

Corrigendum

Brief description of Tender Enquiry: Supply, Installation & Commissioning of Field Emission Scanning Electron Microscope and detectors/accessories for BGRL, Karad, Maharashtra

Tender Enquiry Reference number and Date:

S- 011/0518/1/ Koyna/Purchase/NCS/Major_Equipments, Dated: 14.12.2021

The following changes have been made in the above Tender Enquiry.

1. **GI Clause 8.3 (e):** Should be read as “Foreign vendor shall quote prices on D.A.P basis. Evaluation the tender will be on D.A.P basis, however the Purchaser reserves all the right to select the order in any INCOTERM. ”
2. **GI Clause 8.3 (p):** Should be ignored.
3. **GI Clause 8.3 (s):** Should be read as “Customs Duty is levied on all import meant for MoES/NCS/BGRL as applicable to Govt./Service/R&D Institutions in India. The suppliers are requested to quote on D.A.P. basis.
4. **RFP clause 3 (Technical specifications):** The table of Technical Specifications has been modified as given in Enclosure-1.
5. **RFP clause 4 (Qualification criteria for Bidders):** The following criteria are added and will be part of the tender:
 - d) The Bidder should comply fully with Technical specifications.
 - e) The bidder should comply fully with Compliance statement as per Annexure-11.
6. **RFP clause 5.1.1(Delivery Schedule):** Should be read as “Delivery of one number of FE-SEM including all detectors and accessories, and above specified attachments (DAP) shall be done at BGRL campus, Hazarmachi, Karad 415105, Maharashtra, India within 180 days from the date of placement of supply order”.
7. **RFP clause 6.4.2** should be read as “Annual Maintenance Contract (AMC)”
 - a) After expiry of standard warranty period of 3 years, from the date of acceptance of the installed equipment, the firm shall provide a quote for AMC for five years separately.
 - b) The bidder shall give a separate undertaking for the acceptance of the terms and conditions.
 - c) The Firm shall do preventive maintenance and two breakdown visits per year. The preventive maintenance visits will be at least once in 6 months or as per the requirement of client, during which it shall check the performance of all components of the equipment. The preventive maintenance shall be duly countersigned by the local authorized official. The duly signed satisfactorily preventive maintenance report

countersigned by the designated official shall be the basis of releasing the periodic AMC payment.

- d) AMC charges quoted by the firm will not be taken into account for the cost comparison purpose. This AMC cost will be a part of the price bid but will not be considered for determining L1.
 - e) Proportionate amount for AMC will be paid to the firm once in half year after successful maintenance of the system and after deduction of applicable penalty if any.
 - f) During the period of warranty, in the event of the equipment developing snags or malfunctioning or if it stops functioning altogether, the Purchaser will promptly inform the Bidder, and the Bidder's maintenance engineers should attend to the complaint immediately and operationalize the equipment in the least possible time.
8. The **Annexure -6, Annexure -11, and Annexure -12**, have been modified and should read as attached below.

Financial Bid for quoted item

Table A					
Sl. No.	Item Name (With full specification)	Unit	Quantity	Rate	Amount
1.	Supply, installation and commissioning of FE-SEM as per "Technical Specification"				
	Total Tender Price				
	Total in words				

Table B: Post warranty Annual maintenance contract (AMC) charges					
Sl. No.	Item		Charges in INR	GST (if any)	Amount (INR)
1.	AMC as per the RFP	Post warranty 1 st year			
		Post warranty 2 nd year			
		Post warranty 3 rd year			
		Post warranty 4 th year			
		Post warranty 5 th year			
Total (INR)					

Place:.....

Signature of bidder.....

Date:.....

Seal of bidder

Note:

- 1 The names of each stores/items must be mentioned including services if any. The deliverables list attached with financial bid must be exactly same as per technical bids without mentioning prices.
- 2 Charges, if any, for inland (within the India) Transportation /freight/insurance of stores shall be mentioned separately. In case not mentioned, it is treated as free of cost.
- 3 If there is a discrepancy between the unit price and the total price, then THE UNIT PRICE shall prevail.
- 4 All applicable taxes must be mentioned against each item. Rate of each applicable tax must be mentioned in price bid.
- 5 Price schedule for optional items should be attached separately and not to be mentioned in main price bid.

Place : _____ Date : _____ Signature of Bidder _____ Seal of the Bidder _____

Annexure -11

Format Technical Compliance Statement

Note: Bidder should write make and model of each hardware /firmware/software offered in appropriate place. Write Not Applicable (N/A) wherever not required.

1 Scope of the tender:

	Requirements	Specifications Offered by the Bidder	Complied/Non-Complied	Deviation if any with remarks
I.	Supply, installation and commissioning of Field Emission Scanning Electron Microscope with following detectors at BGRL Campus, Hazarmachi, Karad. a. Secondary Electron (SE) b. Back Scattered Electron (BSE) c. Cathodoluminescence (CL) d. Energy dispersive spectroscopy (EDS) e. Electron backscatter diffraction (EBSD) f. Accessories and spares for proper functioning of the laboratory			
II.	Training in operation and maintenance of the whole system at BGRL Campus, Hazarmachi.			
III.	Three years standard warranty and provide a quote for AMC for five years separately, for the items mentioned above.			
IV.	The bidder shall take all necessary actions related to the supply, transportation of equipments to the sites, installation, configuration and integration of the complete hardware and software modules to meet the requirements as per RFP on turn-key basis			

2. Technical Specification

Requirements			Specifications Offered by the Bidder	Complied /Non-Complied	Deviation if any with remarks
1	Resolution	1.3 nm at 1 kV or better and 0.7 nm at 15/20kV			
2.	Magnification	X 10 to X10,00,000			
3.	Acceleration Voltage	0.1 or less to 30 kV or higher. All voltage settings should be controlled with software.			
4.	Chamber	Large chamber with at least 7 accessory ports. Chamber design should allow quick changing of the specimens. Chamber should be provided with CCD camera or suitable device to view the sample & stage inside the chamber without interfering with detectors. CCD camera should be able to display both colour image with visible light and monochrome images with IR light source. The microscope should be able to support a WDS port for field installations without any modifications.			
5.	Stage	5 axes motorised eucentric stage. Movements equivalent to or better than below X = 100 mm or more Y= 100 mm or more Z = 50 mm or more Tilt range = -3° to +70° R = 360° Stage movement should be able to control via. both software and manually (with joystick).			
6.	Probe current	Up to 200 nA or more. Stability better than 1 % covering 1hr, 6hrs, 12hrs, 24hrs of continuous operation. Probe current detector must be included for probe current measurement.			

7.	Detectors	<p>a) Secondary electron (SE) detector</p> <p>b) High resolution back scattered electron (BSE) detector</p> <p>c) For low detection of SE and BSE through the lens detector with user controllable energy filter for collection of topographic (SE) contrast or atomic number (BSE) contrast.</p> <p>d) Cathodoluminescence (CL) detector CL detector should be based on mixed pixel photon counter technology. Wavelength range of 320-900 nm. CL detector should work in combination with other detectors, should have external control panel extension for controlling signals.</p> <p>e) Energy-dispersive (EDS) detector</p> <p>f) Electron backscatter diffraction (EBSD)</p> <p>g) A through-lens detector with adjustable energy reflection filter desirable for mixed (SE+BSE) contrast. Also stage voltage biasing or in-column deceleration for good resolution. With Energy filtering range up to 1500V.</p> <p>h) Compatibility with Wavelength-dispersive (WDS) detector</p>			
8.	Electron gun	Schottky field emission electron gun. The emitter should be covered under warranty. The warranty period would include any extended warranty purchased.			
9.	User interface	Keyboard, mouse, control panel with multifunction for the control and adjustment of SEM parameters.			
10.	Electron Optics	<p>The Condenser lens system should consist of dual condenser lens to allow changes in beam current continuously.</p> <p>The Objective lens should consist of both Electrostatic and Electromagnetic Lenses with beam acceleration and deceleration within the lens to reduce aberration and</p>			

		<p>improve probe diameter.</p> <p>There must not be any Objective Lens electromagnetic leakage flux below the lens allowing imaging of magnetic or paramagnetic samples at short Working Distance and preventing pattern distortion while carrying out EBSD analysis. There should be a dedicated lens setting for ultra-long depth of focus for the wide area EBSD analysis using beam scan.</p> <p>The system should have beam deceleration or stage biasing technology for High resolution analysis.</p>			
11.	Display/computer	<p>24" high end TFT flat screen or better monitors for SEM, capable to store images in various formats like jpeg, tif, bmp, etc. Image store resolution of 5120 x 3840 or better.</p> <p>Should be high end computer/workstation with not less than 16 GB RAM, 2 GB graphics card and 2TB hard drive and Intel i7 processor to handle large image, volumes of data along with image processing software. Provision for USB and CD/DVD record.</p> <p>Provide colour Laser Printer with photocopy/scanning facility with minimum speed of 20 pages per minute and 600 DPI.</p>			
12.	Vacuum system	<p>Fully automated controlled vacuum system. Suitable vacuum system having ion pump, turbo pump and rotary pump (should be of reputed brands). Pump down time should be less than 5 min. FESEM should be equipped a suitable vacuum system to avoid contamination.</p>			
13.	Essential Accessories	<p>a) CCD colour camera (to view inside chamber), also see point 4</p> <p>b) Chiller and Compressor from the column OEM required for operation of the FE-SEM.</p> <p>c) Interface between FESEM, EDS, WDS and EBSD</p> <p>d) Sputter unit (gold) and carbon unit separately</p>			

		e) 5 number of single stubs and 5 number of multiple sample holders			
14.	Calibration standards	<p>Standard samples to check system calibration i.e., magnification should be supplied along with the system.</p> <ol style="list-style-type: none"> 1. Magnification standard (Mesh Sample), 2. Single-element EDS/WDS and multi-element standards covering 56 elements with Faraday cup 3. Resolution standards - Gold on Carbon standard for SEM, 4. Separate Faraday cup for probe current measurement 			
15.	EDS	<p>LN2 free EDS system. 40mm² ± 10mm² 127eV resolution for Mn, 50 eV for carbon and 60 eV for fluorine or better capable of identifying elements from Boron to Uranium, should do the functions like qualitative, quantitative and elemental mapping. EDS should be capable of line scan, selected area analysis and multipoint analysis. EDS need to be integrated with FESEM. The detector should be as per ISO norms.</p> <p>EDS server & analysis software should have capability to do Qualitative & Quantitative Analysis, Peak and Auto ID routine, Spectral Match Analysis, Database management and reporting, Elemental Mapping, Point Analysis, Line Scanning, Real time Phase mapping, Phase to Element and Element to Phase maps with specimen drift correction. Pile up correction and background noise reduction, simultaneous imaging and analysis should be possible.</p> <p>All these capabilities should be applicable for polished flat specimens, fractured samples and</p>			

		<p>nanostructured particulate systems.</p> <p>User interactive qualitative and standard less/ standards based quantification with K, L, M, N line database. Real time elemental mapping with auto elemental identification, quantification based on ZAF, PhiZAF.</p> <p>Should have quantification algorithm for uneven surfaces and under tilted conditions</p>			
16.	EBSD	<p>1. The EBSD system should include Hardware consisting of EBSD camera/detector and control electronics and software for acquisition and indexing of electron backscatter diffraction patterns and phase mapping with SEM beam and stage control with interface, pre-tilt sample holders, Calibration samples, Operation manuals should be included.</p> <p>2. CMOS based EBSD camera with at least 1244 x 1024 pixels resolution and indexing speeds of 4500 pps (or better)</p> <p>3. The EBSD system Angular resolution should be less than 0.1 deg.</p> <p>4. The EBSD camera should have tapered nose design to prevent shadowing to other detectors of FESEMs. The EBSD camera should have motorised insertion and retraction mechanism. The position accuracy is to be 0.1mm.</p> <p>5. The system software should include following features Latest Data Acquisition Software working on WINDOWS 64bit platform, System software with latest indexing algorithms.</p> <ol style="list-style-type: none"> a) Auto tilt correction b) Phase Reflector File Creation Software c) Pole Figure Software – texture analysis d) Mapping Software – post processing for grain size, Grain Boundary characteristics, etc e) Large area Mapping 			

		<p>f) ODF Software – texture analysis</p> <p>g) Imaging and Beam Control Software</p> <p>h) Stage Control Software</p> <p>i) Phase Identification Software</p> <p>j) ICSD Data Base</p> <p>1 additional off line licence</p>			
18.	Spares and consumables	<p>a) 10 nos. Carbon rod/thread & Carbon tapes (20m).</p> <p>b) Provide recommended essential consumables for uninterrupted operation of the equipment for five years.</p> <p>c) 50 numbers of specimen stubs.</p> <p>d) 2 electrostatic tweezers suitable for handling stub.</p> <p>e) Other specimen handling tools, sample preparation materials and general tools for the maintenance of FESEM should be provided.</p>			
19.	Vibratory Polisher	<p>A good quality vibratory polisher that should remove minor deformation remaining after mechanical preparation revealing a stress-free. Also, oscillate horizontally; maximizing the length of time the specimen touches the polishing cloth. Supplier should provide colloidal silica to chemo-mechanically polish a rock specimen to a surface finish suitable for electron-backscatter diffraction (EBSD). Specimens should naturally rotate around the polishing bowl allowing users to set-up the system and walk away. The instrument along with the following accessories should be supplied.</p> <p>a) 3 numbers of specimen holders of 2 inches (50mm) length</p> <p>b) Colloidal Silica, 64oz (2 litres)</p> <p>c) 10 numbers of MicroCloth, 12in (305mm) diameter</p>			

20.	Warranty & Training	<p>a) 3 year comprehensive warranty. Warranty should start from the date of completion of installation.</p> <p>b) Full on-site training must be given to BGRL/MoES for the smooth operation of FESEM and, for data acquisition, processing and interpretation.</p> <p>c) One week initial training during installation and at least 10 days of advanced training after 4 months of installation of machine at the customer site. All the training should be part of the supply and installation.</p>			
21.	UPS	Branded 15 KVA or better with at least 1 hour back-up time and 3 year warranty on UPS and batteries.			
22.	Sputter unit	Good quality sputter units (gold and carbon separately) from column OEM supplier with turbo molecular/ rotary pump and with necessary vacuum gauges.			
23.	Required documents along with technical specification	<p>a) List of at least 3 Institute/laboratories in India with similar system installed during last 5 years</p> <p>b) The supplier should provide calibration /traceability certificate of the equipment.</p>			
24.	Pre-installation requirements	Pre-installation requirement such as required power, space, etc. are to be surveyed by the supplier at the installation site and inform to BGRL.			
25.	Operation Table Tool kit	<p>Anti- vibration table along with associated accessories.</p> <p>Essential tool kit for FESEM to be provided for handling during preventive maintenance.</p>			
26.	Application notes	The supplier must provide up-to-date technical brochures adequately explaining the availability of the features in the model of the			

		equipment supplied.			
27.	Up-gradation	The supplier should supply upgraded softwares whenever there is an up-gradation during warranty period.			
28.	Compliance statement	The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent verifiable through Printed brochures of the Principals / OEM and webpage:- Features not matching – must be clearly indicated. Additional features and features in the quoted equipment which are better than those in the indent – may be clearly mentioned and explained.			
29.	Availability of spares	The model quoted should be explicit and one of the latest with spares availability letter from principals for next 10 years post the expiry of the warranty.			
30.	Post warranty AMC	AMC charges for the five years after initial 3 year warranty to be mentioned with a yearly charge breakup (to be quoted separately). This cost will be a part of the price bid but will not be considered for determining L1.			

3. Commercial and Other Terms & Conditions

Requirements		Specifications Offered by the Bidder	Complied/Non-Complied	Deviation if any with remarks
1.	Delivery schedule	Delivery of one no. of FE-SEM including all detectors and accessories, above specified attachments shall be done at BGRL campus, Hazarmachi, Karad,		

		Maharashtra within 180 days from the date of placement of supply order.			
2.	Late Delivery Charges	If firm is unable to meet above delivery schedule a Late Delivery charges of 0.5% of the goods value for undelivered portion per week will be levied, subject to maximum value of LD being not higher than 10% of the value of the delayed stores. Late delivery charges will be deducted from the final payment.			
3.	Installation Terms	Item shall be installed within 90 days from the date of delivery of stores at BGRL campus, Hazarmachi, Karad, Maharashtra. If Firm is unable to install the system within 90 days, of the delivery, then also LD charges of 0.5% of total value of the uncompleted portion of work per week is levied, subjected to maximum of 10% of the total value of the store. Late installation charges will be deducted from the final payment.			
4.	Factory Acceptance Test (FAT):	As per the clause 6.1.1 in RPF			
5.	Site Acceptance Test	As per the clause 6.1.2 in RPF			
6.	On Site Training	The successful bidder should provide in-depth training on operation and maintenance of the instrument to the nominated personnel of BGRL. One week initial training during installation			

		and at least 10 days of advanced training after 4 months of installation of machine should be provided. All the training should be given by factory qualified engineers, free of cost.			
7.	Warranty Terms	As per the clause 6.4 in RPF			
8.	Bidder's Obligation:	As per the clause 9 in RPF			
9.	Qualification criteria for bidders	As per clause 4 in RPF			

4. General terms and conditions

Requirements		Specifications Offered by the Bidder	Complied/Non-Complied	Deviation if any with remarks
1.	Validity of Tender	The tenders shall remain valid for acceptance for a period of 240 days (Two Hundred Forty Days) for Technical Bid after the date of opening of tender as prescribed in the TE document.		
2.	Price bid	As per clause 8.3 in GI		
2.	Bid security declaration	As per Annexure-2A		
3.	Performance Security	As per the clause 25 in GI (Section II)		
4.	Penalty/ Liquidity Damage:	As per the clause 29 in GI (Section II)		
5.	Terms and Mode of Payments:	As per the clause 34 in GI (Section II)		
6.	Termination of tender:	As per the clause 35 in GI (Section II)		
7.	Arbitration	As per the clause 36 in GI (Section II)		

8.	Force Majore	As per the clause 37 in GI (Section II)			
9.	Fall Clause	As per the clause 38 in GI (Section II)			

Annexure -12

Letter Head of the OEM

AGENCY AGREEMENT

Tender Enquiry No. dated

This is to certify that _____ (as Indian Agent) having their registered Office at _____ (complete Address of Indian Agent) will be representing _____ (as Manufacturer/OEM) as our Agents in India for products being manufactured, under following terms.

1.	Date of appointment as Indian Agent	
2.	Date to which the Agreement is valid	
3.	Authority to commit & sign on behalf of OEM whose signature, Name, Designation are given.	
4.	Product (s) covered in Agreement.	
5.	After-sales Services and Back up Support	
6.	Back to Back arrangement during installation, warranty, AMC	

(Authorized signatory of OEM)

Designation
Name :
Address of Indian Agent:
Email Id:
Tel No.
Fax No.

Company seal

(Authorized signatory)

Designation
Name :
Address of Indian Agent:
Email Id:
Tel No.
Fax No.

Company seal

Technical Specifications		
Sl. No.	Features	Specifications
1.	Resolution	1.3 nm at 1 kV or better and 0.7 nm at 15/20kV
2.	Magnification	X 10 to X10,00,000
3.	Acceleration Voltage	0.1 or less to 30 kV or higher. All voltage settings should be controlled with software.
4.	Chamber	Large chamber with at least 7 accessory ports. Chamber design should allow quick changing of the specimens. Chamber should be provided with CCD camera or suitable device to view the sample & stage inside the chamber without interfering with detectors. CCD camera should be able to display both colour image with visible light and monochrome images with IR light source. The microscope should be able to support a WDS port for field installations without any modifications.
5.	Stage	5 axes motorised eucentric stage. Movements equivalent to or better than below X = 100 mm or more Y = 100 mm or more Z = 50 mm or more Tilt range = -3° to +70° R = 360° Stage movement should be able to control via. both software and manually (with joystick).
6.	Probe current	Up to 200 nA or more. Stability better than 1 % covering 1hr, 6hrs, 12hrs, 24hrs of continuous operation. Probe current detector must be included for probe current measurement.
7.	Detectors	a) Secondary electron (SE) detector b) High resolution back scattered electron (BSE) detector c) For low detection of SE and BSE through the lens detector with user controllable energy filter for collection of topographic (SE) contrast or atomic number (BSE) contrast. d) Cathodoluminescence (CL) detector e) CL detector should be based on mixed pixel photon counter technology. Wavelength range of 320-900 nm. CL detector should work in combination with other detectors, should have external control panel extension for controlling signals. f) Energy-dispersive (EDS) detector g) Electron backscatter diffraction (EBSD) h) A through-lens detector with adjustable energy reflection filter desirable for mixed (SE+BSE) contrast. Also stage voltage biasing or in-column deceleration for good resolution. With Energy filtering range up to 1500V.

		i) Compatibility with Wavelength-dispersive (WDS) detector
8.	Electron gun	Schottky field emission electron gun. The emitter should be covered under warranty. The warranty period would include any extended warranty purchased.
9.	User interface	Keyboard, mouse, control panel with multifunction for the control and adjustment of SEM parameters.
10.	Electron Optics	<p>The Condenser lens system should consist of dual condenser lens to allow changes in beam current continuously.</p> <p>The Objective lens should consist of both Electrostatic and Electromagnetic Lenses with beam acceleration and deceleration within the lens to reduce aberration and improve probe diameter.</p> <p>There must not be any Objective Lens electromagnetic leakage flux below the lens allowing imaging of magnetic or paramagnetic samples at short Working Distance and preventing pattern distortion while carrying out EBSD analysis. There should be a dedicated lens setting for ultra-long depth of focus for the wide area EBSD analysis using beam scan.</p> <p>The system should have beam deceleration or stage biasing technology for High resolution analysis.</p>
11.	Display/computer	<p>24" high end TFT flat screen or better monitors for SEM, capable to store images in various formats like jpeg, tif, bmp, etc. Image store resolution of 5120 x 3840 or better.</p> <p>Should be high end computer/workstation with not less than 16 GB RAM, 2 GB graphics card and 2TB hard drive and Intel i7 processor to handle large image, volumes of data along with image processing software. Provision for USB and CD/DVD record.</p> <p>Provide colour Laser Printer with photocopy/scanning facility with minimum speed of 20 pages per minute and 600 DPI.</p>
12.	Vacuum system	Fully automated controlled vacuum system. Suitable vacuum system having ion pump, turbo pump and rotary pump (should be of reputed brands). Pump down time should be less than 5 min. FESEM should be equipped a suitable vacuum system to avoid contamination.
13.	Essential Accessories	<p>a) CCD colour camera (to view inside chamber), also see point 4</p> <p>b) Chiller and Compressor from the column OEM required for operation of the FE-SEM.</p> <p>c) Interface between FESEM, EDS, WDS and EBSD</p> <p>d) Sputter unit (gold) and carbon unit separately</p> <p>e) 5 number of single stubs and 5 number of multiple sample holders</p>
14.	Calibration standards	<p>Standard samples to check system calibration i.e., magnification should be supplied along with the system.</p> <p>1) Magnification standard (Mesh Sample),</p>

		<ol style="list-style-type: none"> 2) Single-element EDS/WDS and multi-element standards covering 56 elements with Faraday cup 3) Resolution standards - Gold on Carbon standard for SEM, 4) Separate Faraday cup for probe current measurement
15.	EDS	<p>LN2 free EDS system. 40mm² ± 10mm² 127eV resolution for Mn, 50 eV for carbon and 60 eV for fluorine or better capable of identifying elements from Boron to Uranium, should do the functions like qualitative, quantitative and elemental mapping. EDS should be capable of line scan, selected area analysis and multipoint analysis. EDS need to be integrated with FESEM. The detector should be as per ISO norms.</p> <p>EDS server & analysis software should have capability to do Qualitative & Quantitative Analysis, Peak and Auto ID routine, Spectral Match Analysis, Database management and reporting, Elemental Mapping, Point Analysis, Line Scanning, Real time Phase mapping, Phase to Element and Element to Phase maps with specimen drift correction. Pile up correction and background noise reduction, simultaneous imaging and analysis should be possible.</p> <p>All these capabilities should be applicable for polished flat specimens, fractured samples and nanostructured particulate systems.</p> <p>User interactive qualitative and standard less/ standards based quantification with K, L, M, N line database. Real time elemental mapping with auto elemental identification, quantification based on ZAF, PhiZAF.</p> <p>Should have quantification algorithm for uneven surfaces and under tilted conditions</p>
16.	EBS	<ol style="list-style-type: none"> 1. The EBSD system should include Hardware consisting of EBSD camera/detector and control electronics and software for acquisition and indexing of electron backscatter diffraction patterns and phase mapping with SEM beam and stage control with interface, pre-tilt sample holders, Calibration samples, Operation manuals should be included 2. CMOS based EBSD camera with at least 1244 x 1024 pixels resolution and indexing speeds of 4500 pps (or better) 3. The EBSD system Angular resolution should be less than 0.1 deg. 4. The EBSD camera should have tapered nose design to prevent shadowing to other detectors of FESEMs. The EBSD camera should have motorised insertion and retraction

		<p>mechanism. The position accuracy is to be 0.1 mm.</p> <p>5. The system software should include following features Latest Data Acquisition Software working on WINDOWS 64bit platform, System software with latest indexing algorithms.</p> <ol style="list-style-type: none"> a) Auto tilt correction b) Phase Reflector File Creation Software c) Pole Figure Software – texture analysis d) Mapping Software – post processing for grain size, Grain Boundary characteristics, etc e) Large area Mapping f) ODF Software – texture analysis g) Imaging and Beam Control Software h) Stage Control Software i) Phase Identification Software j) ICSD Data Base <p>1 additional off line licence</p>
18.	Spares and consumables	<ol style="list-style-type: none"> a) 10 nos. Carbon rod/thread & Carbon tapes (20m). b) Provide recommended essential consumables for uninterrupted operation of the equipment for five years. c) 50 numbers of specimen stubs. d) 2 electrostatic tweezers suitable for handling stub. e) Other specimen handling tools, sample preparation materials and general tools for the maintenance of FESEM should be provided.
19.	Vibratory Polisher	<p>A good quality vibratory polisher that should remove minor deformation remaining after mechanical preparation revealing a stress-free. Also, oscillate horizontally; maximizing the length of time the specimen touches the polishing cloth. Supplier should provide collidal silica to chemo-mechanically polish a rock specimen to a surface finish suitable for electron-backscatter diffraction (EBSD). Specimens should naturally rotate around the polishing bowl allowing users to set-up the system and walk away. The instrument along with the following accessories should be supplied.</p> <ol style="list-style-type: none"> a) 3 numbers of specimen holders - 2 inches (50mm) length b) Colloidal Silica, 64oz (2 litres) c) 10 numbers of MicroCloth, 12in (305mm) diameter
20.	Warranty & Training	<ol style="list-style-type: none"> a) 3 year comprehensive warranty. Warranty should start from the date of completion of installation. b) Full on-site training must be given to BGRL/MoES for the smooth operation of FESEM and, for data acquisition, processing and interpretation. c) One week initial training during installation and at least 10 days of advanced training after 4 months of installation of machine at the customer site. All the training should be part of the supply and installation.

21.	UPS	Branded 15 KVA or better with at least 1 hour back-up time and 3 year warranty on UPS and batteries.
22.	Sputter unit	Good quality sputter units (gold and carbon separately) from column OEM supplier with turbo molecular/ rotary pump and with necessary vacuum gauges.
23.	Required documents along with technical specification	a) List of at least 3 Institute/laboratories in India with similar system installed during last 5 years b) The supplier should provide calibration /traceability certificate of the equipment.
24.	Pre-installation requirements	Pre-installation requirement such as required power, space, etc. are to be surveyed by the supplier at the installation site and inform to BGRL.
25.	Operation Table Tool kit	Anti- vibration table along with associated accessories. Essential tool kit for FESEM to be provided for handling during preventive maintenance.
26.	Application notes	The supplier must provide up-to-date technical brochures adequately explaining the availability of the features in the model of the equipment supplied.
27.	Up-gradation	The supplier should supply upgraded softwares whenever there is an up-gradation during warranty period.
28.	Compliance statement	The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent verifiable through Printed brochures of the Principals / OEM and webpage:- Features not matching – must be clearly indicated. Additional features and features in the quoted equipment which are better than those in the indent – may be clearly mentioned and explained.
29.	Availability of spares	The model quoted should be explicit and one of the latest with spares availability letter from principals for next 10 years post the expiry of the warranty.
30.	Post warranty AMC	AMC charges for the five years after initial 3 year warranty to be mentioned with a yearly charge breakup (to be quoted separately). This cost will be a part of the price bid but will not be considered for determining L1.