Why is it, that when we see this....

| 1

We immediately go to a garage to get it fixed...

| 2

However, when we see this...

| 3

We don't immediately act to get our valves tested!

| 4

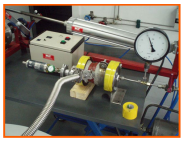
To test or not to test. That is the question.

Klaas Jan Soeteman

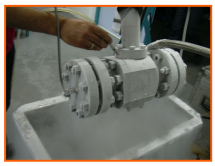
DCI Meettechniek

1.000 valve tests each year

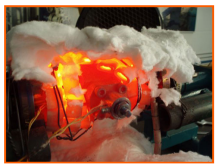
Endurance testing



Fire safe testing



Cryogenic testing



High temperature testing

| 6

Contents:

To test or not to test: 3 questions

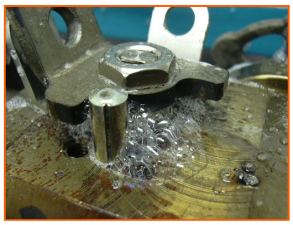
1. When to test, and what test is applicable/sufficient?
2. What about seals?
3. How easy, or how hard is it to test?

When to test?

- Is the valve in compliance with the latest standards? (environmental, safety, used materials)
- Has the valve been tested at design conditions? (max temp., pressure, endurance)
- Did the valve undergo some form of revision? (i.e. different gaskets, stem seals, O-rings)
  - **More than 50% of all valves fail to work under their "guaranteed" design capabilities!**

What about seals?

- Is the TAT-test used according to the latest standards?
- Was testing performed under the P/T conditions guaranteed by the seal manufacturer/sub supplier?
- **Example 1: Problematic stem seal**
  - Guaranteed by manufacturer: design temperature range for the graphite stem seal: -200°C to +450°C, maximum design pressure 200 bar.
  - This seal has been (type approval) tested at a limited pressure of 40 bar, with a valve limited temperature of 250°C. However, during production acceptance tests at 200 bar and an upper service temperature of 300°C this seal failed.



What about seals?

- **Example 2: Failing O-ring**
  - guaranteed by O-ring manufacturer: design temperature range for the O-ring: -25°C to +160°C.
  - Valve was equipped with the O-ring and successfully TA-Luft tested before, at ambient temperature. However, during Functional Acceptance (FA) tests at a pressure of 16 bar and a temperature of -20°C, this O-ring, used for stem sealing, failed several times .

Conclusion:
testing under other circumstances than in practice equals not testing at all.

| 10

How easy, or how hard is it to test?

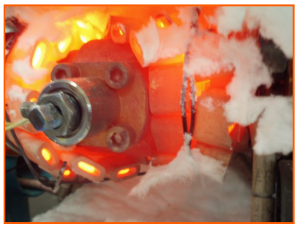
- Not all tests have to be expensive
  - Production testing (at rated pressure, ambient temp)
  - Cycle testing for automated valves
  - Hydrostatic testing
- A random test is often representative for the whole batch

The type of testing however, depends on <u>WHAT</u> the valve is being used for.

| 11

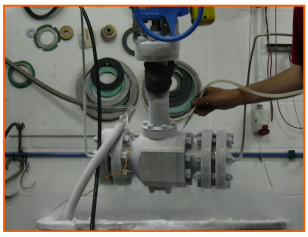
How easy, or how hard is it to test?

- Extreme conditions require extremer tests



(very) high temperature testing on a valve being used in a reactor on a chemical plant in China

Fugitive emmision (-196°C) test of a ball valve that's used for an LNG plant in Qatar

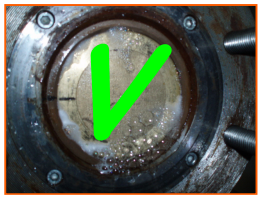


| 12

Conclusion:

To test or not to test?

Seat test at 100 bar water:
Tested leaktight (?)



The same seat test at above 20 bar nitrogen: Test failed !

Test properly, or don't test at all, no question!

| 13

Questions ?

Visit us at standnumber S341

| 14