Safety and Security in chemical plants
A LANUV project

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FB 74: Environmental technique and Plant safety for chemical industry and refinement

- Nature, environment, and consumer protection at one address
- LANUV NRW, the superior state authority of the Ministry for the Environment and Conservation of Nature, Agriculture, and Consumer Protection

- Founded in 01.01.2007 from different prequel institutes
  - Landesanstalt für Ökologie, Bodenordnung und Forsten (LÖBF),
  - Landesumweltamt (LUA)
  - Landesamt für Ernährung und Jagd (LEJ)
  - sowie den Dezernaten 50 der Bezirksregierungen
- technical - scientific agency
- about 1200 employee at 19 sites in NRW
- 8 Departments
Motivation I

Background:

- Industrial facilities are increasingly dependent on the use of IT & OT in the office and in process control systems

- Increasing implementation of IT
  - Increased information requirements
  - Increasing degree of automation
  - Increasing internal and external networking
  - Requirements for industry 4.0

- Convergence of IT & OT leads to a completely new initial situation with regard to the assessment of safety risks
Stress field IT & OT

Context:

Resource planning, finance, human capital, logistics, quality, customer care

IT NETWORK:

Access rights management, network infrastructure

CONVERGENCE

OT NETWORK:

Sensors, actuators, controllers, materials, transport, machinery, equipment

IT Department
- Security -
(IT specialist)

Plant Engineering
- Safety -
(Engineers)
Motivation II

Selected examples from the past 12 months

Massive hacker attack on ThyssenKrupp

- WannaCry Ransomware attack
- 150 countries
- ~220,000 computers infected
Motivation III

A reportable accident:

- A buffer overflow of a PCE-Controller triggered the calibration mode in the SSPS
- Parallel a second wrong signal triggered the Chlorine-Emergency-Stop
- Effects:
  - Opening of the relief valves of the chlorine system to emergency washer
  - But at the same time the chlorine main inlet valves remained faulty open
  - Emergency washer was rapidly saturated
  - 750 kg of chlorine passed through the emergency washer
Impression of the questionnaire I

- **Aim:**
  - The aim of the survey is to determine the previous dealing with this issue as well as its integration into the safety management system

- **Basically:**
  - Anonymous
  - Voluntary
  - If thematically possible, closed questions
  - Comprehensive qualities / give a general view

- **Benefit:**
  - An opportunity to examine the extent to which the various aspects of cybersecurity regarding to plant safety have so far been adequately considered (Self Check)
Impression of the questionnaire II

Topics:

- Rules taken into account
- Cyber-Security in SMS / ISMS
- Interfaces between IT & OT
- Assets
- Authentication, Authorization and Accounting (AAA)
- Updates / Patches
- Cryptography
- Types of attack
- Handling of "Smart Devices"
- Network segmentation
- Training concepts
Impression of the questionnaire III

Structure:

- Outline (48 questions)
  1. General question (1)
  2. Information on operating area (5)
  3. Organization of IT / OT security (9)
  4. Dealing with the topic of cybersecurity (33)
  5. Feedback
Thank you for your attention!

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