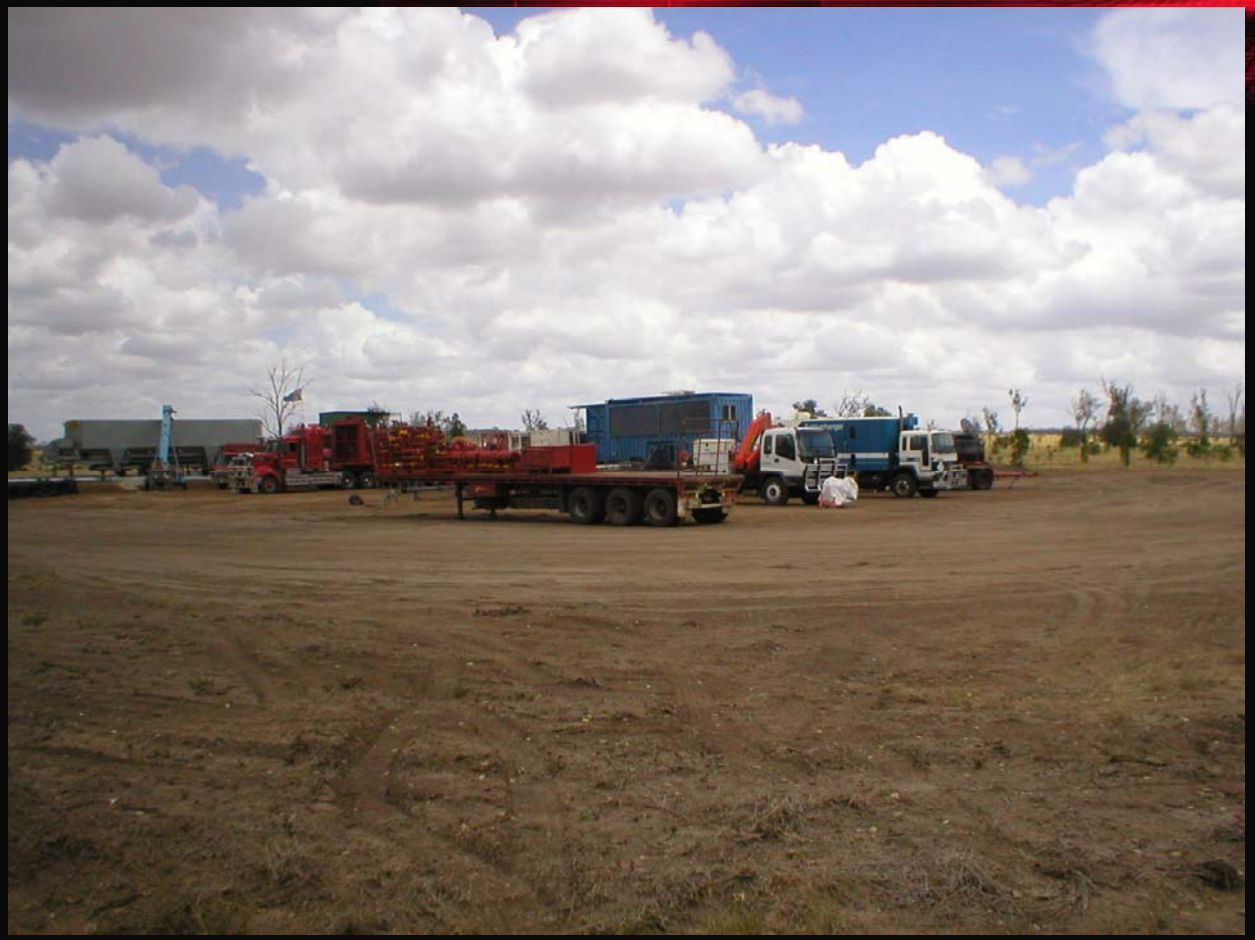
Crushed Fingers Incident

Roma, Queensland
10th Jan 2006



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13 June 2006

Fracturing Operation

At 10.45 hours on Tuesday the 10th January 2006 an operator on a frac location approx. 20km north of Wandoan, Queensland sustained injuries to the fingers of his left hand as a result of being crushed by a hydraulic operated butterfly valve on a suction pump Blender

Chain of Events

Water is sucked from ‘Turkey’s Nest’

Dead grass bottom of pond

Suction hoses / manifold become blocked

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What went wrong ?

Suctions, hoses, manifold removed to clear grass

Blender started and valve opened to remove grass – motor left running

Safe Aspects Taken

- Tool Box Talk (Informal)
- Restraining and securing the manifold with a dog and chain
- Increasing the area for better removal of the spacer piece by having the manifold strapped back
- The use of a small diaphragm pump to remove excess water from the work area
- Securing the spacer piece for safer removal and installation by having it supported by a rope tied off overhead
- Similarly the butterfly valve was secured by rope

What went wrong ?

When opening the valve it dropped, grass was removed and IP repositioned valve. During this process IP requested Blender operator (who cannot see IP from console area) to close valve.

IP's fingers were on valve paddle. 4 fingers severely crushed requiring amputation at first knuckle

Failed Barriers

- Working on energized equipment – Console should have been closed and Locked Out
- Change in job – brief TBT conducted prior to unblocking grass. Extent of blockage wasn't known, continued to disassembled manifold. No systematic approach to identify hazards and safe work method, JSA not performed
- Perceptions – task not consider high risk, although performed infrequently.
- IP was being observed at time by multiple parties, no one identified the at-risk practice as it occurred nor at-risk hand finger placement.
- Crew always use LOTO in facility but rarely on location

Taproot® - Root Causes

- **Causal Factors**

- **Corrective Action Needs Improvement *(Root Cause)***

The dry grass accumulating in the pond had been identified during the first frac job as a problem that needed addressing prior to the next job. As no relatively quick solution could be identified a decision was made to start the second frac job. The extent of blocking that the grass created was not anticipated, by all parties, to be as severe as too what occurred

- **No Procedure *(Root Cause)***

The removal of Master Suction Valve and manifold is an infrequent job. Prior to commencing the task a JSA should have been conducted by personnel performing the task. A correctly completed JSA will identify hazards, the required controls and safe working procedure

- **Pre-job briefing needs improvement *(Root Cause)***
- **Lock out / Tag out Needs Improvement *(Root Cause)***
- **Standards, Policies, or Administrative Controls Not Used *(Near Root Cause)***
- **Enforcement Needs Improvement *(Root Cause) (Referring to LOTO and JSA requirements)***

Actions

- IP rehabilitated and back at work (April) performing field duties – under return to work plan.
- LOTO field procedures implemented
- Mesh filter installed between suction hose and manifold
- Customer managing dead grass in ponds
- JSA Completed for this task
- Released TBT prompt card to improve consistency of TBT's
- Safety Stand Down across Australasia

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Working Safely

SUPERVISORS TOOLBOX TALK

PROMPT CARD

- Discuss the Job / Task to be performed
- The procedures to be followed.
- Responsibilities of each team member
- **Supervision Requirements**
- **Communication**
- **Identify Hazards and their Controls.**
- **Tools, Equipment and Material required.**
- **Permit to Work.**
- **Lock Out / Tag Out (Isolation)**
- **Other activities occurring in work area**
- **Personal Protective Equipment.**
- **Safe Access and Exit from work site.**
- **Problems encountered in pervious similar job**
- **Emergency Response Plans**

CONFIRM TEAM UNDERSTANDS BEFORE COMMENCING TASK.

Remind team, if it is unsafe STOP the job

Hazard Guide

- **Noise** - high noise level areas.
- **Chemicals** – MSDS reviewed
- **Flammable Atmosphere** – ignition sources.
- **Manual Handling** - lifting technique.
- **Confined Spaces** - PTW, atmosphere tested.
- **Working Environment** – heat, dust, visibility.
- **Pressure** – DME, tanks, hydraulic hoses.
- **Working at height** – safety harness, hand rails.
- **Walking Surface** – slips, trips and falls.
- **Overhead** – cranes, power lines, guy wires.
- **Lifting Slings** – certified, shackle pins secure.
- **Vehicle movements** – forklifts, cranes, trucks
- **Rigging up** – back, hand & finger injuries.
- **Rigging Down** – pressurized lines –bleed off.
- **Radiation** – Densometers / LWD RA sources. NORM scale
- **Explosives** – Radios off.
- **Well bore Fluids and Gases.**
- **Electrical** – power tools/cables, isolation, power lines.
- **H2S** – detectors, escape path.
- **Lithium Batteries.** – handling, keep dry.

HANDS AND FINGERS are the most common part of our body that we injure at work.

Emergency Response

- Location of Safety shower / Eye Wash
- First Aid Station
- Fire Fighting Equipment
- Spill Control
- Emergency Shut Sown procedures
- Assembly Point
- Wind Direction
- Rescue Procedures
- First Aid Responders