Fatality Case – Contractor staff working on well test equipment at Utorogu 32.
Fatality Incident at Utorogu 32 Well Test Site

What happened

At about 1345 hours on 30/11/2005, the IP, while operating a sand filter valve in a temporary well test setup, sustained a severe multiple injuries caused by the impact from a female hammer union, inadvertently dislodged from a side outlet, as well testing was in progress. He was thrown 19 ft from the sand filter equipment. He was medevaced to a regional clinic where he underwent emergency surgery. He later died in the clinic.

Incident Title: Fatality
Place: Utorogu-32 well test site
Date: Wednesday 30th Nov, 2005
Time: 1345hrs
RAM Rating: Actual: 1P (fatality)
Potential: C5(P)
Single fatality (High): Incident happens in our company.
Fatality Incident at Utorogu 32 Well Test Site

Overview of Test Site

Sand Filter

No permanent access for valve operation

IP was thrown this distance
Fatality Incident at Utorogu 32 Well Test Site

Sequence of events

- 0700 hrs: Obtained signed PTW and held toolbox talk
- 0927 hrs: Held safety meeting with Rig Team and Gas plant Operations team leader.
- 1028 hrs: Open up well to well test surface facilities. Produce well, testing in progress.
- 1345 hrs: IP, climbed the sand filter equipment, stood on the wheel of the discharged valve to operate the middle valves in order to sample for sand. His lower abdomen faced the side outlet. The female hammer union dislodged from the side outlet and hit him in the lower abdomen.
- 1345 hrs: Engaged ESD systems closing the FLWV, SSV and TRSCSSSV.
- 1350 hrs: Rig medic administered first aid at accident scene.
- 1355 hrs: Moved IP to rig sick bay and was given first aid.
- 1407 hrs: Medivaced IP to Ufor Clinic, Ughelli with rig ambulance accompanied by rig medic.
- 1430 hrs: IP arrived at retainer Clinic and was received by awaiting emergency medical team and immediately taken to operating theatre for surgery.
- 1715 hrs: Completed emergency surgery in retainer Clinic.
- 2010 hrs: IP died in retainer clinic.
Fatality Incident at Utorogu 32 Well Test Site

Position of IP at time of incident (re-enacted)

IP was closing this valve

Failed Side outlet

Valve # 1

Valve # 2

Valve # 3

Valve # 4

Stripped Out Female Sub
Fatality Incident at Utorogu 32 Well Test Site

Valve # 2

Side outlet which failed

While operating this valve
IP stood on this valve

Approx 6 ft
Fatality Incident at Utorogu 32 Well Test Site

Findings-1

1. Rig up of Temporary Well test facilities was completed and tested on 29/11/2005
2. Pre-job safety meeting was held with all parties concerned prior to start of operations on 30/11/2005.
3. Subject discussed was generic.
4. Equipment was pressure tested to 4500 psi. (expected THP: 3500 psi)
5. HAZOP was conducted on Saturday, 26/11/2005 on all rigged up well test equipment.
6. HAZOP identified absence of permanent safe access to sand filter valves (refer item 16 of HAZOP report)
7. Close out of action items in HAZOP report conducted on 28/11/2005. (Temporary ladder was provided)
8. Connection was a mismatch between the male and female hammer Union (602 female to 1502 male).
9. Pressure gauge had been removed from the needle v/v
10. Sand Filter equipment belongs to Shell (ex Shell EA). and used previously
11. Well test Contractor serviced the side outlet connection prior to Utorogu-32 well test job
   1. Broke connection, replaced seal and made the 602 female back to the 1502 male.
   2. MPI test was done on the piping of the side outlet prior to this well test.
   3. Pressure tested unit to 5000 psi as part of mobilization for Utorogu 32 job
12. Configuration of equipment at Utorogu-32 was not according to manufacturer’s design layout. However, Well Test contractor stated that the configuration at the two previous tests were as in Utorogu-32
13. Manufacturer’s configuration included a permanent access adder and a working platform for operating the middle valves and different orientation of the valves
14. The configuration and operating manual were not available to Well test contractor at the time they took over the equipment.
Fatality Incident at Utorogu 32 Well Test Site

Findings-2

1. Original design had a flanged outlet and not a hammer union
2. Valve orientation may have been changed for convenience to access the valves during servicing of equipment in the yard
3. Change of valve orientation aligned the discharge valves with the side outlet
4. HAZOP did not identify the hazard with valve orientation and configuration
5. IP was wearing PPE (safety helmet, boots, glasses & gloves)
6. IP had 6 years experience in Well Test Operations
7. IP stood on discharge valve wheel, about 3ft above the ground to operate the middle valve (8.6 ft high) isolating the lower chamber.
8. IP had operated this unit in other well tests.
9. IP was thrown 19 ft when hit by the dislodged female sub hammer Union and thrown against cutting skip used as bleed down tank.
10. IP did not use the temporary access (ladder) provided and in any case it was not fit for operating the valve.
11. Well testing activities has a signed program/proposal
12. Site Specific Concurrent Operations Procedure was available for the well test
13. Copy of PTW (Permit To Work) was sighted
Fatality Incident at Utorogu 32 Well Test Site

Differences in union female subs

Type 1502 union female sub (15,000 psi)

Type 602 union female sub (6,000 psi)

This part was blown out at 3,500 psi
Fatality Incident at Utorogu 32 Well Test Site

Initial Main recommendations, awaiting final conclusions and reports

1. Shell and contractor companies to stop work
2. Check all temporary piping and remove non standard subs from site
3. Visit ongoing well test sites and audit the set-up and piping.
4. Remove and replace sand filter
5. Send out industry alert on dangers of hammer lug unions
6. Shell/Contractors jointly develop a seminar on safety of pressure vessels.
7. Extend same to other well intervention facilities and rig up.
8. When handing over equipment to other parties, ensure the history, certification and operating sequence are included.
9. Print a laminated alert, hang on connections and rigged-up facilities and issue to all personnel to increase awareness
10. HAZOP reporting format should clearly state hazard and recommendation to enable linking of close-out action.
Fatality Incident at Utorogu 32 Well Test Site

Differences in union female subs

Type 602 union male sub (6,000 psi)

Type 1502 union male sub (15,000 psi)

Differences in O.D. at thread crest is 0.3 inch (7.93 MM)
Fatality Incident at Utorogu 32 Well Test Site

Note damage
Also note “rounded” threads which are
A rejection criteria
Fatality Incident at Utorogu 32 Well Test Site

602 female sub & 1502 male sub

1502 female sub & 1502 male sub
Fatality Incident at Utorogu 32 Well Test Site

1502 female sub & 602 female sub

Note the difference