

What happened

In one of our projects, a leak-tightness test was carried out on a newly installed dry fire main. For this test, the pipework is filled with water and then put under a pressure of 16bar for a certain period to reveal any leaks.

While pressurising the pipe, the flange (see Figure 1) shot away, bounced off a concrete wall and hit one of the mechanics in the knee.

The mechanic was taken to hospital by ambulance. At the hospital, the wound on his knee was sutured and a fracture in his kneecap was observed.

Given the 'favourable' fracture in the kneecap, surgery was not necessary for a full recovery of the knee. The mechanic returned to alternative work in the warehouse and the office after 3 months.

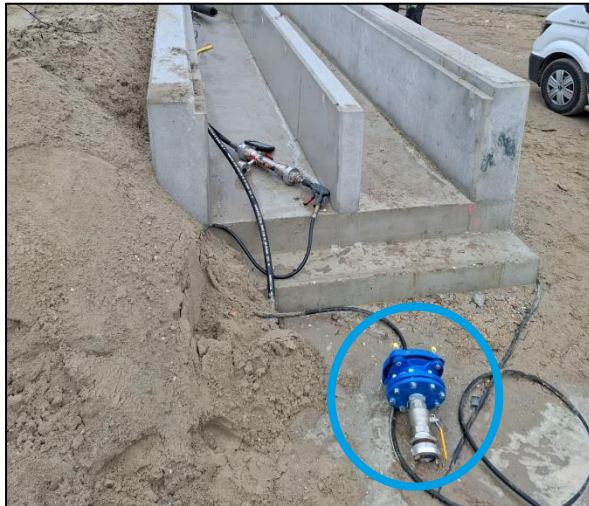


Figure 1 - Grip flange including pressurising equipment

Facts

- A specialised company had been contracted to pressurise the dry fire main.
- Pressurisation was carried out by 2 certified employees.
- The grip flanges had been fitted by the company that installed the dry fire main.
- For reasons of time, it was decided to use grip flanges (max. 16bar) instead of welding.
- The risk of parts flying through the air had received scant attention in the risk analysis of the work.
- The required safety measures had not been discussed during the kick-off meeting.
- Before the start of pressurisation, it was checked that the flanges had been fitted according to the instructions in the manual.

- The flange was not secured or shielded, making it a risk to bystanders if ejected.
- No barrier had been placed in the danger zone of the work.
- The victim was in the line of fire (the area in which you are at risk when parts come loose) during the accident.
- At a pressure of 10bar, the flange came loose.
- The flange first hit a concrete wall and then the victim.
- The victim suffered a kneecap fracture upon impact.
- The victim returned to alternative work after 3 months.

Points for attention

- When outsourcing work, always request a work plan with a task risk analysis from the contractor.
- Always have these work plans and TRAs reviewed by the safety expert.
- Welding the pipe is a safer alternative to the use of grip flanges.
- Do not start work before the safety measures are known, shared, and organised.
- Always secure potentially ejectable parts against ejection.
- Never enter the line of fire.
- Perform an LMRA before start-up and before each restart.
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Life saving rules

- I take responsibility for my own and others' safety.
- I have the correct instruction and information available.



Hein dilemma

A safety expert always looks on during work preparations.

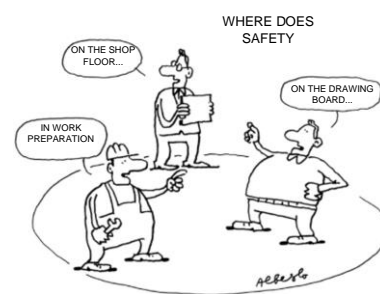




Figure 2 - Grip flange shot away



Figure 3 - Grip flange shot away



Figure 4 - Top view of dry fire main

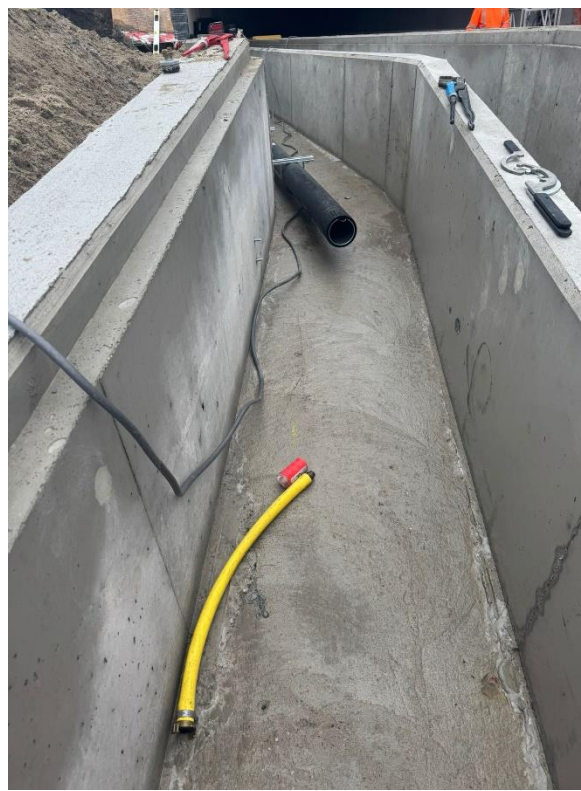


Figure 5 - Dry fire main cable duct