



सत्यमेव जयते



भारत सरकार / Government of India  
श्रम एवं रोजगार मंत्रालय / Ministry of Labour & Employment  
खान सुरक्षा महानिदेशालय / Directorate General of Mines Safety



DGMS (Tech.) Circular No. 05 of 2020, Dhanbad, dated 24.02.2020

To

All Owners, Agent, and Managers of Oil/Gas Mines.

**Subject: Safe Conduct of Drilling and Production operations in Oil & Gas Mines.**

Recently, there has been a spate of several fatal/serious accidents in oil/gas mines/installations, caused mainly due to sudden ignition/fire of surcharged HC gas cloud in the area. While the enquiry into these accidents revealed several shortcomings as the root cause, there still appeared many areas for enhancing work-procedures to completely avoid such accidents.

Accordingly, the matter was discussed with various senior representatives from various oil/gas mines, OISD in addition to officers from DGMS, for evaluating risk factors associated with such operations in oil & gas mine(s) by on-site examination and study of various procedures in vogue, measures & type of safety features/equipments in use during various processes of production & drilling operations. Subsequent to holding detailed deliberations and discussions with various stake holders, the following guidelines are framed for ensuring safe conduct of drilling and production operations in oil/gas mines.

**A.1 - General:-**

1. In every mine, personal Supervision of the mine or part of the mine shall be exercised by the Manager at least once in every week to see that safety in every respect is ensured. He shall also ensure to carry out at least one inspection of complete installation at every new location. Of these inspections, one at least in every fortnight shall be made during the night shift.
2. Every company shall have defined HSE Policy for the hiring of services. The technical qualifications as well as competency of the persons to be employed by the hiring agencies shall be evaluated before deployment.
3. The qualifying criteria based on HSE policy or standards/guidelines of the company for hiring of services and/or equipment/Rig, etc. shall be framed by the Owner/Agent/Manager before awarding the Contract.
4. Qualification and competency of all contractual persons employed or to be employed in the mine shall be evaluated by the board constituted by the management (i.e. owner/Agent/Manager) of the mine, who shall be persons

who are not connected with imparting of training, provided that the training officer may be co-opted in the board as observer.

5. In case of well-defined sequential procedures involving multiple operating groups at any given work site, a system of obtaining electronic permits/clearances for the sequential operations, shall be installed and also implemented to effectively preventing bypassing the sequence, thereby avoiding cropping-up of hazards as a consequence.
6. It shall be ensured that persons deployed within 30 m of any tank, separator, oil well, oil/gas manifold in the installation including Zone-2 hazardous area(s), do not carry/possess mobile phones and electronic device, cigar, cigarette, biri/other smoking apparatus or any match or kind which is capable of producing a light, flame or spark, except intrinsically safe apparatus or such device which are housed in a flame proof enclosure.
7. It shall be ensured that the entire process area and/or drilling area is kept under intrinsically safe effective CCTV surveillance to monitor all operations closely. Recording of all such surveillance shall be stored for a period of at least 30 days. Before deleting the data, it shall be examined for unsafe act/practice. If any abnormality is observed, the same shall be rectified and recorded in a bound paged book kept for the purpose.
8. Record of every inspection, testing, examination of any apparatus, equipment, controls, machinery, system or any part of the installation shall be maintained in the bound paged book kept for the purpose. The record shall be signed by the person(s) making such inspection, testing, and examination and be countersigned by the installation Manager/Dy. Manager/ Manager.

#### **A.2 -General (Machinery & Equipment):-**

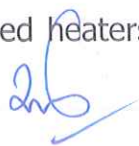
9. In an area where flammable gas concentration is found or likely to contain in excess of the limit as specified in Regulation 95(2) of the Oil Mine Regulations 2017 (OMR-2017), the area shall be cordoned/fenced off and no person shall enter into such area. Provided that only competent person with all provisions of life saving rescue apparatus and equipment may be allowed to enter into such area(s) for the purpose of detection and control, subject to the condition that the flammable gas concentration does not exceed the lower limit of explosion. Any vehicle/internal combustion engine without air intake shutoff valve, spark arrestor and without proper insulation of exhaust pipe, catalytic convertor & such other hot components of the equipment shall not be allowed in such area.
10. All machinery and equipment deployed in the mine shall be inspected at least once in a week by the competent person (s) appointed for the purpose to ensure its safe working and also to ensure that machinery being maintained as per OEM guidelines and strictures and statute of Oil Mines Regulations, 2017. Record of all such examination shall be kept maintained at the site.
11. Where compressed air operated starter of IC engine is not provided, the starter and the battery shall be housed in flame proof enclosures.
12. It shall be ensured that suitable protective systems, such as automatic fire detection and suppression system (AFDSS), engine coolant temperature

sensor, engine oil pressure gauge, over heating tripping system and exhaust manifold and turbo charger guards, are provided and maintained on every IC engine. It shall also be ensured that the exhaust of every IC engine including exhaust pipe, muffler/ silencer, are adequately insulated/protected to prevent contact with inflammable fluids.

13. At every new location, before commencement of production/drilling activities, a pre-commissioning audit of all the equipments shall be carried out by a HSE team and the deficiencies, so observed shall be rectified before commencement of production/drilling activities. A record of the same shall be kept available at the Installation for reference and shall be produced to the Inspecting Officer, whenever required.
14. Diesel engine of fixed/mobile vehicles used in hazardous area shall be provided with a readily accessible air intake shut off valve, in addition to the remote controlled provided where a diesel engine is located within 30 m of a well as per the Regulation 97(3)(a) of OMR, 2017.

### **B.1 - Production Operations (On-site Requirement):**

15. The abstract of operating instructions, emergency shutdown (ESD) procedure, ESD Trip set pressures shall be displayed / made available in the control room and near all important operating equipment in local language or language known to majority.
16. A system for continuous monitoring and detection of hydrocarbon gas with alarm system shall be provided and maintained at production manifold, gas injection manifold, gas separator/scrubber area, all fired heaters areas including heater treater, bath heater, indirect heater areas, flare knockout drum area and other areas as determined by manager for the purpose. In addition, monitoring by portable spot gas detection system on hourly basis or at shorter intervals as may be decided by the manager shall be carried out and a record of such monitoring/detection by portable spot gas detection system shall be kept in register kept for the purpose and shall be signed and dated by the person making the measurement and countersigned by the Installation Manager. In case of the continuous monitoring and detection system, the measured reading for at least 30 days shall be kept in distinct non-editable electronic form.
17. Intrinsically safe internal communication system, like paging, walkie-talkie & mobile phones shall be provided at strategic locations for the purpose of effective communication.
18. An Alarm Management System shall be established to ensure that all the alarms are monitored, analysed, segregated and acted upon so that all the operational parameters are well within the permissible limits.
19. Pneumatic or electronic operated Emergency shutdown (ESD) valve to shut off fuel/gas supply in fired heaters, heater treater and bath heaters for quick response, in case of any emergency, shall be provided and maintained.
20. Exhaust pipe of any burners (fired heaters, heater treater, bath heater, etc) shall be thermally insulated.



## **B.2 - Production Operations (Pipelines):**

21. Detailed Layout plan(s)/part plan(s) of all pipelines & their network, connected to production Installation showing clearly the size, length, identification code & purpose, shall be prepared on a suitable scale, maintained and kept available at the mines in addition to the plans maintained under Regulation 9(1) of the OMR-2017. The plan shall be accurate and updated whenever any pipeline is laid/replaced/removed.
22. Records of pipeline data, containing design data and as laid drawings shall be maintained at respective Installation. Operating conditions of pressure /temperature and dozing shall be prepared for each and every pipeline with suitable controls.
23. It shall be ensured that persons engaged in operation and maintenance possesses adequate knowledge and experience to ensure functioning of the pipelines in a safe and efficient manner.
24. If a pipeline system is de-rated to a lower operating pressure in lieu of repair/ replacement or reduction in pipe wall thickness, the new MAWP (Maximum Allowable Working Pressure) shall be determined.
25. Records of all operational activities for pipelines shall be kept and maintained. All pipelines operations & maintenance including detection of leakage, repair, laying and replacement shall be carried out by the person authorised for the purpose under the supervision of an official/ competent person(s), carrying adequate safety devices including portable gas detector and arrangement of Fire Fighting.
26. The persons engaged in operation shall maintain vigilance for detection and control of any leakages. At least three portable gas detectors, duly calibrated, shall be kept available and maintained at Installations to monitor the leakage.
27. Any reported leakage of any pipeline shall be immediately investigated/ examined by competent person(s) authorized for the purpose and report of all such examinations and repair carried out thereafter shall be recorded in a bound page book.
28. Persons likely to be affected shall be made aware about the hazards associated with the Hydrocarbon pipeline(s) and suitable measures to be taken in case of observance of oil/gas leakages, at periodic/regular interval.
29. The fire-fighting arrangements shall be made and kept readily available for immediate use while detecting and repairing of hydrocarbon leakage.
30. Sections in pipelines where probability of water and / or solid accumulation is more shall be identified and flagged. Such identified sections that are predicted to have highest susceptibility to accumulation of corrosion causing substance and for longest residence time shall be assessed to have highest likelihood of occurrence of internal corrosion.
31. If there is high number of leakages in the pipeline, then the pipeline shall be replaced on priority.

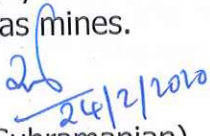
32. On the basis of analysis of pipe line survey/measurement results, the competent person authorized for the purpose shall declare a pipeline, whether it is 'fit for use'. The period of further use of pipeline after every such test shall be clearly mentioned in the report. The residual life of all pipelines arrived/based on recommended practice shall explicitly be recorded in terms of years & months.
33. Non-destructive Testing of all Pipeline(s) shall be carried out to detect cracks, fissures, metallurgical degradation besides physical deterioration such as loss in thickness, pitting etc. Ultra sonic/Non-destructive Testing of pipe wall thickness measurement shall be carried out for both underground as well as above ground pipeline sections once in every five years and records thereof shall be maintained. The frequency of Ultrasonic Test inspection shall be increased as determined by the manager depending upon the pipeline condition, leakage history and criticality of operation.
34. Valves on flow pipelines shall be tested and serviced once in every year in in-situ condition to ensure in safe working order.
35. Calibrated pressure gauges & Pressure relief valves of each type used in mine shall be kept readily available in spare in adequate numbers.
36. After Bean Pressure(ABP) of flowing wells shall be monitored on daily basis. If there is any abnormal reduction or increase in ABP, investigation shall be carried out to ascertain the reason for the same and corrective measures shall be taken.
37. Standing operating Procedures for rig-less logging of the well shall be prepared and implemented to ensure safe operations.
38. Non- destructive testing & structural stability test shall be carried out for installation structure(s) including flare structure which are susceptible to stress, corrosion and fatigue once in every five years.
39. All equipment, plant, machinery and facilities system which are no longer in use shall be taken out of service with all hazardous fluid removed from the system.

### **C. - Drilling Operations:**

40. Detailed layout plan, on a suitable scale, of all the production/injection pipelines, power cables and any other line connected with any production facilities shall be prepared and kept available, in addition to the plan maintained under Regulation 9(1) of the OMR,2017 and a copy thereof shall be provided to concern Installation Managers of the drilling & production operations.
41. Rig transportation, rigging-up and rig-dismantling operations shall be carried out under the constant and close supervision of official authorized by the manager for the purpose.
42. During rigging-up and rig-dismantling operation, a suitable arrangement for anchoring of safety belt and/or other suitable fall prevention devices, like mobile elevating work platform, shall be provided.

43. In case of drilling activity inside an installation/at cluster location, prior to movement of the rig, detailed risk analysis shall be carried out to determine the additional risks that may arise due to drilling rig related activities.
44. In a cluster well location, the drilling rig and equipment shall be suitably placed at safe distance from a production/injection wells, X-mas trees, flow lines and injection lines to carry out drilling activities in safe & efficient manner and protected to prevent from damage due to fall of material during rig transportation, rigging-up and rig-dismantling operations.
45. Procedure for handing over/taking over including intervening activities of well shall be documented.
46. Tubing tongs with proper locking arrangement shall be provided for making and breaking of tubing connections.
47. A gas detector or explosimeter, connected to audio visual alarm near the driller's stand, shall be provided and maintained at the riser mouth in addition to the detector provided at shale shaker.
48. Pressure gauges of hydraulic power tongs shall be provided at driller's stand for monitoring, in addition to that provided at substructure of the rig.
49. It shall be ensured that every draw works is provided with fail safe braking system, so as to get automatically applied in case of any pneumatic/hydraulic component failure.
50. Care shall be taken for ensuring that various SOP's made in connection with drilling operation shall be in accordance with OMR 2017 and relevant OISD standards and guidelines issued from time to time.

All Owners, Agents and Managers of the oil mines are therefore, advised to strictly comply with the aforementioned guidelines for enhanced safety in their respective oil/gas mines.

  
24/2/2020  
(R. Subramanian)  
Chief Inspector of Mines and  
Director General of Mines Safety(O).