

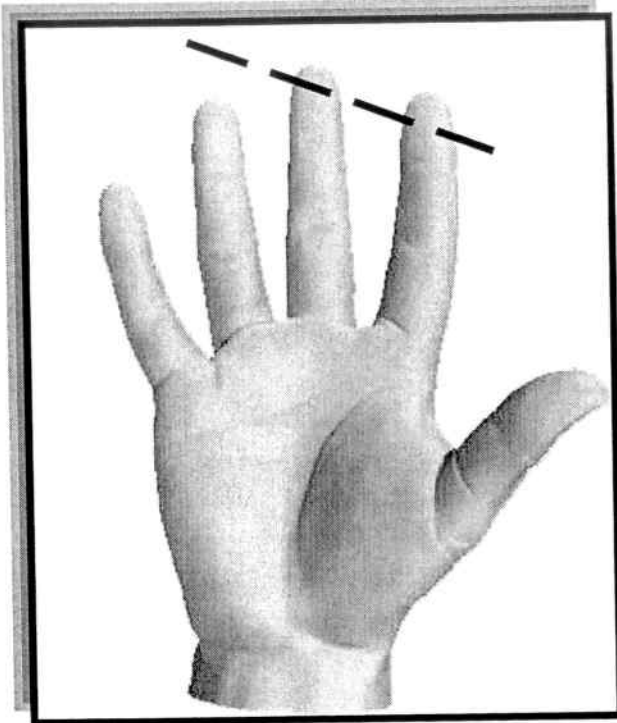
Suncor Sarnia Refinery

2011 Plant 3-4 Turnaround

Description of Incident

• Serious Incident: April 2 2011 Saturday @ approximately 8:30am.

Workers Injured hand



- Boilermakers were removing studs on a shell and tube heat exchanger.
- Boilermakers loosened the nut on one of the studs but could not remove it due to galling.
- Torque tool and back up wrench was then used in an attempt to remove the galled nut.
- The back up wrench was anchored against an available stud five stud holes away.
- Torque tool was unable to break the nut free causing the torque tool and wrench to become jammed.
- A co-worker hit jammed wrench with a hammer in an attempt to dislodge it while injured worker was supporting wrench with right hand to control it.
- Stored energy in wrench caused it to spring upward when struck by the hammer.
- The fingers on the injured worker were severed when wrench sprang upward pinching his fingers between wrench and exchanger shell.

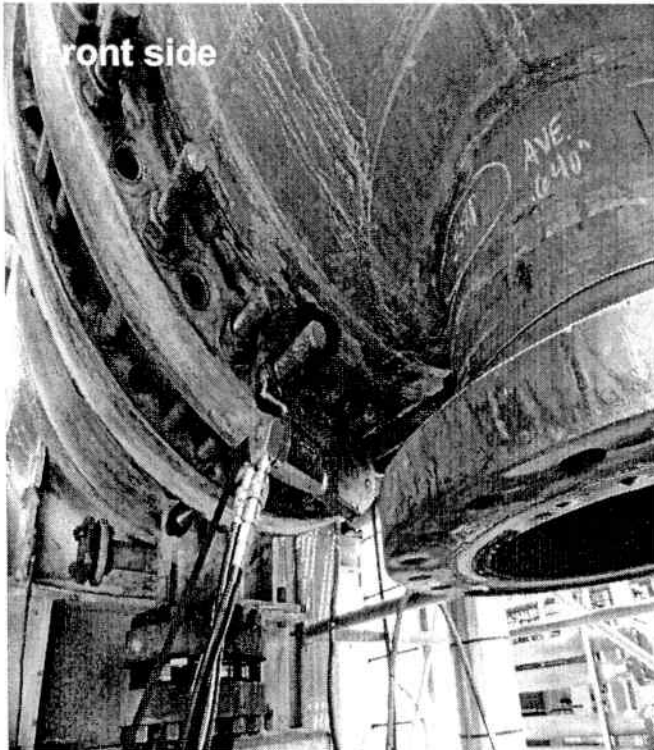
Contributing Causes:

- No written procedure for removing nuts with torque machine.
- Worker failed to recognize the stored energy in the jammed wrench and torque tool.
- Failure to secure wrench with mechanical device versus hand.
- Boilermaker initial attempt to remove galled nut created some play in stud contributing to stored energy in wrench.

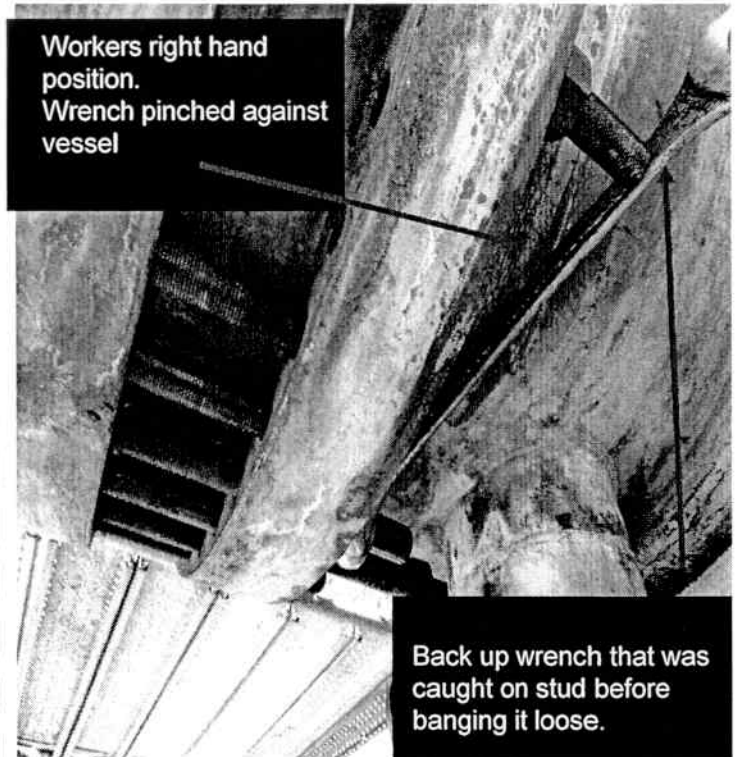
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Root Cause

- Incorrect anchor point (reaction fulcrum) of wrench allowed hazardous energy to be stored in wrench.



Torque tool



Workers right hand position. Wrench pinched against vessel

Back up wrench that was caught on stud before banging it loose.

Corrective Actions:

- Modify current torque procedure to include de-torque procedure to remove nut, appropriate method to secure back up wrench (mechanical device) and location of anchor point.
- In the event a stud has become galled the stud should be cut versus using an hydraulic torque wrench.
- Share learning of hazards of stored energy when using hydraulic torque wrench system.