

**STATUS OF IMPLEMENTATION
OF REPORTS OF
THE PREVIOUS COMMITTEES**



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III CHAPTER

3.1.0. Introduction

The expansion of GSI over the years in response to the increasing demands on its services necessitated several changes in the functioning, organizational structure and scope of the organization. To better understand the context of changing national developmental priorities in which GSI may be required to function and to plan for the changes, the Government set up expert committees periodically for reviewing GSI and its operating environment. Many of the recommendations made by these committees, which were in the nature of re-organizing geoscience activities in the country to meet developmental priorities, have been implemented and have led to very significant developments in the minerals and Earth science sectors. The changes include:-

- Formation of Indian Bureau of Mines (IBM) in 1948 and transfer of functions and core personnel engaged in detailed mineral exploration, mineral economics and mine regulation from GSI to the newly created organization.
- Creation of the Raw Materials Division (now Atomic Minerals Directorate) of the Atomic Energy Commission in 1949 followed by the transfer of functions and core personnel involved in search for atomic minerals from GSI to the newly created department.
- Transfer of functions and core personnel involved in search of petroleum and natural gas from GSI to the Oil & Natural Gas Commission (ONGC) in 1956.

3.1.1. The important changes which were the outcome of the recommendations of many of subsequent committees set-up for reviewing GSI are chronologically given below:

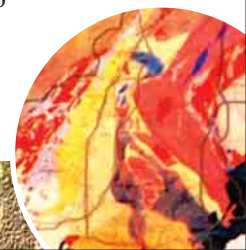
3.2.0. N.N. Kashyap Committee in 1961:

3.2.1. The recommendations of the Committee for re-organization of GSI resulted in:

- Transfer of Exploration Wing of Indian Bureau of Mines (IBM) back to GSI in January, 1961.
- a decentralized set-up for GSI with Regional Offices created for a cluster of States and opening of offices in each State.
- Adoption of a national programme for systematic geological mapping of the entire country on 1:50,000 scale to aid in the assessment of the total mineral resource potential of the country.
- Airborne Mineral Survey and Exploration (AMSE) as a separate organization under the Department of Mines, Government of India; subsequently merged with GSI in September 1970.

3.3.0. B.C. Mukherjee Committee in 1966:

3.3.1 The committee made a recommendation for the transfer of the Exploration Wing of GSI back to IBM, which however, was not accepted by the Government



3.4.0. Committee on Science and Technology (COST) in 1971:

3.4.1. The National Committee on Science and Technology (NCST), a sub-Committee of the Committee on Scientific Research (COSR), in 1971 recommendations included:-

- Formation of Mineral Exploration Corporation Limited (MECL) in 1973 with headquarters at Nagpur.
- Transfer of functions of the Ground Water Wing of GSI to Central Ground Water Board in 1972.

3.5.0. Prof. K.V Subramaniam Committee in 1971:

3.5.1. A comprehensive review and assessment of the achievements of GSI was made by the Technical Committee headed by Prof. K.V. Subramaniam in 1971. The Subramaniam Committee made several observations on the constraints and impediments hindering the optimal functioning of the Department. These were identified as lack of planned, integrated, systematic, coordinated approach in different activities, proliferation of bureaucracy due to the enormous expansion of the Department which has killed the initiative and enthusiasm of its officers, cumbersome administrative machinery, need for considerable improvement in efficient utilisation of technical, scientific and organisational capabilities of the Department, etc. In the field of geological mapping which constitutes the core activity of the Department, the committee noted that concurrent synthesis had not been attempted with the progress in geological mapping. Non-availability of maps on different scales and hurdles in the transfer of information on the results of its investigations to various users was also cited as a major lacuna. The committee felt that GSI should act as a coordinating agency for collecting, storage and dissemination of all information resulting from geological work carried out in the country by any agency whatsoever. In the Committee's opinion, adequate attention had also not been given to a very important aspect of GSI's work, namely compilation, coordination, interpretation and synthesis of mineral exploration data, which would be of immense help in discovering in detail the laws of distribution of mineral deposits. In its work domain, lack of continuous and prompt feedback of data from the laboratories to the field projects, lack of published case histories in Engineering Geology Division and inadequate training programmes of the Department were listed as shortcomings.

3.5.2. The Subramaniam Committee acknowledged that despite its being one of the largest and oldest established scientific departments, playing a vital role in the economic and scientific life of the Nation, the Geological Survey of India has been severely restricted in functioning as a subordinate department of the Government of India. One of the recommendations of the Subramaniam Committee was the setting up of a National Commission for Minerals on lines similar to the National Commission for Agriculture. The relationship between the Director General, Geological Survey of India, to this proposed National Commission for the mineral industry could be similar to that of the Director General, Council of Agricultural Research to the National Commission for Agriculture (This recommendation was not implemented by the Government).

3.5.3. However, many of the other observations made by the Subramaniam Committee have been, over the years, to a large extent, addressed, especially with regards to its main work domains in that the Department has made concerted efforts and progress in collection, synthesis, storage and dissemination of data. However, many of the shortcomings noted by the Subramaniam Committee still remain and need to be attended to. One direct outcome of the recommendation of the Subramaniam Committee was the Notification of the Charter of Functions of GSI in 1973.

3.6.0. Dr. A. K. Ghosh Committee in 1977

3.6.1. The extensive reviews undertaken by the committee headed by Dr. A.K. Ghosh in 1977 was one of the important developments in the ongoing reorganization of GSI. Many of the important recommendations of the Ghosh Committee were implemented and account for some of the notable changes in the organizational set-up of the GSI in the eighties. The summarised recommendations of this Committee and status of implementation are described below in Table - III.1:

Table – III.1

Recommendations of the Ghosh Committee and Action Taken

Particulars	Implementation Status
1. Constitution of a Management Council which will be the forum of long- term planning, policy formulation, operational sanctions, control and monitoring of the GSI's activities.	Implemented. However, Management Council wound up in 2002
2. Setting up of an Executive Committee within the GSI.	Not implemented
3. Management Council to decide issues likely to affect the career and posting of the members of the EC.	Not implemented
4. Management Council should adopt a model for Regional Executive Committees.	Not Implemented
5. Creation of a level of management to be designated Senior Deputy Director General below the Director General and above the Deputy Directors General Headquarters, in order to improve the chain of command and to provide a better organisational design.	Implemented
6. Creation of at least four such positions to start with, to be designated as Sr. DDG (operations), Sr. DDG (Scientific Services), Sr. DDG (Engineering Services) and Sr. DDG (Personnel) at the Central Headquarters.	Implemented partially with three Sr. DDG (2 from Geology and 1 from Support services)
7. Experienced Industrial Engineering and Workshop Management Executive be inducted as Sr. DDG (Engineering Services).	Not implemented
8. Creation of a cell headed by a Chief Planning Officer for implementing long range and operative planning concepts. This DDG (Planning) should report to the DG, though the programming of operations and long term planning of the GSI's activities should be group decisions.	DDG (Planning, Programming and Monitoring) oversees these functions at present.
9. GSI to adopt a system of a slightly longer rolling plan of 7 years in order to provide data support to the Government's 5 year rolling plans.	Not implemented
10. Adoption of a performance budgeting system. This would flow from the rolling plan and to be adopted by the Management Council.	Adopted
11. Annual sanction for gross expenditure and the allocation of funds should be given by the Government in one stroke, based on the approval of such an annual plan.	Department functions on Annual Plan basis. Expenditure for each Annual Plan approved and sanctioned by the Govt on yearly basis.
12. A system of advance planning for procurement, and purchase sanction (involving creation of corresponding expenditure liability for the future) of long lead and special sophisticated items of equipment should be introduced.	Implemented to the extent of formulation of Five Year Plans

Particulars		Implementation Status
13.	Programmes of the GSI should be identified and delineated in integrated programme units or projects or tasks; and the responsibility for their implementation should be entrusted to specially constituted groups or teams with identified team leaders.	Not implemented
14.	Once a programme unit or a set of programme units constituting a project has thus been identified and resources allocated, the team or project leader should have complete delegated authority of operation and should be held accountable through appropriate monitoring and control systems.	Not implemented
15.	Induction of a senior executive to be designated as DDG (Finance) in the pay scale of Rs.2250-2750/- p.m. reporting to the DG, GSI at the Central Headquarters.	Implemented
16.	GSI to adopt a detailed form of financial accounting and cost accumulation, which enables individual items to be grouped and regrouped in any form required by examination.	Not implemented
17.	GSI should establish a distinction between Capital and Revenue Expenditure and introduce the concept of depreciation accounting for effective asset management for internal management purposes.	Capital, Revenue distinction in place. Depreciation accounting not introduced so far
18.	The scheme developed by the finance Sub-committee including a suggested organisational set-up for the Finance and Accounts function, or any alternate scheme of devolution of powers and responsibilities, be one of the major tasks to be attempted and overseen by the Management Council.	Implemented
19.	The activities of the GSI should be regrouped in accordance with following categories: i) Systematic area-wise coverage including geological maps, geophysical maps, landuse maps, geo-hydrological maps and area-wise inventory of resources. (ii) Systematic integrated mineral exploration including airborne, geochemical surveys, (iii) Systematic study of special geological problems (iv) Technical development and R&D (v) Provision of all laboratory and other scientific services to back up and support the geological activities (vi) Publication, map preparation, printing and production and related services (vii) Drilling, engineering workshop, materials management & transportation.	Implemented in phases following successive committee reports
20.	A matrix-type organisation structure and working be introduced whereby operational control and logistic support are provided from the Regional/Circle Headquarters and specialist scientific guidance from the specialists at the Central Headquarters. (The matrix structure proposed reflects relationships both at GSIs headquarters and at Regional and Circle offices).	Not implemented
21.	The Director in charge of the State administrative circle should be Selection Grade Director, in view of the additional responsibilities (as proposed later)	Not implemented
22.	Airborne Mineral Survey and Exploration (AMSE), Division of Regional Integrated Survey (DORIS), Field Technique Research Unit (FTRU) and Geochronology Division, should be reorganised to form parts of mineral exploration and other supporting divisions at the Headquarters, to assist the operations in the field, to be worked out and introduced gradually by the Management council.	Re-organised to some extent. Geochronology Division provides support to the field investigations. DORIS and FTRU wound up.

	Particulars	Implementation Status
23.	<p>GSI's tasks in the field of mineral investigation should be:-</p> <p>a) to maintain a running appraisal of the country's mineral resources under the categories E to C2; and</p> <p>b) planning work in such a way that the resource estimates can be upgraded (i.e. resources transferred progressively from E to C2) as fast as possible, in a systematic manner</p>	<p>GSI carries out exploration in well-defined stages (P-I, P-II, E-I, E-II) corresponding to the G-4, G-3 and G-2 (partly) stages of the UNFC classification within the realm of preliminary exploration. Future exploration will be as per UNFC classification with well defined stages (P-I, P-II, E-I, E-II) within the realm of preliminary exploration followed. Continuous upgradation as necessary is carried out with the progress of exploration.</p>
24.	<p>A comprehensive review be made of the facilities and allowances given to field personnel of GSI, survey of India, AMD and other similar organizations to arrive at and adopt uniformity in line with present-day situations and the need to keep field morale high.</p>	<p>Not implemented. No review carried out in relation to other organizations. The problem of improving the morale of field personnel still needs to be addressed.</p>
25.	<p>Government to provide special hazard allowance, make arrangement for supply of rations and take the help of Defence and other services for infrastructure support for expeditions to mountainous terrains, in order to boost the morale.</p>	<p>Help from Defence taken in the case of expeditions, etc. Special allowances need to be reviewed.</p>
26.	<p>Hazardous conditions of work be recognised and that the GSI be authorized to take a blanket group insurance cover against all types of accidental injuries/deaths of all its field employees.</p>	<p>Not implemented in totality</p>
27.	<p>GSI should accept as a routine obligation the reimbursement of surcharges for retaining the validity of their own life insurance covers as required in specific terrains and GSI be authorised to take a blanket group insurance cover against all types of accidental injuries/deaths of all its field employees.</p>	<p>Not implemented</p>
28.	<p>GSI should establish a total and integrated wireless communication system for all its field operations.</p>	<p>Not implemented so far. Mobile telephony with internet connectivity under consideration.</p>
29.	<p>In the case of laboratories in GSI, the committee recommends the following:-</p> <p>i) There should be adequate and complete facilities in all regional headquarters to cover the base load of work of the regions;</p> <p>ii) There should be no proliferation or duplication of facilities without adequate volume of work, particularly setting up of large facilities all over the country, which should be discouraged;</p> <p>iii) Attempts should be made to operate expensive instruments on multi-shift basis;</p> <p>iv) Staff/equipment for sample / thin section preparations and for similar basic facilities should be augmented, because, in the absence of this, work tends to get delayed and the more costly primary equipment has to remain idle.</p> <p>v) Jobbing work should be done by outside laboratories to clear the backlog;</p>	<p>(i) Regional laboratories located at all regional headquarters</p> <p>(ii) Implemented</p> <p>(iii) Not implemented due to shortage of manpower and infrastructure</p> <p>(iv) Facilities exist</p> <p>(v) Not implemented</p>



	Particulars	Implementation Status
	<p>vi) A few mobile laboratories with certain minimum specialised facilities should be made available where effective deployment depends on the availability of quick chemical analysis of samples; and</p> <p>vii) Laboratories should be equipped with modern basic equipment. A complete list of such necessary items of equipment may be prepared after taking into consideration the inventory of all the machines/ equipment in these laboratories.</p>	<p>(vi) Not available</p> <p>(vii) Modernisation programme under implementation</p>
30.	There should be sufficient facilities of ore dressing and the equipment should be attached to the chemical laboratories of the CHQ and the relevant regions where integrated research studies should be carried out.	Implemented. Rock processing facilities available in all chemical laboratories
31.	As a first step, any increase in demand on instrumental analytical facility should be met by GSI by placing their existing outfits on multiple shift operation and providing for adequate manning for preparatory and analytical work.	Multi-shift operation not implemented due to man-power shortage. Extended working hours implemented as and when needed
32.	There should be no further sanction for new equipment for instrumental analysis to the GSI without clearance of Management Council.	MC wound up.
33.	Necessity for giving top priority for planned integrated office-cum-laboratory buildings, which will not only help improve the quality of the work but also increase the quantum of output.	Under implementation in phased manner. Constraints of fund allotment
34.	Drilling and engineering activities should be placed under a common Chief Engineer recruited from outside, equivalent in status and pay to a DDG.	Implemented. DDG-level officers heading Drilling and Engineering Services.
35.	Adoption of three-shift operation in drilling, whenever possible, and two shifts at a minimum, with necessary rig lighting and other paraphernalia provided.	Two shift operation in general.
36.	Pending rationalisation, fresh induction of capital, human or other resources in the sectors of drilling, transport and workshop in GSI should not be made except with the specific clearance of the Management Council.	Implemented. Changes in induction of HR and other resources introduced by later committees
37.	<p>The Committee recommends that the Stores organization of GSI should take the following steps:</p> <p>a) Prepare a separate inventory of the GSI's capital assets. This would show not only the original purchase price, as at present, but also the depreciated value;</p> <p>b) Remove as many readily available materials as possible from the Stores stock list by entering into running rate contracts.</p> <p>c) Introduce a common vocabulary of the stock items so that each region stocks the same items under common names/codes;</p> <p>d) Standardise the basic equipment in use so that the number and variety of spares are drastically reduced, and support this measure by finding out the interchangeability of components; and</p> <p>e) Introduce modern stock recording and control system and a number of other standard materials management procedures so that the Stores Department can function as a much more efficient adjunct to the organisation with use of available computer facilities.</p>	Partially implemented. Needs to be reviewed due to induction of high-technology equipment. Procurement and materials management procedures needs revamping
38.	GSI should be permitted to take advance purchase action on the basis of past consumption pattern and norms to be set up for consumption.	Normal Govt procedures followed

	Particulars	Implementation Status
39.	GSI to obtain the services of a fully trained and competent materials Manager to head its Stores, Purchase and Inventory Control Wing at the level of Dy. DG. He will report to the Sr. DDG (Engineering Services). The Committee endorses the recommendations in the report of the Subcommittee on Inventory Control, Stores and Workshop Management. (Appendix 2, vol. ii).	Not implemented.
40.	The entire plan of construction of integrated office accommodation should be condensed within a five year term; and a suitable machinery set up to initiate and follow through all the steps of the programme in association with a competent architect group.	Construction programmes drawn up on Five year Plan basis and implemented through Public Works Departments
41.	Along with office accommodation construction programme, the GSI to develop a series of housing colonies as well	Implemented but constrained on account of restricted allotment of funds
42.	Where collaboration with HUDCO, State agencies or Employees Cooperatives prove impracticable, the GSI should take up on its own the construction of such housing colonies. The Committee recommends that Government should consider residential housing programmes as a part of the capital budget for the next plan programme of GSI.	Implemented.
43.	In the context of information system, GSI to develop three types of activities viz., a) classified culling of information from publications and internal records; b) proper data coding, storage and retrieval, and c) preparation of geological manuals/bibliographies of regions.	Significant progress has been achieved in the field of information dissemination and IT. LAN, WAN, GSI Portal are major developments.
44.	Establishment of a competent information system and services under guidance of a professional expert of high standing with consultancy services and computer help for the first and second activities under Recommendation 43.	Implemented. Modern information system being put in place however professional expertise and consultancy yet to be integrated.
45.	The unhappy situation regarding publications of an individual should be rectified in accordance with the proposed proposals and procedure to be adopted (Streamlining the procedures for publications in Forum/ Journals outside the GSI and also for printing in GSI publications).	Not implemented.
46.	Systematic projects should be taken up for updating and revising classic reports like the memoirs of Pascoe, Heron, etc. and integrated field programme may be drawn up by the Sr. DDG (operations) with the help of Sr. DDG (scientific Services) and DDG (Planning).	Implemented. Pascoe Volume is under revision
47.	Establishment of a Public Relations Wing of the GSI, but steps would have to be taken to ensure that this does not degenerate into a publicity wing.	Not implemented
48.	The map printing organisation should be placed under a competent professional with both managerial and commercial experience in the field.	Not implemented. Managed at present by in-house expertise.
49.	It is recommended that the most suitable persons from amongst the scientists/experts available in the GSI in the various functional streams be identified and inducted to form nuclei/core groups under Sr. DDG (Scientific Services) immediately.	Not implemented
50.	The areas of Engineering Geology/Geotechnical and Environmental Geology need to be strengthened with creation of expertise for research in those fields to cope with the increasing demands for geological advice in the sectors of rural development, irrigation and flood control.	Not implemented fully



	Particulars	Implementation Status
51.	The GSI must build up a modern personnel management organisation whose primary function would be planning, development and management of human resources.	Not implemented. HRD functions need drastic improvement and modernisation
52.	The Committee recommends that a competent and experienced person should be inducted to head the vital/ Personnel/ Management Wing immediately for the present from out side as Sr. DDG (Personnel) at a fixed pay of Rs. 2750/- per month.	Personnel Wing headed by DDG level Officer at present
53.	Three Directors have to be selected, from amongst those inside the GSI, who have the right aptitude to take over responsibility of the following functions:- 1) Director of Personnel (A&B) 2) Director of Personnel (C&D) 3) Director of Administration.	Implemented. One post of Director Personnel at present. The role and functions of Director HRD vis-à-vis Director Personnel needs to be re-assessed.
54.	For training arrangements it is recommended the Director of Personnel (C&D employees) has to be helped by a full time officer to be known as Chief Training Officer (C &D employees) in the pay scale of Rs.1300-1700/- per month as the category of training would be totally different and highly job oriented.	Not implemented.
55.	To make his positions within the organisation commensurate with the responsibility, workload and background, the Chief Welfare Officer should have a pay scale of Rs. 1300-1700/- per month. However, the Welfare Officers in Regions should be on a scale of Rs. 1100-1600/- per month.	Not implemented.
56.	To provide a forum to the Chief Welfare Officer for interaction with the associations of the employees, the Committee recommends the formation of a staff Welfare Council, the details of which may be worked out by the MC.	Staff Welfare Cell in CHQ created to deal with the matters of service organizations.
57.	One Selection Grade Director to assist the Deputy Director General of each Region, who will be declared a head of the office and will perform all administrative and financial responsibilities pertaining to the Regional office. (Please see also paras 3.5.3 to 3.5.5)	Implemented, but HOO generally performed by JTS/STS level.
58.	GSI must have two channels open to its scientific personnel for career progression- 1) One of these would be related to increasing levels of hierarchical responsibility, and only those scientists who have the requisite degree of managerial skill should be selected for these positions. These posts would necessarily be restricted to the number of such controlling points required. 2) The other channel should relate entirely to scientific excellence and specialisation. In this channel, promotion on career progression should have no relation to vacancies as such.	Not implemented. FCS under consideration.
59.	Government should give urgent consideration to the suggestion of creation of a Central Geological Service, which may cover the needs of all Central Government departments for Earth scientists, to begin with, and subject to the willingness of State Government to participate, be extended to cover geological services of the country as a whole.	Not implemented.
60.	It is recommended that such a service should have a single running scale of Rs. 700-40-900-50-1100-EB-50-1500-EB-1560-60-1800-100-2000/- with two efficiency bars.	Not implemented.

	Particulars	Implementation Status																				
61.	The committee strongly recommends that 1/3 rd of the posts in the Junior scale of all streams should immediately be converted into Senior scale or Rs 1100-1600/- on seniority-cum-merit basis. Similarly, 1/3 rd posts of the senior scale should be converted into superintending scales of Rs. 1500 - 2000/- in all streams.	1 st and 2 nd Cadre Review implemented. 3 rd Cadre review under consideration.																				
62.	The committee recommends that 20% of the present posts of Director or its equivalent categories in other streams be converted immediately into the post of Selection Grade Directors in the scale of Rs. 2000-2250/-.	Only 15% posts converted. Needs to be reviewed in the case of Geology stream, which is declared as an organized service.																				
63.	<p>Only the Selection Grade Directors will be known as Directors in future and the incumbents of Rs. 1500-2000/- scale will be redesignated as Superintending Geologists, etc. as in the past. The two routes recommended by the committee for career progression of scientists at senior levels are as follows:-</p> <table border="0" data-bbox="261 733 829 1044"> <tr> <td>A. Management Position</td> <td>Pay Scale</td> </tr> <tr> <td>1. DG</td> <td>Rs. 3000/- fixed</td> </tr> <tr> <td>2. Sr. DDG</td> <td>Rs. 2750/- fixed</td> </tr> <tr> <td>3. DDG</td> <td>Rs. 2250 - 2750/-</td> </tr> <tr> <td>4. Director</td> <td>Rs. 2000 - 2250/-</td> </tr> <tr> <td>B. Scientist specialist Position</td> <td>Pay Scale</td> </tr> <tr> <td>1. Eminent Scientist</td> <td>Rs. 3000/- fixed</td> </tr> <tr> <td>2. Chief Specialist</td> <td>Rs. 2750/- fixed</td> </tr> <tr> <td>3. Senior Specialist</td> <td>Rs. 2250 - 2750/-</td> </tr> <tr> <td>4. Specialist</td> <td>Rs. 2000 - 2250/-</td> </tr> </table>	A. Management Position	Pay Scale	1. DG	Rs. 3000/- fixed	2. Sr. DDG	Rs. 2750/- fixed	3. DDG	Rs. 2250 - 2750/-	4. Director	Rs. 2000 - 2250/-	B. Scientist specialist Position	Pay Scale	1. Eminent Scientist	Rs. 3000/- fixed	2. Chief Specialist	Rs. 2750/- fixed	3. Senior Specialist	Rs. 2250 - 2750/-	4. Specialist	Rs. 2000 - 2250/-	Not implemented.
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64.	Upgradation of the posts of Chief Geophysicist and Chief Chemist as DDG (Geophysics) and DDG (Geochemistry) and modification of their present scale to that of the Deputy Director General level.	Implemented.																				
65.	Services of a suitable consultancy group/organisation be obtained to evolve an objective assessment and review system, in keeping with modern requirements.	Not implemented. Deserves fresh examination. Some revision of assessment system has been proposed related to implementation of FCS																				
66.	Selective lateral entry should be adopted for getting in competent individuals at all levels of the organisation, and in all disciplines to permit infusion of external scientific excellence and competence.	Not implemented. Partially done for a few streams																				
67.	Linking of the transfer policy with time span and continuity of a project. Nobody associated with a sanctioned project should be disturbed till its completion, including the period of report writing and follow up action if any.	Not implemented. Long-term transfer policy and strict implementation needed.																				
68.	Training to be complex and an integral part of a career development policy and the co-ordinating function would have to be the primary responsibility of the Director of Personnel concerned.	Implemented. Organised by Training Institute under DDG (TI)																				
69.	The Committee endorses the report of the Sub-committee on the Training Institute completely and recommends its immediate shift from Raipur to Hyderabad.	Implemented.																				
70.	Formation of an Advisory Committee for the Training Institute by the MC to help in formulation of its courses and review its works, from time to time.	Implemented.																				



Particulars		Implementation Status
71.	The Committee feels that before seeking further increase in manpower:- a) GSI must have key people recommended in position. b) The proposed organisational structure get well on its way towards implementation; and c) Have a critical systems analysis and O & M type of examination in most areas, to fix cadre strengths in GSI offices, if necessary by a consultant.	Not Implemented.
72.	Till such time the whole cadre situation is reviewed by the Management Council, the recruitment of Geologist (Junior) should be carefully implemented.	Implemented.
73.	The recommendations of the report of the Sub-committee of C & D employees fully accepted, which interalia includes the following main measures: a) Regionalisation of cadres (b) regarding contingent workers – impose embargo on recruitment of contingent workers (c) Rationalization of C & D cadres (d) Career growth (e) Departmental training facilities, (f) Welfare facilities/ ancillary benefits.	Reviewed again by subsequent committees.
74.	Immediate action for fixing cadre strengths, formulation of Recruitment Rules, identification of training programmes and inputs with certification, to link them with better cadre management of the large strength of supporting C & D employees of GSI as a follow-up action of this report.	Partly implemented. Under constant review as directed by the Administrative Ministry

3.7.0. Studies by Dr L.M.H.J. van Gaffen from the Maastricht School of Management, Netherlands, 2000.

3.7.1. Dr L.M.H.J. van Gaffen was engaged by the Department of Mines, in the year 2000, as a consultant for organizational and management survey of Geological Survey of India. Dr van Gaffen, in his report noted several major constraints in the functioning and structure of GSI and made broad suggestions on increasing the effectiveness of the organization. These include:

- Introduction of a project-based, multi-disciplinary way of operation in all activities
- Introduction of “market-oriented” departments to initiate and coordinate activities in mineral exploration, environmental issues, disaster prevention, etc.
- Introduction of a matrix-type organizational structure
- Introduction of new customer-oriented departments for strategic planning, marketing of services, public relations, scientific research, etc.
- Manpower Planning
- A dual career structure between scientific and managerial streams.
- Development of criteria and assessment procedure of scientific/ professional career path
- Development of criteria and assessment procedure of management/ administration career path
- Organization of training of top management positions
- Introduction of FCS

The report also recommended more functional autonomy to GSI.

3.8.0. Expenditure Reforms Commission 2001

3.8.1. A high-level committee was constituted by the Government of India, Ministry of Finance under the Chairmanship of Shri K.P. Geethakrishnan, the former Secretary (Expenditure) to examine General Financial Rules, Treasury Rules, State Government business, optimization of workforce, etc. The panel, known as the Expenditure Reforms Committee, in its Seventh Report made certain recommendations in respect of Ministry of Mines, including Geological Survey of India, regarding restructuring of some of its functions and reduction in the total manpower strength of the Department. The recommendations of the Committee are summarized below:

- Redefinition of Charter of Functions
- Focus on Geological Surveys
- GSI to be national repository for Earth science data and high-tech IT-based “Natural resources Information System” to be set up
- Reduction of Drilling Fleet from 122 to 25 rigs
- Coal Wing to be downsized to a small Coal Data Centre
- Overlap of work of Marine Wing with Department of Ocean Development and other agencies to be removed
- Airborne mineral surveys to be handled by NRSA
- GSI to withdraw from Rural Surveys
- Two units, one for geological and allied services and the other for GIS work, to be formed under GSI for commercial work
- Central Headquarters to be downsized
- Surplus of 4000 staff to be identified and declared surplus
- All vacant posts to be abolished
- More powers to be delegated to DG, GSI

3.8.2. The Geological Survey of India fundamentally disagreed with the recommendations. The major recommendations of the Expenditure Reforms Commission and GSI's views on these recommendations are given in Table - III.2. The matter was further considered by the Arvind Varma Committee 2003 (see para 3.10.0)

Table – III.2

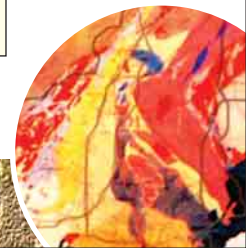
Recommendation of Expenditure Reforms Commission

Views of ERC	GSI's Views
Basic and Primary geological exploration covering 97% of the area is completed. The exploration work now being carried out is mostly detailing over the same areas for establishing a higher level of confidence. (Para 2.7)	<p>General Issues</p> <p>i) This is an incorrect perception. Systematic Geological Mapping on 1:50,000 scale has been misunderstood or misrepresented as ‘primary geological exploration’. These two are entirely different types of activities.</p> <p>ii) During mapping litho units along with structural features on regional scale are recorded. After critical examination, some selected blocks/areas are taken up for detailed examination with every minor detail of structure where the emphasis is on local geology and the identification of economic prospect is one of the important but not the only spin-off.</p>



Views of ERC	GSI's Views
<p>Some of the activities/ functions are overlapping with those of other organizations like MECL, CMPDIL, DOD, NRSA, NGRI and Wadia Institute of Himalayan Geology, etc. (2.8 & 2.13.1)</p>	<p>i) The mandates of these organizations are quite different from the functions of GSI. GSI as a National Survey Organisation is the principal provider of Earth science information and knowledge base to the Govt., industries and public.</p> <p>ii) Other organizations were specifically entrusted to take up those functions which GSI will not pursue. Say for instance, MECL was asked to carry out detailed exploration and mine planning, CGWB to conduct ground water survey and exploration. GSI is not pursuing these activities and hence no overlap.</p> <p>iii) The ERC's misconception of overlapping in some of the fields like coal exploration, marine survey and exploration, airborne survey etc. have been discussed elaborately in relevant paragraphs.</p> <p>Theme: Coal Exploration</p>
<p>Coal resources in the country have more or less been established to the last known coal deposit. All that remains include only the detailing of the deposit which is the responsibility of MECL, CMPDIL, Private companies... [Para2.12 (v) Recommendation 5)] (Additional information provided in the report about proposed disinvestment of MECL in Para 1.3)</p>	<p>i) Out of the prospective area of 17,200 sq. km with viable resources of coal within 900m depth, so far only 10,200 sq. km** has been covered; thus leaving a balance of 7000 sq. km. Therefore it is wrong to conclude that <i>coal resources in the country have more or less been established to the last known coal deposit.</i></p> <p>ii) Projected production of coal by next 20 years is 1000 m. tonnes annually. To sustain this production, identification of additional resources is necessary by prioritising the regional exploration of coal – “core competency of GSI”.</p> <p>iii) Regional exploration mainly by GSI has resulted in revision of coal reserve from 81 billion tonnes in 1972 to 214 billion tonnes at present.</p> <p>iv) GSI is entrusted with regional coal exploration, which results in narrowing down of target areas for further detailed exploration and following mine planning by CMPDIL, MECL, private agencies etc. However recently MECL is also entrusted with regional exploration in limited ways.</p> <p>Theme: Airborne Surveys</p>
<p>The National Remote Sensing Agency (NRSA), an autonomous body under the Department of Space, could better handle airborne mineral surveys and related activities. GSI would function as the national data repository (Para 2.13(v); Recommendation 7).</p>	<p>i) Airborne survey is the initial step for rapid scanning during regional exploration. So far around 50% of the country has been covered by high altitude aeromagnetic survey and 10% by multisensor aerogeophysical surveys.**</p> <p>ii) Airborne surveys have to be followed up by integrated geological-geophysical- geochemical ground studies. AMSE wing of GSI has the complete package of expertise required for such studies.</p> <p>iii) NRSA has the capability of on ground satellite data collection, processing and generating digital and analog data products for a host of users. It is the sole agency for generating and marketing such product. In the field of airborne geophysical survey, it has carried out some magnetic and radiometric surveys for NGRI, NEC and AMD, but in such cases equipments and expertise of collaborating agencies or other national organisations have been utilised. Entrusting the work of AMSE Wing of GSI to NRSA will mean developing the capabilities and expertise afresh.</p> <p>Theme: Marine Surveys</p>
<p>Marine Geology and allied fields: there is significant overlapping in different activities being undertaken by GSI and the Department of Ocean Development and other agencies(Para 2.12 (vii), Recommendation 6).</p>	<p>i) Duplication between the objectives of GSI and those of other national organisations does not arise, because the specialisation and work profile of GSI including mapping of seabed and preliminary evaluation of abiotic resources, is very distinct from the scope and capabilities of other organisations working in this field.</p> <p>ii) DOD's function as per its charter is to frame policies including co-ordination, regulatory measures and to develop technology related to ocean and its charter also excludes “matter relating to the ocean and not</p>

Views of ERC	GSI's Views
	<p>specifically allotted to any other departments/ Ministries". National Institute of Ocean Technology (NIOT) has been established by DOD for developing technology for various ocean related activities and Indian National Centre for Ocean Information Services (INCOIS) develops and disseminates the database on ocean-related activities, generated by different National organisations, for the benefit of scientists and policy makers.</p> <p>iii) Survey and assessment of non-renewable resources in the submerged land is GSI's responsibility. It also collaborates with different agencies working in related fields and undertakes sponsored work for specific needs.</p> <p>iv) GSI is also a major participant in the National programme, co-ordinated by DOD, on delineation of legal continental shelf.</p> <p>v) There is a direct linkage between offshore and onshore geological studies. In the existing framework of GSI, there is an upstream or backward linkage, by which Marine Wing gets access to the entire specialized human resource pool, laboratory, common facilities and client base of the GSI. Thus Marine Wing, within the ambit of GSI, functions very effectively because of constant integration of on- and off -land Earth science activities.</p>
<p>Work being carried out the programme called 'Thematic mapping/Region geology' is very high in effort and low in output as well as utilisation of the final product. This requires a thorough review and privatisation with a view to cutting down the manpower presently allocated to these activities. (Para 2.12 (viii))</p>	<p>Theme: Theme based Mapping</p> <p>i) Due to vast advancement in concept and requirement of high resolution maps, second generation maps on 1:25,000 scale are being produced through Specialised Thematic Mapping (STM) to cater to a wide range of users. Hence, for obvious reasons such high resolution maps need "high effort" because of integration of entire gamut of earth science database like geology, geophysics, geochemistry, etc. supported by wide ranging state of the art laboratory input.</p> <p>ii) These maps have direct/ indirect bearing on numerous socio- economic developmental projects as well as in academic arena. Thus, the wide-spectrum and long-term societal relevance of these maps makes it an invaluable database to be generated by Govt.</p> <p>iii) Not only are long term durable benefit are derived from STM, but also immediate returns are achieved, as evident from spectacular discoveries of (a) kimberlite pipes in Chhattisgarh and Andhra Pradesh, (b) several gold prospects/incidences in Karnataka and Rajasthan.</p>
<p>i) A reduction of 30% of the present strength is possible. All vacant position should be abolished. Fresh recruitment should be stopped at all levels at least for 3 years. Another 4070 personnel in various categories/groups are surplus. (Para 2.20)</p> <p>ii) The offices, divisions and wings of GSI located along with its Central Head Quarters account for 43% in manpower and 46% in terms of annual expenditure. The simple analysis shows how important it is to downsize GSI. (Para 2.19.3)</p>	<p>Theme: Suggested Remedial Measures</p> <p>GSI's requirement of scientific and technical manpower (Group- A & B combined) based on envisaged priorities and activity profiles during X Plan and beyond has been worked out in detail activity-wise along with minimal requirement of supporting manpower for smooth functioning of the Department and furnished in subsequent sections of the report.</p>



Views of ERC	GSI's Views
iii) The strength of Coal Wing needs to be reduced from the present 1455 to no more than 25-30 persons at headquarters for managing 'Coal Data Centre' and another about 150 persons in field unit, who should be responsible for collection, collation and compilation of data generated by other agencies. (Para 2.13 (I)) (Recommendations 5 to 12)	

** Data valid at the time of publication of report

3.9.0. Expert Panel on Modernization of GSI, 1999-2000

3.9.1. The Parliamentary Standing Committee on Industries, in its Report on Demands for Grants (1999-2000) of Dept. of Mines, made a special note of the services rendered by GSI in national development in the past and recommended modernization and upgradation of capabilities of GSI to international standards, with the view to equip the organization to meet the demands of its expanded areas of activities and enable it to face new challenges in the future. On the advice of the Parliamentary Standing Committee, the Department of Mines constituted an Expert Panel on Modernisation of GSI in 1999 under the Chairmanship of Shri K. Krishnanunni, the then Sr. Dy. Director General, GSI. The Committee studied in detail the organizational structure and work profile of GSI including projections for the next quarter of a century. The Expert Committee also made an in-depth assessment of the role and functioning of the laboratories and field units and identified several areas for modernization and infusion of new technology.

3.9.2. Based on the recommendations of the Expert Committee, GSI embarked on a concerted programme of modernization and upgradation of data-generation capabilities in all spheres of its activities in real earnest from the beginning of the X Plan. In view of the fact that there have been rapid technological advances in the field of analytical instruments with wide applications in the field of Earth sciences, GSI embarked on an intensive drive to incorporate the latest developments into its existing armoury of field and laboratory equipments.

3.9.3. The broad areas identified for modernization include equipment such as field and survey instruments, drilling rigs and accessories, laboratory equipment which covers geophysical, geological and geochemical instruments and IT infrastructure. Some of the proposed items have been categorized as "High-cost" equipment. Such major items involving substantial expenditure, which were proposed to be procured during the X Plan include (a) Blue Water Research Vessel (b) Geotechnical Vessel and (c) Heliborne Geophysical Survey System (d) Fixed Wing Aircraft and (e) Coastal launch. The Planning Commission provided adequate budgetary support in the X Plan outlay for the modernization programme of GSI. The thrust on modernization is planned to be continued in the XI Plan period.

3.9.4. The Union Cabinet has approved the acquisition of a new research vessel by GSI at an estimated cost of Rs.448 crore as a replacement for its ageing research vessel R.V. Samudra Manthan. The new research vessel would be tailor-made with state-of-the-art equipment for carrying out seabed surveys and exploration of non-living resources. The generated data will be useful for creating and updating national database in the field of Earth science, oceanography and offshore mineral resources. The

process of acquisition of other high-cost equipments such as Geotechnical Vessel, Heliborne Geophysical Survey System, etc. is on (The recommendations of the Expert Panel on Modernization of Geological Survey of India, 2000 is appended as Annexure-III. I & III.II).

3.10.0. Arvind Varma Committee, 2002

3.10.1. In pursuance to a recommendation of the report of the Expenditure Reforms Commission 2001, an Expert Committee was set up by the Ministry of Mines under the Chairmanship of Shri Arvind Verma, former Secretary to the Government of India and co-chaired by Dr S.K. Joshi, former Director General, Council of Scientific and Industrial Research. The Committee submitted its report in 2003 and most of the recommendations of the Committee were accepted by the Ministry. The recommendations of the Committee along with the action taken status are furnished in Table - III.3.

Table – III.3

Recommendation of Varma Committee and Action Taken

Recommendations of the Expert Committee	Status of the recommendation	Action taken
The Revised Charter of Functions along with its Preamble and the operational strategies be duly notified in the Gazette of the Government of India	Accepted	Notified on 13 th June, 2003
Broad areas of its activities to be defined in a Mission Mode. The committee has identified 12 broad areas for which missions are proposed.	Accepted	Implemented. Activities have been classified into 12 mission modes and are being implemented under 7 schemes approved by the Planning Commission
Department of Earth sciences to be established with GSI as the executive arm and DG, GSI concurrently as the Secretary to the Govt of India	Accepted	Not implemented as per recommendation of the committee. Ministry of Earth Sciences formed. However, GSI not included.
Rules for selection of DG, GSI to be amended for constituting a search committee headed by Cabinet Secretary	Not Accepted	
Retention of the existing structure of regional offices and the specialised wings	Accepted	Existing structure of regional offices have been retained
All investigations should be conducted by GSI in project mode	Accepted	Not implemented. DG, GSI was requested to take action accordingly. Although GSI has already taken initiative for formulation, several aspects such as managerial and financial hierarchy have to be redefined and re-oriented. Changes in organizational structure needed for effective implementation of project mode operation.
Setting up of a Geosciences Institute for attaining excellence in R&D efforts	Accepted	Not implemented so far. DG, GSI was requested to work out the modalities and make a comprehensive proposal for consideration. As a first step a document "Setting up of a national Institute of Geological Sciences" have been circulated to all HODs. Further action to be taken.
Setting up of commercial wing	Accepted	The revised proposal considering all aspects of the creation of an autonomous body under GSI for providing consultancy services to various organisations and Groups on scientific matters sent to Ministry



Recommendations of the Expert Committee	Status of the recommendation	Action taken
		of Mines in Nov., 2005. In principle administrative approval of Ministry awaited
For developing strong Management Information System (MIS), if need be, a management institute may be engaged as consultant	Accepted	Maastricht School of Management, the Netherlands evaluated the working of GSI under project INDIGEO. GSI is implementing a robust information infrastructure through GSI Portal, LAN, WAN, etc.
Recommendation regarding staff strength in various categories.	Accepted	DG, GSI has sent a comprehensive proposal for implementing phased induction of Group A & B scientific & technical personnel as per the recommended revised sanctioned strength. Approval of MOM for bulk recruitment of Group 'A', S&T personnel received
Streamline of procedure of recruitment at the Group "A" level	Accepted. Proposals would need inter-Ministerial consultations	Introduction of Flexible Complementing Scheme in GSI has been agreed to by the Govt. Revised RRs have been formulated. Submitted to Ministry.
Reduction in a phased manner of staff in Group "B", "C" and "D" categories	Under consideration	Under consideration in the Ministry*.
Use of information technology	Accepted	Under implementation. GSI Portal, LAN installed. WAN under installation
Modernizing the laboratories and acquisition of other equipments	Accepted	Expert Committee constituted and recommendations on modalities of modernization submitted in 2000. Being implemented.
Opening of the laboratories round the clock for optimum utilization of specific sophisticated equipment	Accepted	Not implemented due to shortage of manpower and infrastructure.
Introduction of orientation courses for new entrants, other courses at all levels to cover issues of mineral policy, environmental regulations, refresher and advanced courses in thematic area and re-skill those personnel whose particular trades have become obsolete.	Accepted	Implemented. GSI Training Institute regularly conducts orientation courses for new entrants. Other courses are conducted based on need of the organisation
Training of middle-level scientists, Senior Scientists in specialized area in collaborating institutions and also for short-term visits and exchanges and collaborative programmes, and inviting leading scientists from other countries to the training courses and asking the scientists who have undergone training abroad to disseminate their learning, etc.	Accepted	Implemented. Need for more collaborative or exchange programmes with other institutions within and outside the country. Officers need to be encouraged to participate in seminars/ symposiums to upgrade status of knowledge
For upgrading the Training Institute	Accepted	Proposal under process

* The Expenditure Reforms Commission in para 2.21 of its report has suggested reduction in the personnel strength in GSI in a phased manner, i.e. over a period of 3 years. Further, it was recommended to reduce the manpower to 9000 against a total strength of 13040 as on 1.4.2001. The Expert Committee has recommended a total strength of 11420. The Expenditure Reforms Commission while suggesting "right- sizing" of GSI, in fact, had not recommended abolition of posts but had suggested a gross reduction in strength whereas the Expert Committee proposed merger of Group A & B Scientific and Technical cadres with a strength of 3820. However, the overall reduction in staff strength as recommended by expert panel works out to 30% of the then sanctioned strength of 16310.

Recommendations of the Expert Panel on Modernization of GSI

The roles that GSI has to perform in the coming quarter of a century has been identified by the Expert Panel as : a) a provider of authentic scientific information to the Govt. and the public b) regional exploration/ assessment of abiotic natural resources including airborne geophysical surveys c) marine geoscientific surveys and environmental and engineering geoscientific consultancies. To enable GSI to fulfil the above roles with quality, reliability, timeliness and cost effectiveness the panel recommends that the organization should embark upon a programme of a) upgradation of laboratories, drilling machinery, survey/ data collection system with state-of-the-art equipment, b) HRD initiatives to improve motivation and morale of its work force c) networked computer system accessible to all the scientists for the archival information systems and publication activities d) high inflow of Information Technology in the management and establishment functions for authentic and quick responses.

The recommendations can be broadly grouped as modernization/improvements in the areas of i) Equipment, ii) Techniques and Operational methods iii) Organizational Structure and Policies, and referring to the respective sections for appreciating the rationale behind each recommendation the concerned para number is given at the end of each recommendation.

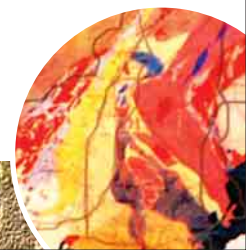
EQUIPMENT

It is recommended that computer compatible field location-cum-data collection systems to be introduced in GSI comprising:

- GPS- Palmtop computer – Digital camera – Cellular phone for each field officer
- Differential GPS-A3 size plotter– Laptop computer for the exploration/ geophysical/ geotechnical survey parties and the present topo survey equipment progressively disposed off.

Instrumentation appropriate for the following areas for ground geophysical survey are recommended to be progressively introduced at scales re-assessed at 5 yearly intervals in order to take advantage of technological breakthrough and changes, if any, in GSI's requirement:

- Magnetic Gradiometry (up to 3 systems in each Region)
- Gamma-ray Spectrometry (up to 10 portable scintillometer systems in each Region)
- Magneto-telluric survey systems
- Penetrometers
- Frequency domain EM sounding systems
- Multi-frequency EM profiling systems
- Transient EM sounding and profiling
- Resistivity & IP systems with signal stacking
- Multi-spectral Induced Polarization (IP)
- Signal enhancement seismograph
- Ground Probing Radar
- Multi-parameter well logging system.



GSI/ DOM may enter into a MoU with Shipping Corporation of India (SCI) for the latter to procure as well as operate the research vessels as needed for GSI's marine surveys, on condition that GSI commits itself to utilizing these vessels for an agreed minimum annual workload over the next 15-20 years. The procurement and operation of the geotechnical (drilling) vessel in the territorial waters, however, should be done by GSI itself.

National capability should be developed in air-borne gravity-magnetic surveys to cater to its own requirement. The Committee considers it the better option to develop such capabilities for data acquisition at the National Remote Sensing Agency (NRSA, an autonomous body under Dept. of Space) that are already operating airborne Mag-EM-Spectrometric Survey Systems since the 1980s with its own aircrafts. GSI may enter into an MOU with NRSA expressing the former long-term commitment to usage of the additional air-borne geophysical data acquisition capability.

It is also recommended that GSI should enhance its airborne geophysical data processing capabilities at least three-fold to handle the projected flight programme.

The Panel recommends that GSI should modernize its laboratories with state-of-the-art equipment to generate data compatible with the world standards. The indicative lists of equipment/instruments for modernization are compiled together and given in *Annexure – III. II* below. Augmentation as suggested therein may be in phases based on 5-yearly assessment suggested above.

An IT infrastructure, spanning the whole GSI is recommended to be set up with the following components:

- Establishment of GSI-NET, an Intranet at GSI headquarters and its distributed and other offices throughout the country.
- Comprehensive Networking within GSI HQ and each of the offices with subnets at departmental/sectional level.
- Fast and permanent connectivity to Internet.
- Web Server for giving information about GSI and permitting E-Commerce.
- FTP server to distribute sharable scientific data across Internet.
- E-mail server for communication within the GSI-NET as well as with outside world.
- E-mail and Internet facility on all the desktops of all the GSI offices.
- Formation of IT Services Group as well as IT Services Associate Group at all major offices of GSI including headquarters

GSI has a large number of antiquated field and office equipment with other facilities at a very low level. This has led to a not-too-conducive work environment. Some of the identified needs for motivating personnel for doing better quality of work have been identified by the Panel as follows:

- Better office and laboratory layout, canteens, recreation rooms, Internet access.
- Improved field logistics such as caravans (instead of tents), diesel generators for field parties (for camp lighting) as well as powering field computers and communication systems
- Better field kit comprising, say, portable sample drill, palmtop computer, portable GPS and cell-phone (in addition to hammer and compass.)

- For survey, exploration and geophysical parties, laptop computer, differential GPS and field plotter.
- Modern tools, equipment and techniques in laboratories and workshops.
- Simpler (and faster) rules and procedures to take care of housekeeping and establishment functions as well as write-off procedures for unserviceable item.

TECHNIQUES AND OPERATIONAL METHODS: The Panel recommends that:

- (a) GSI may opt for non-core drilling, initially for the large barren portions of 2nd and 3rd level drilling in metallic mineral prospects and regional coal drilling. A fair trial should also be given to non-core drilling for more than half the depth in the + 1000 m boreholes proposed.
- (b) Purely mechanical, medium-depth drilling units may not be added to the drill fleet, once the on-going procurement is completed. Further replacement of the ageing fleet should be with the commissioning of 15-20 deeper capacity (1000-2000 m) hydraulic units and shallow (upto 100 m) down-the-hole or reverse-circulation drills.
- (c) Prospecting for precious minerals (Au, PGE, diamond, etc.) need larger samples and hence large diameter, shallow capacity drills may be inducted for this purpose.
- (d) Geotechnical drilling on-land, as well as near shore, would profit from deployment of attachments for core penetration test (CPT), push and piston samplers in conjunction with non-coring drill string.

Every project/ investigation may be manned by inter-disciplinary teams (geologist/ geophysicist/ chemist/ engineer) as required under a common control point – the Project Director instead of separate stream-based control points for each activity component. This system, along with lateral and vertical linkages through simultaneous reporting on technical matters to higher level officers in specialized streams would facilitate far better focus on objectives and methods.

Similarly for operating the high tech instruments in the laboratories, interdisciplinary teams may be identified, to be trained by the suppliers at the time of procurement and retained in the concerned lab for about a decade. It would even be better to configure the labs around the identified streams.

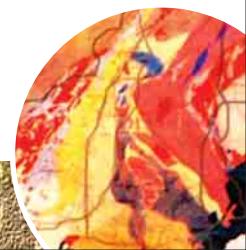
ORGANISATIONAL STRUCTURE AND POLICIES

It is recommended that GSI carry out a categorization of its different laboratories:-

All India Facilities (N), Regional Labs(R) and those at outlying HQ's (O) to develop internal norms for deployment of instruments, scientific and support personnel, etc. for each category and utilize these norms during the 5-yearly assessment of new requirement as mentioned earlier.

It is recommended that within a short period of time (2 to 3 years) most of the administrative, accounts, purchase and stores work should be database oriented.

Since almost all users of PCs have need for 'Office' software, it is recommended that GSI should enter into commercial agreement either with the manufacturers or the authorized vendors of this software for a large number of licensed copies for distribution in GSI offices. Similarly a commercial agreement could be entered into for Anti-Virus software, with regular updates being provided.



A common Geoscientific Examination may be conducted by UPSC for all scientific personnel for stream-specific recruitment in the three scientific streams – Geology, Geophysics (merged with Instrumentation and Mineral Physics) and Chemistry. No change in the induction pattern for the merged Engineering Services stream (Drilling and Mech. Engg.).

Intake of personnel to be in a phased and regulated manner to avoid stagnation due to mid-course bottlenecks.

Training: Recent years have witnessed rapid advancement in the spheres of Earth sciences. It may be stressed here that due to innumerable variables operating in natural process, extensive and intensive database has to be developed for refining existing concepts and defining new ones. In this aspects development of individual acumen and skill in tune with the international standards is of utmost importance in earth resource evaluation and management. The aim of the training in GSI should be to:

- Provide adequate exposure to the scientific personnel to acquire, assimilate, operate and design innovative techniques/methods/concepts/instruments.
- Introduce a Visiting Scientists programme with national and international experts working side by side with GSI professionals to catalyses quick assimilation of thoughts, principles and practices.
- Encourage collaborative programmes and accord visible recognition to scientific contributions there from.
- To evolve programmes tailored to the needs and it is recommended to use outside facilities to utmost instead of building in house capabilities.

Introduce a Visiting Scientists programme with national and international experts working side by side with GSI professionals to catalyze quick assimilation of thoughts, principles and practices.

Flexibility in deployment of specialized and expert professionals, without change in head-quarters (and consequent disturbance in family set-up, children educations, etc.) may be adopted.

The Panel recommends that to imbibe a right work culture several managerial steps need be taken such as proper training of new entrants, encouragement of innovativeness, recognition of good work, equitability, clarity, accountability in regard to all types of work, proper career progression and congenial work environment be made.

The Panel recommends that the statues of GSI be upgraded to an “Attached Department” of the Govt. of India, as the Deptt. of Earth Sciences, with the Director General, GSI as Secretary to the Govt. of India (ex-officio) to the Govt. of India, so as to enable the GSI to speed up its activities by faster action on the manpower induction, procurement and policy formulation avail of budgetary support for its activities of use to the S&T, Power, Transport & Communications and other sectors from these sectoral plan allocations, as in the case of the Dept. of Space.

The Panel recommends that the foreign travel component of GSI budget may be pegged at 0.5 – 0.75 % of the total budget (Plan and non-plan put together) and immediately enhanced to Rs. 1.00 crore annually, with the DG, GSI empowered to sanction deputation abroad of scientists for participating in international conferences/seminars and training courses, including those sponsored by international agencies and foreign governments.

The commercial set-up envisaged cannot be a totally separate and distinct entity, but would have to operate as a “shell company”, with a strong umbilical cord with the GSI providing it with all material resources and feeding back the financial returns. A separate enactment by the Parliament may be required to bring forth such a system. This Committee humbly submits that the department related Parliamentary Standing Committee considers this issue in depth and recommends appropriate action.

The Panel recommends an urgent and thorough review of the essential infrastructure, whether in terms of vehicles or drills or cameras or theodolites and personnel requirement in each technical stream, with a view to outsource as many of the activity components as possible to reduce long-term commitments. The examples are Xeroxing, computer data entry, security services, facility maintenance, vehicle repairs, etc.

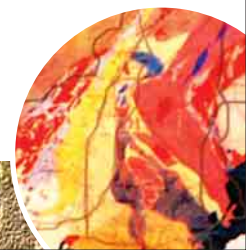
FINANCIAL MATTERS

The Panel recommends that the Government of India may make a capital account provision of around Rs.150 crore during the X Plan and Rs.50 crore during the XI Plan for the steps suggested for the modernization of the GSI. If the option of capitalization of ships and aircrafts needed the surveys projected is exercised, an additional provision of about Rs. 950 crore suitably phased may be made.

The Panel further recommends that in order to make optimal use of the new equipment and infrastructure thus provided, the operational (recurring) budget of GSI be enhanced by around Rs. 95 crore annually during the X Plan and by Rs. 160 crore annually during the XI Plan, over and above the current level. The recurring costs would be less if the survey ships and aircrafts were owned by GSI.

Suitable provisions may be made in the Financial Rules for GSI to utilize the amounts received for sponsored work, data supply, etc. perhaps at the rate of half towards direct operational costs and the other half towards replacement of instruments and facilities.

The Panel recommends that project-based budgeting and expenditure monitoring including cost on personnel and travel as per actual deployment and apportionment of the cost of common facilities may be introduced in GSI.



List of Laboratory Equipments Proposed for Modernization of GSI

a. Equipments for Geological Laboratories		
1.	Research microscopes with digital image capture facility for work in transmitted and reflected light	O
2.	Automated thin sections/polished sections/ polished thin section study preparing equipments	O
3.	Fluid inclusion equipments with image capture facilities	R
4.	Automated comminution equipments for sample powdering (full range)	O
5.	Fully automated X-ray diffraction facilities with search software for identification of mineral phases and clay mineralogy (ASTM powder data files etc.)	R
6.	X-ray fluorescence spectrometers (with full range of sample preparation/fusion bead) preparations facilities for major-and minor-element analysis (whole rock) in geological samples.	R
7.	Scanning Electron Microscope with energy dispersive X-ray attachment (SEM with EDX)	N
8.	Electron Microprobe Analyser facility (EPMA) insitu analysis of minerals/ores	N
9.	Gas Source Mass Spectrometry facility for stable isotope geochemistry of sulphur, carbon, hydrogen and oxygen	N
10.	Gas Source Mass Spectrometer for Ar - Ar dating	N
11.	Thermo-luminescence dating equipment (TL-dating for dating very recent events (order of 0000 years)	N
12.	14C dating facility (approximately 10000 to 40000 years) for dating organic matter of recent origin.	N
13.	Sensitive High Resolution Ion Microprobe (SHRIMP) facility (for zircon dating) etc.	N
14.	Digital image processing systems (including microwave data processing)	O
15.	Soft copy photogrammetry system	O
b. Equipments for Chemical Laboratories		
1.	Laser Ablation – Inductively coupled Plasma-Quadrupole Mass Spectrometer (LA-ICP-QMS) for PGE analysis	N
2.	Atomic Absorption Spectrometers (AAS) for trace elemental analysis in geological samples	O
3.	High performance Liquid-Chromatography equipment for organic specification and functional group identification.	R
4.	Gas Chromatography facility (for gaseous organic samples)	R
5.	Total Organic Carbon and Nitrogen analyzer (TOC analyzer)	R
6.	Graphite Furnace Atomic Absorption Spectroscopy (GF-AAS) for determination of gold up to ppt levels.	N
7.	Differential Thermal Analysis/Differential Thermogravimetry equipment for clay mineralogy	R
c. Equipments for Geophysics Laboratories		
1.	Signal Enhancement Seismo. With I & S Sensors (Every division should have it)	
2.	Ground probe Radar (GIR)	
3.	EM Frequency Sounding (Multi Separation/Multi Frequency)	
4.	X-ray Spectrometers	
5.	Resistivity & IP with signal stacking, Autoplot & interpreter facilities	

STATUS OF IMPLEMENTATION OF REPORTS OF THE PREVIOUS COMMITTEES

6.	Multispectral IP	
7.	Magnetic Gradiometers with IGS attachment	
8.	Gravimeters (v gal)	
9.	Magneto – Telluric System	
10.	Differential GPS units for position locations	
11.	Compact-portable multi parameter well log systems (wireline logging) (Res+r+acpistoc+ caliper)	
12.	Portable Scintillometers	
13.	Modern Physical Property labs.	
14.	Penetrometers (Engineering Props.)	
15.	Multi frequency EM Profiling (100 to 8-10 KHg)	
16.	Transient EM Profiling system (0.1 ms – 40 – 50 ms)	
17.	Transient EM sounding system (up to Secs)	

N :All India Facilities; R: Regional Labs and O: those at outlying HQs

