

Flange failure due to incorrect tool used to set flange

SAFETY ALERT

Description of incident:

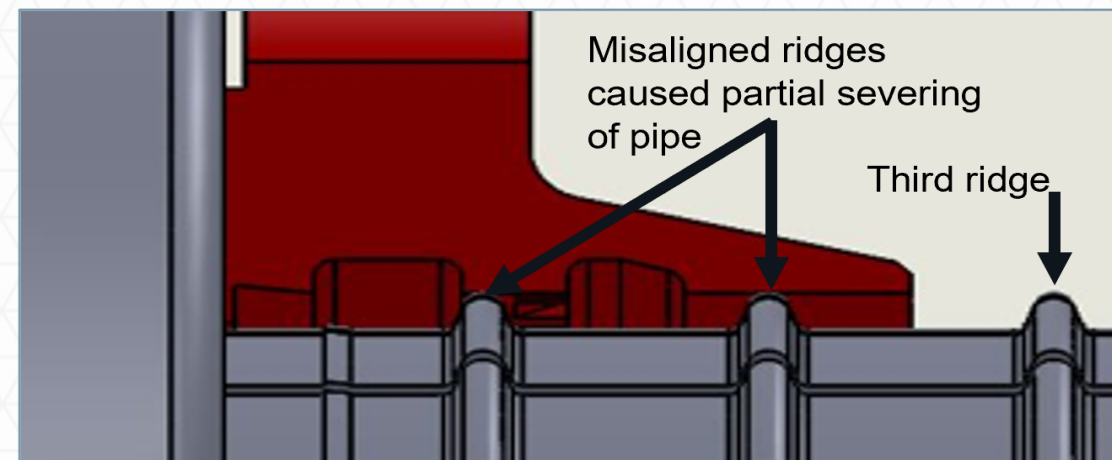
A mechanical connector installed as part of an 8" cooling medium line failed resulting in approx. 20m³ of cooling medium (water / glycol mix) being released to sea in 15 seconds. There were no visible warning of failure before the line failed. No personnel were injured.

Findings:

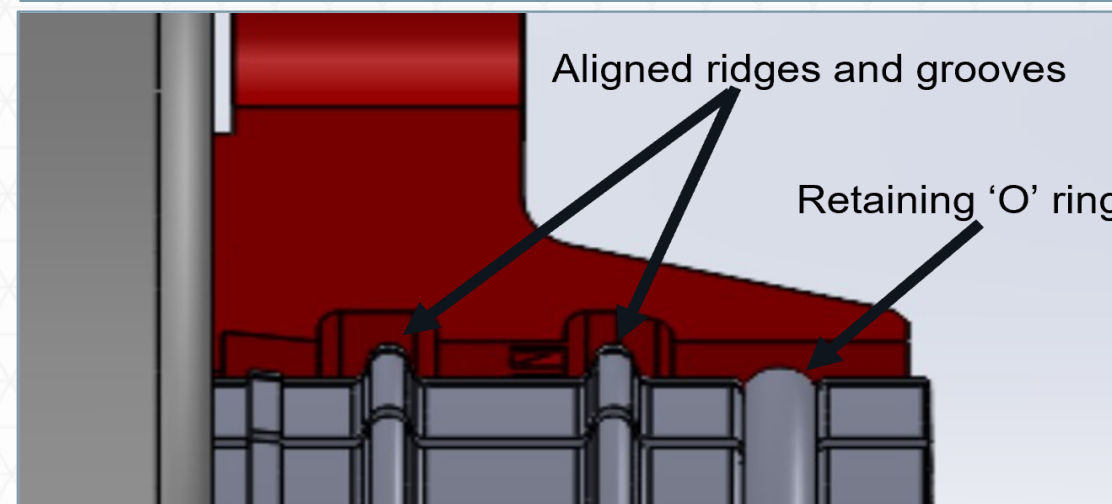
- Incorrect tool had been used to set the flange.
- Incorrect tooling alignment created stress raisers in the pipe and within the weld-neck area, out of the supported area of the flange.
- Incorrect pressure was applied during the installation, causing partial severing of the pipe - 700 bar pressure used for the tool, correct for tool but well above the pressure for the flange type (460 bar).
- Large dilation of the flange and pipe, plasticity deformed due to over pressurisation of the joint.

Good practice:

- Ensure the correct tool is selected for the job.
- Understand the operating limits of plant and equipment and stay within them.



Above: close-up of incorrect tool and groove alignment, third ridge on tool outside the flange. NB. Pipe removed for clarity.



Above: close up of correct tool and groove alignment, note no ridges outside the flange. NB. Pipe removed for clarity.