

			PROJECT	Standby SRU & Additional Tanks IOCL Paradip Refinery	
			CLIENT	INDIAN OIL CORPORATION LIMITED	
JOB SPECIFICATION FOR RIGGING, HAULAGE & HEAVY LIFT	Project No. 080557C001	Document No. 080557C-000-JSC-0000-001		Rev. No. 0	Page 1 of 35

Annexure-II

JOB SPECIFICATION FOR RIGGING, HAULAGE & HEAVY LIFT

0	21.11.2019	ISSUED FOR IMPLEMENTATION	TB	PKP / LA	LA	JMC
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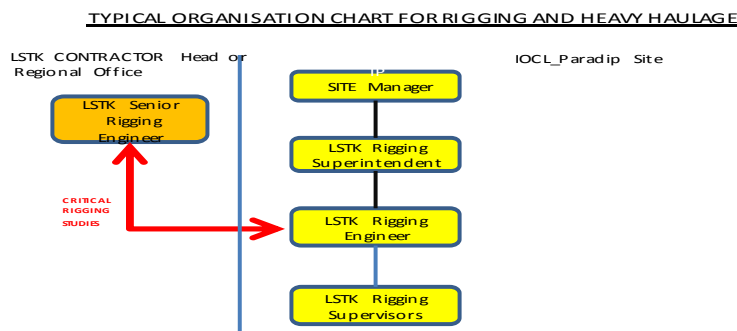
1 PURPOSE

The purpose of this procedure is to define key elements of a viable crane, rigging and haulage safety management system to be adopted on IOCL-Paradip

2 SCOPE

The scope of this procedure is intended to include all LSTK personnel and subcontractors engaged in lifting and heavy haul work activities. Subcontractors may elect to use alternative forms of documentation but they shall adhere to the fundamental elements of this procedure.

3 ROLES AND RESPONSIBILITIES



3.1 SITE MANAGER AND CONSTRUCTION MANAGER

The Site and Construction Manager has the ultimate responsibility to ensure that this procedure is followed for all rigging and heavy haul activities.

3.2 RIGGING SUPERINTENDENT /SUPERVISOR

The Rigging Superintendent/Supervisor shall have the necessary experience and knowledge in their designated field of work.

The Rigging Superintendent/Supervisor is responsible for;

- All the project lifting and heavy haul activities.
- Ensuring all crane operators and riggers are certified.
- Preparing Medium Lift Plans with the Site Rigging Engineer.
- Co-ordinating crane schedules and resources.
- Co-ordinating any specialist subcontracted heavy haul company.
- Conducting Pre-Lift and Pre-Haul Safety Talks

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- Ensuring rigging and heavy haul plans are carried out as per approved procedures and standards.
- Maintaining the site rigging equipment inventory.
- Ensuring Tool Box Talks are conducted on a regular basis and before each lift.

3.3 SITE RIGGING ENGINEER

The Site Rigging Engineer shall have the necessary experience in the preparation and compiling of rigging & haulage plans and is required to have a technical and in depth knowledge in their designated field of work.

The Site Rigging Engineer is responsible for;

- Overseeing all rigging and heavy haul activities.
- Co-ordinating with the Senior Rigging Engineer during the preparation of critical lift and critical haulage plans.
- Preparation of Medium Lift Plans with the Rigging Superintendent/Rigging Supervisor.
- Preparation of Medium & Critical Haulage Plans with the specialist subcontracted heavy haul company.
- Ensuring construction hold points are identified for lifting and heavy haul activities.
- Ensuring necessary ground improvement conditions are identified.
- Ensuring all lifts and heavy haul activities are categorised correctly.
- Identifying any additional assistance required during project execution or planning e.g. geo-technical, engineering resources.
- Providing technical rigging support to site personnel.
- Co-ordinating with Procurements to review transportation drawings and site delivery of equipment from Vendors.

3.4 SENIOR RIGGING ENGINEER

The Senior Rigging Engineer is usually located in the Head or Regional home office and has an in-depth knowledge and expertise in the field of rigging and heavy haulage.

The Senior Rigging Engineer is responsible for;

- Providing support as and when necessary to the Site Rigging Engineer, Rigging Superintendent /Supervisor and Sub-Contractors.
- Preparation of critical lift and critical haul plans with the Site Rigging Engineer.
- Review and approval of all critical lift and critical haul plans.
- Review and approval of medium lift and medium haulage plans if not reviewed and approved by the Site Rigging Engineer.

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3.5 CRANE OPERATOR

All Crane Operators shall be certified in accordance with the 'Certification System for Crane Operators' or a comparable national or international certification system. The Crane Operator shall be a competent person, trained, certified, carry the appropriate license to operate a specific model and crane capacity and shall have the necessary documented training available for review.

The crane operator shall be responsible for;

- Selecting the appropriate boom, jib and crane configuration to meet lift requirements and to determine the net capacity of this configuration.
- Completing the Daily Crane Operation Log (Attachment A1) with the Rigger for all light lifts.
- Operate the crane in a safe, controlled and smooth manner.
- Inspect the crane on a daily basis and fill in the Crane Daily Checklist and report any faults to the Rigging Superintendent / Supervisor.
- Inform the Rigging Superintendent/Supervisor of any potentially dangerous conditions before or during the lifting operations.
- Identification of all potential hazards.
- Correct utilization and understanding of the cranes load chart.
- Having a thorough knowledge of the cranes operating manual and to fully understand the cranes limitations.
- Knowing the load and rigging weight at all times.
- Assessment of weather conditions before and during the lift.
- Checking the site is adequately prepared for the crane location.
- Never leaving the crane controls while a load is suspended.
- Ensuring the crane is set up, assembled and rigged as per manufacturer's specifications.
- Attending Pre-Lift Safety and Toolbox talks.

3.6 RIGGER

All Riggers shall be certified in accordance with the 'Certification System for Riggers' or a comparable national or international certification system. The rigger certification levels are Rigger 1(Advanced level), Rigger 2 (Intermediate level) and Rigger 3 (Basic Level). Depending on the riggers certification level they shall only be allowed to carry out specific roles and responsibilities which are detailed in the table below;

Rigger 1 Advanced Level	Rigger 2 Intermediate Level	Rigger 3 Basic Level
Can perform and manage all types of rigging activities.	Can perform and manage all lifts classified as 'light lifts'.	Carries out site preparation (barricading, sign posting and colour coding) Can assist in handling taglines but not permitted to do any lift alone and must always work under the supervision of a Level 1 or Level 2 Rigger.

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The Rigger shall be responsible for;

- Attaching the rigging equipment to the load correctly (Rigger 1 medium/critical lifts & Rigger 2 light lifts) and ensuring the rigging is in accordance with the approved lift plan. (Rigger 1)
- Ensuring all rigging equipment that is used is inspected and holds current certification. (All rigger levels)
- Ensuring that all JSA's and Pre-lift Checklists (Medium and Critical Lifts) are completed prior to the lift. (Rigger 1)
- Selecting the correct rigging equipment when carrying out light lifts. (Rigger 2)
- Reviewing any approved Medium and Critical lift plans prior to the lift. (Rigger 1)
- Completing the Daily Crane Operation Log (Attachment A1) with the Crane Operator for all light lifts. (Rigger 2)
- Attending Pre-Lift, Pre-Haul and Toolbox talks when required. (All rigger levels)
- Ensuring any additional PMC/ OWNER requirements are followed and approved rigging practices are carried out at all times. (All rigger levels)
- Giving the correct and approved hand signals to the crane operator. Rigger 1 Medium and Critical lifts, Rigger 2 'light lifts'.
- Knowing the load and rigging weight at all times. (All rigger levels)
- Assessment of weather conditions before and during the lift. (Level 1& Level 2 Riggers)

3.7 SUB-CONTRACTORS

Any Sub-Contractors engaged in any project execution, planning, review and approval of any lifting or heavy haul activities shall follow the core requirements of this procedure. This includes addressing identification of any required ground improvements or other site conditions e.g. foundations that could affect the installation or transportation of equipment.

3.8 LOGISTICS DEPARTMENT

The Logistics Department shall co-ordinate through the relevant contractor to ensure that any haulage of any major pieces of equipment (Medium or Critical classification) outside of the site facilities has been planned well in advance, ensure the route has been surveyed and there are no impediments on route that would adversely affect the safe and timely delivery of the equipment to site.

The Logistics Department shall also advise site in a timely manner of any equipment being delivered to site that requires a Lift Plan so that the Rigging Department has sufficient time for preparation and the required signatory approvals.

3.9 LIFTING EYE AND OR TRUNNIONS

The design for the safe transportation and lifting of equipment shall be the responsibility of the LSTK Contractor. LSTK Contractor shall ensure that the design of adequate lifting eyes and/or trunnions and transport support points.

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3.10 ENGINEERING

When an additional level of expertise is required during the planning of heavy lift and haul activities engineering support shall be sought either within the company or through additional third parties.

Engineering support can include but is not limited to the following;

- Verification of loads imposed on permanent structures during any construction activities such as jacking and skidding operations, strand jack lifts and installation of tower cranes.
- Verification of designed and proposed lifting points.
- Verification and assistance in the design of special lifting attachments, lifting and spreader beams etc.
- Design and verification of any requirement for additional structural strengthening such as bracings.
- Verification of loads imposed on large structures during lifting or haulage e.g. modules.

4 DEFINITIONS

4.1 PAYLOAD

Payload is the weight of the item you are intending to lift. The payload is to include additional attachments such as transportation saddles, temporary supports, stiffeners and insulation etc. The rigging weight which is associated with the payload is not to be included.

4.2 COMPETENT PERSON

A competent person is a person who has extensive knowledge and experience and can successfully demonstrate their competency in their designated field of work.

4.3 CRANE

A crane is a device used for raising, shifting or lowering a load. It shall refer to any device that is stationary or mobile including but not limited to Crawler Cranes, Telescopic Cranes, Strand Jack Systems, Gantry Cranes and Hydraulic Jacking Systems.

4.4 RIGGING EQUIPMENT

Rigging equipment are items that are used to attach to a payload to lift, secure and/or support. Examples include but are not limited to the following; slings, shackles, spreader beams, lifting beams etc.

4.5 SAFE WORKING LOAD

Safe Working Load (SWL) is the maximum load which can be lifted, suspended or lowered by a device such as a crane, hoist or lifting equipment. The components with the lowest safe working load limits the total capacity.

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4.6 TRANSPORTATION EQUIPMENT

Transportation equipment is any piece of equipment used to transport a load. Examples include but are not limited to the following self propelled trailers, trailers hauled by a truck and barges.

4.7 METRIC SYSTEM

For this procedure, the metric system will be used for weights and measures. For the weight metrification system “tonne” refers to 1000 kgs and is sometimes abbreviated as “t”.

4.8 RIGGING ACTIVITIES

Rigging activities is any lifting of a payload that falls under this Rigging and Heavy Haulage procedure.

4.9 HEAVY HAUL ACTIVITIES

Heavy haul activities are the movement of any materials or equipment from one defined point to another that falls under this Rigging and Heavy Haulage procedure.

4.10 RIGGING & HAULAGE PLANS

These are a group of approved documents that illustrates the efficient and safe manner as to how the lift and/or transportation shall be carried out.

4.11 SAFE LIMIT OF APPROACH

Safe Limit of Approach is the closest distance to an energized power line a piece of equipment can operate e.g. crane or trailer. A spotter shall be deployed at all times when operating near energized power lines and personal protection barriers used.

Line Voltage Absolute Safe Limit of Approach for operational clearances are detailed in Table 1 and transit clearances are detailed in Table 2 ;

Table 1 – Operational Clearances

- Up to 50 KV – 3.05 meters (10ft)
- Over 50 KV to 200 KV - 4.6 meters (15ft)
- Over 200 KV to 350 KV - 6.1 meters (20ft)
- Over 350 kv to 500 KV – 7.62 meters (25ft)
- Over 500 KV to 750 KV – 10.67 meters (35ft)
- Over 750 KV to 1000 KV – 13.72 meters (45ft)

Table 2 – Transit Clearances

- Up to .75 KV – 1.22 meters (4ft)
- Over 0.75 KV to 50KV - 1.83 meters (6ft)
- Over 510KV to 345 KV - 3.05 meters (10ft)

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- Over 345 KV to 750 KV – 4.88 meters (16ft)
- Over 750 KV to 1000KV – 6.1 meters (20ft)

KV= Kilovolt (1000 volts), a unit of electrical potential difference.

Any country standards or client requirements found to be more stringent shall take precedence over the above criteria.

4.12 LIFT DATA SHEET

Lift Data Sheets contain groups of operational parameters which gives the required information for the lifting activity.e.g. crane type/configuration, rigging equipment and crane deductibles etc. Technip data sheets consist of a Single Lift Plan Data Sheet (refer to Attachment 5) and a Two Crane Tandem or Upending Lift Plan Data Sheet (refer to Attachment 6). It is recommended that all LSTK contractors use these data sheets or follow a similar format. These Lift Data Sheets are available in Excel format from the Technip or optionally they can be printed and the required information manually input.

5 REFERENCES

Reference Standards

- Code of Practice for Safe Use of Cranes
- GeneralBS 7121-1 : 2006
- Inspection, Testing and ExaminationBS 7121-2 : 2003
- Mobile Cranes.....BS 7121-3 : 2000
- Lorry Loaders.....BS 7121-4 : 1997
- Tower Cranes.....BS 7121-5 : 1997
- Offshore Crane.....BS 7121-11 : 1998
- Code of Practice for Safe Use of Cranes.....CP 3010 : 1972
- Cranes-Requirements for Health
and Safety –Limiting and Indicating Devices.....BS EN 12077-2 : 1999
- Cranes- Mobile Cranes.....BS EN 13000 : 2004
- Cranes-Safety-Hand Powered Lifting Equipment.....BS EN 13157 : 2004
- Cranes-Safety-Non Fixed Load Lifting Attachments.....BS EN 13155 : 2003
- Offshore Cranes-General Purpose Offshore Crane.....BS EN 13852-1 : 2004
- Cranes and Lifting Appliances- Selection of Wire Rope.....BS ISO 4308-1 : 2003
- Lifting Slings – Methods of Rating.....BS 6166-1 : 1986
- Lifting Slings- Specification for Marking.....BS 6166-2 : 1986
- Guide to the Selection and Safe Use of Lifting Slings for
Multiple Purposes.....BS 6166-3 : 1988
- Short Link Chain Slings for Lifting
Purposes- Safety Chain Slings GR 8.....BS EN 818-4 : 1997
- Flat Woven Webbing Slings.....BS EN 1492-1 : 2000
- Round Slings.....BS EN 1492-2 : 2000
- Steel Wire Rope Slings- Safety Slings for General Service.....BS EN 13414-1 :2003
- Grommets and Cable Laid Slings.....BS EN 13414-3 : 2003
- Steel Wire Ropes- General Requirements.....BS EN 12385-1 : 2002
- Steel Wire Ropes-Definitions.....BS EN 12385-2 : 2003
- Steel Wire Ropes-Information for Use and Maintenance.....BS EN 12385-3 : 2004

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- Stranded Ropes for General Lifting.....BS EN 12385-4 : 2002
- Lifting Appliances.....ISO 4301-1 : 1986
- Mobile Cranes.....ISO 4301-2 : 1985
- Tower Cranes.....ISO 4301-3 : 1993
- Jib Cranes.....ISO 4301-4 : 1989
- Overhead Travelling and Portal Bridge Cranes.....4301-5 : 1991
- Stability of Cranes.....ISO 4304 : 1987
- Lifting Operations and Lifting Equipment Regulations.....LOLER – UK : 1998
- Provision and Use of Work Equipment Regulations.....PUWER 1998

6 CLASSIFICATION OF LIFT PLANS

The competent person planning the lift shall refer to the lift classifications in the following table to determine the classification of the lift and to determine the amount of planning and documentation required.

6.1 LIFT PLAN CLASSIFICATION TABLE

Light Lift	• Payload 0 tonne to less than 20 tonne
Medium Lift	• Payload 20 tonne to less than 50 tonne • Greater than 75% but less than 90% of a cranes chart capacity • Any two crane lift below 75% of a cranes chart capacity • 75% or less than 90% of a cranes hoist line pull capacity
Critical Lift	• Payload 50 tonne or greater • 90% or greater of a cranes chart capacity • Any two crane lift where either crane is 75% or greater of a cranes chart capacity • Any lift using more than two cranes • Lifting over or within 10 meters of existing facilities e.g. piperacks, electrical switch rooms • Any part of a crane and/or load when working within 10 meters of any populated traffic area. • 90% or greater of a cranes hoist line pull capacity • Any crane lift within 1 meter of a crane safe limit of approach of power lines • Hydraulic Gantry Lifts • Strand Jack Lifts • Skidding or jacking operations
Notes	Any lift that involves high cost or long lead items may be reclassified to a higher lift classification if management deem it necessary.

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6.2 SIGNATORY APPROVAL & DOCUMENTATION REQUIREMENTS FOR LIFT PLANS

Light Lifts

No lift data sheet or rigging plan is required for lifts classified as 'light' but the Daily Crane Operation Log (Attachment A1) and Rigging/Heavy Haul Job Safety Analysis (Attachment A2) must be completed. In addition, a Level 2 (Intermediate) Rigger and Crane Operator shall carry out all light lifts and approved safe rigging practices shall be used at all times.

Medium Lifts

The rigging plan shall be prepared and completed by the Site Rigging Superintendent/ Supervisor and/or Site Rigging Engineer Medium Lift Plans shall be reviewed and approved by the LSTK Site Rigging Superintendent/Supervisor and Site Rigging Engineer. In addition, LSTK contractor generated Medium Lift Plans need to be reviewed and approved by the PMC /OWNER

Critical Lifts

The rigging plan shall be prepared and completed by the Site Rigging Engineer and/or Senior Rigging Engineer. All Critical Lift Plans shall be reviewed and approved by the LSTK Site Rigging Superintendent, Site Rigging Engineer, Site or Construction Manager. In addition, LSTK contractor generated Critical Lift Plans need to be reviewed and approved by the PMC /OWNER

All Medium and Critical Lift Plans shall include as a minimum the following information;

- Applicable crane load charts
- Elevation view drawing (to scale) of the crane, load and nearby structures or obstacles which could interfere with the lift.
- Lifting radius and boom length(s)
- All rigging equipment required to undertake the lift e.g. slings, lifting beams, shackles and any other special lifting device. The rigging equipment is also to be identified by length, location, capacity and size.
- Plan View Drawing (to scale) of the crane, load and nearby structures or obstacles which could interfere with the lift.
- Position of any transportation trailers.
- Initial pick radius of the load
- Final set radius of the load
- Crane route if the crane has to travel with the load.
- Applicable tail swing radius
- Crane matting requirements
- Identification of underground utilities that could affect the lift.
- Lift Data Sheets
- Equipment drawings confirming erection, shipping weights, location of centre of gravity and designated rigging attachment points.

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- Rigging/Heavy Haul Job Safety Analysis (RHJSA) Attachment A2 (to be completed prior to lift)
- Pre-Lift Safety Check-List Attachment A3 (to be completed prior to lift)
- Lift Plan Cover Sheet (Refer to Attachment 8)

6.3 LIFT PLAN VALIDITY

From the date of final approval all lift plans shall have a validity of 30 days after which the lift plan will expire. To re-validate the lift plan for a further 30 days it will require to go through the same signatory approval process as detailed in Section 6.2.

6.4 GENERIC LIFT PLANS

It is acceptable to use a Generic Lift Plan when there is repetitive lifting and the lift has fixed parameters. Examples of a Generic Lift Plan would be the offloading of Containers and Piping. For a lift plan to be a Generic Plan the following parameters must be followed;

- Maximum and minimum radius shall be specified
- Rigging configuration and rigging shall be the same for all lifts.
- Crane type and crane configuration shall not change.
- Location of the lift shall not change.
- A maximum lift weight shall be specified.
- Classification of lift shall be no higher than a 'Medium' lift.
- Generic Lift Plan validity shall follow Lift Plan validity requirements as detailed in section 6.3.

6.5 SUBMISSION OF LIFT PLANS

To enable sufficient time for the review and approval process all LSTK contractor lift plans require to be submitted seven days prior to the planned lift date.

7 CLASSIFICATION OF HAULAGE PLANS

This procedure is limited to any haulage to be performed within the Construction Site , including the equipment laydown area(s) . It excludes the transportation from the fabrication shop to the construction site.

The competent person planning the haulage shall refer to the haulage plan classifications in the following table to determine the classification of the haulage and to determine the amount of planning and documentation required.

7.1 HAULAGE PLAN CLASSIFICATION TABLE

Light Haulage	• Payload 0 tonne to less than 40 tonnes • Trailer operating at less than 75% of its capacity
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	- Width of trailer or load less than 4.5 meters - Length of trailer or load less than 14 meters
Medium Haulage	- Payload 40 tonne to less than 90 tonnes - Width of trailer or load 4.5 meters or greater - Trailer operating at 75% but less than 90% of its capacity - Angle of stability above 8 degrees to 12 degrees. - Length of trailer or load 14 meters to less than 20 meters.
Critical Haulage	- Payload 90 tonne or greater - Trailer operating at 90% or greater of its capacity - All hydraulic suspension 4 point arrangements - Angle of stability 5 degrees to 8 degrees. - Crossing over critical underground utilities - Carrying of loads with large sail areas - Using trailers with turntables - Any part of the trailer or load 3 meters or less laterally to any live and/or critical plant - Any part of the load to within 1 meter or less vertically of any piperack or overhead obstruction. - Length of trailer or load greater than 20 meters. - Any part of the load coming within 1 meter of the safe limit of approach of power lines
Notes	Any haulage that involves high cost or long lead items the lift may be reclassified to a higher haulage classification if management deem it necessary.

7.2 SIGNATORY APPROVAL & DOCUMENTATION REQUIREMENTS FOR HAULAGE PLANS

Light Haulage

No formal plan is required for a light haulage but any haulage activities shall be carried out by competent and trained people using approved safe transportation work practices at all times. A Rigging and Heavy Haul Job Safety Analysis shall be completed for all light haulage activities.

Medium Haulage

The haulage plan shall be prepared by the LSTK Site Rigging Engineer, Site Rigging Engineer and/or specialist subcontracted transportation company. All medium haulage plans shall be reviewed and approved by the Site Rigging Superintendent/ Supervisor and Site Rigging Engineer. In addition, LSTK contractor generated Medium Haulage Plans or their specialist subcontracted transportation company haulage plans shall be reviewed and approved by the PMC /OWNER

Critical Haulage

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The haulage plan shall be prepared by the LSTK Site Rigging Engineer and/or Senior Rigging Engineer, and/or specialist subcontracted transportation company. All Critical Haulage Plans shall be reviewed and approved by the Site Rigging Superintendent /Supervisor, Site Rigging Engineer, Site or Construction Manager. In addition, LSTK contractor generated Critical Haulage Plans or their specialist subcontracted transportation company haulage plans shall be reviewed and approved by the PMC /OWNER.

All Medium and Critical Haulage Plans shall include as a minimum the following information;

- Identification of underground utilities that could affect the haul activities and any additional measures to protect the underground utilities such as ground preparation, steel plates or wooden mats.
- A scaled drawing in plan view showing the travel path of the trailer and load including turning radius of trailer and any clearance requirements of existing or temporary or permanent facilities and any overhead power lines.
- A scaled drawing of the trailer configuration and load in plan, side and rear elevation view with complete dimensions of the load being carried and dimensions of the trailer. Payload centre of gravity to be clearly shown, crane angle, stability triangulation, trailer weight, payload weight, number of axles, weight per axle, weight per axles line, weight per tyre, shadow load and method of securing load on trailer.
- Equipment drawings confirming erection, shipping weights, location of centre of gravity.
- Rigging/Heavy Haul Job Safety Analysis (RHJSA) Attachment A2 (to be completed prior to any haulage.)
- Pre-Haul Safety Check-List Attachment A4 (to be completed prior to medium or critical haulage)
- Haulage Plan Cover Sheet (Refer to Attachment 9)

7.3 HAUL PLAN VALIDITY

From the date of final approval all medium and critical haulage plans shall have a validity of 30 days after which the haul plan will expire. To re-validate the haul plan for a further 30 days it will require to go through the same signatory approval process as detailed in Section 7.2.

7.4 SUBMISSION OF SUBCONTRACTOR HAUL PLANS

To enable sufficient time for the review and approval process all LSTK contractor haul plans require to be submitted seven days prior to the planned haul date.

8 GENERAL REQUIREMENTS

8.1 UNDERGROUND CONDITIONS AND GROUND PREPARATION

LSTK Contractor firstly required to confirm ultimate ground bearing capacities on a project. Certain areas may have particularly lower ground bearing pressures due to different ground conditions and the presence of underground services. Regardless of the classification of the lift all cranes are to be located on adequately prepared ground and crane mats or outrigger pads used so that the exerted ground bearing pressure are within acceptable limits.

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When particularly making medium or critical lifts the ground bearing pressures exerted during the lift needs to be compared to the allowable ground bearing capacity. This information needs to be established in the preliminary crane planning stages so any necessary ground improvement work can be planned and crane matting quantities established.

The above is also applicable to all heavy transportation activities and relocation of heavy lift cranes. It is essential that a detailed route survey is carried out for the trailer or crane which establishes any ground preparation and additional matting requirements.

8.2 WEATHER CONDITIONS

Wind

The majority of crane manufacturers have recommendations regarding the maximum permitted wind speeds which shall not be exceeded for the configuration the crane is operating in. If there is no information in the crane manual or load charts the permitted wind speeds shall be adhered to as detailed in 'Wind Speed Parameter Operational Guidelines' Attachment 7. All LSTK worksites shall have a weather station monitoring the wind speed and direction and this information shall be readily available to all site personnel when required. Cranes with a long boom configuration shall also be fitted with a wind speed indicator (Anemometer).

The following factors also need to be taken into consideration when operating in windy conditions;

- Assess how high the load is to be lifted as wind speed generally increases with height.
- If the load has a large sail area.
- What direction is the wind blowing. If the wind is blowing from the rear this can affect stability by blowing the load away from the crane, increasing the radius and placing additional load on the boom. The load can also be blown from vertical if the wind direction is blowing from the side.
- If the crane is operating between process equipment or buildings it could act as a 'wind tunnel'. The wind velocity can be increased as it blows around any of the obstructions and may exceed the crane operational permitted wind speed even though the general wind speed is acceptable.

Other Climatic Conditions

Other weather conditions can affect lifting activities such as cold weather, excessive heat, fog, rain, lightning or snow.

- Rain, snow or fog can obscure the load, the rigger giving hand signals and the tip of the crane boom making the lifting operations extremely hazardous.
- Extreme cold weather can also have a severe impact on lifting activities. In extreme cold temperatures, the crane and lifting equipment manufacturer shall be consulted regarding any lifting restrictions that require to be imposed.
- The presence of thunderstorms/lightning shall be monitored on site and distance parameters set at the start of the project as to when lifting operations must cease when

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a thunderstorm or lightning is approaching. If lifting operations must be ceased due to lightning the crane boom shall be lowered and/or retracted as much as possible and the rigging crew shall leave the work area.

- In excessive heat conditions the rigging crew can become quickly fatigued which can have an adverse effect on their work and safety performance. Rotating the rigging crew and regular breaks shall be considered when planning any prolonged lifting activities.

8.3 PRE-LIFT & PRE-HAUL MEETINGS

A Pre-Lift and/or Pre-Haul meeting shall be carried out for all Medium and Critical lifts/heavy hauls just prior to the lift/haul taking place. The Rigging Superintendent/Supervisor shall conduct the Pre-Lift and/or Pre-Haul meeting and all personnel involved in the lifting and/or haul activity shall be present. On completion of the Pre-Lift and/or Haul meeting the Pre-Lift and/or Pre-Haul Safety Checklist (Attachment A3 & A4) shall be completed and signed off by all personnel as confirmation they fully understand their roles and responsibilities.

For any light lifts the rigging crew and crane operator(s) shall have a Pre-Lift talk which discusses the lift addressing all issues including the method of communication between the Rigger (minimum level 2) and Crane Operator. In collaboration with the Crane Operator and Rigger the Daily Crane Operation Log (Attachment A1) shall be completed prior to different light lifts taking place. For light haulage activities, a Pre-Haul talk shall also take place as part of the Job Safety Analysis process.

8.4 RIGGING AND HEAVY HAUL JOB SAFETY ANALYSIS

It is a Technip requirement that all personnel involved in lifting and heavy haul activities regardless of classification complete a Rigging and Heavy Haul Job Safety Analysis (RHJSA) Attachment 2.

8.5 PRE-LIFT & PRE-HAUL CHECKS AND PREPARATION

For medium and critical lift and/or haul activities the LSTK Rigging Superintendent/Supervisor and/or Site Rigging Engineer shall inspect the load to ensure all the rigging equipment is set up as per the approved rigging plan or in the case of haul activities the trailer, load and transportation lashings are as per the approved transportation plan. For lifting activities, the lifting lugs and/or trunions and attachment welds shall be inspected by the Rigging Superintendent/Supervisor and/or Site Rigging Engineer prior to the lift. Tag lines shall be attached to the load to control it during the lift, the lift area barricaded and other work parties in close vicinity to the work area shall be advised the lift is taking place. Just before the lift or haul commences the Rigging Supervisor or Site Rigging Engineer must re-evaluate the weather conditions and confirm if the weather parameters do not have an adverse effect on the work activities.

For light lifts and light haulage activities the same procedure applies but they can be carried out by a Level 2 Rigger for light lifts and a deemed competent person in transportation for light haulage activities.

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8.6 MONITORING DURING EXECUTION OF THE LIFT OR HAUL ACTIVITIES

During a medium and critical lift and/or haul activity the LSTK Rigging Superintendent/Supervisor and/or Rigging Engineer shall continually monitor the activity and shall be vigilant that the lift and haul parameters do not significantly change. For light lifts a Level 2 Rigger can do the monitoring and a deemed competent person in transport operations can supervise light haul activities.

8.7 COMPLETION OF LIFT OR HAUL ACTIVITIES

When work is completed for all lift and haulage activities the Rigging Superintendent /Supervisor shall ensure all tag lines, rigging and temporary barricades are removed and the crane(s) and haulage equipment are either demobilized if no longer required or removed to a suitable holding area if required for further work.

8.8 RETENTION AND STORAGE OF LIFT AND HAULAGE PLANS

All lift and haulage plans shall be issued a project sequential reference number for tracking and retention purposes. All lift and haulage plans when completed including Job Safety Analysis, Pre-Lift and Pre-Haul Check Lists, Daily Crane Operation Logs shall be returned to the site rigging office and placed in suitable binders. On completion of the project they shall be submitted to PMC/OWNER.

8.9 PAYLOAD WEIGHT ACCURACY

To accurately verify the payload of a piece of equipment authenticated shipping manifests, manufacturing data and weighing by specialized calibrated equipment is the only reasonable way of confirming the payload accurately. Generally, weights confirmed by specialized calibrated equipment can be used without adding an additional safety margin but in other cases it is good practice to add 5% to 10% to the payload weight given in the manufacturing data when planning a lift. It shall also be verified that when vessels have been hydro tested that all water has been completely drained from the vessel before carrying out the lift.

Removal of an existing piece of equipment can pose the most difficult situation when you are trying to accurately verify the payload as the manufacturing data may no longer be available, additional weight could have been added since initial installation and residual process material could be inside the equipment. Considerable corrosion could have also taken place between the mating surfaces and even when all the location bolts have been removed additional load can be applied when the equipment is initially removed. Taking all these issues into consideration it is not an unreasonable approach to add an additional 20% to 25% to the payload of the existing piece of equipment you intend to remove.

8.10 USE AND CERTIFICATION OF RIGGING EQUIPMENT

All rigging equipment shall be used in accordance within manufacturer's recommendations, national and international recognized standards and never used beyond its design limits. No modifications shall be carried out to rigging equipment without the manufacturer's written approval. All rigging equipment shall have a valid test certificate, marked with a unique identification number traceable to the test certificate and marked clearly with its designed safe

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working load (SWL). In the case of Lifting or Spreader Beams or any other specialized lifting device where the weight is significant it shall also be marked clearly with its 'Tare Weight'. Regular inspections shall also be carried out and documented by a competent person in accordance with national and international recognized standards and available for review on site with the test certification records.

8.11 RIGGING EQUIPMENT MANAGEMENT

All rigging equipment shall be stored in one central location on site and shall be the responsibility of the Rigging Superintendent/Supervisor. Large slings and shackles shall be stored preferably in racks, smaller items in storage bins and in a dry, dust free environment. Synthetic slings shall be stored away from exposure to direct sunlight. A person competent in rigging shall be appointed to issue any rigging equipment from the rigging stores to only authorized field personnel and the rigging equipment shall be returned to the rigging stores in a timely manner when no longer required. Any rigging equipment found to be defective shall be appropriately tagged with a red label 'DO NOT USE' placed in a quarantine area and either repaired or destroyed as soon as possible.

8.12 PROCUREMENT OF RIGGING EQUIPMENT

One person competent in rigging shall be designated as the person responsible for the procurement of rigging equipment. All rigging equipment ordered shall conform to national and international certification standards and shall be supplied with original test and inspection documentation.

8.13 NIGHT TIME LIFTING AND HEAVY HAUL ACTIVITIES

Night time lifting and heavy haul activities (Medium and Critical) shall be avoided as much as possible but if necessary shall only be carried out in suitable flood lighting subject to approval of PMC/ OWNER, set up in advance and the 'lux' value recorded with a light meter before the lift and/or heavy activities commence. The artificial lighting shall provide sufficient light for all personnel so they have an accurate perception of the lift and/or haul activities with the elimination of shadows. All night time lifting and/or heavy haul activities shall be specifically addressed on the Job Safety Analysis (JSA) when it is prepared.

8.14 PICK AND CARRY OPERATIONS

For crawler cranes it is allowable to walk with a suspended load but the following recommendations shall be followed;

- Crane manufacturers recommendations are followed for pick and carry operations.
- Ground shall be level, compacted and matted to meet manufacturers' specifications.
- Crane travel speed shall not exceed manufacturers' recommendations.
- Avoid sudden stops and starts.
- Boom if possible shall be in the direction of the travel.
- Suspended load shall be kept as close as possible to the ground.
- A rigger shall walk with the crane to assist the crane operator.
- Any underground utilities or above ground obstructions to be identified prior to movement of the crane.
- Tag lines shall be attached to the load to control any swinging of the load during travel.

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As regards Rough Terrain and All Terrain Hydraulic Canes travelling with a suspended load it is a more inherently hazardous procedure and requires extra precautions and as such no pick and carry operations shall be permitted using these types of cranes.

8.15 CRANES MOUNTED ON BARGES OR PONTOONS

Land based cranes may sometimes be mounted on barges or pontoons. For cranes operating under these conditions they will be subject to different loading conditions compared to cranes that are land based. Before a crane is put into service on a Barge or Pontoon the following must be complied with;

- Stability calculations shall be made by a competent person (e.g. Marine Engineer) to confirm the position and weight of the ballast. This is to determine that the barge or pontoon will not heel more than specified by the manufacturer. Stability calculations shall also be made by the competent person with the load over the stern, sides and front. (Some pontoons have tables for calculating the heel under different systems of loading these are available from the manufacturer.)
- After confirming the maximum load/working radius and length of boom the manufacturer shall provide the maximum heel at which the crane is safe to operate
- Any crane that is mounted on a barge or pontoon is a major modification which affects the stability and therefore the competent person must carry out a thorough test and examination before the crane is put into service.
- The stability of the barge or pontoon and the capacity of the crane must be taken into account when working in tidal waters.
- Guard rails must be installed.
- During icy conditions sand and salt must be used on the deck and also kept free of any oil or grease at all times.
- Compliance with any water authority by laws such as towing and mooring.
- No loads which are unauthorised are to be placed on the barge or pontoon which could have an effect on the stability.
- As soon as the crane is positioned on the barge or pontoon the load/radius information shall be modified to the calculated heel. To enable the safe load indicator to be adjusted to the true maximum heel (i.e. boom over the side) a load/radius curve requires to be plotted to confirm the loads can be safely applied at the specified radius.

8.16 CRANE AND EQUIPMENT ASSEMBLY

The delivery, offloading and assembly of any crane or piece of construction equipment are not exempt from these procedures. All component weights shall be known and classified

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accordingly so the necessary Lift Plan can be prepared and approved.

8.17 SITE INDUCTION

All site personnel involved directly or indirectly in lifting and haulage activities shall attend the 'Rigging and Heavy Haulage Induction' this includes but is not limited to the following people; Managers, Site and Area Superintendents, Rigging Engineers, Rigging Superintendents/Supervisors, Riggers, Crane Operators, Craft, Craft Supervision, Field Engineers and Logistics personnel. The aim of the induction is to cover LSTK Contractor procedural rigging and haulage requirements and rigging and heavy haulage safe work practices.

8.18 CRANE LIFTING FACTORS

Important note - Once the provisions of 6.1 have been met the cranes can be operated up to % capacities shown in table below.

Single crane static lift	90% SWL
Crawler crane travelling with load	85% SWL
Tailing operation	
Main crane –	90% SWL
Tailing crane -	90% SWL
Tandem Lifts	75% SWL each crane (see note 1)
Multi crane lifts (3 or more cranes)	80% SWL each crane

Note 1 – For cases where two cranes are required to lift a single load in unison at one position, each crane may be used up to 75% capacity once the equipment has been weighed and the COG position located. This shall only apply when the 'competent person' is satisfied that all relevant factors such as weight, centre of gravity, crane synchronisation, supervision, etc. have been accurately identified and monitored.

When all factors cannot be accurately evaluated, a minimum down-rating to 60% of chart capacity shall be applied. Where 3 or 4 cranes are involved the factors shall be reduced further as per table above.

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9.0 ATTACHMENTS

ATTACHMENT 1



DATE :	CRANE OWNER :
CRANE MAKE & MODEL :	CRANE SERIAL / I.D NO. :
OPERATOR :	PROJECT / AREA :

Lift No.	Payload Description	Boom Length	Boom Angle or Radius	Load Chart Capacity	Pay Load & Rigging Inspected	Weight Verified (Y) (N)	% of Chart Capacity	Approved By Crane Operator	Approved By Rigger
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

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ATTACHMENT2

Project _____

Area / Location _____

Company Name _____

Emergency Assembly Area # / Location _____



RIGGING AND HEAVY HAULAGE JOB SAFETY ANALYSIS			
Date and Time :	EMERGENCY NO :	Weather Conditions :	
Supervisor :	Task in Detail :	General Wind Direction :	
Contact No :	Location :	Fire Extinguisher :	
	Safety Shower / Eyewash Locations :	Colour Code :	
THESE STEPS INCLUDE AREA HAZARDS WHICH ARE REQUIRED TO BE COMMUNICATED WITH OTHER WORK PARTIES			
Basic Steps	Potential Risks	Preventive Measures / Safe Job Procedures	Tools / Equipment Needed
1)	1)	1)	1)
2)	2)	2)	2)
3)	3)	3)	3)
4)	4)	4)	4)
5)	5)	5)	5)
6)	6)	6)	6)
7)	7)	7)	7)
8)	8)	8)	8)
PLANNING CHECKLIST		YES	NO
REVIEW, COMMENTS AND NECESSARY ACTION			
A)			
B)			
C)			
Supervisor Comments :			

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ATTACHMENT 2 (CONTINUED)

RIGGING AND HEAVY HAULAGE JOB SAFETY ANALYSIS



Reviewed N/A		Reviewed N/A		Reviewed N/A	
Ground Conditions	<table border="1" style="width: 40px; height: 20px;"></table>	Fall Protection	<table border="1" style="width: 40px; height: 20px;"></table>	Vehicle & Mobile Equipment	<table border="1" style="width: 40px; height: 20px;"></table>
PPE	<table border="1" style="width: 40px; height: 20px;"></table>	Scaffolds, Ladder & Stairways	<table border="1" style="width: 40px; height: 20px;"></table>	Fire Prevention	<table border="1" style="width: 40px; height: 20px;"></table>
Slip / Trip / Fall	<table border="1" style="width: 40px; height: 20px;"></table>	Excavations & Trenches	<table border="1" style="width: 40px; height: 20px;"></table>	Communication of Hazards	<table border="1" style="width: 40px; height: 20px;"></table>
Tools & Equipment	<table border="1" style="width: 40px; height: 20px;"></table>	Lifting Equipment	<table border="1" style="width: 40px; height: 20px;"></table>	Permits	<table border="1" style="width: 40px; height: 20px;"></table>
Housekeeping	<table border="1" style="width: 40px; height: 20px;"></table>	Breathing Hazards	<table border="1" style="width: 40px; height: 20px;"></table>	Heat / Cold Hazards	<table border="1" style="width: 40px; height: 20px;"></table>

HAZARD CONTROL MEASURES											
PPE	Yes	N/A	Inspection:	Yes	N/A	Permit Requirements ?	Yes	N/A	Fall Prevention / Protection:	Yes	N/A
Hard Hat	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Rigging / Taglines	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Confined Space	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Guard Rails	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Ear Plugs	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Ladders	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Excavation	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Ladders	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Safety Glasses	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Hoses / Cords	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Work at height	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Rebar Caps	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Goggles	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Transportation Trailers	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Removal Platform / Gratings	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Floor Holes Covered	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Safety Footwear	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Harness / Lanyards/Safety lines	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Road Closure Notice	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Anchorage points	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Respirator/Mask	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Tools / tool lanyards	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Electrical / LOTO	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Other _____	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Face Shield	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Housekeeping	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Man Basket	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>			
Fall Protection	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Fire Extinguisher	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Hot Work	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>			
Gloves	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Barricades / Scaffold Tag	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Other _____	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>			
Other _____	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Payload	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>						

Environmental:	Yes	N/A	Environmental:	Yes	N/A	Training:	Yes	N/A	Training:	Yes	N/A
Spill Kits	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Dust Containment Plan	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Crane Operator	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Fall Protection	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Containment	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Dust Control	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Rigger	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Manlift	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>
Waste Disposal	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Other _____	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Signalman	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>	Electrical / LOTO	<table border="1" style="width: 40px; height: 20px;"></table>	<table border="1" style="width: 40px; height: 20px;"></table>

WE / I Accept Responsibility for Safe Work Actions and Environmental Issues. I will Promptly Report all Incidents to the Safety Department & my Supervisor

NAME / SIGNATURE & EMPLOYEE No.

Signature & Date _____
Foreman

NAME / SIGNATURE & EMPLOYEE No.

Signature & Date _____
Supervisor

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	CLIENT	INDIAN OIL CORPORATION LIMITED		
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ATTACHMENT 3

PRE-LIFT MEDIUM AND CRITICAL SAFETY CHECKLIST



Performing Company :		Lift Date / Time :	
Payload Name :			
Equipment Number :		Rigging Drawing Number :	
Verified Weight of Payload		Dimensions of Payload: (L) X (W/ Ø) X (H)	
Make & Model of Crane(s) :		Equipment Number of Crane(s)	
Weather Conditions/Wind Speed :			
1	Lift Plan Classification. ☐ Medium Lift ☐ Critical Lift		
2	Final Check of Crane(s) ☐ Crane(s) set up & located as per approved rigging plan ☐ Radius from crane(s) center of rotation to payload checked ☐ Boom length(s) & number of line parts in hook block(s) is correct ☐ Underground utilities verified & protection installed as required ☐ Crane(s) set-up on mats if required (Verify size & quantity) ☐ Crane(s) on even level and compacted ground ☐ Safe working distance from power lines verified ☐ Crane travel paths (where applicable) leveled & compacted and matted where specified		
3	Final Check of Crane(s) Hook Block(s) & Rigging ☐ Slings are seated correctly in the hook block(s) ☐ Hook block(s) have safety catches fitted & are functioning correctly. ☐ Correctly rated Slings selected are as per rigging plan ☐ Correct Spreader Bar/ Lifting Beam is used (if required) ☐ Correct size shackles are installed ☐ Softeners provided at rigging bearing points (where req'd) ☐ All rigging equipment is certified and has correct colour code ☐ Tag Lines attached to control payload		
4	Safety measures and communications verified : ☐ Job safety analysis (JSA) ☐ Personnel Safety & tail swing barricades installed ☐ Only authorized personal in area ☐ Crane(s) have valid third party certification. ☐ Proper PPE used ☐ Required permit in place? ☐ Lift, travel & swing area clear ☐ Crane(s) Daily Check List with Crane Operator ☐ Crane's or alternate air horn available ☐ Radio communication required ?		
5	Operator(s) and Rigging Superintendent ☐ Operator(s) Name : ☐ Operator is Certified : ☐ Rigging Superintendent / Supervisor(s) Name ☐ Rigging Superintendent / Supervisor(s) Certified :		
6	Does the actual rigging procedure differ from the approved rigging plan ? ☐ Yes ☐ No If yes, explain why : 		
7	A detailed final description of the planned sequence of the lifting operation was discussed with ALL people involved in the lift ? ☐ Yes ☐ No If no, explain why, or if yes and there were any comments from the pre-lift discussion that should be noted : 		

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ATTACHMENT 4

PRE-HAUL MEDIUM & CRITICAL SAFETY CHECKLIST

Company Performing Work:		Haul Date and Time :	
Payload Name :			
Equipment Number :		Haulage Drawing Number :	
Verified Weight of Payload :		Dimensions of Payload: (L) X (W/ Ø) X (H)	
Make/ Model of Trailer and/or Prime Mover :			
Weather Conditions/Wind Speed :			
1 Classification of Haul Plan ☐ Medium ☐ Critical			
2 Final Check of Trailer / Payload & Documentation			
☐ Payload weight verified. ☐ Payload configured on trailer as per approved transportation - drawing.			
☐ Trailer configured as per approved transportation drawing. ☐ Transportation supports / saddles checked and verified.			
☐ Lashing & securing arrangements verified. ☐ Transportation plan is approved and has all the required approval signatures.			
☐ Trailer valve positioning checked and verified.			
☐ Center of gravity on payload clearly marked and - verified.			
3 Final Check of Haulage Route			
☐ Intended route has been identified and approved. ☐ Clearances to existing and temporary facilities verified.			
☐ Underground utilities verified and protection installed as required.			
☐ Safe working distance from power lines verified.			
☐ Travel route is level compacted and matted where required.			
4 Safety measures and communications verified :			
☐ Job safety analysis (JSA) ☐ Escorts in place to ensure safe movement of the load. ☐ Method of communication verified.			
☐ Personnel barricades are installed where required on route. ☐ Proper PPE used			
☐ Any required permits are in place. ☐ Road closure and traffic management plan in place.			
5 Trailer Driver(s) / Operator(s) and Person in Charge			
☐ Trailer Driver(s) / Operator(s) Name : ☐ Person in Charge of Haul Activities			
Name : Name :			
6 Does the actual haulage procedure differ from the approved haulage plan ?			
☐ Yes ☐ No If yes, explain why :			

7 A detailed final description of the planned sequence of the haulage activities was discussed with ALL individuals - involved in the haulage ?			
☐ Yes ☐ No If no, explain why, or if yes and there were any comments from the discussion that should be noted :			

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ATTACHMENT 5

LIFT PLAN (SINGLE CRANE)					
1	Project Title:				
	Performing Party :		Operating Party:		
	Area :	Area Incharge:	Lifting Date :	Time:	
	Lift Permit No.:	Review. By:	Aprd. By:	Date :	Time:
	Lifting Study No.:	Prepared By:	Aprd. By:	Rev.:	
	Reference Drawing Number:				
	Primary Units:	Metric (m - Te)	Dimensions:	m	Weight: Te
	Lifting Crane Description and Details :-				
	Manufacture:	Model No.:		Year of Manuf.:	
	Type of Crane:	Telescopic	Type of Boom:	Lattice	Crane Configuration:
Crane CWTs.:	Hook Block Type:		Main Hook Block	Hook Block Cpy.	
Main Boom Length:	CWTs. (Carbody):		Parts of Line:		
Jib Type:	Erected - Not Used	Super Lift CWTs.:	Rope Size (Dia/ Ø): mm		
Jib Length:	Superlift Type:		Cwt. Tray	Single Line Pull Cap'y:	
Jib Offset (Degrees) :	°	Superlift Radius:	% of Line pull Cap'y: 0.00%		
3	Pay Load Description:				
	Lifting Description and Details :-				
	Pay Load Details	Dimension (LxW/ ØxH)	Quantity	Weight Each	Total Weight
	Total Pay Load to be lifted (Without Rigging)				
4	Rigging Equipment Description				
	Capacity (SWL)	Quantity	Weight Each	Total Weight	
	Total Weight of Rigging Equipment				
5	Gross Capacity Deductions :				
	Main Hook Block:	Main Hoist Line:	Auxiliary Hoist Line:		
	Auxiliary Hook Block:	Jib:	Enter Deduction		
	Aux. Boom Sheaves:	Other (Specify):			
	Total Capacity Deductions:				
	0.0	Te			
6	Crane Capacities (Net):				
	Planned Radius for Lifting :	Radius 1	Radius 2	Radius 3	
	Load Chart Radius Used :				
	Chart Capacity:				
	Pay Load:				
	Rigging Equipment Weight:				
	Capacity Deduction:				
	Total Load to Lifting Crane :				
	Max Percentage (%) Capacity Used:	0.00%			
7	Classification of Lift				
	No				
8	Supporting Information :				
	Ground Bearing Pressure:	Actual	Te/m ²	Allowable	Te/m ²
9	NOTES /COMMENTS :				
10	Final Approvals:				
	Name		Signature	Date:	Time:
	Rigging Superintend (Perform. Party):				
	Rigging Engineer(CONTRACTOR):				
	Senior Rigging Engineer:				
	Area / Construction Manager:				

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ATTACHMENT 6

LIFT PLAN										
(TWO CRANE TANDEM OR UPENDING LIFT)										
1	Project Title:									
	Performing Party :				Operating Party:					
	Area :		Area Incharge:		Lifting Date :		Time:			
	Lift Permit No.:		Review. By:		Aprd. By:		Date :		Time:	
	Lifting Study No.:		Prepared By:		Aprd. By:		Rev.:			
	Reference Drawing Number:									
	Primary Units:		Metric (m - t.)		Dimensions:		m.		Weight: kgs	
	2 Lifting Crane Description and Details :-									
	Head Crane (Main Crane)					Tailing Crane (Supporting Crane)				
	Manufacture:					Manufacture:				
	Model No.:					Model No.:				
	Year of Manuf.:					Year of Manuf.:				
	Type of Crane: Crawler					Type of Crane: Telescopic				
	Type of Boom: Telescopic					Type of Boom: Telescopic				
	Crane Configuration: S-Main boom only					Crane Configuration: S-Main boom only				
Main Boom Length:					Main Boom Length:					
Jib Type: Not Applicable					Jib Type: Not Applicable					
Jib Length:					Jib Length:					
Jib Offset: Degrees					Jib Offset: Degrees					
Crane CWTs.:					Crane CWTs.:					
CWTs. (Carbody):					CWTs. (Carbody):					
Superlift Type: Not Used					Superlift Type: Not Used					
Super Lift CWTs.:					Super Lift CWTs.:					
Superlift Radius:					Superlift Radius:					
Hook Block Type: Main Hook Block					Hook Block Type: Auxiliary Hook Block					
Hook Block Cap'y:					Hook Block Cap'y:					
Parts Line:					Parts Line:					
Rope Size (Dia/Ø): mm					Rope Size (Dia/Ø): mm					
Single Line Pull Cap'y:					Single Line Pull Cap'y:					
% of Line pull Cap'y: 0.0% Tandem 0.0% Install					% of Line pull Cap'y: 0.0%					
3	Pay Load Description:									
	Lifting Description and Details :-									
	Total Pay Load to be lifted (Without Rigging)									
4	Rigging Equipment Description									
	Head Crane (Main Crane)					Tailing Crane (Supporting Crane)				
	Description	Qty.	Wt.each	Total Wt.	Description	Qty.	Wt.each	Total Wt.		
	Total Weight of Rigging Equipment:				Total Weight of Rigging Equipment:					
	5	Capacity Deductions :								
Head Crane (Main Crane)					Tailing Crane (Supporting Crane)					
M. Hook Block:			M. Hoist Line:		M. Hook Block:		M. Hoist Line:			
Auxiliary Block:			A. Hoist Line:		Auxiliary Block:		A. Hoist Line:			
Aux. Boom Sheaves: 1					Aux. Boom Sheaves:					
Jib: Not Applicable					Jib: Not Applicable					
Other (Specify):					Other (Specify):					
Gross Capacity Deductions :				Gross Capacity Deductions :						

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ATTACHMENT 7

RECOMMENDED WIND SPEED LIMITS FOR CRANE OR LIFT OPERATION								
Wind Force level		1	2	3	4	5	6	7
Wind Speed (m/s)				3.4 - 5.4	5.5 - 7.9	8.0 - 10.7	10.8 - 13.8	13.9 - 17.1
(km/hr)				11.1 - 17.7	18.0 - 28.8	28.9 - 39.6	39.7 - 50.4	50.5 - 75.6
(mph)				6.9 - 11.0	11.2 - 17.9	18.0 - 24.6	24.7 - 31.3	31.4 - 38.0
<u>Description of crane lift activity</u>								
Tower crane assembly, jacking and dismantling work.				A	B	C		
All tank jack-up work				A	B	C		
All lifting/ tank erection work with sail area (e.g. tank shell plate, panel etc) based on work height and controllability.					A	B		
All other general lifting activities						A	B	
All critical lifts.					A	B		
<u>Type of crane configurations at work</u>								
Cranes with 50m or longer boom/jib configuration.					A	A	C	
Cranes with less than 50m boom/jib configuration.						A	B	C
Tower crane lift operation						A	B	C
Hydraulic crane operation with short telescopic boom (less than 20m)						A	B	C
Wind Force level		1	2	3	4	5	6	7

LEGENDS:

A	NOTIFICATION TO CRANE USER OR SUPERVISOR TO EXERCISE CAUTION AND VIGILANCE IN LIFT. LIFT OPERATION MAY PROCEED SUBJECT TO FIELD JUDGEMENT BY SUPERVISOR/OPERATOR/RIGGER
B	LIFT OPERATION TO CEASE
C	IMPLEMENT MEASURES AGAINST HIGH WIND

E.G : TOWER CRANE TO FREE SLEW OR ALIGN AND TIE AGAINST SUITABLE SUPERSTRUCTURE.

CRANES WITH LONG LATTICE BOOM/JIB LOWERED TO GROUND. HYDRAULIC CRANE TO BE IN PARKED POSITION. CRANE MANUFACTURER RECOMMENDED MEASURES TO APPLY.

CRANES WITH LONG LATTICE BOOM/JIB LOWERED TO GROUND AS FAR AS POSSIBLE. HYDRAULIC CRANE TO BE IN PARKED POSITION.

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ATTACHMENT 8

LIFT PLAN – COVER SHEET	
Project :	
Location/Area :	
Payload :	
Description of Lift :	
Lift Classification :	
Lift Plan Ref No. :	
Revision No. :	

Lift Plan Approval Signatures

	Signature	Date	Classification
Rigging Superintendent/Supervisor Contractor Name :			
Site Rigging Engineer-Contractor Name :			
Site/Construction Manager-Contractor Name :			
Technip / Owner Name :			

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ATTACHMENT 9

HAUL PLAN – COVER SHEET	
Project :	
Delivery Location/Area :	
Payload :	
Description of Haulage :	
Haul Classification :	
Haul Plan Ref No. :	
Revision No. :	

Haul Plan Approval Signatures

	Signature	Date	Classification
Rigging Superintendent/Supervisor- Contractor Name :			
Site Rigging Engineer- Contractor Name :			
Site/Construction Manager-Contractor Name :			
Technip / Owner Name :			

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