1.0 Objective:
This code has been prepared to provide guidelines & the minimum acceptable mandatory requirements to develop and maintain Safe method of Transportation of material by Heavy vehicles such as Truck, Trailer, Dumper, etc and the associated hazards as mentioned in 3.2.

2.0 Scope:
This code provides guidelines & the minimum acceptable mandatory requirements to develop and maintain Safe method of Transportation of material by Heavy vehicles such as Truck, Trailer, Dumper, etc. and it also ensure safety involving movement of all size of vehicles, mobile machinery, forklift & engineering equipments.

3.0 Procedure:
3.1 Risk assessment
3.1.1 Line Manager should identify the risks associated with the activities and possible danger involved & what is causing those dangers. For example, could someone be hit by a moving vehicle? Could someone fall from a vehicle, e.g. while getting in or out, or during loading or unloading? Or be hit by an object falling from a vehicle? Could a vehicle tip over?

3.2 Identification of Associated Hazard
3.2.1 Here some associated hazards are identified which can cause danger during transportation:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Materials</th>
<th>Mode of Transportation</th>
<th>Types of Vehicle Used For Transportation through Road</th>
<th>Associated Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Raw Materials</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Iron Ore</td>
<td>Road, Rail, Conveyor</td>
<td>Dumper, Truck,</td>
<td>Falling of material, Spillage, Dust,</td>
</tr>
</tbody>
</table>

Page 1 of 38
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>1.2</td>
<td>Coke, Coal</td>
<td>Road, Rail, Conveyor</td>
<td>Dumper, Truck, Tipper Trailer</td>
</tr>
<tr>
<td>1.3</td>
<td>Lime</td>
<td>Road, Rail, Conveyor</td>
<td>Dumper, Truck, Tanker</td>
</tr>
<tr>
<td>1.4</td>
<td>Sinter</td>
<td>Conveyor</td>
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</tr>
<tr>
<td>1.5</td>
<td>Flue Dust</td>
<td>Road</td>
<td>Dumper, Truck</td>
</tr>
<tr>
<td>1.6</td>
<td>Hot Metal</td>
<td>Road, Rail</td>
<td>Camag Car, Hot Metal Ladle Vehicle</td>
</tr>
<tr>
<td>2.0</td>
<td>Finished Product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Slab</td>
<td>Road</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.2</td>
<td>Billet</td>
<td>Road</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.3</td>
<td>Coils</td>
<td>Road</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.4</td>
<td>Sheet</td>
<td>Road, Rail</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.5</td>
<td>Bar</td>
<td>Road, Rail</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.6</td>
<td>Wire</td>
<td>Road, Rail</td>
<td>Trailer</td>
</tr>
<tr>
<td>2.7</td>
<td>Rod</td>
<td>Road, Rail</td>
<td>Trailer</td>
</tr>
<tr>
<td>3.0</td>
<td>Miscellaneous</td>
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<tr>
<td>3.1</td>
<td>Supply Material</td>
<td>Road</td>
<td>Dumper, Truck</td>
</tr>
<tr>
<td>3.2</td>
<td>Refractory Material</td>
<td>Road</td>
<td>Dumper, Truck</td>
</tr>
<tr>
<td>3.3</td>
<td>Sand</td>
<td>Road</td>
<td>Dumper, Truck</td>
</tr>
<tr>
<td>3.4</td>
<td>Bricks</td>
<td>Road</td>
<td>Dumper, Truck</td>
</tr>
<tr>
<td>3.5</td>
<td>Slag</td>
<td>Road, Rail</td>
<td>Dumper,</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Vehicle Type</td>
<td>Result</td>
</tr>
<tr>
<td>---</td>
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<td>------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>3.6</td>
<td>Granulated Slag</td>
<td>Dumper, Truck</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.7</td>
<td>Scrap Uneven</td>
<td>Dumper, Truck, Trailer</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.8</td>
<td>Scrap Mill</td>
<td>Dumper, Truck</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.9</td>
<td>Descale of Tundish</td>
<td>Dumper, Truck, Trailer</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.10</td>
<td>Pig Iron Scrap</td>
<td>Dumper, Truck</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.11</td>
<td>Biodegradable Scrap</td>
<td>Dumper, Truck</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>3.12</td>
<td>Coal Tar</td>
<td>Dumper, Truck</td>
<td>Spillage of Materials, Toppling, Dashing, Collision, Break Down</td>
</tr>
<tr>
<td>4.0</td>
<td>Chemical &amp; Gases</td>
<td>Tanker, Truck, Container</td>
<td>Spillage of Materials, Toppling,</td>
</tr>
</tbody>
</table>
3.3 Responsibility:
   i) Line Management
   ii) Transporters/Contractor/Suppliers/Vendors/Customers/ User department

3.4 Responsibility of Management:

3.4.1 Develop and ensure implementation of Transportation Safety Standards.
   i) To ensure that this standard is made available to and understood by all transporters/Contractor/Suppliers/Vendors/Customers/ User Department.
   ii) To ensure that Transporters /Contractor/ Suppliers/ vendors/customers/ User Department are appropriately trained to transport materials.
   iii) Investigate thoroughly all motor vehicle incidents and collisions.
   iv) Recognize and reward excellence in motor vehicle operations and in safe transportation skills.
   v) Audit of loading, unloading, transportation of material and audit of fitness of vehicles as per check list on an established frequency.
   vi) All concerned party should be informed about the hazards prevailing while transportation of material in general and specific.

3.4.2 Responsibility of Contract Owner:
   i) To provide direction & coordination related to vehicle movement in his work area.
   ii) To ensure that the vehicle is fit & road worthy and is driven by the authorized personnel only in his work area.
iii) To ensure traffic management for safe movement of vehicles in his work area.

iv) To carry out audit of vehicles and mobile machinery and stop the use of faulty vehicle when it is deemed necessary.

v) To ensure all vehicles & mobile machinery working under his work area are registered with Security.

vi) To ensure contractor is briefed with guidelines of Safe transportation before performing any work.

vii) To report and / or to lead for investigation of near miss and / or accident at their work area.

viii) Ensure that no driver under influence of alcohol or drugs enter the Plant Premises.

3.4.3 Responsibility of Transporters/Contractor/Suppliers/Vendors/Customers


ii) Comply with driving laws and regulations both inside and outside works guided by Authorities.

iii) Ensure adequate and appropriate defensive driving safety training has been received and successfully completed.

iv) Report all incidents and collisions to concerned line managers of department or Safety Office and keep record.

3.4.4 Responsibility of Driver / Operator:

i) To adhere all rules & regulations, and Safe work procedures whilst operating the vehicles and mobile machinery.

ii) To conduct daily inspection of vehicles & mobile machinery once in a shift as per check list made available by line management.

iii) To ensure all loads are tied and securely transported.

iv) To ensure all unattended vehicles and mobile machineries have the handbrake or emergency brake applied & Scotch block provided under the wheel to avoid roll down.

v) Driver carrying hazardous material must carrying tremp card/ MSDS.
vi) To inform and request to line management / contractor for repair of any fault or deviation observed.

vii) To inform all incidents and near miss to line management / Contractor.

viii) All drivers & Operators must observe the Safety of other road user also.

### 3.5 DEFINITIONS

i) **Heavy Motor Vehicle:** Any goods carriage the gross vehicle weight of which or a tractor or a road roller the tare weight of either of which exceeds 12 Ton.

ii) **Projected Materials:** Any over dimensional consignment which are of extra ordinary dimensions and tonnage.

iii) **Side Projection:** Any load which is project more than 150 mm over the sides of the trailer, and must not be more than 2.5 meters in total width.

iv) **Rear Projection:** Any load projected more than 1.2 meters over the rear side of the trailer. If measured from the centre of the trailer axle or axle group, a load must be Not more than 3.7 meters, and not longer than the length of the load in front of the axle, or axle group.

v) **Height Projection:** The height of the materials should not exceed above the height of the Vehicle cabin.

### 3.6 REGULATORY REQUIREMENTS

3.6.1 All Transporters/Contractor/Suppliers/vendors/customers must follow all government laws and regulation concerning driving, including

i) Alcohol/illegal drug prohibitions.

ii) Having a valid vehicle pass, driver’s license or permit to operate the vehicle being driven.

iii) Obeying all traffic signage and regulations.

iv) No loose clothing and improper Personal protecting Equipment’s (PPE).

3.6.2 **Painting of vehicle registration number:**

Registration number of motor vehicles must be marked as per the guide-lines of Central Motor Vehicle Rules, 1989.

3.6.3 **Motor vehicle records**

The Factory/ Department/Division must keep a record of heavy vehicles of Transporters /Contractors / Suppliers / Vendors /Customers operating under the specific department.

3.6.4 **Driver Training:**
Drivers must undergo defensive driving training as appropriate to their levels of use. Line managers must organize training in regular interval for their heavy vehicle’s driver operating under their department.

3.6.5 Safe driving audit:

Each Department/Division/other locations may establish and ensure a Transportation audit schedule. It must be carried out at loading, unloading, parking, and during movement of the vehicles inside as well as outside the plant. All collisions or incidents shall be reported to line management and the safety department promptly (e.g., within 24 hours).

3.7 HUMAN:

3.7.1 General Safety Requirement for Heavy Vehicle Drivers

3.7.1.1 Following are some safety requirements for Heavy Vehicle Drivers:

i) Do not drive vehicle during the restricted hours of the respective plants.

ii) Do not allow any person to stand at foot rest or sit on the loaded material of the vehicle.

iii) Do not allow any body to get ON and OFF during running of vehicle.

iv) At all Railway level crossing follow the principle of STOP LOOK AND PROCEED.

v) Never overload the vehicle beyond its carrying capacity.

vi) Before coming out or going inside Factory, stand in queue.

vii) Before starting vehicle ensure that the material loaded on vehicle is properly secured.

viii) Never drive vehicle beyond speed limit (Please know the speed limit before entering inside Works and similarly to all out locations).

ix) Ensure about the route for destination, if not sure, ask the concern department for guide.

x) Give prior signal at least 30 meter before taking turn at right or left side.

xi) Keep a safe distance of 2 seconds to the vehicle ahead.

xii) Never sit or take rest under the vehicle or within the vicinity of 10 feet of the vehicle or at any parking place area.

xiii) While taking a turn speed should be below 10 km/hr.
xiv) When turning to the left, drive as close as to the left-hand side of the road from which the turn is being made and of the road which is being taken.

xv) When turning to the right draws as near as may be to the centre of the road and arrive as near as may be at the left hand side of the road which is being taken.

xvi) Driver of the vehicle shall not, when being overtaken or being passed by another vehicle, neither increase speed nor do anything in any way to prevent the other vehicle from passing it.

xvii) Use seat belt while driving vehicle and all the vehicles must be fitted with seat belt for all the Crew members, if allowed.

3.7.1.2 General Safety requirement for Fork Lift Operation:

i) Fork lift operation will be restricted only for in plant operation.

ii) Fork lift will not allow moving on road inside works with load.

iii) Fork lift will be operated by only authorized trained & licensed personnel.

iv) Use of seat belt is mandatory while operating Fork lift.

v) Speed of the Fork lift should not be more than 5 KM/hr.

vi) Keep arms and legs inside the Fork lift while operating.

vii) Fork lift will be used to handle only stable loads.

viii) Be careful while negotiating sharp turns with load.

ix) Load should be placed on fork in such a way that it should not block your view.

x) No person will be allowed to seat on fork lift other than operator.

xi) While operating fork lift with load, Center the load on the forks and as close

xii) to the mast as possible to minimize the potential for the forklift tipping or load falling.

xiii) Overloading a Fork lift makes it hard to control and could make it tip over.

xiv) Place the load at the lowest position for travelling.
xv) Don’t place extra weight on the rear of a counterbalanced forklift to allow an overload.

3.7.2 Safety precaution during parking of vehicle:

3.7.2.1 Every vehicle needs to be parked at parking or any other place. Driver must know that where to park the vehicle. Following precautions before parking the vehicle to be observed.

i) Do Not park the vehicle where there is “No Parking” board displayed.
   Park at designated parking place or at safer place and not on road.

ii) Do not park the vehicle in such a way that it is obstructing the movement of other vehicle or narrowing the width of road.

iii) Keep the parking light ON.

iv) Before parking please ensure that no one is at the rear side of the vehicle.

v) After parking apply the hand brake.

vi) Place scotch block under the wheel at both side of wheel.

vii) Reverse the vehicle slowly

3.7.2.2 Safety at Railway level crossing for all:

i) Stop your vehicle before crossing all railway level crossings.

ii) First look left, then right and again left before crossing Rail.

iii) Road junction Allow the loco to cross the level crossing first

iv) Do not park your vehicle near / on railway tracks.

v) Do not enter into level crossing while the drop gates are lowering down.

vi) Stop your vehicle before STOP line when the drop gate is being closed/closed.
vii) Do not cross railway tracks at any other places than specified.

3.7.3 Rules for Using Mobile Phone while driving:

i) Do NOT use mobile phones while driving, with or without accessories like hands free, wireless, headset and Bluetooth etc. as it causes distraction while driving which in turn can cause accidents.

ii) In case of emergency, one should park the vehicle at safe place and then attend the call.

3.7.4 Defensive driving method

Defensive driving is the practice of safe driving techniques. These techniques are used regardless of the actions of others or of adverse conditions created by the environment or vehicle condition. Safe driving techniques call for the driver to be prepared for a variety of potentially dangerous and often life threatening driving situations. The following things must be ensured apart from the learning of the defensive driving method.

i) Ensure the checklists that have been appended with this standard.

ii) Keep the space on either side of your vehicle free.

iii) Do not drive parallel to other vehicle except while overtaking.

iv) Always Stop, Look and Listen at railroad crossings unmanned before proceed.

v) Crash and vehicle break-down scenes

vi) If the vehicle develops mechanical or tire trouble and begins to slowdown, drive it to the side of the road as far as possible from traffic.

vii) Activate the vehicles hazard-warning lights.

viii) Switch off the ignition of immobilized crashed vehicles to reduce risk of fire.

ix) Wear High Visibility Jacket while attending the breakdown.

x) Place a hazard-warning triangle (with Reflector) to the both side of the road, 50 meters from the scene.

xi) Barricade the vehicle with red tapes.
xii) Avoid working on the traffic side of your vehicle.
xiii) Remove all the barriers and clean the oils from the road before moving ahead.

3.8 PHYSICAL

3.8.1 Vehicle Maintenance

Vehicle servicing must be performed at least according to the manufacturer’s requirements and at the appropriate time, mileage, and driving condition intervals specified in the vehicle’s operator’s manual. Record must be available with the driver.

3.8.2 Vehicle fitness

All vehicle must be fit enough to transport the specific load. Vehicle must be selected as per requirement of materials to be transported. All Vehicles must comply the mandatory requirement of Transport Authority as per attached check list.

**Check List of Heavy Vehicles (Dumper, Truck, trailer etc)**

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Criteria</th>
<th>OK</th>
<th>Not</th>
<th>NA</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Steering Bush Play (No Play)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>Steering wheel play (20-30 mm)</td>
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<tr>
<td>3</td>
<td>Rear view mirror (Physical condition)</td>
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<tr>
<td>4</td>
<td>Three Piece Mirror (left Side)</td>
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<tr>
<td>5</td>
<td>Horn (Physical condition)</td>
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<tr>
<td>6</td>
<td>Cabin door (Physical condition)</td>
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<tr>
<td>7</td>
<td>Body condition (Standard physical)</td>
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<tr>
<td>8</td>
<td>Material Body (physical condition)</td>
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</tr>
<tr>
<td>9</td>
<td>Seat Belt (Retractable Type)</td>
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</tr>
<tr>
<td>10</td>
<td>Reversing Buzzer (Audible)connected with</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Side Indicator with Audible Buzzer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Wiper Blade assembly Should be in</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Front wind Glass (Clear without scratch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Spring Pin bolt, Clamp (Looseness to be</td>
<td></td>
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</tbody>
</table>
3.8.3 General requirement to ensure road worthiness of vehicles:

i) Vehicle must be fit enough to transport the specific load. Vehicle fitness certificate must be issued by a competent person.

ii) Retreaded tyres should not be used in front wheel.

iii) Rear view mirror & three piece mirror should be fitted for clear visibility.

iv) Horn sound should be audible from at least 30 meter distance. Intensity of sound should not be more than 90 db. Presser horn should not be used in vehicle.

v) Vehicle’s cabin, cabin door, cabin door handle, material body etc should be physically in good & working condition. Vehicles having bulged body should not be used for transporting the materials.

vi) Vehicle’s number plate, parking light, side indicator, brake light etc should be cleaned at regular interval for clear visibility. Light reflecting radium tape to be past on peripheral of must.

3.9 SYSTEM
3.9.1 Safety during transportation of Materials:

3.9.1.1 Transportation of hazardous materials:
Transportation of hazardous materials/dangerous goods must be done in accordance with applicable laws and regulations. Dangerous or hazardous goods specified in column 3 Table 1 to rule 137 of CMVR 1989 must be transported as per guideline given in sec 129 to sec 137 of Central Motor Vehicle Rule 1989.

3.9.1.2 Safety during transportation of CR/HR Coils

Associated Hazards
i) Poor site layouts
ii) Fall of coils from Vehicle
iii) Height Restriction
iv) Overturning
v) Collisions
vi) Striking people and equipment
vii) Vehicle roll down

Loading/Unloading of CR/HR coils:

Do's
i) Wear personnel protective equipment.
ii) Wear High Visibility Jacket for better visibility to other crew member.
iii) No person will be on trailer during loading/unloading of material.
iv) All sticker pasting, painting of the coil will be done on ground by keeping at safe distance.
v) For positioning the coil at center of the bed, signal will be given from ground.
vi) Put scotch block under the wheel to prevent rolling down of vehicle.
vii) Vehicle will be allowed to go only after ensuring that material is properly secured and tightened.
viii) Materials to be loaded as per trailer capacity.
ix) Use proper De-shackles, Pins, Chains and Links.
x) Each Coils to be tied to trailer bed individually with two chains at an angle of 45 degree.
xi) Three chains to be used for each coils.
xii) Rubber pads to be provided for edge protection.

xiii) Drivers should sit at drivers rest point during loading of coil.

xiv) Never over load the trailer beyond Safe work load.

**Don’ts**

i) Do not cook food at in the trailer at loading/unloading point.

ii) Do not lash the coil with the hook of the bed.

iii) Do not allow crew member and others in loose clothing.

iv) No person will move under the hanging material.

v) Do not sleep / take rest in front of or below or side of the vehicles.

vi) Do not park at unauthorized parking place.

vii) Do not move here & there after placing the trailer at loading point.

**Loading/ Unloading point design/ condition**

i) Wherever possible, loading areas should be selected and designed to be flat / level. Where vehicle alignment is critical from safety point of view (e.g. when using twin hoist cranes), alignment lines must be clearly marked and the Safe Working Procedure must incorporate this requirement.

ii) The loading / unloading area design must be subjected to a full risk assessment. The loading / unloading risk assessment must consider the following attributes of the loading point:

a) **Side slope / Long slope** When loading areas are not flat / level, load stability may be compromised depending on the nature of the load. This is particularly relevant prior to load restraint being applied, or when removing load restraint prior to unloading.

b) **Road Camber**: This can have a similar effect to side slope, and needs to be considered particularly if moving loads without full load restraint.

c) **Surface condition**: Potholes, ruts and drains can have a destabilizing effect on forklifts (and any load being carried) as well as being slip/trip hazards for pedestrians.

d) **Flagmen**. Trained, competent Flag men may be used to guide and direct reversing vehicles. Where Flagmen are deployed, there must be clear rules on signals and safe positioning to avoid potential for trapping. He should always be visible to operator.
e) **Segregation of vehicles / pedestrians / other traffic.** As an alternative to Flagmen, the loading area should be segregated to prevent pedestrian access during reversing. Use of robust barriers to protect plant/equipment may be necessary.
Coils will be placed on trailers having rubber sole.
All coils are covered with laminated HDPE.
Chain lashing is done (2 coils at a time whenever 2 rows of coils are placed) with rubber pad at edges.

Covering Arrangement

Lashing Arrangement

Utilization of Galvanized Plain and CRCa Coils

Coils will be placed on trailer having rubber sole.
All the coils are covered with laminated HDPE.
Chain lashing is done (2 coils at a time whenever 2 rows of coils are placed) with rubber pad at edges.
3.9.2 Safety during transportation of Wire coil / Wire rod:

Associated Hazards:

i) Poor site layouts
ii) Fall of coils from Vehicle
iii) Opening of coil
iv) Height Restriction
v) Overturning
vi) Collisions
vii) Striking people and equipment
viii) Vehicle roll down

**Loading/Unloading of Wire coils:**

**Do’s-**

i) Wear personnel protective equipments

ii) Wear High Visibility Jacket for better visibility to other crew member No person will be on trailer during loading/unloading of material.

iii) All sticker pasting, painting of the coil will be done on ground by keeping at safe distance. For positioning the coil at center of the bed, signal will be given from ground.

iv) Put scotch block under the wheel to avoid rolling down of vehicle.

v) Vehicle will be allowed to go only after ensuring that material is properly secured and tightened. Materials to be loaded as per trailer capacity.

vi) Use proper De-shackles, Pins, Chains and Links.

vii) Coils to be tied to trailer bed with chains as shown in figure.

**Don’ts-**

i) Donor cook food at in the trailer at loading/unloading point

ii) Do not allow crew member and others in loose clothing

iii) No person will move under the hanging material

iv) Do not sleep/take rest in front of or below or side the vehicles.

v) Do not park at unauthorized parking place

vi) Do not move here & there after placing the trailer at loading point.

vii) Do not transport wire rod without providing red flag on both side of rear part.
3.9.3 Transportation of Pipes:
Specific requirement for safe transportation of pipes:

i) Pipes up to 200mm dia shall be unitized before transporting. These are normally available at 6m length. There shall be 6 straps in a length of 6.0m. The largest dimension of the bundle shall not exceed 800mm. These bundles shall be transported on trucks having full height side and back ‘dala’. The posts of the dala shall be laterally fastened at the top (sketch no. 1).

ii) Pipes more than 200mm dia shall be transported on trailer bed, without being unitized.
   a) For 6.0m long pipes, there shall be 2-chain lashings and 2 wooden dunnages.
   b) For 12.0m long pipes, there shall be 3-chain lashings and 3 wooden dunnages.

iii) Flat bed trailer shall be used for transporting pipes over long distance. Semi flat bed trailer can be used for local transportation. Semi flat bed trailers shall have 3 nos. of wooden logs in addition to the log for dunnage to make up level. (Sketch no. 2).

iv) Two types of wooden dunnage may be used on a trailer bed.
   a) Grooved Dunnage: (Sketch no. 3a and 3b).
   b) Flat Dunnage with side choker blocks: (Sketch no. 4a and 4b).

v) Pipes of 1300mm or greater diameter will be transported over steel saddles with seating arrangement as shown in sketch no. 5.

vi) Proper platform with ladder shall be used for working on the trailer bed, for placing dunnage for the pipe, for lashing and for rigging work for loading and unloading.

vii) Chain lashing of minimum 12mm φ links or web lashing of equivalent strength shall be used. With chain lashings, necessary fixtures like bracket, D-Shackles, turn buckles shall be provided. The link chain shall be tightened with turn buckle and web lashing with standard ratchet.
viii) The trailer shall be fitted with head boards to prevent injury to the driver by sliding of pipes in case of sudden braking.

ix) Height of stacking on trailer bed: No. of tiers of pipes loaded on trailer shall not be more than the no. of pipes in the bottom row. In no case the carrying capacity of the trailer shall be exceeded. Any projection of pipe beyond trailer bed shall not be allowed. Single pipe having width and/or length more than the trailer bed shall be treated as an oversized consignment and arrangement for transportation shall be made accordingly.

x) Loading and unloading of pipes shall be done using C- hooks and slings of adequate length. The C- hooks shall be anchored at the end of the pipes.

xi) The arrangement of loading, depending on diameter of the pipe is given in table: 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Diameter (mm)</th>
<th>Arrangement of loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>D=700</td>
<td>To be unstrapped and transported on truck with full height data</td>
</tr>
<tr>
<td>b.</td>
<td>200&lt;D≤1200</td>
<td>Transport on trailer bed with number of lashings as specified. Based on available width of trailer bed between number of posts as 2400mm. Following configuration may be followed:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diameter of pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>900</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1200</td>
</tr>
<tr>
<td>c.</td>
<td>D&gt;1200</td>
<td>Transport one pipe on steel saddle as given in (sketch no 5).</td>
</tr>
</tbody>
</table>

CHECK LIST-

<table>
<thead>
<tr>
<th>Posts</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
</tr>
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<tbody>
<tr>
<td>1. Are the pipes up to 700mm diameter unstrapped before transporting? Is the largest dimension of the bundle exceeding 800mm? Are the bundles being transported on tracks having full height side and back “data”? Are the posts of the data laterally extended at the top as shown in (sketch no 1)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Are 2 chain lashings and 2 wooden damages used for transporting pipes with dia more than 200mm and 6.0 m in length on trailer bed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Are 3 chain lashings and 3 wooden damages used for transporting pipes with dia more than 200mm and 12.0 m in length on trailer bed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Is proper platform with ladder being used for working on the trailer bed, for placing damages for the pipe for lashing and for rigging work for loading and unloading?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Is the chain lashing of minimum 12mm Ø links or web lashing of equivalent strength being used?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Are chain lashings provided with necessary fixtures like bracket, D- Shackles, turn</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANNEXURE-I

SIGNODE OR SIMILAR MAKE
32mm WIDE STEEL STRAP

TOTAL 6 - BANDS
2 - BANDS AT ONE END
2 - BANDS AT THE OTHER END
2 - BANDS IN THE MIDDLE

ANNEXURE-I
STRAP

TYPICAL CROSS SECTION

SKETCH NO. 01
ANNEXURE-II

**SKETCH NO. 02**

L-65X65X6 X 200 LONG
3 PIECES ON EACH SIDE
6 PIECES PER BEAM

- RUBBER PAD
  - 250mm WIDE
  - 5 mm THK.
  - BET. CHAIN & PIPE

- CHAIN LASHING

- SINGLE WOODEN BLOCK DIMENSION 'a' AS SHOWN

- ENLARGED DETAIL AT "X"

- NAILED

- 5mm GAP

- 300

- ALTERNATE ARRANGEMENT AT "X" WITH STEEL BEAM OTHER DIMENSIONS SIMILAR
ANNEXURE-III

CHAIN LASHING

RUBBER PAD
250mm WIDE
5mm THK.
BET. CHAIN & PIPE

GROOVE ON TIMBER

TURN BUCKLE

STIFF POST

TRAILER BED

70 mm MINIMUM

ROAD LEVEL

<800 mm

SKETCH NO. 3a
RUBBER PAD 250mm WIDE 5mm THK, BET. CHAIN & PIPE

CHAIN LASHING

INTERMEDIATE DUNNAGE (GROOVED TO SUIT PIPES)

≤800 mm

STEEL POST

70 mm MINIMUM

ROAD LEVEL

TURN BUCKLE

TRAILER BED

INTERMEDIATE DUNNAGE (GROOVED TO SUIT PIPES)

TIE STEEL POSTS WITH 8mm DIA. LINK CHAINS, WHEN PIPES ARE SEPARATED BY INTERMEDIATE DUNNAGE

≤800 mm

STEEL POST

70 mm MINIMUM

ROAD LEVEL

SKETCH NO. 3b
ANNEXURE-V

- RUBBER PAD 250mm WIDE 5mm THK.
- BET. CHAIN & PIPE
- TURN BUCKLE
- STOPPER BLOCK 150 HIGH X 150 WIDE X 200 LONG
- ROAD LEVEL
- TRAILER BED
- STEEL POST 800 mm
- CHAIN LASHING

7" LONG SCREW
4" LONG SCREW
"C' NAIL 8 mm DIA BOTH SIDES
ENLARGED DETAIL AT "Y"

SKETCH NO. 4a
3.9.4 Transportation of freight materials (Granulated Slag, Coal, Coke, Flue dust, Scrap etc):

Loading and unloading areas should be:

i) Clear of other traffic, pedestrians and people not involved in loading or unloading.

ii) Clear of overhead cables, pipes, or other dangerous obstructions.

iii) Level to maintain stability, vehicles should be parked on firm level ground; fenced or provided with other edge protection where there is a danger of people falling.

iv) If necessary, protected against bad weather, e.g. strong winds can be very dangerous during loading.

v) Loads should be spread as evenly as possible, during both loading and unloading. Uneven loads can make the vehicle or trailer unstable. Loads should be secured or arranged so that they do not slide around.

vi) All such materials must be transported with cover on it. In no case materials should fall on road.

vii) For transporting materials like flue dust which is hot in nature, special arrangement should be made by line management / process owner to stop spillage of materials.

3.9.5 Transportation of Projected material:

i) Check and ensure that material has been properly tied with chain and shackle
ii) Fitness of vehicle must be checked and ensured that vehicle is fit to transport such material.

iii) Measure, the dimension of loaded material, projected outside data body at all or any sides (Rear, sideward, above the driver’s cabin).

iv) Driver must know the dimension of projected material.

v) Centre of Gravity of the material must lie in the centre of vehicle to maintain the balance.

vi) Route survey to be done from start to destination and must be ensured that through selected route there is adequate side & height clearance and material can be transported.

vii) A Flag man must move at least 30 feet ahead of vehicle to escort the vehicle to destination and caution the Oncoming traffic (Red/Green flag in day time and Red/ Green torch in night time).

viii) All such material should be transported in night time from 10.30pm to 5.00am. If it is being transported in day time, one must take permission from appropriate Authority.

ix) While transporting in night time red bulb in working condition must be fitted at both side and rear of the outer most projected material. While in day time, red flag of appropriate size must be fastened up at outer most part of all projected material at both side and rear side.

x) Flag man must wear personnel protective equipments.

xi) Flag man must wear high visibility jacket for better visibility to other crew member.

xii) Use red / green light battery-operated torch for signalling.

3.9.6 Transportation of Hot metal / hot slag:

i) Check & ensure that ladle has been properly placed on its foundation.

ii) Check the material has been covered properly & there is no chance of heat emission.

iii) Check for any spillage of materials from the ladle. Material should not spill out of ladle.

iv) Movement of vehicle should be clear from other traffic.
v) Flagman must accompany the vehicle to warn the other road users.

vi) Provision of siren must be there which should be audible from safe distance.

   Siren must be in operation while vehicle will move on road.

vii) In case of breakdown of vehicle, immediate action should be taken to remove the

     vehicle at safe place.

viii) Vehicle should not be stop under any gas pipe lines or cable bridge.

ix) Both operator & Flagman must be trained for safe operation of vehicle & can take

    appropriate action in case of emergency.

3.9.7 Exclusion zones:

Effective exclusion zones must be implemented at every loading point where mechanical handling equipment is used. This applies whether the loading point is inside or outside a building.

The principles that must be applied are:

Unsafe “Red” zones must be clearly identified. These are the areas that no one can enter during loading/unloading. The size /nature/ position of the zone will vary from product to product and situation to situation, but should be large enough to ensure that should something go wrong during the activity, personnel Safe “Green” Zones must be clearly identified. These are the areas where people should be during loading / unloading.

Note that it is the principles that must be applied–the actual implementation will vary and the identification of exclusion zones (e.g. painting, barriers etc.) is not prescriptive.
All relevant personnel should be trained in the principles and implementation of exclusion zones. This training must make clear that it is the crane driver /forklift /mobile plant driver incharge of loading who is responsible for enforcing the exclusion zone.

3.9.8 Falling off Trucks:
Work on the bed of a vehicle or trailer must be avoided wherever possible. Where a task cannot be completed without accessing the vehicle, appropriate measures must be implemented to prevent falls or mitigate the consequences of falls. Refer Safety Standard SS/GEN-52 (Material Storage and handling) for details of fall prevention and protection system.

3.9.9 Suspended Loads:
The requirement to touch suspended loads must be avoided wherever possible. Suspended loads must not be taken over people, or be so close to them that they could be crushed or trapped by a swinging or falling load. When loads are being moved by overhead crane, where possible establish flight paths that avoid travelling over walkways or key equipment.

3.9.10 Load Limits:
Be aware of the load limits of varying equipment when operating different machines throughout the day. Depending on the equipment set-up and size
the load limits can change drastically. When lifting objects with a machine make sure loads are secure with the proper rigging attachments, and always inspect to ensure they are in good working condition. As with most equipment operations, confirm all workers are at a safe distance when lifting and moving loads. Load related notification may be referred as released by government of India as attached in annexures.

Annexure: Revised Safe Axle Load for Transport Vehicles

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### Revised Safe Axle Load limits for Transport Vehicles

| Sr No | Type of Vehicle          | Axle Combination on Tractor | Axle Combination on Trailer | No of Axles | Single Axles | Tandem Axle | Dual Axle | Tridem Axle | Permissible G.W | Remarks         |
|-------|--------------------------|----------------------------|----------------------------|-------------|--------------|-------------|-----------|-------------|----------------|----------------|-----------------|
| 1     | Two Axle Rigid Truck     | Two tyres on front axle and four tyres on rear axle | -                          | 2           | 1            | 0           | 1         | 0           | 19             |                 |
| 2     | Three Axle Rigid Truck   | Two tyres on front axle and eight tyres on one tandem (two) axle | -                          | 3           | 1            | 1           | 0         | 0           | 28.5           |                 |
| 3     | Four Axle Rigid Truck    | Two tyres each on two axles and eight tyres on one tandem (two) axle | -                          | 4           | 2            | 1           | 0         | 0           | 36             |                 |
| 4     | Five Axle Rigid Truck    | Two tyres each on three axles and eight tyres on one tandem (two) axle | -                          | 5           | 3            | 1           | 0         | 0           | 435            |                 |
| 5     | Five Axle Rigid Truck    | Two tyres each on two axles, four tyres on one tandem (two) axle | -                          | 5           | 2            | 1           | 1         | 0           | 47.5           |                 |
| 6     | Six Axle Rigid Truck     | Two tyres each on four axles and eight tyres on one tandem (two) axle | -                          | 5           | 4            | 1           | 0         | 0           | 49             | To be capped at 49 tonnes. |
| 7     | Tractor - semi articulated trailers | Two tyres on front axle and four tyres on rear axle | Four tyres on single axle | 3           | 1            | 0           | 2         | 0           | 305            |                 |
11.12 Scotch block:

It is important to have adequate scotch block against the wheel once driver is coming out of vehicle. It is advised to have minimum one pair of wheel to be placed against the wheel nearer to driver. However, while using two pairs of wheel chock it should be used to diagonally opposite wheels. Standard dimension of wheel Chock/Scotch block is mentioned in drawing for reference.
3.9.11 Unloading:

All statements on loading apply equally to unloading points and activities. Loads must be inspected prior to the removal of any load restraint. This is to ensure, so far as possible, that the load is stable and will not slip/fall when load restraint equipment is removed.

3.10 SAFETY PRECAUTION WHILE MOVEMENT OF MOBILE CRANE AND OTHER CRANES

Do's while operating Hydra/Ace crane

i) Use of Mobile cranes at construction sites to be restricted, so that there is no movement of persons around the Mobile cranes. Area around Mobile cranes operations should be identified and barricaded to prevent unauthorized person in the hazardous zone.

ii) Mobile cranes is not allowed to move on road with load.

iii) The operator should have only one helper to move ahead of Mobile crane at a distance of 3.0m ahead of boom length on road at right side to guide the operator. While two helper is allowed at Construction site only.

iv) The helpers should wear fluorescent jacket. The Helpers should be provided with whistle at ground to caution the surroundings & his own presence to the operator.

v) The operator should have a valid HMV driving license.

vi) The operator and Helper shall be well trained.

vii) Extended guard on front & rear wheel and Bumper must be provided.
viii) Guy ropes of required length on both sides of object shall be provided for lowering and lifting of material only.

ix) Clear access while movement of the equipment to be ensured.

x) Extra reflective mirrors in operator's cabin to overcome the difficulties pertaining to the left side view shall be provided.

xi) Automatic reverse horn should be provided.

xii) The operator should stop the movement of the crane if the helper's signal is not visible.

xiii) Always keep the loading area as level as possible.

xiv) The terrain should be reasonably hard. The undulation of path across the direction of travel ways should be less than 10 degrees.

xv) The Centre of Gravity of the load shall always be within the wheel load.

xvi) Before lifting load, check if connecting string / tackle are properly hooked and are strong enough to take the load.

xvii) Before using Mobile cranes, proximity hazards and obstructions to the movement should be identified and corrected.

xviii) Apply parking brake and scotch block when the machine is parked.

xix) Lift loads as far as possible with crane in unscrewed position.

xx) Helper to ensure avoidance of man movement within the vicinity of crane.

xxi) Tyre pressure to be checked on daily basis.

xxii) Keep the load to the minimum height.

xxiii) Length of slings should not be too long to avoid swinging.

xxiv) Avoid going over extremely rough tracks consisting of pot holes or sudden dumps. If at all such path is to be negotiated, minimum speed and lowest gear should be used.

**Don'ts while operating Mobile cranes/Ace crane**

i) Engagement of two Mobile cranes to lift single object should not be done.

ii) Overloading of the machine should not be done.

iii) Do not start the crane unless all routine pre-operation is done.

iv) Do not drive the crane too close to the edge of ditch or excavated pit.

v) Do not coast down a gradient in neutral gear.
vi) Do not leave the crane seat with the load raised and never leave the crane unattended while engine is running.

vii) Mobile phone and radios should not be used by the operator and helper while crane is in operation.

viii) No other person should be in driver’s cabin during operation.

ix) No oblique pulling on boom.

3.10.1 Some important points for loading cranes (e.g. Ace Crane) on trailer

i) Examine the trailer for tyre condition, general health, road worthiness and conformance to all safety requirements

ii) Examine the under frame of the trailer to ensure that it can take the load of the crane at the edges. For transporting crane the loading will be mostly on the edges of the trailer.

iii) Width of the trailer bed should be such that when the center line of the track chain is parallel to the length of the trailer, most of the track chain will be within the width of the trailer.

iv) The trailer should be parked on the level ground at the time of the loading. Necessary wedges should be put on the wheel to prevent movement during loading.

v) No one should be on the trailer bed while loading the crane on the trailer.

vi) The loading crane and lifting arrangement should be checked as per the relevant safety standards.

vii) All fastening between the trailer and the crane like D – Shackles, chains, hooks etc. should be checked beforehand.

viii) The counter weight, boom etc. of the crane being loaded should be removed before hand.

ix) The cabin should be locked with the base to prevent any rotation.

x) After the crane is loaded on the trailer, necessary cleats and stoppers of adequate strength shall be welded on all four sides to prevent any movement of the crane during transit. The cleats shall be welded without any movement of the trailer.
xi) Necessary lashing, chain etc. Shall be used to hold the load in desired condition. These should be of adequate strength to prevent toppling on transit.

xii) All other jobs related to this shall be done as per the requirement of relevant safety standards.

3.11 VEHICLE INCIDENT / COLLISION REPORT:

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Criteria</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Registration Number of vehicle</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Type of vehicle</td>
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<tr>
<td>3</td>
<td>Vehicle pass number</td>
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</tr>
<tr>
<td>4</td>
<td>Safety Number</td>
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</tr>
<tr>
<td>5</td>
<td>Department under which vehicle is operating</td>
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<tr>
<td>6</td>
<td>Name of the driver/employee to whom vehicle is assigned</td>
<td></td>
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<tr>
<td>7</td>
<td>P.No./Gate Pass number</td>
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</tr>
<tr>
<td>8</td>
<td>Brief description of collision/incidents</td>
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</tr>
<tr>
<td>9</td>
<td>Damage report of company property</td>
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</tr>
<tr>
<td>10</td>
<td>If the operator injured then details of injury by first Aid Station</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Doctor’s report if any</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Damage report of vehicle</td>
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</tr>
<tr>
<td>13</td>
<td>Is the vehicle collided with other vehicle?</td>
<td></td>
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<tr>
<td>14</td>
<td>If Yes, Details of the other vehicle in the same format</td>
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</tr>
<tr>
<td>15</td>
<td>Weather conditions at time of collision/incident</td>
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<tr>
<td>16</td>
<td>Were seat belts worn?</td>
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<td>Was the accident alcohol related?</td>
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<tr>
<td>18</td>
<td>Was speeding involved?</td>
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<td>Road conditions</td>
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<td>20</td>
<td>Last time the vehicle operator received driver training</td>
<td></td>
</tr>
</tbody>
</table>

4.0 Reference:

2. IPSS: 1-11-023-15
3. Tata Steel Standard -SS/GEN-29, Version-04 and SS/Gen-52