With the promulgation of National Mineral Exploration Policy (NMEP) 2016, Government of India has laid enormous thrust on regulation of minerals, roles of State in Mineral development, survey and exploration, handling of database of mineral resources and tenements and strategy of mineral development. The just approved NMP 2019 encourages the private sector to take up exploration, which may help augment the exploration process in the country. Odisha covering an area of 155,707 km², which is 4.87% of the total area of the country, is endowed with huge resources of ferrous group minerals (34% Iron, 28% Manganese, 96% Chromium, 95% Nickel and 98% PGE of total national resources) confined to restricted areas within a complex geological milieu. Judicious exploitation and utilization of country’s mineral potentialities can be achieved by carrying out systematic and detailed exploration using state-of-the-art techniques in a time bound programme. Geological Survey of India, besides Directorate of Geology, Odisha is instrumental in discovering and exploration of most of the deposits of ferrous group minerals in Odisha and in the process have chiseled out some of the finest geoscientists of the country.

The recently constituted Institution of Geoscientists Odisha (IGO) formed by highly experienced former geoscientists of Geological Survey of India undertook a maiden attempt to provide an interface between the experienced geoscientists and the young professionals engaged in exploration and exploitation of ferrous group minerals in the state. The five day workshop cum training on “Geology and exploration of the Ferrous Group of minerals in Precambrian milieu of Odisha”, sponsored by NMDC was conducted during 6th to 10th March, 2019 with trainees from NMDC, Tata Steel, Rungta Mines, SPS Geomine and GSI.

The workshop was inaugurated on 6th March 2019 by Shri Deepak Mohanty, Director of Mines, Government of Odisha as the Chief Guest while Shri L.L. Viswakarma, DDG, State Unit: Odisha graced the function as Guest of Honour. The programme started with a series of lectures delivered by domain experts and members of IGO. The programme was started with series of lectures delivered by domain experts and members of IGO. Shri R.N. Sar, former Dy. D. G., GSI spoke on Ferrous Group Metallogeny in Precambrian from global and Indian perspective while Shri B.K. Jena, former Dy. D. G., GSI elaborated on Geology of Singhbhum Craton with special reference to IOG rocks and Horse Shoe belt of Jamda-Koira. Shri J.K. Nanda, former Dy. D. G., GSI highlighted in detail on Orthomagmatic ore deposits in the Singhbhum Craton with special reference to the chrome mineralization in the Sukinda Ultramafic Complex. Dr. Manoranjan Mohanty, former Dy. D. G., GSI with his involvement in NMET explained on Advance Techniques of Mineral exploration and Shri R.N. Patra, former Dy. D. G., GSI gave a talk on Lateritisation process: implications for ferrous group of mineral deposits.. Shri K.C. Das, Director, GSI, SU: Odisha gave an overall picture of the Exploration program by
GSI in Odisha. This provided a platform for the trainees to refresh their knowledge on various aspects of ferrous group of minerals, their distribution and exploration.

The four day long field training programme began on 7th March 2019. The first day was devoted to field traverse across the contact zone between the Eastern Ghats Mobile Belt (EGMB) and the Singhbhum Craton making the trainees abreast with the regional geological set-up in general and identification of various rock types (charnockite-enderbite, khondalite, and leptynite) in particular. Appraisal of Mobile belt-Craton relation, study of characteristic features of the Sukinda thrust, and zones of mylonite and pseudotachylite characterizing parts of the Brahmani lineament and nature of contact zone granite were made along the road section between Brahmani River and Duburi. The mine sections in Kaliapani opencast chromite mine of Odisha Mining Corporation (OMC) were studied along with observation of the orthopyroxenite, chromitite and nickeliferous laterite. The drill cores of the boreholes presently being drilled by OMC are also scrutinized and nuances of borehole logging were demonstrated.

The Mesoarchaean Iron Ore Group (IOG) of rocks in Bonai-Keonjhar (BK) belt is disposed in a horseshoe shaped synclinorium structure in the western part of the Singhbhum Craton and is considered as a metal bowl because of huge iron and manganese resources. Second day was devoted to the regional traverse across the Singhbhum craton examining the different components of the Singhbhum Granite (homphanous gneissic granite, stromatic to agmatic type migmatites and porphyritic granite). The archaeological site at Sitabinjhi, Kendujhar district, exhibiting type section of megacrystic Singhbhum Granite was examined. Newer dolerite dykes comprising dolerite and peridotite were studied. The unconformable contact of the Singhbhum Granite and the arkosic gritty sandstone of the Iron Ore Group as well as the amygdaloidal metabasalt (Malangtoli-Nuakot) overlying the arkosic quartzite was examined in Rugudi road section. Trainees visited the Chamakpur, detrital iron ore deposit (DID) along the eastern bank of the Baitarani River, considered to be part of the Kolhan Group. Here large boulders and cobbles of both haematite and BIF are embedded in a matrix varying from arenaceous to ferruginous in composition, thus making the deposit viable for mining since last forty years. Traverse was undertaken in Kundra Nala section to understand the structural disposition of the BIF and underlying tuffaceous unit on the eastern limb of the Horse-shoe synclinorium.

On the third day control of iron ore mineralization and techniques to be deployed during exploration of these bodies were discussed in detail at the mine section of Joda (East) iron ore
Training by Sarat Kumar Jena (center) to the participants in Tata Steels’ Joda East Mine

Similarly, control of manganese mineralization and its exploration strategy was examined at Joda (West) manganese mine of Tata Steel. The highlight of the program was that in every evening, interactive sessions were conducted by the faculties to clarify the doubts of the inquisitive trainees and further elaboration on the subjects of interest.

On the last day, exploration methodology adopted by GSI in exploring the iron ore bodies within the valley portion of BK belt was discussed in the drilling camps of GSI and the cores were examined. The drilling site at Gandalpara block, Kendujhar district was visited and unresolved issue of the stratigraphic position of valley iron ore bodies vis-à-vis the BIF hosted ones on the eastern and western limb of the synclinorium was elaborated. The dolomite horizon at Kasia containing oldest biota was also studied. In the afternoon Valedictory function was held in the conference hall of Joda (West) mine of Tata Steel. Shri Ansuman Dutta Gupta, Senior Director, Tata Steel graced the function as Chief Guest. Shri S.K. Jena, former Dy.D.G., GSI, delivered a talk on exploration of Iron ore in the valley areas of BK belt and emphasized possibility of finding unexplored huge resources of iron ore in the valley region, concealed under alluvium or laterite. In his valedictory talk Shri Anshuman spoke about the complexity of manganese exploration in BK belt and emphasized that this type of field training cum workshop with input from the experienced professionals would help in tackling these complex issues. Certificates were distributed to the trainees by the Chief Guest. The officer trainees expressed their immense satisfaction and unequivocally appreciated the interactions with the experienced trainers. The field training was guided and conducted by S/Shri Jayanta Kumar Nanda, Sarat Kumar Jena and Dr. Manoranjan Mohanty whereas Shri J.N.Das, former DDG, GSI coordinated and managed the programme.

Dr. B.M. Faruque, Member, IGO
bmfaruque@gmail.com

Participants of Workshop cum Field Training and organisers of the IGO. Standing in the center are Shri G.P.Mohapatra, Secretary, IGO (former ADG, GSI), Shri L.L.Viswakarma, DDG, SU: Odisha, GSI and Shri S.C.Rath Vice President, IGO (former DG,GSI)