Safety Clicks

Learning from others' mistakes

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Cranes & Winches – More than Just the SWL

By Shannon Smith

When auditors look at winches and cranes, they are usually focused on the Safe Working Load (SWL) markings, load charts and paperwork– are the lift certificates current? Is the load cell certification current? Have the Pre-Use checklists for the crane been filled out? Any issues reported to maintenance and addressed? These are all important things to check, but by themselves, they don't create a safe work environment.

Everyone knows that "checking the boxes" doesn't make work safe. Properly completed paperwork is just evidence of a safety culture– not the source of it.

The safety attitude of people who use the equipment is the strongest line of defense against lifting accidents. That is where your safety culture lives– in the people who do the work. A crane and winch operator may be highly skilled; he conducts the inspections, notices maintenance issues and even works with the Chief Engineer to resolve them. But if he doesn't document anything, it shows disrespect to the next operator, engineer and deck team. How will they know what the maintenance issues are and what to keep an eye on?

The Winch/ Crane Operator is also the Deck Boss. He must lead by example and demonstrate by his own actions that the safe way is the only way to do things. On the flip side, crane and winch safety isn't just his responsibility. The engineering team has to ensure winches and cranes are maintained so they are safe to operate. Deckmen must report anything that may affect winch and crane safety to the Deck Boss, and ALL employees must exercise the right to **STOP WORK** if they observe unsafe conditions or behaviors.

In the following story, **a simple 6 foot lift resulted in a catastrophic crane failure** and hospitalization with surgery and a long recovery for the operator. It's easy to see the contributing factors in hindsight. Which of those factors could apply to our crane operations today?

Does the crew feel comfortable reporting issues to their supervisors? Are supervisors creating a positive work environment and looking out for the safety of their workers? Would YOU be willing to **STOP WORK** if you saw something dangerous?

Checklists are designed to remind you of little details that are easily missed in a dynamic work environment, where you are often interrupted or distracted by normal work activity.

TDI Policies and Procedures for **Crane and Winch Operations** are found in the Safety Management Manual in **SOP-GEN-007X .**

Crane Failure and Injury on the *Gate Dancer* In the Gulf of Mexico

The Job: The Tidewater vessel *Gate Dancer* was hired to offload snubbing pipe from a production platform operated by Burlington.

TOP Safety Card Hits

Safety Attitude	**7**
Procedures	**6**
Maintain/ Inspections	**4**

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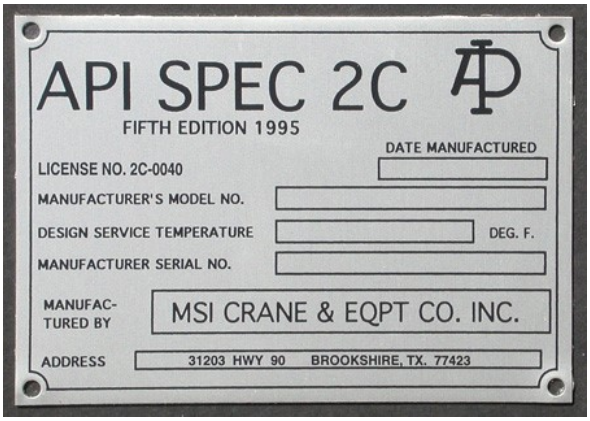
The Crane: Burlington has made no attempt to identify the manufacturer of the crane and the investigating panel was unsuccessful in making a positive identification of the manufacturer or model of the crane involved in the incident. Although the crane manufacture date is unknown, the crane was installed in 1977. The crane had passed its annual inspection in January 2000, two months before the incident. Four days before the incident, the crane was inspected and the main hoist cable changed out by another company. A load chart had been generated for the crane, but was incorrect for the type of reeving that was on the crane. Records indicate that Burlington had tried to operate the crane outside the designed working limits and safe working load at least twice before.



Crane identification plate (sample)

The Supervisor: The on site supervisor was a contractor representing Burlington and has several years' experience. He was responsible for all on site activities and the safety of all personnel at the site, which had six contractors involved. He had the required training for crane operations. However, he was also the designated Incident Commander for all emergencies and had not had any mandatory incident commander training (24 hour class and 8 hr refresher). The Supervisor claimed to have over 2,000 hours of supervisory training, but could not provide any documentation. Burlington had received several complaints about the supervisor and personnel interviews revealed he created a stressful work environment. He did not explain their roles or duties to either of the Crane Operators when they arrived per Burlington's HSE Safety Handbook.

The Crane Operators: The Day Crane Operator was the senior operator for the operation, had 33 years of experience and had been with the company for a year. The Night Crane Operator had less than one year of experience operating a crane. Neither Operator was aware that the company had a Pre-Use Hydraulic Crane Preventative Maintenance Program. Both said they conducted daily pre-use inspections, but could not provide any documentation. Both advised the Supervisor on several occasions of the poor performance of the crane.

Tank to be repositioned

Sequence of events: During the shift change Toolbox meeting, the Night and Day Crane Operators discussed the need to move the tank in order to offload pipe. They discussed the weight of the tank and the crane boom angle.

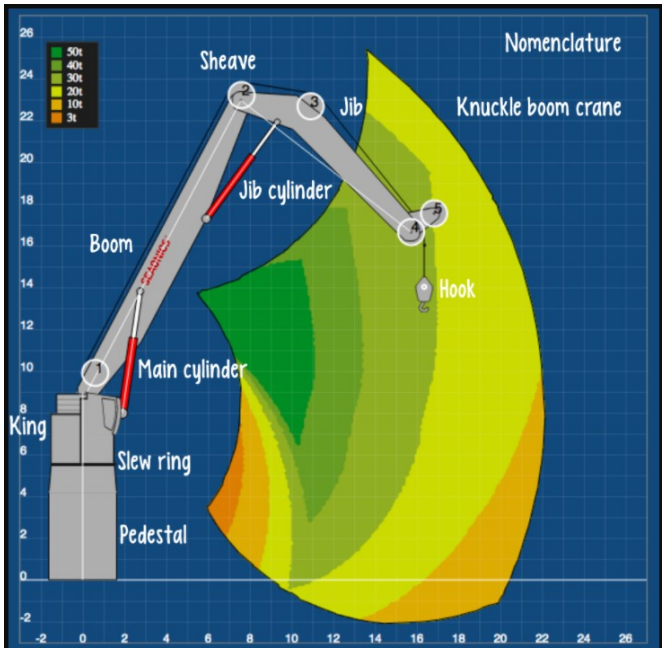
The Night Crane Operator started offloading pipe to the deck and rearranged other cargo to accommodate more pipe. The Crane Operator radioed the Master to reposition the vessel for the lift. The Master tried to move the vessel into the new position, but told the Crane Operator he was having trouble due to current and wind conditions.

The Supervisor overheard the discussion and told the Master if he couldn't hold a position the Supervisor would find someone who could. The Master advised the Supervisor he was only trying to assist the Crane Operator. Supervisor then told the Crane Operator to stop moving cargo around and keep offloading pipe.

The Master moved the vessel to its original position, then a little closer to the platform. Crane Operator advised the Master the vessel was too close to the platform and he couldn't see the tank from the crane operator's station, so the Master moved the vessel a little away. The Crane Operator advised the Master he was going to lift the tank and rotate it 90 degrees to make more room for the pipe and asked the Master to advise the riggers.

The Crane Operator lowered the boom angle to near zero degrees and lowered the block in preparation to pick up the tank. He was unaware that the hydraulic unloading system on that crane cannot function at angles of less than four degrees. The riggers attached slings to the tank and signaled the Crane Operator to pick up the tank. The Crane Operator raised the crane about 6 feet off the deck. At that point the ball ring on the crane snapped in four places and the crane and operator fell to the deck.

The riggers moved the Crane Operator away from the wreckage to safety. The crane fell over the side of the vessel and was hanging from the rigging. The crane Operator was evacuated by helicopter to the nearest hospital for surgery. The next day the crew had to use a torch to cut the load line from the crane and let the crane sink to the seafloor, where it was later retrieved for investigation.



Common Causes of Crane Failures

Brookes Bell's crane experts have investigated thousands of crane failures across the world and identified a number of commonalities between incidents across the global shipping industry. Among the most common are:

1. Wire Failures (most common cause of crane accidents)

On a ship's crane, wires can fail due to being overloaded, fatigued, having a pre-existing defect, or suffering from deterioration. This type of incident can cause serious damage, with cargo being dropped unexpectedly from height.

2. Slew Bearings

If slew bearings are not properly specified for their required use, monitored correctly, and looked after in service, then over a period of time, their failure can be catastrophic; ultimately resulting in the whole crane toppling over, with serious human and financial implications.

3. Sheaves

Sheaves must have their bearings greased on a regular basis. Remote greasing systems may fall into disrepair, meaning it becomes necessary to grease the bearings locally, often involving the use of rigging to climb up a crane and gain access to the area. Once the maintenance becomes more difficult and time consuming, it is more likely to be neglected, increasing the chance of failure. Sheave issues are likely to promote abnormal and accelerated wire wear.

4. Mishandling

Mishandling a crane or swinging its load can cause damage including major structural collapse, with serious implications in worst-case scenarios.

5. Maintenance misconceptions

Manufacturers can describe a number of key crane components as 'maintenance free'. However, crane failures have been caused by such components. Individuals have interpreted manufacturer's guidelines and assumed that certain crane components do not require any maintenance over their entire lifecycle when they do still require periodic overhaul.

Underlying issues

The most common causes of crane failure are avoidable. So why do incidents still occur?
Cranes are often not given the priority that they deserve as highly complex pieces of machinery. Unlike a vessel's main engine, which must be kept in full working order for the vessel to perform its role, a crane is only required when loading or unloading cargo. Although cranes are not at use during a vessel's voyage, their ropes and other elements are still subject to degradation caused by the marine environment, which can eventually lead to failure.

Furthermore, owners' and operators' efforts to reduce costs in the current financial climate can negatively impact maintenance and pro-active periodic overhaul of critical machinery items. **However, it is in the owners' and operators' best financial interests to mitigate the risk of crane failures.**

CRANE SAFETY WORD LIST

BALL RING
SHEAVES
BOOM
JIB
SLEW RING
PEDESTAL
HOOK
INSPECTION
OPERATOR
LOAD CHART
WIRE ROPE
SAFE WORKING LOAD
STOP WORK
HAND SIGNALS
CONTROLS
RAMS
HYDRAULIC FLUID
LOAD TEST
SAFETY ATTITUDE

N	O	S	D	E	H	E	T	G	J	B	F	Q	G	A
O	Z	L	A	R	O	D	R	H	H	G	C	T	S	L
I	M	E	O	Q	O	U	A	Y	A	B	R	G	J	X
T	L	W	L	Y	K	T	H	D	N	A	C	E	G	E
C	O	R	G	D	G	I	C	R	D	L	I	P	L	S
E	A	I	N	U	L	T	D	A	S	L	C	O	O	T
P	D	N	I	T	A	T	A	U	I	R	O	R	P	O
S	T	G	K	S	T	A	O	L	G	I	N	E	E	P
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G	G	Z	E	V	E	F	A	L	S	J	L	N	O	K
F	H	U	F	E	P	A	R	U	J	I	S	W	R	G
I	U	G	A	S	G	S	W	I	Y	B	X	F	X	S
M	J	X	S	P	V	Y	A	D	E	B	O	O	M	G