

# TapRoot Investigation

## RESTRICTED WORK CASE

**Finger injuries of 3<sup>rd</sup> Engineer and  
Discharge of Product to Machinery Space  
(24<sup>th</sup> December 2009)**

***SEACOR JEFFERSON***

# Description of Incident

- On the midnight of 23rd Dec 2009, the vessel was instructed to transfer 17 metric tonnes of Lite Crete to the Ensco 88.
- There was no pressure on the discharge line from tank no1 and after a few minutes the discharge valve was shut down.
- The discharge valve was disassembled to check for any faults. None were found and the valve was reassembled.
- The Chief Engineer decided to remove the actuator and discharge valve.
- On the 3rd attempt, there was still no discharge pressure and decided to increase the pressure to 75psi.
- As the pressure approached 70psi, the product started to move and a vent was sighted on the rig.
- Shortly after the 3<sup>rd</sup> Engineer leaving the ECR, the Chief Engineer noted a sudden drop in pressure on the discharge from 70 to 22psi.
- Emergency shutdown was activated, but as the actuator had been removed the discharge valve could not be shut down.
- The 3<sup>rd</sup> Engineer removed his gloves and used his bare hand to verify leaks.
- At this time the pipe ruptured around the clamp coupling causing the 3<sup>rd</sup> Engineer to sustain deep lacerations to two fingers on the left hand.
- The rig medic cleaned the injured fingers and medivaced the IP to Doha for further treatment.
- The IP had minor plastic surgery on his fingers to close the wounds and returned to the vessel on night of the 25<sup>th</sup> Dec.

# Photographs and Illustrations



**The STRAUB-GRIP-L Coupling can clearly be seen to have moved along the piping. Visible are the scrapes of the serrated teeth and the area where the air and product under pressure to 70psi escaped.**

# Photographs and Illustrations (cont.)



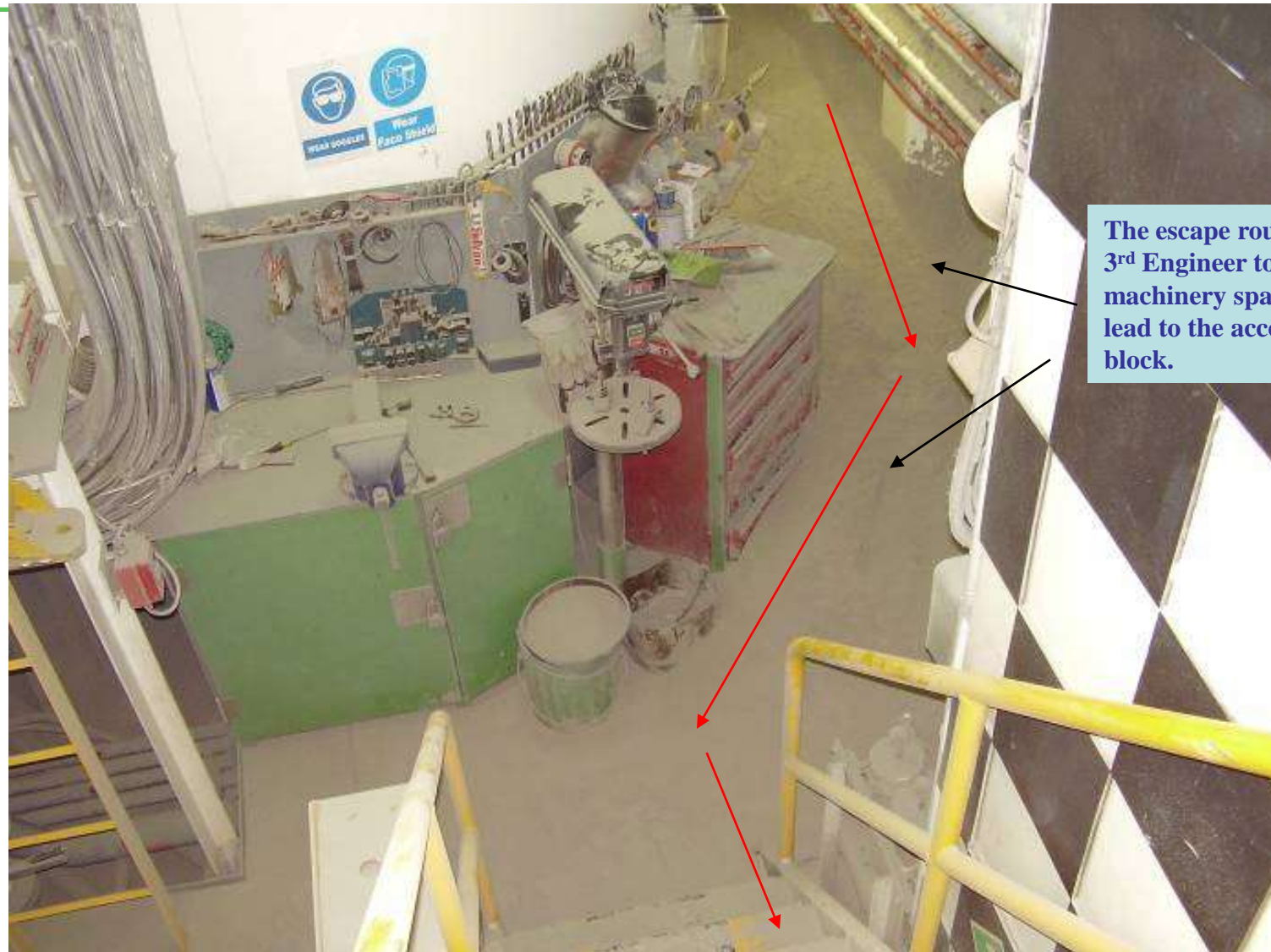
**The same clamp coupling arrangement in place at another location on the bulk discharge system**

## Photographs and Illustrations (cont.)



The resultant Lite-Crete spill resembled a snow drift and covered much of the machinery space, reaching a depth of around 3-4ft at the rupture point.

# Photographs and Illustrations (cont.)



The escape route used by the 3<sup>rd</sup> Engineer to exit the machinery space. The stairs lead to the accommodation block.

# Actions to prevent recurrence

Root Cause	Corrective Action	Due Date	Responsibility
<p><u>Procedure</u></p> <ul style="list-style-type: none"> <li>• Not Used / Not Followed</li> </ul>	<p>RasGas Drilling will examine the length of time infrequently used products should be kept on vessels to avoid settling issues. After discussion and agreement a procedure will be issued.</p>	<p>10<sup>th</sup> Feb 2010</p>	<p>RasGas Drilling and Completions Operations Managers</p>
<p><u>Management System</u></p> <ul style="list-style-type: none"> <li>• SPAC NI</li> </ul>	<p>The removal or disabling of any safety function requires a management of change review to assess the risks. Personnel should be reminded of the requirement of adhering to company MOC guidelines.</p>	<p>10<sup>th</sup> Jan 2010</p>	<p>Seacor Marine</p>
<p><u>Work Direction</u></p> <p>Preparation</p>	<p>All personnel involved in any job must be given a formalized and documented briefing of the task at hand, particularly at times of shift change. Seacor Marine to send a written reminder to the vessel of the importance of effective JSA review, TBT and documentation.</p>	<p>10<sup>th</sup> January 2010</p>	<p>Seacor Marine</p>

# Actions to prevent recurrence

Root Cause	Corrective Action	Due Date	Responsibility
<p><u>Training</u> Understanding NI</p>	<p>Seacor Marine to initiate training program outlining the accepted standards of checking for leaks on lines under pressure and safe working practices around lines under pressure. RasGas to be provided a copy of the training program.</p>	<p>28<sup>th</sup> Feb 2010</p>	<p>Seacor Marine</p>
<p><u>Management System</u> •SPAC NI</p>	<p>Seacor Marine to ensure the JSA for bulk pumping references how to identify leaks. A work procedure for identifying and trouble shooting leaks also requires development. The identification of leak location should be specified as being done by means other than bare skin</p>	<p>28<sup>th</sup> Feb 2010</p>	<p>Seacor Marine</p>
<p><u>Management System</u> •SPAC NI</p>	<p>Maintenance records require improvement. The checking of the torque of all restraining bolts on other STRAUB-GRIP-L couplings onboard requires verification and this must be added to planned maintenance schedule. This must be documented and in accordance with the manufacturers instructions.</p>	<p>Immediate</p>	<p>Seacor Marine</p>
<p><u>Quality Control</u> QC NI</p>			

## Other Corrective Actions

- **All other vessels with STRAUB-GRIP-L Couplings within RasGas fleet to be requested to check torque for compliance with manufacturers instruction.**
- **All STRAUB-GRIP-L Couplings on Seacor Jefferson to be changed out with new.**
- **Emergency escape from Machinery Space / Engine Room drills to be held on all RasGas chartered vessels. These should be documented and submitted to RasGas with any problems highlighted.**
- **RasGas QA representatives will perform Quality and Safety Audits on all RasGas chartered vessels through 2010 and will continue to ensure each vessel is audited at least once per year. This will include bulk pumping systems. It is anticipated Seacor Jefferson will be audited by mid-January**