Proposal for upgradation of Geosoft Software (Oasis Montaj™) Licenses in Geological Survey of India

Introduction

Before 1998, Geophysical Divisions of Geological Survey of India processed and interpreted geophysical data using manual processes, programmable calculators and few code based computer programs by individuals leading to inconsistency in data processing and interpretation across GSI. Around 2000, GSI started using Geosoft (Oasis Montaj) licenses by RSAS (erstwhile, AMSE), six regions and M&CSD (erstwhile, Marine Wing) in restricted manner using limited number of Geosoft (Oasis Montaj) licenses for systematic processing and interpretation of gravity, magnetic, induced polarisation/ resistivity (land survey) data. After 2010, Geosoft software is being used extensively by Geophysics Divisions of six regions (ER, NER, NR, WR, CR and SR), RSAS, M & CSD and CHQ, Kolkata for systematic processing and interpretation of geophysical data for mapping of subsurface structures and mineral exploration.

1. Geosoft Software (Oasis Montaj)

   Geosoft software is a user-friendly software for processing and interpretation of geophysical data. The present OEM of the software is M/s Seequent Burlington (Bentley System) Suite-405, 5035 South Service Road, Burlington, Ontario-L7L6M9Canada. M/s DATACODE, K-26, 2nd Floor, Kinkhede Layout, Opp-L.I.T. Bharat Nagar, Nagpur-440033 Maharashtra, India is the sole authorized Indian distributor of Geosoft software. The software has several modules for processing and interpretation of geophysical data (land, marine and airborne) and 2D/3D modelling. This software has also been used by different national and international public and private agencies to analyse the geophysical data since three to four decade.

2. Distribution and Users of Geosoft software in GSI

   The six Regions, Marine and Coastal Survey Division (M & CSD), Remote Sensing and Aerial Survey (RSAS) and Central Head Quarter, Kolkata, GSI uses Geosoft software. Following is the distribution of the 20 software in GSI.

Sl. No.	Location	No. of Licenses
1.	CHQ, Kolkata	1
2.	Central Region, Nagpur	1
3.	Northern Region, Lucknow	2
4.	Western Region, Jaipur	2
5.	Eastern Region, Kolkata	2
6.	Southern Region, Hyderabad	3
7.	North-Eastern Region, Shillong	1

8.	RSAS, Bangalore	5
9.	M & CSD, Kolkata	1
10.	M & CSD, Visakhapatnam	1
11.	M & CSD, Mangalore	1
Total		20

3. Outcome of the uses of Geosoft software

Since inception of National Geophysical Mapping (NGPM) project in 2002-2003, more than 14 lakhs sq.km area has been covered under NGPM programme. The objective of the project is to delineate geophysical anomalies and infer about the subsurface rock type and structures which can hold mineralization. The prediction/ inference of mineral potential zones is performed through generation of gravity and magnetic anomaly maps and several derivative maps (a minimum of 16 maps for each project items of NGPM) using Geosoft software.

GSI officers are performing TS-QC of geophysical data acquired in different blocks and toposheets covered under NAGMP and NGPM programmes respectively by various PIAs (outsourced) using Geosoft software.

4. Current status of the existing Geosoft licenses

Presently, twenty licenses of Geosoft (Ver. 9.7) are available in GSI for which software maintenance contract expired on 31st March 2020. Since then, the existing licenses have been utilized by GSI without any updates. As of today, nineteen (19) out of twenty (20) number of Geosoft licenses are working condition but there is a time dependent module of the software which expired its operation period and needs to be resolve by upgrading a minimum of nine (09) software - one for each Geophysics Division of GSI. Other than the time dependant module there are several other modules upgraded in the new version (latest Ver. 2024.1) of Geosoft those would be value addition for processing and interpretation of geophysical data.

There were technical glitches reported on the operation of existing Geosoft software, however **M/s Seequent (OEM) and M/s DATACODE (only Indian Vendor) expressed their inability to provide any further technical support to these existing conventional versions of the software licenses.** Non-availability of the updated version of the Geosoft modules (like 2D/3D inversion) as well as end of support of the software seriously jeopardises the regular geophysical data processing and interpretation exercises pertaining to the FSP items of Geophysics Divisions, GSI.

The OEM converted the conventional Geosoft License to yearly subscription basis Enterprise License.

5. Value addition by upgradation

The upgraded version (Ver. 2024.1) of the Geosoft will resolve the many issued in the previous version. Some of the major updates in the modules those will resolve difficulties of the user Divisions of GSI and value addition are as follow:

- For magnetic data correction, the main field and secular variation needs to computed using International Geomagnetic Reference Field (IGRF) for the respective epoch. So IGRF need to be updated for each epoch. Presently GSI has been doing the compilation work of ground gravity magnetic data collected under NGPM programme and aero-geophysical data acquired under National Aero geophysical Programme but the data have been acquired different epoch. Hence, to mitigate the emergent issues the Geophysics Divisions urgently requires the IGRF for the present magnetic epoch for the data compilation.
- Levelling module of Geosoft has been upgraded by the OEM which will add value to levelling processing of airborne magnetic data providing upgraded base level correction. This will enable uses identifying better anomalous zone. When performing micro levelling, the error "NLFilt_DU: Invalid Filter Width" no longer occurs if the database lines have "dummy" X & Y coordinate values. Moreover, lines with invalid locations are now documented in the log file.
- Gravity and Terrain Correction - Added new tools to the Gravity and Terrain Correction Extension for Geosoft (Oasis Montaj) to improve effectiveness whilst further streamlining the workflow. New features include levelling and atmospheric correction.
- The updated Induced Polarization Extension for Geosoft (Oasis Montaj) delivers better control on the 2D and 3D IP displays resulting in better and faster analysis. Interactive visualization tools contribute to clearer understanding of the relationship between the plot points and their contributing electrodes.
- Dynamic data linking (database to map linking) now works correctly for pseudo-section maps; the cursor is accurately represented on the map, and the QC tools depict the correct cursor location along the IP lines.
- Presently, GSI is visualizing 3D model in terms of stacked 2D models. For availing continuous 3D modelling, one license of the software will be upgraded including 3D module.

6. Upgradation Requirement for GSI

   Considering the wide uses of the Geosoft software in different domain (land, marine and airborne) and processing, interpretation and 2D/3D modelling of geophysical data of various categories to augment mineral exploration activities of GSI, upgradation of the conventional Geosoft licenses to yearly subscription based license is an urgent requirement for execution geophysical FSP items. This is particularly necessary for completion (advance processing and interpretation) and monitoring of the NGPM and NAGMP projects – in-house and outsourced.

7. Estimated cost and previous cost of CAMC

   The estimated cost of upgradation of the conventional Geosoft Licenses to subscription-based Enterprise Licenses arrived from communication with the M/s. DATACODE (Indian vendor) and asking for an estimated quotation.

   GSI, NR upgraded two licenses of Geosoft in 2022 vide GeM Contract No. GEMC-511687732481620 dated 15.03.2022 with total cost of Rs. 90305400/- inclusive of all taxes. National Remote Sensing Centre, Hyderabad procured one license of Oasis Montaj vide Contract No. GEMC-511687771734422 dated 02-02-2024 at the cost of Rs. 7699500/- inclusive of all taxes

   The last upgradation of conventional licenses under three years CAMC (in 2017) contact was executed in 2019 for twenty licenses vide Purchase Order No. 255/A/103/19/Cos/AP&M/26B-2017 dated 09.09.2019 with total cost of Rs. 3,36,39,672/-.

8. Year wise requirement of fund and requirement of fund from NMET.

   The year wise breakup of fund required from NMET

Year wise Estimated Coast in USD and INR (conversion date: 20.11.2024 @ ₹84.38)			
Geosoft(Oasis Montaj)	No. of Licenses	1st Year USD/(INR)	2nd Year USD/(INR)
Geophysics Standard (GROUND)	7	$354130 (₹29881489)	$371840 (₹31375859)
Airborne Field	1	$39050 (₹3295039)	$41000 (₹3459580)
Geophysics Advance	1	$86750 (₹7319965)	$91090 (₹7686174)
Total Estimatedyearly cost in USD (INR)		$ 479930 (₹40496493)	$503930 (₹42521613)
Grand Total for 2 years (in INR) without GST		₹8,30,18,107	

Since the upgraded licenses are yearly subscription-based Enterprise License, no AMC or CAMC are required. The vendor will provide all the support required during the subscription period.

Submitted to Chairman NMET, for kind necessary approval of the followings.

1. GSI's proposal for the upgradation of nine (09) Geosoft (Oasis Montaj) licenses for a period of two years may kindly be considered for funding through NMET.

2. If approved the competent authority may kindly accord the administrative approval and financial sanction from NMET for an amount of ₹8,30,18,107(Eightcrore thirty lakh eighteen thousand one hundred and seven only) plus 18 % GST of ₹1,49,43,259 (One crore forty-nine lakh forty-three thousand two hundred fifty-nine only**), with a total amount of ₹9,79,61,366/- (Nine crore seventy-nine lakh sixty-one thousand three hundred sixty-six only) for the duration of 2 years.**

3. The proposal has approval of Director General, GSI for submitting to NMET.

25.11.2024

DDG(GP), STSS& NMH-IB (Add. Charge),
CHQ, GSI, Kolkata