

Systemic Improvement for OB Measurement undertaken by CIL

Background

- Reporting of production of Coal, removal of Over Burden, maintenance of coal stock and measurement thereof in CIL mines are conducted as per the guidelines popularly known as “Yellow Book”.
- The first “Code for Uniform System of Maintenance, Control and Verification of Coal Stock in all Mines of CIL” was approved by CIL board in its 118th meeting on 22.08.91 in modification to the Balram committee report.
- Subsequently, based on recommendations submitted by M/S. A.F. Ferguson & Company, the consultant engaged by CIL, “Production, Dispatch and Coal Stock Reporting Policy of CIL” was approved by CIL board in its 228th meeting on 04.09.06.
- Thereafter, a “New Code for Uniform System of Maintenance, Control and Verification of Coal Stock in all Mines of CIL” was approved by CIL board in its 273rd meeting on 20.09.11 and implemented w.e.f 01.01.12.

Background (Contd..)

- With change in time and introduction of latest survey equipment like Electronic Total Station (ETS), 3D Terrestrial Laser Scanners (3DTLS), Aerial Laser Scanners (ALS), it was felt to revise the practices being followed in measurement and computation of Coal and Overburden (OB).
- Accordingly, a committee consisting of Director (Tech.), CMPDIL, GM (Production), CIL, GM (Geomatics), CMPDIL and HoD (Survey), BCCL was constituted on 19.12.18. The committee, after various meetings, deliberations, referring to guidelines and circulars issued from time to time and getting inputs from all subsidiary companies prepared a revised New Yellow Book.
- The New Yellow book called “Code for Uniform System of Maintenance, Control, Verification of Coal Stock and Measurement, Verification of Over Burden Removal in all Mines of Coal India Limited (Revision-2020) was approved by CIL board in its 409th meeting on 25.08.2020 and implemented w.e.f. **01.09.2020**.

Methodology for Survey Measurement Using Different modern Instrument

Yellow Book (2011)	Yellow Book 2020
<p>No specific instrument to be used is provided.</p> <p>4(iv) In case of use of modern instrument like TOTAL STATION etc. the levels shall be taken on random basis & shall be interpolated on the corresponding points of the initial RLs.</p>	<p>Instruments to be used has been specified:</p> <p>4.a) Measurement of over burden removal in open cast mines shall be done by using any of the system i.e, LASER scanner (Terrestrial or Airborne) and / or Electronic Total Station (ETS).</p> <p>b)In regard to computation of volume, for the routine measurement, the Mine may adopt any of the system either Cross Sectional Method or Digital Terrain Model (DTM) to DTM method, but once a method is adopted that shall not be changed. However, if necessary to switch over to other system, it can be done with permission from Director (Technical) of the Subsidiary, mentioning the conditions for such change in system.</p>

Periodicity of Measurement

Yellow Book (2011)	Yellow Book 2020
<p>4 (iv) The levels of the overburden at 15m interval at the exact spot, where initial levels were taken, will be taken in the working area at the end of each month. The dates of all such measurements and also the date of initial measurement will be recorded on the plan along with the reduced level of each point. If the entries are too numerous and difficult to accommodate on the plan, a register may be maintained for recording the levels with dates.</p>	<p>4 d) In case of Over Burden, monthly measurement shall be carried out by colliery surveyor in both Hired and Departmental OC. In addition to monthly measurement of OB by Colliery Surveyor, quarterly measurement shall be carried out by a Team constituted at Area Level. For departmental OCs, half yearly and Annual measurement of over burden shall be conducted by a team to be constituted by subsidiary HQ or any other agency like CMPDI, authorized by subsidiary HQ.</p> <p>e) However, the mines producing more than 1 million te of coal per annum shall be measured by CMPDI on annual basis.</p> <p>f) Annual and / or Half yearly OBR measurement in all Hired HEMM Patches shall be conducted by CMPDI.</p> <p>g) In case of any unforeseen circumstances / unavoidable reasons when CMPDI is unable to conduct measurements, subsidiary may engage any other agency or team, constituted at subsidiary HQ level for conducting measurement of OB, with approval of concerned CMD.</p>

Action for Variation in OB measurement

Yellow Book (2011)	Yellow Book 2020
<p>10.ii) (b) In case of overburden removal, in every quarter Where quantum of overburden removal is less than 2.5 lakh cubic mtrs., no corrections need be made so long as the variance is less than (+ -) 5%. Where quantum of overburden removal volume is 2.5 lakh -1.25 million cu.m, no corrections need be made so long as the variance is less than (+ -) 3%. Where quantum of overburden removal in excess of 1.25 million cu. m., no corrections need be made if the variance is within (+ -) 2%.</p> <p>iii) This permissible tolerance should be considered as measurement tolerance due to instrumental error, error due to measurement of irregular volume and human error etc., and should not be written off.</p>	<p>19(i) Monthly measured Over Burden as per measurement done by colliery survey team shall be considered as firm reported figure of OB removal for the month.</p> <p>(j) In case of overburden removal, variation shall be determined by comparison with the firm reported quantity with quarterly / half yearly / annual measurements. The permissible tolerance of variation in quantity of all OB measurements shall be as follows: (i) (+/-) 5% for OB < 2.5 Lcum per quarter; (ii) (+/-) 3% for OB 2.5 Lcum to 12.5 Lcum per quarter. (iii) (+/-) 2% for OB >12.5 Lcum per quarter.</p> <p>(k) During the OB measurement, so long the variation is within the slab of permissible limits, no action is required to be taken.</p> <p>(l) In case of variation in OB measurement in quarterly / half yearly / annual measurement is found beyond the slabs of permissible tolerance, reason for the variation shall be enquired and identified by a departmentally constituted committee at subsidiary HQ level to fix up responsibility and action shall be taken in accordance with the recommendations of this committee.</p> <p>(m) This permissible tolerance, is being considered as measurement tolerance due to instrumental error, error due to measurement of irregular volume and human error etc., and should not be written off.</p>

OB Measurement Report submission by CMPDI

- It has been made mandatory to submit OB Measurement report within 15 days of measurement by CMPDIL