ABU DHABI OIL REFINING COMPANY (TAKREER)

RUWAIS REFINERY EXPANSION (RRE) PROJECT

PROJECT NO. 5578 / AGREEMENT NO. 09-5578-E-4

EPC PACKAGE - 4 : TANKAGE AND ASSOCIATED INTERCONNECTING PIPING

DOCUMENT / DRAWING COMMENTS SHEET

COMMENTS TO BE RETURNED TO:
COMPANY/PMC

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By: **Signed** **Date**

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2. COMMENTS AS NOTED : WORK MAY PROCEED SUBJECT TO COMPLIANCE WITH AND INCORPORATION OF COMMENTS ☐
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CRANE & LIFTING WORK PROCEDURE

AGREEMENT NO.	**:**	**09-5578-E-4**
PROJECT NAME	**:**	**Ruwais Refinery Expansion Project EPC-4: Tankage & Associated Interconnecting Piping**
COMPANY	**:**	**Abu Dhabi Oil Refining Company (TAKREER)**
PMC	**:**	**Mott MacDonald Ltd.**
CONTRACTOR	**:**	**Daewoo Engineering & Construction Co., Ltd.**

This page is a record of all revisions of this document. All previous issues are hereby superseded and are to be destroyed.

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SIGNED (Initials)							

NOTES:

(a) Revisions are denoted by a vertical line placed in the right-hand margin against the revised text.

(b) PREP = Prepared by, CHKD = Checked by, REVD = Reviewed by, APP'D = Approved by.

(c) In case of conflict between any requirements stipulated in this document with the contractual requirements, the contractual requirements shall prevail.

REVISION INDEX DETAILS

Rev	Location of Change	Brief Description of Change

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1. INTRODUCTION

1.1 Purpose

The purpose of this procedure is to clearly define and ensure the safe operation of all Crane and rigging activities in the Ruwais Refinery Expansion project.

1.2 Scope

The scope of this procedure extends to all cranage, rigging and lifting operations, which are to be performed by CONTRACTOR on the Ruwais Refinery Expansion Project.

This procedure covers safety in the use of crane, vehicle mounted personnel platforms, elevated by scissor mechanisms, telescoping towers, jibs or articulating arms. Procedural requirements are applicable to CONTRACTOR owned and subcontractor's cranes and lifting works in conjunction with requirements related to the use of lifting equipment.

2. DEFINITIONS

Company	Abu Dhabi Oil Refining Company (TAKREER)
Contractor	Daewoo Engineering and Construction Company Ltd.
PMC	Mott MacDonald

3. ROLES AND RESPONSIBILITIES

3.1 Project Manager

- Has the final responsibility to ensuring that all crane operation works on the project is done without endangering health and safety in accordance with the local legislation, client’s requirements and stipulations laid down in the HSE management system document.
- Ensure that all crane and lifting related accidents are reported, investigated and that corrective and preventive measures are taken: joins the accident investigation team.
- Has the power to stop any work or operation under his authority on health, safety or environmental grounds until effective measures have been taken.
- Has the power to remove personnel, including sub-contractor’s personnel from the project site if despite repeated warnings (including written warning), they work in a manner which endangers health or safety.

3.2 HSE Manager

- Shall coordinate with the section managers to ensure that suitable arrangements, including subcontractors, are in place to conduct the crane operation and lifting activity safely.
- Shall ensure that the crane, all lifting tools and tackles have current valid third party inspection certificates.
- Shall ensure that the crane operator and riggers have necessary qualifications and third party certificates to carry out the lifting operation.
- Shall ensure that the necessary work permits and documents are in place for heavy and critical lifts.
- Shall assign HSE officers for performing internal inspections, advising employees on subjects concerning health and safety.

3.3 Section Manager

- Ensure that the crane operation on the project site is carried out without endangering health and safety in accordance with the HSE plan and procedure
- Give his staff members job-related information and instructions on the subject of health and safety and repeats such information and instructions as needed
- Conducts audits checks on plant and equipment prior to commencement of work
- Ensures that all employees receive PPE and sees to it that it is used where necessary and maintained correctly
- Makes inventory of potential hazards, takes corrective and preventive actions, ensures that Site Safety Officer records these to the Project Manager
- Is authorized, if he is of the opinion that there is a threat of immediate and serious danger, to stop any activity under his authority from being carried out and/or stop the use of plant and equipment, machinery, etc. until effective measures have been taken
- Ensures that PTW (Permit to Work) is validated and all necessary documents related to the crane operation shall be completed.

3.4 Supervisor

- To ensure that all personnel are ; adequately trained for the relevant task; that they are using the correct equipment and personal protective equipment; that all relevant hazards have been identified; and that the respective permit to work formalities have been correctly addressed, where required.
- Must conduct a tool box talk meeting with his crews about the crane operation, related hazards and control measures to prevent any kind of injury.
- Have responsibilities of providing the required PPE to his crew for the job as mentioned herein this procedure.

3.5 Employee

- All Personnel carrying out the tasks covered by this procedure are responsible for operating the relevant equipment and performing the activities in a safe and proper manner and in accordance with this procedure. They shall also ensure that they are fully aware of all the hazards involved in the specific and carry out all the appropriate safety precautions and should:
- Get involved in crane operation hazard assessments.
- Obtain assistance from experts in the field of concern.
- Complete the check lists needed to make corrective actions.
- Attend the necessary trainings.

4. GENERAL REQUIREMENTS

4.1 Crane Operation

- CONTRACTOR and its subcontractors shall ensure that all cranes under its direct or indirect control are registered and certified and that all crane drivers and operators hold current valid certificates/licenses to operate a particular crane.
- Copies of current crane certification and crane operator certificates are to be kept by the CONTRACTOR and be made available for audit purposes of the Client.
- Clients reserve the right to test any crane operator for competence, familiarity with the operating manual requirements.
- CONTRACTOR shall advise Client of the arrival of any crane at the site, and will subject the particular crane to an inspection to be carried out by Client or its nominee. This inspection shall include a winch line load test at a weight which is equal to 100% of the rated winch line pull capacity. Any load test activities shall be arranged by CONTRACTOR Heavy Equipment Department including the preparation of test weights.
- All cranes, except tractor type cranes, shall be fitted with an anti two-block device to both main and auxiliary hoist lines. Heavy Equipment Department shall ensure all such equipment is regularly maintained and calibrated so as to ensure its effective operation.
- It is Heavy Equipment Department's responsibility to ensure that operators who operate any crane under its direct or indirect control are adequately trained and conversant in the following:

- The safe operation of the machine
- Location and operation of all safety backup systems
- Reading and understanding of the load charts
- Capabilities of the machine in any unusual circumstances
- Any peculiarities pertaining to the machine

- CONTRACTOR shall not allow crane operators to operate machines for which they are not trained; it is Heavy Equipment Department's responsibility to ensure the operator receives adequate training in the safe operation of the relevant machine.
- Heavy Equipment Department and the HSE Department shall record details of operator training carried out to the satisfaction of the client. Details shall include acknowledgement from operator that he is satisfied with level of training provided.
- A person who slings or directs the movements of loads handled by a crane on the site is required to be a qualified rigger.
- It is forbidden for any person to ride upon any hook, load, and sling or hoist line or be transported around the site by crane.
- Cranes shall operate only near to power lines according to safe distance in section 13 of this procedure or such lines have been isolated or insulated by CONTRACTOR competent person or proper authority.
- If outriggers are fitted, they shall always be used when lifting operations are being performed.
- Where cranes are to be left unattended for some time or at the end of each shift, they shall be parked in an "Out of Service" condition in accordance with the manufacturer's recommendations. Where the manufacturer's recommendations are not practicable, the following minimum site requirements shall be carried out.
- All mobile cranes (truck mounted or crawler) shall be temporary parked with the boom over the front end in the direction of travel. The boom should be lowered to an angle of approximately 50 degrees.
- The hoist rope (preferable main hoist) should be secured by the hook and slings, under tension, to the chassis of the crane or preferably to a suitable structure with slew brake locked on.
- The crane boom shall be orientated so that the boom does not project over or lie in the direction of items of operating plant.
- In the event of strong wind or a gale warning, all crane booms shall be laid down and adequately secured.
- Truck mounted cranes and all terrain cranes shall not under any circumstances lower their booms to the ground over the side of the machine. Should any boom be lowered to the ground it will be done over the rear of the machine.

4.2 Cranes Lifting Personnel

Any crane required to lift personnel will only do so upon receipt of a Work Permit from CONTRACTOR. No crane shall be permitted to lift any personnel without the following:

- Only an approved personnel basket is to be used for lifting personnel by crane.
- Crane to have positive drive up and down on the winch used to lift the man-cage. Cranes with only free fall facilities will not be used to lift personnel.

- Crane must be equipped with a fully functional anti two-block device.
- Crane must not operate outside of a radius that reduces the cranes capacity by more than 50 %.
- All shackles attaching the basket to the crane (slings) shall have the shackle pins secured.
- An additional sling that is attached above the cranes block or headache ball shall be provided and used as a lifeline for individuals using the man-cage.
- The man-cage shall not be used to lift personnel and material at the same time.
- The maximum number of persons lifted in a man-cage shall not exceed three people or as approved load capacity of the man-cage whichever is lower. All personnel will wear a full body safety harness. Safety belts (waist type) shall not be used.
- All signals given to the crane operator will be given by a qualified rigger who will be permanently assigned during all lifting operations. Rigger shall be wearing high visibility jacket/uniform.

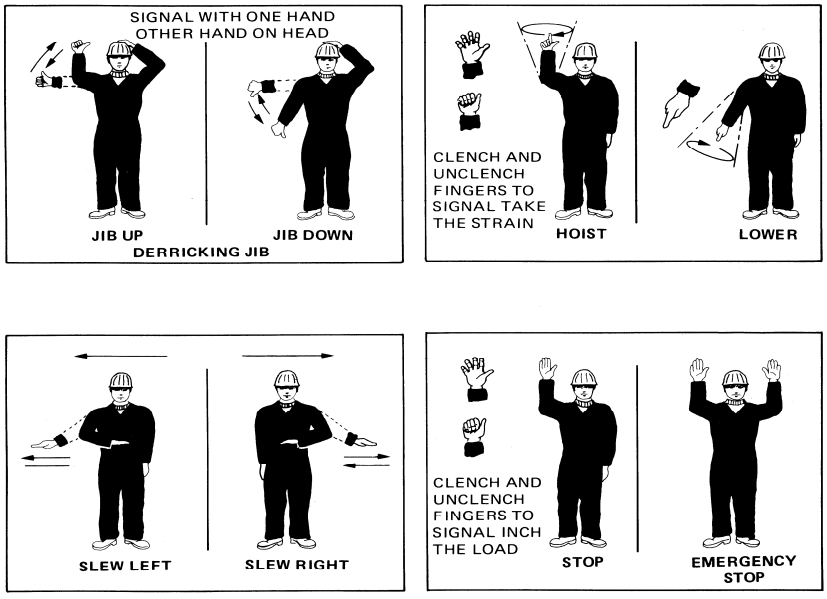
THE SIGNALLER MUST STAND IN A SECURE POSITION WHERE

HE CAN SEE THE LOAD AND CAN BE

SEEN CLEARLY BY THE DRIVER

FACE THE DRIVER IF POSSIBLE

EACH SIGNAL MUST BE DISTINCT AND CLEAR



- All Work Permits for the lifting of an approved man-cage shall be signed by:
- The person applying for the permit
- Crane operator
- Crane Supervisor
- Rigging Supervisor
- CONTRACTOR HSE Manager
- Client HSE Representative
- Man-basket Work Permits will only be valid for a maximum of seven (7) days. Work Permits will be issued for specific tasks only. A Work Permit will cover multiple tasks or areas.
- Man-cages will not be used as a means of accessing elevated areas. Personnel will not be allowed to climb in or out of man-cages once the man-cage has been raised, unless specific written approval is obtained from Client.

4.3 Hoisting of Material Using an Approved Material Basket

Only an approved material basket will be used at the worksite for the hoisting or lowering of materials or rubbish. Any items that will be hoisted shall be properly secured allowing no possibility of and objects falling whilst being hoisted. The immediate surrounding area shall be barricaded to avoid any unauthorized persons entering the area.

4.4 Rigging

- All persons employed by CONTRACTOR and Subcontractor to carry out rigging activities, will be qualified with certification and will have to attend CONTRACTOR site rigging competence training and successfully pass.
- The Heavy Equipment Department and HSE Department shall maintain a register of all qualified riggers.
- Only persons qualified as riggers shall directly supervise or be engaged in rigging work.
- Upon production of a rigger's qualifications, CONTRACTOR shall issue each rigger with a laminated badge to enable clear identification of the rigger's authority.
- A rigger shall act on the site without endangering his life or the life of other persons. Subcontractor shall ensure that all provisions of CONTRACTOR Construction Safety Regulations, Client requirements and relevant Government Requirements pertinent to rigging work are complied with at all times.
- Lifting of plant and equipment shall be done in consultation with CONTRACTOR and Client. All lifts that falls in the category as Critical lifts such as a lift in excess of 40tons and all special and difficult lifts (e.g. high, long reach or 2 crane lifts) shall only be done after review of rigging study.

- Supervisor shall ensure that structural steel members solely designed for the support of cable trays are not used as anchor points for the use of chains blocks, snatch blocks, tirfors or anchorages for winches or any other lifting medium.
- All ropes, whether fiber or steel wire, shall be kept in good condition. Any rope showing indications of excessive wear, rust, splintering, high stranding, bird caging, broken strands/wires or any other defect shall be immediately discarded and destroyed. All rigging equipment will be supported by a valid test certificate.
- HSE shall maintain an on-going rigging register, which confirms inspection of all rigging gear, carried out by a Heavy Equipment Department Competent Person on a monthly basis. Only approved rigging equipment shall be used in the project. All rigging equipment will be color coded to clearly show proof of inspection.
- All crane travel 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 lock device shall be engaged to prevent the boom from swinging during travel.
- Repositioning of lattice boom cranes, without boom disassembly and on the same job, may be permitted providing the movement is less then 1 km. and all cranes turns shall be assisted by a flagman to ensure the boom tip is clear of any obstruction.
- All cranes working around populated or traffic areas shall have barricades placed to provide clearance for tail swing and only authorized personnel permitted inside. Lifts shall not be made over occupied parts of buildings. The load capacity of roof, floors, etc.; should be verified, to ensure an acceptable risk analysis, by a work proponent.
- It is the responsibility of users with full-time assigned cranes to install and reposition swing-away jibs, and extensions on the hydraulic cranes. It is also the User's responsibility to reeve the hook block with the proper number of wire rope falls to accommodate the load to be lifted within the safe working limits of the crane.
- Suitable tag lines shall be used as appropriate to control suspended loads.
- The pinned extension of the hydraulic boom crane shall be extended prior to using a jib to obtain the maximum lifting capacity and radius.
- All cranes shall have their safe working load rating clearly visible in English and/or appropriate markings. All mobile crane operators shall perform a daily pre-start safety inspection, prior to operating his assigned crane. His supervisor shall sign/concur on the inspection form and send a copy, if maintenance is required, to the Area Heavy Equipment Division. Any hazardous safety deficiency shall require corrective maintenance prior to the crane being used.
- All mobile cranes shall be fitted with the following safety items: fire extinguisher (except when prohibited by User's regulations); seat belts; back-up alarm; spark arrestor. All mobile cranes working in Plants or other hydrocarbon areas shall be fitted with a Safe Load Indicator.
- Removable float-pads on cranes shall be removed and stowed prior to traveling the crane.
- All cranes shall be leveled to within 1 % prior to performing any lift

4.5 Critical Lifts

Critical Lifts: Critical lifts should meet following criteria

- Any lift above 40 Tons.

Crane lifts performed in 'high risk' work environments. High risk work environments include the following examples:

- All cranes working around energized electrical lines.
- All cranes working around hydrocarbons and pressurized piping areas. Cranes working in close proximity to or having to suspend a load over vessels, piping, and equipment containing hydrocarbons, steam, or other pressurized liquids.
- All cranes working around populated/traffic areas. Cranes working in close proximity to, or having to suspend a load over: pedestrians, vehicle traffic, occupied construction equipment, and occupied buildings
- Cranes working from barges, hydrocarbon product loading piers, and onboard other marine vessels.
- Special critical crane lifts which are hazardous by their nature and require special training, rigging, and/or boom attachments.
- Tandem, Multiple or Tailing Lift: This lift is when two or more cranes are required to lift one load.
- In the case wherein 85% of the Crane Safe Working Load (SWL) was utilized (Crane outriggers are fully extended).
- When the size of the load to be lifted will create a considerable hazard during lifting operation. (Width, length or shape must be considered carefully)

4.6 Rigging Study/Lift Plans

A Rigging study/Lift plan is a document that identifies a specific load and the operating restrictions.

Pertinent information includes all weights of hook blocks and attachments

NOTE: The capacities plus wind speed, ground conditions and crane configuration shall be verified. Lift plan approval shall be by competent Rigging personnel designated by the work proponent.

The following items shall be addressed within an approved Rigging study/lift plan

- Description of the load to be lifted specifying the weight in kilograms or tons.
- The total boom length requirement including details of any extensions or jibs that are to be used, stating type and length (jib lengths to be included in total boom length specified in meters).
- Identify the maximum operating radius required and specify in same length units as above.
- Determine and specify the high and low degree of boom angle operating limits.

- Identify the hoist to be used (main or auxiliary) and state wire rope size, construction and capacity.
- Determine the rigging equipment required to attach the load to the crane hook. Identify the item, quantity required, and describe the type, size, construction and state capacity. Include the specific hitch arrangement to be used and its capacity in kilograms or tons.
    - ✸ **NOTE:** Rigging tackles shall be inspected per CONTRACTOR Color Coding Procedure (DTMS-HSE-PS004)
- Determine the total weight of all rigging devices, boom attachments (including extensions, jibs, hook block, headache ball, spreader bar, etc.) and state weight in kilograms or pounds. The above information is used to determine if the selected crane has adequate capacity to safely perform the lift as confirmed by the crane load chart.
- The Rigging study/Lift plan shall be signed by the originator and crane operator. It shall also be reviewed and approved by a Rigging competent person.
- A blanket lift plan may be used for repetitive lifts when there is no change in crane, load weight, location, obstructions, work environment or crane and rigging configurations.
- Determine that ground conditions are adequate or use additional floatation devices.
- A Rigging study/lift plan may be reused for critical lifts that are repeated, and where conditions remain unchanged. This applies to multiple use of the same blanket lift plan having the identical load configuration, using the same lifting equipment and accessories.

4.7 Vehicle Mounted personnel Platforms

Vehicle mounted personnel platforms are highly versatile for temporary access to points which can be as much as 20 meters above the vehicle parking place. Used properly, they add to the safety of temporary access. They must be used strictly within the manufacturer's loading and range recommendations.

Hazards

The particular hazards of vehicle mounted personnel platforms are:

- Knocking or trapping of passengers against fixed objects
- Trapping of personnel by the platform mechanism
- Failure of the mechanism with the platform in an elevated position, causing personnel to be stranded
- Overturning due to overloading, excessive wind loading, excessive platform movement, inadequate foundation, use on an excessive gradient or attempted movement against obstruction
- Impact from other vehicles
- Falling materials
- Contact with live electrical conductors
- Hazards of catapulted out of the platform

Equipment Standards

A vehicle mounted personnel platform, whether on a purpose built access vehicle or a fork lift truck must incorporate:

- A personnel platform capable of supporting personnel, tools and materials.
- A structure and mechanism to support and elevate the personnel platform.
- A vehicle chassis to provide a base for the personnel platform.
- A power unit which might serve both to propel the vehicle and move the platform.
- Controls to manipulate the platform and move the vehicle.
- Loading recommendations instrument or Charts

The floor of the platform should be well drained and slip resistant. It must be surrounded by a plated wall or guard rails. If guard rails are provided, strong mesh walls or intermediate guard rails with deep toe boards are required.

Any access gate provided on the platform should open inwards, upwards or sideways and should return automatically to the closed and fastened position.

There must be a safe means of access to the platform when it is at its lowest position. Anchor points must be provided for attachment of the passengers' safety harnesses. The platform must not be modified in any way which increases its weight or its wind profile without the approval of the manufacturer.

The scissor mechanism, telescoping tower, telescoping jib or articulating arm used to support and elevate the platform might be moved by hydraulic means, screw jacks or racks with pinions.

Fail safe devices must be fitted to prevent uncontrolled platform vehicle movement or a fork lift truck power failure. Cut-off systems, applicable to the type of equipment, should be provided to prevent possibility of tipping.

Stops and guards must be fitted to constrain platform travel within safe limits at permissible extremes of vehicle inclination and eliminate trapping points on the elevating mechanism.

A vehicle designed for use with outriggers must not be used without them, except as recommended by the manufacturer. Inclinometers with safe working bands marked should be provided so that the operator can readily check that the chassis is within the acceptable inclination limit before the platform is used.

Recommended tire pressures must be clearly indicated on a notice fixed to the chassis

All personnel platform positioning controls must be;

- Of the type which necessitates hands-on throughout all platform movements (Dead-mans Handle).
- Clearly and durably marked to indicate their function and mode
- Designed and arranged, as far as is reasonably practicable, to preclude unintentional operation.

The normal operational controls for the movement of the platform should preferably be located on the platform. If a duplicate set is provided on the vehicle chassis, provision should be made for that set to be

encased and lockable to prevent accidental and malicious operations. Nevertheless, an overriding emergency platform lowering control should be provided on the chassis.

An audible or visual alarm should be fitted to give warning whenever the platform is loaded to more than 110% of the Safe Working Load. The vehicle movement controls and any outrigger controls should be interlocked to make them inoperable when the platform is elevated.

Marking of Equipment

Each personnel platform must be conspicuously marked with:

- The Safe Working Load.
- The maximum number of persons which may be carried.
- The maximum permissible wind speed in which it may be used.

Inspection

When in constant use, vehicle mounted personnel platforms should be checked daily by the users for the condition of brakes, tires and hydraulic systems. There should be a more detailed inspection at least weekly with a written record of the inspection and any faults found. All working parts of vehicle mounted personnel platforms must be 'elevated' during these checks and inspections.

A thorough examination by a competent person from the Inspection Division shall be conducted at least once every six months in accordance with Company Code of Practice for lifting equipment. Records of all examinations must be kept by the Company and a certificate of the latest examination should be readily available for inspection.

Safety Signs and Barricades

Where the platform working area might be traversed by other vehicles, arrangements should be made to divert traffic or to erect temporary barricades, warning cones, lights or signs and to arrange for someone to direct traffic around the personnel platform. If work is to be carried out during the hours of darkness, flashing warning lights, appropriately certified for the classification of the area, should be used. In areas open to pedestrian traffic, the area beneath the platform should be marked with highlight tapes.

Precautions During Work

Work carried out from the platform should not entail a reach which would take the worker's feet off the platform or the worker's centre of gravity outside the platform guard rails.

All passengers should remain entirely within the guard rails as the platform is moved. The vehicle must not be moved with the platform in the elevated position except as specifically provided for by the manufacturer. The platform loading limits must be strictly adhered to.

The platform must not be used as a crane, unless provided for by the manufacturer. It must not be used as a jack, to put pressure against a fixed object. The use of two platforms in tandem or one platform jointly with an elevated crane to support a single object should be avoided. Special precautions are necessary, under the direction of a suitably qualified engineer, for any such operation.

A full body harness must be worn at all times when working on a platform.

Wind Restrictions

The Manufacturer's Operating Instructions must be strictly obeyed with regard to wind velocities during operation. Measurements of the wind speed should be made as necessary, within the operating area. An anemometer might be required.

Manufacturers' recommendations for restrictions due to wind velocities should be prominently displayed on the platform or the chassis.

All crane lifting activities should stop if the wind speed is 10 m/s or above.

Work near Transmitters and Overhead Cables

Personnel platforms must not be operated near transmitter towers where an electrical charge can be induced in the equipment or materials being handled.

Any overhead wire shall be considered to be energized unless an Authorized Electrical Person deems otherwise and is satisfied that it has been adequately grounded (earthed).

Except where the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work, or where insulating barriers, not part of, or an attachment to the equipment have been erected, to prevent physical contacts with the lines.

4.8 Contact With Electrical Cable

In the event of contact with electrical cables (alive or dead), the following action should be taken:

The Operator should:

- Remain on the platform.
- Keep still.
- Not touch any part of the platform

Other personnel should:

- Raise the alarm.
- Summon a Competent Electrical Person / Emergency Services..
- Keep well clear and not touch any part of the equipment until the power has been confirmed as 'switched off.

4.9 Fall Protection

All personnel (riggers, scaffolds, painters, etc) working aloft will be provided with and instructed to wear an approved full body safety harness. Please refer to Fall Protection and Prevention Procedure (DTMS-HSE-PS011).

4.10 Equipment versus High Voltage Power line clearance

RECOMMENDED REQUIRED CLEARANCE FOR NORMAL VOLTAGE IN OPERATION NEAR HIGH VOLTAGE POWER LINES AND OPERATION IN TRANSIT WITH NO LOAD AND BOOM OR MAST LOWERED

Normal Voltage, Kv (Phase to Phase)		Recommended Minimum Requirements Clearance, Meter (m)
Operation Near High Voltage Power Lines		See Note 2.
	To 50	3.1 m
Over 50	To 200	4.6 m
Over 200	To 350	6.1 m
Over 350	To 500	7.6 m
Over 500	To 750	10.7 m
Over 750	To 1000	13.7 m
Operation in Transit with No Load or Mast Lowered		
	To 0.75	1.2 m
Over 0.75	To 50	1.3 m
Over 50	To 345	3.5 m
Over 345	To 750	4.9 m
Over 750	To 1000	6.1 m

Note 1: Permits will be required where equipment must be operated within 6m or less of overhead electrical service lines regardless of the voltage.

Note 2: The minimum clearance distances are:

- 50 Kv or below - 3m
- Over 50 Kv - 3m plus 100mm for every 10 Kv over 50 Kv.

5. ATTACHMENT

LIFTING OPERATION PLAN

Contractor		Date	
Description of Load		Crane Model	
Weight of Load		Boom Length	

RIGGING GEAR REQUIRED-SIZE

Shackles				Spreader	
Slings				Tailing Hook-Up	
Weight of Load				Boom Length	
Weight of Rigging and Block				Jib Length	
Total Erection Load				Maximum Radius of Lift	
Percent Crane Capacity at Maximum Lift Radius				Crane Capacity at Maximum Radius of Lift radius	
Non-Engineered Lift (below 40 tons)		Engineered Lift		Attach supporting Rigging Study, Drawings for all Engineered Lifts (above 40 tons).	

LOAD AND LIFTING LUG

1.	Has the weight of the load been documented or accurately calculated?		2.	Are all items that will be lifted with the equipment included in the weight?	
3.	Have the lifting lugs that will be used to lift the load been designed for that purpose?		4.	Will the lifting lugs be used with the correct shackle?	
5.	Will the lifting lugs be loaded only in the strong direction(s) of the lug?		6.	Are the lifting lugs visibly free of defects or damage?	
7.	Has the load been checked for loose or unsecured items, which might fall off during the lift?		8.	For a one-crane lift will the crane hook be over the centre of gravity at the initial pick?	

RIGGING GEAR

9.	Have the capacities of the slings and shackles been checked for the load?	10.	Have the slings and shackles been visually inspected for defects or damage?
11.	Have the sling angles been considered when checking the capacity of the slings and shackles?	12.	Has the centre of gravity been considered when checking the capacities of the sling and shackles?

CRANE

13.	For a crane that **has a load-indicating device** with overload cut-off, is the total load less than **90%** of the allowable crane capacity?	14.	For a crane that does **NOT have a load indicating device** with overload cut-off, is the total load less than **80%** of the allowable crane capacity?
15.	Has the crane received a daily inspection and operational check by the operator?	16.	Is the crane set up according to the manufacturer's specifications?
17.	Is the crane supported by approved crane mats?	18.	If the lift involves more than one crane, can it be made without any possibility of one of the cranes being overloaded?
19.	Has the soil been inspected and determined to be adequate?		

LIFT

20.	Has the radius of the lift been checked by a tape measure?	21.	Is the lift area free of operating process equipment, piping, or live electrical lines?
22.	Has the area under the lift been barricaded or everyone warned to stay away?	23.	Is the wind less than 20 miles per hour?
24.	If there is a possibility for boom or equipment interference, has a rigging layout or clearance study been made?	25.	Has one person been designated "Signalman-in-Charge" for the lift?

Rigging Superintendent _____Field Rigger Responsible for Lift_____

Date:_____ Date:_____