REQUEST FOR QUOTATION

MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER: PSS0000206

RFQ DATE : 10.08.2017

Due Date/Day: 04.09.2017 MON
Time : 13:00 HRS
Tender Box : Reception Area
Opening Venue:
NEW ENGG. BLDG

(address for communication) :

(for all correspondence)
Purchase Executive : SIVASHANKARI P
Phone : 25146134
Fax : 00918028520135
E-mail: fsesdmm@bheledn.co.in

1. Separate offer in English language addressed to the Purchase Executive shall be made for this RFQ in three parts.
2. Reference Documents: PS-460-0157 Rev00 is to be completely read, understood and should be acceptable to bidder. Supplier has to give clause wise compliance to PS-460-0157.
3. Warranty as per clause mentioned in PS-460-0157
4. Documents to be provided along with the supply of the items
a. Refer to Requirements mentioned in PS-460-0157
b. Certificate of Conformance
c. Test Certificate
Conformation to be provided in Technical offer.
5. DELIVERY : 14 weeks from date of Purchase Order.
6. Terms & Conditions shall be as per Doc Ref Doc no: BHEL: EDN: GCC - SHOP: Rev00, Instructions to bidders as per Doc no: BHEL: EDN: ITB - SHOP: Rev00, and Annexures.
7. Price basis shall be firm; Price Variation Clause is NOT acceptable.
8. Tender opening Time is 01:30 PM on the tender due date, Place: Tender opening room @ BHEL-ESD, Electronic city, Bangalore.
9. Please drop your offer before due date & time in the tender box named "Monday" kept at the reception of BHEL-ESD, Electronic city, Bangalore.
10. Items should be delivered to
BHEL-ESD,
PLOT NO 98,
ELEGTRONIC CITY PHASE 1,
HOSUR ROAD,
BANGALORE-560100,
KARNATAKA

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	DS0830005480 Panel PC 10.4" (MIL Grade) * HSN/SAC : 9032 Test Certificate MIL Grade 10.4" Panel PC As per Purchase Specification Document No: PS-460-0157	3	NO	3	11.09.2017

Total Number of Items - 1

1.
2.

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES :
1.This RFQ is Governed by :
a)INSTRUCTIONS TO BIDDERS/SELLERS(Doc No :BHEL:EDN:ITB-SHOP) available at
www.bheledn.com (RFQ-PO Terms & Conditions)
b)GENERAL CONDITIONS OF CONTRACT FOR PURCHASE(Doc no :BHEL:EDN:GCC-SHOP) available at **www.bheledn.com (RFQ-PO Terms & Conditions)**
c)Any other specific Terms and Conditions mentioned.
2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same .
* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

SIVASHANKARI P
Contrl Eqpment - ESD

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PURCHASE SPECIFICATION OF

MIL Grade Panel PC for NAVAL Applications

REVISION HISTORY SHEET FOR PURCHASE SPECIFICATION

REV NO	DATE	NATURE OF CHANGE	REASON FOR CHANGE	PREPARED BY	APPROVED BY
00	04/04/2017	First Issue	--	GLB	PB

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AUTHOR'S ABSTRACT:

The purpose of this document is to define the features, functionalities and requirements of the MIL Grade panel PC to be supplied to BHEL.

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1. INTENT OF SPECIF ICATION

1.1 This specification covers the features, functionalities and requirements of the MIL Grade panel PC, to be supplied for Naval application.

1.2 It is not the intent to specify completely herein all the details of design and construction of equipment. However, the equipment shall be complete in all respects conforming to high standards of components which may not have been specifically mentioned, but are essential for satisfactory and trouble free operation/maintenance of the equipment.

1.3 The supplier while quoting shall go through the specifications in detail and all the attachments thereof and furnish all documentation as indicated elsewhere in the specification. Deviations from specifications, if any, should be clearly specified. Compliance shall be assumed if not mentioned otherwise.

2. GENERAL TERMS

2.1 The supplier must clearly quote for unit price as well as lot price for deliverables including accessories and cables for indisputable calculations of lot prices in case of revised quantities later.

2.2 Any deviations with respect to the above specification should be brought out in the offer otherwise offer may be rejected.

3. SCOPE OF SUPPLY

3.1 The scope of supply will include the following deliverables:

a) MIL Grade panel PC

The item has to be of reputed make meeting all the MIL grade requirements as specified in this document. The mating cables with mating connectors are to be provided by the supplier. The length of the cable will be informed during detail design.

4. EXCLUSIONS

--- Nil -----

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5. FREE SUPPLY OF ITEMS BY BHEL

--- Nil -----

6. APPLICABLE TEST & CERTIFICATIONS

The ruggedized panel PCs to be supplied shall meet the applicable standards & test conditions indicated below. Bidder to furnish the compliance with detailed analysis/justification along with the Technical Offer for below listed standards & tests.

i. Temperature: Operating : 0 - 50 Deg C , Storage 0 – 60 Deg C as per JSS 55555:2000 or equivalent MIL Standard.

ii. Humidity:

Relative Humidity: 98% for temperature range 0 to 40degC
Period: Continuous Condensing as per JSS 55555:2000 or equivalent MIL Standard.

iii. Vibration Resistance: The equipment should be able to withstand vibration levels as specified below,

a. 01Hz to 05Hz – Acceleration of 0.1g

b. 05Hz to 50Hz – Acceleration of 2.0g

iv. Vibration Levels: The equipment should withstand vibration levels in 1/3 Octave band frequency range from 25Hz to 8 KHz with a reference to 1×10^{-5} m/sec^2 and the maximum vibration levels shall not exceed the straight line joining the values as specified : -

a. At 5 Hz -- 48 dB

b. At 8 KHz -- 80 dB

Equipment will remain in ON condition during the vibration test.

v. Shock: Panel PC will be mounted on the panel with provision for cut out as required for the panel PC. The shock values for panel PC to be met are given below,

1. In X Direction, 50g, 37msec full sinewave.
2. In Y Direction, 50g, 37msec full sinewave.
3. In Z Direction, 60g, 32msec full sinewave.

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As per MIL-S-901D class 1 i.e without use of any additional shock absorbers externally on the unit. The test will be done with equipment remaining in ON condition.

vi. EMI/EMC: MIL-STD-461E as per the tests given below.

S.No	Requirement	Type of test	Description	Frequency range
(1)	CE-101	Cond. Emissions	Power Leads	25 Hz – 10 KHz
(2)	CE-102	Cond. Emissions	Power Leads	10 KHz – 10 MHz
(3)	CS-101	Cond. Susceptability	Power Leads	25 Hz – 150 KHz
(4)	CS-114	Cond. Susceptability	Bulk Cable Injection	10 KHz– 200MHz
(5)	CS-115	Cond. Susceptability	Ground - Bulk Cable Injection	Impulse Excitation
(6)	RE101	Rad. Emissions	Magnetic Field (Cables & equipt)	25 Hz – 100 KHz
(7)	RE102	Rad. Emissions	Electric Field	10 KHz – 18 GHz
(8)	RS-101	Rad. Susceptability	AC Magnetic Field	25 Hz – 100 KHz
(9)	RS-103	Rad. Susceptability	Electric Field	2 MHz – 40 GHz
(10)	RS-06	Rad. Susceptability	DC Magnetic Field	1200 A/m

Supplier should take sufficient care in design so as to meet the above standards and also include EMI mesh filter on the display to sustain EMI-EMC noise issues.

vii. Acoustic Noise: Average level of sound pressure measured in the test bed in accordance with ISO 3744 on conformed surface at a measuring distance of one meter, in dB (A) with respect to reference threshold level of 2 x 10^-5 N/m^2 should not exceed 60dBA.

viii. Ingress Protection (IP) Rating: Minimum protection required is IP65 from front side as per IEC-60529.

ix. Mould growth & Salt corrosion tests: The panel PC should be compliant with mould growth & salt corrosion as per JSS 55555:2000 or equivalent MIL standard. As per standard, any exposed metallic components are to be subjected to mould growth & salt corrosion tests on sample materials as per JSS 55555:2000 or equivalent MIL Standard.

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Note:

1. Supplier has to provide certificate of compliance with detailed analysis/justification on meeting all the type tests mentioned in above clause i.e clause no 6.

2. For clause 6(iii), 6(iv) &6(v), supplier has to carry out transient structural analysis for the shock & vibration levels as per the requirement given in clause 6 for the proposed MIL grade panel PC. The reports to be submitted within 2 weeks after the placement of PO.

3. If any failure observed during type tests of the complete panel due to panel PC, then the supplier has to support BHEL to resolve the same at free of cost. This includes even any design changes/replacement/modfications for qualifying the type tests as listed in this specification.

7. ENVIRONMENTAL STRESS SCREENING (ESS) TESTS

a. ESS is the tailored application of electrical and environmental stresses, to electronics parts modules and units to identify and eliminate defective abnormal or marginal parts and manufacturing defects. Production screen is normally conducted on 100% of the manufactured items. The intent of ESS is to simulate infant mortality failures via accelerated aging without causing damage or inducing wear out to the product under development manufacture.

b. As mentioned, ESS is required to be conducted on electronic components/units/sub-assemblies and as such hardware incorporating purely mechanical system/elements including wire strapped backplanes are exempted. Further electronic unit/sub-assemblies which are susceptible to failure during ESS such as LCD panels, hard disk drives etc. due to their fragile nature or possible deformation due to thermal stresses should not be subjected to ESS. Therefore, due care to be taken by the supplier to determine the list of items which are to be exempted from ESS.

c. Supplier to provide ESS test certificate or perform the ESS tests as mentioned below in clause (d).

d. The complete panel shall be tested for ESS at approved ETDC laboratories, equipped with facilities to undertake these tests as given below.

The ESS tests consists of:-

(aa) Thermal shock:

i.)The minimum & maximum temperature range of the components selected by the supplier to be used as an input to establish the overall range. However the range should be at least more than or equal to the operating temperature

as given in this specification. The maximum safe range and the fastest rate of change of temperature provides the best screening.

ii) The recommended rate of change of temperature of 10degC/min is desirable.

iii) A recommended 10 thermal cycle should be performed in order to eliminate most latent workmanship defects in electronic equipment.

iv) Dwell time at the upper and lower temperature range limits should be long enough to reach thermal stability and time required for performance testing.

(bb) Random Vibration (20 Hz to 2000 Hz)

In random vibration stress screening (RVSS), the UUT is normally vibrated from 20Hz to 2000Hz. It can expose mechanical fatigue or failure, loose solder joints, improper bonding or chip level mechanical flaws. As a starting point for input stimulus i.e a power spectral density of 0.04 g^2 /Hz from 20 to 2000Hz with a 3dB/Octave roll-off from 350 to 2000Hz shall be used as reference. A roll-off of 3dB/octave between 20Hz to 80Hz with starting power spectral density of 0.01 g^2 / Hz may also be used if the screening facility or the equipment to be screened is not tolerant of low frequency vibration stimulus. The input stimulus shall be either random or quasi-random. If quasi-random stimulus is used, a ±10 dB tolerance shall be maintained. Other random stimuli shall maintain a ±3 dB tolerance. The test is to be subjected to all the three axis and time duration should be minimum of 10 minutes in each axis. The performance monitoring is needed when done at module/system level and the same is not required if test is done at PCB level.

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8. Panel PC Functional Requirements

Parameter	Requirement
Type :	Panel mounted.
Input:	24V DC(+/- 15%)
Restart:	System should be able to reboot itself back into the Windows operating system without manual intervention, after a power outage
Processor	Minimum: Intel I5 5th generation processor, 2.2GHz, 3MB Cache, 2 cores or better
RAM:	8 GB DDR3 non-ECC (minimum 1333MHz) RAM, expandable to minimum 16 GB
Hard drive:	Minimum 128GB SSD drive. SLC or iSLC variant of high reliability to be provided.
Monitor	Touch screen LCD 4:3 aspect ratio, minimum resolution 1024 X 768, minimum 16.7 M Colors, viewing angle more than 170deg. EMI filter on the monitor for EMI/EMC compliance. Contrast ratio > 600:1. Luminance required is > 400 cd/m^2 for indoor application and should be adjustable to reduce atleast upto 10 cd/m^2.
I/O interface	a. 2 x RS232/422/485
	b. 2 x USB ports (USB 2.0 or higher).
Ethernet Ports:	Two Ethernet ports 100Mbps – Minimum required.
Connectors	MIL Grade circular connectors to be provided for all the interfaces.
Audio	Integrated Audio with in-built buzzer to be provided for generating alarms/alerts. Accoustic pressure 90dB @ 0.1m @ 1KHz.
Operating System (OS)	Genuine Windows 7 Professional 64 bit with latest service pack to be preloaded. WIN 7 Professional Recovery / IMAGE CD TO BE SUPPLIED If downgraded from Win 8.1, 8.1 CD also to be provided.
OS Compatibility	In addition to above, the panel PC should be

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	compatible to load Windows 2008 Standard R2 server, 64 bit edition.
Drivers	CD's or USB pen drive to be supplied with Windows 7 Professional 64 bit drivers suitable for All controllers, with required installation / set up utilities.
Dimension & Weight	Maximum : 300 x 300 x 125 mm (H x W x D). Weight of the panel PC to be less than 6Kg.
Temperature	Operating : 0 - 50 DegC , Storage: 0 – 60 Deg C
Conformal coating	Required
Warranty	3 Years on site comprehensive warranty

9. Reliability & Availability

Each component and system offered by the Bidder shall be of established reliability. The minimum target reliability of each piece of equipment like each electronic module/card, Power supply, peripherals, etc. shall be established by the Bidder, considering its failure rate / mean time between failures (MTBF). MTBF should be greater 50,000 Hrs (Minimum).

The bidder shall furnish their MTBF conformance in the technical offer for proposed panel PC. MTBF calculation and detailed compliance to be provided along with the supply of the items.

The supplier to ensure that the components used in the panel PC are of MIL grade to the maximum extent possible to ensure high reliability.

In order to ensure the target reliability, the Bidder shall ensure selection of proper materials, control manufacturing process, use quality controlled components and parts, take adequate design margins & derating of electronic components and parts and carry out necessary tests, etc

The equipment shall employ latest state of the art technology to guard against obsolescence. In case, it is felt by the Bidder that certain equipment/component is likely to become obsolete the bidder shall clearly bring out the same in his offer and indicate steps proposed to deal with such obsolescence.

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10. SUPPLIER DOCUMENTATIONS

a. Documents to be submitted in Technical Offer

1. Technical data sheet.
2. Technical literature / catalogue /Datasheets of each component.
3. Power consumption & Dimensions/weight details to be furnished.
4. Compliance with justification as given in clause 6.
5. Single point contact detail to be furnished for after sales service support under Warranty.
6. Clause wise compliance/deviations confirmation as per sample format given in Annexure A.

NOTE: Offers without Technical datasheet and Duly Filled in Compliance list will be treated as incomplete and REJECTED.

b. Documents to be given along with the equipment

1. Manuals / Driver CD‘s for CPU to be supplied.
2. Technical Datasheets.
3. Certificate of conformance as given in clause 6.
4. ESS Test Certificate
5. Country of origin certificate (if applicable).
6. Warranty/Guarantee certificates.

c. Test Certificate:

Supplier has to provide routine test certificate for all the items supplied including the tests as mentioned below,

1. Dimension & Weight Checks.
2. Functional Test.
3. Insulation Resistance Test (cold and hot)

11. WARRANTY

The supplier has to provide warranty for the product for a period of 36 months from the date of supply. The warranty includes the repair/replacement of the defective parts/items. The cost of logistics for movement of parts/ items for repair/ replacement to be borne by the supplier

12. PACKAGING/FORWARDING & LABEL IDENTIFICATION

The supplier to ensure the product contains all the identification labels including the model no, make details.

The unit should be suitably water proof packed for transportation and sent to BHEL ESD Bangalore.

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Annexure – A

Sample format as given below for clause wise compliance/deviation matrix to be submitted along with technical offer,

S. No	Clause No	Clause Description	Bidder Acceptance/Deviation Remarks
1	1	-----	---
2	2	-----	---
3	3	-----	---
4	4	-----	---
-	-	-----	---
-	-	-----	---
-	-	-----	---

Clause wise compliance matrix is mandatory to be submitted along with technical offer otherwise the offer is liable to be rejected.

ADDITIONAL TERMS AND CONDITIONS

(RFQ NO. PSS0000206)

1. Separate offer in English language addressed to the Purchase Executive shall be made for this RFQ in three parts.

Three Part Bid : Offer shall be made in three parts as detailed below:

"Pre-Qualification Bid (Part I Bid)" : Documents related to PQC to be placed in a sealed cover super scribed with RFQ No., Due Date and ''Pre-qualification Bid (Part l Bid)''.

"Techno-commercial Bid (Part II Bid)" : Techno-commercial Bid to be placed in a separate envelope super scribed with RFQ No., Due Date and "Techno-commercial Bid (Part II Bid)". This bid should contain all commercial terms i.e. delivery terms, payment terms, applicable taxes/duties etc.

"Price Bid (Part III Bid)" : Price of the offered item to be placed in a separate sealed envelope super scribed with RFQ No & Due Date.

All the three sealed envelopes shall be placed in another sealed envelope super scribed with RFQ No & Due Date.

Pre-qualification bid will be opened on due date. Techno-commercial bid (part II) will be opened for the vendors who are qualified in the pre-qualification bid.

2. Reference Documents: PS-460-0157 Rev00 is to be completely read, understood and should be acceptable to bidder.
3. Pre-qualification criteria is attached herewith.
4. All Specification for Pre-Qualification and Technical to comply to BHEL Doc Ref No. PS-460-157
5. Supplier has to give clause wise compliance to PS-460-0157
6. Warranty as per clause mentioned in PS-460-0157
7. Documents to be provided along with the supply of the items
    a. Refer to Requirements mentioned in PS-460-0157
    b. Certificate of Conformance
    c. Test Certificate

Conformation to be provided in Technical offer.

8. DELIVERY : 14 weeks from date of Purchase Order.
9. Terms & Conditions shall be as per Doc Ref Doc no: BHEL: EDN: GCC – SHOP: Rev00, Instructions to bidders as per Doc no: BHEL: EDN: ITB – SHOP: Rev00, and Annexures.
10. Price basis shall be firm; Price Variation Clause is NOT acceptable.
11. Tender opening Time is 01:30 PM on the tender due date, Place: Tender opening room @ BHEL-ESD, Electronic city, Bangalore.
12. Please drop your offer before due date & time in the tender box named **"Monday"** kept at the reception of BHEL-ESD, Electronic city, Bangalore.
13. Items should be delivered to

BHEL-ESD,
PLOT NO 98,
ELEGTRONIC CITY PHASE 1,
HOSUR ROAD,
BANGALORE-560100,
KARNATAKA.

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PQC for MIL Grade panel PC

1. Pre-qualification criteria (PQC):

1.1 The panel PC make should be of reputed make and the bidder should be capable to manufacture or supply as per the purchase specification (PS-460-0157). In case of authorized dealer, the same is applicable to OEM of the product.

1.2 The purchase specification document PS-460-0157 Rev00, is to be completely read, understood and should be acceptable to bidder. Compliance to same shall be provided.

1.3 The bidder must have supplied similar MIL GRADE panel PC for defence applications complying to MIL-STD-461E/F.

1.4 The bidder should furnish Overall General Arrangement (OGA) Drawings for verifying limiting dimensions of panel PC.

1.5 The average annual financial turnover of the bidder in the preceding three financial years as on March 31st 2017 shall be at least INR 3 crores. In case of dealer, OEM's turnover to be considered for pre-qualification criteria.

2. Document submission :

2.1 The bidder shall submit supporting documents to comply with Sl. No 1.1 regarding manufacturing and routine testing capabilities of said panel PC. If necessary, BHEL may visit the works.

2.2 Compliance to PS-460-0157 Rev 00 purchase specification at Sl. No 1.2 shall be provided.

2.3 Document to support the supply in compliance to Sl. No 1.3 to be provided.

2.4 OGA shall be furnished to verify that limiting dimensions will be met as mentioned in Sl. No 1.4.

2.5 Self-certified document in respect of financial turnover in compliance of Sl. No. 1.5 above.

Offers without above necessary documents shall be liable for rejection.