insert date of signing)

Corporate Seal (where appropriate)

Note:

1. In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid.
2. Bid Security declaration must be signed in by the Proprietor/CEO/MD or equivalent level of Officer of the company.