



SAFETY ALERT

Overturn of a Freestanding Mobile Double Service Rig

Safety Alert: #06 - 2010	Release Date: May 20, 2010
Incident Type: Fatality	Country of Origin: Western Canada

Description of Incident:

- On December 10th, 2009, a freestanding mobile double service rig was erected with the catwalk in the incorrect position preventing the drillers side tubing board guy wire from being secured
- The off drillers side tubing guy wire could not be tightened to required tension.
- The Rig commenced work in an unstable environment.
- On December 14th, 2009, 113 stands of 3.5" tubing were evenly racked; 15 stands of 4.75" Drill Collars, 10 stands racked on the drillers side and 5 stands racked on the off-drillers side.
- A single or combination of triggers, such as wind on the racked tubing, un-even racked drill collars in the tubing board, ice heave or shift in soil, potentially created a twist in the structure.
- With the tubing board guy wires not installed and pre-tensioned, the mast stem carried the twist through the tubing board lugs.
- The rig overturned fatally injuring a worker.

What caused it:

- Review of the rig design by an independent engineer to the API Specification 4F, 2nd Edition, found the overall rig assembly was stable and safe for operation within the manufacturers design load limits as per the recommended rig up procedure.
- Wind acting on the driller's side of the racked pipe (26 km/hr) and the un-even racked load created a positive induced torsion twist around well center of the mast stem.
- When the tubing board twisted, a side load was applied as the racked pipe shifts from a straight lean (away from the mast) to a combined straight and side lean. At the point just prior to the mast overturning to the off-driller's side, the side load at the tubing board exceeded the torsional stiffness of the mast stem and overturning capacity of the free-standing package.
- The point of failure was determined to be the pin connection on the off-driller's side load beam. As the mast stem and pipe began to shift, the resulting overturning load caused the rear jacks to "lift off" of the load beam. As the off-driller's side rear jack began to lift off the load beam, the load in the pin connection exceeded ultimate strength and failed causing the off-drillers side outrigger to shear off.

Corrective Actions:

- Ensure all rig designs meet or exceed API Specifications 4F, 2nd & 3rd Edition
- Communicate the importance of following company and manufactures safe operating procedures.
- Educate employees of the importance of the employee's obligation to refuse unsafe work ([Alberta OH&S Act Section 35](#))
- Educate employees of the Wellsite Safety Responsibility for the Operator, Wellsite Supervisor and Employer. ([IRP 7 – Section 7.4](#))

Contact:

For more information of event, please contact safety@enform.ca

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