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NEW INDIA @75 आज़ादी का अमृत महोत्सव

आईआरईएल (इंडिया) लिमिटेड IREL (India) Limited

(पूर्वमेंइंडियनरेअरअर्थ्सलिमिटेड Formerly Indian Rare Earths Ltd.) रेअरअर्थ्सप्रभाग Rare Earths Division, उद्योगमंडल Udyogamandal, कोची Kochi-683501 CIN: U15100MH1950GOI8187 ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 COMPANY GST ID No. 32AAACI2799F2ZM



महोत्सव

Corrigendum-l

Date: 11.04.2025

Sub: Procurement of HP-Ge Spectrometer

Ref: Tender No. GEM/2025/B/6085530 dt.25.03.2025 for "Procurement of HP-Ge Spectrometer"

The above referred tender is amended as follows:

In place of	To be read as under
Technical Specifications for HPGE based Gamma Ray Spectrometer (Annexure-II A as per SCOC of Page No.15 of 34 to 19 of 34)	Technical Specifications for LN2 Hybrid Cooled HPGe based Gamma Ray Spectrometer as per attached "Revised Annexure II A" Page No.1 of 5 to 5 of 5)

Other terms and conditions of the tender and subsequent corrigendum's remains unaltered.

सादर /Regards,

14/2028

वी ए अनिल कुमार / V.A.Anil Kumar मुख्य प्रबंधक (तकनीकी), क्रय / CM - Technical, (Purchase)

"Revised Annexure II A"

Technical Specifications for LN2 Hybrid Cooled HPGe based Gamma Ray Spectrometer

S.	Description	Value
No		
1.00	Detector	
1.01	P-type coaxial vertically vacuum dipstick mou	nted, High Purity Germanium detector
	(HP Ge) with pre-amplifier housed in a single	e capsule.
1.02	End Cap diameter	76mm (3.2 inch) dia
1.03	Input Window material	Carbon Composite
1.04	Energy Range	3 keV to 10 MeV
1.05	Relative Efficiency	≥ 40 %
1.06	Energy Resolution as FWHM at 122 keV	≤ 1 keV
1.07	Energy Resolution as FWHM at 1.33 MeV	≤ 2.1 keV
1.08	Peak shape (FWTM/FWHM)	≤ 3.0
1.09	Peak to Compton Ratio	≥60
1.10	HV Inhibit (Warm-Up/HV shutdown)	Must
1.11	Should provide Detector test/performance cer	rtificate
1.12	Cables Set for Power, HV, Output Signal,	1 Set
	Pre-Amplifier and LN2 Sensor	
2.00	Intelligent Cryo-Cycle Hybrid Cryostat	
2.00	intelligent oryo oyolo riyona oryootat	
2.01	Intelligent Cryo-Cycle Hybrid Cryostat with	One Set
	Vacuum Dewar compatible with HPGe	
	detector vacuum dipstick. All fittings to hold	1.
	detector vacuum dipstick securely and leak	
	proof on dewar. All fittings and accessories	
	for liquid nitrogen filling in vacuum Dewar.	
2.02	Vacuum Dewar Liquid Nitrogen Capacity	25 Ltrs
2.03	LN2 level and SoH monitoring	LCD screen on front panel
2.04	Interface for remote status readout	USB with compatibility for Windows
2.04		10/11.
3.00	Pre-Amplifier	
3.01	Intelligent Pre-Amplifier built in Detector Caps	sule
0.01		
3.02	Pre-Amplifier parameters	Monitoring with USB interface to PC
3.03	Pre-amplifier software should provide the	Detector Leakage Current
	parameters	Charge Loop DC level
		Out stage DC level
		FET Backgate Voltage
		FET Drain Ref Voltage
		HV Inhibit status
		High Count Rate status
		DDTD1 and DDTD2 Targe arefure
		PRIDI and PRIDZ Temperature

		Voltage supply	
4.00	Digital Signal Analyzer	3 11 7	
	Digital Digital Analyzei		
4.01	Integrated Desktop Multi Channel Analyzer based Digital Signal Analyzer. Operates		
	through software and compatible with the detector.		
4.02	16 K (Minimum) Channel conversion gain/spe	ectrum memory	
4.03	Communication type & Speed	USB with 12 Mbits/s	
4.04	Modes of Operation	MCS/PHA mode	
4.05	PHA Mode	Live or True Time, counts in single	
		channel, Counts in ROI, Counts in multiple ROIs	
		256, 512, 1024, 2048, 4096, 8192 or 16 384 channels. Support for two memory groups of equal size	
4.06	MCS Mode	Sweeps, count greater or equal to preset	
1.00		Counts, count greater or equal to preset ROI Counts	
		256, 512, 1024, 2048, 4096, 8192 or 16	
		384 channels. Support for two memory	
		groups of equal size	
4.07	Integrated desktop MCA based on Digital Sig	nal Processing (DSP)	
4.08	Count Rate and Temperature stability		
4.09	Rise time	0.2 to 38 µs.	
4.10	Flat Top	0 to 3 µs	
4.11	Coarse Gain	x2 .0 – x430.5 in 19% increments	
4.12	Fine Gain	x0.8 to x1.2 in ~0.004% increments	
4.13	Integral Non-Linearity	≤±0.025% of full scale over the top 99% of selected range.	
4.14	Differential Non-Linearity	≤±1% over the top 99% of the range including the effects from integral non- linearity	
4.15	Gain Drift	≤35 ppm/°C after 15 minutes of operation.	
4.16	Zero Drift	<3 ppm/°C after 15 minutes of operation	
4.17	Pulse pair resolution	Better than 500 ns with NORMAL Fast	
1 18	PLIP Guard	1 1 to 2 5 in 0 1 increments	
1 10	Indicators	Full set of Front papel LED indicators	
4.15	Auto pole zero correction facility		
4 21	Input polarity	Software Selectable	
4.22	Live Time Correction facility	Yes	
4 23	Digital Stabilization Canability	Yes	
4 24	Base line restorer	AUTO HARD MEDIUM SOFT	
4 25	Digital fast discriminator	Yes	
4.26	Indicators	Power, High Voltage, Acquisition, Count rate indicators.	
4.27	High Voltage Power Supply	Inbuilt of Digital Signal Analyzer	
		Polarity: Selectable by Software	
		Ranges: ± 200 to ±1500 V dc or ±1500 to ±5000 V dc	
		Ripple: ≤ 10 mV P-P	
		Temperature Coefficient: ±50 ppm/°C.	

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		Stability: 0.01%/h. 0.02%/8 h.	
		Accuracy: $\leq \pm 5\%$	
		Load Regulation: 1%	
		Setting Resolution:12-bit (1/4096)	
4.28	Operates directly or via power adapter from 200 to 240 V AC 50 Hz power supply		
1 20	Overlead protected Detector Preamp Power +24 V +5% at 50 mA max		
4.23	Supply	+12 V +5% at 100 mA max	
1 30	Communication	The Integrated Desktop Multi Channel	
4.00	Communication	Analyzer communicates with computer	
		USB port	
4.31	Physical	All Metal Enclosure	
4.32	Operating Temperature	-20 to 50 °C	
4.33	Operating Humidity	85% non-condensing as per EN-61010	
5.00	Gamma Spectroscopy Analysis Software,	comprises of following	
5.01	Preloaded with latest version of instrument sc	oftware compatible and operates/control all	
	the functions of:		
	1. Digital Signal Analyzer,		
	2. Pre amplifier and		
	HPGe Detector & Cryostat		
	Control High Voltage Power Supply		
5.02	Peak Search & Library Directed Peak Search		
5.03	Peak Area calculations		
5.04	Multiple methods for Energy & Efficiency Cali	bration	
5.05	Can able to view multiple spectrums side by s	side	
5.06	Compare two spectrums in a single window		
5.07	Can merge multiple spectrums; counting time should not get added while merging		
5.08	Peak Smoothing and Stripping feature		
5.09	Ref. Background subtraction, Standard Background Subtraction feature		
5.10	Automatic Interference correction		
5.11	Parent/daughter decay correction		
5.1Z	Gain Evaluator & Auto Gain Adjustment		
5.13	Minimum Detectable Activity Calculations with	Curie MDA KTA MDA ISO11929 MDA	
5.14	Peak Weighted mean Nuclide activity calculat	tion	
5.16	Auto Nuclide identification		
5.17	Report generation in printable format		
5.18	Hard Copy and complete documents of the Li	censed Software	
5.10	Quantification in units uCi/Bo		
5.20	Quality assurance feature to monitor and reco	ord parameters such as peak centroid.	
0.20	FWHM Nuclide activities. MDA and other imp	portant results.	
	The QA data stored and the results obtained	should be displayed in a chart type or as a	
	report template.		
5.21	Ability to review, adjust, or add/delete peaks i	n specific regions/ROI	
5.22	Python scripting integration for customizable	results.	
5.23	Should be organized into multiple sectioned b	ased pages	
5.24	Should provide information such as basic san	nple information; a spectral image with	
K.	count information in one section		
5.25	Should provide information such as MCA para	ameters, library information, analysis	
	algorithm executed details etc. in next section		
5.26	Should provide ROI, FWHM, peak area, unce	rtainties and background counts	
	information, with an option to sort the results	using header in next section.	

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5.27	Nuclide Results section: Should provide summary of nuclide activities, MDA results for identified andlibrary radionuclides, Uncertainties. Provision to expand the radionuclide to view the results of each emission line. Provision to toggle the uncertainty results from percentage and absolute values.	
5.28	Provision to inspect any emission line in the results page by clicking on the energy and can launch Interactive peak fit for reviewing the peaks.	
5.29	Provision for flagging the energy line that needs to be reviewed later stages for perfect analysis.	
6.00	Data Acquisition System	
6.01	Desktop computer preloaded with licensed latest Windows OS.	
6.02	The computer shall have communication port to communicate with the instrument	
6.03	Core i7-14700K or greater processor, 32GB DDR4 RAM, 1TB SSD, 24" LED display unit. Latest MS Office, wireless keyboard & optical mouse.	
7.00	Lead Shield for the HPGe system	
7.01	Lead shield for lower background with a support table suitable for the detector as detailed	
	Shielded Cavity Dimensions:	
7.02	 ≥250 mm gap between top of the detector and sliding door 	
1	 >150 mm gap between detector wall and shielding inner wall 	
7.03	Shielding Type: Solid-cast reprocessed lead with steel casing and graded-Z liner.	
98 C.	Shielding material Specifications:	
	• 12.7 mm (0.5 in.) low-carbon steel casing	
7.04	 101 mm (4 in.) reprocessed lead 	
	0.5 mm (0.02 in.) tin sheet liner	
	• 1.6 mm (0.064 in.) soft-copper sheet liner	
	• Support Stand Material, Low-carbon steel square tubing and plate.	
8.00	DEM/DEM authorization letter should be provided along with the offer. Otherwise, offer will be rejected technically	
	All the parameters mentioned as complied should be provided with sufficient	
9 00	documentary evidence such as OFM datasheet or on OFM letterhead, along with the	
0.00	offer. Without sufficient documentary evidence, offers will be rejected technically.	
	Warranty	
10.00	 System should be supplied with two years comprehensive warranty from the date of installation (inclusive of all parts of HPGe and accessories, UPS, UPS Batteries etc). The successful bidder will be responsible for the comprehensive maintenance of the supplied machine and its related accessories free of charge during the warranty period. In case of any complaint in the working of the instrument during the warranty period, the firm shall attend the same within 48 hours from the time of logging of 1st complaint call by IREL and the instrument must be repaired within 10 days thereafter. Further, in case of failure to do so, penalty @ Rs. 2000/- per day will be applicable. 	
	Installation & Training	
11.00	 Supplier should provide training on operation and application of the equipment. Installation and commissioning to be done at our site with full demonstration of software and day to day maintenance of the equipment. One week comprehensive training on the use of the systems should be provided by the Supplier at our site at IRE, RED, Udyogamandal after successful installation and commissioning. During the training, the supplier should provide necessary inputs through the engagement of application executive for development of methods for the analysis of all Rare earth products as 	
	 specified by IRE, RED. Transportation, boarding and lodging for the trainers will be borne by the supplier during the training at IRE_RED. 	

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	Qualifications for installation crew to meet the related statutory body requirements and approvals shall also be complied
12.00	 Other requirements All necessary pre-installation requisites for complete installation of equipment will be carried out by the Supplier. Power requirement for the system and any local ancillary equipment/ instrument necessary to run the system, in addition to the above, shall be informed to IREL in advance, before supplying the instrument. The successful bidder has to give undertaking stating capability to supply the required spares and optical components for a period of minimum 10 years after completion of two years comprehensive warranty period as per requirement ensuring instrument operating in good condition and able to carry-out AMC after warranty. A maintenance chart for all the components in the system shall be provided. Manual: One set of Operating manual and Service manual (in English language) with complete circuit diagrams should be provided with the instrument. The Manual should be presented in both, hard and soft copy.
13.00	Pre-requisites All necessary installation requirements to be informed before supplying the instrument.
14.00	IREL scope of supply Power connections, Bench/platform for installing the equipment, water & electricity required for commissioning.

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