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## 1.0. SCOPE / PURPOSE

- 1.1. The guidelines in this document are not meant to supersede or replace regulatory requirements, nor is it intended to be all inclusive of the applicable regulatory requirements. Instead, it's intended to be supportive and complementary to such requirements.
- 1.2. The loading and unloading of pipe/cylindrical stock, means the moving or handling of pipe, by lifting, lowering, pushing, carrying, holding, or restraining. The movement of pipe may be hazardous and the level of hazard depends on the type of pipe being handled, what the task is, and what the conditions are at the workplace or work site. The location of the loading or unloading may present unique circumstances that should be evaluated and planned prior to the activity.

## 2.0. ACTIVITY DESCRIPTION

- 2.1. The intent and purpose of this guideline document is to provide safe and consistent methods for loading and securement, for transportation to the destination, and for unloading and stockpiling of pipe and other cylindrical stock at the destination.

## 3.0. HAZARD ASSESSMENT

- 3.1. Hazard assessments are performed to identify pipe loading and unloading-related hazards, and to recommend the appropriate remedy or mitigation. Please keep in mind that the following are examples of conditions and hazards that should be considered while loading/unloading pipe (cylindrical stock) but, should not be considered an all-inclusive list.
- 3.2. Please refer to the sample Job Hazard Analysis (JHA)/Job Safety Analysis (JSA) in "Appendix A" for a list of common hazards/risk factors associated with loading and unloading pipe/cylindrical stock. A sampling of hazards/risk factors to be considered are:
  - Weight of the load lifted.
  - Range of the lift.
  - Location of the pipe.
  - Size and shape of the pipe.
  - Number and frequency of lifts performed.
  - Proper selection of equipment for the loading and unloading tasks.
  - Pinch points/line-of-fire area.



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- Overloaded or improperly loaded (poor weight distribution) trucks/rails/trailers.
  - Uneven and/or shifted loads reducing the overall stability of the load/vehicle.
  - Missing or damaged strapping/tie-downs.
  - Requirement for stanchions on trailers/trucks.
  - Potential energy stored in load.
  - Means of securement (tie down strap, banding, etc.).
  - Proximity of the operation to overhead power lines or other structures.
  - Presence of ice, snow, or other environmental hazards.
  - Worker safety when working from an elevated position.
  - Proper selection and inspection of lifting rigging (chains, slings, straps, vacu-lifts, etc.).
  - Qualified operators must run the lifting equipment.
  - Change of ground conditions as it relates to equipment stability.
- 3.3. Hazard assessments are reviewed, conducted, and/or updated:
- For each new task and/or when there is a change in how a task is performed.
  - At the beginning of each shift.
  - As needed.
  - A change in environmental conditions.
  - A change in terrain or weather conditions

#### 4.0. RESPONSIBILITIES

4.1. **Management / Supervisor Responsibilities** *(includes all personnel on site with a supervisory role)*

- 4.1.1. Enforce guidelines governing the safe loading, unloading, inspection, and handling of pipe/cylindrical stock, including but not limited to confirming that:
- A Site Hazard Assessment or JSA has been completed thoroughly and controls have been implemented to reduce or mitigate all recognized hazards to an acceptable level.



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- Designated procedures are communicated, available for review and followed.
  - Those individuals responsible for carrying out tasks have been sufficiently trained and are competent, hold any applicable/necessary certifications to safely perform the tasks.
  - Verify that all lifting equipment (i.e., cranes, forklifts, vacu-lifts, etc.) are inspected per the various regulatory and manufacturer requirements.
- 4.1.2. Participate in the development of specialized lifting plans when applicable for the intended/specified equipment. This may include but is not limited to, developing a critical lift plan/checklist under certain conditions, such as: The lift exceeds 80% of the rated capacity of crane/lifting equipment or, requires use of more than one crane. Note that individual companies may have more stringent requirements to follow with respect to percentage of rated capacity or other special circumstances that require critical lift plans.
- 4.1.3. Must confirm that personnel involved in the activity/activities are aware of the weight of the load/cylindrical stock.
- 4.1.4. Must monitor lifting/loading activities to verify safe loading/lifting capacities of the equipment and rigging are not exceeded. This applies to all equipment involved.
- 4.2. **Health and Safety Responsibilities**
- 4.2.1. Assist with developing specialized lifting plans, including but not limited to providing technical support for cranes and hoist lifting plans, when applicable/required.
- 4.2.2. Perform periodical audits of the mechanical lifting activities.
- 4.2.3. Review inspection reports for completeness and closure of deficiencies.
- 4.2.4. Assist Management/Supervisors in the development/enforcement of Safe Work Practices (SWPs), Training Programs, and compliance with applicable regulations.



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#### 4.3. Employee Responsibilities

- 4.3.1. Follow established procedures/protocols associated with the operations of loading and unloading pipe/cylindrical stock.
- 4.3.2. Operators shall be responsible for determining how many joints of pipe can be safely maneuvered/carried at one time, based on: characteristics of the load (e.g., weight, diameter, etc.); characteristics of the rigging equipment (e.g. engineered load rating); Adherence to the safe operating practices of lifting/transportation equipment in accordance with the manufacturer's instructions (e.g. engineered load rating chart, vehicle/trailer ratings, environmental factors such as slope, weather, etc.)
- 4.3.3. Employees shall visually inspect all rigging prior to use to determine if it is suitable for the lifting operations. Note that chain slings are required to have permanently affixed, legible identification markings stating size, and rated capacity.
- 4.3.4. Verify that stakes/uprights in pockets on trailer edge, chocks on deck, strapping/tie-downs or other similar devices are of sufficient width and padded to prevent damage to or shift of the pipe/cylindrical stock when applicable.
- 4.3.5. Employee(s) should inspect all pipe/cylindrical stock to ensure it is properly secured so as to prevent unplanned movement during loading/unloading activities.

#### 5.0. EQUIPMENT AND SUPPLIES

- 5.1. All rigging/lifting equipment must be inspected by qualified individuals prior to use and determined to be in safe/sound working order. Discard/red tag all defected rigging/lifting equipment immediately.
- 5.2. Ensure equipment/lifting devices being used do not compromise the integrity or quality of the load/pipe being maneuvered/shipped.

#### 6.0. HAZARD MITIGATION

##### 6.1. Personal Protective Equipment (PPE)

- 6.1.1. Refer to INGAA Construction Safety Guidelines "CS-G-1 Basic Personal Protective Equipment (PPE)" for guidelines on PPE that should be worn by all individuals during and in the vicinity of construction-related activities.



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- 6.1.2. Hearing protection should be worn when noise level exceeds 85 dBa (In general, if you have to elevate your voice to talk to someone standing beside you, hearing protection is needed.)
- 6.1.3. On occasions where steel banding is used, additional PPE should include face shields, protective sleeves, and gloves.

## 6.2. General

- 6.2.1. All employees involved in the loading/unloading tasks must remain alert and work to prevent anyone from walking under suspended loads or being in the vicinity of lines holding a strain.
  - Never position any body part under a suspended load.
  - Never stand under or downhill of hoisted pipe/cylindrical stock.
  - Be alert for crane/spotter warning sound.
- 6.2.2. An exclusion zone of twenty to thirty feet (20' to 30') should be maintained from each end of the pipe/cylindrical stock while loading/unloading tasks are in progress. Exceptions may be made if taglines are utilized.
- 6.2.3. Appropriately trained and qualified crane operators (especially at capacities >2000 lbs per OSHA 1926.1400) should be used. Also, trained spotters should be assigned to monitor the safe access zones and alert personnel that may inadvertently enter same.
  - A trained and qualified spotter/flagman is required during loading and unloading operations to alert personnel that may be subjected to the hazards associated with the work, and to alert Operators of other hazards, such as overhead power lines, etc.
- 6.2.4. Slip, trip, and fall hazards must be avoided. Hazards include but are not limited to: boards with nails, metal and nylon strapping, mud/gravel, water, ice, cords and uneven surfaces.
- 6.2.5. When working around High Voltage Electrical Transmission Lines, proper grounding shall be implemented per applicable regulatory requirements and/or Company specific AC Mitigation plan(s). Personnel must follow all the precautions identified for working safely around Overhead power lines [Refer to INGAA Construction Safety Guidelines "CS-S-8 (Overhead Utilities Safety Guidelines), and in particular maintaining minimum approach distances (MAD) and the grounding of equipment/materials.



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### 6.3. Loading and Unloading Trucks and Trailers

#### General:

- 6.3.1. All pipe/cylindrical stock should be off-loaded either by a hydraulic excavator fitted with a vacuum lift, pipe layer or crane fitted with a vacuum lift, hydraulic excavator fitted with a Deckhand pipe handling system (or similar approved device), pipe layer, crane or hydraulic excavator with appropriately rated sling(s) or spreader bar and lifting shoes, or a forklift/fork truck.
- 6.3.2. Rigging devices used to off-load pipe/cylindrical stock may consist of but not be limited to; vacuum lift, sling, cables with lifting shoes, etc.. Where necessary a spreader bar will be utilized to minimize the induced stresses on the pipe/cylindrical stock.
- 6.3.3. If taglines are used, spotters shall ensure that the tag lines are made of nonconductive material. Tag lines must be dry and in good condition. Never wrap a tag line around any part of your body.
- 6.3.4. It is the operator's responsibility to identify the appropriate rigging to be used for the lift based on the weight and length of the pipe.
- 6.3.5. Drivers shall check all load securement devices. The initial road check should be completed within 50 miles of travel. Subsequent load checks occur within 150 miles as well as within 3 hours or with change of duty status (whichever comes first).
- 6.3.6. No person will place themselves between the load and the truck/trailer/lifting equipment or any other pinch point locations that may arise while loading/offloading (i.e. boulder, tree, concrete retaining wall, etc.)
- 6.3.7. No person will work on the opposite side of the trailer other than the operator seated in the cab of the backstop forklift.
- 6.3.8. When applicable, the crane operator will sound crane alarm prior to and during pipe movement (as necessary) to alert personnel. The Crane operator should also sound the alarm during movement as necessary.
- 6.3.9. During loading and unloading, Safe/Controlled Access Zones (Safety Zones) will be identified and established. Caution Cones/delineators must be put in place to delineate/identify the exclusion (controlled access) zones as identified in the JSA.



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- 6.3.10. If only one worker is on site, he/she will verify that no one is located around the controlled access/exclusion zone, or in the travel path of the vehicle, then will release the driver.
- 6.3.11. If only the driver and operator are on site, a cone indicator can still be used to prevent a driver from coming into the operating area before the previous truck has departed.
- 6.3.12. If only one signal person/spotter is on site, a cone should be placed at the side of the access road indicating where the next truck will stop prior to entering the work area.
- 6.3.13. During loading and unloading, use wheel chocks to block the wheels prior to any handling of material.
- 6.3.14. If unauthorized personnel enter the loading area, the loader operator must shut down all loading activities immediately.
- 6.3.15. If unloading alongside an existing trench, no person should ever place themselves between the load and the trench.
- 6.3.16. Skids or other foreign objects should never be inserted into the end of a pipe joint to “balance” the load. If out of balance, the load should be returned to its original position, made secure, and the rigging or vacuum lift re-positioned to achieve proper balance.
- 6.3.17. Keep all additional load straps in place during unloading until the section of the uppermost tier of a stacked load has been completed. The straps should be utilized to keep the remaining load secure in place, as well as a means to cradle the pipe/cylindrical stock to prevent rolling, (i.e. bunks, double-cut bunks with chocks secured on top and bottom or bolsters) should be left in place. Upon completion of the unloading of first tier, the next section of that tier or the second tier can then be unstrapped and unloaded.
- 6.3.18. When loading/unloading pipe/cylindrical stock during wet/snowy conditions on an inclined surface take precautions to restrain the downhill end of pipe/cylindrical stock from sliding off of truck/trailer.
- 6.3.19. When transporting pipe on trailers: Overhang tailpipe should be flagged on driver and passenger side of loaded trailer.



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### Preparation and Setup:

- 6.3.20. To facilitate the loading and unloading of pipe, position the trailer in a location that is as level as possible and chock the wheels. This will reduce the potential of any movement that could cause the pipe/cylindrical stock to shift and/or roll off the trailer.
- 6.3.21. When approaching the trailer to be loaded, the operator centers the pipe with the trailer so that pipe is evenly distributed over the trailer deck when pipe/cylindrical stock is less than or equal to the length of the trailer being loaded.
- 6.3.22. Trailers need to be of sufficient length and width to eliminate excessive overhang. Overhang which is legal by ruling authorities is approved or disapproved by the designated entity (typically the Owner/Operator).
- 6.3.23. In the event the trailer has an upward curve, be sure the bunks or 4 x 4 timbers are appropriately placed to prevent teetering of the pipe.
- 6.3.24. Prior to unstrapping load(s), always ensure that stakes/uprights in pockets on trailer edge, chocks on deck, or others similar devices are substantial enough, high enough and securely in place to prevent the highest layer of material from rolling off the trailer deck when the straps/load securement/banding is removed.

### Cargo Securement:

- 6.3.25. Cargo must be firmly immobilized or secured on or within a vehicle by structures of adequate strength, hardwood dunnage, stakes, tie-downs or a combination
- 6.3.26. Articles of cargo that are likely to roll must be restrained by chocks, wedges, a cradle or other equivalent means to prevent rolling. The means of preventing rolling must not be capable of becoming unintentionally unfastened or loose while the vehicle is in transit. Articles of cargo placed beside each other and secured by transverse tie-downs must be:
  - Placed in direct contact with each other, or
  - Prevented from shifting towards each other while in transit.



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**Loading Trucks and Trailers:**

- 6.3.27. When utilizing a forklift, before releasing the joint of pipe, place the forks as low as possible to avoid dropping the pipe joint(s) onto the deck.
- 6.3.28. Always position work activities on the uphill side of the trailer and/or material when a level surface is not available.
- 6.3.29. The load(s) must be inspected by the driver to confirm that the load is evenly distributed on the trailer and adequately secured. Any and all adjustments should be made before leaving the yard/work area.
- 6.3.30. The driver is ultimately responsible for appropriately and adequately securing the load to the trailer in a safe and legal manner per any applicable local, state, federal, or Company requirements.

**Loading a Stacked Load:**

- 6.3.31. Check the general condition of the trailer deck. Verify that the trailer deck is clear of all debris (snow, ice, mud and other articles that may damage the pipe).
- 6.3.32. Once the bottom tier of a stacked load is completed, straps should be utilized to secure the load in place, as well as a means to cradle the pipe/cylindrical stock to prevent rolling, (i.e. bunks, double-cut bunks with chocks secured on top and bottom or bolsters) should be put in place. One potential BMP (Best Management Practice) is a minimum of 4 bunks, evenly spaced. The second tier can then be loaded.

**NOTE:** Special consideration should also be given to the loading/securing of “specialty items” such as pup joints, headers, etc. While they may be much shorter, they pose similar hazards.

- 6.3.33. If utilizing a forklift, have the forklift hold the last joint on the bottom tier in place while the deck pins and blocking are secured in place. This will reduce the chance of any rolling of the pipe during off-loading.
- 6.3.34. When the loaded vehicle has cleared the area the rear man may now remove the rear cone and the next vehicle can drive into the operations area.



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- 6.3.35. Verify that the entire load is tied down; also make sure the individual tiers are tied separately to avoid loosening the entire load when off-loading the first joint.
- 6.3.36. The driver is ultimately responsible for appropriately and adequately securing the load to the trailer in a safe and legal manner per any applicable local, state, federal, or Company requirements.

### **Loading a Pyramid Load:**

- 6.3.37. Check the general condition of the trailer deck. Verify that the trailer deck is clear of all debris (snow, ice, mud and other articles that may damage the pipe).
- 6.3.38. Once the bottom tier of a pyramid load is completed, make sure proper separators are in place, like rope, or rubber belting.
- 6.3.39. The second and subsequent tiers/levels of pipe/cylindrical stock are stacked directly over the gaps/in between the joints of the bottom tier, until the entire pyramid load is completed. A viable BMP is to not pyramid the top joint on pipe diameters less than 16”.
- 6.3.40. The driver is ultimately responsible for appropriately and adequately securing the load to the trailer in a safe and legal manner per any applicable local, state, or federal requirements.

### **Leaving the Yard and/or Entering a Public Roadway**

- 6.3.41. Once the load is to leave the yard or enter the public roadway, the load must be secured with the appropriate number of rated straps per the DOT and/or other Regulatory Requirements.

### **Unloading Trucks and Trailers:**

- 6.3.42. Once a truck has arrived at offloading location, an Operator will sound horn where truck needs to stop. At this point the driver will set all parking brakes on the truck and trailer, exit the vehicle, and securely chock the wheels.
- 6.3.43. At no time will truck drivers will be allowed to unstrap loads when they are alone or prior to being directed to do so by the crew leader (or assigned designee).
- 6.3.44. Always position work activities on the uphill side of the trailer and/or material when a level surface is not available.



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- 6.3.45. Before unloading any pipe, the lay down area should be inspected and prepared. Confirm that the worksite is free of debris, holes and objects that could obstruct the loading or unloading process, damage the pipe, or cause slips, trips and falls.
- 6.3.46. Visually inspect the loaded trailer; check that the bottom pipe sections are properly seated in their cradle and that none of the chocks are missing or loose. Check that the above pipe sections are properly nested. Confirm that chocks are in place and secure between the joints of pipe. Stop all work immediately and correct any hazards identified before releasing the tie down straps.
- 6.3.47. Ensure stabilization protocol for lower tiers of pipe comply with the loading protocol stated above for stacked loading and pyramid loading and ensure chocks, cribbing, tie downs and side truck stakes are sufficiently robust and adequate height to prevent inadvertent loss of lower tiers of the load as a result of a pipe shift. Add additional securities as necessary prior to removing transport ratchets/straps from the trailer.
- 6.3.48. When releasing the ratchets/straps on the trailer, confirm that the pry bar is in the holes securely and that fingers are clear when releasing the catch on the ratchet to release it.
- 6.3.49. Forklift equipment should not be used to remove coated pipe that is in a pyramid configuration (nested in tiers).
- 6.3.50. Driver and ground crew (if approved by driver) will remove strapping from load and all ground crew members will proceed to the previously designated safe zone or, in front of truck. Once all ground crew members are clear, the spotter/signal person will signal the operator to commence offloading pipe from truck and place on wooden skids with pads to protect coating when needed.
- 6.3.51. When permissible (i.e. drill stem, flume pipe, or other uncoated materials/cylindrical stock) release the joint(s) of pipe slowly to ensure that they roll in to place gently to prevent any damage.

**6.4. Unloading on the Right-of-Way (ROW):**

NOTE: Please refer to “Pipe Hauling and Stringing Safety During Construction Activities” (CS-R-10) for pertinent Information



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## Pipe Storage, Placement, and Laydown Areas

- 6.4.1. Storage areas should be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage.
- 6.4.2. Whenever possible, the lay down area should be free of overhead and underground utilities. If underground or overhead hazards are present, warning signs/devices must be installed prior to utilizing the area.
- 6.4.3. Conspicuously post, and do not exceed:
  - Maximum safe load limits of floors (except floors or slab on grade).
  - Clearance limits.
- 6.4.4. The location identified for the stockpile site should be relatively level. Earthen berms for stockpiling shall be sufficiently leveled and placed at appropriate intervals per manufacturer guidelines or engineering calculations (when applicable).
- 6.4.5. Provide covers and/or guardrails to protect personnel from open pits, tanks, vats, ditches, etc. Hole covers need to be marked "HOLE." Covers need to be securely fastened to prevent movement.
- 6.4.6. Pipe shall be stacked to Company Specifications. A recommended BMP is to "pin" the first 3 joints on the bottom row, and the first 2 joints on the second row.
- 6.4.7. Store pipe on specially designed earthen/soil berms and sand sills or racks.
- 6.4.8. Safely block all pipe, if the dirt sill or storage rack cannot prevent the individual pipes or pipe stack from moving.
- 6.4.9. Keep aisles and passageways clear and in good repair with no obstruction across or in aisles that could create a hazard.
- 6.4.10. Appropriately mark permanent aisles and passageways.
- 6.4.11. Ramps, blocking or grading should be used to assure the safe movement of vehicles between different levels.
- 6.4.12. Remove all nails from used lumber and stack it to prevent falling.



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6.4.13. Unless racked, structural steel, poles, pipe, bar stock and other cylindrical materials are stacked and blocked so as to prevent spreading or tilting.

## 6.5. Alarms, Alerts, and Flags

### Low Vacuum Alarms

- 6.5.1. In the event of a low vacuum alarm activation, operations will cease until the vacuum has been re- established
- 6.5.2. The vacuum lift equipment has visual/audible alarms which activate when a loss of vacuum has or may occur, it is backed up with a non-return valve fitted to the head, which will hold the vacuum within the seal head during the lift.

### Hand Signals

- 6.5.3. Approved hand signals will be reviewed and used.

## 7.0. TRAINING

- 7.1. Initial and periodic refresher training should be conducted on procedures for the safe loading and unloading of pipe/cylindrical stock during construction activities.

## 8.0. REFERENCES

Current versions of the references automatically supersede the references listed below.

### 8.1. Occupational Safety and Health Administration (OSHA)

- 29 CFR 1910, Subpart N. (Materials Handling and Storage) General Industry
- 29 CFR 1910.179 (Materials Handling and Storage) Overhead and Gantry Cranes
- 29 CFR 1910.180 (Materials Handling and Storage) Crawler Locomotive and Truck Cranes
- 29 CFR 1926, Subpart H (Materials Handling, Storage, Use, and Disposal)
- 29 CFR 1926, Subpart N (Cranes, Derricks, Hoists, Elevators, and Conveyors)
- 29 CFR 1926, Subpart O (Motor Vehicles, Mechanized Equipment, and Marine Operations)



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- 29 CFR 1926, Subpart CC (Cranes and Derricks in Construction)
- 8.2. **American Petroleum Institute (API)**
- API-RP-5L1, Recommended Practice for Railroad Transportation of Line Pipe
  - API-RP-5LW, Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels
  - API-RP-5LT, Recommended Practice for Truck Transportation of Line Pipe
- 8.3. **Other**
- The American Association of Railroads (AAR) Open Top Loading Rules Manual Section 1, General Rules, Part 2
  - Code of Federal Regulations, Title 49, Part 192, Transportation of Natural Gas and Other Gas by Pipelines: Minimum Federal Safety Standards, issued by the Department of Transportation (D.O.T.)

#### 9.0. HISTORY OF REVISIONS

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0	8/2017	Initial Issue
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