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Owner: America's Mechanical Leadership Team	Previous Revision: May 15, 2017	Current Revision: June 4, 2018

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1. PURPOSE

- 1.1. Exxon Mobil Corporation and its affiliates adopt Manufacturing Best Practices as part of an ongoing global effort to enhance safe practices worldwide. This Best Practice has been designated a Tier 1 Manufacturing Best Practice (T1BP), which has the potential to prevent Category 1 safety, health, environmental, or security risks.
- 1.2. This document defines the minimum requirements to prevent fatal injuries associated with lifting and rigging activities. *Sites* must establish *Site*-specific procedures which are consistent with these guidelines and ensure compliance with all requirements of this T1BP.

2. PHILOSOPHY

- 2.1. Preventing lifting-related incidents is the primary focus of this T1BP. The scenarios used to develop these safeguards included loss of control of the *Load* or tipping of the *Crane* and subsequent fatal crush injuries to those nearby, as well as fatal injuries as a result of loss of containment of hazardous materials. The requirements included herein reduce the probability of fatal incidents to an "E" probability on the Corporate Risk Matrix. However, in some instances measures to mitigate the consequence of an incident may also be appropriate. Accordingly, *Sites* shall define the criteria for when lift-specific emergency response plans are required for lifts over or near process equipment containing highly hazardous materials. Lift-specific emergency response plans must be approved by the Process Manager or their delegate. Appendix R provides factors to consider when developing *Site* criteria for when specific emergency response plans are required and what should be included in them.

3. SCOPE

- 3.1. Implementation is mandatory at each *Site* owned or operated by Exxon Mobil Corporation or its wholly-owned or majority-owned affiliates adopting Manufacturing T1BPs, and is the responsibility of line management. All new capital projects must comply with Manufacturing T1BPs.
- 3.2. This document applies only to land-based *Crane* lifting and rigging activities, and *Manual Hoisting & Shifting* activities. The requirements apply to the personnel involved in planning and executing the work, including ExxonMobil employees, lifting equipment owners, contractors and their subcontractors.
- 3.3. The format and content of the checklists included as Appendices must not be modified except to comply with local regulatory requirements. Terminology on the forms may be altered to be consistent with the local vernacular, and a header and footer may be added to facilitate inclusion of form in the site document management system.

4. DEVIATIONS AND CONTINUOUS IMPROVEMENT

- 4.1. Compliance with local laws and regulations and timing of such compliance are independent of the requirements expressed here. Notwithstanding anything to the contrary expressed or implied in these materials, local legal requirements must be met. Where the requirements in this T1BP differ from local legal requirements, the more stringent must be adopted unless there is a conflict. If there is a conflict, the local legal requirements must be adopted.
- 4.2. *Sites* must follow the deviation process as defined on the Tier 1 Best Practice Administration page of the Manufacturing OIMS eManual.

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- 4.3. Deviations from the Engineering Controls requirements defined in LoP 2.1 - 2.7 must be documented and approved using Appendix Q, and are not subject to the requirements of 4.2.
- 4.4. *Sites* are encouraged to submit continuous improvement suggestions to the Crane & Lifting CoP to be vetted and potentially incorporated in periodic updates.

5. CRITICAL LIFE-SAVING MEASURES

CLSM 1 – Competent Personnel

CLSM 2 – Engineering Controls

CLSM 3 – Inspection and Maintenance

CLSM 4 – Lift Planning

CLSM 5 – Lifting Personnel

CLSM 6 – Lifting Near Overhead Power Lines

CLSM 1 - Competent Personnel

LoP 1.1 General Competency Requirements

* **Requirement 1.1.1** The competency requirements for personnel involved in planning and executing lifts are defined in Appendix O. Satisfactory attainment of the applicable competency must be verified and documented prior to performing lifting work.

LoP 1.2 *Lift Crew* – Key Responsibilities

* **Requirement 1.2.1** *Lift Crew* members shall:

- i. Only perform roles for which they possess the necessary skills/qualification and which they are *Authorized* to perform.
- ii. Signal for the lift (or shift), or *A/D* to stop if unsafe conditions arise or if the *Lift Plan* (or *A/D Plan*) is not being, or cannot be followed.
- iii. Actively participate in the entire pre-lift briefing to ensure they know and understand the lift sequence, travel path of the *Load*, and their responsibilities during the lift.
- iv. Know the boundaries of the *Exclusion Zone(s)* and the plans for preventing non-lift crew personnel from entering them.
- v. As required by the applicable checklist(s), acknowledge their understanding of the items discussed during the pre-lift briefing (i.e., the *Lift Plan*) by signing them.

LoP 1.3 *Site Lift Specialist* – Key Responsibilities

* **Requirement 1.3.1** A *Site Lift Specialist* shall:

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- i. Be formally designated by the *Site*.
- ii. Possess and apply advanced knowledge and understanding of the planning and execution of lifting and rigging operations.
- iii. Understand and apply the applicable Company, regulatory, and industry standards.
- iv. Ensure a process is in place for providing *Lift Crews* with access to sling softeners and edge protectors.
- v. Approve the Complex Lift Plan Checklist prior to the documents defined by the checklist being collected and generated.
- vi. Approve *Complex Lift Plans* for lifting activities performed by a *Lift Crew* that includes an EM employee or that use an EM-owned/direct leased *Crane*.
- vii. Audit lifting service providers both on and off *Site* including elements of contractor's *Complex Lift Plans* that fall within their specific competency.
- viii. Interpret audit and OCVM results per *Site* requirements.
- ix. Advise and consult with line management on lifting-related matters.
- x. Provide assistance in interpreting the requirements of this T1BP.

LoP 1.4 *Lift Planner - Key Responsibilities*

*** Requirement 1.4.1** A *Lift Planner* shall:

- i. Select a *Crane* or *Manual Hoist* that meets the minimum requirements for the lift, and complete the planning section of the applicable lift plan checklist(s).
 - (a) Obtain the weight and size of the *Load*, including application of appropriate contingency factors and the weight of any process residuals.
 - (b) Determine rigging configuration (e.g., number of slings, length, etc.) with respect to capacity and load stability.
 - (c) Determine the maximum radius during the lift along the entire path of the *Load*.
 - (d) Interpret manufacturer's instructions (e.g., load chart for a *Crane*) regarding the capacity of lifting equipment in the context of how it will be used.
 - (e) Determine minimum *Support* requirements for the *Crane* or *Manual Hoist*.

LoP 1.5 *Lift Director - Key Responsibilities*

*** Requirement 1.5.1** The *Lift Director* shall:

- i. Confirm that all applicable lift plan checklists have been completed.
- ii. Complete the highlighted fields in the verification section of the applicable lift plan checklist(s).
- iii. Ensure all *Lift Crew* members and *Lift-Related Personnel* participate in a pre-lift briefing, during which the following items are discussed:
 - (a) The highlighted fields on the applicable lift planning checklist(s).
 - (b) The plan for managing the boundaries of the *Bystander Exclusion Zone*.
 - (c) The *Drop Zone(s)* and *Load Crush Zone(s)*, and the criteria for when (if at all) *Lift Crew* members may enter them.

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- iv. Ensure *Lift Crew* members acknowledge their understanding of the items discussed during the pre-lift briefing (i.e., the *Lift Plan*) by signing the applicable lift plan checklists.
- v. Confirm appropriate measures (e.g., barricades) have been implemented to prevent personnel from entering the *Counterweight Crush Zone*.

LoP 1.6 A/D Director - Key Responsibilities

*** Requirement 1.6.1** The *A/D Director* shall:

- i. Be present for the entire duration of any assembly and disassembly of the *Crane*. If transferring the role to another person, ensure that the incoming *A/D Director*:
 - (a) Participated in the initial pre-job briefing, or has reviewed the *A/D Plan*, and
 - (b) Has been informed of the status of the job, and
 - (c) Signs on to the risk assessment (LMRA/JSA/JLA) being used to manage the job.
- ii. Lead the pre-job briefing to review the *A/D Plan* with the *Lift Crew*.
- iii. Monitor weather conditions so that *A/D* activities are ceased if weather conditions are forecasted to potentially exceed the limits defined in the job plan.
- iv. Monitor communications between *Lift Crew* members during *A/D* to verify that the job is being executed per the plan. If radios are being used by the *Lift Crew*, the *A/D Director* must also have a radio.

LoP 1.7 Operator - Key Responsibilities

*** Requirement 1.7.1** The requirements for the *Operator* in this Tier 1 BP apply to lifting and *A/D* activities. *Operators* shall:

- i. Operate only the specific make and model *Cranes* for which they have been trained.
- ii. Only perform lifting operations in a manner consistent with the *Crane* manufacturer's instructions.
- iii. Not initiate *Crane* motion unless directed by a *Signal Person* and only then if satisfied that the movement will not create an unsafe condition. Exception: While traveling outside a process unit, a *Signal Person* is not necessarily required.
- iv. Stop the lift if any member of the *Lift Crew* signals the lift to be stopped due to an unsafe condition.
- v. Carry a radio to allow two-way communication with the *Signal Person* except in circumstances where the *Operator* and *Signal Person* can clearly hear each other.
- vi. Perform and document a pre-use inspection prior to the first lift for each *Crane* that they operate during a shift.
- vii. Assess the adequacy of *Support* conditions prior to any travel or positioning of the *Crane*.
- viii. Confirm the *Support* for the *Crane* conforms to the *Lift Plan*.
- ix. Participate in a job plan briefing with the *Lift Crew* to review the plan for assembly, disassembly, or reconfiguration of a *Crane* prior to commencing those activities and at appropriate intervals during those activities.
- x. Participate in performing the verification checks defined in the Lift Plan Checklist(s).

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- xi. Monitor wind speed and stop the lift if it exceeds the allowable limit taking into account the wind sail area of the *Load* and the ability to safely control the *Load*.
- xii. Safe-park the *Crane* prior to leaving it unattended.
- xiii. Only perform the role of *A/D Director* when the complexity of those activities does not compromise the ability to operate the *Crane* safely.

LoP 1.8 *Rigger* - Key Responsibilities

* **Requirement 1.8.1** The requirements for the *Rigger* in this T1BP apply to lifting activities, assembly/disassembly and configuration changes. The *Rigger* shall:

- i. Select rigging components, perform the planning and verification checks defined in the Rigging Plan Checklist, and document them on the Rigging Plan Checklist when the *Load* weighs more than 2t.
- ii. Inspect rigging and segregate or tag deficient rigging equipment for repair or disposal (in accordance with local *Site* procedures).
- iii. Protect synthetic slings by using softeners or edge protectors if they are, or could be in contact with the *Load*, unless the *Load* has a round smooth surface such as a pipe.
- iv. Analyze *Loads* to determine the potential for instability/tilting/inverting, and rig/support/constrain them to ensure their stability.

LoP 1.9 *Signal Person* - Key Responsibilities

* **Requirement 1.9.1** The *Signal Person* shall:

- i. Carry a radio to allow two-way communication with the *Operator* except when lifting with a *Fixed Cab Crane* and the *Operator* and *Signal Person* can clearly hear each other.
- ii. Provide signals to the *Operator* via radio when *Lifting Blind*, when lifting personnel (except when the occupants of the *Man-Basket* are required to wear a respirator or use breathing air), or when the *Load* or *Signaler* is not in full view of the *Operator*. Otherwise provide them verbally, by hand, or by whistle.
- iii. During *Crane* positioning and set-up, position themselves so that they can view clearances between the *Crane* and obstructions.
- iv. Provide clear instructions to the *Operator* for any and all movement of the *Crane* or *Load* during *A/D*, mobilization/demobilization (including positioning or traveling within a process unit), moving an empty hook, or lifting activities in either of the following ways:
 - (a) Signals containing three elements issued in the following order:
 - (i) Function and direction of each motion (i.e., may be one or more motions simultaneously). then
 - (ii) Distance and/or speed, which must be updated frequently enough throughout the motion to indicate that communication has not been broken, then
 - (iii) Function (if simultaneous commands have been provided) and Stop, or
 - (b) Simple instructions to move the *Load* to a specific destination point, without describing each motion in detail, provided all of the following conditions are met:
 - (i) The *Load* must remain in full view of the *Operator*, and

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- (ii) The *Operator* must have sufficient view of potential obstructions to be able to maintain adequate clearance, and
- (iii) No *Lift Crew* members or other personnel are (or will be) in the *Drop Zone* or the *Load Crush Zone* during movement of the *Load*.
- v. Monitor movement of the *Load* and *Crane* until such time that the lift is complete or another *Signal Person* acknowledges acceptance of signaling the *Crane*.
- vi. Understand when and to whom the responsibility for signaling the *Operator* is to be transferred during the lift sequence.
- vii. Monitor clearances to prevent contact between the *Crane/load line/rigging/Load* and obstructions, and when necessary, utilize a *Hazard Watch* to prevent contact.
- viii. Only relay signals to the *Operator* via another *Signal Person* in the event of a radio failure.

LoP 1.10 *Spotter* - Key Responsibilities

* **Requirement 1.10.1** A *Spotter* must be utilized if any part of the *Work Zone* is closer than the *Minimum Approach Distance (MAD)* to an *Overhead Power Line* that has not been confirmed by an authorized representative of the electrical asset owner/operator to be de-energized and visibly grounded or sufficiently insulated to prevent electric shock. The *Spotter* shall:

- i. Possess the competency of a *Signal Person*.
- ii. Use a visual aid such as a line painted on the ground or a clearly visible line of stanchions to assist in identifying the *Minimum Clearance Distance*.
- iii. Hold a horn (or other noise generating device) to indicate an "all stop" command.
- iv. Position themselves to effectively view the clearance between the *Crane* or *Load* and the boundary of the *MAD* (or *Minimum Clearance Distance* if lifting inside the *MAD*).
- v. Monitor and anticipate movement of the *Crane* and *Load* and signal all-stop to prevent encroachment using any reliable means (e.g., horn or whistle).
- vi. Have no responsibilities other than those described above.

LoP 1.11 *Hazard Watch* - Key Responsibilities

* **Requirement 1.11.1** A *Hazard Watch* must be utilized when the *Signal Person* is unable to see all potential contact points between parts of the *Crane/load line/rigging* or the *Load* that could contact obstructions during the lift. The *Hazard Watch* shall:

- i. Position themselves to effectively view the clearance between the *Crane* or *Load* and obstructions.
- ii. Monitor movement of the *Crane* or *Load* and provide appropriate information to the *Signal Person* in a timely manner to prevent contact with obstructions.
- iii. Have no responsibilities other than those described above until released by the *Signal Person*.

LoP 1.12 *Inspection and Maintenance Personnel* - Key Responsibilities

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* **Requirement 1.12.1** Lifting equipment must be inspected, maintained, and repaired by a *Qualified Person* who shall:

- i. Possess sufficient knowledge and understanding of the lifting equipment they inspect or repair.
- ii. Inspect, maintain, and repair lifting equipment per manufacturer's instructions.
- iii. Document the results of inspections and maintenance they perform.

CLSM 2 - Engineering Controls

LoP 2.1 Load Moment Limiter (*LML*)

* **Requirement 2.1.1** *Cranes* must be equipped with an *LML* that shuts off power to functions that would cause the *Crane* to be operated beyond its rated capacity and range limits. The *LML* must display current load, radius, and rated capacity.

* **Requirement 2.1.2** Safety features of the *LML* must not be bypassed except during *A/D*, reconfiguration and positioning activities, and only then if required by the manufacturer's operating manual. If the *LML* is bypassed, it must be re-enabled as soon as practicable.

* **Requirement 2.1.3** *LML* bypass switches that bypass anything other than the anti two-block limit switch must meet the following requirements:

- i. *LML* bypass switches located inside the operator cabin must be keyed, and its key must be stored outside the reach of the *Operator*.
- ii. *LML* bypass switches located outside the *Operator's* reach may be keyed or unkeyed.

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LoP 2.2 External Capacity Indicating Lights

* **Requirement 2.2.1** *Cranes* must be equipped with external lights that indicate the load utilization status of the *Crane* relative to its capacity.

- i. External indicator must illuminate red to indicate when *Crane* utilization exceeds 100% of its rated capacity, when the *LML* system is bypassed, or when the anti-two block function is defeated with anything other than a momentary type switch or button.
- ii. External indicator must illuminate amber to indicate high utilization which should occur above 80% of rated capacity.
- iii. External indicator should illuminate green to indicate the *LML* is not bypassed and that the load status is less than or equal to 80% of rated capacity.

LoP 2.3 Event Recorder

* **Requirement 2.3.1** *Cranes* must be equipped with an event recorder that monitors and records load-related data and *Crane* geometry information when events such as overloads, bypassing of the *LML*, activation of safety interlocks, and configuration changes trigger data capture. Event data stored in the event recorder must be capable of being retrieved in the event of an incident.

LoP 2.4 Range Limiting Switches

* **Requirement 2.4.1** *Cranes* must be equipped with range limiting switches (e.g., anti two-block limit switch) to prevent contact between *Crane* components that could result in damage.

* **Requirement 2.4.2** If a range limiting switch is bypassed during assembly/disassembly, reconfiguration, or positioning activities, it must be re-enabled as soon as practicable.

LoP 2.5 Disable Free Fall Feature

* **Requirement 2.5.1** *Cranes* other than those dedicated to clamshell/dragline operations that are equipped with a boom or load line free fall feature must have it disabled in a manner such that the *Operator* does not have the ability to re-enable it.

LoP 2.6 Swing (Slew) Alarm

* **Requirement 2.6.1** Crawler *Cranes* with a counterweight less than two (2) meters above the ground must be equipped with an audible swing (slew) alarm. The alarm must sound while swinging/slewing (rotating) motions are occurring and be loud enough to warn personnel in the vicinity.

LoP 2.7 Rear Facing Camera

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* **Requirement 2.7.1** Crawler *Cranes* with a counterweight less than two (2) meters above the ground must be equipped with a rear-facing camera. The camera must provide the *Operator* with a clear view of anyone in the *Counterweight Crush Zone* created between the counterweight and a stationary object other than the carrier of the *Crane*.

LoP 2.8 Design and Testing of *Engineered Lifting Attachments* and *Engineered Rigging Components*

* **Requirement 2.8.1** *Engineered Lifting Attachments* and *Engineered Rigging Components*:

- i. Must be designed according to relevant industry consensus standards such as ASME BTH-1, Design of Below-the-Hook Lifting Devices.
- ii. Must have their design calculations verified and certified by a third party *Qualified Person* and must be provided with a certificate that describes any restrictions on how these items must be used to achieve their rated capacity.
- iii. Must be marked with their rated capacity. Note: Section 3.3.1.ii contains requirements for existing lifting attachments that are not marked.
- iv. Must be examined by an appropriate non-destructive examination prior to first use or following repair or modification.
- v. *Engineered Rigging Components* should be *Proof Load Tested* prior to first use in accordance with the industry standard to which they were designed. *Engineered Rigging Components* not *Proof Load Tested* must be evaluated prior to initial use to confirm they have been constructed in accordance with their design.

CLSM 3 - Inspection and Maintenance

LoP 3.1 Inspection of *Cranes*

* **Requirement 3.1.1** The structural and mechanical components and safety devices of *Cranes* must be inspected and tested to ensure the *Crane* is capable of functioning and performing as designed. The scope of the inspections must be in accordance with manufacturer's recommendations and must include sufficient detail to ensure the detection of any deficiencies which could affect the capacity or safe operation of the *Crane*. All of the items inspected and all deficiencies must be documented by the person performing the inspection, and must be retained by the equipment owner for audit for the retention period indicated below. Deficiencies which could affect the capacity or safe operation of the *Crane* must be rectified prior to use. An investigation must be conducted to determine the cause of any deficiencies not attributable to normal use.

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*** Requirement 3.1.2** Mandatory *Crane* inspections:

- i. *Initial:* Must be performed by a *Qualified Person* prior to the first use of a *Crane* at the *Site*. This inspection must include confirmation that the *Crane* is fitted with the required engineering controls. Document retention period: 12 months or until next annual inspection.
- ii. *Post-assembly:* Must be performed by a *Qualified Person* following assembly or reconfiguration except if only changing outrigger extension, changing amount of counterweight, or telescoping of the boom. Document retention period: Until the *Crane* departs the *Site* or until next annual inspection.
- iii. *Pre-Use:* Must be performed by the *Operator* prior to first use in the shift or following any change of *Operator*. The accuracy of the *LML* radius readout must be verified using a tape measure as part of this inspection. Document retention period: 30 days.
- iv. *Periodic:* Must be performed by a *Qualified Person* at a frequency consistent with manufacturer's recommendations. Document retention period: 12 months or until next annual inspection.
- v. *Annual:* Comprehensive inspection and full function testing performed by a *Qualified Person* in accordance with the manufacturer's instructions. Document retention period: Life of equipment.
- vi. *Post Repair or Modification:* Must be performed by a *Qualified Person* if the repair or modification has the potential to affect the capacity or safe operation of the *Crane*. The scope of the inspection plan must be determined by the *Crane* manufacturer's representative or a *Qualified Person* and must include relevant non-destructive testing, function testing, and a statement as to why load testing is not required if it is not part of the inspection plan. Document retention period: Life of equipment.

LoP 3.2 Inspection of <i>Rigging</i> including <i>Engineered Rigging Components</i>
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*** Requirement 3.2.1** A pre-use inspection of all rigging components including shackles and *Manual Hoists* must be performed prior to each use to ensure that all load bearing parts are capable of withstanding their design loads.

- i. Results of the inspection must be recorded on the Rigging Plan Checklist if the *Load* weighs more than 2t.
- ii. Rigging components must be clearly marked or labeled to identify the manufacturer, rated capacity, and means of traceability (i.e., serial/lot number).
- iii. Equipment with deficiencies must be segregated or tagged for investigation and repair or disposal.

*** Requirement 3.2.2** All rigging components except for shackles must be inspected periodically at an interval not exceeding 12 months.

- i. The inspection results must be documented. Document retention period: Life of equipment.
- ii. Rigging that has been inspected must be marked to indicate that its inspection is current.
- iii. Defective equipment must be segregated or tagged for investigation and repair/disposal.

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- iv. All rigging equipment must have a certificate of manufacture to a recognized industry standard. The certificate of manufacture must be traceable to the rigging item by the lot/serial number.

* **Requirement 3.2.3** *Engineered Rigging Components* must be subject to the following additional inspection requirements.

- i. Must be marked with their rated capacity or evaluated to ensure they are adequate for the load that will be applied to them.
- ii. Prior to use, conformance to requirements of 2.8.1 must be confirmed.

LoP 3.3 Inspection of *Engineered Lifting Attachments*

* **Requirement 3.3.1** A pre-use inspection of all *Engineered Lifting Attachments* must be performed prior to each use to ensure that all load bearing parts are fit-for-purpose.

- i. Results of the inspection must be recorded on the Rigging Plan Checklist unless the *Load* weighs less than 2t.
- ii. Lift attachments with a required capacity greater than 1t that are not marked with their rated capacity must have their capacity formally evaluated.
- iii. Equipment with deficiencies must not be used until repaired to be fit-for-purpose.

CLSM 4 - Lift Planning

LoP 4.1 *Lift Plans*

* **Requirement 4.1.1** All lifting (or shifting) jobs within the scope of this T1BP must be planned using the applicable lift plan checklist(s) included as appendices. All of the applicable fields on the checklist(s) must be completed, or equivalent information must be included in attachments.

* **Requirement 4.1.2** A pre-lift briefing must be conducted for all lifting (or shifting) jobs to review the *Lift Plan* with the all *Lift Crew* members and all *Lift-Related Personnel*, even if a checklist is not mandatory for the job.

- i. A pre-lift briefing must be conducted prior to connecting the rigging to the *Load*, and must be repeated following a crew change prior to disconnecting the rigging from the *Load* at the end of the lift.
- ii. At a minimum, the following items must be reviewed during the briefing:
 - (a) The highlighted fields on the applicable lift planning checklist(s).
 - (b) The plan for managing the boundaries of the *Bystander Exclusion Zone*.
 - (c) The locations of the *Drop Zone(s)* and *Load Crush Zone(s)*, and the circumstances for when (if at all) *Lift Crew* members may enter them.

* **Requirement 4.1.3** All lifts by *Cranes* must have a *Lift Director*.

* **Requirement 4.1.4** For lifts by *Cranes*, as required by the specific checklist(s) being used:

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- i. In order to confirm that the *LML* is configured correctly, the *LML* capacity, adjusted for reeving configuration, must be confirmed to match the load chart capacity. This comparison must be made prior to the lift, and at a radius chosen from the applicable load chart.
- ii. A *Dry Run* must be performed with no *Load* or rigging on the hook to verify key *Lift Plan* parameters including adequate capacity and clearances prior to the lift proceeding.
- iii. After all field verifications are completed, the maximum expected capacity utilization must be reassessed to verify that the lift can be completed without exceeding the *Crane's* rated capacity or the *Crane Support* capacity.

*** Requirement 4.1.5** A group of lifts by a *Crane* may be planned using a single Mobile Crane Lift Plan Checklist and is subject to the following requirements:

- i. The lift plan parameters documented on the checklist must be for the lift with the highest capacity utilization of the *Crane*. Exception: The *Drop Zone/Load Crush Zone/Rigging Assessment* portion of the Verification Section may be used to document the assessment for all of the lifts within the group or any subset of the lifts within the group.
- ii. There must be no changes to the *Crane* location or configuration.
- iii. There must be no *Complex Lifts* within the group except if all of the lifts within the group have identical planning parameters.
- iv. All of the lifts within the group must be performed by the same *Operator* during the same shift.
- v. The *Dry Run* performed for the group of lifts must assess the operating envelope created by all lifts within the group.
- vi. A separate Rigging Plan Checklist must be used for each unique rigging configuration for *Loads* greater than 2t.
- vii. All of the lifts within the group must be assessed against the parameters listed in the *Drop Zone/Load Crush Zone/Rigging* section of the checklist. Note: Using this section of the checklist as a guide will allow the user to identify if the documented assessment is representative for all of the lifts within the group, or only for a subset of them. If deemed necessary by the *Lift Director*, further lift-specific *Drop Zone/Load Crush Zone/rigging* assessments can be documented using a Rigging Plan checklist.

*** Requirement 4.1.6** *Complex Lift Plan* Requirements:

- i. For all *Complex Lifts*, the Complex Lift Plan Checklist must be used to define which documents (if any) that are needed for the *Lift Plan* in addition to the Checklist(s) already required, as well as supporting documents that are not required to be included in the *Lift Plan* (e.g., design documents for *Engineered Rigging Components*).
- ii. The *Site Lift Specialist* shall approve the Complex Lift Plan Checklist prior to the documents defined by the checklist being collected and generated.
- iii. Calculations or drawings prepared for a *Complex Lift Plan* must be checked by someone other than the originator of the work before being issued.
- iv. The Complex Lift Plan Checklist must be included in the *Lift Plan*.

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* **Requirement 4.2.1** For lifts by *Cranes*, the path of the *Load* throughout the lift cycle must be assessed to identify the location of the maximum lift radius.

- i. The maximum lift radius must be determined by tape measure, scaled drawing, laser range finder, or other suitable (i.e., fit-for-purpose) means.
- ii. The maximum lift radius must be documented in the *Lift Plan* prior to the *Dry Run*.

* **Requirement 4.2.2** *Load Weight* must be established by one or more of the following means:

- i. Weighing by calibrated scale or load cell(s).
- ii. Data from drawing, document, or name plate.
- iii. Engineering calculation.
- iv. Estimate (only for *Basic Lifts* of *Loads* expected to weigh less than 2t that will utilize less than 75% of the rated capacity of the *Crane* or *Manual Hoist*).

* **Requirement 4.2.3** If the lift does not involve *Sudden Load Transfer*, the following contingency factors must be applied to the *Load Weight* to calculate the *Factored Load Weight*.

- i. No contingency is required if both of the criteria below are met:
 - (a) The weight of the *Load* is known because documentation is available from when it was previously weighed using a weighbridge/scale/load cell, or *LML*, and
 - (b) The *Load* is *Dressed* the same as it was when it was weighed.
- ii. 10% contingency must be added to weights that are obtained from vendor drawings, calculated, or estimated (if weight < 2t).

* **Requirement 4.2.4** If the lift involves *Sudden Load Transfer* to a *Crane*, a contingency of 100% must be used to calculate the *Factored Load Weight*.

* **Requirement 4.2.5** The weight of process residuals must be included in the *Factored Load Weight*. If residuals are present, or could be present, the weight of residuals must be:

- i. Calculated, or
- ii. Based on directly relevant previous experience, or
- iii. An estimate not less than 15% of the *Load Weight*

LoP 4.3 Load Transfer

* **Requirement 4.3.1** In order to prevent the possibility of overloading / impacting the *Crane* or *Manual Hoist*, and to prevent unexpected *Load* movement, *Sudden Load Transfer* must be avoided except in circumstances where there are no practical means of avoiding it. Temporary supports or bolted joints that can be progressively undone should be considered as a means to comply with this requirement.

* **Requirement 4.3.2** A *Crane* must not be used to free (i.e., break loose) a *Load* that is stuck or bonded to its supports. Jackbolts, wedges, jacks, etc. should be considered as a means of complying with this requirement.

* **Requirement 4.3.3** *Loads* must be adequately stabilized and secured prior to being released from a *Crane* or *Manual Hoist*.

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* **Requirement 4.3.4** The *Support* for a *Load* (including those that are partially complete) must have adequate capacity to support the weight of the *Load*.

LoP 4.4 Load Spreading and *Support* for Crane

* **Requirement 4.4.1** The capacity of the *Support* for the *Crane* must not be exceeded.

- i. *Sites* shall determine the *Support* capacity so that the load spreading requirements can be determined.
- ii. Load spreading material must be of a sufficient size and strength.
- iii. The effect of underground services, voids, and excavations must be considered.
- iv. *Crane* manufacturer's specified limits for levelness must not be exceeded, including consideration of the effects of differential settlement.

LoP 4.5 Rigging Plan

* **Requirement 4.5.1** *Loads* that have a *Factored Load Weight* greater than 2t must have a documented plan for rigging using the Rigging Plan Checklist unless the *Load* has dedicated rigging (e.g., skid pan / material box).

- i. All of the fields on the Rigging Plan Checklist must be completed or equivalent information must be included in attachments prior to proceeding with lift.
- ii. The *Load* must not be allowed to tilt or invert in an uncontrolled way. To ensure this, the rigging connection/choke points must be above the center of gravity, or the rigging arrangement must constrain the *Load*.
- iii. Rigging arrangements must be configured in consideration of the orientation and design of the lifting attachments.
- iv. Synthetic slings must be protected by softeners or edge protectors if they are, or could be in contact with the *Load*, unless the *Load* has a round smooth surface (e.g., pipe).
- v. When more than two slings (legs) are used to connect a *Load* to a hook, a maximum of two legs may be used to calculate the required sling capacity unless the actual load distribution between the legs has been determined by a *Qualified Person* or by direct measurement (e.g., by using load cells on each leg).

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LoP 4.6 Job Plan for Assembly, Disassembly and Configuration Changes (A/D)

* **Requirement 4.6.1** An *A/D Director* must be designated for *Crane* assembly, disassembly, and configuration changes.

* **Requirement 4.6.2** A *Site* specific job plan consistent with manufacturer's instructions must be developed for *Crane* assembly, disassembly, and configuration changes including deploying/stowing the jib, changing manual jib offset or changing number of parts of line. This requirement does not apply to changes that only involve changing outrigger extension position or telescoping of the boom.

* **Requirement 4.6.3** Prior to commencing *A/D* operations, and at other appropriate stages of the *A/D* operations, the *A/D Director* shall conduct a pre-job briefing of the *A/D Plan* with all crew members to ensure they understand the following:

- i. Their tasks.
- ii. The hazards associated with their own tasks as well as how they might be impacted by the tasks of others.
- iii. The hazardous positions/locations that they need to avoid.
- iv. That before they go to a location that is out of view of the *Operator* and is where they could be injured by movement of the *Crane* or *Load*, they must inform the *Operator* that they are going to that location.

* **Requirement 4.6.4** Lifts associated with *Crane* assembly, disassembly and configuration changes must be planned in accordance with the requirements for *Basic* and *Complex Lifts*.

LoP 4.7 Restrict access to Drop Zone, Load Crush Zone and Counterweight Crush Zone

* **Requirement 4.7.1** Only *Lift Crew* and *Lift-Related Personnel* are permitted inside the *Bystander Exclusion Zone*.

* **Requirement 4.7.2** Only *Lift Crew* members are permitted inside the *Drop Zone* or the *Load Crush Zone*. *Lift Crew* members are not allowed to enter either zone except:

- i. During dismantling or final setting of a *Load*, or while actuating a *Manual Hoist*, and
- ii. Their presence is essential to perform the lift, and
- iii. There is no lower risk alternative way of completing the task, and
- iv. The lifting device(s) are not imparting any net lateral force on the *Load*.

* **Requirement 4.7.3** The boundary of the *Counterweight Crush Zone* must be marked with warning lines, railings or similar barriers to prevent personnel from entering. Where it is not feasible to erect barriers, the hazard areas must be clearly marked with warning signs.

* **Requirement 4.7.4** *Lift Crew* personnel may enter the *Counterweight Crush Zone* only if they inform the *Operator* and the *Signal Person* immediately prior to entering, and the *Operator* must not rotate the superstructure until being informed that the *Lift Crew* member is in a safe position.

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LoP 4.8 Taglines

*** Requirement 4.8.1** *Taglines* must:

- i. Only be used when they are needed to limit swinging of the *Load* or to control the orientation of the *Load*.
- ii. Only be retrieved when the *Load* is not being moved by the *Crane* (i.e., when there is no active *Load Crush Zone*).
- iii. Be long enough to allow users to stay outside the *Drop Zone* and *Load Crush Zone* when the *Load* is being moved by the *Crane*.

LoP 4.9 Inclement Weather

*** Requirement 4.9.1** Lifting activities must cease if weather conditions compromise the safety of the lift.

- i. A *Weather Forecast* must be used to confirm that the lift can be completed without exceeding the allowable wind speed and in compliance with *Site* guidelines for lifting when lightning is in the vicinity.
- ii. The allowable wind speed must be adjusted based on the sail area of the *Load* and the need to control the *Load* against the effect of the wind, and wind speed must be monitored when there is a reasonable potential for it to exceed the allowable limit.

*** Requirement 4.9.2** *Cranes* out of service must be parked in a configuration capable of withstanding the maximum expected winds.

- i. If the *Weather Forecast* indicates an out of service *Crane* may experience winds in excess of allowable for out of service, a contingency plan must be developed to ensure:
 - (a) Sufficient space is available to lay the boom down.
 - (b) Resources are available to lay the boom down prior to winds exceeding allowable.

LoP 4.10 Manual Hoisting & Shifting

*** Requirement 4.10.1** *Manual Hoisting & Shifting* jobs involving hoisting *Loads* > 0.5t or shifting pipe or structural members beyond their fit-up (i.e., design) position must:

- i. Have a designated *Lift Director*.
- ii. Be planned using the Manual Hoisting & Shifting Checklist. All of the fields on the checklist must be completed or equivalent information must be included in attachments.

*** Requirement 4.10.2** The force exerted to operate a *Manual Hoist* must not exceed that which one person can apply.

*** Requirement 4.10.3** Engineering approval is required for:

- i. Use of a *Cantilever* member for a *Support Structure* unless it is specifically designed to be a *Support Structure* for a hoist.
- ii. Use of a *Support Structure* to lift a *Load* with a *Factored Load Weight* >3t unless the *Support Structure* is specifically designed for a hoist (e.g., a monorail).

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- iii. Use of pipe with a cast iron valve as a *Support Structure*, or shifting (i.e., deflecting) pipe with a cast iron valve beyond its fit-up position.

* **Requirement 4.10.4** When cross-hauling/fleeting a *Load* (i.e., using multiple hoists to move a suspended *Load* laterally), each hoist and anchor point must be either rated for the *Factored Load Weight* or rated for the maximum load they will be subjected to as determined by calculations performed by a *Qualified Person*.

CLSM 5 - Lifting Personnel

LoP 5.1 Equipment Design

* **Requirement 5.1.1** *Cranes* for lifting personnel:

- i. Must be approved by their manufacturer for lifting personnel.
- ii. Must have an emergency lowering system if there is no alternative way to rescue personnel in the event of loss of *Crane* motion.
- iii. Should have an emergency operating system to help expedite a rescue operation in the event of loss of normal *Crane* power source.

* **Requirement 5.1.2** *Man-Baskets* must be designed and constructed according to relevant consensus standards such as ASME B30.23, Personnel Lifting Systems.

LoP 5.2 Lift Plan for Lifting Personnel

* **Requirement 5.2.1** A plan for lifting personnel with a *Man-Basket* must be documented using the Lifting Personnel Checklist.

- i. All of the fields on the checklist must be completed or equivalent information must be included in attachments prior to proceeding with lift.
- ii. A new checklist must be utilized:
 - (a) At the start of each shift.
 - (b) If the *Crane* is repositioned.
 - (c) If the boundaries of the work area change.

LoP 5.3 Communication while Lifting Personnel

* **Requirement 5.3.1** The *Signal Person* shall be an occupant of the *Man-Basket* except when the occupants of the *Man-Basket* are wearing a respirator (or using breathing air) that impedes their ability to use a radio.

* **Requirement 5.3.2** The primary method of communication between the *Signal Person* and *Operator* must be by radio. A secondary means must be available to signal all-stop.

* **Requirement 5.3.3** Where necessary, a *Hazard Watch* must be used to help monitor clearances to avoid contact between the *Crane/load line/rigging/Man-Basket* and obstructions.

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CLSM 6 - Lifting Near Overhead Power Lines

LoP 6.1 *Lift Plan for Lifting Near Overhead Power Lines*

* **Requirement 6.1.1** *Overhead Power Lines* must be considered energized and uninsulated unless an authorized representative of the electrical asset owner/operator has verified that they are de-energized and visibly grounded, or sufficiently insulated to prevent electric shock.

* **Requirement 6.1.2** When *Lifting Near Overhead Power Lines*, the boundaries of the *Work Zone* must be determined. Note: See definition of *Lifting Near Overhead Power Lines* and *Work Zone*.

* **Requirement 6.1.3** If no part of the *Work Zone* is closer than 20' (6m) to the power line:

- i. The boundary of the *Work Zone* must be demarcated with flags, cones or similar objects (that are not normally in the environment) in a manner that prevents any part of the *Crane* or *Load* (including rigging) from encroaching the 20' (6m) clearance distance so long as the *Crane* is not operated beyond the demarcated *Work Zone* boundary.
- ii. The flags, cones, or similar objects used to demarcate the *Work Zone* boundary must be located and spaced such that the *Operator* and *Signal Person* are able to use them to judge whether the *Crane* and *Load* remains within the demarcated boundary.
- iii. The location of the *Overhead Power Lines* and the boundaries of the *Work Zone* must be reviewed during the pre-lift briefing.

* **Requirement 6.1.4** If any part of the *Work Zone* is closer than 20' (6m) to the power line:

- i. The Lifting Near Overhead Power Lines Checklist must be used, and all of its applicable fields must be completed or equivalent information must be included in attachments prior to proceeding with lift.
- ii. An authorized representative of the electrical asset owner/operator must confirm that the power line is de-energized and visibly grounded or that the power line is sufficiently insulated to prevent electric shock, then implement requirement 6.1.5, or
- iii. An authorized representative of the electrical asset owner/operator shall determine the voltage of the power line and its corresponding *Minimum Approach Distance (MAD)* and implement the applicable requirements listed below to maintain safe clearance and prevent electrocution.

* **Requirement 6.1.5** If the power line is de-energized and visibly grounded, or sufficiently insulated to prevent electric shock per requirement 6.1.1, the following requirements apply:

- i. A pre-lift briefing must be conducted with the *Lift Crew* and other workers who will be in the area of the equipment or *Load* to review the location of the power lines and the steps that have been implemented to prevent encroachment/electrocution.

* **Requirement 6.1.6** If the power line is energized and uninsulated, and if no part of the *Work Zone* is closer than the *Minimum Approach Distance (MAD)* to the power line:

- i. The boundary of the *Work Zone* must be demarcated with flags, cones, or similar objects in a manner that prevents any part of the *Crane* or *Load* (including rigging) from

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breaching the *MAD* so long as the *Crane* is not operated beyond the demarcated *Work Zone* boundary.

- ii. The flags, cones or similar objects used to demarcate the *Work Zone* boundary must be located and spaced such that the *Operator* and *Signal Person* are able to use them to judge whether the *Crane* and *Load* remains within the demarcated boundary.
- iii. The location of the *Overhead Power Lines* and the boundaries of the *Work Zone* must be reviewed during the pre-lift briefing.

*** Requirement 6.1.7** If the power line is energized and uninsulated, and if the *Work Zone* is closer than the *Minimum Approach Distance (MAD)* to the power line:

- i. The lift must be classified as a *Complex Lift* except when the work is being performed by electrically qualified personnel working on electric power transmission and distribution lines and equipment.

*** Requirement 6.1.8** If the power line is energized and uninsulated, and if the *Work Zone* is closer than the *Minimum Approach Distance (MAD)* to the power line, but no part of the *Crane* or *Load* is planned to be closer than the *MAD* to the power line:

- i. A *Spotter* who shall fulfill the requirements defined in section 1.10.1 must be used.
- ii. A range limiting feature (of *LML*) must be used to prevent encroaching the *MAD* in accordance with manufacturer's instructions.
- iii. The *Crane* must be properly grounded.
- iv. Slings must be non-conductive (i.e., special type synthetic slings).
- v. If tag lines are used, they must be non-conductive.
- vi. A pre-lift briefing must be conducted with the *Lift Crew* and other workers who will be in the area of the equipment or *Load* to review the location of the power lines and the steps that have been implemented to prevent encroachment/electrocution.

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*** Requirement 6.1.9** Lifts where any part of the *Crane* or *Load* will be closer than the *MAD* to an energized, uninsulated power line should be avoided. Power lines must be de-energized and grounded when feasible (i.e., possible to do easily or conveniently) and when doing so would not result in higher net risk (e.g., process safety risks associated with a unit shutdown). However, if it is necessary to lift inside the *MAD*, the following additional requirements apply:

- i. Except when the work is being performed by electrically qualified personnel working on electric power transmission and distribution lines and equipment, a *Qualified Person* shall determine the *Minimum Clearance Distance* that must be maintained in light of on-site conditions affecting the ability to prevent electrical contact such as wind conditions, degree of sway in the power line, atmospheric conductivity, etc.
- ii. *Lift Crew* members other than the *Operator* shall wear voltage rated gloves during the lift.
- iii. Insulating line hose or cover-up must be applied to exposed conductors.
- iv. If the power line's circuit interrupting device contains an automatic reclosing feature, it must be made inoperative if the design of the device permits.
- v. An insulating link must be installed between the load line and the *Load*, and while any part of the *Crane* or *Load* is closer than the *MAD* to the power line, workers other than the *Operator* must be prohibited from touching the load line above the insulating link.
- vi. A barricade forming a perimeter at least 10 feet away from the *Crane* must be erected to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the *Crane* as feasible.
- vii. Except when the work is being performed by electrically qualified personnel working on electric power transmission and distribution lines and equipment, or when lifting above or below an *Overhead Power Line*, an elevated warning line or barricade must be provided, in view of the *Operator*, and must be equipped with flags or similar high-visibility markings.
- viii. A *Spotter* who shall fulfill the requirements defined in section 1.10.1 must be used except when the work is being performed by electrically qualified personnel working on electric power transmission and distribution lines and equipment.
- ix. A range limiting feature (of *LML*) must be used to prevent encroaching the *Minimum Clearance Distance* and must be used in accordance with manufacturer's instructions.
- x. Slings must be non-conductive (i.e., special type synthetic slings), and if tag lines are used, they must also be non-conductive.
- xi. Only personnel essential to the lift are permitted to be in the area of the *Crane* and *Load*.
- xii. The *Crane* must be properly grounded.

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GLOSSARY

Authorized	Formal recognition by the employer that a person meets the minimum requirements as defined by the <i>Site</i> to perform a role. Minimum requirements must include the competency requirements as defined in Appendix O, and could include certification, letter of authorization from employer, etc.
A/D	Assembly, disassembly, and reconfiguration of a <i>Crane</i> .
A/D Director	Person designated to be overall responsible for <i>A/D</i> . The <i>Operator</i> shall be the <i>A/D Director</i> unless specified otherwise on an <i>A/D Plan</i> .
A/D Plan	Written job plan for <i>A/D</i> that provides all instructions that must be followed to ensure tasks are completed safely.
Basic Lift	Lift that does not meet the criteria of a <i>Complex Lift</i> .
Bystander	Person that is neither a member of the <i>Lift Crew</i> nor meets the criteria for <i>Lift-Related Personnel</i> .
Bystander Exclusion Zone	Area defined by physical barricade(s) or <i>Human Barricade(s)</i> from which <i>Bystanders</i> are excluded in order to prevent them from entering the <i>Drop Zone(s)</i> and <i>Load Crush Zone(s)</i> .
Cantilever Support	A <i>Support Structure</i> that is supported only at one end.
Complex Lift	A lift that meets one or more of the following criteria: <ul style="list-style-type: none"> a. <i>Factored Load Weight</i> over 50t (metric tonnes <u>or</u> short tons; units appropriate to location) in the planning phase. b. <i>Crane</i> capacity utilization exceeds 80% (of the chart capacity) in the planning phase. c. More than one <i>Crane</i> being used. d. While <i>Crane</i> supported on tires (except for Fixed Cab <i>Cranes</i>). e. Travelling with a <i>Load</i> on the hook (except for Fixed Cab <i>Cranes</i>). f. <i>Work Zone</i> is closer than the <i>Minimum Approach Distance</i> to an energized, uninsulated <i>Overhead Power Line</i> (except when the work is being performed by electrically qualified personnel working on electric power transmission and distribution lines and equipment). g. Over an occupied building. h. Potential for <i>Sudden Load Transfer</i> to the <i>Crane</i> or <i>Manual Hoist</i>. i. Use of an <i>Engineered Rigging Component</i> except for the following: <ul style="list-style-type: none"> • Single-purpose lifting beam / spreader bar • Multi-purpose (i.e., adjustable/modular) lifting beam / spreader bar that is labeled with instructions for use.
Counterweight Crush Zone	Area between the rotating counterweight of a <i>Crane</i> and a fixed object (including the carrier of the <i>Crane</i>) in which a person could be crushed.

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Crane	Land-based equipment used to lift, lower, and swing <i>Loads</i> at various radii that incorporates a lattice or hydraulic telescopic boom and is designed to be readily moved between operating locations. Types include: Rough Terrain, Truck, All Terrain, Carrydeck, Crawler, and Tractor, but specifically not a Lorry Crane where an articulating boom is mounted behind the cabin of a conventional truck (or similar).
Crane – Fixed Cab	<i>Crane</i> which has its operator cabin located within the undercarriage/carrier and has a capacity of not greater than 25t. Equivalent term: carry deck crane, Franna.
Dressed	The presence of auxiliary structures and materials (e.g., piping, platforms, ladders, insulation, etc.), that are connected to a <i>Load</i> .
Drop Zone	Area in the vicinity of a suspended <i>Load</i> where a person could potentially be struck if the <i>Load</i> were to drop or invert. When the <i>Crane</i> is in motion, this includes the area below an empty hook and any below-the-hook lifting attachments (e.g., spreader bar).
Dry Run	Maneuvering a <i>Crane's</i> empty hook (or a <i>Man-Basket</i> with proof load weight) to the points along the load path (or through the perimeter of the work area) to verify clearances and <i>Lift Plan</i> parameters including radii and adequate capacity.
Engineered Lifting Attachment	Welded or bolted attachments used to connect rigging apparatus to equipment, including but not limited to lifting lugs, pad eyes, and trunnions.
Engineered Rigging Component	Rigging components such as lifting beams, spreader bars, and link plates. Note: Mass-produced items such as shackles, slings, and eyebolts are not considered <i>Engineering Rigging Components</i> .
Exclusion Zone	Area defined by physical barricades, <i>Human Barricades</i> , or horizontal distance from the <i>Load</i> to prevent unauthorized personnel from entering the <i>Drop Zone</i> , <i>Load Crush Zone</i> or <i>Counterweight Crush Zone</i> .
Factored Load Weight	The weight of the <i>Load</i> to be used for planning the lift following application of contingency factors and accounting for process residuals.
Hazard Watch	Person designated to provide details of clearances between the <i>Crane / Load</i> and obstructions to the <i>Signal Person</i> .
Human Barricade	Person positioned at the boundary of an <i>Exclusion Zone</i> to prevent personnel from entering.
Lifting Blind	Lifting when the <i>Operator</i> cannot see the <i>Load</i> .

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Lift Crew

Personnel involved in the execution of a lift or *A/D*, including *Lift Director, A/D Director, Operator, Rigger, Signal Person, Hazard Watch, Human Barricade, Spotter* and any other personnel that will be (or could be) required to perform a task within the *Drop Zone* or *Load Crush Zone*.

Lift-Related Personnel

Personnel that are required to perform a task inside the *Bystander Exclusion Zone*, but are not a member of the *Lift Crew*.

Lift Director

Person who is designated to ensure compliance to the specific T1BP requirements listed in LoP 1.5 (*Lift Director - Key Responsibilities*).

Lifting Near Overhead Power Lines

Lift by a *Crane* that meets either of the following criteria:

- a. Any part of the *Crane*, load line, or the hook can get closer than 20' (6m), measured horizontally, to an *Overhead Power Line* in any direction at the maximum working radius of the boom length indicated on the lift plan checklist without the *Load* on the hook.
- b. Any part of the *Crane*, load line, hook, or the *Load* (including rigging) can get closer than 20' (6m), measured horizontally, to an *Overhead Power Line* in any direction at the maximum working radius of the longest boom length indicated on the lift plan checklist with the *Load* on the hook.

Exception: When the uppermost part of the boom, when in the fully extended position, at true vertical, would be more than 20' (6m) below the plane of the power line.

Lift Plan

The documents and discussions held by the *Lift Crew* at the lifting location for executing the lift, including:

- The applicable Lift Plan Checklist(s)
- Documents referenced by the applicable Lift Plan Checklist(s)
- Documents identified by the Complex Lift Plan Checklist required to be at the lift site
- Discussions for how to prevent personnel (including *Lift Crew* members and *Lift-Related Personnel*) from entering the *Drop Zone* and *Load Crush Zone*.

Lift Planner

A person who plans all or part of a lift.

LML

A Load Moment Limiting system that limits the overturning moment on a *Crane* and also controls other range limiting devices. The system compares the lifting condition to the *Crane's* rated capacity for the current configuration, and when the rated capacity is reached, shuts off power to those *Crane* functions that can increase the severity of loading on the *Crane*, while allowing those functions that decrease the severity of loading on the *Crane* to remain operational. Equivalent terms: rated capacity limiter, "computer".

Load

Object(s) being lifted by a *Crane*, or lifted (or shifted) by a *Manual Hoist*.

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Single Point of Contact: AMLT C&L CoP Coordinator	Supersedes Version 3	Revision No. 4
Owner: America's Mechanical Leadership Team	Previous Revision: May 15, 2017	Current Revision: June 4, 2018

Load Crush Zone	Area between a suspended <i>Load</i> and a stationary object where a person could be crushed if lateral control of the <i>Load</i> is not maintained. While traveling with a <i>Load</i> , the <i>Load Crush Zone</i> must be expanded in consideration of the dynamic effects of the movement of the <i>Crane</i> .
Load Weight	The weight of the <i>Load</i> without contingency.
Man-Basket	Platform suspended from a <i>Crane</i> for moving people and their tools. Equivalent terms: crane basket or suspended personnel platform.
Manual Hoist	Non-powered device used to apply a force to lift or shift a <i>Load</i> . Examples: chain hoist, lever hoist.
Manual Hoisting & Shifting	Use of one or more <i>Manual Hoists</i> to suspend or shift a <i>Load</i> . Shifting a <i>Load</i> is moving a <i>Load</i> that is not suspended, or deflecting a member such as pipe or structural steel. Exceptions: Use of a <i>Manual Hoist</i> as part of a rigging assembly to connect a <i>Load</i> to a <i>Crane</i> , or use of a <i>Manual Hoist</i> permanently connected to a <i>Support Structure</i> designed for lifting (e.g., monorail) does not constitute <i>Manual Hoisting & Shifting</i> . Equivalent terms: bull rigging.
Mat	Pad, plate or cribbing placed under outriggers or crawler tracks to prevent exceeding the maximum allowable load bearing capacity of the ground or other supporting surface.
Minimum Approach Distance (MAD)	The minimum allowable distance between an energized, uninsulated <i>Overhead Power Line</i> and any part of the <i>Crane</i> or <i>Load</i> (including rigging) as defined by local regulatory requirements for non-electrically qualified workers. In the absence of local regulatory requirements, <i>MAD</i> must be per Table 5-3.4.5.1-1 in ASME B30.5, Mobile and Locomotive Cranes.
Minimum Clearance Distance	When lifting closer than the <i>Minimum Approach Distance (MAD)</i> to an energized, uninsulated <i>Overhead Power Line</i> , the clearance that must be maintained as determined by a <i>Qualified Person</i> in light of on-site conditions.
Operator	Person who operates a <i>Crane</i> .
Overhead Power Line	Aerially suspended power transmission lines that are either insulated or uninsulated, and either energized or de-energized. Insulated cables in temporary installations, or suspended in cable tray or conduit are not considered <i>Overhead Power Lines</i> .
Proof Load Test	A load test equal to or greater than the rated load of a <i>Crane</i> or rigging component as specified by the local consensus standard or regulation to demonstrate it is fit-for-purpose.

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Qualified Person	A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter.
Rigger	A person who selects, inspects and connects rigging components to a <i>Load</i> .
Signal Person	A person who monitors clearances between the <i>Crane</i> and fixed objects during positioning and lifts, and directs the <i>Operator</i> to move the <i>Crane</i> or the <i>Load</i> . Equivalent terms: banksman, dogman.
Site	Company facility or construction site and the personnel responsible for its management.
Site Lift Specialist	The person designated by the <i>Site</i> to approve the content and review process for <i>Complex Lift Plans</i> and provides assistance in interpreting the requirements of this T1BP.
Spotter	The person who monitors clearances between <i>Overhead Power Lines</i> and the <i>Crane</i> or <i>Load</i> , and communicates with the <i>Operator</i> to ensure safe clearance is maintained. Equivalent terms: electrical overhead spotter.
Sudden Load Transfer	Removing support of a <i>Load</i> (e.g., cutting support clips, etc.) without having confirmation (e.g., horizontally oriented bolts becoming slack) that the <i>Crane</i> or <i>Manual Hoist</i> is applying a lifting force equal to the actual weight of the <i>Load</i> .
Support	Surface or structure that supports a <i>Crane</i> or <i>Load</i> (e.g., ground, concrete slab, steel structure, road, etc.).
Support Structure	A structure that an anchor point for a <i>Manual Hoist</i> is attached to.
Tagline	A rope attached to a <i>Load</i> for the purpose of controlling its orientation, or to limit its swinging (i.e., pendular motion).
Total Lift Weight	Total weight to be lifted including the <i>Factored Load Weight</i> and all <i>Crane</i> and rigging components.
Weather Forecast	A fit-for-purpose prediction of future weather conditions that, depending on circumstances (e.g., duration of the lift, weather volatility at the site, etc.), may range from a formal weather report from a weather agency to an informal assessment by the <i>Lift Crew</i> of the weather conditions immediately prior to the start of the lift.
Work Zone	The 2-dimensional area (plan view) representing the furthest extent any part of the <i>Crane</i> or <i>Load</i> (including rigging) will be allowed to reach during assembly, disassembly, reconfiguration, and lifting, based on the planned <i>Crane</i> configuration(s) and <i>Load</i> orientation(s).

Appendix A

MOBILE CRANE LIFT PLAN CHECKLIST

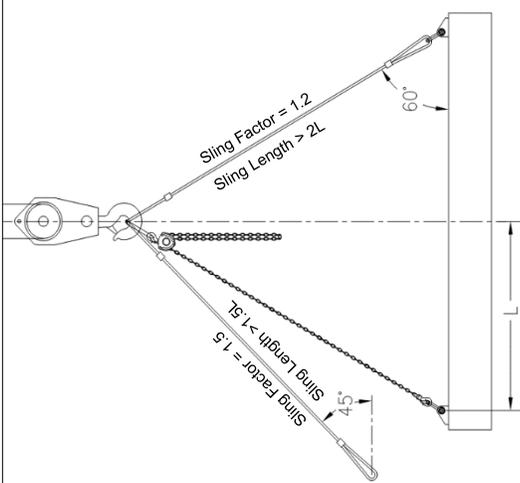
PLANNING SECTION

Lift location:	Unit:	Company:	Permit No.
<input type="checkbox"/> Single Lift	Lift Description:	Crane Make/Model/Capacity:	
<input type="checkbox"/> Group of Lifts	Description of the group of lifts:		
	Lift with highest utilization:		
Lift Classification: <input type="checkbox"/> Basic <input type="checkbox"/> Complex (Appendix D attached) Criteria: <input type="checkbox"/> Engineered Rigging Component <input type="checkbox"/> Lift on Tires (except fixed cab) <input type="checkbox"/> Planned Factored Load Weight >50t <input type="checkbox"/> Planned capacity utilization > 80% <input type="checkbox"/> Multi-crane lift <input type="checkbox"/> Sudden Load Transfer <input type="checkbox"/> Travelling with Load (except fixed cab) <input type="checkbox"/> Work Zone closer than MAD to an Overhead Power Line <input type="checkbox"/> Lift over occupied bldg.			
Units used: <input type="checkbox"/> Feet/Pounds/Tons <input type="checkbox"/> Meters/Metric Tonnes Load Weight determined by: <input type="checkbox"/> Drawing <input type="checkbox"/> Document <input type="checkbox"/> Name Plate <input type="checkbox"/> Calculation <input type="checkbox"/> Estimate (only if less than 2t) Load Weight verified by: <input type="checkbox"/> Scale <input type="checkbox"/> Load Cell <input type="checkbox"/> Unverified Planned Load Weight (no contingency): _____ Contingency: <input type="checkbox"/> 0%(weighed) <input type="checkbox"/> 10%(calculated/drawings) <input type="checkbox"/> 100% (Sudden Load Transfer) Contingency (weight): _____ Wt. of Residue (15% minimum if unknown): _____ Factored Load Weight: _____ Completed by (name): _____		Crane capacity basis: <input type="checkbox"/> 360° <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Tires <input type="checkbox"/> Pick & Carry Outriggers (or crawlers) at full extension?: <input type="checkbox"/> Yes <input type="checkbox"/> No If no, spread: _____ (dimensions) Mat sizing basis: <input type="checkbox"/> Site Standard <input type="checkbox"/> Calculation Dimensions: _____ Thickness: _____ Material: <input type="checkbox"/> Steel <input type="checkbox"/> Wood <input type="checkbox"/> Synthetic Known underground hazards mitigated <input type="checkbox"/> Confirmation of ground conditions by (name): _____ Counterweight: <input type="checkbox"/> Full <input type="checkbox"/> Reduced Counterweight amount(s): _____ Lifting with: <input type="checkbox"/> Main Boom <input type="checkbox"/> JIB/Boom Extension Jib/Boom Extension: <input type="checkbox"/> Retracted <input type="checkbox"/> Partial <input type="checkbox"/> Full Main boom length: _____ Configuration of boom telescopic sections: _____ Boom extension Length: _____ offset (degrees): _____ Required no. of parts of line: _____ Hook Block Capacity: _____ Safe access for connecting/disconnecting rigging by: <input type="checkbox"/> None <input type="checkbox"/> Ladder <input type="checkbox"/> Scaffold <input type="checkbox"/> Aerial Lift <input type="checkbox"/> Man basket Safe access for disconnecting the rigging by: <input type="checkbox"/> None <input type="checkbox"/> Ladder <input type="checkbox"/> Scaffold <input type="checkbox"/> Aerial Lift <input type="checkbox"/> Man basket Emergency Response Plan Required: <input type="checkbox"/> Yes <input type="checkbox"/> No Plan for stabilizing/securing Load prior to load transfer from Crane <input type="checkbox"/> Provisions for controlling the Load at start of lift: <input type="checkbox"/> Tagline(s) <input type="checkbox"/> Push-pole(s) <input type="checkbox"/> Hand <input type="checkbox"/> Neither Provisions for controlling the Load during final placement: <input type="checkbox"/> Tagline(s) <input type="checkbox"/> Push-pole(s) <input type="checkbox"/> Hand <input type="checkbox"/> Neither Primary signaling method: <input type="checkbox"/> Radio <input type="checkbox"/> Hand <input type="checkbox"/> Whistle <input type="checkbox"/> Verbal Backup method: <input type="checkbox"/> N/A <input type="checkbox"/> Radio <input type="checkbox"/> Hand <input type="checkbox"/> Whistle <input type="checkbox"/> Verbal Distance to nearest Overhead Power Lines: _____	
Main Block weight: _____ Aux. Block weight: _____ Aux. Sheave weight: _____ Stowed jib weight: _____ Erected jib weight: _____ Rigging weight: _____ Hoist line weight: _____ Total Lift Weight (including contingency): _____ Initial (pick) radius: _____ chart capacity: _____ Final (set) radius: _____ chart capacity: _____ Maximum radius: _____ chart capacity: _____ Max planned capacity utilization during lift: _____% Bystander Exclusion Zone barricade: <input type="checkbox"/> Physical <input type="checkbox"/> Human Overlaps with those for nearby Cranes: <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, a coordination plan in place to prevent collision: <input type="checkbox"/>		All of the above fields completed: <input type="checkbox"/> OR Equivalent information included in attachments: <input type="checkbox"/>	
CRANE VERIFICATIONS		LIFT DIRECTOR VERIFICATIONS	
Pre-use inspection completed: <input type="checkbox"/> LML bypass key not in Operator cab: <input type="checkbox"/> <u>360° slew with min. boom & min. radius (where possible):</u> Completed: <input type="checkbox"/> Yes <input type="checkbox"/> Not possible due to obstructions Counterweight clearance to obstructions sufficient: <input type="checkbox"/> Crane level, mats/ground condition satisfactory: <input type="checkbox"/> LML code entered: _____ <input type="checkbox"/> N/A LML code correct for current configuration: <input type="checkbox"/> <u>Dry Run (with empty hook)</u> Actual max radius: _____ LML capacity: _____ LML capacity @ max radius > planned Total Lift Weight: <input type="checkbox"/> LML capacity matches load chart capacity: <input type="checkbox"/> Boom clearance to obstructions sufficient: <input type="checkbox"/>		Lift Crew briefed on emergency response plan: <input type="checkbox"/> <input type="checkbox"/> N/A Maximum allowable wind speed: _____ <input type="checkbox"/> N/A Person monitoring wind speed: _____ <input type="checkbox"/> N/A <u>Exclusion Zones</u> Counterweight Crush Zone barricaded or marked: <input type="checkbox"/> Lift Crew and Lift-Related Personnel understand the locations of the Drop Zone(s) and Load Crush Zone(s): <input type="checkbox"/> Lift Crew members understand the circumstances they may enter the Drop Zone(s) or Load Crush Zone(s): <input type="checkbox"/> Lift Crew briefed on location of power lines: <input type="checkbox"/> <input type="checkbox"/> N/A Work Zone boundaries demarcated (for power lines): <input type="checkbox"/> <input type="checkbox"/> N/A <u>Rigging</u> Rigging arrangement will prevent Load from inverting: <input type="checkbox"/> Softeners or edge protectors ready to protect slings: <input type="checkbox"/> <input type="checkbox"/> N/A Appendix C attached (if Factored Load Weight > 2t): <input type="checkbox"/> <input type="checkbox"/> N/A	
All Highlighted fields discussed during pre-lift briefing <input type="checkbox"/> Led by: <input type="checkbox"/> Lift Director <input type="checkbox"/> Other (name): _____ Crane Operator _____ Signal Person _____ Signal Person _____ Rigger _____ Rigger _____ Spotter _____ Hazard Watch _____ Hazard Watch _____ Lift Director(1) _____ Date _____ Time _____ Lift Director(2) _____			
Actual Lift Weight from LML : _____ Crane capacity and Support adequate for actual Lift Weight: <input type="checkbox"/> Load confirmed stable: <input type="checkbox"/>			

Appendix C

RIGGING PLAN CHECKLIST (Mandatory for Loads > 2t)

To be used for simple 1, 2, 3 and 4 leg arrangements. For other arrangements, provide sketch and calculations on additional page(s) as required.

Lift location:	Unit:	Company:	Permit #:
<input type="checkbox"/> Single lift <input type="checkbox"/> Group of lifts	Lift description:		
Lift involves Sudden Load Transfer? <input type="checkbox"/> Yes <input type="checkbox"/> No Engineered Rigging Components* being used? <input type="checkbox"/> Yes <input type="checkbox"/> No *Except if exempted in T1BP If answered "Yes" to either questions above, lift classified as Complex, and rigging arrangement must be shown on a separate sheet and attached to this form			
		Rigging attachment points above CG or prevent Load from inverting <input type="checkbox"/> Load has adequate strength at rigging connection points <input type="checkbox"/> Load has adequate overall strength to be lifted? <input type="checkbox"/>	
Sling type: <input type="checkbox"/> Wire Rope <input type="checkbox"/> Synthetic <input type="checkbox"/> Chain block <input type="checkbox"/> Chain <input type="checkbox"/> Other _____ Number of legs: _____ Sling length: _____ Sling vertical capacity: _____ Connector Type: <input type="checkbox"/> shackle <input type="checkbox"/> link plate <input type="checkbox"/> turnbuckle <input type="checkbox"/> direct Connector Capacity: _____ Lifting attachment: <input type="checkbox"/> lug <input type="checkbox"/> eye bolt <input type="checkbox"/> trunnions <input type="checkbox"/> direct Capacity: _____ <input type="checkbox"/> Marked <input type="checkbox"/> Evaluated "L" = _____		Units: <input type="checkbox"/> Feet & Pounds <input type="checkbox"/> Meters & Metric Tonnes A: Factored Load Weight (including contingency + residuals) _____ B: # of Legs Factor: <input type="checkbox"/> 1 <input type="checkbox"/> 2 C: Hitch Factor: <input type="checkbox"/> 0.8 (choker) <input type="checkbox"/> 1.0 (vertical) <input type="checkbox"/> 1.6 (basket) D: Sling Factor: <input type="checkbox"/> 1.0 (vertical) <input type="checkbox"/> 1.2 (> 60°) <input type="checkbox"/> 1.5 (45° to 60°) Required Sling Capacity = $\frac{A \times D}{B \times C}$ = _____ Minimum Chain Block Capacity = Required Sling Capacity x 1.5 = _____ Actual Sling Capacity > Required Sling Capacity <input type="checkbox"/> Connector (e.g., shackle) Capacity > Required Sling Capacity <input type="checkbox"/> Lifting Attachment Capacity > Required Sling Capacity <input type="checkbox"/> Actual Chain Hoist Capacity > Required Capacity <input type="checkbox"/> Yes <input type="checkbox"/> N/A Comments: _____	

All of the above fields completed: <input type="checkbox"/> OR Equivalent information included in attachments: <input type="checkbox"/>	
VERIFICATION SECTION	
Edge protection used? <input type="checkbox"/> Yes <input type="checkbox"/> N/A Softeners used? <input type="checkbox"/> Yes <input type="checkbox"/> N/A Close Visual Inspection of rigging completed <input type="checkbox"/> Close Visual Inspection of lifting attachments completed <input type="checkbox"/>	Rigging components are compatible <input type="checkbox"/> Rigging in-line with lifting lug (i.e., not side loading) <input type="checkbox"/> Loose items secured? (or N/A) <input type="checkbox"/> Rigging marked/tagged with capacity <input type="checkbox"/> Periodic sling inspection (visual indicator) current <input type="checkbox"/> Comments: _____

Rigger Signature: _____ Date: ____/____/____

Appendix D

COMPLEX LIFT PLAN CHECKLIST

Lift location:	Unit:	Company:	Permit #:				
Item(s) to be lifted:	Lift Description:	Crane Make/Model/Capacity:					
C Crane Provider R Reviewer (3rd Party) X EM Mechanical L Lift Specialist P Prime Contractor N NDE Contractor M Mech. Contractor V Equipment Vendor Z Specialty Contractor T Transport Contractor D Lift Director LP Lift Planner O Owner's Engineer G Geotechnical Engineer S Site Lift Specialist E Engineering Contractor		Documents Required to Supplement Checklists	Obtain/Generate	Review	Approve	Completed * (initials)	Document Confirmed to be in the Lift Plan
Yes	No						
Design documents for <i>Engineered Rigging Components</i>		<input type="checkbox"/>	<input type="checkbox"/>				
<i>Proof Load Test</i> documents for <i>Engineered Rigging Components</i>		<input type="checkbox"/>	<input type="checkbox"/>				
Design documents for <i>Engineered Lifting Attachments (e.g., lugs)</i>		<input type="checkbox"/>	<input type="checkbox"/>				
Inspection records for <i>Engineered Lifting Attachments (e.g., lugs)</i>		<input type="checkbox"/>	<input type="checkbox"/>				
<i>Documentation</i> of adequacy of strength of Load during lift		<input type="checkbox"/>	<input type="checkbox"/>				
<i>Drawing of Load that shows location of center-of-gravity</i>		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Scaled and dimensioned lift plan drawing (plan view)		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Scaled and dimensioned lift plan drawing (elevation view)		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Applicable load chart (to confirm configuration and capacity)		<input type="checkbox"/>	<input type="checkbox"/>				
Ground load calculation documentation:							
crawler or outrigger loads		<input type="checkbox"/>	<input type="checkbox"/>				
mat area, mat drawing		<input type="checkbox"/>	<input type="checkbox"/>				
mat design/structural calculation		<input type="checkbox"/>	<input type="checkbox"/>				
location and detail of vulnerable underground hazards		<input type="checkbox"/>	<input type="checkbox"/>				
geotechnical reports or foundation design		<input type="checkbox"/>	<input type="checkbox"/>				
Detailed rigging calculations		<input type="checkbox"/>	<input type="checkbox"/>				
Detailed rigging arrangement drawing		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Documented plan or drawing for managing <i>Exclusion Zones</i>		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Environmental limits (other than wind speed) and monitoring plan		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Documented access plan for rigging/de-rigging		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Documented management of change procedure		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Documentation of acceptance criteria for lift completion		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Communication procedure		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Other Document:		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Other Document:		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Other Document:		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Other Document:		<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Comments: _____ Complex Lift Plan Checklist prepared by: _____ Date: _____ Site Lift Specialist Approval (of checklist): _____ Date: _____ Documents confirmed to be in the field by: _____ Date: _____							

* Initialing in this column signifies that the document has been reviewed (without exception) and approved in accordance with the checklist.

Appendix E

MOBILE CRANE MAN-BASKET CHECKLIST

Lift location:	Unit:	Company:	Permit No:
Safer WAH Alternative not Practicable: <input type="checkbox"/>		Crane Make/Model/Cap/Serial Number:	

PLANNING SECTION

<p>Units: <input type="checkbox"/> Feet/Pounds <input type="checkbox"/> Meters/Metric Tonnes</p> <p>Crane manufacturer approves lifting personnel: <input type="checkbox"/></p> <p>Not possible to activate freefall capability (or N/A): <input type="checkbox"/></p> <p>Planned number of occupants: _____</p> <p>Estimated weight of tools & materials: _____</p> <p>Total estimated payload weight: _____</p> <p>Nameplate weight capacity of the <i>Man-Basket</i>: _____</p> <p>Weight of <i>Man-Basket</i> + dedicated rigging: _____</p> <p>Main Block weight: _____</p> <p>Auxiliary Block weight: _____</p> <p>Auxiliary Sheave weight: _____</p> <p>Stowed boom extension/jib weight: _____</p> <p>Hoist line weight: _____</p> <p>Total Lift Weight (<i>Man-Basket</i> @ 100% capacity) _____</p> <p style="text-align: center;">Planned radius and capacity values:</p> <p>Maximum planned radius: _____</p> <p>Capacity at maximum planned radius: _____</p> <p>Capacity utilization at maximum planned radius: _____ (Note: Capacity utilization must not exceed 50%)</p> <p>Lifting with: <input type="checkbox"/> Main Boom <input type="checkbox"/> JIB/Boom</p> <p>Jib/Boom Extension: <input type="checkbox"/> Retracted <input type="checkbox"/> Partial <input type="checkbox"/> Full</p> <p>Main boom length: _____</p> <p>Configuration of telescopic sections: _____</p> <p>Boom extension Length: _____ Offset (degrees): _____</p> <p>Number of parts of line: _____</p> <p>Line Pull Capacity: _____</p>	<p>Crane capacity basis: <input type="checkbox"/> 360° <input type="checkbox"/> Over Front <input type="checkbox"/> Over Rear</p> <p>Outriggers (or crawlers) at full extension?: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no, spread: _____ (dimensions)</p> <p>Mat sizing basis: <input type="checkbox"/> Site standard <input type="checkbox"/> Calculation</p> <p>Mats area dimensions: _____ Mats thickness: _____</p> <p>Material of construction: <input type="checkbox"/> Steel <input type="checkbox"/> Wood <input type="checkbox"/> Synthetic</p> <p>Known underground hazards mitigated <input type="checkbox"/></p> <p>Confirmation of ground conditions by (name): _____</p> <p>Counterweight <input type="checkbox"/> Full <input type="checkbox"/> Reduced</p> <p style="padding-left: 40px;">Counterweight amount(s): _____</p> <p style="text-align: center;">Basket Inspection:</p> <p>Suspension Rigging: <input type="checkbox"/> permanently attached <input type="checkbox"/> new</p> <p>Name plate capacity matches planning basis <input type="checkbox"/></p> <p>Visual inspection revealed no cracks or deformation <input type="checkbox"/></p> <p>All shackle pins secured by split pin or other means <input type="checkbox"/></p> <p>Overhead protection required? <input type="checkbox"/> Yes <input type="checkbox"/> No In place <input type="checkbox"/></p> <p>Solid toe board in place <input type="checkbox"/></p> <p>Sidewall openings below midrail < ½" (12mm) <input type="checkbox"/></p> <p>Internal grab rail except at openings <input type="checkbox"/></p> <p>Gates/doors open inwards only and close securely <input type="checkbox"/></p> <p>Hook block safety latch positively locked or moused <input type="checkbox"/></p> <p>Inspected by: _____ Date: _____</p> <p>Provisions for controlling <i>Man-Basket</i>: <input type="checkbox"/> Tagline(s) <input type="checkbox"/> Push-pole(s)</p> <p><i>Bystander Exclusion Zone</i> barricade: <input type="checkbox"/> Physical <input type="checkbox"/> Human</p> <p style="padding-left: 40px;">Overlaps with those for nearby <i>Cranes</i>: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p style="padding-left: 40px;">If yes, a coordination plan in place to prevent collision: <input type="checkbox"/></p> <p>Distance to nearest <i>Overhead Power Line</i>: _____</p>
--	---

CRANE VERIFICATIONS

Pre-use inspection completed:

Not possible to activate freefall capability:

LML bypass key not in *Operator* cab:

360° slew with min boom & radius (where possible)

Completed: Not possible (due to obstructions)

Counterweight clearance to obstructions sufficient:

Crane level, mats/ground condition satisfactory:

Crane level, mats/ground condition satisfactory:

Counterweight Crush Zone barricaded or marked:

LML code entered: _____

LML code correct for current configuration:

Trial Lift

Proof Load Weight for trial lift (125% of capacity): _____

Basket inspection satisfactory following trial lift:

Dry Run (with proof load in basket) thru perimeter of work area

Actual Max radius: _____ LML capacity: _____

LML capacity @ max radius at least 2x *Total Lift Weight*
 with *Man-Basket* loaded to 100% capacity

LML capacity matches load chart capacity:

Boom & *Man-Basket* clearances to obstructions sufficient:

LIFT DIRECTOR VERIFICATIONS

Exclusion Zones:

Counterweight Crush Zone barricaded or marked

Lift Crew and *Lift-Related Personnel* know the locations of the *Drop Zone(s)* and *Load Crush Zone(s)*:

Lift Crew members know the circumstances they may enter the *Drop Zone(s)* or *Load Crush Zone(s)*:

Lift Crew briefed on location of power lines: N/A

Work Zone boundaries demarcated: N/A

Miscellaneous:

Maximum allowable wind speed limit: _____

Person monitoring wind speed: _____ N/A

Weather forecast acceptable for duration of work:

Work Zone boundaries demarcated: Yes N/A

Signal Person has radio and will occupy man-basket

Backup method: Hand Whistle Verbal

Wt. of occupants + tools < *Man-Basket* rated capacity:

Rescue: Plan in place, or Have Emergency Lowering System

Fall arrest equipment available for occupants:

Lift Crew briefed on emergency response plan: N/A

All **Highlighted** fields discussed during pre-lift briefing Led by: *Lift Director* Other (name): _____

Operator: _____ Signal Person: _____ Rigger: _____

Spotter: _____ Hazard Watch: _____ Occupant: _____

Occupant: _____ Occupant: _____ Occupant: _____

Lift Director(1): _____ Date _____ Time: _____ *Lift Director*(2): _____

Appendix F

Lifting Near Overhead Power Lines Checklist

Required if any part of the *Work Zone* is closer than 20' (6m) to an *Overhead Power Line*

Lift location:	Unit:	Company:	Permit #:
<input type="checkbox"/> Single Lift <input type="checkbox"/> Group of lifts	Lift description:	Crane Make/Model/Cap:	

SECTION 1: Work Zone and Work Schedule (to be completed by lift crew):

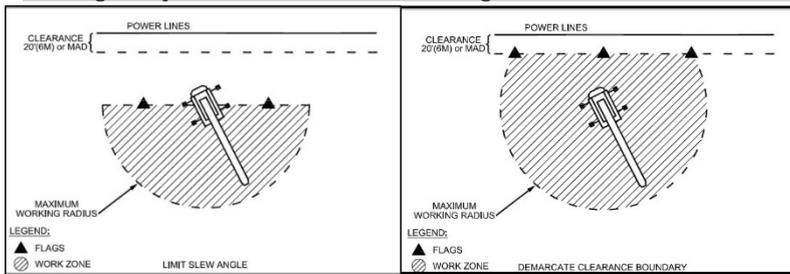
- 1) Shortest distance (measured horizontally) from the *Work Zone* to an *Overhead Power Line*: _____
- 2) Scheduled Start Date & Time: _____ Schedule Completion Date & Time: _____

SECTION 2: Power Line Information (to be completed by an authorized representative of the electrical asset owner/operator):

- 3) Power line voltage: _____ N/A (confirmed deenergized & visibly grounded, or insulated)
- 4) **Minimum Approach Distance (MAD)** based on voltage: _____ N/A (confirmed deenergized & grounded or insulated)
- 5) **Additional requirements/information:** _____
- 6) Authorized representative (Print): _____ (Signature): _____ Date _____
- 7) Skip to SECTION 7 if power line deenergized & visibly grounded, or insulated
- 8) Is any part of the *Work Zone* closer than the *MAD* to the power line? Yes No *If "Yes", skip to SECTION 4*

SECTION 3: Method of Work Zone Demarcation to Prevent Encroaching MAD (to be completed by *Lift Crew*):

- Lifting Away from Power Line
 Lifting Toward Power Line
 Working in a corner



Skip to SECTION 7

SECTION 4: Work Zone Closer than MAD to Power Line (to be completed by *Lift Crew*):

- 9) Complex Lift Plan Checklist completed
- 10) Is any part of *Crane* or *Load* planned to be closer than the *MAD* to the power line? Yes No *If "No", skip to line 21*

SECTION 5: Lifting Inside MAD (to be completed by an authorized representative of the electrical asset owner/operator):

- 11) Circuit interrupter automatic reclosing feature disabled? Yes N/A (doesn't have feature, or design doesn't permit disabling)
- 12) Insulating hose or cover-up applied to exposed conductors
- 13) Authorized representative (Print): _____ (Signature): _____ Date _____

SECTION 6: Lifting Inside MAD (to be completed by *Lift Crew*):

- 16) *Minimum Clearance Distance* _____ *Qualified Person* that determined distance (Print Name): _____
- 17) Elevated Warning Line provided for *Operator*
- 18) Insulating link installed between hook and *Load*
- 19) Voltage-rated gloves provided to workers that may contact the *Load* when it is closer than the *MAD* to the power line
- 20) Barricade erected at least 10' (3m) around perimeter of *Crane* Yes As far from the *Crane* as feasible (if obstacles prevent 10')
- 21) *Spotter* (Print Name) _____ Visual Aid provided for *Spotter* to identify clearance Horn/Claxon for *Spotter*
- 22) Range limiting feature of *LML* used to prevent breaching *Minimum Clearance Distance*
- 23) *Operator* familiar with manufacturer's procedure for use of *LML* range limiting feature
- 24) *Crane* grounded
- 25) Slings are non-conductive Yes Not Being Used
- 26) Tag lines are non-conductive Yes Not Being Used

SECTION 7: All Highlighted fields discussed during pre-lift briefing Led by: *Lift Director* Other (name): _____

- 14) Briefing led by (print): _____ Date & Time: _____
- 15) Signatures: Utility Owner/Operator Rep: _____ *Lift Director*(1): _____
Operator _____ *Spotter* _____ *Signal Person* _____
Rigger _____ *Rigger* _____ *Rigger* _____
Hazard Watch _____ Other Worker _____ Other Worker _____
 Comments: _____ *Lift Director*(2): _____

Appendix G

Manual Hoisting & Shifting Checklist (for hoisting Loads > 0.5t, or shifting members beyond fit-up position)

Unit:	Lift Location:	Description of Load(s):
<input type="checkbox"/> Single lift (or shift) <input type="checkbox"/> Group of lifts		
SECTION 1: LOAD WEIGHT (all applicable boxes must be checked)		
<input type="checkbox"/> Shifting only (i.e., Load will not be suspended) If yes, skip to SECTION 2 Load weight obtained from: <input type="checkbox"/> Scale <input type="checkbox"/> Drawing / Data Sheet <input type="checkbox"/> Name Plate <input type="checkbox"/> Calculation <input type="checkbox"/> Estimate (up to 2t) <input type="checkbox"/> Lift Plan Checklist A: Load Weight (heaviest if group of lifts): _____ B: Contingency (wt.): _____ <input type="checkbox"/> 0% (weighed) <input type="checkbox"/> 10% (not weighed) C: Process Residual Weight: _____ <input type="checkbox"/> N/A <input type="checkbox"/> Calculated <input type="checkbox"/> Estimated _____ % (minimum of 15%) D: Factored Load Weight (A+B+C): _____		
SECTION 2: SUPPORT STRUCTURE & ANCHOR POINT (all applicable boxes must be checked)		
Type of hoist(s): <input type="checkbox"/> Chain Hoist <input type="checkbox"/> Lever Hoist <input type="checkbox"/> Other _____		Type of anchor point: <input type="checkbox"/> Sling <input type="checkbox"/> Beam Clamp <input type="checkbox"/> Other _____
Capacity of weakest hoist: _____ <input type="checkbox"/> > Factored Load Weight (or calculated max force)		Lowest rated anchor point capacity (including reduction factors): _____
Type of support structure: <input type="checkbox"/> Beam <input type="checkbox"/> Pipe <input type="checkbox"/> Other _____		<input type="checkbox"/> Safe access for connecting/disconnecting to anchor point and to Load
SECTION 3: ADDITIONAL PLANNING REQUIREMENTS (all applicable boxes must be checked)		
<input type="checkbox"/> Factored Load Weight > 2t		<input type="checkbox"/> N/A <input type="checkbox"/> Appendix C attached
<input type="checkbox"/> More than one hoist/support used simultaneously to support the Load		<input type="checkbox"/> N/A <input type="checkbox"/> JLA/JSA attached and anchor point(s) rated for non-vertical loads
<input type="checkbox"/> Factored Load Weight > 3t, or Support Structure is cantilever		<input type="checkbox"/> N/A <input type="checkbox"/> Engineering approval to use Support Structure (if not designed for a hoist)
<input type="checkbox"/> CG uncertain or potential for Load to tilt or invert		<input type="checkbox"/> N/A <input type="checkbox"/> Rigging configured or constraints added to ensure stability of the Load
<input type="checkbox"/> In-service piping used as Support Structure		<input type="checkbox"/> N/A <input type="checkbox"/> Equipment owner approval
<input type="checkbox"/> Cast iron valve* in Support Structure or in pipe shifted beyond fit-up position <small>* Commonly used in water service, and usually have flat-faced flanges</small>		<input type="checkbox"/> N/A <input type="checkbox"/> Engineering approval obtained
SECTION 4: FIELD VERIFICATION CHECKS (all boxes must be checked)		
<input type="checkbox"/> Bystander Exclusion Zone established (or N/A)		<input type="checkbox"/> Rigging (including anchor point) pre-use inspection completed
<input type="checkbox"/> Drop Zone & Load Crush Zone(s) defined, and crew understands circumstance for entry (or N/A)		<input type="checkbox"/> Pawl functioning properly ("clicking" when hoisting up) or N/A
<input type="checkbox"/> Observer assigned to monitor deflection of Support Structure (or N/A)		<input type="checkbox"/> Sling softeners/edge protectors used correctly (or N/A)
All Highlighted fields discussed during pre-lift briefing <input type="checkbox"/> Led by: <input type="checkbox"/> Lift Director <input type="checkbox"/> Other (name): _____		
1) _____ 2) _____	3) _____	4) _____
5) _____ 6) _____	7) _____	8) _____
Lift Director(1): _____	Date _____	Time _____ Lift Director(2) _____
<input type="checkbox"/> Brake test completed, i.e., brake holds after hoisting up and after lowering the Load (or N/A)		<input type="checkbox"/> Stability Check Performed (or N/A)