



INF. 11

2 November 2017

(English only)

RID: 8th Session of the RID Committee of Experts' standing working group
(Utrecht, 20 to 24 November 2017)

Subject: Extract of a report on a rail incident on 17 October 2017 investigated by the Dutch Human Environment and Transport Inspectorate of the Ministry of Infrastructure and Water Management

Information from the Netherlands

Introduction

1. On 17 October 2017 a company (consignee of tank-wagons) in the Netherlands informed the Human Environment and Transport Inspectorate of two leaking tank-wagons which had to be loaded with UN 1279, 1,2-Dichloropropane, Class 3, F1, PG II.
2. During the testing before loading both rail wagons were leaking from the top valves. There was slight leakage of the above-mentioned product. The consignee depressurized the tank-wagons and then refused to refill them. After emergency repairs, both tank-wagons had to be removed from the consignee's site. With the permission of the Dutch authorities the wagons were transported to facilities to be cleaned in accordance with RID 1.8.1.3, 4.3.2.4.3 and 5.4.1.1.6.3 (a). After the tank-wagons were cleaned, an investigation was carried out by the Dutch authorities on German territory with the permission of the Federal Ministry of Transport and Digital Infrastructure.



Both tank-wagons with spill bag emergency repair on top

Investigation

3. The following questions were part of the investigation by the Inspectorate:
 - Was this accident caused by human error?
 - Was it a technical problem, and if so, can this be prevented in future and how?
4. After removing the spill bags and bringing the wagon under 1 bar pressure it was checked whether all the openings were closed and gas tight.



Wagon X was not gas tight. The wagon was leaking at:

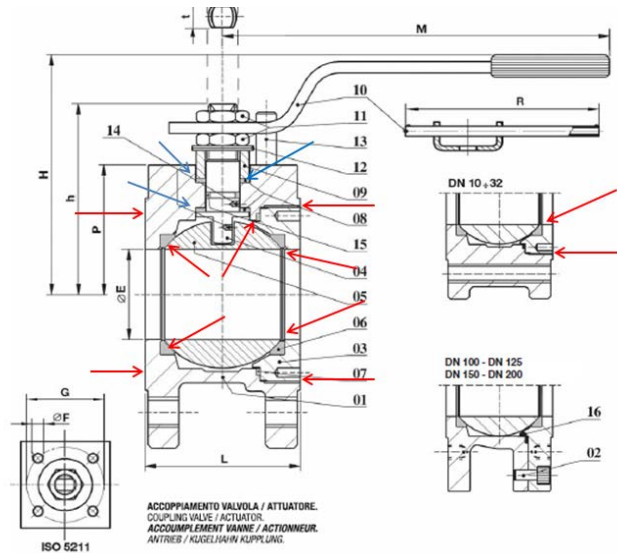
- both top valves red and blue
- the side valve (at the break cylinder side)



Wagon Y was not gas tight. This wagon was leaking at:

- both top valves red and blue

- the manhole seal topside
 - the TODO side valve (not the break cylinder side)
 - the bottom valve
 - the probe valve in front of the side valve (at the break cylinder side).
5. The top of both tank-wagons was not properly cleaned or maintained.
 6. The top valves were of the brand Bonetti Armaturen GmbH & Co KG, Type: ALFA 10 NF, CF8M, 50 and 80. All are types of ball valves.



Drawing of the ball valve

Every red arrow in this drawing marks a point of leakage, as shown in the pictures.

No leakage was detected at the points shown by the blue arrows.

7. The closing ring of the ball valve was the main area of leakage.



8. The ring was not closed correctly. It was only manually fastened, so it could easily be unlocked manually.

9. Below the closing ring there was a sealing ring that was damaged by rust particles. The ball of the valve was also damaged by the rust particles and was grooved at its surface.



10. All the Teflon seals were dented and dirty as a result of rust particles. None of the seals and balls were fully functioning and gas tight.
11. The damaged parts were removed and repaired or replaced by new parts. After a new pressure test all parts were closed and again certified.

Conclusions

12. The cause of the leaking valve was both a technical defect and human error and can be explained as follows:
 - There were a lot of rust particles in the valve and both the Teflon seals and the ball of the valve were damaged (see pictures);
 - The pressure ring was not mounted correctly. The ring was manually mounted and did not place sufficient pressure on the seals to be able to close the valve so as to be gas and vapour tight;
 - In addition, the pressure/closing ring of the ball valve was not equipped with a technical system to secure the fastening. As a result of vibrations from the moving train, this ring could not be prevented from coming loose;
 - The damage to the sealing ring of the TODO valve could possibly be caused by the valve's incorrectly remaining open due to maintenance procedures.
 - Old and leaking gaskets were used.
13. The Dutch Inspectorate is of the opinion that these problems could possibly be prevented if the following prevention measures are taken:
 - Before closing with the blank flange, each loader and/or unloader should be certain that the equipment is clean and in good technical order for each subsequent journey. The vertical mounting of these valves makes them more vulnerable to the ingress of dirt or dirt staying in the head of the valve. Turning the valve with a dirty interior will scratch the ball of the valve and damage the seals. It was particularly the flakes of iron rust that caused the damage to the hard Teflon seals.

For a period of time after opening and closing the valve, there is always leakage that cannot be stopped.

- After unloading, each loader of a tank-wagon should check that the valves are gas tight and are correctly assembled.
 - A technical system, e.g. a lock screw, to secure the fastening of the closing ring on the ball valve could prevent loosening of this ring in the future.
14. This information might be of use to all who wish to prevent future accidents caused either by human error or by technical problems such as those outlined above.
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