

Minutes of the 49th meeting of Standing Scientific Advisory Group (SSAG) held on 31st July 2018 at 11.00 A.M in Khanij Kaksh, “B” Wing, Shastri Bhavan, New Delhi. The list of participants is enclosed at Annexure-A.

Secretary, Ministry of Mines and chairperson, SSAG welcomed the members to the 49th SSAG meeting. He mentioned that SSAG plays an important role in fostering R & D projects in mining, minerals and materials sector, mineral processing & recovery from waste, metal extraction and alloy development. The SSAG considered projects which were reviewed and recommended by the Project Evaluation and Review Committee (PERC).

2 EA and chairman, PERC briefed the SSAG regarding the review process of the project proposals conducted by PERC before recommending these to the SSAG. A total of 100 project proposals were received under Science and Technology Programme Scheme of Ministry of Mines for the year 2018-19. The new project proposals and 6 proposals recommended by the 16th PERC for resubmission were considered and evaluated in the 17th PERC meeting held on 19-20th July 2018 at JNARDDC, Nagpur. The PERC recommended 12 (twelve) Project proposals, 7 on-going projects for extension of duration, acceptance of final reports of 10 completed projects, 1 ongoing project for foreclosure and 1 ongoing project for transfer from one to another institution for consideration and approved SSAG..

3 Dr. Joyesh Bagchi, Director (Technical), Ministry of Mines, Member Secretary, SSAG presented the proposals recommended by PERC before the SSAG.

4 After detailed deliberations SSAG approved following proposals:

4.1 Development of a Low-cost Portable Optical Reflectance Spectrometer for Mining and Mineralogy, Indian Institute of Technology, Madras

Total Cost : Rs. 10 lakh (Capital: Rs. 3 lakh, Recurring: Rs.7 lakhs)

Duration : 1 year

4.2 Novel Approach to Recover Individual Valuable Heavy Minerals from Pyriboleferrous Beach and Dune Sand Deposits, CSIR-Institute of Minerals & Materials Technology, Bhubaneswar.

Total Cost : Rs. 15 lakh (Recurring)

Duration : 1 year

4.3 Investigation of the dynamics & mechanism of flocculation by polymers and biopolymers for separation of solid particles of high rate thickeners in mineral processing industries, CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) Industrial Estate P.O, Thiruvananthapuram.

Total cost: Rs.60 lakhs, [MoM's share subject to 50% contribution towards capital expenditure by DST]

Duration: 2 years

1 st Year	2 nd year	Total
Rs.30.955 lakh (Capital: Rs. 17.383 lakh, Recurring: Rs.13.572 lakh)	Rs.11.655 lakh (Recurring)	Rs.42.61 lakh

Subject to approval by DST. NIIST to obtain approval of DST also for the proposal

- 4.4** Use of Overburden Clay as alternate for aggregate, Indian Institute of Technology Madras Chennai-600 036, India & Neyveli Lignite Corporation Ltd. (NLC Ltd).

Total cost: MoM's share: Rs.70 lakh, NLC contribution: Rs. 103 lakh.

Duration: 3 years

MoM's contribution

1 st Year	2 nd year	3 rd year
Rs. 40 lakh (Capital: Rs.30 lakh, Recurring: 10 lakh)	Rs.20 lakh (Recurring)	Rs. 10 lakh (Recurring)

NLC's contribution

1 st Year	2 nd year	3 rd year
Rs. 8 lakh	Rs.85 lakh	Rs.10 lakh

- 4.5** Texturally controlled micro-chronological and extraction protocol studies on Pt-Chromite mineralization (Preliminary studies), Centre for Earth Sciences, Indian Institute of Science Bangalore 560 012, India & Indian Bureau of Mines.

Total cost: MoM's contribution - Rs.8 lakhs to IISc Bangalore (Recurring), IBM to meet expenditure of balance Rs. 8 lakh from its sanctioned budget.

Duration: 1 year

- 4.6** Development of Ready-To-Use Assorted Sand for Construction Activities from Zinc Refining Wastes and Marble Powder, Manipal University Jaipur, Dehmi Kalan, Jaipur, Rajasthan.

Total cost: Rs.20 Lakhs (Capital: Rs.9.60 lakh, Recurring: Rs.10.4 lakh)

Duration: 1 year

- 4.7** To study the fire retardancy of nano-ATH in polymers, Jawaharlal Nehru Aluminium Research Development and Design Centre, Wadi, Nagpur & CIPET

Total cost: Rs. 56.98 Lakhs (JNARDDC - Rs.31.30 lakh & CIPET - Rs.25.68 lakh)

Duration: 2 years

JNARDDC

1 st Year	2 nd year	Total
Rs.15.47 lakh (Recurring)	Rs.15.83 lakh (Recurring)	Rs. 31.30 lakh

CIPET

1 st Year	2 nd year	Total
Rs. 12.58 lakh (Recurring)	Rs.13.10 lakh (Recurring)	Rs.25.68 lakh

- 4.8** Techno-economic Survey of Aluminium Scrap Recycling in India, Jawaharlal Nehru Aluminium Research Development and Design Centre Wadi, Amravati Road, Nagpur – 440 023 (Maharashtra) & Metal Recycling Association of India

Total Cost: JNARDDC - Rs. 53.55 Lakh (Recurring)

Duration: 1 year

The report should include an analysis of the survey and recommendations for developing the ecosystem.

- 4.9** High performance of rare earth metal as Electrode material for super-capaciter application and fuel cell, Velammal Institute of Technology, Panchetti, Chennai.

Total Cost: Rs. 30.96944 Lakhs

Duration: 2 years

1 st Year	2 nd year
Rs. 25.73803 lakh (Capital: Rs. 18.91387 lakh, Recurring: Rs.6.82416)	Rs.5.23141 lakh (Recurring)

- 4.10** Development of open cell aluminium foams for heat sink and EMI shielding Applications, Advanced Materials And Processes Research Institute (AMPRI), Bhopal.

Total Cost: Rs.30 lakh [MoM's share - Rs.21 lakh, CSIR's Share- Rs.9 lakh]

Duration: 2 years

1 st Year	2 nd year
Rs.10.5 lakh (Recurring)	Rs.10.5 lakh (Recurring)

5 SSAG did not approve following projects

- 5.1** Design and development of new approaches for recovering copper from mill tailings, Indian Institute of Technology (Indian School of Mines), Dhanbad.

Total Cost: Rs.17 Lakhs

Duration: 2 years

A similar project has already been implemented by BITS, Pilani.

- 5.2** Rare-earth free intermetallic compounds to develop a new generation of high-performance Permanent Magnets, CSIR-National Institute for Interdisciplinary science and Technology (CSIR-NIIST) Industrial Estate P.O, Trivandrum 695019 & Central University of Rajasthan, Dist. Ajmer (jointly)

Total Cost: Rs.42.94 lakh (NIIST - Rs.23.06 lakh, CURAJ – Rs.19.88 lakh)

Duration: 2 years

The representative from DMRL informed that DMRL is working on a similar project. PERC may examine the utility of the project in light of DMRL's project.

6 Review of the on-going Projects for extension of project tenure.

The following seven projects were considered by the SSAG for review and extension of time. PERC had already recommended the extensions of the project without any cost overruns. After detailed deliberation, the SSAG approved the proposed time extension to following seven projects as below:

- 6.1** Technology Development (TRL-7) for calico- thermic reduction of rare earth metal oxides and establishment of pilot plant for extraction and purification of samarium, Non-ferrous technology development centre, Hyderabad. Extension upto 31.03.2019 without cost escalation.
- 6.2** Recyclability strategy or value-added utilization of iron/ manganese ore tailing/low grade ore: evaluation of energy storage capacities. Institute of Mineral & Materials Technology, Bhubaneswar. Extension upto 30.04.2019 without any cost escalation.
- 6.3** Developing downstream application of strip cast aluminium alloys (AA8011 & AA3004), JNARDDC, Nagpur, VNIT, Nagpur and NALCO, Bhubaneswar (Jointly). Extension upto 31.03.2019 without any cost escalation.
- 6.4** Development of Nickel containing steel from chromite over burden, Indian Institute of Technology, Kharagpur and Institute of Minerals & Materials

Technology, Bhubaneswar (Jointly). Extension upto 31.03.2019 without any cost escalation.

- 6.5 Prospecting/Exploration of Platinum group of metals within Nega Hills ophiolite at Thengahu Ridge-Moke area, Phek District, Nagaland, Directorate of Geology and mining, Government of Nagaland, Nagaland: Dimapur. Extension till 31.03.2019 without any cost implications. Project progress may be reviewed by Ministry of Mines separately.
- 6.6 Novel synthesis routes for high purity kesterites (CZTS:Cu-Zn-Sn-S; Cu-Zn-Sn-Se) and development of cost kesiterite based solar PV cells and modules, Nonferrous Materials Technology Development Centre, Hyderabad. Extension till 31.03.2019.
- 6.7 Study of alkaline-carbonatite complexes as potential resource for REEs, NB-TA and U-TH, Indian Institute of Technology, Roorkee. Extension up to 31.12.2018 without any cost escalation

7 Acceptance the final report and closure of completed projects.

The final reports of the following ten projects were considered by the SSAG. After detailed deliberation and evaluation, the SSAG accepted the final reports of the following ten projects and approved closure of projects:

- 7.1 Physico-chemical processing of low grade chromite ore for beneficiation and agglomeration of fines for recovery of metal values, Jadavpur University, Kolkata.
- 7.2 Study of toxic fumes and development of Carbon nanotubes based sensing Device, CIMFR and Amity University (Jointly)
- 7.3 Development of copper bio-leaching methodology/ technique from tailing waste at Hindustan copper limited, Khetri, Birla Institute of Technology & Science, Pilani.
- 7.4 Development of hard and high temperature refractory material/ aggregate from sapolite, Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur.
- 7.5 Development of TDR based wireless system for slope stability monitoring in opencast mines, National Institute of Technology, Rourkela.
- 7.6 Recoverable reserve estimation using non-gaussian copula-based ore body simulation along with open pit and stope optimization techniques, National Institute of Technology, Rourkela, Orissa and Indian Institute of Technology, Kharagpur (Jointly).
- 7.7 Feasibility and application of Bio-fuel as well as low cost and diluted ANFO, CIMFR, Dhanbad.
- 7.8 Development of state-of-art facilities for in-situ stress measurement by hydrofracture in porous and fractured rocks, NIRM, Karnataka.

- 7.9 Evaluation of Biomarkers for early detection of noise induced hearing loss, NIMH, Nagpur. Pilot project may be undertaken by NALCO and HCL based on the project findings.
- 7.10 Development of Standard Framework and Guidelines for Noise Mapping in Mines and Surrounding Community, NIMH, Nagpur. Pilot project may be undertaken by NALCO and HCL based on the project findings.

Executive summary of completed projects, with a section on commercial applications, to be sent to Ministry of Mines, which will be placed on the website of Ministry of Mines for wider dissemination.

8 Foreclosure of Project

- 8.1 Postural risk analysis of mining equipment operators and its relation to musculoskeletal disorder, NIMH Nagpur

After deliberation SSAG was in the view that the project may be continued and granted 8 months extension up to 19.06.2019. The project will be reviewed in next PERC.

9 Transfer of the project from one institution to another.

Simulation of simultaneous rock fractures at multiple scales, BITS Pilani, Goa Campus. (Transfer of project from BITS Pilani, Goa Campus to IIT, Delhi subsequent to transfer of PI)

SSAG approved the transfer of the project as requested by PI.

The meeting ended with vote of thanks to the Chair.

Annexure-A

**LIST OF PARTICIPANTS OF 49TH SSAG MEETING HELD AT KHANIJ KAKSH,
MINISTRY OF MINES, SHASTRI BHAVAN, NEW DELHI UNDER
CHAIRMANSHIP OF SECRETARY (MINES) ON 31.07.2018**

S.No	Name	Portfolio
1.	Shri Anil Gopishankar Mukim	Secretary (Mines)
2.	Shri K Rajeswara Rao	Additional Secretary (Mines)
3.	Ms. Reena Sinha Puri	JS & FA (Mines)
4.	Shri Alok Chandra	Economic Adviser (Mines)
5.	Shri Amit Saran	Director (Mines)
6.	Dr. J. Bagchi	Director (Technical) , Mines
7.	Dr.K.Balasubramanian	Director, NFTDC Hyderabad
8.	Dr. A. Agnihotri	Director, JNARDDC and Director (Addnl. Charge), NIMH
9.	Dr. H. S. Venkatesh	Director, NIRM
10.	Shri T. K. Chand	CMD, NALCO
11.	Shri Santosh Sharma	CMD, HCL
12.	Shri C. K. Thoolkar	GM, MECL
13.	Dr. T. K. Nandy	Scientist H, DMRL DRDO
14.	Prof. G. G. Roy	Professor and Associate Dean, IIT Kharagpur
15.	Shri Pushpendra Gaur	DCOM, IBM
16.	Dr. A.K. Srivastava	Director, CSIR-AMPRI, Bhopal
17.	Shri R. Saravanabhavan	Dy. Adviser (Minerals), NITI Aayog
18.	Dr. Bhoop Singh	Head (NRDMS), DST
19.	Dr. Dinesh Gupta	DG, GSI
20.	Shri Y. R. Patel	Under Secretary (Mines)
21.	Dr. M. K. Ghosh	IMMT Bhubaneswar
22.	Dr. Rajendra Singh	CSIR-CMFIR, Dhanbad

Leave of absence granted to other members.