1st NNRSM COURSE ON REMOTE SENSING APPLICATION FOR MINERAL EXPLORATION

COURSE REPORT

During 1986 to 1998 in 12 courses under the NNRSM (ISRO Sponsored) training programme, the Geological Survey of India Training Institute has trained 175 Geo-Scientists on "Photo-Interpretation and Remote Sensing in Geology" from different Central, State Government Organizations and Universities.

The Present course "the first course on Remote Sensing Applications for Mineral exploration" was designed to train the Geo-scientists with the objective to appraise them on the application of Remote sensing for mineral exploration.

This course was jointly conducted Survey of India Training Institute and NRSA and was scheduled to be covered in five modules, four in GSI TI, Hyderabad and one (4th Module) on GIS in NRSA, Balanagar, Hyderabad. The course commenced on 11.11.1999 and concluded on 11.01.2000.

Originally 18 candidates were selected to undergo the training programme, out of which one candidate Dr. D. Deva Verma. Asst. Professor, Andhra University has to discontinue on health ground.

The following team constituted the faculty for the training programme

1. Sri V. V. Rao, GSI TI.	Course Director
2. Dr. Ashis Bhattarcharya, Head, Geo-Science Division, NRSA	Course Co-ordinator
3. Sri U. N. Satapathy, Geologist (Sr.)	G.S.I.T.I.
4. Dr. K. Kameswar Rao, Geologist(Sr.)	P.G.R.S. Division, SR, GSI, HYD.

Twenty four Guest faculty having wide experiences in different fields of Geology delivered lectures on different topics under modules I,II III, and V at GSI Training Institute, Hyderabad and during field work.

The Guest faculty include:-

1. Dr. S. K. Mazumder	Sr. Dy. Director General, GSI,SR.
2. Dr. R. N. Mishra	Dy. Director General, GSI, Coal Wing.
3. Sri L. S. Suryanarayanan	Director, GSI, Chennai.
4. Sri E. V. R. Parthasaradhi	Director, GSI,MPD, Hyderabad.
5. Sri Manoj Daugwal	Scientist, NRSA.
6. Sri K. Vinod Kumar	Scientist, NRSA

7. Dr. A. Perumal	Scientist, NRSA.
8. Dr. T.V. Ramachandran	Director, GSI, AMSE, Bangalore.
9. Sri S. S. Nayak	Sr. Geologist, GSI, OP:AP.
10. M. Venkateshwar Rao	Director, GSITI.
11. Sri E. V. Mahesh Reddy	Consultant, RSI, Hyderabad.
12. Sri A. Sekharam	Sr. Geologist, PGRS Division, GSI, SR.
13. Sri U.S.N. Reddy	Sr. Geologist, MPD, GSI, Hyderabad.
14. Dr. J. Simhachalam	Sr. Geologist, Geo-Data Division, GSI, SR, HYD
15. Sri T.R.K. Chetty	Scientist, NGRI, HYD.
16. Sri P.K. Srivastava	Scientist, Space Application centre, Ahmedabad.
17. Sri T. A. Dattanarayan	project Co-ordinator, ASRS Group, AMD, HYD.
18. Sri V. Subrahsdmanyan	Director, GSI, Bangalore.
19. Dr. B.K. Bandopadhyay	Director, GSI, Nagpur.
20. Sri S. N. Mitra	Director, GSI, Culcutta.
21. Sri M.V. Kamaraju	geophysicist, NRSA.
22. Sri P. Chakravarti	Director, GSI, Culcutta.
23. Sri.K.R.P. Rao	Sr. Geologist, GSI, OP:AP, Hyderabad.
24. Sri N. Devaraj	-- do --

In the Inaugural speech, the Chief guest Dr. S.K. Mazumser, Sr. Dy. Director General, GSI, elaborated on the role of NNRSM in National Planning and contribution of GSI Training Institute towards this effort. The chairman of the session Dr. N. Chattopadhyay, Dy. Director General, Training Institute spoke on the utility of Remote Sensed data products in Mineral exploration.

The guest of honour Dr. S. Kalyanraman, Programme Director, ISRO Satellite Centre delivered a lecture on the progress and development of Indian Satellite, particularly on IRS System, which was established with the launch of IRS - IA in March, 1988.

The course started with the three important lectures on Geological and tectonic frame work of India, Mineral Deposits of India - a minerogenetic appraisal and Exploration of Minerals - an applied science and an over view of Remote Sensing for Mineral exploration delivered by Dr. S. K. Mazumder, Sr. Dy. Director General, GSI, Dr. R. N. Mishra, Dy. Director General, GSI, and Dr. A. Bhattacharya, Group Head Geo - Science Group, NRSA on 11.11.99 and 12.11.99 respectively.

in the Module I on aerial photography Photogrammetry, Remote Sensing Principles and Interpretation techniques conducted during 13.11.99 to 27.11.99, the trainees-officers have been provided an insight into various aspects of the geometry of aerial photographs, stereoscopy, aerial mosaic and determination of scale of aerial photographs through lectures, demonstrations and practical exercises.

The basic principles on remote Sensing including data types and formats, Remote Sensing in visible, thermal and microwave regions and interpretation of terrain and structural elements, discrimination of sedimentary, igneous and metamorphic rocks were also covered through lectures and practicals with the aid of suitable aerial photos and satellite images.

Application of Remote Sensing for exploration on Ground water, gold, diamond, bauxite, limestone and base metals were also covered through lectures and practicals.

In the Module II between 29.11.99 to 8.12.99 the trainees-officers were exposed to Digital Image processing. They were introduced to the fundamentals of computers, Windows - 95 Operating System and ERDAS - IMAGINE Software. Lectures were delivered on statistical methods in Remote Sensing and Data Processing, Image Processing techniques both Radio matric and Geo-matric and image manipulation, Enhancement techniques - Radiometric - -spatial and spectral filtering and multi-spectral classification.

the trainees have utilised the ERDAS IMAGINE Software for the data generation applying different techniques of digital data processing. the digital data in CD of Agnigundala, Jonagiri and Ramgiri were utilised for image enhancement, Band combination, spatial filtering and multi-spectral classification.

In Module III - earth Sciences Application - Case Studied, a series of lectures on the application of Remote Sensing in different mineral explorations were delivered. Dr. A. Bhattacharya delivered a lecture on base-metal and oil and natural gas exploration. Lectures on remote Sensing activities for oil exploration in Ganga Valley project, Atomic Mineral exploration, Coal and lignite and Geo-environmental studies were delivered by Sri E.V.R. Parthasaradi, Sri. T.A. Dattanarayana, Sri S.N.Mitra and Sri P. Chakravartu respectively.

Lecture on Remote Sensing application for tectonic analysis in Eastern Ghat Granulite belt, Southern granulite belt and granite-greenstone terrain was delivered by Sri. T.R.K. Chetty.

Special lectures on Global Positioning system by Sri P.K. Srivastava, Geo-Chemical sampling by Sri V. Subramanian and Airborne magnetic survey, Geophysical image generation and integration of Remote Sensing data and mathematical modelling for mineral exploration by Sri M.V. Kamaraju were taken up.

Dr. B.K. Bandopadhyay spoke on GEOISMM on 17.12.99 in which he gave a detailed geological information on the Central Tectonic Zone falling in parts of Madhya Pradesh & Maharashtra.

The trainees-officers attended the Geographical Information System module between 13.12.99 to 17.12.99 at Balanagar, Hyderabad conducted by NRSA. They visited Sadnagar Satellite Earth Station on 18.12.99.

A comprehensive written test in phoptogeology, Remote Sensing and Digital Image Processing was conducted on 20.12.99. The trainees showed keen interest and involvement in the test and the performance was very good.

The Module on the Project work and the related field was covered during 21.12.99 to 06.1.2000. Two important areas namely the Penakcherla Schist belt and the Ramgiri schist belt falling in Degree. Sheets 57E and 57F were selected for block interpretation for preparation at lithostructural maps to study the controls of gold mineralisation and Kimberlite emplacement. The IRS IC & ID, Liss III full scenes, IRS IB Geo-coded scenes and aerial photos on 1:60,000 scale were provided to the trainees for this purpose. The structural details mainly the folds, granitic domes, lineament were brought out by visual interpretation. The major phases of granitic activities were depicted from the topographic expressions and tonal variations of granitic bodies.

Field checks were carried out in Wajrakurur diamond field and Penakcherla - Ramgiri gold field. the trainee-officers were shown, some of the Kimberlite pipes and were explained the lineament patterns/basement fracture systems that are responsible for emplacement of these pipe rocks. The gold mineralisation in the sheared quartz veins in Meta-basics were explained to them in the field.

On the return from the field the trainee-officers prepared a report on the result of the block interpretation and incorporated the necessary changes in the interpreted maps.

The trainee-officers had a group discussion with Sri V.V. Rao, Course Director and other Faculty members on the Project work and fields checks carried out in Wajrakarur and Ramgiri areas on 10.1.2000.

The valedictory Function was held on 11.1.2000 under the chairmanship of Dr. N.Chattopadhyay, Deputy Director General, Training Institute, Geological Survey of India. the Chief Guest, Dr. K. Radhakrishnan, Dy, Director, NRSA addressed and the distributed certificates. The course was concluded with vote of thanks by Sri P.S. Anil Kumar, Geologist, GSI Training Institute.