

Science and Technology Programme

7.1 The Science and Technology programme of the Ministry of Mines initiated in 1978, covers the disciplines of Geology, Exploration, Mining and Environment, Bio-leaching, Beneficiation Rock Mechanics and Ground Control and Non-Ferrous Metallurgy. 124 projects have been completed so far and 35 are in progress.

7.2 The projects having the basis of national requirement, industrial requirement and PSU's requirements are approved by the Standing Scientific Advisory Group (SSAG) of the Ministry under the Chairmanship of Secretary (Mines). The projects based on the national requirement are financed through the grant-in-aid from the Government. The projects based on industrial requirement are financed through the contributions from the Government, industry and the implementing organizations. The projects based on the PSU's requirement are financed through their own resources.

7.3 During the 10th Five Year Plan emphasis will be on multi-disciplinary, multi-organisational projects catering to the national requirements and for building the capabilities and strengths of the mineral and non-ferrous metal industries.

Financial Outlay

7.4 The outlay of Rs. 8.55 crore (budget support of Rs.5 crore) provided in BE 2004-05 for S&T programme has been retained in RE. An outlay of Rs.7.43 crore (budget support

Rs. 3.88 crore) has been approved for the year 2005-06.

Centres of Excellence

7.5 Three Centres of Excellence set up under the Science & Technology Programme of the Ministry for research in specialised areas are:-

- ▶ National Institute of Rock Mechanics (NIRM), Kolar Gold Fields rock mechanics and ground control.
- ▶ Jawaharlal Nehru Aluminium Research Development and Design Centre, (JNARDDC) Nagpur bauxite, aluminium and alumina technology.
- ▶ National Institute of Miners' Health (NIMH), Nagpur occupational health monitoring and mitigation of health hazards.

National Institute of Rock Mechanics(NIRM),KGF

7.6 The NIRM was registered as a society in July 1988 to conduct research, render guidance and provide consultancy in mining and civil engineering sectors. NIRM has been accredited as ISO 9001 organization in August 2002. With a total strength of 65 scientists and staff, in April -December,2004, 25 projects have been completed and 25 new projects have been conferred. At the end of December, 2004, 45 projects were under implementation. The scientists have

published 24 research papers (10 international & 14 national). 49 technical reports relating to the projects undertaken, were published upto December,2004.

7.7 The total external cash flow till the end of December, 2004, was Rs. 2.97 crore. Rs. 38 lakh were released by the Ministry of Mines as grant-in-aid under non-plan to finance salary expenditure. The Institute has created a corpus of Rs. 4.5 crore. For 2004-05 a budget support of Rs. 60 lakh (Plan) and Rs. 115 lakh (Non-Plan) provided in BE was retained in RE. For 2005-06 budget support of Rs. 60 lakh (Plan) and Rs. 115 lakh (Non-Plan) has been approved.

Jawharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur

7.8 The JNARDDC was registered as a society in 1987. The objective of the Centre is to assimilate the technology available in the country for production of alumina and aluminium including aluminium alloys and to develop technical know how for the basic engineering. The centre's 41 scientists and staff in April-December, 2004 have completed three projects. Seven projects are under implementation.

7.9 JNARDDC has received an excellent response to it's new Thermography service from Railways, Thermal power plants, containers terminals etc. The scientists have received two prestigious awards from Indian Institute of Metals, Kolkata and Indian Institute of Mineral Engineers, Jamshedpur .

7.10 An income of Rs. 66.69 lakh was generated till December, 2004. During 2004-05, a budget support of Rs. 100 lakh (Plan) and Rs. 90 lakh (Non-Plan) has been provided. For 2005-06 the provisions of Rs. 98

lakh (Plan) and Rs.90 lakh (Non-Plan) has been approved.

National Institute of Miners' Health(NIMH), Nagpur

7.11 The NIMH was registered as an autonomous society in February, 1990 to address exclusively the Occupational Health problems of miners due to their long exposure to the mining environment. Among the number of notable adverse health effects associated with mining, like respiratory diseases, diseases due to exposure to high level of noise, vibrations, poor illumination etc., the problem of respirable dust and occupational lung diseases poses a major threat to the mining population in coal and non- coal mines. The evaluation survey was conducted in the diamond mining project and Donimalai & Kumaraswamy Iron Ore Mines of (National Mineral Development Corporation) and Rajanka Limestone Mines, Associated Cement Corporation, Chaibasa. The free silica content in all the analyzed samples was within the permissible limits.

7.12 At Hutti Gold Mines, 66 chest X-rays were evaluated as per ILO classification of chest radiography for pneumoconiosis and appropriate disability compensation was recommended. The prevalence of silicosis was found to be 15 %.

7.13 At Nevyeli Lignite Corporation integrated study was taken up to assess noise levels (Area and Personal)and vibration levels.

7.14 The vibration levels were plotted on ILO standard graphs for analysis, it was confirmed that the vibration levels were within tolerance limits.

7.15 In 2004-05, an income of Rs.8 lakh is

likely to be generated for 200405, Budget Support of Rs.25 lakh(plan) & 25 lakh non-plan provided in BE has been retained in RE also. For 2005-06, Budget Support of Rs.35 lakh (plan) & 25 lakh (non-plan) has been approved.

Major On-going Projects

7.16 Extraction of magnesium from indigenous raw materials - National Metallurgical Laboratory, Jamshedpur :- The project was approved by the Standing Scientific Advisory Group in its 22nd meeting held on 19th December 1997 at cost of Rs. 229 lakh. The Ministry of Mines is to contribute Rs. 184 lakh and Department of Science & Technology Rs. 45 lakh. The objective of the project is to develop indigenously a Silico - thermic reduction process which is more efficient than the process currently used for extraction of magnesium. A pilot plant was designed , fabricated and installed. In twelve trials conducted, about 115 kg. of crude magnesium were produced.

7.17 National Facility for Semi Solid Forming - Indian Institute of Science Bangalore:- The project was approved by the Standing Scientific Advisory Group (SSAG) in its 29th meeting at a cost of Rs. 409 lakh. Ministry of Mines is to contribute Rs. 292 lakh, Department of Science & Technology Rs. 92 lakh and Defence Research and Development Organisation Rs. 25 lakh. The cost of the project was revised to Rs. 476 lakh with the contribution of Ministry of Mines as Rs. 359 lakh in the 33rd meeting of the SSAG. The objective of the project is to set up a National Facility to develop semi solid forming technology to produce quality aluminium casting for automotive and other

sectors. The construction of the building was completed in August, 2004. Cable work relating to 300 KVA power supply has been completed. Over head crane, Buhler's die casting machine, electrical holding furnace, metallo-graphic testing equipment have been installed. Four proto types of electromegnetic stirrers were designed and fabricated. The facility will be fully functional by 31 March, 2005. The Engineering industry has evinced keen interest in using the facility for development of prototype components and is eagerly awaiting the inauguration of the facility.

7.18 Enhanced Gravity and Magnetic Separation Studies for Recovery of Values from Plant Tailings and Ore Slimes-Indian Bureau of Mines :- The project at a cost of Rs. 49.25 lakh was approved by the SSAG in its 31st meeting held on 15th May 2002. Characterisation studies on three iron ore tailings/slimes samples collected from the beneficiation plants of M/S Sesa Goa, M/s Formento, Goa and Bhilai Steel Plant, Dalli-Rajhara were completed. Characterisation studies on two chromite tailing samples from the beneficiation plants of M/s TISCO and M/s FACOR, Sukinda, Orissa are in progress.

7.19 Attenuation of hexavalent chromium in Sukinda Chromite belt by Bio remediation Technology-Indian Bureau of Mines :- The project at a cost of Rs. 30.00 lakh was approved by the SSAG in its 31st meeting held on 15th May, 2002. The project was initiated in collaboration with Orissa Agricultural University, Bhubaneswar for attenuation of Hexavalent Chromium in the mines discharge water from a group of chromite mines in Sukinda area, Jajpur district, Orissa.