United Nations Framework Classification and the Indian Mining Industry

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Responsible Reporting

Mineral are basic building blocks of the mining industry, which forms the back-bone of the world economy. However, its contribution to national economy varies greatly from country to country. In a global economy establishing a complete picture of the current & future supply base of fossil energy and mineral is essential for effective resource management. The huge mineral resources are needed to be interpreted and understood internationally in market economic terms by the governments, industry and investors.

Responsible reporting of mineral assets as regards to their long term availability and rate of depletion is of prime importance to planners for the sustainable development of the exploration and mining industry.

Resource Classifications

A large number of country specific mineral resource classifications were in use. However, a number of developments since 1990 led to a renewed urgency to develop a universally acceptable mineral – reserve / resource classification and a standard reporting system. Two important initiatives resulted in an attempt to address this need.

Council of Mining and Metallurgical industries (CMMI)

The first initiative to develop the code and standard was taken under the auspices of Council of Mining and Metallurgical Industries (CMMI) 1994, by members of the Committee for Mineral Resource International Reporting Standard (CRIRSCO).

Committee members were national reporting organizations (NROs), which not only developed but were also responsible for mineral reporting codes, standards and guidelines for a country or a group of countries. The members of NROs were:
United Nations Framework Classification (UNFC)

The second initiative was by United Nations and more particularly by a Working Party on Coal setup by Economic Commission for Europe to develop a user friendly and uniform system for clarifying and reporting reserves of solid fuels and mineral commodities.

This resulted in the development of United Nations Framework Classification for Reserves and Resources of Solid Fuels and Mineral Commodities (UNFC 1997). In 2004, the classification was extended also to apply to petroleum (oil and natural gas) and uranium (UNFC 2004). Governments of China, India and some Eastern European Countries accepted the UNFC. UNFC helped in the long term planning with the inclusion of prospective estimates of mineral potential.

Indian Scenario

Prior to UNFC a comprehensive scheme of classification ore and mineral reserves was followed. To keep pace with the growing demand of minerals there was an urgent need for exploration both by Government and private agencies to be guided by long term national goals. The relevance of evolving an “Universal Classification” was felt. FIMI as a responsible industry organization impressed upon the Government of India to adopt UNFC-1997 for reporting reserves and resources as per international standards by integrating the Indian Classification System into the UNFC. This would also help in paving the way for foreign direct investment into exploration and mining in India. Ministry of Mines gave its approval for implementation of UNFC and field guidelines for exploration were issued in May 2001.
Indian Mining sector adopted UNFC in 2003. The following initiatives were taken:

- Amendments were made in the Mineral Conservation and Development Rules, 1988 (MCDR) in the Year 2003 making it mandatory for all lessees to file returns in UNFC format.
- National Mineral Inventory for the Year 2005 was brought for the first time as per UNFC system by IBM.
- Specifying UNFC, as the common standard for assessment of exploration data for grant of Mineral Concession.
- All exploration activity by RP and PL holders to conform to UNFC field guidelines.
- Mine Plan and Scheme of Mining to be UNFC compliant.

**Implementation Status**

IBM made concerted efforts by circulating guidelines for adoption of UNFC system to various organizations and State DGMs. Geological Survey of India (GSI), Coal India Ltd. (CIL) and Mineral Exploration Corporation Ltd. (MECL) adopted UNFC norms in their exploration, investigations and reporting of reserves estimate. State DGMs were not equipped technically for mineral exploration and assessments under UNFC system.

On the initiative taken by FIMI, a Study Group was constituted by the Ministry of Mines for assessing the implementation of UNFC on ground level, which gave its report in April 2009. The group conducted studies on 23 mines of various categories as to the implementation of UNFC and made the following observations:

- Most of the mining leases with large holdings adhere to the exploration norms as well as categorization of the reserves as per UNFC norms. However, many leases with small holdings are reporting the reserves 111 and 121 categories without adequate exploration.

- The exploration carried out during RP / PL stage is not in conformity with the requirements of UNFC norms. There is a tendency on the
part of RP / PL holders not to invest much on exploration during RP / PL for not being sure of getting mining lease.

- In case of minor minerals such as granite, marbles etc., UNFC system remained yet to be introduced.

- It was observed that the Registered Qualified Persons (RQPs) entrusted with the Mining Plan are not adequately trained to comprehend the significance of UNFC norms.

Based on the recommendations of the Study Group, IBM conducted training programmes for creating awareness about UNFC for the RQPs. This has ensured realistic reporting of the data by the lessees. UNFC has also been implemented for the minor minerals such as granite, marbles etc. All exploration agencies are now adhering to exploration norms and reporting data on the resources as per UNFC.

Coal India switched over to UNFC Code in April 2011. As on April 2010 Coal India pegged the extractable reserves at 18.21 billion tonnes

### Issues Faced by Industry

The **Mining Industry in India** is largely fragmented comprising several small scale operating mines.

#### Area Wise Distribution of Mining Leases*

*(Frequency in Hectare) (as on 31.3.2011) (All India)*

<table>
<thead>
<tr>
<th>Frequency Group area in Hects.</th>
<th>Number of Mining Leases</th>
<th>Percentage of Total Leases</th>
<th>Area in ‘000 Hects.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>6,714</td>
<td>61</td>
<td>27</td>
</tr>
<tr>
<td>10-20</td>
<td>1064</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>20-50</td>
<td>1358</td>
<td>12</td>
<td>45</td>
</tr>
<tr>
<td>50-100</td>
<td>919</td>
<td>8</td>
<td>68</td>
</tr>
<tr>
<td>100-200</td>
<td>447</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>200-500</td>
<td>293</td>
<td>3</td>
<td>89</td>
</tr>
<tr>
<td>Above-500</td>
<td>208</td>
<td>2</td>
<td>241</td>
</tr>
<tr>
<td><strong>All Groups</strong></td>
<td><strong>11,003</strong></td>
<td><strong>100</strong></td>
<td><strong>548</strong></td>
</tr>
</tbody>
</table>

Source: Indian Bureau of Mines, Nagpur
61% of the leases have areas <10ha, 22% of leases have areas between 10 – 50 ha and only 17% lease areas are 50 ha and above.

The mining in India is dominated by the State sector, which accounts for 66% of overall production. The State sector involvement is as high as 90% in coal sector and almost 100% in gold, lignite and gypsum. The production value of minerals during 2012-13 was Rs. 4,82,368 Crores ($96,473 million).

(i) **Adoption of UNFC norms for Beach Mineral Sands**

As per the UNFC norms the proven / probable reserves of the mineral deposits and grades are to be calculated and indicated in the mining lease applications and the mine plans are to be based on such reserves codification as a statutory requirement.

The Beach Sand Mineral deposits comprise an unique assemblage of minerals like garnet; ilmenite; rutile; zircon; sillimanite and leucoxene. All of them are in loose and uncombined states. Unlike metallic or non-metallic / industrial minerals, once mined, the area becomes depleted for further viable exploitation, the Beach Placer mineral deposits are constantly ‘replenishable’. Due to the “replenishable reserves”, the insitu’ reserves may keep on changing,

The field studies in the Tirunelveli coast of Tamil Nadu, recently conducted by Sri. R. Srinivasan, former Director of Geology & Mining, Tamil Nadu, have brought to light that almost 100% replenishment takes place in the ‘inter tidal zone’ [18 – 25 m wide]; about 50% in the ‘Beach area’ [45 – 60 m from the HTL] and about 30% in the ‘Berm area’ [150 m – 230 m from HTL]. This is a rare feature among the “wasting assets”.

As per Sec 5[2] of the MMDR Act, 1957, the mining leases will be considered only for the ‘prospected’ areas. Problems are, therefore, faced in accounting of the mineral reserves in all the leaseholds or part of it. In other words, the “insitu’ mineral reserves and the constituent mineral percentages [assessed at the time of filing the ML application] get changed from genuine replenishment during every season.

In the case of beach Placer minerals, since the quantity and assemblages of constituent minerals are bound to change from season to season depending upon the “dynamic forces” described
in earlier paragraphs, the adoption of the UNFC codification to the beach placer mineral sands, while applying for the mining leases and also in the preparation of the mine plans, should be waived off. ‘Credence’ should be given to the replenishable reserves during the submission of the mining programme.

(ii) **Reports Generated before UNFC**

UNFC classification by and large is reasonable in terms of classification of intensity of prospecting, feasibility study, and economic study. As per Section 5(2)(a) of MM(DR) Act, 1957 provided that mining lease may be granted by the State Government if it is satisfied that there is evidence of the existence of mineral contents therein has been established by means of prospecting such area.

The reports of exploration carried out by Government agencies such as Directorate of Geology and Mining, Geological Survey of India etc., and made available by the State Government for applying for direct ML, many times do not conform to the UNFC guidelines resulting in confusion at the time of mining plan approval by IBM, which is needed before execution of ML. Most of the time the exploration carried out is not as per UNFC norms and IBM insists for the reserves under UNFC class 111, which may require more intense drilling. Similar other issues are faced by the lessees.

**National Mineral Policy 2008**

The National Mineral Policy 2008 also envisage maintaining the national inventory of mineral resources in accordance with the latest version of the UNFC system showing reserves and remaining resources, ensure sustainable mining and sustainable development around mining areas.

To enhance mining’s economic and social contribution Draft MM(DR) Rule 2011 Section 26(1) provides a mining plan to be prepared for the entire lease area incorporating environmental and social sensitivities mine closure and post mine closure activities.

UNFC-2009 is a generic intuitive and users’ friendly framework classifications applicable to all extractive activities, covering solid mineral and fossil energy resources, including oil, natural gas, coal and uranium. A key benefit of UNFC-2009 is the fact that it provides a common basis for the solid minerals and petroleum sectors, whose classification systems have been developed largely independently of each other, primarily focusing on the mining of solids and the production of fluids respectively. The importance of environmental and social issues in the context of resource extraction is also appropriately recognized in UNFC-2009.

UNFC-2009 utilizes three fundamental criteria for reserve and resource classification; economic and social viability; field project status and feasibility; and, geological knowledge. Each of these criteria are subdivided into categories and sub-categories, which are then combined in the form of Classes or Sub-classes.

UNFC-2009 will significantly facilitate the availability of resources, exploration needs and bring public awareness about the national resources. It would adequately meet the needs of key areas such as international energy and mineral studies, Government resource management, industry business processes and financial reporting.

**What needs to be done?**

To keep pace with the growing demand for minerals there has to be an increased emphasis on exploration. Indian mining sector is lagging behind with very low expenditure on exploration.

Determination of existing reserves requires knowledge of mining, processing, economics of supply demand and price as well as social and environmental factors and the influence of each other. The reporting of reserves and resources in UNFC-2009 will greatly facilitate in knowing the above parameters. Adoption of UNFC 2009 will have to be ensured through capacity building by the Indian Mining Industry. Core to capacity building will be effective adoption and adherence by the industry to the classification.

*This will enhance the mining’s economic and social contribution.*

UNFC 2009 requires that in addition to the regulatory bodies, the task of corporate reporting of reserve resources estimation is carried out by “competent person”. The competent person should possess relevant
experience and professional qualification in the estimation of quantities associated with the type of deposits under evaluation.

Let us build a team of professional with core competence to take this task forward.