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aramco

HYUNDAI ENGINEERING & CONSTRUCTION

AMIRAL PROJECT

Contract No : 6601000283(IK)

LIFTING SAFETY PROCEDURE

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2	IFU	21-Jul-2024	Issue fir Use	D.H.CHANG	D.S.LEE	Y.H.JUNG	
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1 PURPOSE

To outline the requirements for managing and controlling lifting operations during construction and commissioning activities.

2 SCOPE

This procedure shall be applied to all operations in AMIRAL Program pkg.4 involving the use of Cranes and Lifting Gear. The general requirements for this procedure apply to all lifting operations, irrespective of weight and complexity of arrangements.

For lifts that are programmed to go over live process areas, in the vicinity of other potentially hazardous areas and passing overhead or nearby members of the public, these requirements need to be reviewed, assessed and planned for applicability.

3 DEFINITIONS

Company	Is a legal entity formed by a group of individuals to engage and operate in business enterprise in a commercial or industrial capacity.
Contractor	A person or company that is paid by another company to work on a particular project for a particular amount of money.
Lifting Appliances	A crab, winch, pulley block or gin wheel used for raising or lowering and a hoist, crane, etc.
Lifting Gear	It is a chain sling, rope sling, or similar gear, and a ring, link, hook, plate clamp, shackle, swivel or eye-bolt.
Hoist	A lifting machine, whether worked by mechanical power or not, with a carriage, platform or cage the movement of which is restricted by a guide or guides, but does not include a lifting appliance used for the movement of trucks or wagons on a line of rails.
Hoisting Equipment	Means commercially manufactures lifting equipment designed to lift and position load of known weight to a location at some known elevation and horizontal distance from the equipment's center of rotation. The other types of lifting equipment are cranes (mobile overhead and jib), lifts and hoists and lifting tackle.
Safe Working Loads (SWL)	The loads shown on a test certificate, and marked on the lifting appliance or gear.
Certified Inspector	A person certified by the Saudi Aramco Inspection Department to perform inspections and certifications on elevating/lifting equipment.
Crane (Mobile)	A crane consisting of a rotating superstructure with a power plant, operating machinery, and boom, mounted on a base that is either fixed, equipped with crawler treads for travel or mounted on a crane carrier equipped with axles and rubber-tired wheels for travel.
Crane Lift – Critical	Any crane lift that requires a Critical Lift Plan. See Section 5.5 Critical Crane Lifts
Crane Lift – Standard	A standard crane lift is any lift not classified as a critical lift. Crane configuration

	shall be with main boom only.
Critical Lift Plan	A Critical Lift Plan is a document that identifies a specific load and the operating restrictions. Pertinent information includes all weights on hook blocks and attachments.
Crane Operator	A person holding a heavy equipment operator certificate who is certified as being qualified to operate a specific model and capacity of crane as per Saudi Aramco Certification requirements; or a specific type or class as per the approved certification authority's requirements; may also receive additional certifications for crane attachments, tandem lifts, pick and carry operations, and personnel platforms (man-baskets)
Rigger	A person certified by Saudi Aramco, accepted local training provider, a Saudi Aramco approved international institution, or a home country certification to prepare a load for lifting. Saudi Aramco rigger categories are Rigger-I, II, III.
Safe Work Instruction (SWI)	Provides step-by-step instructions for specific work being conducted at a drilling rig. This Drilling & Workover (D&WO) procedure is applicable to all D&WO rigs and service providers.
Slinger	A person certified by Saudi Aramco, accepted local training provider or a Saudi Aramco approved international institution to prepare loads for lifting only at onshore, Drilling and Workover (D&WO) Rigs and D&WO Rig less operations
Tandem Lift	Crane lift involving two (2) or more cranes lifting, turning, or tailing the same load at the same time.
Ton(s)	All load weight units used in this GI should be considered as METRIC ton unless otherwise specified. Note that 1 Metric ton = 1,000 Kgs = 2204 lbs.
Tailing	The placement of a load resting on the ground from the horizontal position to the vertical position or the vertical position to the horizontal position.
Joint JSA Meeting	A Job site meeting between Crane Operator(s), Rigger(s) and USER Supervisor before signing the Critical Lift Plan Form SA-9644 which will depict that all parties involved are agreed with the information filled and then sign the critical lift plan form after making necessary correction in lifting parameters/Crane Configuration (if there is any needed). It shall include any special notes or drawings if there is a need for such document as determined by Rigger-I based on his judgment, this could include but not be limited to task-specific Job Safety Analysis (JSA) and special documents involved in the lift such as manager approval and method statements.

4 ROLES AND RESPONSIBILITIES

4.1 Project Manager

To ensure that all lifting operations are adequately planned, executed and that all lifting equipment used on site is certified and conforms to this procedure.

4.2 Construction / Commissioning Manager

Shall ensure that this procedure is implemented properly on site.

Shall ensure that the lifting operations on site are provided with competent personnel, equipment, facility and

necessary resources to effectively implement, administer and enforce this procedure.

4.3 HSE Manager

- To liaise with all members of the Project Management Team, Supervisors and Sub-contractors on the planning of all lifts including erections certifications and maintenance of all lifting appliances.
- To ensure that all persons involved in the lifting operations are competent and suitably trained in HSE matters for the operations to be performed.

4.4 Safety Supervisor/Safety Officer

- To ensure that all persons involved in the lifting operations are competent and suitably trained in HSE matters for the operations to be performed.
- To ensure that the crane operation team carry out their duties safely.
- To carry out the assessment of the lifting operation to provide such planning, selection of crane(s), lifting gears and equipment, instruction and supervision as necessary for the task to be undertaken safely.
- To ensure that adequate inspection and maintenance of the equipment has been carried out.

4.5 Lifting Operators

- To be responsible for the correct operation of the crane in accordance with the manufacturer's instructions and within the Safe System of the work.
- To respond to the signals from one banksman who should be clearly identified at any time.
- To ensure the crane is in good working condition by daily inspection.
- To be familiar with the fire appliance on the crane and trained in their use.

4.6 Site Supervisor Role

Lift Responsibilities:

1. **Pre-Job Planning:** The Site Supervisor is responsible for:
   - Reviewing the lifting plan and job specifications.
   - Identifying potential hazards and developing a risk assessment.
   - Ensuring all necessary permits, approvals, and documentation are in place.
2. **Resource Allocation:** The Site Supervisor is responsible for:
   - Allocating resources (e.g., personnel, equipment) for the lifting operation.
   - Ensuring that all personnel are properly trained and equipped for the task.
3. **Safety Briefing:** The Site Supervisor conducts a pre-lift safety briefing with all personnel involved in the operation, including:
   - Reviewing the lifting plan and safety procedures.
   - Identifying potential hazards and emergency procedures.
   - Ensuring all personnel understand their roles and responsibilities.

During Lift Responsibilities:

1. **Monitoring:** The Site Supervisor monitors the lifting operation to ensure:
   - Compliance with safety procedures and regulations.
   - Proper crane setup and operation.
   - Load handling and placement.
2. **Communication:** The Site Supervisor maintains open communication with:
   - Crane operators.
   - Banksmen/Flagmen.
   - Other personnel involved in the operation.
3. **Troubleshooting:** The Site Supervisor troubleshoots any issues that arise during the lift, including:
   - Identifying root causes of problems.

- Developing solutions or modifications to ensure safe continuation of the operation.

Post-Lift Responsibilities:

1. **Debriefing:** The Site Supervisor conducts a post-lift debriefing with all personnel involved in the operation, including:
   - Reviewing the lift's success or any issues that arose.
   - Identifying lessons learned and areas for improvement.
2. **Documentation:** The Site Supervisor ensures that all necessary documentation is completed, including:
   - Lift records.
   - Safety incident reports (if necessary).
3. **Follow-up:** The Site Supervisor follows up on any actions identified during the debriefing, ensuring that corrective actions are taken to prevent similar issues in future lifts.

Additional Responsibilities:

1. **Regulatory Compliance:** The Site Supervisor ensures that all lifting operations are conducted in compliance with relevant regulations, codes, and standards.
2. **Site Management:** The Site Supervisor is responsible for managing the site and ensuring that all activities are conducted safely and efficiently.
3. **Resource Management:** The Site Supervisor manages resources, including personnel, equipment, and materials, to ensure that the lifting operation is completed effectively and efficiently.

Skills and Qualifications:

To perform these responsibilities effectively, a Site Supervisor should possess:

1. Strong leadership and management skills.
2. Knowledge of crane operations, safety procedures, and regulations.
3. Experience in supervising lifting operations or construction sites.
4. Ability to make quick decisions in high-pressure situations.
5. Strong problem-solving and analytical skills.

4.7 Banksman/Flagman

- Ensure that he is easily identifiable from other personnel by wearing a hi-vis jacket or reflective vest which is clearly marked to indicate that he is an authorized banksman or flagman.
- Ensure that both he and crane operator are aware of all aspects of the lifting operation to be undertaken.
- Check that the area around the load to be lifted is clear and that the load is not attached to the deck, transportation cradle, or adjacent equipment. Ensure that taglines in use are not secured or tied off to adjacent equipment or structures.
- **Visual Observation:** The Banksman or Flagman is responsible for visually monitoring the crane's operation from the ground, ensuring the crane is properly positioned, and the load is properly lifted and moved.
- **Signaling:** The Banksman or Flagman uses hand signals, flags, or other visual aids to communicate with the crane operator about:
  - Crane positioning and movement.
  - Load lifting and placement.
  - Potential hazards or obstacles.
- **Load Handling:** The Banksman or Flagman is responsible for:
  - Ensuring the load is properly secured and balanced.
  - Monitoring the load's movement and trajectory.
  - Providing guidance to the crane operator to prevent damage or accidents.
- **Safety Checks:** The Banksman or Flagman performs safety checks before, during, and after crane operations, including:
  - Verifying that the crane is properly set up and secured.

- Checking for any obstacles or hazards in the operating area.
- Ensuring that all necessary safety equipment (e.g., nets, soft-landing systems) is in place.

- **Communication:** The Banksman or Flagman maintains open communication with the crane operator and other personnel involved in the operation to ensure a smooth and safe operation.
- **Emergency Response:** In case of an emergency, the Banksman or Flagman acts quickly to alert others, assist with evacuation procedures, and provide first aid if necessary.

4.8 Riggers/Slinger

- A person certified by Saudi Aramco to prepare a load for lifting.
- To be responsible for attaching and detaching the load to and from the crane load lifting attachment and for the use of the correct lifting gear and equipment in accordance with the planning of the operation.

4.9 Signalman

- To be responsible for relaying the signal to the crane operator.
- To direct movement of the crane and load.

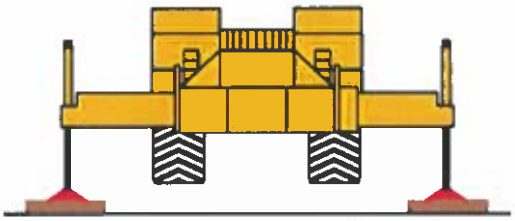
5 REQUIREMENTS FOR LIFTING OPERATION

The following safe practices must be adhered to for all lifting operations and will assist in reducing the risks associated with such hazardous operations.

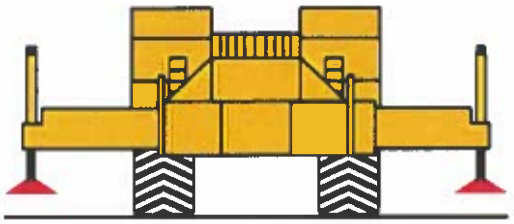
5.1 General Requirements

- All crane operators shall be SAG licensed and certified by Saudi Aramco or COMPANY Approved by 3rd party Organization for the crane type/model they are being use.
- Pedestal and tower cranes operators are allowed to operate with Saudi Aramco certification.
- Cranes, side booms and other elevating/lifting equipment shall be certified by Amiral.
- Cranes or other lifting devices shall not lift any scaffold, unless it is classified as a "special scaffold" that is specifically designed to be lifted and the scaffold plan was reviewed in accordance with GI 8.001.
- Lifting hardware shall be designed to provide sufficient strength to withstand the imposed loads with a minimum safety factor of at least five (5).
- Pin-lock of the outriggers must be secured when the outriggers are fully extended.
- Crane load shall not exceed manufacturer's rated lifting capacity (e.g. as per indicated in the data plate)
- Appropriate work permits shall be issued for crane operations in accordance with CONTRACTOR's SA-AMI-000-HDAI-710007 and COMPANY GI 2.100 and Chapter I-4, Work Permit System.
- Crane operators shall have the final decision on crane lifts that affect the safety of the crane.
- Cranes shall be inspected by the crane operator using on daily basis prior to use.
- All cranes shall have a valid crane inspection sticker issued by COMPANY or by a COMPANY-approved third-party inspection agency.
- Crane cabs shall provide maximum visibility (e.g., curtains/cardboard shall not obstruct the operator's view during operation). Cabs shall be kept clean and clear of items such as rubbish and loose tools. Windows shall be kept clean at all times and shall be replaced if the glass becomes pitted, cracked, or broken.
- All riggers shall be certified as per COMPANY's GI 7.024 and/or GI 7.025, as applicable. Only certified riggers shall rig loads to be lifted, including transport trucks and boom trucks, with no exceptions. The rigger shall have responsibility for coordinating activities of all personnel involved with the lift.
- Personnel with both an approved crane operator and rigger certification shall not be allowed to act in both capacities for the same lift (e.g., such a person shall not supervise/rig a lift while operating a crane).

- Crane lifts shall not be performed in wind speeds exceeding 32 km/h (20mph) (17.4 knots) (9 m/sec), unless otherwise specified by the crane manufacturer.
- Crane lift areas shall be barricaded and secured. Only authorized personnel shall be permitted inside the barricaded area. Warning signs shall be placed at barricaded perimeters warning site personnel of the hazards of overhead lifting activities.
- All cranes shall be leveled in accordance with manufacturer's specifications and shall be located on a properly compacted foundation prior to performing any lift. All cranes shall be provided with a fixed bull's-eye level and/or a carpenter's level to verify the crane is level.
- During a lift, the crane's outriggers shall be fully extended and lowered to raise the wheels and level the crane, unless otherwise specified in the crane manufacturer's load chart.

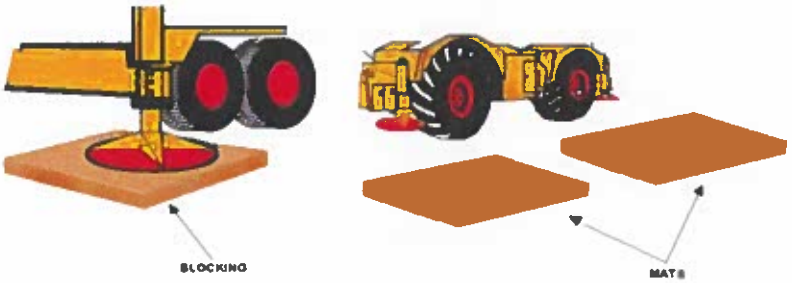


Properly Extended Outriggers



Improperly Extended Outrigger
(Wheels Carrying the Load)

- Outrigger mats shall be used under all crane outrigger float pads during crane lifts. Outrigger mats shall be designed to support the total weight of the crane and load to be lifted.
- Mats shall not be permanently secured to the outrigger pads.



- Tag lines shall be used to control suspended loads unless their use may cause a greater hazard. Tag lines shall not be tied around the hand/wrist. They shall be fully gripped by all fingers.
- The crane operator shall not leave the controls at any time while a load is attached.
- Crane operators shall only pick up loads when the boom head and hook are centered directly over the load.
- All crane lifts shall be partially lifted (e.g., floated for at least 3 seconds) to ensure rigging and lift integrity prior to proceeding with the actual lift.
- A designated signalman shall be used at all times during the lifting, moving, and setting of a load. Only one designated signalman shall give signals to the crane operator. Universal hand signals shall be used. In the event that the crane operator cannot see the signalman, radio communications shall be used.
- When a crane is operating near an energized power line, a designated signalman shall be assigned to ensure the following minimum distances are maintained as follows:

Voltage	Absolute Limit of Approach
Up to 50,000 volts	3.1 meters/10 feet

50,000 to 200,000 volts	4.6 meters/15 feet
200,000 to 350,000 volts	6.1 meters/20 feet
Over 350,000 volts	7.6 meters/25 feet

- Personnel shall not ride a hook or auxiliary headache ball at any time. Personnel shall not ride the load during the lift.
- Welding on or modification of hooks and other lifting equipment is strictly prohibited.
- Cranes shall be secured during high winds or after working hours by snubbing to structures, laying down lattice booms, withdrawing hydraulic boom extensions, or according to manufacturer's specifications. Tower cranes when unattended shall have the slew brakes released to allow weathervane.

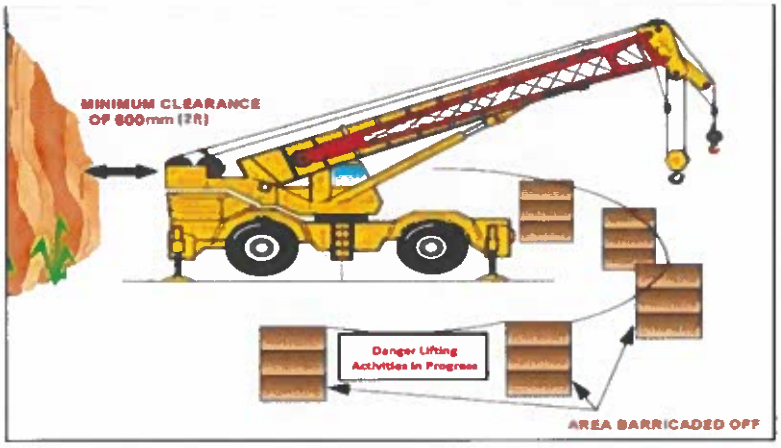
5.2 Trial Lifts

All crane lifts shall have a trial lift prior to the actual lift. The trial lift shall consist of the load being hoisted just clear of the support (float/suspend the load) to test the mechanical condition of the crane and to ensure that rigging hardware is properly secured.

Every Lifting activity, the load must be taken carefully and raised for a short distance to check stability and safety before continuing the lift. (Refer to Attachment 1 – Safety Working Load)

5.3 Crane Operations

- Crane travel on highways and outside plant areas shall be with the normally mounted boom sections only. All hydraulic cranes shall have boom sections fully retracted, jibs removed or stowed, and hook blocks secured.
- A positive locking device shall be engaged to prevent the boom from swinging during travel.
- For cranes fitted with retractable suspension units, the suspension shall be level before traveling.
- Hydraulic cranes traveling inside plant facilities with more than the normally mounted boom sections shall not travel a distance more than 1 km (0.6 miles).
- Lattice boom cranes traveling inside plant facilities shall be permitted without boom disassembly and on the same job, providing the movement is less than 1 km (0.6 mile) and the crane is escorted at the front and back.
- Cranes traveling inside plant facilities shall be assisted by a flagman to ensure the boom tip is clear of any obstruction.
- Cranes shall not be used to drag a load along the ground.
- Cranes working near trenches and excavations shall be at the minimum clearance specified in COMPANY's Construction Safety Manual Chapter II-1, Excavations and Shoring and in CONTRACTOR's SA-AMI-000-HDAI-710018_Excavations Safety Procedure
- Cranes shall be provided with a 30m (100 ft) tape measure to assist with crane positioning and determining the crane's exact working radius.
- Cranes shall have a minimum tail swing clearance of 0.6m (2 ft). Barricades shall be provided at the crane's working radius when working around personnel.



5.4 Side Boom Tractor

- Lifts using side boom tractors shall comply with COMPANY's General Instruction GI 7.028.
- Side boom tractors when used for lifting purposes other than pipe laying shall have a safety latch fitted on the hook or the hook/sling wired ("moused") to prevent a slack sling becoming loose. See Part III-8, Slings and Rigging Hardware. Additionally, certified riggers are not required when using side boom tractors to conduct pipe laying operations (see GI 7.028).
- Side boom tractors should be used for its primary designed purpose.
- Side boom tractors, when used for lifting purposes other than pipe laying, shall have a safety latch fitted on the hook or the hook/sling wired to prevent a slack sling becoming loose.
- Side boom tractors shall be exempt with regards to critical lift requirements when used for pipe laying only.
- Piles shall only be lifted and positioned in the pile gate, or onto the leaders or rig, with sound lifting gear adequate for the purpose.
- Welding or modifying the boom structure or superstructure shall be performed in strict accordance with ASME B30.14. Welding or modifying the load hooks or other lifting equipment is strictly forbidden.
- Prior to traveling, the side boom tractor operator shall:
  - Visually check the immediate surrounding area to ensure it is free of obstructions and personnel.
  - Sound a warning signal, if supplied by the manufacturer, prior to movement and intermittently during travel.
  - When traveling with a load, check the position of the load, boom location, ground support, travel route, and speed of movement to ensure that they do not present a safety hazard.

5.5 Critical Crane Lifts

- Critical Lift Plan shall be completed and approved in compliance with COMPANY regulations and made available on-site prior to any critical crane lift.
- Critical crane lifts include, but are not limited to, lifts:
  - When any part of a crane whose boom or boom attachment is to be within 10m (33ft) of hydrocarbon or pressurized piping. This includes cranes having to suspend a load over a vessel, piping, or equipment containing hydrocarbons, steam, or other pressurized liquids.
  - When any part of a crane whose boom or boom attachment is to be within 10m (33ft) of any populated/traffic areas. This includes cranes having to suspend a load over pedestrians, vehicle traffic, occupied construction equipment or occupied buildings.

  - When any part of a crane whose boom or boom attachment is to be within 10m (33ft) of a railway line.
  - Requiring an attachment to the main boom.
  - When any load is 36,300 kg (40tons) or greater.
  - On rubber or pick-and-carry lifts.
  - When any load that exceeds 85% of the crane's rated load capacity or manufacturer's specifications for that specific lift. That requires manufacturer specification for that lift. (As manufacturer specification shall not be exceeded at any movement.)
  - Occurring at night (i.e., between sunset and sunrise).
  - When an explosion, fire, or high heat hazard is present.
  - When the crane is operating near energized power lines.
  - Involving high level or long reach lifting.
  - On barges, vessels, or hydrocarbon-loading piers.
  - With at least one vessel afloat and the sea conditions exceed those noted in GI 7.024.
  - Other crane lifts as required by the COMPANY.
- A COMPANY-certified Rigger-I shall be in charge of coordinating all critical crane lifts.
- Nighttime crane lifts require prior written approval from the COMPANY facility manager, except during a test and inspection (T&I) or shutdown.
- The work area for nighttime crane lifts shall be provided with proper lighting sufficient to perform the lift safely.

5.6 Special Critical Crane Lifts

5.6.1 Tandem Lift

Tailing, tandem (multiple) or turning lifts shall be per GI 7.028 and require:

- Derating of all involved cranes by 25% of the load chart.
- Utilizing cranes of the same size, manufacturer, and model, if possible, for tandem (multiple) and turning lifts.
- Having a separate, approved Critical Lift Plan on-site prior to the lift each time one of these types of lifts is performed.
- Having a COMPANY-certified Rigger-I in charge of actual lift coordination.
- Drilling and workover operations involving the maneuvering of bottom hole assemblies per GI 7.028.

5.6.2 Man-basket

Crane-Suspended Personnel Platform (Man-basket) lifts shall comply with COMPANY requirement as GI 7.027, including the following:

- Work from or transport by crane-suspended personnel platforms (man-baskets) shall only be allowed when conventional means of performing the work or reaching the work site (such as personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold) would be more hazardous or is not practical because of structural design or work site conditions.
- Man-baskets shall be inspected by a certified inspector per GI 7.027 and shall have a valid inspection sticker.
- An identification plate shall be attached to the man-basket and shall display the following minimum information:
  - Identification number (ID #).
  - Empty weight.
  - Rated capacity.
  - Maximum number of personnel allowed.
  - Date of manufacture.

- An approved Critical Lift Plan shall be available on-site prior to any man-basket lift.
- Each man-basket operation shall have an approved Crane Suspended Personnel Platform (Man-basket) Permit (SA 9648) properly issued prior to any man-basket lift.
- A pre-lift safety meeting shall be held, as required by the Critical Lift Plan form and the Crane Suspended Personnel Platform (Man-basket) Permit.
- The crane capacity load chart shall be derated 50% when lifting an occupied man-basket.
- Man-basket crane lifts shall not be performed in wind speeds exceeding 25km/h (15mph) (13knots) (7m/sec).
- Man-basket lifts shall not be performed if the crane operator has been working for more than 10 continuous hours prior to the start of the lift, or the lift will not be completed before the crane operator has been working for 12 continuous hours.
- Man-basket dedicated rigging hardware, for attachment to the crane hook, shall:
  - Have four swaged (mechanically spliced) wire rope slings of equal length and with a rated SWL required for the most heavily loaded leg, attached to a shackle or approved steel master link, which shall be attached to the crane hook on one end.
  - Have each of the other ends of the four slings attached to the top man-basket eyelets with individual shackles and designed with thimbles in each eye.
  - Have the length of the four slings long enough to permit adequate head room for workers inside the man-basket while maintaining a minimum sling angle of 45 degrees from the crane hook.
  - Have an approved, self-closing safety latch fitted on the crane hook.
  - Have slings designated for man-basket use only and not used for any other operation/lifting purpose.
- Prior to the actual man-basket lift, a trial lift shall be performed with a test weight equivalent to the personnel to be lifted. The trial lift shall start at ground level, or at the location where personnel will enter the man-basket, and proceed to each location where the man-basket is to be positioned to ensure there is not excessive up and down boom movement and to verify proper rigging, etc.
- Hoisting of the man-basket shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane, derrick, or man-basket. Crane operators shall not lift or lower an occupied man-basket at a speed in excess of 30.5 m/min (0.5 m/sec), (100 ft/min).
- Cranes shall not travel with an occupied man-basket.
- Develop and approved a robust rescue plan that enhances the safety and preparedness of your team. Regular training, practice, and updates are essential for maintaining the effectiveness of the rescue plan over time
- Free-fall devices shall not be used on a friction or hydraulic-type crane hoist during suspended man-basket operations. The crane operator shall not leave the controls at any time while a man-basket is attached to the hook.
- Personnel shall only be permitted to work outside a suspended man-basket when the requirements of GI 6.19 are met.
- A designated signalman shall be used at all times during man-basket operations. Only one designated signalman shall give signals to the crane operator. He shall wear a high-visibility vest for easy identification. Radio communication is preferred, especially in cases where signal relays are required.
- If at any time the crane operator does not have direct eye contact with the designated signalman, he shall immediately stop the man-basket operation until such time that he can again see the signalman.
- Each worker inside a suspended man-basket shall wear an approved full body harness and approved lanyard attached to a designated location on the man-basket. Fall arrest equipment shall allow a maximum free fall of 1.8m (6 ft). See Section II-5, Fall Protection.
- The crane shall not be used for any other purpose while handling a suspended man-basket.
- Welding electrodes shall not be allowed to make contact with the man-basket or rigging. Welders shall remove the electrode from the electrode holder when welding operations are discontinued for any period of time.

- Man-basket operations performed at night shall require prior written approval of the Project manager

5.7 Inspection and Color Coding

- Regular inspection in monthly basis shall be conducted by a competent person to all lifting equipment, appliances, chains, ropes, lifting gears and hoist. A system of color coding should be introduced to easily identify that lifting equipment and lifting gears has been thoroughly inspected (recommended every month). (Do not use the color red for color coding as this denotes scrap lifting equipment).
- Responsible Manager shall send a request for mobilization of lifting equipment and appliances to HSE Manager and Relevant Discipline Manager using form provided in Attachment 10 – Notification of Lifting Equipment.
- The rigger shall visually inspect slings and other rigging hardware prior to each use in compliance with COMPANY regulation as per GI 7.029. please see Attachment 2 Daily / Weekly Lifting Equipment Inspection Report.
- Slings, other rigging hardware, and hooks shall also be periodically inspected by a certified rigger at a maximum interval of 6months. These inspections shall be recorded in the Sling Inspection Log. Please see Attachment 3 Lifting Gear Equipment Appliances Inspection Report.
- Periodic inspection - Detailed visual inspection by a COMPANY certified rigger performed within a maximum of six (6) month intervals. The inspection is recorded in the Sling/Rigging Hardware Inspection Log, listing any deficiencies found. Records shall be maintained by the CONTRACTOR HSE Department.
- The COMPANY may request that a certified inspector perform additional assessments of slings and other rigging hardware as needed. The COMPANY reserves the right to require an increased frequency of inspections.
- A-frames shall be inspected and certified by a COMPANY-certified inspector prior to attaching rigging equipment.

5.8 Receiving lifting equipment Crane (mobile/crawler), boom truck on Site

It is necessary to examine the following documentation and check the items below before allowing a crane to work.

- Crane or other lifting equipment shall submit documents for the verification prior for visual inspection.
- Crane(mobile/crawler) and boom/lorry truck shall undergo Contractor inspection.
- After lifting equipment inspected and approved, Contractor equipment inspector shall issue inspection sticker with 90days validity
- The record of 3rd party inspection for test and thorough examination shall be issued every inspection.
- Crane Operator Certificate who is certified as being qualified to operate a specific model and capacity of crane.
- A record of the weekly inspections on the crane. This must be signed weekly by a competent person.
- That the lifting equipment to be used is suitable for the job and that records of thorough examination of such items are available.
- That the crane complies with the requirements of the job assessment.
- That the safe load indicator and load radius indicator are working and set correctly for the crane as rigged.
- Crane operators shall check their cranes daily for oil, hydraulic oil, leaks, water etc.
- Cranes having their configuration changed, dismantled and re-erected will also be tested.
- The crane manufacturer manual will be adhered to for ongoing maintenance.

5.9 Slings and Rigging Hardware

5.9.1 Inspection

Inspection of slings and rigging hardware shall be of two (2) types:

- Frequent inspection - Visual examination by a Saudi Aramco certified rigger prior to use. Records are not required.
- Periodic inspection - Detailed visual inspection by a Saudi Aramco certified rigger performed within a maximum of six (6) month intervals. The inspection is recorded in the Sling/Rigging Hardware Inspection Log (SA 9657) listing any deficiencies found. Records shall be maintained by the USER.

5.9.2 General Requirements

- Slings shall be in accordance with COMPANY's GI 7.029 and ASME B30.9 or equivalent. Slings and other rigging hardware, and hooks shall be periodically inspected by a certified rigger at a maximum interval of 6 months. These inspections must be recorded in the slings inspection log (SA9657).
- Piles shall only be lifted and positioned in the pile gate, or onto the leaders or rig, with sound lifting gear adequate for the purpose.
- When hollow sections or concrete piles are lifted with chains or wire slings, timber or burlap packing as softener shall be placed between the lifting gear and the pile.
- Wire rope clips (clamps) shall not be used to make slings for lifting purposes.
- Come-a-longs or lever blocks shall not be used for lifting loads unless they meet the requirements of ASME B30.21.
- Unstable or unsecured loads shall not be transported. Loads shall not be raised or lowered while the forklift is moving.
- Slings and other rigging hardware shall have a minimum design safety factor of 5.
- All slings have been proof-tested by the manufacturer at 200% of the rated capacity.
- The manufacturer's safe working load (SWL) and serial number shall be clearly marked on each sling. Riggers shall not use a sling unless the SWL is clearly visible.
- Slings shall have a durable identification tag or ferrule permanently affixed that contains the identification information required by GI 7.029 for that specific type of sling. Identification information shall be maintained by the COMPANY or CONTRACTOR in legible condition during the life of the sling.
- Fasteners or other rigging hardware manufactured in-house from bolts, rods, pins, hooks, etc., shall not be used.
- COMPANY and CONTRACTOR shall maintain a job-site log of slings containing the following information: sling ID number, sling description, date placed in service, SWL as stated in proof load certificate, and full details of periodic inspections.
- Slings shall not be modified, repaired, shortened, or lengthened.
- Defective or damaged slings and other rigging hardware, or slings and other rigging hardware not complying with COMPANY requirements, shall be recorded in the Sling Inspection Log and immediately removed from the job site and destroyed.
- Working conditions that may affect slings and other rigging hardware shall be evaluated, with special attention to temperatures, chemicals, abrasions, etc.
- Slings or other rigging hardware in contact with sharp corners shall be padded to prevent damage to the sling, other rigging hardware or the load being lifted.
- Slings shall be rigged to provide the best load control.
- The force on each sling during a lift shall be less than the sling manufacturer's rated SWL. The lift capacity and force calculated for each sling shall be reduced as required for the lifting angle of the slings. See the IPT's Crane and Rigging Handbook. Multi-leg slings shall have a rated SWL required for the most heavily loaded leg(s) rather than equally distributing the total lifted load, as it is possible for some of the legs to take essentially the full load while the other legs merely balance the load.

- The recommended safe lifting angle for slings is 60 degrees above the horizontal. Sling angles less than 30 degrees above the horizontal shall not be used.
- Other rigging hardware (e.g., shackles, eyebolts, hooks, rings, links, coupling pins) shall be selected to provide capacities equal to or greater than the SWL of the sling.
- Rigging from process piping is prohibited. Loads shall be rigged from load-bearing structural members only after prior approval is obtained from the COMPANY.
- Standing or walking under a suspended load is prohibited.
- Suspended loads shall not be left unattended.
- Slings and other rigging hardware shall be stored so as to protect them from mechanical damage, corrosives, direct sunlight, moisture, extreme heat, etc.

5.9.3 Wire Rope Slings

- Eyes for wire rope slings shall be the Flemish eye type (i.e., swaged endings and pressed metal sleeve).
- Homemade wire rope slings are not permitted and shall not be used.
- Fold back eyes for wire rope slings are not permitted and shall not be used.
- Aluminum ferrules shall not be used for wire rope slings.
- Wire rope slings shall be visually inspected by the rigger prior to use to verify there is no evidence of the following:
  - Missing or illegible sling tag identification, including SWL.
  - Broken wires.
  - Abrasion (e.g., wire wear exceeds 1/3 the original diameter).
  - Crushed strands.
  - Kinking, bird-caging, or other distortion.
  - Evidence of heat damage.
  - End attachments that are cracked, deformed, or excessively worn.
  - Bent or open eyes/hooks.
  - Severe corrosion.

5.9.4 Synthetic Webbed Slings

- Only synthetic webbed slings fabricated by stitching shall be used.
- Synthetic webbed slings shall be visually inspected by the rigger prior to use to verify there is no evidence of the following:
  - Chemical or thermal burns on any surface of the sling.
  - Considerable fiber breakage beyond the edges (e.g., the warning strand is not visible).
  - Snags, punctures, tears, or cuts.
  - Broken stitches.
  - Distorted or damaged fittings.

5.9.5 Hooks

- Hooks shall be in accordance with GI 7.029 and ASME B30.10 or equivalent.
- Hooks designed with a safety latch (catch) shall have a properly fitted and self-closing latch.
- Hooks not designed with a safety latch shall be "moused" to secure the load, except for side-booms in pipe laying service. Please refer to COMPANY's Construction Safety Manual CSM Chapter III-7, Cranes and Lifting Equipment. (Note: "Mousing" entails wrapping wire or rope around the throat of the hook to ensure the rigging does not slip out of the hook during a lift.)
- Loads shall be applied only on the part of the hook designed to take them (i.e., the bend [bow] of the hook).
- Hooks shall be visually inspected by the rigger prior to use to verify there is no evidence of the following:
  - Visible cracks, nicks, gouges, or corrosion.
  - The body is twisted more than 10 degrees out of alignment.

- The throat opening is stretched open more than 15% beyond the manufacturer's specification.

5.9.6 Spreader Beams

- Spreader beams (bars) shall be in accordance with GI 7.029 and ASME B30.20 or equivalent.
- Spreader beams shall be permanently identified with the manufacturer's name, ID/serial number, gross weight, SWL (rated capacity) and shall have a valid inspection sticker issued by SA or by a SA-approved third-party. See SA standard drawings AA-036878-001 and AA-036878-002.
- Spreader beams shall be visually inspected by the rigger prior to use to verify there is no evidence of damage or defect.

5.9.7 Shackles

- Shackles and other connecting devices shall be completely closed or bolted.
- Shackles shall be marked with the manufacturer's SWL.
- The correct shackle pin shall be used with each shackle. A shackle pin shall never be replaced with rebar, mild steel bolt, or similar item.
- Shackles shall be visually inspected by the rigger prior to use to verify there is no evidence of the following:
  - Signs of cracking around the eyes, signs of body wear, distortion, or bending.
  - Pin does not secure (i.e., tighten) or seal adequately.
  - Signs of pin wear or flattening.

5.9.8 Eyebolts and Safety Hoist Rings

- Shoulder-less eyebolts shall be used only for vertical lifts.
- Shouldered eyebolts shall only be loaded at angles greater than 45 degrees off the horizontal and shall only be loaded in the plane of the eye.
- Safety hoist rings (swivel eyes) shall be bolted in place with a calibrated torque wrench to maintain maximum capacity at all angles.
- Eyebolts shall be visually inspected by the rigger prior to use to verify there is no evidence of the following:
  - Visible cracks, wear, or damage (often found inside and outside the diameter at the top of the eye).
  - Stripped threads on the shank.
  - Bending of the shank or distortion of the eye.

5.9.9 Wire Rope Clips

- Wire rope clips (clamps) shall not be used to make slings for lifting purposes.
- Wire rope clips shall be installed with the bridge (flat) of the clip bearing against the live (long) end of the wire rope and with the U-section pressing against the dead (short) end of the rope (e.g., "Don't saddle a dead horse").
- Wire rope clips shall be spaced about six-rope diameters apart and shall not be staggered.
- Wire rope clips shall be visually inspected by the rigger prior to use to verify there is no evidence stripped threads, cracks or other damage/defect.

5.9.10 Come-A-Longs

- Come-a-longs with defective or damaged components shall not be used.
- The throat latch shall work properly and be in good condition.
- The cable, chain, or strap shall be in good condition (e.g., no fraying or splitting).
- The rated load capacity shall be clearly marked on the come-a-long and shall not be exceeded.
- Appropriate end clamps and connectors shall be used.
- Come-a-longs shall not be used instead of blocking raised equipment.

- Come-a-longs shall not be straddled or connected to each other to increase load capacity or reach.
- Come-a-longs shall not be used for lifting loads unless they meet the requirements of ASME B30.21.
- Users shall ensure anchor points for come-a-longs are sufficient for the load to be lifted.
- Use of cheater bars on come-a-long levers is prohibited.

5.9.11 Chain Falls

- Chain falls shall meet the requirements of ASME B30.16.
- The rated load capacity shall be clearly marked on the chain fall and shall not be exceeded.
- The lift chain, pinion, sheaves, and hooks on chain falls shall be inspected prior to use for excessive wear or distortion.
- Users shall ensure anchor points for chain falls are sufficient for the load to be lifted.
- Chain falls shall have a properly fitted and working safety latch.
- Scaffolding shall not be used as a point of attachment for lifting devices such as chain falls unless the scaffolding is specifically designed for that purpose. Please see COMPANY's CSM Chapter II-2, Scaffolding and CONTRACTOR's SA-AMI-000-HECM-710017 Scaffolding Safety Procedure.

5.9.12 Marking of Safe Working Loads

- Cranes
  - All cranes must be marked clearly with their maximum safe working loads.
  - If the lifting radius can be varied, the crane must be marked with the safe working load at various radii and an indicator must be fitted which shows the safe load at each operation radius.
  - Derricking cranes must be marked with the maximum operating radius of the jib.
  - All cranes must have clear identification marks.
- Winches
  - All winches must be clearly marked with their maximum safe working load (or loads) and an identity mark.
- Pulley blocks, sheer legs, derrick masts, cableways
  - These appliances must be clearly marked with their safe working load (or loads) and an identification mark. Appliances with a maximum safe working load of less than one ton are exempted.

5.10 Competent Persons

5.10.1 Crane Operator

Crane operators must be appointed in line with the following requirements:

- Must be over 21 years of age and competent to operate the crane.
- Must be Saudi Aramco certified.
- Physically fit and physically capable of operating the crane safely. Able to judge distances, height and clearances, and not be color blind.
- Operator shall be adequately trained and have a valid heavy equipment operator certificate to operate the specific heavy equipment to which he is assigned.
- A heavy equipment operator shall possess a valid Heavy SAG license and the government driving license printout showing the specific equipment type which he is assigned. Operator shall immediately provide his heavy equipment operator certificate and SAG license (if license is required), to any authorized Saudi Aramco representative, upon request.
- Know the means of escape and safe use of fire extinguishers.
- A heavy equipment operator, involved in a crane incident, shall immediately surrender his heavy equipment operator certificate to the CONTRACTOR's representative during the investigation. Based on the outcome of the investigation, the operator certificate will be returned to the operator or in the

case of certifications issued by Saudi Aramco, be forwarded to ITD until the operator is re-certified. For certifications issued by accepted local training provider, Saudi Aramco approved international institution or a home country certification, the CONTRACTOR shall retain the certification until the operator is recertified by the issuing authority.

- Heavy equipment operators (Crane Operators) must be certified by Saudi Aramco, accepted local training provider, or by a Saudi Aramco approved international institution.
- For heavy equipment operator certifications issued by Saudi Aramco, an online request should be submitted by an approved initiator by using the ITD online Certification and Tracking system for each request. The heavy equipment operator applicant shall provide soft-copies of the following documents to the CONTRACTOR to upload them:
  - Saudi Aramco ID copy only,
  - SAG Public Driver's License or SAG Heavy Equipment Operator License copy (if required) and a copy of the Government Driving License Printout showing the specific equipment Type.
  - Colored clear recent photographs and scan copy of the applicant
  - SA 9663 - Saudi Aramco/CONTRACTOR's Medical Examination for Heavy Equipment Operators "Physician's Examination Form" – Completed, signed, and stamped if required.

NOTE: For CONTRACTOR heavy equipment operators, form SA 9663 shall be completed by a physician in accordance with Johns Hopkins Aramco Healthcare (JHAH) Medical Services Policy MSP-98, Attachment D. Upon completion, the contractor heavy equipment operator's supervisor shall submit the completed soft-copy of SA 9663 and any other required documents, to their proponent assigned initiator for the online request submission.

For heavy equipment operators who have medical fitness for duty provided through the third-party agreement (TPA) insured hospital network in the Western and Central Regions, recording of 'fit for duty' will be communicated electronically to Saudi Aramco via the Medical Joint Venture Coordination Department (MJVCD) for record update purposes.

5.10.2 Rigger/Slinger

Rigger must be trained and competent for the task, specifically they will:

- Must be over 21 years of age.
- Must be Saudi Aramco certified
- Be trained to determine the weight, center of gravity and characteristics of a load.
- Able to inspect and determine whether a wire rope sling or other piece of lifting equipment is damaged or not fit for purpose.
- Be familiar with the different and correct slinging techniques.
- Know the correct hand signals.
- Be authorized by the employing contractor.
- All riggers and slingers shall have a valid rigger or slinger certificate issued by Saudi Aramco, a SA approved international institution or a home country certification for the load weight limit and type of lift to be rigged/slung without supervision per GI 7.025. Only a Saudi Aramco certified Rigger-I may approve Critical Lift Plans. The rigger/slinger certification categories are as follows:
  - Slinger can rig loads up to 5.0tons and all pre-rigged/slung loads that are included in a rigs pre-prepared Safe Work Instruction (SWI) except loads that require a Rigger-I.
  - Rigger-III Can rig loads up to 10 tons (except loads that require a Rigger-I.
  - Rigger-II Can rig loads up to 40tons, originate Critical Lift Plans, and rig/supervise crane suspended personnel platform (man-basket) operations.
  - Rigger-I Can rig all loads and approve Critical Lift Plans for critical lifts.
  - A Rigger-III and/or a Rigger-II may only rig loads exceeding their certificate level if supervised by the Rigger of the higher certificate level. Slingers shall not rig loads exceeding their certificate level.

  - Loads noted in approved Critical Lift Plans shall be rigged by a rigger certified for that load category (Rigger-I, -II, -III) However, all loads forty (40) Tons or greater require a Rigger-I to supervise the lift. Slingers shall not rig loads requiring a Critical Lift Plan.
- The Rigger-I shall physically examine the job site and the equipment to be used prior to the lift. He shall be physically present to supervise all lifts that require a Rigger-I.
- Certified riggers and slingers shall be used to rig all loads, regardless of weight to be lifted, configuration, or location. This includes such operations as standard and critical lifts, loading or off-loading trucks (including boom trucks), etc. However, certified riggers are not required for pipe laying operations when using side boom tractors.

5.10.3 Appointment of Competent Personnel

Only personnel who are formally appointed can perform lifting operations. The following documentation shall be completed by Responsible Manager:

- Attachment 4 – Letter of Appointment (Lifting Supervisor)
- Attachment 5 – Letter of Appointment (Crane Operator)
- Attachment 6 – Crane Operator Record
- Attachment 7 – Letter of Appointment (Rigger)
- Attachment 8 – Letter of Appointment (Signalman)

5.11 Signals

- All signals (hand, mechanical, or electrical) must be clear and distinct (refer to Attachment 11 – Signals for Lifting Operations).
- Mechanical and electrical signal systems must be kept in good order and safeguarded against accidental operation.

5.12 Tower Cranes

5.12.1 Siting of Tower Cranes

- Once a building or structure is finished, a tower crane has to be dismantled - this factor should always be taken into account when deciding its initial position.
- Special attention should be paid to:
  - Gradients: bases for tower cranes (static or rail mounted) must be properly designed and well drained. Manufacturer's recommendations on the maximum permitted gradient should be strictly observed.
  - Proximity hazards: sufficient clear space for the length of the jib involved should always be provided. With other cranes nearby, overlapping of jibs can create a special problem - jibs and counter jibs might touch and it is essential, therefore, to have a height differential. Great care is equally necessary to avoid ropes fouling and loads being damaged. In such circumstances, operators should be provided with audible warning devices or intercom speech facilities and a priority movement system should be introduced.
- Apart from the major hazard of overhead power lines, consideration should also be given to the proximity of other structures, buildings, houses, public access areas like highways, railways and rivers - the position should always be checked with the owners or appropriate local authorities.

5.12.2 Erection Precautions

- The erection of a tower crane requires personnel with a good head for heights, specially trained and experienced in the particular type to be assembled, working under the control of a trained and competent supervisor.

- Insistence must be placed upon the use of safety harness. The wearing of safety helmets shall be enforced.
- Before erection commences, a final check should be made to ensure that the foundations for a static crane, the track for a travelling crane, or the supports for a climbing crane, meet the detailed requirements of the manufacturer, and the Project Construction Department.
- The crane to be used in erecting a tower crane should be adequate for any lift involved. Therefore, the weight of each component (and its center of gravity) should be determined and sufficient margin allowed for error. The suitability of all lifting gear should be carefully considered, particularly in terms of clearance height. Its weight, together with any attachments, should be included in the load.
- Local weather and wind speed forecasts should be obtained from the Meteorological Office and erection should only take place if the wind speed is within the limit quoted in the manufacturer's instructions for erection. Nearby buildings can produce a shielding effect at, or near, ground level which can give a completely false impression of the conditions above building height. In certain cases, tunneling (venturi) effects can create special dangers.
- Erection areas should be kept clear of non-essential materials, equipment and personnel. Before transferring any large crane section from one-plane to another (e.g. form horizontal to vertical) a check should be made that no loose items (tools, bolts, etc.) have been left - falling objects are dangerous.
- Where cranes are being erected beyond free standing heights, particular attention must be paid to the design and fitting of the frames and anchorage points to nearby building or solid structures.
- It is important that concrete structures should be allowed to harden long enough to acquire sufficient strength to take the loads imposed on the ties of climbing cranes. Assemblies for transferring loads from crane to supporting structure should always be designed and approved by a competent engineer who should confirm that the structure is capable of supporting or withstanding the required loads.
- Where rail mounted cranes are to be operated in a fixed position or tied in, secure stops should be fitted to the rails in close contact with the bogies to eliminate all longitudinal movement.
- At each stage of erection, the correct amount of ballast and counter-weight must be properly positioned. On many cranes the counter-weight is set in place on the counter-jib before the main jib is erected.
- Weight for ballast and counter-weight, as supplied by the manufacturer, should be marked with their weight and secured in position to prevent accidental displacement and damage. Ballast charts, showing the amount, distribution and unit weights of ballast used, must be fitted to the crane base. Charts must be sited on the crane where they can readily be seen at all stages of construction work.
- Safe means of access must be provided to the cab and throughout the structure for the purpose of inspection and maintenance. Access to the cab will be achieved using a permanent steel ladder, fitted with safety hoops and provided with rest platforms at 9m vertical intervals.
- For inspection, access along the jib may be afforded by the provision of an expanded metal walkway inside the jib, with life lines fitted to permit the fixing of safety harnesses, or by the use of an inspection cage suspended from the jib or fitted to the saddle.
- It is strongly recommended that all tower cranes are fitted with wind speed indicators. Visible in or from the driver's cabin, and at the base of the crane. If the wind velocity registered is near the manufacturer's safe working limit, the crane should be placed out of service.
- Automatic audible alarm must be fitted to sound when rail mounted cranes travel.
- Where tower cranes are operated close to active airports, the airport management should be consulted on the need to fit aircraft warning lights. Warning lights should always be fitted where the top of the crane exceeds 150m above local ground level and may be required where the obstruction exceeds 90m.

5.12.3 Tower Cranes Mounted on Rail Tracks

- The foundation should be calculated from the manufacturer's loading configuration considering the worst possible condition and soil bearing capacity.

- Where rails are to be laid on a concrete base, the concrete should be level and strong enough to stand the loading. Thin hardwood, grout or dry pack should be used between rails and concrete to prevent the holding bolts from becoming loose as the rails bed down.
- Where rails are to be laid on timbers, it is preferable for the timbers (of rectangular section) to be set longitudinally so that the rail itself does not have to act as a bridge between adjacent sleepers. (crane tracks have very different loadings from railway tracks) if longitudinal timbers need further support or load spread, timber sleepers should be set under and in direct contact with them. For leveling purposes, softwood packing is totally unsuitable.
- Rails should be straight or true to curve, slightly but not excessively worn, and be free from holes burnt in the web.
- Holes in rails should always be drilled (burning makes the rails too brittle).
- Rails should preferably be bolted to timbers and bolts kept tight. (dogs or spikes are not recommended)
- Track must be laid to an accuracy of 6 mm in gauge and the maximum slope either along or across the track should not exceed 1 in 200 mm unless recommended by the manufacturer.
- The area between the rails must be kept clear of all materials and obstructions.
- All rails must be effectively earthed and electrical continuity provided between individual rails. Fish plates are not enough to give electrical continuity. The resistance between rail and earth should never exceed I ohm.
- Deflection of rail track under full load should never exceed 3 mm.
- Track must be inspected regularly to check tightness and settlement, particularly at the commencement of crane use, and thereafter weekly or after adverse weather condition.
- Water must be kept away from track as it will possibly cause settlement. On sites with impervious ground conditions, a blinding layer of sand or ashes should be laid over clay, etc. and under the ballast.

5.12.4 "Out of Service" Precautions

- Whenever the crane is to be left unattended, even for short periods, the load should be removed from the hook, the hook itself raised to its highest working position at the appropriate radius and the power switched off. (Both the switch in the driver's cabin and main isolating switch, normally at ground level).
- The manufacturer's "Out-of-Service" instructions should be strictly observed. The jib should be slewed to the lee-ward of the tower, aligned with the wind direction, put into free slew and left to "weathercock" with the wind. The power supply should be switched off; any fuel supply should be cut off; door and panels giving access to electrical and mechanical equipment should be closed and locked.

6 REFERENCE

Construction Safety Manual III-7 Cranes and Lifting Equipment

General Instructions (GI 7.025) Heavy Equipment Operator and Rigger Testing and Certification

General Instructions (GI 7.027) Crane Suspended Personnel Platform (Man-basket) Operations

General Instructions (GI 7.028) Crane Lifts: Types and Procedures

General Instructions (GI 7.029) Rigging Hardware Requirements

7 ATTACHMENTS

[Attachment 1] Illustrations

[Attachment 2] Crane Operator Daily Inspection Checklists

[Attachment 3] Sling and rigging hardware inspection log

[Attachment 4] Letter of Appointment (Lifting Supervisor)

[Attachment 5] Letter of Appointment (Crane Operator)

[Attachment 6] Crane Operator Record

[Attachment 7] Letter of Appointment (Rigger)

[Attachment 8] Letter of Appointment (Signalman)

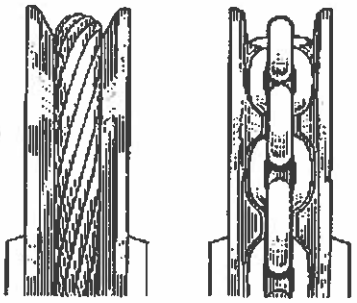
[Attachment 9] Particulars of Crane Operation Team

[Attachment 10] Notification of Lifting Equipment

[Attachment 11] Signals for Lifting Operations

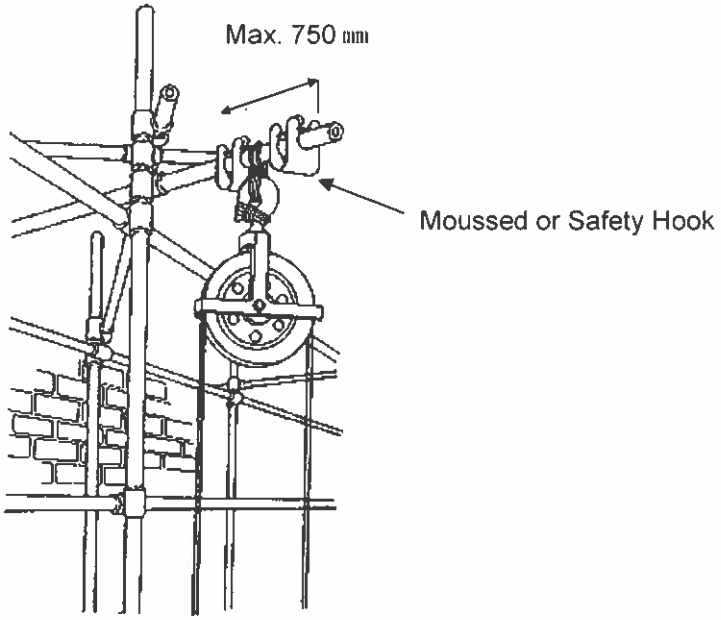
[Attachment 1] Illustrations

- The size of Pulley (or Drum)



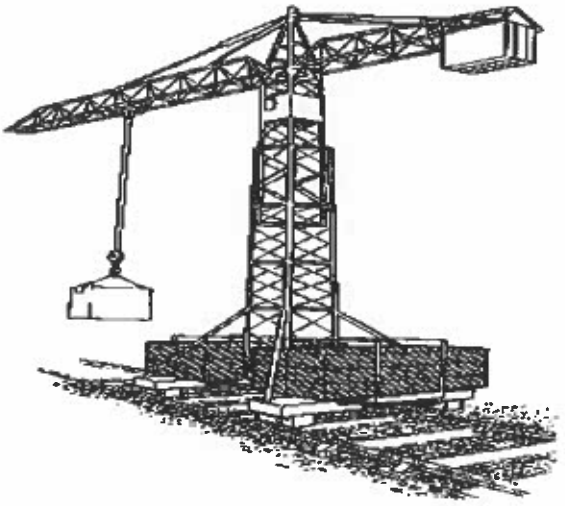
The size of pulley (or drum) in use must match the size of the rope or chain.

- Pulley blocks and Gin Wheels



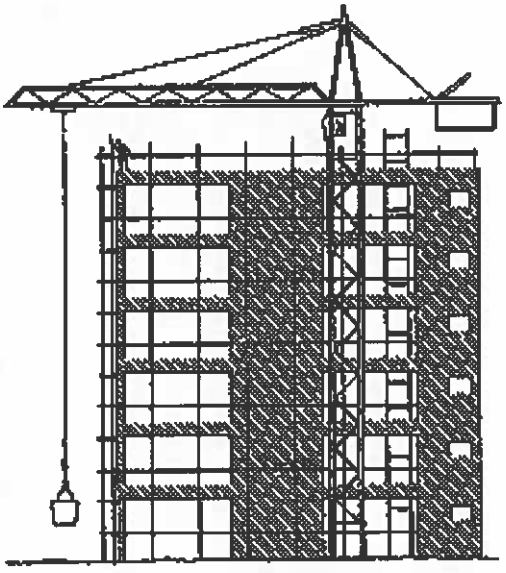
Pulley Blocks and Gin Wheels must be properly secured to the poles or beams from which they are suspended; any pole, etc., must be strong enough to carry the fixture and its load and be secured against movement.

- Balance of Crane



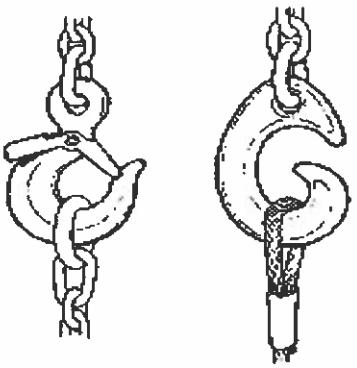
Cranes must be securely counterweighted or ballasted to prevent overturning when working. A diagram of the counterweight or ballast must be fixed to the crane. Ballast must be checked after bad weather.

- The Role of Banksman



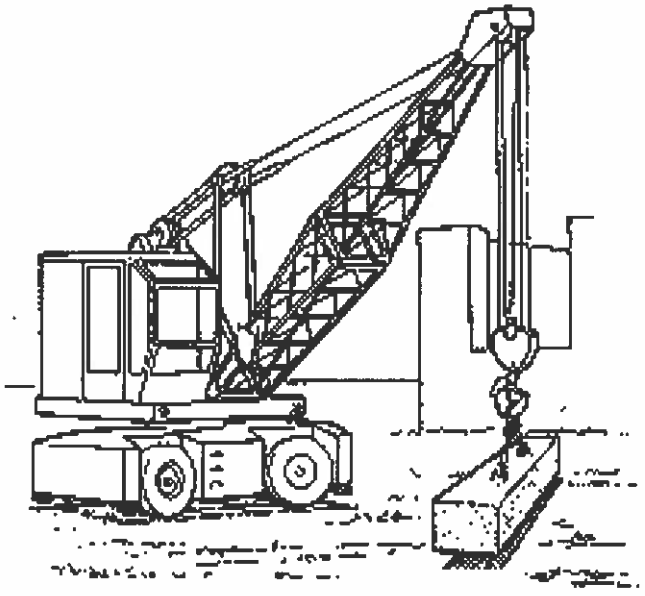
If a driver cannot see the load during the whole lifting operation, there must be, if possible, one or more trained banksman to enable the load to be handled safely.

- Hooks



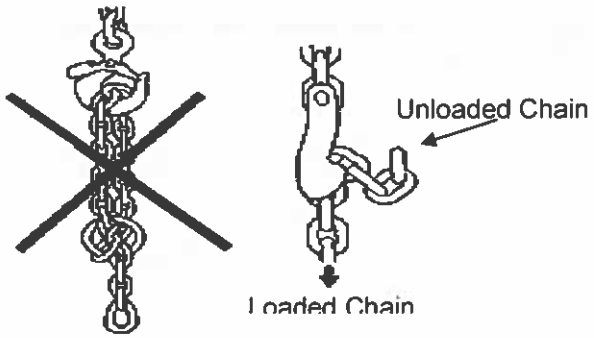
All hooks used for lifting must be fitted with a safety catch or be shaped to prevent the load coming off the hook.

- Safe Working Load



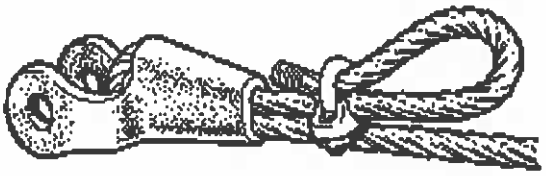
When loads, approaching the safe working load of the plant are to be lifted, the load must be raised a short distance first and the operation stopped to check stability and safety before continuing the lift.

- Chain



Loads must not be raised, lowered or suspended by any chain, etc. in which a knot has been tied (left). Chains may only be shortened properly, by means of a chain shortening clutch (right).

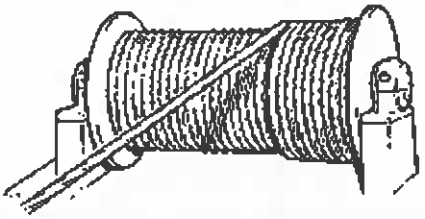
- Termination of Ropes



Ropes should be correctly terminated. When bulldog grips are used the rounded portion should hold on the free end. When pear wedges are used they should be of the right size for the rope and the dead end should be looped back and secured with a bulldog grip.

Where the rope cannot be looped back on itself because of the rope diameter, then a small length of the rope can be attached to the dead end as shown below.

- Ropes on Winding Drums



Ropes should lay correctly on all winding drums.

[Attachment 2] Crane Operator Daily Inspection Checklists

SAUDI ARABIAN OIL COMPANY (Saudi Aramco)

GENERAL INSTRUCTION MANUAL

ISSUING ORG TRANSPORTATION & EQUIPMENT SERVICES DEPARTMENT

SUBJECT CRANE LIFTS TYPES AND PROCEDURES

GI Number	Approved
0007.028	
ISSUE DATE 02/07/2022	REPLACES 05/3/2015
APPROVAL NAJ	PAGE NO 16 OF 16

Saudi Aramco 8160 (03/05) Saudi Aramco GI 7.028 Attachment #2

CRANE OPERATOR DAILY INSPECTION CHECKLIST

Crane Operator Badge #	Supervisor Badge #	Organization Code	Telephone#	Location
Manufacturer	Equipment #	Model	Capacity	

Carrier	Hour Meter Start	Hour Meter Finish	Crane	Hour Meter Start	Hour Meter Finish

PHASE	ITEM	ITEM NAME	OK	NOT OK	N/A	DEFICIENCY
PRE-START WALK-AROUND CHECKS	1 1	Inspection Sticker				
	1 2	Cabin Doors Panels Mirrors				
	1 3	Spark Arrester				
	1 4	Under-Chassis Leak Check				
	1 5	Air Reservoir				
	1 6	Tire Condition – Pressure Tread Sidewall				
	1 7	Tracks Drive Chains				
	1 8	Deck - Housekeeping Leaks				
	1 9	Coolant Level (Radiator)				
	1 10	Engine Oil Level				
	1 11	Engine Oil Leak Check				
	1 12	Wire Rope - Condition Drum Lay				
	*1 13	Sheaves Hook Block Headache Ball Safety Latch				
	1 14	Swing-Away Jib				
	1 15	Cab – Doors Glass Mirrors Housekeeping				
	1 16	Seat Belts				
	1 17*	Load Chart(s) - Accessible Readable				
	1 18	Fire Extinguisher(s) – Mounted Inspected				
	1 19	Hydraulic Oil Level				
	*1 20	Battery – Terminals Cables Electrolyte				
	1 21	Fan Belts				
ENGINE START-UP CHECKS	2 1	Engine Start				
	2 2	Voltmeter Ammeter Tachometer (RPM Gauge)				
	2 3	Turn Signals 4-Way Flasher Switch Beacon Light(s)				
	2 4	Horn Lights Wipers				
	2 5	Engine Oil Pressure Gauge				
	2 6	Transmission Converter Temperature Gauges				
	2 7	Engine Coolant Temperature Gauge				
	2 8	Fuel Gauge Level				
	2 9	Braking System(s)				
	2 10	Transmission Oil Level				
	2 11	Air Filter Restriction Condition				
	2 12	Hydraulic Filter Condition				
	2 13	Suspension System				
CRANE SAFETY DEVICES & OPERATIONAL CHECKS	3 1	Anti-Two Block Two Block Damage Prevention				
	3 2	Rated Capacity (Load) Limiter (RCL)				
	3 3	Outriggers Stabilizers Float Pads				
	3 4	Bubble Check				
	3 5	Steering System				
	3 6	Rear Axle Oscillation Lockout System				
	*3 7	Boom Extension Lift Controls Lift Operation Crane Counterweight				
	3 8	Hoist Controls Hoist Operation				
	3 9	Positive Swing Lock Swing Controls Operation				
	3 10	Back-Up Alarm				

Crane Operator Name (Please Print) Signature

Supervisor Name (Please Print) Signature

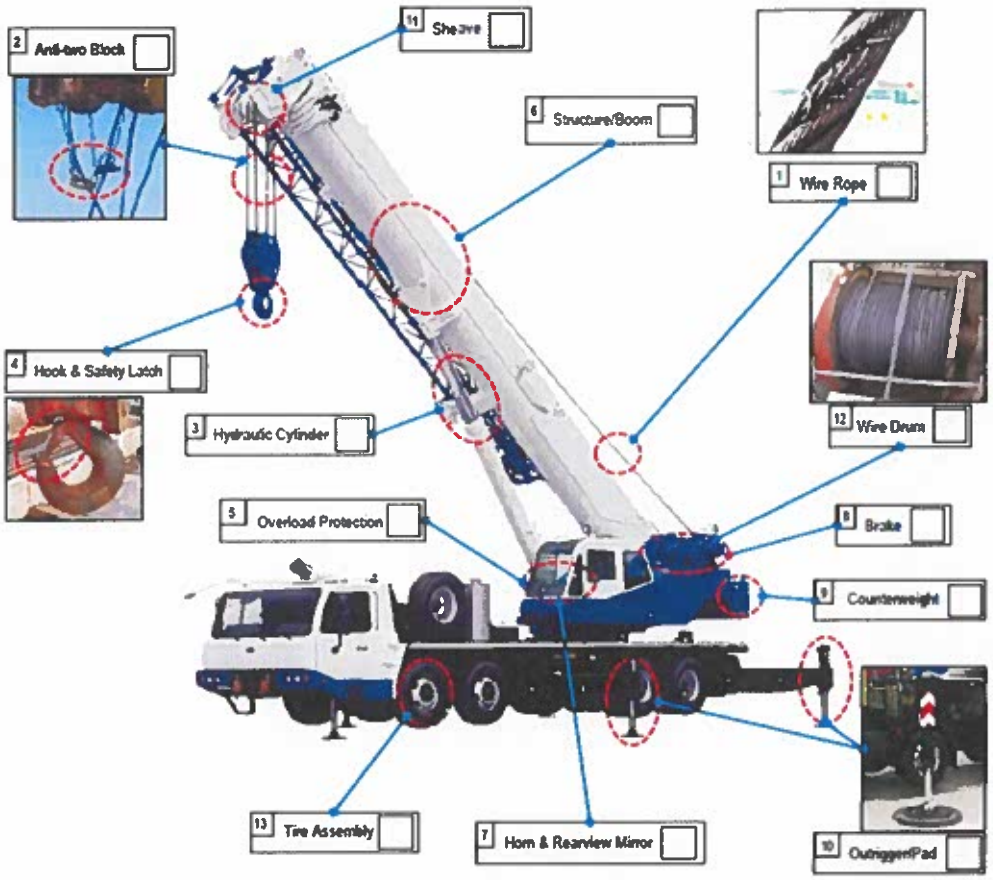
Distribution: Original – Supervisor Copy – Operator Copy – NA CA SA WA Heavy Equipment Division's Maintenance Unit

*CHANGE	**ADDITION	NEW INSTRUCTION	COMPLETE REVISION

Saudi Aramco: Company General Use

(For HEC) WEEKLY INSPECTION CHECKLIST FOR HYDRAULIC(MOBILE) CRANE

Project Name		Department		Date of Inspection	
Subcontractor		Equipment Plate Number		Capacity	
Insepctor	Name :		Signature :		



14	Certification		16	Oil Leakage		18	Lifting Gears		20	Fire Extinguisher	
15	Permit to Work		17	SignalMan (Banksman)/Rigger		19	Overhead & Ground Condition		21	Alcohol Test	

Note: Please submit the results of the weekly inspection to the site HSE Department.

Note: Mark appropriate boxes with : ✓ Acceptable; × Unacceptable; △ Need Further Check; NA Not Applicable

HYUNDAI ENGINEERING CO., LTD

(For Subcon.) Daily PRE-START CHECKLIST FOR HYDRAULIC(MOBILE) CRANE

NO	ITEM	MON	TUE	WED	THU	FRI	SAT	SUN	ETC
		/	/	/	/	/	/	/	
1	Wire Rope								
2	Anti-Reverse								
3	Hydraulic Cylinder								
4	Hook & Safety Latch								
5	Overload Protection								
6	Structure/Boom								
7	Horn & Rearview Mirror								
8	Brake								
9	Counterweight								
10	Outrigger/Pad								
11	Sheave								
12	Wire Drum								
13	Tire Assembly								
14	Certification								
15	Permit to Work								
16	Oil Leakage								
17	Banksman/Signal Man								
18	Lifting Gears								
19	Overhead & Ground Condition								
20	Fire Extinguisher								
21	Alcohol Test								
22									
23									
24									
25									
26									
Sign	Subcontractor_Operator (Name:)	Signed							
	Subcontractor_Comfirmed BY (Name:)	Signed							
Subcontractor Name					Equipment Plate Number				

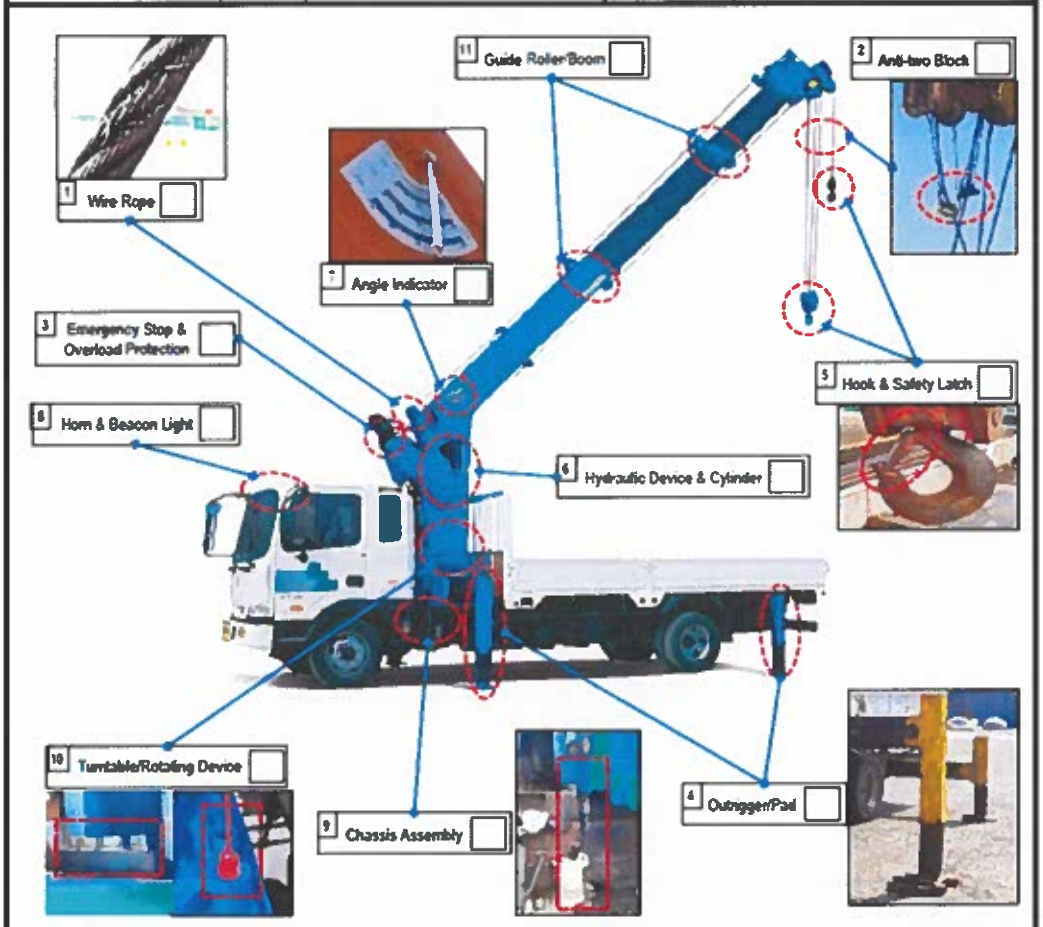
Note: Keep the copy of Daily Pre-Start Equipment Checklist on Site for the job duration, Submit a copy to HEC-HSE Department by Subcontractor HSE on weekly basis

Note: Mark appropriate boxes with : ✓ Acceptable, × Unacceptable, △ Need Further Check, NA Not Applicable

HYUNDAI

(For HEC) WEEKLY INSPECTION CHECKLIST FOR BOOM TRUCK/CARGO CRANE

Project Name		Department		Date of Inspection	
Subcontractor		Equipment Plate Number		Capacity	
Insepctor	Name :		Signature :		



12	Certification		14	Oil Leakage		16	Overhead & Ground Condition		18	Fire Extinguisher	
13	Permit to Work		15	SignalMan (Banksman)/Rigger		17	Lifting Gears		19	Alcohol Test	

Note: Please submit the results of the weekly inspection to the site HSE Department.

Note: Mark appropriate boxes with : ☑ Acceptable; ☒ Unacceptable; △ Need Further Check; NA Not Applicable

HYUNDAI ENGINEERING CO. LTD

(For Subcon.) Daily PRE-START CHECKLIST FOR BOOM TRUCK/CARGO CRANE

NO	ITEM	MON /	TUE /	WED /	THU /	FRI /	SAT /	SUN /	ETC
1	Wire Rope								
2	Anti-Two Block								
3	Emergency Stop & Overload Protection								
4	Outrigger/Pad								
5	Hook & Safety Latch								
6	Hydraulic Device & Cylinder								
7	Angle Meter								
8	Horn & Beacon Light								
9	Counterweight								
10	Outrigger/Pad								
11	Sheave								
12	Wire Drum								
13	Tire Assembly								
14	Certification								
15	Permit to Work								
16	Oil Leakage								
17	Banksman/Signal Man								
18	Lifting Gears								
19	Overhead & Ground Condition								
20	Fire Extinguisher								
21	Alcohol Test								
22									
23									
24									
25									
26									
Sign	Subcontractor_Operator (Name:)	Signed							
Sign	Subcontractor_Comfirmed BY (Name:)	Signed							

Subcontractor Name		Equipment Plate Number	

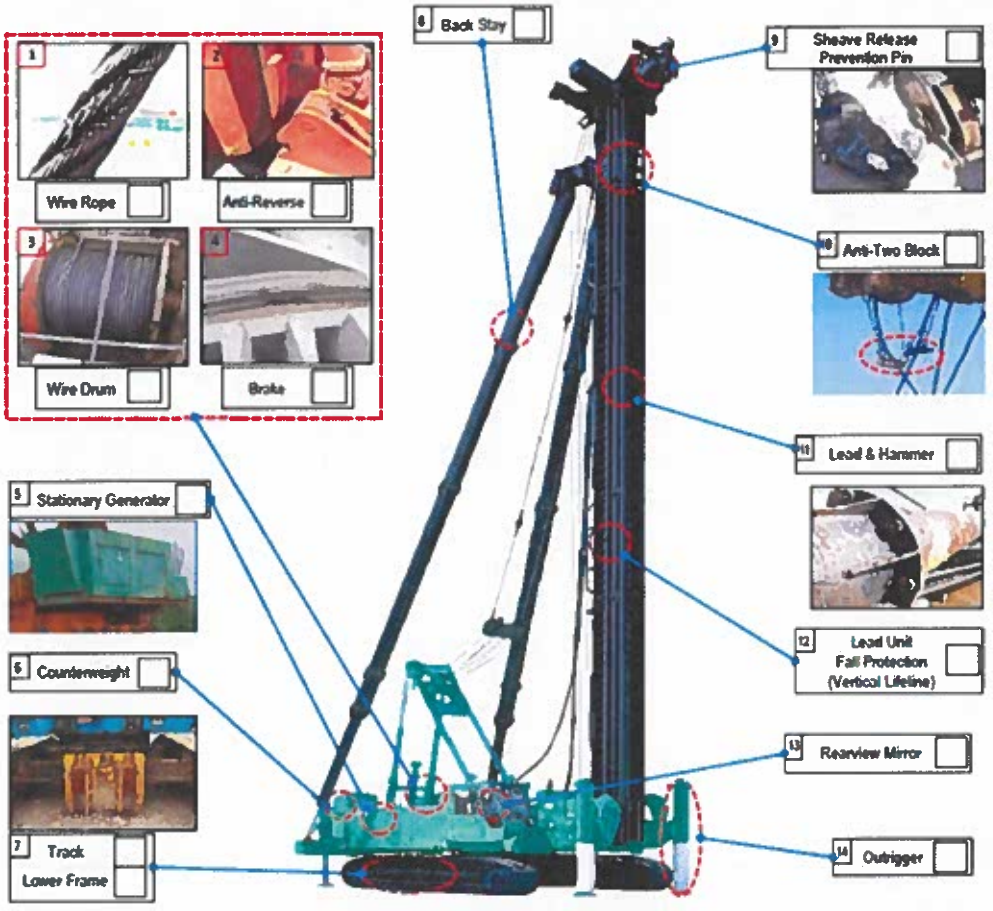
Note Keep the copy of Daily Pre-Start Equipment Checklist on Site for the job duration, Submit a copy to HEC-HSE Department by Subcontractor HSE on weekly basis

Note Mark appropriate boxes with : ✓ Acceptable, × Unacceptable, △ Need Further Check, NA Not Applicable

HYUNDAI ENGINEERING CO. LTD

(For HEC) WEEKLY INSPECTION CHECKLIST FOR PILE DRIVER

Project Name		Department		Date of Inspection	
Subcontractor		Equipment Plate Number		Capacity	
Insepctor	Name :		Signature :		



15	Certification		17	Oil Leakage		19	Fire Extinguisher				
16	Permit to Work		18	Seat Belt		20	Alcohol Test				

Note: Please submit the results of the weekly inspection to the site HSE Department.

Note: Mark appropriate boxes with : ✓ Acceptable, ✗ Unacceptable, △ Need Further Check, NA Not Applicable

HYUNDAI ENGINEERING CO. LTD

(For Subcon.) Daily PRE-START CHECKLIST FOR PILE DRIVER

NO	ITEM	MON /	TUE /	WED /	THU /	FRI /	SAT /	SUN /	ETC
1	Wire Rope								
2	Anti-Reverse								
3	Wire Drum								
4	Brake								
5	Stationary Generator								
6	Counterweight								
7	Track & Lower Frame								
8	Back Stay								
9	Sheave Release, Prevention Pin								
10	Anti-Two Block								
11	Lead & Hammer								
12	Lead Unit Fall Protection (Vertical Lifeline)								
13	Rearview Mirror								
14	Outrigger								
15	Certification								
16	Permit to Work								
17	Oil Leakage								
18	Seat Belt								
19	Fire Extinguisher								
20	Alcohol Test								
21									
22									
23									
24									
25									
26									
Sign	Subcontractor_Operator (Name:)	Signed							
Sign	Subcontractor_Comfirmed BY (Name:)	Signed							
Subcontractor Name					Equipment Plate Number				

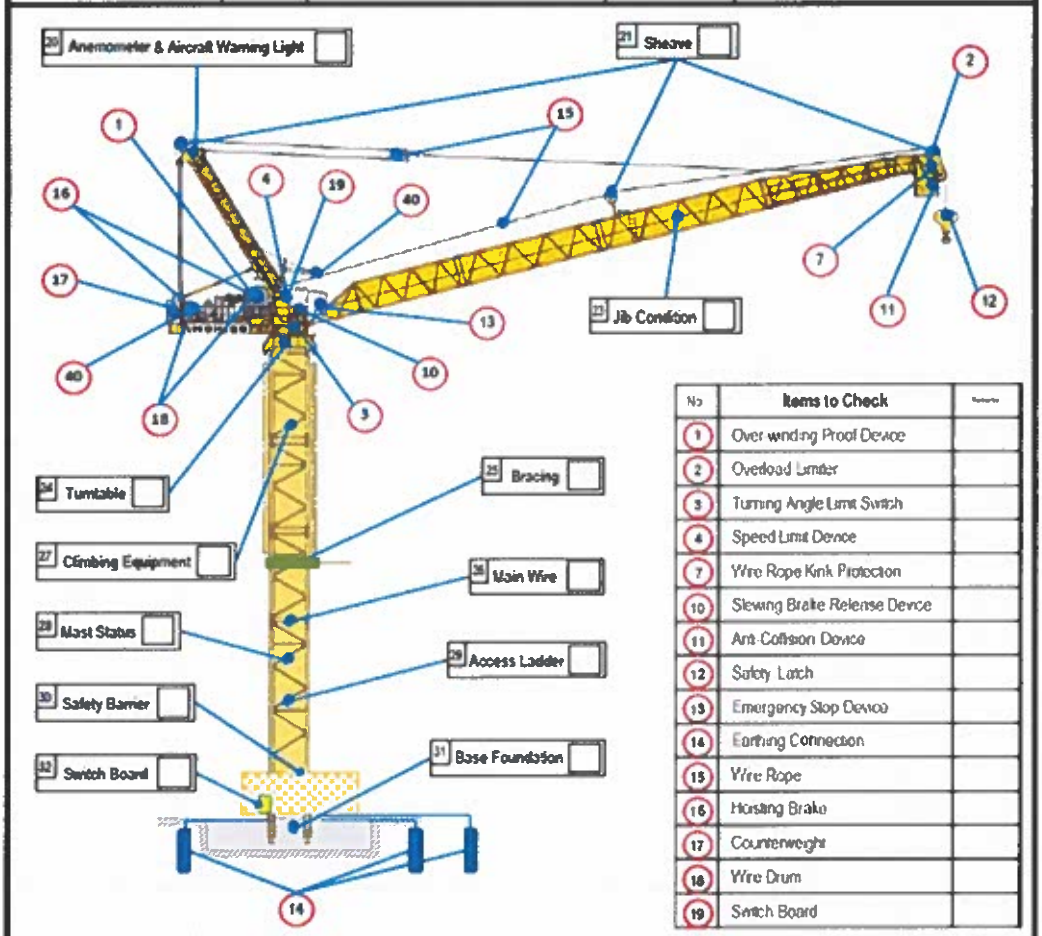
Note: Keep the copy of Daily Pre-Start Equipment Checklist on Site for the job duration, Submit a copy to HEC-HSE Department by Subcontractor HSE on weekly basis

Note: Mark appropriate boxes with : ✓ Acceptable, × Unacceptable, △ Need Further Check, NA Not Applicable

HYUNDAI ENGINEERING CO. LTD

(For HEC) WEEKLY INSPECTION CHECKLIST FOR TOWER CRANE(Luffing-Type)

Project Name		Department		Date of Inspection	
Subcontractor		Equipment Plate Number		Capacity	
Insepctor	Name :		Signature :		



No	Items to Check	
1	Over winding Proof Device	
2	Overload Limiter	
3	Turning Angle Limit Switch	
4	Speed Limit Device	
7	Wire Rope Kink Protection	
10	Slewing Brake Release Device	
11	Anti-Collision Device	
12	Safety Latch	
13	Emergency Stop Device	
14	Earthing Connection	
15	Wire Rope	
16	Hoisting Brake	
17	Counterweight	
18	Wire Drum	
19	Switch Board	

33	Certification & Plan		35	Rigger Certification/Training		37	Indicator/Monitor		39	Fire Extinguisher	
34	Installation/Dismantling Supervision		36	Cabin Status		38	Operating Switch				

Note: Please submit the results of the weekly inspection to the site HSE Department.

Note: Mark appropriate boxes with : ☑ Acceptable; ☒ Unacceptable; △ Need Further Check; NA Not Applicable

HYUNDAI ENGINE ENGINE CO. LTD

(For Subcon.) Daily PRE-START CHECKLIST FOR TOWER CRANE

NO	ITEM	MON /	TUE /	WED /	THU /	FRI /	SAT /	SUN /	ETC
1	Over-winding Proof Device								
2	Overload Limiter								
3	Turning Angle Limit Switch								
4	Speed Limit Device								
5	Trolley Control Device								
6	Trolley Stopper(T-type)								
7	Wire Rope Kink Protection(Swivel)								
8	Trolley Rope Breakage Device(T-								
9	Trolley Rope Tension Device(T-								
10	Slewing Brake Release Device								
11	Anti-Collision Device								
12	Safety Latch								
13	Emergency Stop Device								
14	Earthing Connection								
15	Wire Rope								
16	Hoisting Brake								
17	Counterweight*								
18	Wire Drum								
19	Electrical Switch Board(Upper)*								
20	Anemometer & Aircraft Warning								
21	Sheave								
22	Lighting								
23	Jib Condition								
24	Turntable								
25	Bracing*								
26	Main Wire*								
27	Climbing Equipment*								
28	Mast Status								
29	Acces Ladder								
30	Safety Barrier*								
31	Base Foundation*								
32	Electrical Switch Board(Bottom)*								
33	Certification & Plan*								
34	Installation/Dismantling								
35	Rigger Certification/Training*								
36	Operator Cabin status*								
37	Indicator/Monitor								
38	Operating Switch's Safety Device								
39	Fire Extinguisher								
40	Derricking Limiter(L-type)								
s i g n	Subcontractor_Operator (Name:)	Signed							
	Subcontractor_Comfirmed BY (Name:)	Signed							
Subcontractor Name					Equipment Plate Number				

Note: Keep the copy of Daily Pre-Start Equipment Checklist on Site for the job duration, Submit a copy to HEC-HSE Department by Subcontractor HSE on weekly basis.

Note: Mark appropriate boxes with : ✓ Acceptable, × Unacceptable, △ Need Further Check, NA Not Applicable

HYUNDAI ENGINEERING CO., LTD.

[Attachment 3] Sling and rigging hardware inspection Log

SA 9657 (07/07) Saudi Aramco GI 7.029 Attachment #1

***SLING /RIGGING HARDWARE INSPECTION LOG**

*NOTE: EACH SLING /RIGGING HARDWARE SHALL HAVE A SEPARATE SLING INSPECTION LOG PAGE

*SLING/RIGGING HARDWARE TYPE: _____ *SERIAL #: _____ SAFE WORKING LOAD (SWL): _____

*SLING/RIGGING HARDWARE DESCRIPTION: _____

*IN-SERVICE DATE: _____ *OUT-OF-SERVICE DATE: _____

INSPECTION DATE	*RIGGER/RIGGING COMPETENT PERSON NAME, CERTIFICATE #, & SAUDI ARAMCO ID #	REMARKS

Saudi Aramco: Company General Use

[Attachment 4] Letter of Appointment (Lifting Supervisor)

Letter of Appointment

(Lifting Supervisor)

In accordance with the HEC Procedure Lifting Operations (**HEC-AH-H04-H31**), I of , appoint Mr. with effective from As lifting Supervisor who shall be responsible for lifting operations on the project.

The appointee shall :

1) Co-ordinate lifting activities.
2) Check the load and riggings to ensure that the load can be lifted and removed safety by the crane.
3) Ensure that the ground conditions are safe for the lifting operations to be performed by crane.
4) Ensure that lifting activities are carried out in accordance with safe and sound practices.
5) Take all necessary measures to rectify any unsatisfactory or unsafe conditions reported to him by the crane operator/site supervisor.

I confirm that the appointee has attended and/or passed a Safety Instruction Course for Lifting Supervisor.

Appointed by:

Name : _____

Designation : _____

Signature : _____

Date : _____

[Attachment 5] Letter of Appointment (Crane Operator)

Date :

To : Hyundai Engineering Co., Ltd.

From :

Letter of Appointment

(Crane Operator)

In accordance with the HEC Procedure Lifting Operations (**HEC-AH-H04-H31**), I Name of person who will appoint of Company's Name and Address, appoint Mr. Name of Crane Operator with I/D or Passport No. effective from Date of appointment. To operate a mobile crane on the Project Name project.

I confirm that the appointee has attended and/or passed a Safety Instruction Course for Lifting Supervisor.

A copy of the certificate is attached.

Appointed by:

Name : _____

Designation : _____

Signature : _____

Date : _____

[Attachment 6] Critical lifting form

SAUDI ARABIAN OIL COMPANY (Saudi Aramco)

GENERAL INSTRUCTION MANUAL

ISSUING ORG TRANSPORTATION & EQUIPMENT SERVICES DEPARTMENT

SUBJECT CRANE LIFTS TYPES AND PROCEDURES

GI Number	Approved
0007 028	
ISSUE DATE 02/07/2022	REPLACES 05/3/2015
APPROVAL NAJ	PAGE NO 15 OF 16

SA 9644 (07 0") — Saudi Aramco GI 7 028 — Attachment #1

Critical Lift Plan*

(*Each Piece Of Individual Lifting Equipment Shall Have A Separate Critical Lift Plan)

Organization Name
Organization Code # _____
Facility Name _____

Date of Lift
Work Permit Required* YES ☐ NO ☐
Specific Work Location _____ Contract # _____

A) Load Description & Weight (From USER):

_____ lbs kgs

B) *Weights :

Load Handling Boom Attachment	Stowed	Erected	N A	Weight lbs kgs
Swing-Away Jib	☐	☐	☐	_____
Other Jibs	☐	☐	☐	_____
Hook Block (Main)			☐	_____
Auxiliary Boom Head			☐	_____
Headache Ball			☐	_____
Lifting Spreader Beam Needed* YES ☐ NO ☐			☐	_____
Does Beam Have Current Inspection Sticker* YES ☐ NO ☐				
Slings, Shackles etc				_____
Other _____				

Weight of Load Handling Devices (Section B Above) _____ lbs kgs
\- Weight of Load to be Lifted (Section A) _____ lbs kgs
= **Total Gross Weight (Sections A + B)** _____ lbs kgs

C) *Crane Information (See "Notes" Below):

1 SA Inspection Sticker YES ☐ NO ☐
2 Inspection Sticker Expiry Date _____
3 Equipment ID # _____
4 Crane Model _____
5 Crane Type _____
6 Crane Rated Capacity _____ lbs kgs
7 Crane Operating Code # (if applicable) _____
8 Single Line Pull Capacity _____ lbs kgs
9 # of Parts of Line
10 Total Gross Capacity Hook Block as Reeved
_____ lbs kgs

D) Crane Configuration :

1 Required Boom Length _____ ft m
2 Boom Angle _____ degrees
3 Required Counterweight _____ lbs kgs
4 Operating Radius _____ ft m
5 Lift Quadrant (From Rear 360°) _____

E) Rigging :

1 Hitch Arrangement _____
2 Sling Type(s) _____
3 Sling Size(s) _____ in cm
4 Sling Length(s) _____ ft m
5 Shackle Size _____ in cm & Capacity _____ lbs kgs
6 Capacity of Above Configuration _____ lbs kgs

F) Crane Capacity in This Configuration (De-rated, if applicable) _____ lbs kgs | G) Total Gross Weight ÷ Capacity = _____ %

H) Surface Requirements Needed (Other Than Mandatory Outrigger Pads) Man YES ☐ NO ☐ *I) Is the Ground Level* YES ☐ NO ☐ *J) Proper Ground Compaction* YES ☐ NO ☐
K) Excavation Hazards Controlled YES ☐ NO ☐ *L) Other Control YES ☐ NO ☐

M) Wind Speed Shall Not Exceed GI 7 02* Limits for Manbaskets or GI 7 028 Limits Manufacturer's Specifications for Loads

N) Energized Power Lines Within Boom Radius YES ☐ NO ☐ *O) Explosive Fire High Heat Hazards Within Boom Radius* YES ☐ NO ☐
P) Is This a Nighttime Crane Lift YES ☐ NO ☐ If Yes *Q) Do You Have Written Approval From Facility Manager* YES ☐ NO ☐ NA ☐
R) Can it be utilized as **Blanket Critical Lift Plan ** YES ☐ NO ☐
S) Can it be utilized as **Multiple Use Critical Lift Plan** YES ☐ NO ☐ if yes **T) What is the date of Expiry _____
*U) Attendees A Pre-Lift Safety Meeting is Mandatory *V) CAN CRANE MAKE LIFT* YES ☐ NO ☐

Positions	Name (Signature)	Badge #	Certificate #	Approved by Rigger-I
*Originator Rigger	_____	_____	_____	Name (Print) _____
Crane Operator	_____	_____	_____	Badge # _____
USER Supervisor	_____	_____	_____	Certificate # _____
				Signature _____

Notes *(As per section 6 3)

1 Attach sketch (es) of lift site noting obstacles to movement of load boom or tail swing (optional)
2 All units of weight shall be listed in the same units of measure as Crane Load Chart
3 All units of measure shall be listed in the same units of measure as Crane Range Diagram
4 Attach copy of Crane Load Chart Range Diagram and Safety Notes (optional)
5 Certain weights may be deducted from Crane Load Chart capacities based on manufacturer's specifications

_____
CPOD Concurrence
(when required by GI 2 702)

*CHANGE | **ADDITION | NEW INSTRUCTION | COMPLETE REVISION

Saudi Aramco: Company General Use

[Attachment 7] Letter of Appointment(Rigger)

Date :
To : Hyundai Engineering Co., Ltd.
From :

Letter of Appointment

(Rigger)

The following personnel is/are appointed as Rigger(s):

1. Name :
   I.D / Passport No. :
   Date of Training attended / to attend :

2. Name :
   I.D / Passport No. :
   Date of Training attended / to attend :

3. Name :
   I.D / Passport No. :
   Date of Training attended / to attend :

4. Name :
   I.D / Passport No. :
   Date of Training attended / to attend :

5. Name :
   I.D / Passport No. :
   Date of Training attended / to attend :

Duties.

1) Check slings.
2) Ensure slings are not over loaded.
3) Use proper lifting gears
4) Use proper receptacle for loose loads.
5) Padding of sharp edges to protect slings.
6) To submit copy of Training Achievement.

Appointed by:

Name : _____
Designation : _____
Signature : _____
Date : _____

[Attachment 8] Letter of Appointment(Signalman)

Date :
To : Hyundai Engineering Co., Ltd.
From :

Letter of Appointment

(Signalman)

The following personnel is/are appointed as Rigger(s)

1. Name :
   ID / Passport No. :
   Date of Training attended / to attend :

2. Name :
   ID / Passport No. :
   Date of Training attended / to attend :

3. Name :
   ID / Passport No. :
   Date of Training attended / to attend :

4. Name :
   ID / Passport No. :
   Date of Training attended / to attend :

5. Name :
   ID / Passport No. :
   Date of Training attended / to attend :

Duties

Verify that load has been properly rigged.
Give correct and clear signal to guide the operator.

To submit copy of Training Achievement

Appointed by
Name : _____
Designation : _____
Signature : _____
Date : _____

[Attachment 9] Particulars of Crane Operation Team

Client Logo	Particulars of Crane Operation Team Project Name:	HYUNDAI ENGINEERING CO LTD
Name of Contractor		
Name of Submitting Officer		
Designation		Date:
Signature		

No.	No. of Crane	Crane Operator	Lifting Supervisor	Rigger	Signature	Site Location

[Attachment 10] Notification of Lifting Equipment

Notification of Lifting Equipment

To : Hyundai Engineering Co., Ltd. From :

Please be informed of the below named LIFTING MACHINE / LIFTING APPLIANCES / LIFTING GEAR to be used in this worksite.

The detail particulars are listed as follows:

1. DETAILS OF LIFTING EQUIPMENT			
Type		Maker/Brand	
Model		Serial No	
Capacity		Identification	
2. REGISTRATION DETAIL			
Registration No			
Last Date of Examination			
Last Date of Load Test (for LM)			
Safe Working Load			
3. RESPONSIBLE PERSON (OPERATION)			
Name of Operator		ID No.	
Qualifications			
4. RESPONSIBLE PERSON (MAINTENANCE)			
Name		ID No.	
Frequency of Maintenance			
Frequency of Safety Check			
Date	Name		
Lifting Machine(LM) = Cranes, Winches, Gondolas, etc Lifting Gears (LG) = Slings, Shackles, Chains, etc Lifting Appliances (LA) = Chain blocks, Pulley Block etc Copy of Certificates to be attached Responsible person to maintain record of maintenance / safety check report			
Company	Signature	Date.	

[Attachment 11] Signals for Lifting Operations

 **STOP** – With arm extended horizontally to the side, palm down, arm is swing back and forth	 **EMERGENCY STOP** – With both arms extended horizontally to the side, palms down, arms are swing back and forth	 **HOIST** – With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles
 **RAISE BOOM** – With arm extended horizontally to the side, thumb points up with other fingers closed	 **SWING** – With arm extended horizontally, index finger points in direction that boom is to swing	 **RETRACT TELESCOPING BOOM** – With hands to the front at waist level, thumbs point at each other with other fingers closed
 **RAISE THE BOOM AND LOWER THE LOAD** – With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired	 **DOG EVERYTHING** – Hands hold together at waist level	 **LOWER** – With arm and index finger pointing down, hand and finger make small circles
 **LOWER BOOM** – With arm extended horizontally to the side, thumb points down with other fingers closed	 **EXTEND TELESCOPING BOOM** – With hands to the front at waist level, thumbs point outward with other fingers closed	 **TRAVEL/TOWER TRAVEL** – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel
 **LOWER THE BOOM AND RAISE THE LOAD** – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired	 **MOVE SLOWLY** – A hand is placed in front of the hand that is giving the action signal	 **USE AUXILIARY HOIST** (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action
 **CRAWLER CRANE TRAVEL, BOTH TRACKS** – Rotate fists around each other in front of body, direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward	 **USE MAIN HOIST** – A hand taps on top of the head. Then regular signal is given to indicate desired action.	 **CRAWLER CRANE TRAVEL, ONE TRACK** – Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.
 **TROLLEY TRAVEL** – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.		