### SOP for Movement of multi-axle long trailers in mine premises

### with or without heavy & oversized loads

**Purpose**: This **Standard operation procedure** forloading & unloading ofmulti-axle long trailers (hereinafter called trailer) and their movement within the mine premises, whether carrying heavy & over-sized loads or not, establishes a system of work, also fixing responsibilities, as to minimize potentiality of any injury to any person or damage to equipment or property during its loading & unloading operation or its movement.

Trailers are frequently used to transport heavy & oversized loads/equipment/structural components from the manufacturer’s/supplier’s end to the mine, as well as for shifting fixed-plant machinery, equipment, and crawler mounted HEMM within the mine. Potential Risks involved with loading & unloading trailers and their movement inside the mine could be –

* Fall or toppling of the oversized consignment, heavy load, equipment, machinery, or HEMM during loading & unloading operations due to failure of crane/lifting equipment’s structure or its boom, lifting rope, lifting gear (like hooks, shackles, slings, chains, and other attachments/fittings) due to overload, dynamic loading or poor upkeep, thereby causing injury or fatality to persons and/or damage to equipment/property,
* Fall or toppling of the oversized consignment, heavy load, equipment, machinery, or HEMM during loading & unloading operations due to its improper placement on the trailer thereby causing injury/ fatality to persons and/or damage to the equipment/property,
* Toppling of self-propelled HEMM during its loading or unloading onto the trailer due to failure of the access ramp/ramp structure thereby causing injury/ fatality to persons and/or damage to the equipment/property,
* Toppling of the oversized consignment, heavy load, equipment, machinery or HEMM during transport due to improper placement or the load being inadequately secured, thereby causing injury/fatality to persons and/or damage to the equipment/property,
* Loaded trailer failing to negotiate steeper gradients, sharp bends & corners, etc., consequentially causing risk of rolling back and injury/fatality to persons and/or damage to the equipment/property,
* Obstruction to the traffic on the haul road due to wider width of the trailer or its consignment/load and slow movement of the trailer, which in turn may give rise to a risk of traffic-related accidents, thereby resulting in injury/fatality to persons and/or damage to the equipment/property,
* Trailer getting out of control during down-gradient travel which in turn may give rise to a risk of the toppling of the trailer and/or its consignment on the haul road, thereby causing injury/fatality to the driver and/or damage to the equipment,

The above incidents are unwarranted with a view to ensuring life & safety of persons employed in the mine and the safety of equipment, as also to fulfill the Company’s OHSE policy of “Zero Harm”. This SOP lays down guidelines, also incorporating stipulations as prescribed by the Metalliferous Mines Regulations, 1961, as well as directives of Bye-laws, Orders, Circulars, Notifications & Permissions/Relaxations, framed, issued or granted there-under by DGMS from time to time, and shall be strictly complied with.

1. Loading & unloading of any trailer and its movement within the mine premises shall be done under a **system of a Permit** and **under personal supervision** of a competent person authorized for the purpose.

**Responsibility: Manager, Engineer (Mines), Safety Officer**

1. The trailer **shall not be loaded or unloaded** near transmission lines, near sumps or in the vicinity of water bodies, over soft ground conditions, in restricted space, and in adverse weather conditions,
   1. All stipulations of the **SOP on “crane operation & lifting of heavy loads”** in so far as design, construction, examination & maintenance, and operation of cranes & lifting equipment; and design, construction, testing, examination & maintenance of lifting gears; are concerned shall be adhered to.
   2. A **lifting plan** for loading & unloading of heavy loads onto the trailer shall be prepared by the competent person authorized for the purpose which shall be duly approved by Engineer (Mines) before undertaking any such work.
   3. The lifting plan shall outline processes & procedures and safeguards to be taken *vis-a-vis* the risks associated with the job and may call for –

* Work area barricading and putting up of warning notices,
* Restricting access of persons around the area of operation of the crane,
* De-energizing electrical transmission lines, if any, in the vicinity,
* Assessing the lifting requirements in terms of not only the load but also in terms of the vertical lift and horizontal displacement,
* Use of the appropriate crane which should have SWL/WLL commensurate to the load at the operating angle of the boom. **Use of multiple cranes/lifting equipment in tandem shall be avoided to the possible extent.**
* Ground conditions – which may require levelling and compaction to obviate risk of crane or the trailer toppling or digging in into the ground,
* Space requirement - whether the crane has enough area around to swing/ move. Restricted space would mean increasing boom angle which in turn shall reduce the SWL/WLL of the crane.
* In the proximity to water bodies like sumps, etc., the ground conditions are likely to be soft increasing the risk of the crane/trailer digging into the ground or toppling,
* Communication requirements, especially if the job is to lifted and placed in an area where the operator does not have a direct view,
* Weather conditions - strong winds are likely to cause dynamic loading of the boom and thus bad weather conditions should be avoided,
* Competency requirements for operation of the crane and the trailer.
  1. A pre-start check shall be performed on the crane/lifting equipment before operating the machine or undertaking any operation connected with lifting. Crane(s)/lifting equipment found defective shall not be used until the same has been remedied.
  2. All lifting gear like wire ropes, slings, chains, hooks, shackles, and other fittings/ attachments used in connection with lifting shall be checked for their tagging & rated load, and shall also be inspected & examined to ensure that they are safe for use. Faulty lifting gear including shackles, hooks and slings will not be used and shall be removed from the site immediately.

**Responsibility: Engineer (Mines) & Supervisor Authorized**

3.0 The trailers used for transport of heavy loads/HEMM, including one’s entering the mine carrying consignments from manufacturer’s/supplier’s end shall be fitted with following safety devices, which shall be checked by a competent person authorized for the purpose before the trailer is deployed or allowed inside the mine’s premises -

* Cabin guard extension or secured operator’s cabin
* 3-point support access to the operator’s cabin
* Ergonomically designed and adjustable operator’s seat
* Seat Belt & seat-belt reminder, including on helper’s seat
* Rear view & blind-spot mirrors on either side
* Propeller shaft guard
* AFDSS or Portable Fire Extinguisher
* Key operated ignition/self starter
* Horn/audio alarm
* Audio Visual Reversing Alarm and Rear Vision Camera
* Side indicator lights and hazard warning light
* Indicator to show Fuel tank status
* Front, tail & rear floodlights and flashing lights over the driver’s cabin
* Retro-reflective tape/paint on all sides
* Fail-safe Service brake, Emergency Brake & Parking brake
* Exhaust controlled or other suitable Retard Brake
* Properly inflated tires that are not worn out
* Wooden Chocks chained to trailer body above/close to its axles to block wheels if the trailer gets stalled or is parked or stopped on gradient
* Such other additional features as may be desired by the Mines Manager

3.2 The trailer shall have a valid Registration certificate and Fitness certificate issued by the State transport authority, also showing the rated capacity of the vehicle.

3.3 The rated capacity of the trailer used in connection with the transport of heavy load/ consignment/HEMM shall be commensurate with the load being transported as also to the gradient of the road which the trailer needs to negotiate during transport.

3.4 The driver shall possess a requisite and valid driving license issued by the State transport authority. The identity of the driver shall also be cross-checked from the Aadhaar card or any other identity card issued to him.

3.5 Trailer drivers under rolls of Mine Operator/MDO shall be duly authorized by the Manager after imparting them competency-based training, including on this SOP.

**Responsibility: Engineer (Mines) & Supervisor Authorized**

4. Cranes/Lifting equipment shall be operated by operators duly authorized by the Manager after imparting them competency based training, including on this SOP. Assistants, if any, engaged in assisting loading & unloading operations shall also be imparted competency based training and shall be authorized by the Manager.

* 1. The crane operator shall sound a warning before starting the machine and on every occasion when it is necessary to alert workers nearby.
  2. A proper communication between the operator and the supervisor & ground-staff from where the load is being lifted shall be ensured. To the extent possible, the operator shall have a clear view of the job right across the entire lift as well as placement.
  3. It shall be ensured that none remains below the suspended load or within the swing range of the boom when loads are being lifted. Only such number of persons, as may be required for the purpose, shall remain within the lifting zone.
  4. The crane/lifting equipment shall not be operated at a capacity in excess of its Safe Working Load and in case of cranes having a boom which can move in a vertical plane, at load not exceeding the limit specified for that angle. The boom angle shall not be changed once the load has been lifted, whereby it’s safe working load may change/reduce.
  5. In case a self propelled HEMM is to be loaded on the trailer, it shall be ensured that the access ramps to the trailer are of adequate width and strength as to prevent toppling of the HEMM during its loading onto the trailer.
  6. Experienced operator will be deployed for the purpose, who shall ensure that the boom/bucket arm of the HEMM is kept as close to the ground as possible so as not to disturb the equipment’s stability during its way up onto the trailer.
  7. The load or the HEMM shall be centrally placed onto the trailer platform as not to disturb its stability during transport, including whilst negotiating bends & corners along the route.

**Responsibility: Supervisor Authorized & Crane Operator**

1. The lifted load or the HEMM, once loaded onto the trailer shall be secured tightly to the trailer platform by means of an adequate number of lanyards, chains, wire ropes, slings, and stop blocks so that it cannot move from its position during movement of the trailer.

5.1 All lanyards, wire ropes, slings, chains and their hooks, shackles & other fittings/ attachments used in connection securing the load/HEMM onto the trailer platform shall be checked for their tagging & rated load, and shall also be inspected & examined to ensure that they are safe for use. Defective lanyards, wire ropes, slings, and chains shall not be used and shall be removed from the site immediately.

5,2 In cases where a consignment(s) loaded onto the trailer is received at the mine, a competent person authorized for the purpose shall inspect at the entry gate all lanyards, wire ropes, slings, chains, and their hooks, shackles & other fittings/ attachments used in connection securing the consignment onto the trailer platform to ensure that they are in good condition and shall also check for their tightness.

**Responsibility: Supervisor Authorized & Competent Person**

6. Before the trailer loaded with consignment is allowed inside the entry gate, or the trailer loaded within mine premises is allowed to move, a competent person shall physically inspect the transport route for road width, road gradient, sharp turns/ corners/bends as well as for obstructions, including those posed by overhead electric/power transmission lines and overhead pipes to ensure that the loaded trailer can safely pass through.

6.1 In no case shall the trailer be allowed to move on roads having a gradient steeper than 1 in 16 or as prescribed in the trailer’s manual, whichever is less.

6.2 Corners/bends shall be commensurate to the turning radius of the trailer and in case they do not conform to the requirements, the bends/corners shall be dressed down.

6.3 Road surface shall be kept & maintained dry (to obviate the risk of tire-skidding) and free of potholes & obstructions.

6,4 The overhead power/transmission lines crossing the haul route shall be de-energized following the SOP as prescribed for LOTO, and in case the loaded trailer cannot pass through underneath such power/transmission line(s) they shall also be dismantled. Trailer shall in no case be allowed to pass underneath charged or live overhead power/ transmission lines, irrespective of the clearance.

6.5 If the loaded trailer cannot pass through underneath overhead pipelines/structures cutting across the transport route, such structures and pipelines shall also be dismantled after shutting the flow of the media being conveyed through them

**Responsibility: Engineer (Mines) & Supervisor Authorized**

7. Before the trailer is moved or let inside the mine, all traffic, including that of light vehicles, across the entire transport route of the trailer shall be stopped. Guards shall be physically posted at either end and at all points where other roads merge with the transport road, to stop any vehicle entering the transport route of the trailer. The traffic shall also remain suspended when the empty trailer is moving out after unloading operations are completed.

7.1 If the trailer movement is a planned event, it shall be done on an “off day” when operations in the mine remain suspended, and under prior Notice (notifying the time too) to all concerned.

**Note:** Mostly trailers are not only long but are also wide and thus the mine roads designed for dumper/tipper-truck traffic may not suffice for 2-way traffic with trailers moving on it. Further, trailers shall be moving at a very slow speed, which in turn will entail frequent overtaking by other vehicles using the road, thus giving rise to conditions that may result in head-on collisions with the oncoming traffic. **Traffic on the transport route of the trailer shall thus remain invariably suspended so long the heavy load is being moved by trailer and during movement of the empty trailer as well.**

7.2 The trailer, including the empty trailer moving out after unloading, shall be escorted within the mine-premises by escort vehicles with flashing lights at the top or red flags prominently displayed with a mobile public address system. One escort vehicle shall immediately lead the trailer & the other shall follow immediately behind it, to warn passer-byes and likely trespassers, if any.

7.3 The escort vehicle will be manned by a competent person(s) duly authorized for the purpose. In case any trespasser/trespassing vehicle is found along the transport route, it shall be directed to the station/park well away from the trailer’s path. The escort vehicle following the trailer shall ensure that the path of any trespassing vehicle, which may try to overtake the trailer, remains physically blocked. The authorized escorts shall note the details of the trespassing vehicle(s) and pass the same to the Manager for initiation of disciplinary action.

7.4 No person, other than the authorized helper of the trailer driver, shall ride in the trailer’s cabin or at the back of the trailer, including in the operator’s cabin of HEMM, should such HEMM be under shifting.

7.5 Trailers shall move at a speed not exceeding 10/15 Km/hr ***(may be decided by the Manager depending on road condition & gradient)***. Code of traffic rules framed by the Manager shall strictly be adhered to during the movement of the trailer within the mine premises.

7.6 The trailer driver shall drive the vehicle defensively, in proper gear, and without undue aggression. He shall use retard brake during down-gradient travel to keep the vehicle under control. In case the trailer is not able to negotiate any bend/ corner or steep gradient, the trailer shall be immediately put on the emergency brake and the wheels shall subsequently be choked by the helper by wooden chocks chained to the trailer platform.

**Responsibility: Asstt. Manager, Engineer (Mines), Supervisor/**

**Competent Person(s) Authorized & Trailer Operator**

8 On completion of the work, the permit shall be signed off by the Supervisor authorized, and the person(s) notified to stop traffic along the transport route of the trailer shall be informed as to allow resumption of normal work.

**Responsibility: Engineer (Mines), Supervisor Authorized**

9. Competency-based training, including on the SOP frame, shall be imparted to all operators, competent persons, supervisors & officials (including of MOs/MDOs), and all others concerned with the loading & unloading of trailers and their movement in the mine. A record thereof shall be kept maintained at the mine

**Responsibility: Manager, Safety Officer & VTO**

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