GOVERNMENT OF INDIA  
MINISTRY OF MINES  

No.14/1/2012 – Metal IV  

New Delhi, the 26.3.2012

To,

1. Secretary,  
   Dept. of Science and Technology;  
   Technology Bhawan, New Mehrauli Road, New Delhi-110016

2. Director General,  
   Geological Survey of India  
   27, Jawaharlal Nehru Road,  
   Kolkata – 700 019.

3. The Controller General,  
   Indian Bureau of Mines,  
   Indira Bhawan, Civil Lines,  
   Nagpur– 440 001.

4. Advisor (Minerals)  
   Planning Commission,  
   Govt. of India,  
   New Delhi.

5. Prof. D. Acharya,  
   Director,  
   IIT, Kharagpur.

6. Dr. T. Kumar  
   Director,  
   Indian School of Mines University,  
   Barwa Road,  
   Dhanbad-826004

7. The Director,  
   Defence Metallurgical Research Laboratory,  
   P.O. Kanchan Bagh,  
   Hyderabad.

8. The Director,  
   Bhabha Atomic Research Centre,  
   Trombe,  
   Mumbai – 450 085.

9. The Chairman & MD,  
   National Aluminium Company Limited,  
   NALCO Bhawan, P-2, Nayapali, Bhubaneswar  
   751 007.

10. The Director,  
    Regional Research Laboratory,  
    Near Habibganj Naka,  
    Bhopal.

11. The Director,  
    National Institute of Rock Mechanics,  
    Kolar, Karnataka.

12. Dr. Amalendu Sinha,  
    Director,  
    Central Institute of Mining & Fuel Research, Dhanbad, Jharkhand.

13. Dr. Pradip,  
    Group Head,  
    Tata Research Development & Design Centre, 54B Hadapsar  
    Industrial Estate, Pune – 411 013.

14. Dr. K. Balasubrahmanian,  
    Director,  
    Non-Ferrous Materials & Technology Development Centre,  
    Kanchan Bagh, Hyderabad.

15. Prof. B.K. Mishra,  
    Director,  
    Institute of Minerals & Materials Technology,  
    Bhubaneswar.

Subject: 42nd meeting of the Standing Scientific Advisory Group [SSAG].

Sir,

I am directed to forward herewith a copy of the Minutes of the 42nd Meeting of the 
Standing Scientific Advisory Group [SSAG] held on 19.3.2012 under the Chairmanship of 
Secretary (Mines), Ministry of Mines for information and necessary action.

Encl: As above.

Yours faithfully,

(Dr. H.S.M. Prakash)  
Director (T)  
Tel No. 23385329
Copy with the Minutes of the 42nd SSAG meeting to:-

1. Prof. B.C. Meikap, Department of Chemical Engineering, Indian Institute of Technology, Kharagpur-721302, West Bengal.

2. Mr. Anupam Agnihotri, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Amravati Road, Wadi, Nagpur-440023.

Copy also to:-

(i) Sr. PPS to Secretary(M)  (ii) PPS to Addl. Secretary(M)  (iii) PS to JS(NK)  (iv) PS to JS&FA  (v) Director(T)

[Signature]

(Dr. H.S.M. Prakash)
Director(T)
MINUTES OF THE 42nd STANDING SCIENTIFIC ADVISORY GROUP (SSAG) MEETING HELD ON 19th MARCH, 2012 IN MINISTRY OF MINES, SHAHSTRI BHAWAN, NEW DELHI.

Observations:
AS (M) recalled the observations made in the earlier 41st SSAG Meeting, namely (i) the relevance of the project to the overall mandate of mining, minerals, metals, value addition, waste and environmental impact of mining and metallurgical processing, (ii) industry inputs and participation; and (iii) past performance of the institution in execution of earlier projects. With regard to the status of equipments procured with the grant in aid funds for the sanctioned projects, FA(M) also clarified in the 41st SSAG Meeting itself which was reiterated in this meeting that the ownership continues to be with the GOI and the recipient institution becomes the custodian. Decisions regarding transfer of equipment to other institutions, sharing of the resources and any other decisions pertinent to future usage of the equipments continues to lie with GOI. It was therefore decided that as a first step, a database of R & D equipments procured from SSAG grants from projects of last 5 years should be compiled as a first attempt in this exercise.

Dr Balasubramanian who is member of PERC as well as SSAG mentioned that a three part (with multiple subparts) evaluation protocol as given herein has been evolved to evaluate the proposals in PERC before recommendation to SSAG, viz.,

Part I Scientific and Technical Merit
(i) originality in terms of concept, method, innovation, or in application; development of new methods, synthesis of advanced materials, process improvements and innovations, design of apparatus and other research tools, process development for waste/secondary/low grade materials recovery, zero waste mining, large data analysis and simulation, modelling etc.; (ii) nature of study as (a) experimental vs (b) modelling/simulation vs (c) both; (iii) is there a clear enunciation of objectives and deliverables in the proposal; (iv) is prior work in the area adequately covered in literature survey?, (v) is detailing of the research methodology, design of experiments, chosen methods of analysis appropriate and valid?

Part II: Application and Industry relevance
(vi) intended/potential application area clear in the proposal; industry relevance, industry participation if appropriate, (vii) potential scalability to pilot plant and later on plant levels; (viii) what is techno economic benefit (at least rough estimates);

Part III Prior Funding and Past Performance
(ix) prior funding from SSAG or any other funding agency of GOI and status of performance of the scientist/academician as well as the institution in execution of those projects; (x) is it single individual / multiple individuals, multi-institutional proposal (xi) is mandatory requirement of Co-PI satisfied in the proposal.

AS (M) observed that it would be very useful and therefore is necessary to bring in all the available relevant information with regard to technical merit, industrial relevance and techno economics in the PERC minutes. Therefore a SOP for minutes of PERC be evolved and adopted from the next PERC meeting.
Agenda Item 1

1. Development of Fluidized Bed Technique for dry beneficiation of low grade bauxite ores, Dept of Chemical Engineering, IIT KGP

   PI: Prof Meikap
   Duration: 3 Years

   Outlay: Rs 52 Lakh

   This project concept is based on engineered Specific gravity in a air dense fluidized bed (ADMFB) for effecting separation in low bauxite ores. ADMFB method is now thrust area for enhancing separation and therefore beneficiation. Performance parameters have been identified. The main objectives: Design and development of fluidized bed system; performance optimization for low grade ores. The present practice is to blend higher grade ore with lower grades to get a minimum useful feed. As the primary usefulness of the project is pegged on the beneficiation of low grade ores, an opinion emerged that GMDC which has low grade bauxitic ores is partnering with NALCO to blend and they plan to blend with high grade ore to get useful feed. DG, GSI observed low grade lateritic ores if could be handled by this route shall beneficiate Ni and Co values as well. It was decided that the project be referred back to PERC for further review and PI shall incorporate the suggestions with respect to involvement of GMDC in terms of their interest.

2. Development of Mathematical Model (using fuzzy logic) to control superheat of aluminium electrolysis bath, JNARDDC.

   The efficiency of electrolytic bath is now at 50%. Many factors affect the efficiency of the bath. One of the important parameters is the superheat. JNARDDC has over the years, has determined a large quantum of data on actual pots from the Aluminium smelters. The problem of optimization of multi variables in the process in real-time has been the challenge. It was observed by member from NALCO that Rs 20 lakh project was sanction by NALCO to JNARDDC to do an experimental set up to measure the liquidus temperature of bath in a small experimental furnace. This project proposal becomes a logical extension and it would be useful to the aluminium industry in general. Dr Balasubramanian mentioned that all processes in industry are now being analyzed in terms many parameters that could be measured in reactors and using pattern recognition and Large Data Analytics (a new and emerging field of study) auto feedback control logic systems are evolved to control the process to improve energy efficiency and quality. This project is a small step in that direction and on successful completion it would have immediate impact if it is adopted by the aluminium industry in general. The SSAG accordingly approved the proposal as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Cost</th>
<th>Recurring Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Rs. 17.50 lakh</td>
<td>Rs. 4.68 lakh</td>
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<tr>
<td>II</td>
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<td>Rs. 4.41 lakh</td>
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<tr>
<td>III</td>
<td>Rs. 0.50 lakh</td>
<td>Rs. 4.41 lakh</td>
</tr>
<tr>
<td>Total</td>
<td>Rs. 18.50 lakh</td>
<td>Rs. 13.50 lakh</td>
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</tbody>
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