

7.6 TRAINING

7.6.1 Introduction

Training is one of the effective and tested tool for performance enhancement as well as upgradation of knowledge and skills of the personnel. In-house training and refresher workshops are essential for skill improvement and for quality output. Training is imperative in the Mining and Mineral Sector which is a highly field oriented area requiring right skills. It assumes a critical importance in the present scenario as rapid scientific and technological advances in the fields of geological sciences, mining engineering, mineral processing, environmental management of mining operations and other allied fields are a regular phenomenon. Therefore, there is need to develop dynamic training facilities, designed according to the trends in Mineral Industry to create required pool of expertise, in order to achieve the charter set for IBM.

The Committee felt that the whole sphere of the regulation requires a revision and strengthening in training segment. The existing training programmes should be redesigned both in form and content. New additions are needed to be made. The Committee looks upon the training sector as a vehicle of change in terms of its recommendations.

For clear accountability and development of standard processes, adoption of mining-related IT applications to facilitate inter alia faster flow of information & correlation of mineral economics and statistics, the Committee is of the opinion that training for personnel should be a continuous exercise that must be administered in specified intervals so as to enhance the professional and ethical standards. Training must be for specific needs and relevant to different growth stages. Second, with system mechanism of coordination with the State Government recommended and benchmark of excellence specified, it would be mandated for the Bureau to assess and carry out training in the state DGMs. Hence, the Bureau should also look at training the trainers, who in turn would be available as a resource pool with the State Government. An active agenda of training industry personnel should be pursued to convey, clarify and demonstrate the critical aspects and phases involved in mine operations. Thus, training is essential & an integral aspect for achieving the goals of scientific mining.

Given its role as a techno-economic regulator of the Mineral Sector in the country, the curriculum of IBM therefore, must serve the need of its counterparts in the State Government and for the Mineral Industry in addition to the needs of its own personnel. The training curriculum of IBM should have separate module for State

DGMs, Mineral Industry, RQPs and IBM personnel. In addition, IBM being an organisation reinventing itself to play the role of techno-economic regulator for the entire Mining Sector, it would involve re-ordering of functional priorities and re-orientation of manpower in terms of skill and aptitude to effectively deal with its new role. In this context, the need for an appropriate training curriculum would be uppermost. Therefore, the Committee feels that it is imperative for IBM to develop a dynamic training curriculum so that the emerging needs of the Mineral Sector could be effectively handled. In making its recommendations the Committee also did peruse the National Training Policy.

IBM Training Centre at a Glance

▪ Established	1st July 1977
▪ Number of Training Programmes conducted	468
▪ Participants from	<ul style="list-style-type: none"> * IBM Employees * Mining & Mineral Industry Personnel from State/Central Public Sector Undertakings, Private Sector * State DGMs Employees * Academic and R& D Institutes * Foreign Nationals
▪ Number of beneficiaries	<ul style="list-style-type: none"> * IBM Personnel – 5497 * Industry & State Governments Personnel – 4943 * Foreign Nationals – 9

7.6.2 National Training Policy

The salient features of the National Training Policy have been highlighted below. The Committee feels that the Training Programmes of IBM should be in consistent with the National Training Policy.

Salient Features of the National Training Policy

- Training shall strive to achieve objectives of :
 - a) Keeping up-to-date and enhancing professional knowledge and skills needed for better performance of individuals and organisations;
 - b) Promoting better understanding of professional requirements as well as sensitisation to professional, socioeconomic and political environment in which work is done; and
 - c) Bringing about right attitudinal orientation.

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- Social and political ambience is subject to constant change. The Government machinery would have to be continuously attuned to the changing needs. Training programmes for the Civil Services would, therefore, focus on:
 - a) **Responsiveness** to the challenging democratic needs and expectations of the citizens and organisational and technological developments.
 - b) **Commitment** to democratic values and concept of partnership and participative decision making.
 - c) **Awareness** of technological, economic and social developments.
 - d) **Accountability** to ensure high performance in every professional field and cost effective methods of delivery.
- Training would be imparted to all rungs of the Civil Services starting from the lowest to the highest in policymaking.
- All categories of Civil Servants shall receive:
 - a) induction training at time of entry into service; and
 - b) in-service training at suitable intervals in their career.
- Attendance in training programmes shall be prescribed as a mandatory exercise with possible linkages with career progression.
- The in-service training programme for Group 'C' & 'D' expected at the time of movement to a higher Group may be provided in situ or through distance learning methods.
- Training programmes will be specifically designed to meet the requirements of the target group by the Organisation in consultation with the institutions/consultants/experts.
- All organisations will designate training managers at appropriate level to develop and coordinate training programmes and monitor them. The Training Manager shall ensure an integrated approach to training with a view to improve overall performance of the Organisation.
- Training institutions under the Government shall be permitted to diversify their training related activities to cater to the increasing requirements of organisations and functional groups in and outside the Government, so as it can attain a large measure of self-reliance.
- Utmost care shall be exercised in selecting trainers. Efforts shall be made for evolving systems for identifying trainer- potential.
- The trainers shall be provided periodic opportunities for development of knowledge and skills in relevant areas through training programmes in institutions of excellence.
- Overseas training shall be entirely need-based and shall predominately aim at drawing lessons from successful cross-country experiences. Only institutions which are reservoirs of knowledge and database on relevant experiences shall be used.

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- Involvement of Civil Servants in undertaking specific research and studies with a view to formulating new policy initiatives or evaluation of ongoing projects and programmes would be promoted. Necessary facilities for study leave or sabbatical to enable Civil Servants to engage themselves in such tasks, identified and approved by competent authorities, would be provided.
- Each Department shall set apart 1.5% of its salary budget which shall be used solely for the purpose of training and shall not be diverted for use elsewhere.

7.6.3 Training for State DGMs

Optimal mining envisage scientific and systematic mining, including conservation through adoption of comprehensive geological exploration, use of low-grade ore, practices which leads to zero-waste mining. Protection of environment is an important part of the mining process. Socio-economic concerns and sustainable development framework are latest additions to it. Over the years, IBM has carefully crafted a system to ensure development of the country's Mineral Sector on these lines. As it laid systemic parameters, IBM associated the State DGMs to approve mining plans of 29 minerals.

An effective framework for securing expected outcome of the system and administration of the regulatory system would require vigorous DGMs at the state level, appropriately empowered with skills, manpower and infrastructure. As an example, the Committee analysed a situation where mineral profile of a region is thrown up by regional geological studies or relevant literature. The State DGM should then build upon through required chemical analysis and ore dressing efforts. For this purpose, necessary capacities would need to exist. In case they do not exist, facilities would need to be built in stages starting with chemical analysis. Development of matching flow sheets, pilot plant studies etc. are the next stages. Initially, the first stage could be developed, while the next stages could be put in place in collaboration with IBM's facilities. There is need for developing corresponding skills so as to leverage on mining-related IT applications.

IBM should develop a benchmark of excellence in the areas of regulation, such as, processing of mining plans, inspections of mines with special emphasis on monitoring of approved mining plan, implementation of mine closure plans, Sustainable Development Framework (SDF) and developmental activities, such as, mineral processing facilities, mineral information system, mining tenement system, information retrieval etc. IBM should also evolve mechanism and parameters to assess skill development of State DGM authorities in order to prepare them as an effective administrator and regulator for the Mining Industry. The Committee, therefore, recommends that IBM should have regular interactions at appropriate level with the State Government authorities to identify their training requirements. IBM needs to develop as a 'trainer' for DGMs to facilitate mineral development on the framework of a solid, well-endowed regulatory and development system. As

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envisaged in the vision for IBM and as enunciated in the National Mineral Policy, IBM has to impart training to State DGM officials and enhance their capacity building to enable them to perform the role of mining regulator at the state tier.

The focus areas to design training modules as recommended by the Committee for the State Government officials are as under:

Thrust Areas of Training for State Government

- Use of Geographic Information System (GIS) and interpretation of satellite imageries for monitoring mining and environmental aspects.
- Uses of GPS/DGPS for ensuring that mining operations are carried out as envisaged in the approved mining plans/schemes of mining.
- Technical guidance for integration of the database server of DGM & IBM.
- Environmental aspects of mining operations and monitoring of environmental parameters.
- Mineral Policy and Mineral Development Legislations.
- Implementation of Mineral Conservation and Development Rules 1988.
- Monitoring of mining operations with particular reference to implementation of mining plans.
- Classification of Minerals Resources as per United Nations Framework Classification.
- Operations and maintenance of computerised online register of mining tenement system.
- Use of information technology for monitoring of mining operations.
- Sustainable Development Framework (SDF) and their components.
- Rehabilitation and Resettlement aspects of project-affected population.
- Scientific methods of mine closure and reclamation of mined out land.
- Workshops for evaluation of benchmarks to assess the capability of State Governments.
- Conservation and utilisation of low-grade ores and mine wastes.

7.6.4 Training Modules for Industry

As per the role envisioned for IBM in the National Mineral Policy, IBM is required to perform the role of a National Technical Regulator — which would entail IBM to primarily act as second tier regulatory body and which also would be mandated to design system & processes and also issue guidelines for regulation of the Mining Sector. IBM would continue to regulate the Mining Industry through tools, such as, Mining Plan, Mine Closure Plan, Sustainable Development Framework, Inspections of Mines, Computation of Royalty etc. The Industry on the other hand should be updated of the various regulatory and developmental issues in order to become a responsible stakeholder. IBM will have to impart training to industry personnel on regulatory and developmental issues, especially on issues of topical interest. The objective should be to develop ‘trainers’ among industry personnel for field level execution for sustainable, scientific and optimal mining.

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The industry should be updated with various regulatory and developmental issues in order to become a responsible stakeholder.

As the Indian economy grows at a sustained rate, there will be increase in demand from the core sector industries for minerals and raw materials. To ensure that Indian Mining Industry is positioned at the forefront of technological innovation, IBM has to play a role of trainer and facilitator to help the Industry imbibe the latest technologies and best practices for optimum results.

As the Indian economy grows at a sustained rate, there will be increase in demand from the core sector industries for minerals and raw materials. It shall be necessary to ensure that Indian Mining Industry is positioned at the forefront of technological innovation and have the ability to provide an appropriate platform with skilled workforce — required to meet this demand. In this context, IBM has to play a role of trainer and facilitator to help the Industry imbibe the latest technologies and best practices for optimum results.

Training requirements of the Industry can broadly be categorised as basic skill development and cutting edge technological improvement. Basic skill development may involve subjects like geology, exploration techniques, resources estimation as per UNFC, preparations of mining plan, design of mine, mining feasibility studies, advances in drilling and blasting, preparations of mine closure plans, online submission of statutory returns. Technological improvements will be critical in the areas of mineral processing and beneficiation, to serve the intent to extract maximum percentage of minerals and metals from each tonne of ore. Innovative advances in processing technology are therefore the need of the hour. Skills in these areas will increasingly be in demand as competition in the Mining Industry ramps up.

The increasing automation in Indian Mineral Industry can result in shortage of skilled personnel in the coming years. Therefore, IBM needs to focus on training requirement of the industry towards computerisation, automation and mechanisation. Cutting edge technologies in mineral exploration such as Hyperspectral Imaging System, Hyperspectral Remote Sensing and 3-D Seismic Survey, Remote Sensing and Mineral Anomaly Mapping (RSMA), HY LOGGING TM SYSTEM, Aerogeophysical survey, Magnetotellurics (MT), use of latest mining machinery, such as, reverse circulation drilling with inbuilt system for controlled deflection of borehole path, Rotary Air Blast (RAB) drilling, High Angle Conveyor belt for transportation of material, Surface Miner for elimination of drilling and blasting, Mechanical Handling of ROM ore in underground Stopes, Use of Robotics in Mining and use of software, such as, SURVCARD, CRYSTAL, MINEX, MATAFORA, GS32 3-D, GEOSTAT, Q PIT, LYNX, VULCAN MINESCAPE, MINEMAP, TECHBASE, MEDSYSTEM, MINESIGHT, EMPRES, TALPAC, XPAC, SURPAC, DATAMINE, MOCRO MINE, GDM, WHITTLE etc. are the need of hour. There is also a need to sensitise Mining Industry about environmental, ecological and human concerns arising out of present mining practices and the urgent need for moving on to a sustainable development framework. IBM could organise suitable programmes for the Industry. Further, workshops/interactive meets with participation of concerned State Government on state/national level should be organised to exchange positive outcomes and success stories which could be immensely helpful for their application in similar domain areas in the country. Training programmes on mineral processing should also be organised in order to encourage participation of Private Sector in mineral processing activities.



7.6.5 Training Modules for RQPs and Local Communities

Apart from organising training programmes for the Industry and State Government personnel, IBM would have to continue to arrange training modules for the Recognised Qualified Persons (RQPs) in order to keep them abreast with latest technological, legal and procedural matters for preparations of Mining Plans, Schemes of Mining, Mine Closure Plans and Feasibility Reports. In the past, IBM had organised training programmes for RQPs on various aspects relating to preparation of Mining Plan and the Committee recommends that this should be an ongoing activity of IBM Training Modules. In order to have cordial relations between local community and Mining Industry, IBM is required to play a catalytic role. It must act as nodal agency between various organisations of the Central and State Governments, Mining Industry and local population. Therefore, it is recommended that IBM should also organise training programmes/workshops for the local community representatives in various aspects of Sustainable Development Framework including on free, prior and informed consents (FPIC).

7.6.6 Training Modules for IBM Employees

As envisaged in the National Mineral Policy and in sync with the spirit of National Training Policy, the Committee recommends following suggestions for training programmes for IBM's own employees.

7.6.6.1 Training for All Employees

Training programmes should be so designed that employees are imparted training both at the stage of induction and then have refresher courses as in-service training. Training modules, therefore, need to be developed for all levels. Training programmes may be broadly classified into training programmes for (i) lowest level functionaries, who are cutting edge members of the Group 'C' services (ii) supervisory levels, the middle management/administrative level (they are mostly members of the Group 'B' services, beginning with senior levels of Group 'C'); and (iii) Group 'A' services comprising of administration/management level. As far as technical training programmes are concerned, it should be ensured that at least one training programme is scheduled in a year for all technical disciplines of IBM.

In addition to the above, basic training programme on the functions and activities of one discipline in IBM must be imparted to the personnel of other disciplines in order to provide a better understanding of each others' work which the Committee believes would lead to better coordination in work.

7.6.6.2 Induction Training

The Committee observed that Group 'A' officers when recruited have an experience of only three years, a qualification which makes them eligible to apply for position in the Bureau. However, when in the organisation they need to be absorbed into the

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The Committee recommends a six-month on-the-job-training for freshly recruited officers.

IBM should explore the possibility of tie-up with academic institutions both in India and abroad for nominating IBM officers for advanced academic courses which could be of interest to the Bureau.

culture of the Bureau — learn processes, practices of administration of the regulatory system. This can be best acquired through hands-on training on the job. The Committee, therefore, recommends a six-month on-the-job-training for freshly recruited officers. The training should expose them to best practices in exploration, mining, conservation, mineral processing and in sustainable development practices which address the issues of project-affected people and host population.

7.6.6.3 Refresher Training

The training of officers and other personnel should be continuous and held at periodic intervals throughout his/her career. They should be updated with the latest technological advances and changes and their application. They shall also keep themselves updated with such technological changes on their own — at junior, middle and senior level of professional career. The Committee recommends that these training should be made compulsory before assigning the next level of responsibility through promotions. The modules need to be carefully structured including the best in terms of practice and latest in terms of development. IBM should develop its Training Centre through collaboration with various related top institutes in the field. IBM could also explore tie-ups with relevant institutions, on various topics.

Inclusive growth, it was felt was high priority along with sustainable development framework. The front rank mineral producing nations have introduced exclusive modules on the subject, at the end of which degrees were awarded. The Training Centre of IBM, the Committee felt, would need to explore such tie-ups on subjects relevant for discharge of its functions. IBM may tie up with academic institutions like Indian School of Mines, Banaras Hindu University, Indian Institute of Science, National Institutes of Technology and also with foreign universities for providing in-service training to update the technological developments in the respective fields.

7.6.6.4 Training at Advanced Institutes

Deliberating on the training set up in IBM, the Committee felt there should be a regular process of availing of opportunities of training under short-term courses of one month to three months duration with Institutions recognised in particular fields globally. Additionally, it is felt that excellence at various levels could be effectively built by such exposures. It is necessary that expertise in various streams be built and nurtured. The Committee, therefore, recommends that IBM officers be regularly sent for advanced courses of short duration. IBM should explore the possibility of tie-ups with academic institutions both in India and abroad and should nominate its officers for advanced academic courses which could be of interest to the Bureau. Some of the areas where IBM officers could be given international exposure so as to imbibe the best practices are as under;



- a) Training in Sustainable Development Framework (SDF) with assistance of Sustainable Energy Division of United Nations;
- b) Advance methods in mining and mine planning;
- c) Training in offshore survey methods for administration of mineral concessions;
- d) Presentation of papers at national and international forum for cognisance on commendable work done by IBM;
- e) Patenting, particularly, in field of mineral beneficiation, research in mining technology, etc.; and
- f) Extraction of multiphase & meticulous exploration data from RPs, LAPs reports and plans for synthesising metadata as repository in IBM for monitoring purposes.

Some Thrust Areas of Training for IBM Personnel

- Use of Geographic Information System (GIS) and interpretation of satellite imageries for monitoring mining and environmental aspects.
- Uses of GPS/DGPS for ensuring mining operations are carried out as envisaged in the approved mining plans/schemes of mining.
- Environmental aspects of mining operations and monitoring of environmental parameters.
- Interpretation of satellite imagery for monitoring of mining operations.
- Micro level aspects of offshore mining for implementation of various provisions of Offshore Areas Minerals (Development & Regulation) Act 2002.
- Techno-economic aspects of mineral development.
- Advanced mine planning & design with the help of computer softwares, such as, SURPAC, 3D Modeling and Digital mapping.
- Advanced methods of reconnaissance operations and interpretation of reports.
- Advanced methods of mineral beneficiation.
- Energy auditing of mineral beneficiation plants.
- Advanced Techniques of Chemical analysis of ore, minerals and environmental samples.
- Sustainable Development Framework (SDF) and their components.
- Rehabilitation and Resettlement aspects of project-affected persons.
- Scientific methods of mine closure and reclamation of mined out land.
- Mineral Information System with IT as a tool.
- Updates on statistical standards, statistical methods for sampling, surveys, and estimation of non-response forecasting and data analysis methodology.
- Management and Administrative training to technical officers.

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To discharge the role of 'Trainer', the Training Center of IBM has to be upgraded as a centre of excellence for the development and implementation of training initiatives in the field of mineral regulation and development.

The Committee recommends setting up of Regional Training Centres at Hyderabad and New Delhi/NCR so as to cover the northern and southern part of the country effectively. The Training Centre at the Headquarters may be called as 'Central Training Centre' while that at Hyderabad and New Delhi/NCR as 'Regional Training Centre'.

7.6.7 Infrastructure Development & Strengthening of Training Centre

To discharge the role of 'Trainer', the Training Center of IBM has to be upgraded as a centre of excellence for the development and implementation of training initiatives in the field of mineral regulation and development. The Training Center's vision should be to manifest itself into a "one-stop-shop" for both Industry and government on all matters relating to training and development of sustainable workforce to meet the Mining Industry's current and future needs. The Training Centre of IBM is presently headed by the Director (Training) who is of the rank of Regional Controller of Mines. The Committee observed that the Training Centre of IBM is officiated by a small complement of officers and staff and is ill-equipped in terms of resources and modern facilities. To underline the importance of training, the head of the Training Centre should be upgraded to the rank of Controller of Mines with due complement of human resource and infrastructural resources. The Training Centre should have officers from all the disciplines of IBM. Accordingly, re-organisation and strengthening of Training Centre should be carried out. The details of human resource requirement at Training Centre are suggested in the Chapter on Human Resources (Chapter VIII).

Although IBM has two Training Halls which have been renovated and equipped with modern training facilities at its headquarters, they are inadequate. The training classes conducted in the present halls at IBM headquarters building at Nagpur face lot of disturbance and congestion. It is recommended that a separate modern building in the premises of IBM headquarters be constructed exclusively for training purpose. A portion of the building – preferably ground floor – may be allocated to house a "Mining Museum" which can be used for training purpose. Incidentally, this was one of the recommendations of UNDP assisted Programmes.

The Committee also feels that to have wider reach to provide training to all targeted stake holders viz. Mineral Industry, state Governments, RQP's, local representatives and IBM's own employees, it is necessary to create regional training facilities at various places in the country. This would also reduce the burden on IBM's Training centre at the Headquarters. Therefore, the Committee recommends setting up of Regional Training Centres at Hyderabad and New Delhi/NCR so as to cover the northern and southern part of the country effectively. The Training Centre at the Headquarters may be called as 'Central Training Centre' while that at Hyderabad and New Delhi/NCR as 'Regional Training Centre'.

The Committee further recommends that to examine the training requirements of stakeholders and similarly to design & formulate training modules and to deliver quality output, a 'Curriculum Committee' comprising experts from various disciplines may have to be constituted by IBM. The Curriculum Committee would render advisories for designing training modules and its further refinement.