Cyber Security News

Walter Wutzl – Head of Technical Sales Secondary
Franziska Diestel – Head of Software & Digitalization

VAR Partner Day 2022 | September 12 -14 | Zagreb, Croatia

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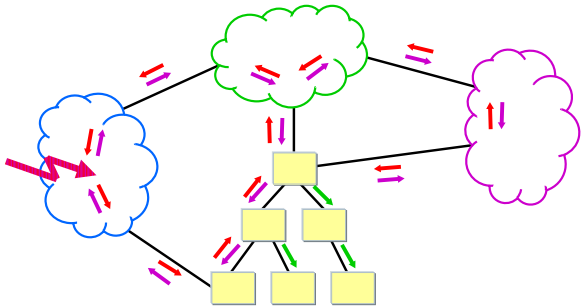
System and Product Solutions for Cyber Security

Intensive collaboration with Austrian utilities since 2013

- Due to a communication problem that affected almost all utilities in May 2013



Siemens Digital Grid Austria certified for ISO/IEC 27001 since 2015

NIS Directive entered into force in August 2016

- 27 months for member states to transpose the NIS Directive into national laws

enisa
EUROPEAN UNION AGENCY FOR CYBERSECURITY

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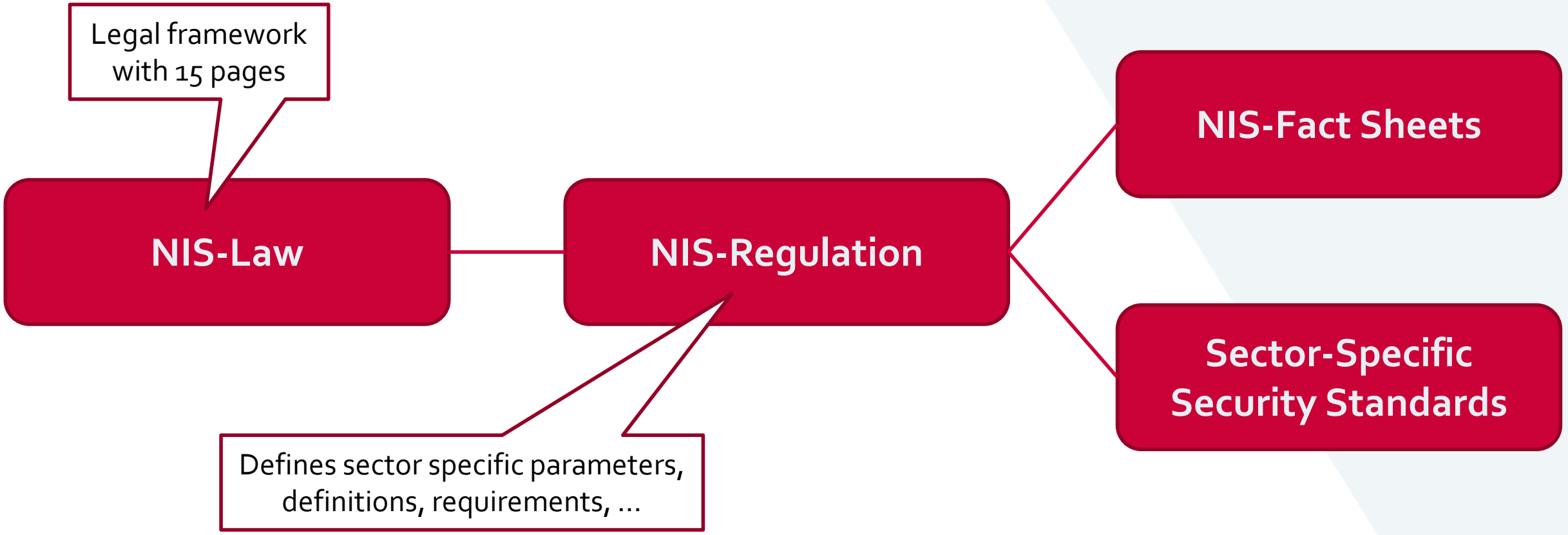
Implementation of the NIS Directive in Austria…

…from the point of view of the Operational NIS Authority in the Ministry of Internal Affairs

Customers started late, are struggling now …

Gernot Goluch, II/.BVT/5-NIS
Wien, 27. Juni 2019

Security Measures – Framework



Sector-Specific Security Standards

Bundesministerium
Inneres

bmi.gv.at

Security Measures – Framework

Legal framework with 15 pages

NIS-Law

NIS-Regulation

NIS-Fact Sheets

Sector-Specific Security Standards

Defines sector specific parameters, definitions, requirements, ...

Siemens – 27. Juni 2019

4

AT-3SV-Elektrizität

Sektorenspezifische Sicherheitsvorkehrungen für den Sektor Energie (AT-3SV-Elektrizität) im Sinne des § 17 Abs. 2 NISG mit Einschränkung auf den Teilsektor Elektrizität im Sinne des § 4 Abs. 1 Z 1 NISV

Versionsnummer: 1.4
Ausstellungsdatum: 24. Juni 2021
Österreichs E-Wirtschaft

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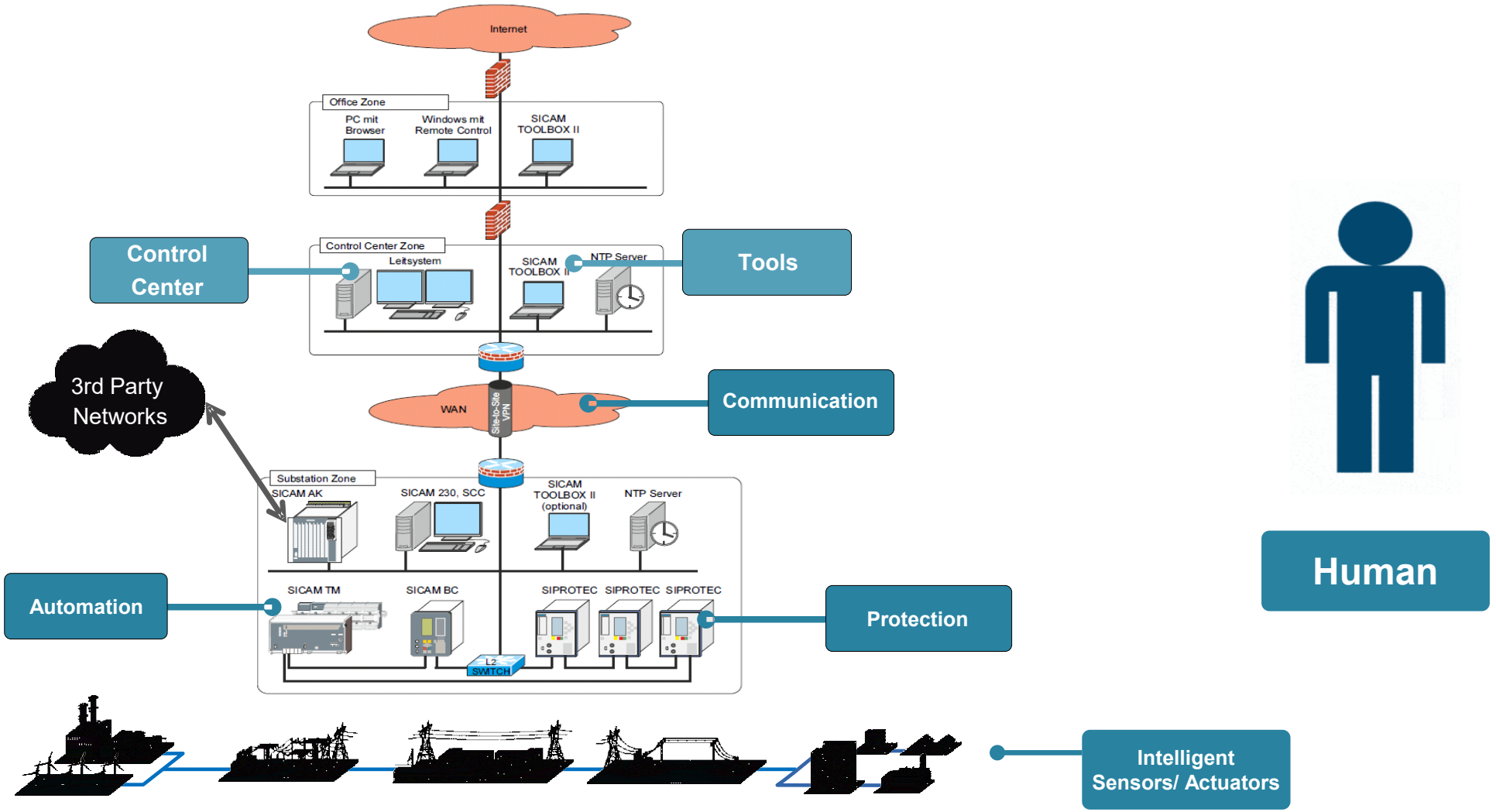
Security – A Holistic View



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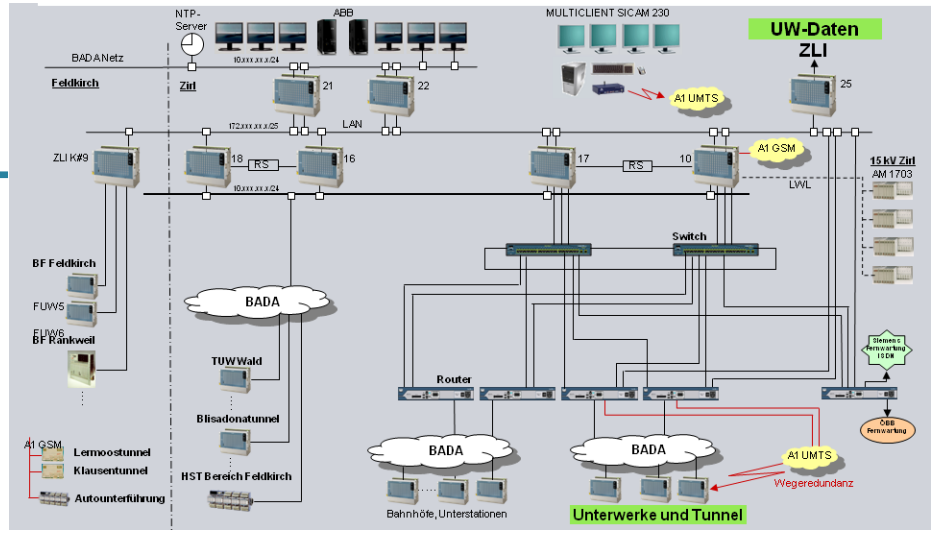
Security - Topics

Products

- Security for control centers
- Security for embedded systems
- Security for engineering tools

System - Security4projects

- Network segmentation
- Data transmission via unsecured networks
- Back up / Restore
- Patch management
- Integration / upgrade of existing systems



Human

- Security Know How
- Security Maintenance

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Security - Topics
SICAM A8000 – Security Features (Excerpt)

Firewall

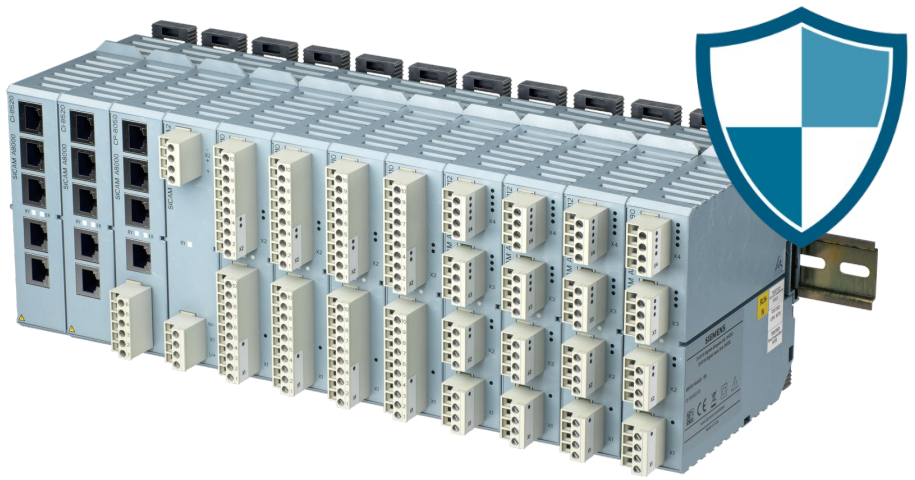
For the separation of TCP/IP networks via integrated software firewall or additional hardware-based application firewall

Firmware Signature

Protection against firmware manipulation

Security Logbook

Non-volatile storage of SYSLOG events



TLS encryption

Certificate based encryption in accordance IEC 62351-3

IPSec encryption

Communication encryption via pre-shared keys

Role Based Access Control

in accordance with IEC 62351-8

VLAN support

in accordance with IEEE 802.1Q

Security – Topics
Data transmission via unsecured networks

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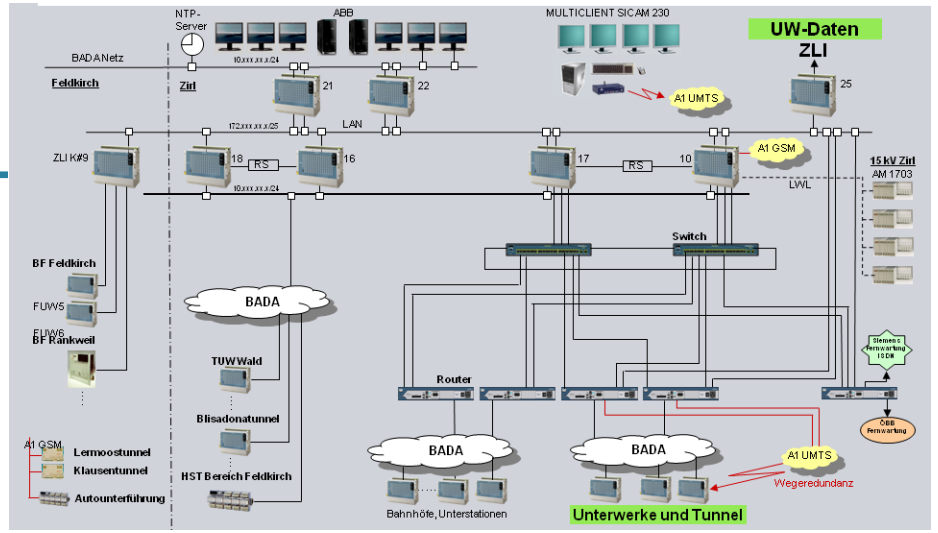

Human
- Security Know How
- Security Maintenance

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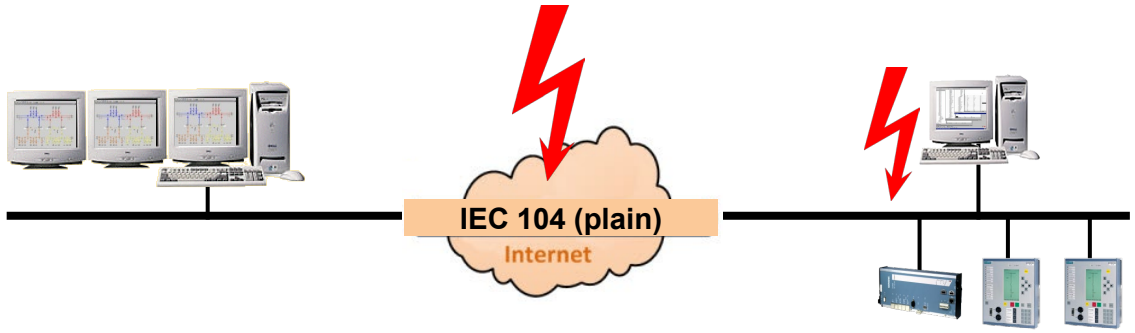
Data transmission via unsecured networks
System - Security4Projects

No secured communication between control center zone ⇔ substation zone

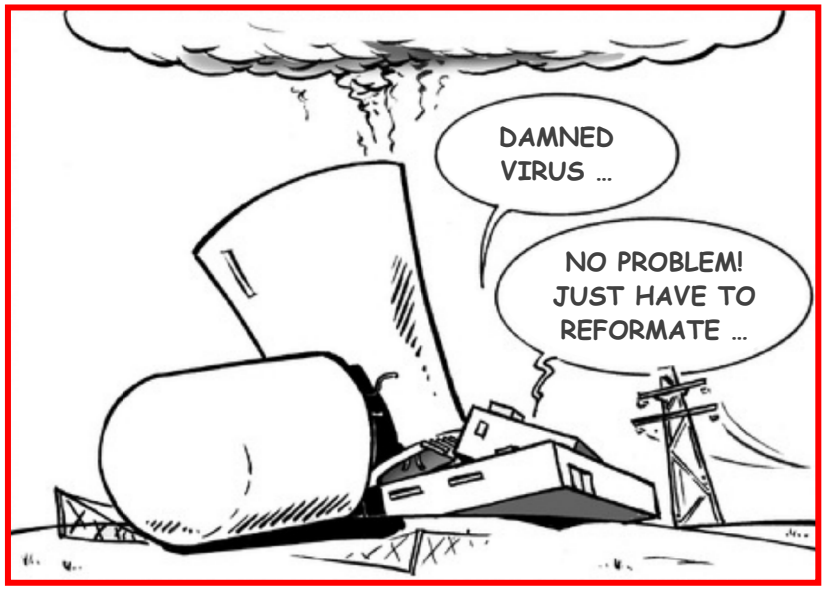
- No problem if secure wide area network …



Control Center Zone **Substation Zone**

Potential threat of

- Man-in-the-middle attack
  - Replay attack for commands …
- IP-based unauthorized access
  - e.g. substation ⇒ control center



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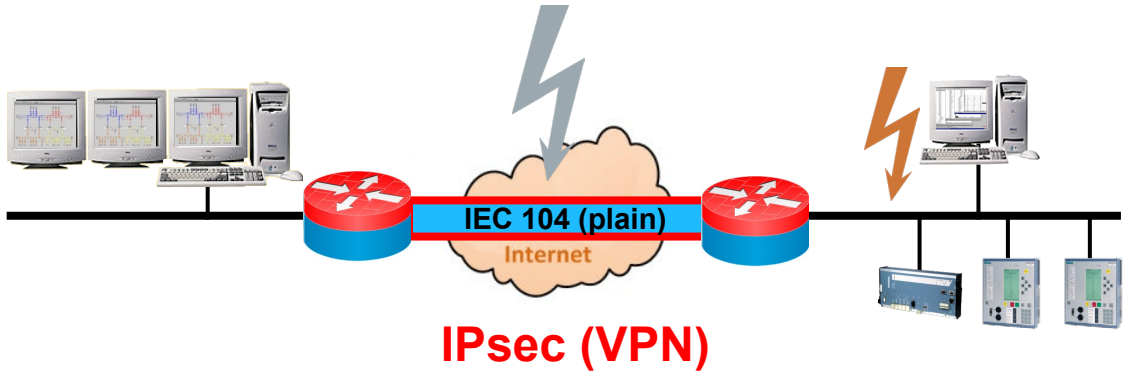
Data transmission via unsecured networks
System - Security4Projects

Site-to-Site Security between
control center zone ⇔ substation zone

- No impact on existing system/devices
- Actual standard for encryption
- Based on network components
  - Need for network know how …



Potential threat of

- Man-in-the-middle attack
  - Replay attack for commands …
- IP-based unauthorized access
  - e.g. substation ⇒ control center

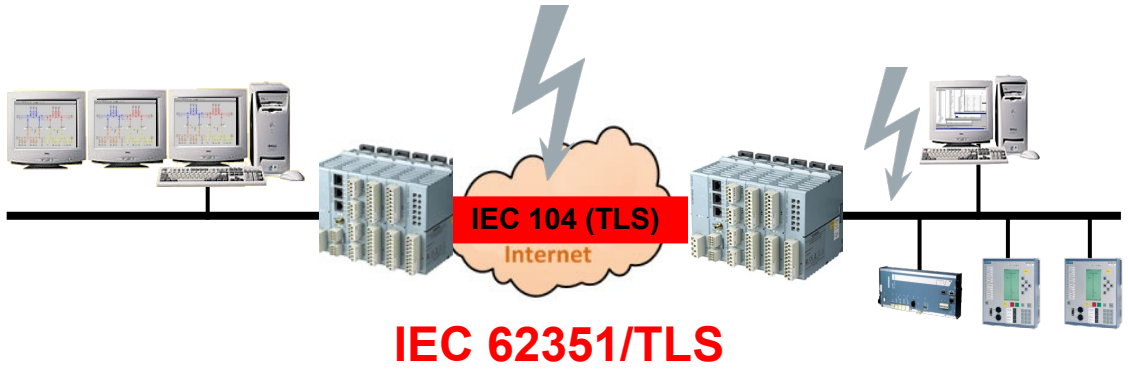
Data transmission via unsecured networks
System - Security4Projects

End-to-End Security between
control center zone ⇔ substation zone

- By Hardware Application Layer Firewall
  - Encryption, authentication
- No impact on existing system/devices
  - Easy to configure
  - Independent from communication network

Potential threat of

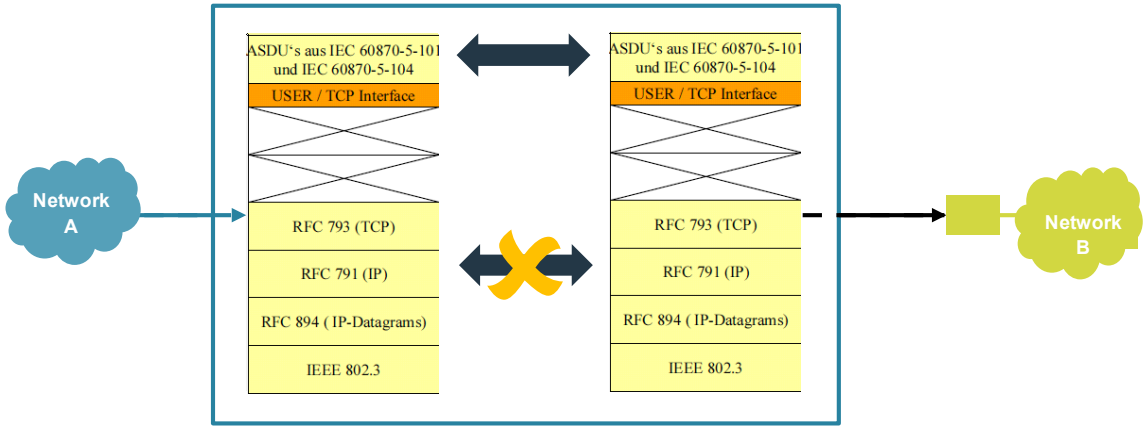
- Man-in-the-middle attack
  - Replay attack for commands …
- IP-based unauthorized access
  - e.g. substation ⇒ control center



IEC 62351/TLS

Control Center Zone **Substation Zone**

Hardware Application Layer Firewall



No Bridging, switching or routing of IP-frames through IED

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Data transmission via unsecured networks
System - Security4Projects

End-to-End Security between
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Potential threat of

- Man-in-the-middle attack
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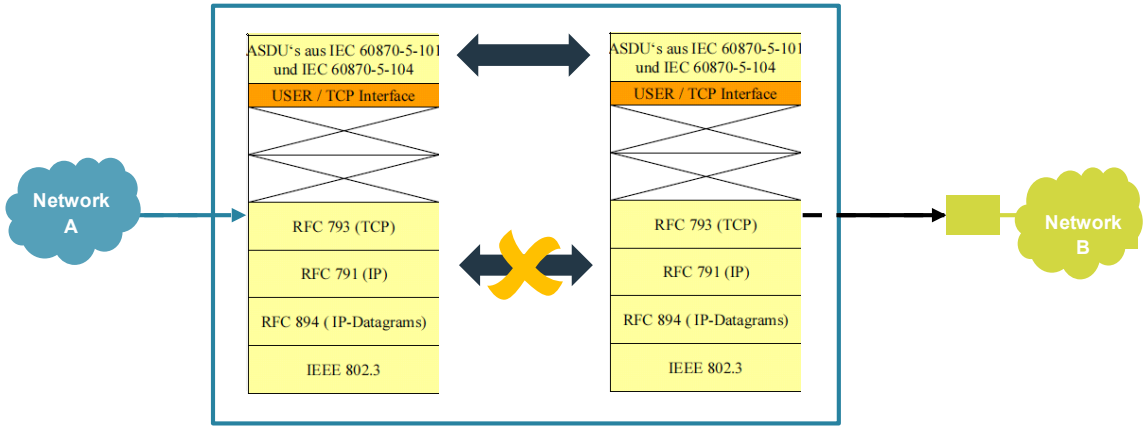
- IP-based unauthorized access
  - e.g. substation ⇒ control center

IEC 62351/TLS

Control Center Zone **Ring Main Unit**

Hardware Application Layer Firewall



No Bridging, switching or routing of IP-frames through IED

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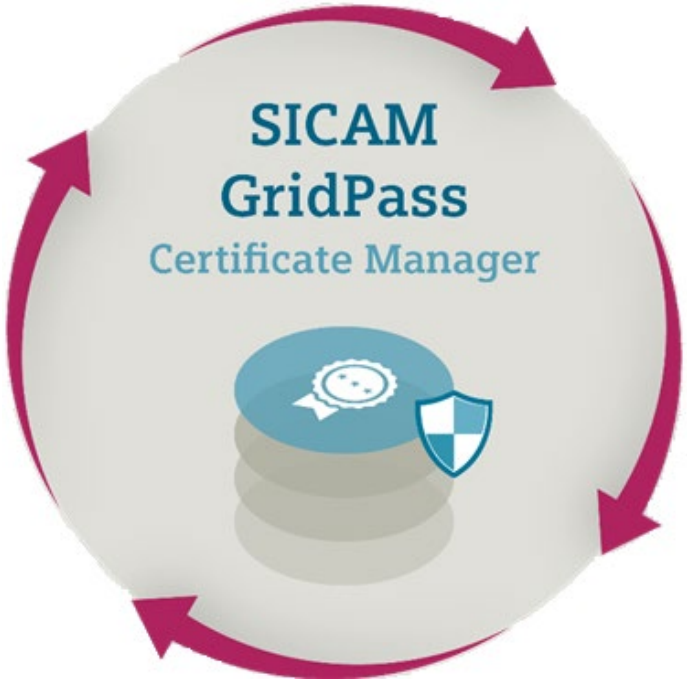
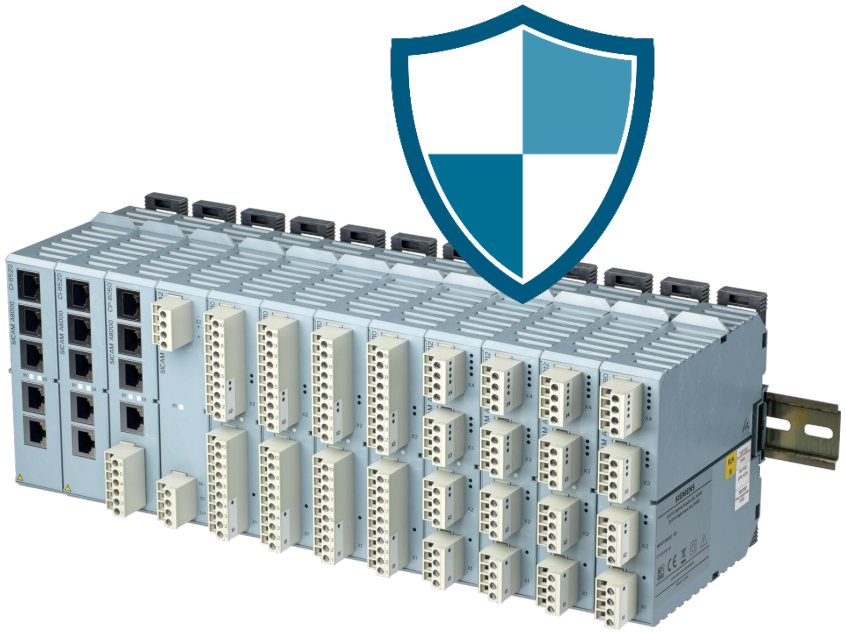
Data transmission via unsecured networks
Certificate Management (SICAM Gridpass)





For automatic exchange of certificates in IED

Security – Topics
Patch management

Products
- Security for control centers
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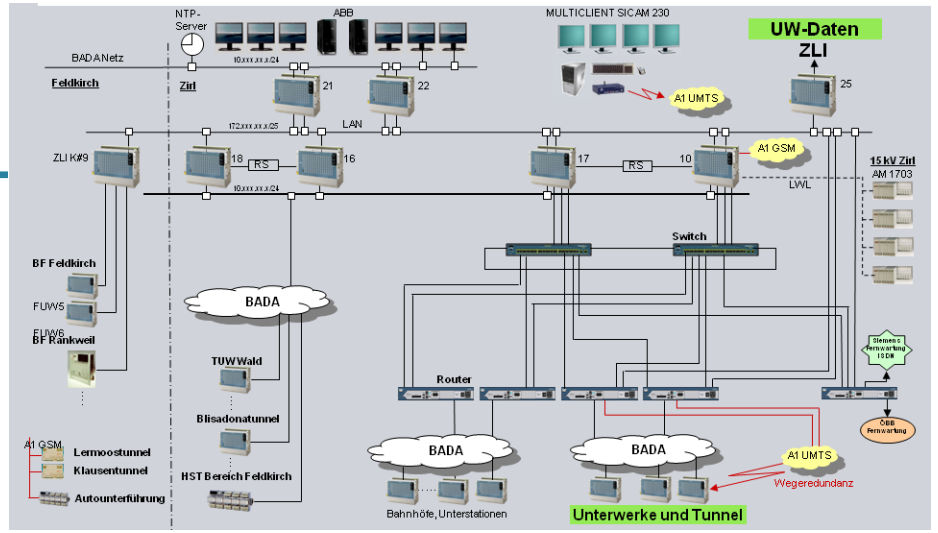

Human
- Security Know How
- Security Maintenance

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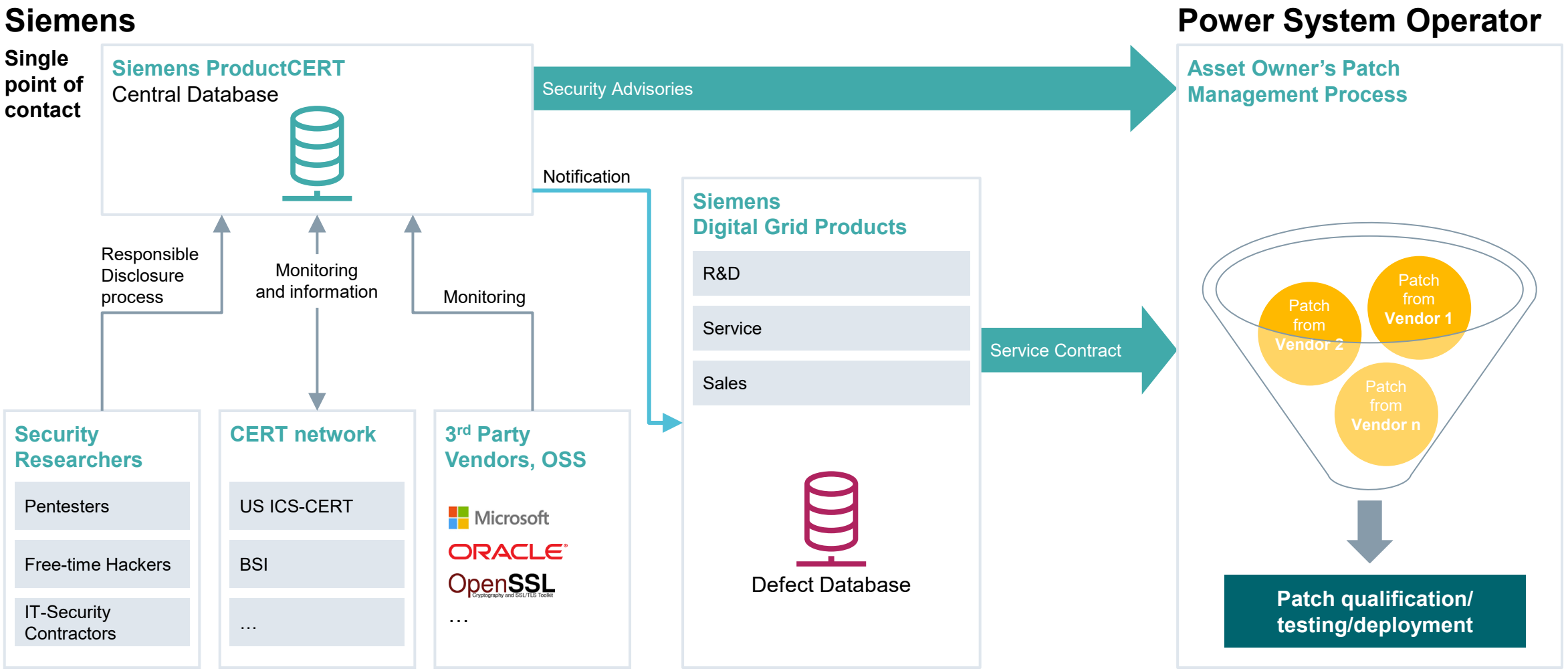
Patch management
Precondition: Monitoring for Vulnerabilities



1st Patch Management Contract @ Austrian Utility since 2017

One of the biggest Austrian Utilities

- Huge installed base
- Over years …

Motivation

- ISO 27001 certified
- NIS Directive

Common development of process/ setup with customer

- Over months …

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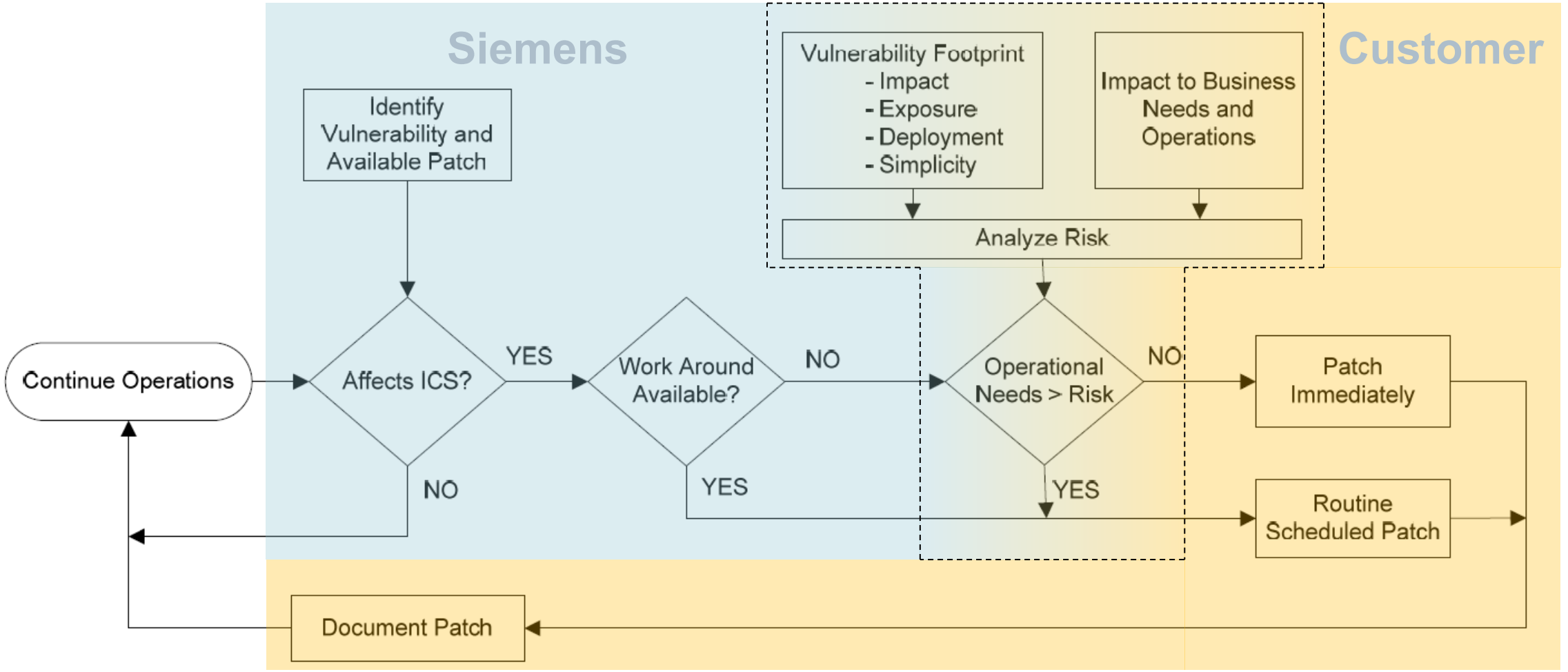
1st Patch Management Contract @ Austrian Utility since 2017
Patch Urgency Decision Tree



Intrusion Detection
How it works in office IT

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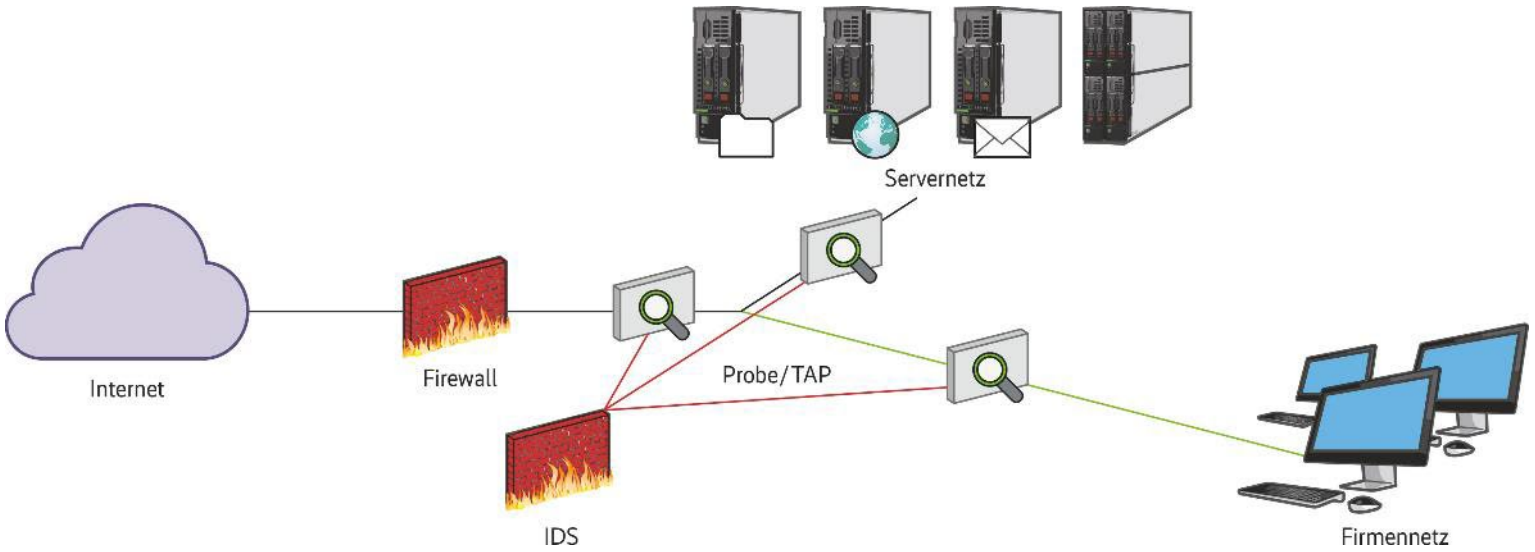
Ingenuity for life

IDS (Intrusion Detection System) analyzes the data stream in network and reports suspicious behavior by

- comparison with known attack signatures (“blacklisting”) and
- statistical analyses

IDS is „listening“ the data stream via

- mirror ports and/ or
- sensors



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IDS (Intrusion Detection System) analyzes the data stream in network and reports suspicious behavior by

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- statistical analyses

Not working for process networks (OT) so far …

- Experience of joint research project together with university and utility
- Feedback from users from other pilot installations

Intrusion Detection
Approach for Process Networks

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Ingenuity for life

IED = sensor and reports

everything it doesn't know („Whitelisting“)

- unknown messages, IP-address, etc. defined in parameters

As well as other „anomalies“

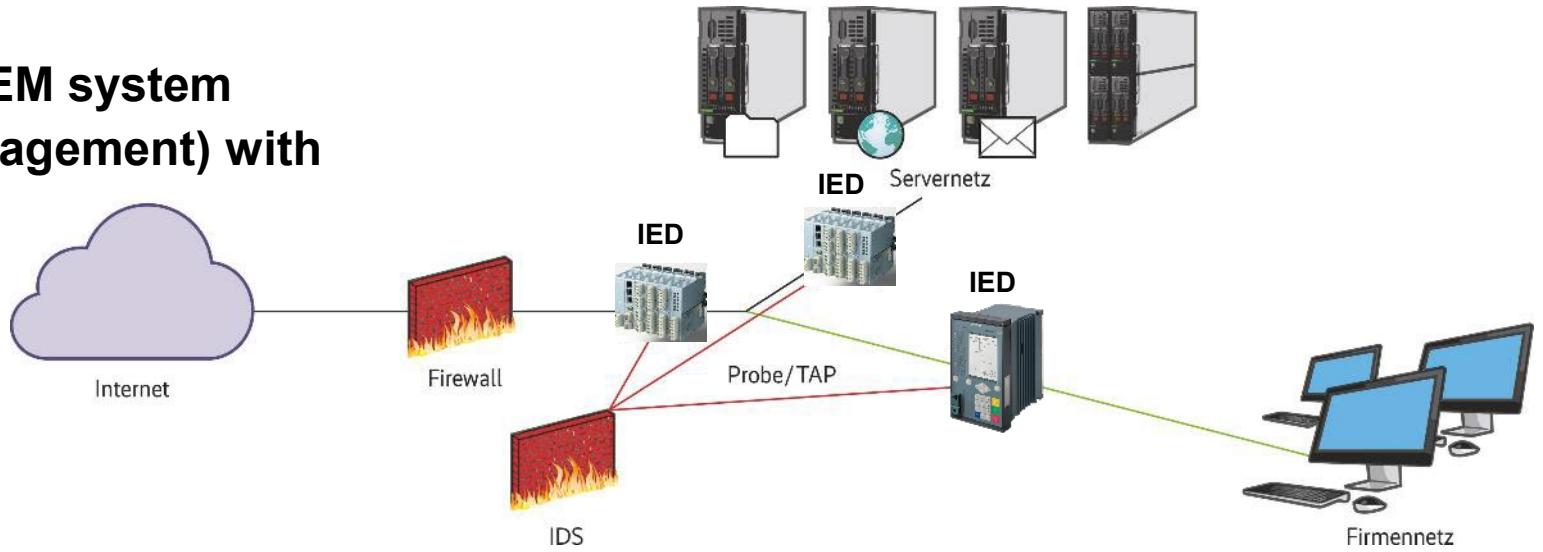
- Remote Access, Ping, new MAC-address, high data load, …

Many sensor functions implemented already

- Integrated syslog with A8000, SIPROTEC 5

Already practical experience with SIEM system (Security Information and Event Management) with

- projects
- internal technical OT network



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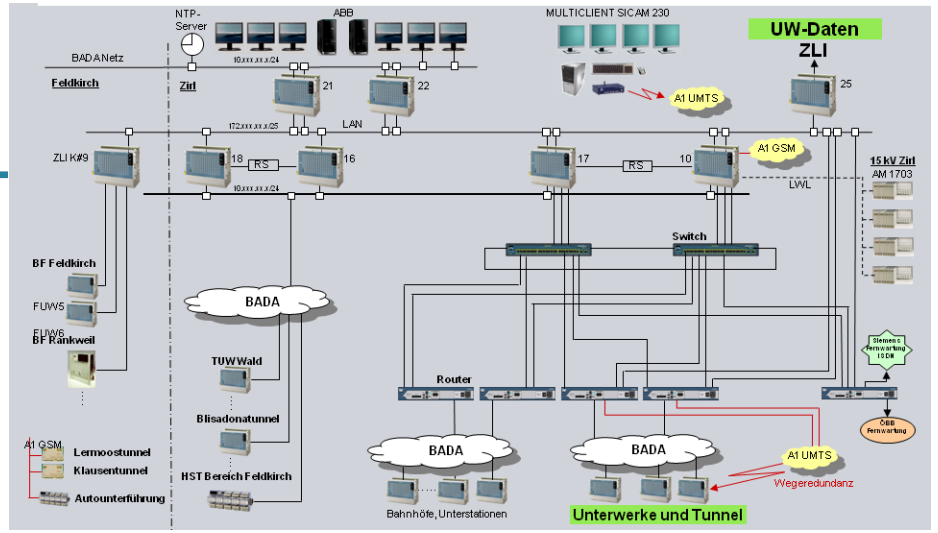

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Implementation of Security Requirements by Defined Process

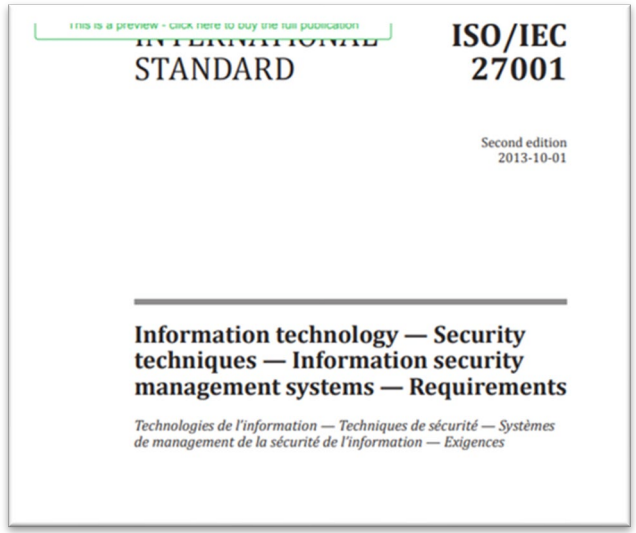
1. Technical assessment of existing system

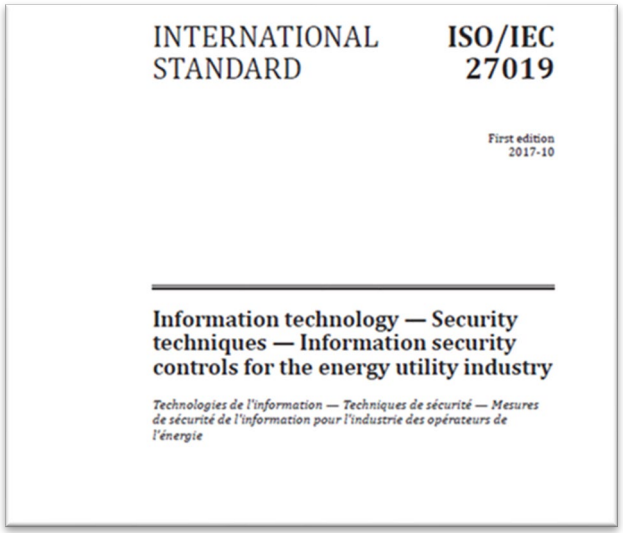
2. Assessment of technical risks in existing system

- Based on ISO 27001

3. Definition of measures for the security enhancement

- Based on BDEW Whitepaper and ISO 27001/ ISO 27019





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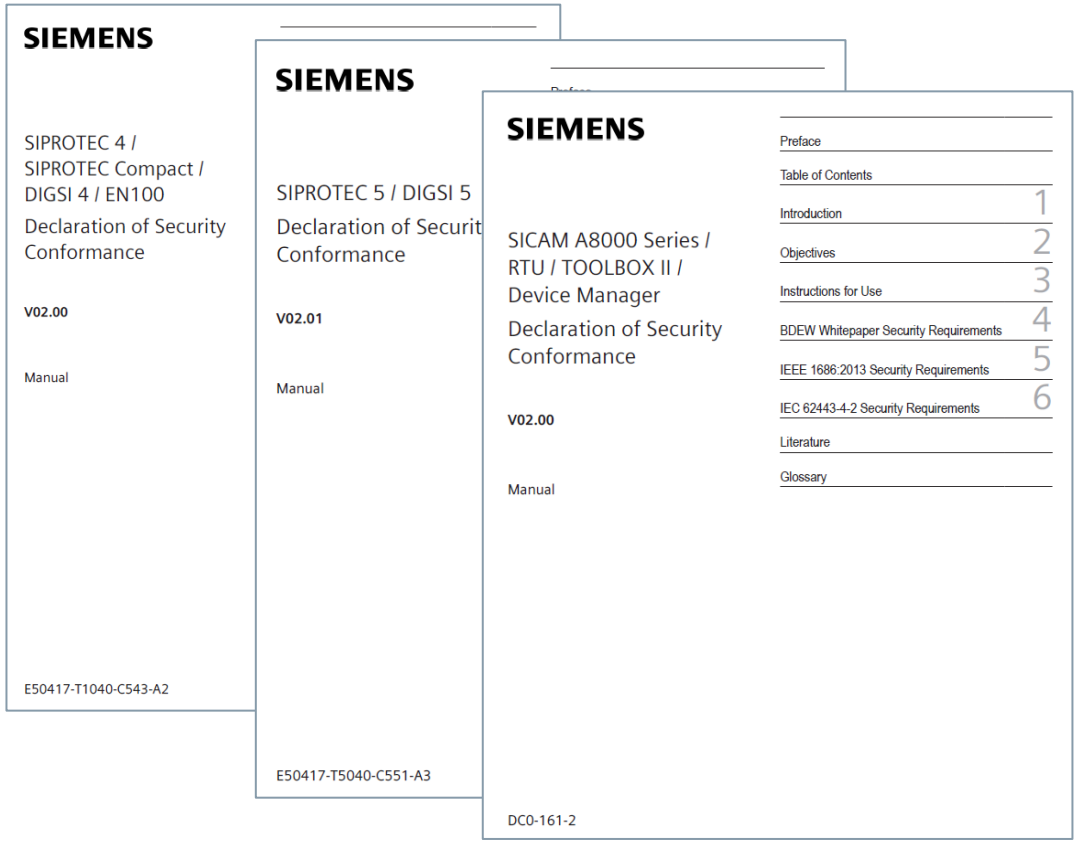

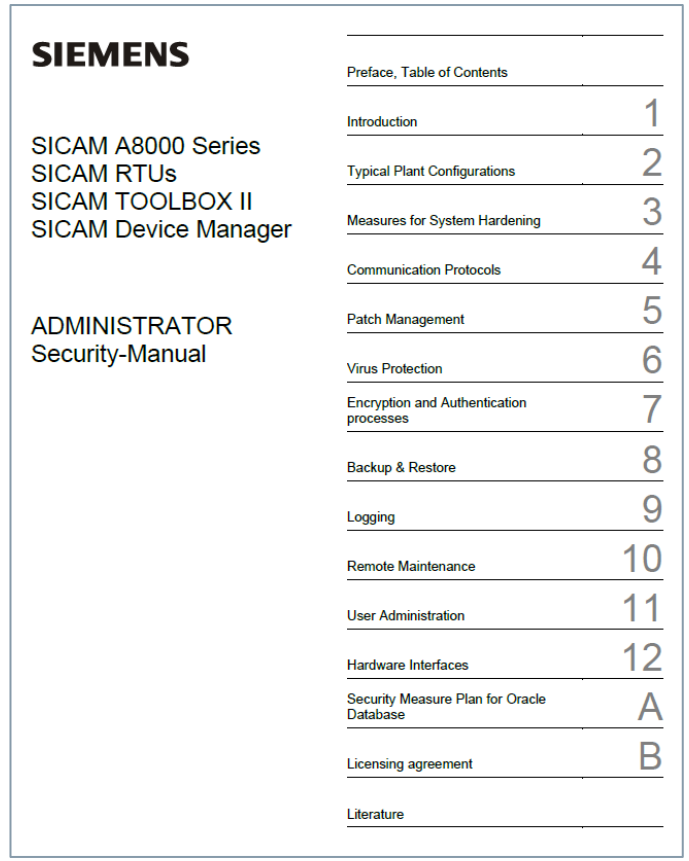

Product security conformance/ functions according to bdew/OE Whitepaper requirements

Guidelines, blueprints, examples

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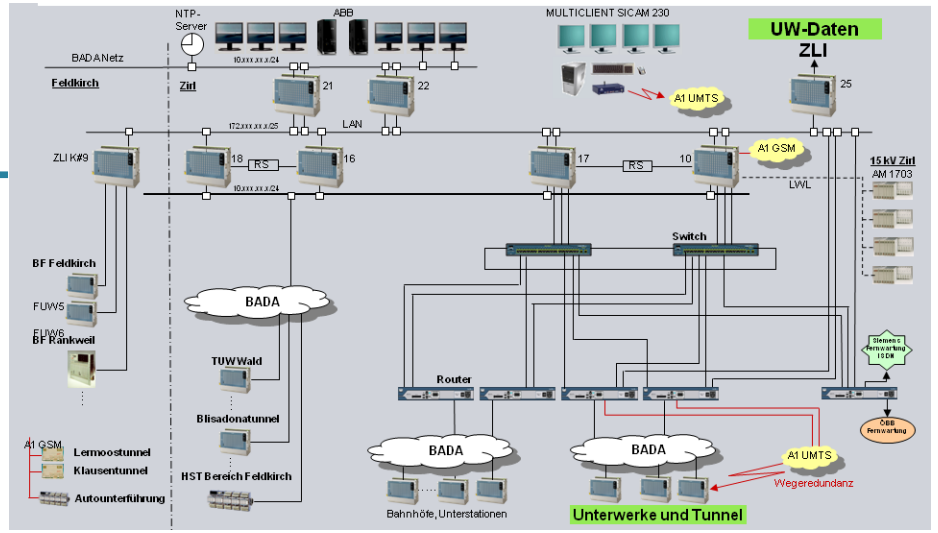

Human
- Security Know How
- Security Maintenance

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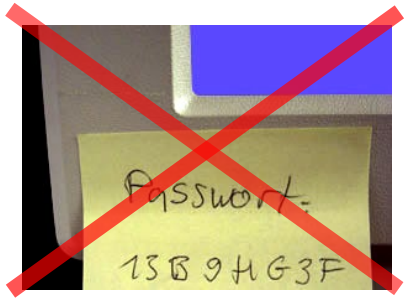
Human – Security Know How

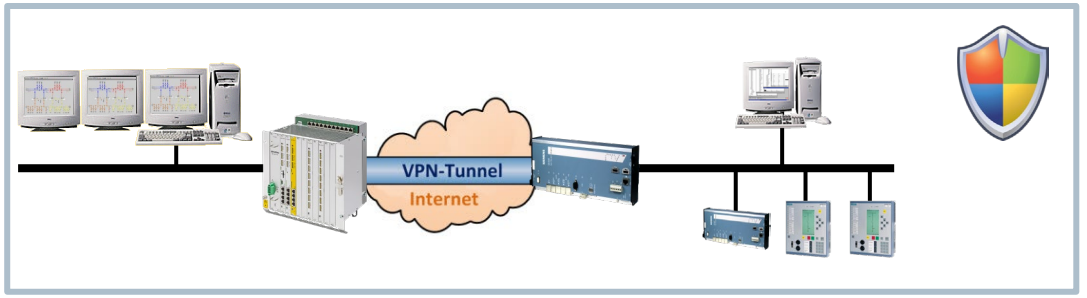
OT Security Basics

- Organizational and technical measures have to be defined and implemented
- Transfer/ training of security know how
- Available applications, technologies, …
- Awareness of staff …



OT Security in projects

- Has to be considered from the beginning
- Has to be tested
- Has to be maintained



Trainings offered by

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