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Sub: Expression of Interest (EOI) for sourcing technology for setting up of Gallium Extraction Plant at Alumina Refinery in Damanjodi, Odisha, India

1.0 Brief of EOI (Background):

National Aluminum Company Ltd (NALCO) is interested for sourcing a suitable and low cost technology supplier for setting up a Gallium extraction unit/plant in company's Alumina Refinery located at Damanjodi, Odisha through a Joint Venture or standalone having Gallium metal purity of $\geq 99.99\%$ (4N+). The capacity of the plant will be of around 10 Tonnes per Annum (TPA), **low cost** and economically viable with state of the art environment friendly technology as per Indian environment standard. For this purpose NALCO invites Expression of Interest (EOI) from the interested and competent manufacturers/technology suppliers interested in providing technology for extraction of Gallium from Nalco Bayer liquor (intermediate process liquor generated from Digestion of bauxite by Bayer process) and having expertise in production and marketing of metallic Gallium or Gallium compound. On receiving proposal from the parties again a fresh tender will be floated to the shortlisted parties for selection of the suitable technology provider on Gallium extraction from Bauxitic resources.

2.0 General Information about Company:

2.1 Company profile and location of the plant:

NALCO was incorporated in 1981 following a major investment decision by the Government of India to exploit a part of the Bauxite deposit discovered in the East Coast of India. The company has charted an excellent track record in both physical and financial performance, and has been listed in the LME(London Metal exchange).Recently, the company has been conferred the "Nav Ratna"(literally Nine Jewels} by the Govt.of India, in recognition of its consistent outstanding performance over the years, hereby incorporating higher investment and operational autonomy.

NALCO is operating a multi-location Bauxite Mines-Alumina-Aluminium complex along with a Captive Power Plant, in the State of Odisha, India. A major expansion programme (1st phase) has been completed in 2001. The Phase-2 expansion has been completed in July, 2012 and up gradation activity of Refinery after Phase 2 expansion completed. Mines up-gradation is going on. The plant capacity and location of various units of the complex after Phase-2 expansion are as under:

Unit	Location	Current Capacities	Capacities after up gradation
Bauxite Mines	Panchpatmali, Dist:Koraput, Odisha,India	6.3 MTPY	6.825 MTPY
Alumina Refinery	Damanjodi, Dist:Koraput,Odisha,India	2.1 MTPY	2.275 MTPY

Aluminium Smelter	Angul,Dist-Angul,Odisha ,India	0.46 MTPY	0.46 MTPY
Captive Power Plant	Angul,Dist-Angul,Odisha ,India	1200 MW	1200 MW
Wind Energy	(i) Gandikota, Andhra Pradesh, India	50.4 MW	50.4 MW
	(ii) Jaishalmer, Rajasthan ,India	47.6 MW	47.6 MW

The current product mixes of NALCO are as follows:

- (a) Alumina & Hydrate : Calcined Alumina(Metallurgical Grade)
Alumina Hydrate
- (b) Special Products : Specialty Hydrate/Specialty Alumina,
Detergent Grade Zeolite A
- (c) Aluminium Metal: : Ingots, Sows, Billet, Wire rod, Alloy wire rods
- (d) Flat Product : Aluminium Flat Rolled Products and Cast strips.

Nalco's metal is registered in the London Metal Exchange (LME) and the products are sold both in domestic and international market.

2.2 Brief of Company Highlights:

2.2.1 Financial

All figures are as on 31st March, 2013 and for FY 2012-13

Sl No	Particular	In INR Crores*	Equivalent in US \$Million
1	Paid-up Share Capital	1288.62	237.18
2	Net Worth	11933	2196.39
3	Sales Turnover	7247	1333.88
4	Net Profit after Tax(PAT)	593	109.14

*1Crores equals to 10 Million.

2.2.2 Achievement:

The company is listed on National Stock Exchange of India and Mumbai stock exchange. The registered office is located at Nalco Bhawan, P/1, Nayapalli, Bhubaneswar-751061, Odisha, India. It is certified for ISO 9001: 2000, ISO 14001 and OHSAS 18001 and SA 8000. It has won several awards for Environmental performance including the most coveted, Indira Gandhi Paryavaran Puraskar- 2000, Pollution Control Excellence Award-2000, and CII, Orissa, Environment Safety & Health Management Award-2005.The Company has also won CAPEXIL Highest Export Award continuously since 1988,the EEPC Export award, FIEO Niryat Shree Award and many other awards for excellence in export performance.

3. Brief Process descriptions:

The process of extraction of Alumina from its mineral bauxite in caustic liquor solution is commonly known as 'Bayer' process. Bauxite received from Mines is either stacked in stock pile or fed directly to secondary crusher for size reduction. Secondary crushed bauxite from Silo is fed to Ball Mill along with caustic liquor for grinding.

Ground bauxite slurry after Pre-desilication is digested at atmospheric pressure (temperature 105-106 degree C) for extraction of alumina. Undigested bauxite is separated as Red mud.

Aluminate liquor is cooled to precipitate ATH (alumina trihydrate) which is calcined to produce alumina.

3.1 Raw Material Availability:

Gallium is available in NALCO Bauxite as Ga_2O_3 around concentration of about 0.008 wt%. Average NALCO Bauxite sample analysis for year 2012-13 is Al_2O_3 (t) 43.96%, Fe_2O_3 26.15%, TiO_2 2.22%, SiO_2 (t) 3.47%, LOI 23.67. Gallium dissolves in liquid phase and get enriched with time as NALCO is not extracting Gallium metal or any compound till now. But some amount of Gallium is escaping from the plant liquor during discharge of red mud as well as with product alumina. The Gallium content in different liquor along with the major constituent are as below:

Typical Analysis:

Sl.No	Gallium as Ga in mg per litre	Na_2O_c in gpl (grams per Litre)	Al_2O_3 in gpl (grams per litre)	Ratio Al_2O_3/Na_2O_c
Spent Liquor	137.8	153.7	87.60	0.57
Green Liquor	200.6	226.76	129.45	0.571
Aluminate Liquor	138.91	147.28	155.38	1.055

The aluminate liquor is the liquor before precipitation of alumina tri-hydrate (ATH), the spent liquor is the liquor after precipitation of alumina tri-hydrate (ATH).The Green Liquor is the concentrated spent liquor after evaporation.

4. QUALIFICATION CRITERIA FOR CONSIDERATION OF THE PROPOSAL:

Firms intending to participate are expected to meet the following criterion for consideration of their proposal.

4.1 The firms should have technical capability (technical knowhow) for Gallium extraction plant of a gallium metal purity of $\geq 99.99\%$ (4N+) from Bauxite based resources or in any Alumina Refinery, currently in operation (details to be provided).

OR

The firms should have adequate technical expertise and association in production and marketing of Gallium of purity $\geq 99.99\%$ (4N+) currently in operation.

AND

4.2 The firms should submit previous experience for documentary evidence & client detail as per format enclosed in Annexure 1.

4.3 The firms should be financially sound, which would be judged by their latest audited accounts. The net worth should be positive, during the last accounting year (documentary evidence to be provided).

5.0 PREPARATION/SUBMISSION OF EOI

5.1 EOI Proposal outline requirements:

The interested Firms are invited to furnish a proposal in a format as outlined below in order to achieve the objective of maintaining uniform proposal structure from all the Firms:

I: LETTER OF SUBMISSION OF THE PROPOSAL

II: EOI QUALIFICATION SUMMARY (as per Para 4.0 above)

III: INFORMATION ABOUT ORGANIZATION

The Firm is requested to furnish details pertaining to company formation, legal status, place of registration, principal place of business of the company, number of years in the relevant business, and volume of sales along with market share in the related segment. Organization Structure along with qualification & experience of key personnel, etc should be provided

IV: TECHNICAL CAPABILITY

The firm should furnish details about technical capability, Intellectual Property Rights (IPR), capacity, market etc in undertaking similar nature of works. Firm may also submit any other information he desires to furnish on his own to supplement his capabilities pertaining to this EOI.

V: OUTLINE OF THE PROPOSED PROJECT (PROPOSAL)

In this section, Firm should furnish a brief on production and business plan pertaining to gallium/gallium compound which should comprise of the technology to be used, their market, growth potential, market price, raw materials and utility sourcing, capital cost and operating cost of 10 TPA or suitable size commercially viable with financial information such as profitability margin.

VI: OTHER REQUIRED DOCUMENTS

- 1) Details of the experience as per Para 4.0 above
- 2) Annual Report and Audited Accounts of the latest financial year.
- 3) CD of submitted proposal.

5.2 SUBMISSION OF EXPRESSION OF INTEREST (EOI):

Firms are expected to prepare EOI in accordance with requirement vide Para 4.0 and considering the EOI brief at para1.0. The language of the proposal shall be "English". The proposal along with all information and requisite documents should be delivered through post or courier in printed format at the following address.

General Manager (R&D)
National Aluminium Company Limited
Nalco Bhawan
P/1, Nayapalli
Bhubaneswar-751 061
INDIA.

Any clarification must be sought to:

Mr P.Bandopadhyay
Asst General Manager (R&D)
Telefax: +91674-2300665
E-mail: partha.bandopadhyay@nalcoindia.co.in
: parthab541@gmail.com

Last date for submission of proposal is 05.06.2014

ANNEXURE 1

The firm should furnish their experience details with reference to the Work, which pre-qualify them in line with Experience Criterion mentioned in Para 4.2 of the EOI.

Sr No	DESCRIPTION	DETAILS
1.	Name of the client Company	
2.	Description of work/process	
3.	Capacity of the plant with purity level of gallium	
4.	Contact Details of Client	Name Postal Address Name & Designation of Person Phone Fax E-mail
5.	Contact Details of Consultant	Name Postal Address Name & Designation of Person Phone Fax E-mail
6	Completion Dates	<ul style="list-style-type: none">• Date of Award:• Starting date:• Scheduled completion date:• Actual completion date:• Delays in weeks, if any:• Reason for delay, if any: