



Safety and Security in chemical plants

A LANUV project

Dr. Adrian Lux
FB 74: Environmental technique and Plant
safety for chemical industry and
refinement

North Rhine Westphalian State Agency for Nature, Environment and Consumer Protection

- **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

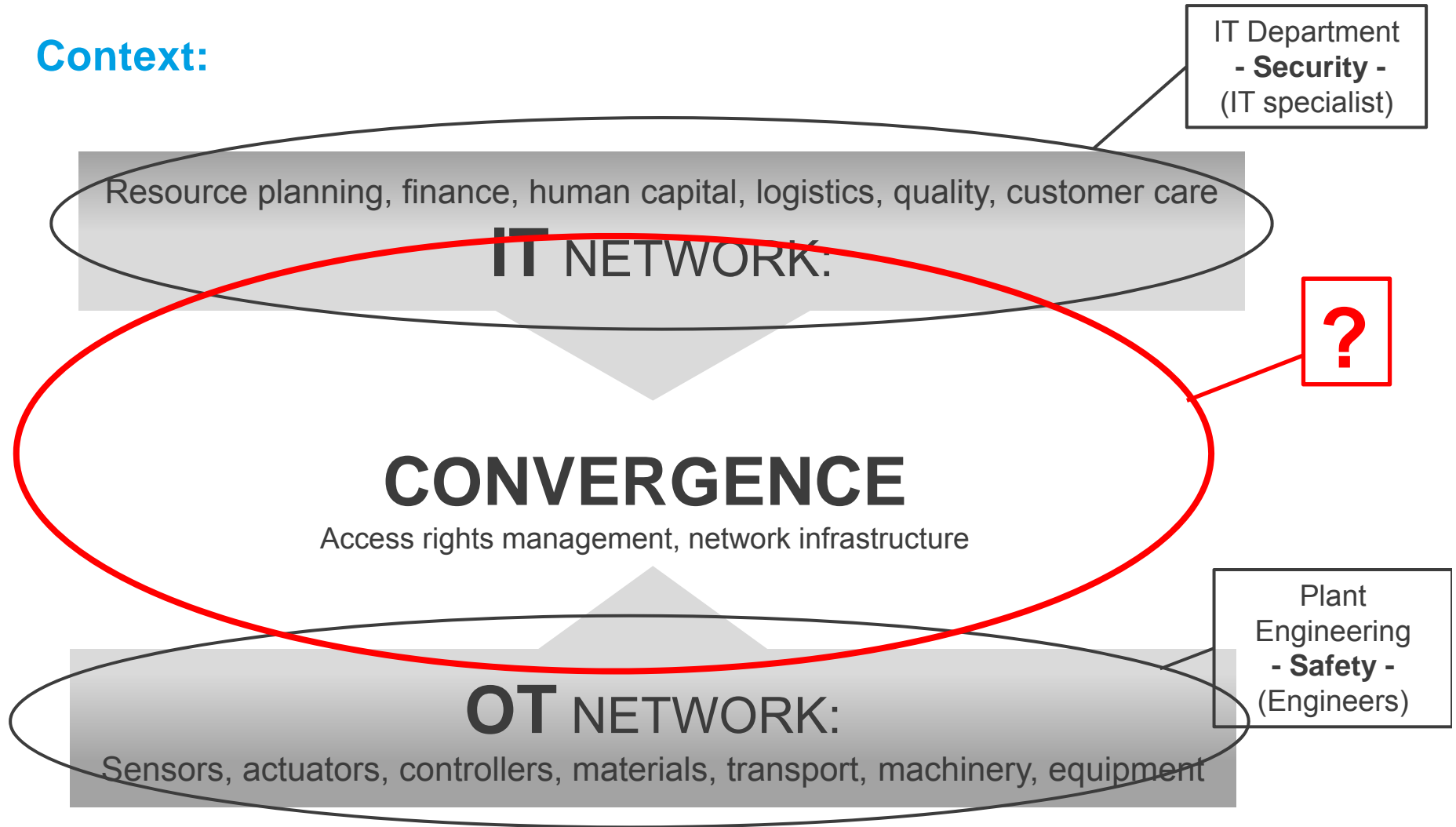
Background:

- 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:

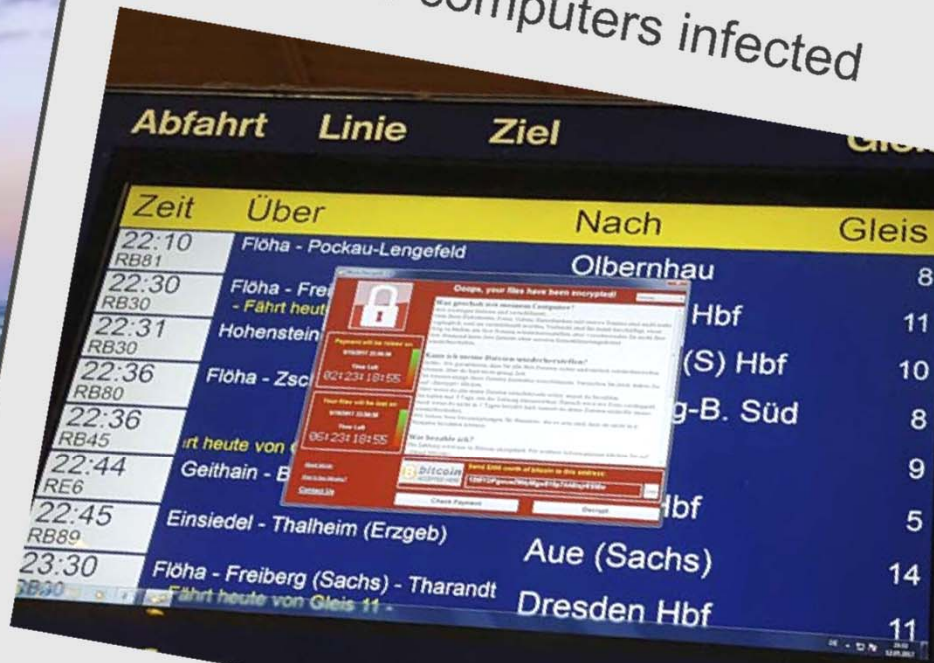


Motivation II

... of IoT

WannaCry Ransomware attack

- 150 countries
- ~ 220.000 computers infected



The image shows a train departure board with a ransomware pop-up window overlaid. The board lists train times, routes, and destinations. The pop-up window displays a message: "Oops, your files have been encrypted!" and provides contact information for ransom payment.

Abfahrt	Linie	Ziel	Gleis
22:10 RB81	Flöha - Pockau-Lengefeld	Nach Olbernhau	8
22:30 RB30	Flöha - Freiberg	- Fährt heute Hbf	11
22:31 RB30	Hohenstein	(S) Hbf	10
22:36 RB80	Flöha - Zsch...	g-B. Süd	8
22:36 RB45	...rt heute von	Hbf	9
22:44 RE6	Geithain - B...	Hbf	5
22:45 RB89	Einsiedel - Thalheim (Erzgeb)	Aue (Sachs)	14
23:30 RB30	Flöha - Freiberg (Sachs) - Tharandt	Dresden Hbf	11

BMG | MIS

Heise.de 13.05.2017

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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