



LIFTING OPERATIONS CRANE(S) MAINTENANCE SYSTEM

IRF (International Regulators Forum) – Maintenance of lifting equipment
 (Templates MAINT1 to 4 only, Template MAINT5 included in LIFTING EQUIPMENT MANAGEMENT PROMPT SHEET)

OPERATOR:
FACILITY / LOCATION:
INSPECTION DATE:

No	Prompt	Remarks	Comments /Status				
1	Maintenance Strategy and Policy		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Tick one (✓)
	IRF MAINT 1 (Strategy for crane maintenance)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tick one (✓)



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No	Prompt	Remarks	Comments /Status
1.1	Does the operator have a written Maintenance Policy?	For example: <ul style="list-style-type: none">• Are the size and nature of assets/equipment to be maintained clearly defined (including cranes)?• Are regulations and standards (both internal and external identified)?• Is the methodology of the maintenance system defined (Planned, Predictive, Corrective)?• Is maintenance risk based?• Are safety critical, essential and non-essential items clearly defined and appropriately addressed?	



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1.2	Is there a crane (lifting equipment) maintenance Policy?	<ul style="list-style-type: none">• Is the policy linked to the Maintenance Policy for the facility?• What are its boundaries/scope?• Are regulations and standards defined?• Are objectives and performance standards/indicators defined for condition, functionality and operability/availability of cranes.• Is maintenance conducted internally or by third parties?	



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1.3	Is there a crane maintenance strategy/plan?	<p>Inspect a copy of the maintenance strategy. There should be clear description derived from the policy of how the crane maintenance system will be:</p> <ul style="list-style-type: none">• Structured• Developed• Implemented• Administered (incl. monitored)• Audited, reviewed and improved <p>Discuss, if available, outcomes of any Failure Mode and Effects Analysis (FMEA) or Failure Mode, Effects and Criticality Analysis (FMECA) and how they influenced the maintenance strategy, work orders etc.</p> <p>There should be an independent body involved in/selected for crane inspections.</p>	<p>IRF MAINT 1</p>



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1.4	What is the rationale behind the crane(s) maintenance strategy?	<p>Interview the independent crane inspection body (third party)</p> <ul style="list-style-type: none">• Have they (or/and crane manufacturer) been consulted in the development of the inspection/maintenance strategy?• Does the maintenance strategy take into account:<ul style="list-style-type: none">- Crane duty (light or heavy)- Crane usage (e.g. frequency, no of hours)- Operational experience- Maintenance history- The consequence of failure?	<div data-bbox="1151 373 1406 421" style="border: 1px solid black; background-color: #cccccc; padding: 2px;">IRF MAINT 1</div>



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2	Responsibilities and Authority		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Tick one (✓)
	IRF MAINT 4 (Thorough examination and expert verification)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tick one (✓)
2.1	Are responsibilities and authority (including reporting lines) defined?	<ul style="list-style-type: none"> What is the structure (organogram) of the crane maintenance group? Which departments are involved? What are their responsibilities? Who has the overall responsibility for the crane maintenance system? Etc. Who has the authority to defer inspection, maintenance work etc.? 					



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2.2	Are there arrangements in place for thorough examination/expert verification of cranes?	<ul style="list-style-type: none">• What factors influenced the operator's assessment and selection of the independent third party responsible for thorough examination /verification of cranes?• Interview an independent (inspection) body to verify the arrangements?• Is there a system for scheduling/managing independent inspections?	<div style="border: 1px solid black; background-color: #cccccc; padding: 5px; display: inline-block;">IRF MAINT 4</div>



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No	Prompt	Remarks	Comments /Status
2.3	Are recommendations made by an independent body/inspector addressed/closed out?	<ul style="list-style-type: none">Request copies of recent independent inspection report to verify close outsAre findings from these inspections fed back into the maintenance system as appropriate?	IRF MAINT 4



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3	Maintenance system scope		<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
3.1	What elements are covered by the crane maintenance system?	<ul style="list-style-type: none"> • Is there a list of equipment (cranes) covered by the system? • Was the maintenance system designed with performance standards, manufacturer's recommendations etc. in mind? • Has the criticality of various cranes been determined/assigned? • Are internal and external parties for performing maintenance tasks identified? • What are the documentary and hardware/software systems? • How alterations are managed (under management of change)? 	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>



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3.2	How are the maintenance system functions organized?	Does the system cover(where applicable) <ul style="list-style-type: none">• Software/database administration• Data input (security, authorization?)• Issuance of maintenance tasks• Hard copy filing/archiving• Maintenance amendments/cancellation• Backlog management?	
3.3	How is the crane maintenance budget determined?	<ul style="list-style-type: none">• Are crane maintenance budget processes/criteria clearly defined?• Are budget/resources committed to maintenance adequate?	



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4	Maintenance schedule		<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Tick one (✓)
4.1	How scheduling of crane maintenance activities/tasks is done (etc.)?	<ul style="list-style-type: none"> Who, what, when? Is the crane criticality a factor? Are there provisions for scheduled and unscheduled crane maintenance within the system? How decisions are made deferring crane maintenance? Is RCM (Reliability Centered Maintenance) applied? (ie. concentrating on areas of most concern/frequent failures). 	



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4.2	<p>What are the bases for determining the extent and frequency of maintenance tasks?</p> <p>Is this consistent with the maintenance policies?</p>	<p>Is it based on:</p> <ul style="list-style-type: none"> • Calendar (time) • Operating hours • Duty cycle • Condition monitoring • Campaign shut downs • Reactive maintenance (repairs) <p>And linked to:</p> <ul style="list-style-type: none"> • Past (and or in house) experience • Manufacturer's recommendations • Regulatory requirements • Standards, codes and/or guidelines <p>or combination of the above?</p>	
5	Documentation (management)		<input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> Tick one (√)
5.1	How is the manufacturer's documentation managed (retained, distributed etc)?	<ul style="list-style-type: none"> • Is the full spectrum of the manufacturer's documentation captured (operations and maintenance manuals, catalogues, instructions, alerts etc.) • Who gets it/keeps it? • How updates revisions are managed? 	



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5.2	How documentation is managed (issued, updated etc)?	Is there a process for managing: <ul style="list-style-type: none"> • Manuals • Drawings and diagrams, • Work instructions, maintenance routines etc? 	
5.3	Is there a system for taking in to account/managing crane specific alerts, manufacturer's warnings, and equipment recalls etc?		
5.4	How certification of cranes (incl. PSVs) is managed?	<ul style="list-style-type: none"> • Who does it? • What are the requirements for certifying/inspecting bodies? • How often are cranes certified? • What documents/certs are generated? • How are they stored? 	
5.5	How changes resulting from maintenance activities are managed?	<ul style="list-style-type: none"> • Is there a change management system in place? 	
5.6	Are there provisions for analysing maintenance workload (including measuring the effectiveness of the maintenance system)?	E.g. <ul style="list-style-type: none"> • What is the ratio between planned maintenance and ad hock repairs? • How are failures to meet the performance standards addressed? 	



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6	Personnel competency and training		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Tick one (✓)
6.1	Is there a system for ensuring competency of maintenance personnel?	What training, assessment of competency and experience is required for: <ul style="list-style-type: none"> • Maintenance planners • Maintenance supervisors and mechanics, • Crane inspectors? 				
6.2	Are there provisions for providing maintenance personnel with specialist training?	For example: <ul style="list-style-type: none"> • Have mechanics received any specific equipment maintenance training from the manufacturer? 				
7	System monitoring, auditing and review		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Tick one (✓)
7.1	What provisions exist to analyse crane maintenance workload?	<ul style="list-style-type: none"> • How do they define backlog? • What are the criteria for managing work backlog (what constitutes acceptable/unacceptable backlog)? 				
7.2	Is there a system for analysing failure trends etc?	<ul style="list-style-type: none"> • Are maintenance records detailed enough? • How is the past maintenance history used? • Who analyses failures (trends)? 				



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7.3	Are there arrangements in place for ongoing monitoring of the equipment (maintenance system) performance?		
7.4	Is the crane maintenance system regularly audited (by an independent party)?	<ul style="list-style-type: none"> Is auditing of the crane maintenance system part of the facility audit program? 	
7.5	Is the crane maintenance system regularly reviewed with a view of making improvements?	<ul style="list-style-type: none"> At what frequency? By whom? 	
7.6	Have recommendation from last crane maintenance been addressed (closed out)?	Ask for and a copy of the last crane maintenance audit report.	
8	Management of change		<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Tick one (✓)
8.1	How are changes to the crane maintenance system controlled?	<ul style="list-style-type: none"> Are parameters for minor and major changes clearly defined? What controls apply (who has the authority) to make minor changes? How major changes are managed (e.g. through management of change)? 	
8.2	Are changes to maintenance routines controlled?		



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8.2	What provisions exist for amendment, postponement or cancellation of work (work orders)?	<ul style="list-style-type: none"> Who, when, how can do that? How are those changes captured, controlled, managed? 	
9	Management of maintenance activities		<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Tick one (✓)
	IRF MAINT 3 (Maintenance activities)		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Tick one (✓)
9.1	What controls exist to ensure that work orders have been completed/properly executed?	<p>What controls are in place to ensure that the actual task/work:</p> <ul style="list-style-type: none"> Has been carried out? Has been correctly recorded/entered in the system? <p>Are there provisions for independent checks, inspection, tests?</p>	
9.2	Are spare parts resourced from reputable/acceptable sources?	<ul style="list-style-type: none"> What arrangements are in place to ensure that spare parts suppliers are not changed without going through a proper change management process? What controls are in place to prevent/control the use of non-original parts? 	



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9.3	Is there a system for prioritising maintenance tasks?	<ul style="list-style-type: none"> See item 7.1 above Is criticality of crane components/maintenance tasks addressed and consistent with the manufacturer's recommendations? – See item 4.1 above. When defects/abnormalities are identified, who decides if they are significant (Is independent crane inspection body consulted)? 	IRF MAINT 3
9.4	How decisions are made to justify deferring crane maintenance?	<ul style="list-style-type: none"> See also item 3.2 above 	IRF MAINT 3
	How level of corrective maintenance activities compares against planned maintenance activities?	<ul style="list-style-type: none"> Is the trend upward or downward? Is this one of the maintenance system performance indicators? (see item 1.2 above) Explore reasons for the backlog of the safety criticality of delayed items. 	IRF MAINT 3
IRF MAINT 2 (Pre-use checks & in-service inspections)			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
			Tick one (✓)



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9.4	Is there a system for daily/weekly crane checks	Claus 727- PSLA Schedule requires logbooks that specify daily and weekly checks by crane drivers, comments, close outs for minor repair work etc.	IRF MAINT 2
9.5	Do safety devices operate correctly on the (sampled) crane?	<p>Witness the crane operator carrying out pre-use or daily check.</p> <p>Request a demonstration of a sample of the crane safety devices such as upper hoist limits, upper boom travel limits, slew limits.</p> <p>Does the safe load indicator indicate a change in load radius when the boom is lowered or raised?</p>	IRF MAINT 2



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9.5	Are work requests and repairs needed resulting from daily/weekly checks captured and closed out?	<p>Inspect a sample of previous check/inspection sheets to identify if there are persistent faults or defects not attended to.</p> <p>Determine how defects are assessed for their significance:</p> <ul style="list-style-type: none"> How is this information reviewed and fed back into the maintenance system? 	<div style="border: 1px solid gray; padding: 2px; display: inline-block;">IRF MAINT 2</div>
10	Risk management (of maintenance activities)		<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Tick one (✓)
10.1	Is there a system for the identification of hazards and assessment/control of risks associated with maintenance work?	<ul style="list-style-type: none"> How is this done (do they use JSAs, PTWs)? Have engineering solutions been implemented to address (eliminate) high-risk jobs (incl. routine and regular jobs – e.g. access to jibs and booms)? Do they have a register of regular maintenance jobs, associated hazards and risk controls? What are the highest risk maintenance tasks/jobs – how are they managed? 	



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Legend:

- non compliance (major failing)
 - partially complies (incomplete system)
 - complies
 - not evaluated

Notes:

1. Scores should be entered in both NOPSA (round) and IRF (square) traffic lights.
2. When allocating traffic light scores for IRF elements only the IRF element marked questions e.g. IRF MAINT 2 should be considered. All questions in each section - including IRF marked - should be considered when allocating NOPSA traffic light scores.
3. In the "Comments/Status" column the following information should be entered, where appropriate:
 - Description of non-compliance(s)
 - Any general or specific comments relating to identified compliance and non-compliance issues
 - Action taken by the OHS inspector
 - Description of identified good practice(s).
4. The Schedule of Specific Requirements as to Offshore Petroleum Exploration and Production 1996 (PSLA Schedule), Part 7- Cranes, applies to Western Australian designated and inland waters (also known as State Waters).

(Please send the completed prompt sheets to T3 EA with 3 good practices and 3 practices with deficiencies/major failures)

INSPECTION CARRIED OUT BY

Name:

Signature:.....