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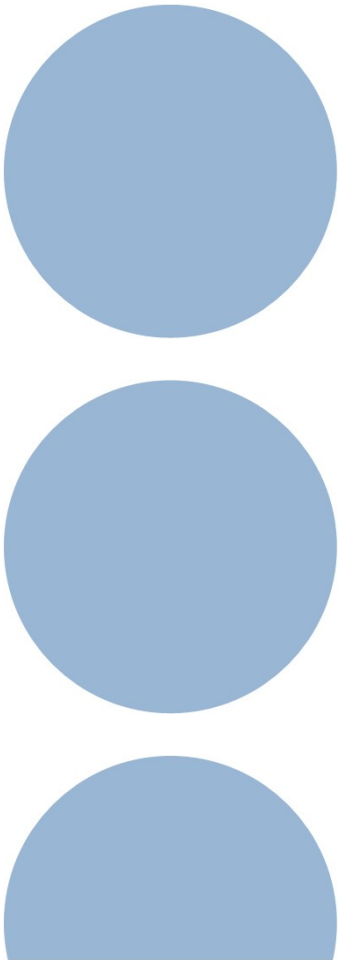
Berufsgenossenschaft
Holz und Metall

Ihre gesetzliche Unfallversicherung

Functional safety in networked production

Remote Access

Thomas Schulz



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Functional safety in networked production

Press release from 16.10.2019

Production disruption at Porsche

According to Spiegel Online 200 servers are down

A hard disk was defective!

https://www.spiegel.de/netzwelt/web/porsche-massive-it-stoerung-legt-produktion-lahm-a-1291792.html

Functional safety in networked production

The problem is every time the communication

- The information is sent but not received
- The information is not understood
- Too much information at once
- Incorrect information
- Incomplete information
- The information was changed during the transmission

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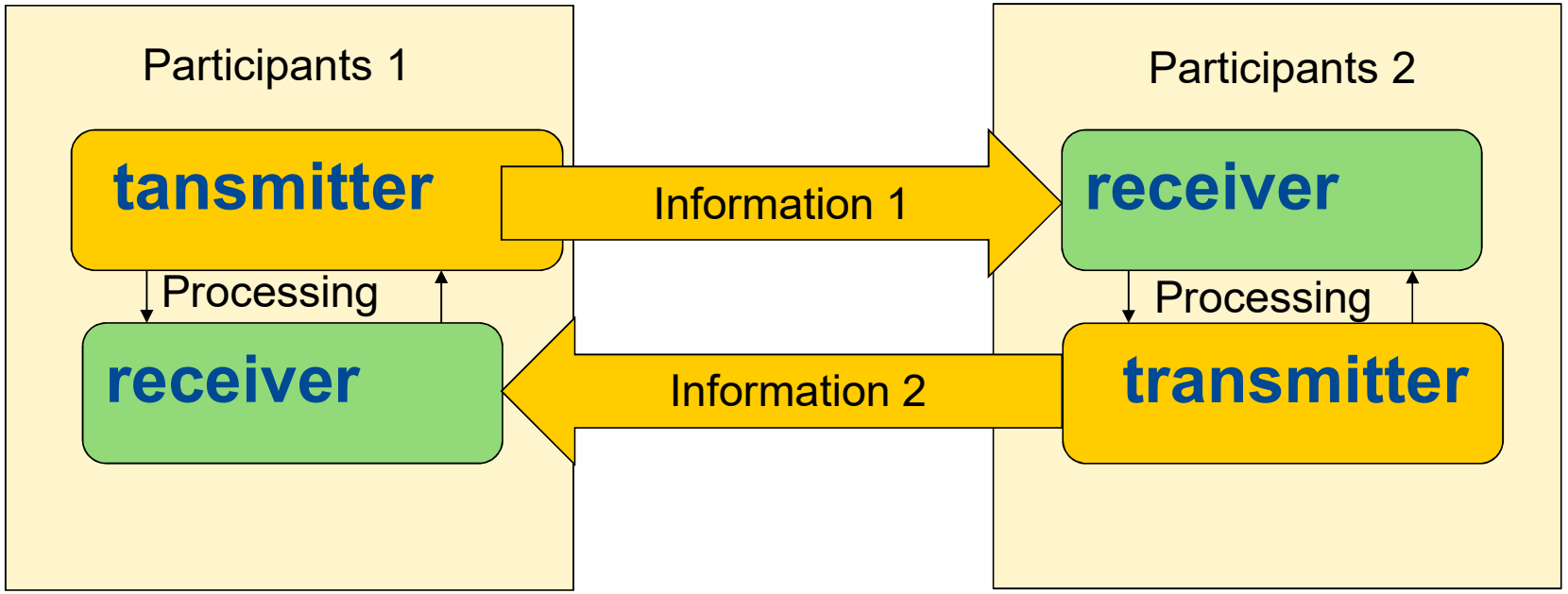
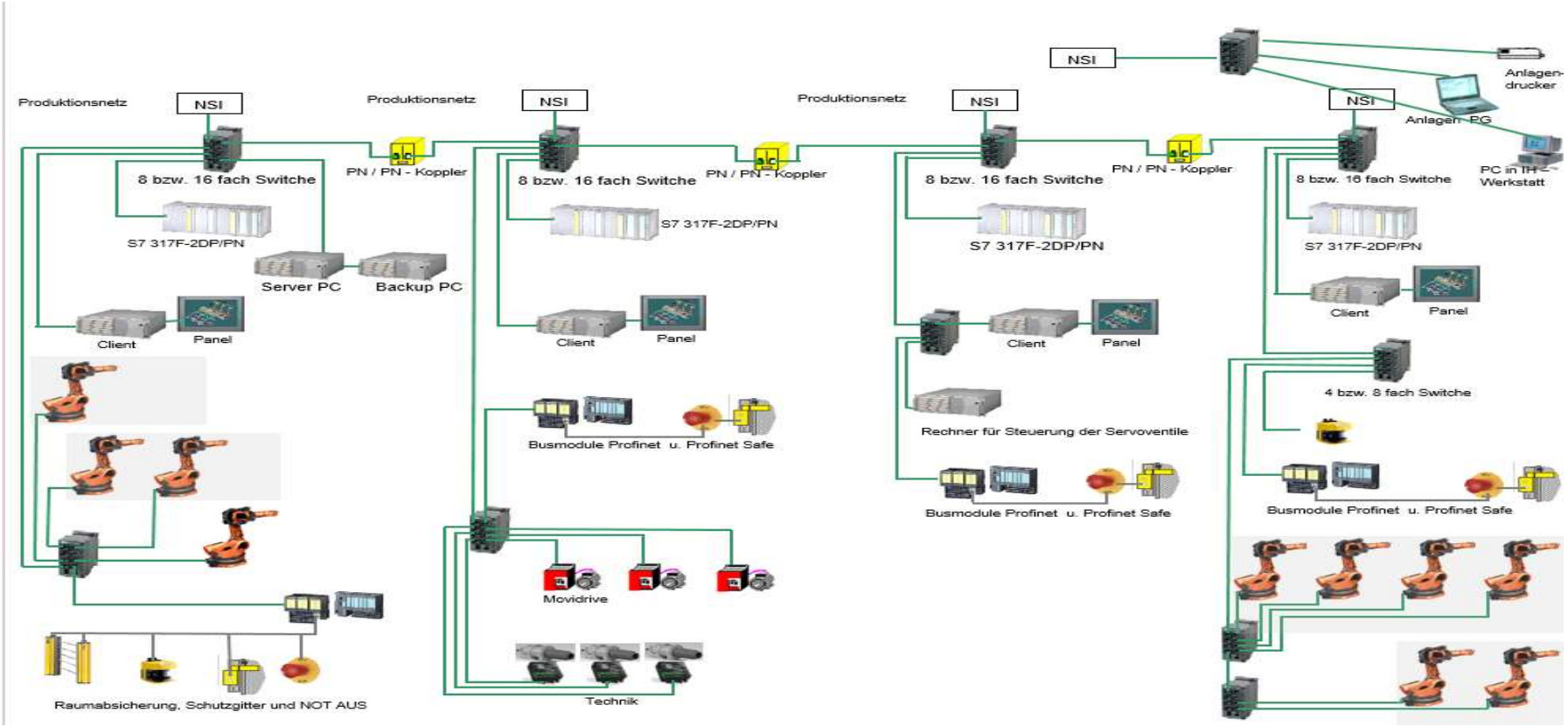
and so on

Functional safety in networked production

Simplified presentation of an easy communication



Simplified presentation of communication in a modern servo press



servo press line

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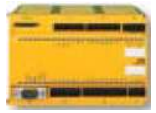
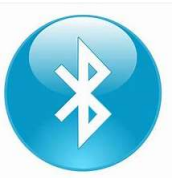
What we can do?

- **Determine and classify hazard factors**









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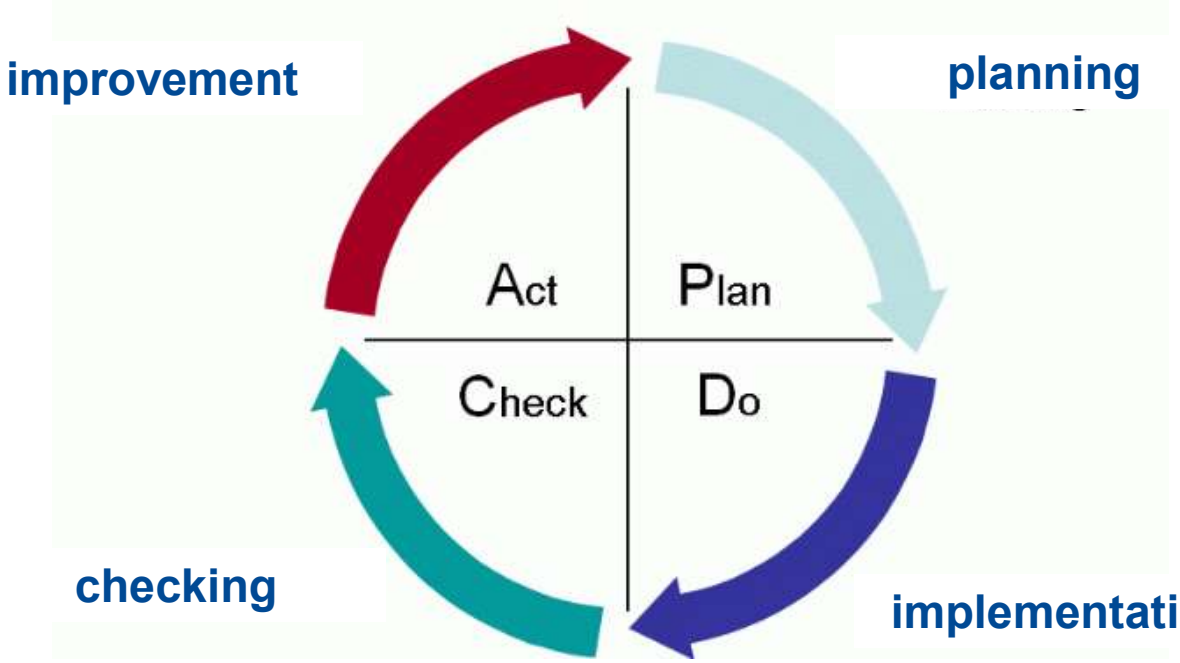
What we can do?

- Risk analysis of internal machine communication
  - Operation mode related
  - during maintenance
  - during repair

- Risk analysis of external communication
  Machine 1 - Machine 2 - Networks - Worldwide network
  - Operation mode related
  - during maintenance
  - during repair

Plan and implement measures and check them again and again



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Example Remote Access:

1 a) PC / PC - Remote control via Worldwide network

- We need a PC incl. configuration software and licenses at the machine.
- There must be a competent person on the machine
- Operation / maintenance by the 4 eye principle

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Example Remote Access :

1 b) Remote control via VPN connection directly with the system

- The visualization PC has internet access
- No configuration software for the machine is required on the visualization PC (only the remote maintenance software).
- The remote maintenance computer requires the complete project planning software including licenses and accesses the system components directly via VPN connection.

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Example Remote Access :

Continued 1 b:

- There must be a competent person on the system / machine.
- The visualization PC is operated according to the 4-eye-principle.
- Changes are only visible on the remote maintenance computer.
- The adaptation / maintenance of the control program remains hidden from the customer / commissioning engineer on site.

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Example Remote Access :

2. Why?

- **Diagnosis of the machine**
  Read error memory
  Recording Trace
  Monitor variables

- **Functional Support Operation**
  Operating aid for the customer

- **Software Diagnostics**
  e.g. be able to trace "malfunctions" of the software

- **Adaptations**
- Small to medium changes of the program ...

Example Remote Access :

3. What are the rules?

- Changing the security parameters / programs
  - Commissioning engineer (qualified person) on the machine
  - The test of the safety function is carried out by the commissioning engineers on the machine.

- Security of the Internet connection of the visualization PC is the responsibility of the plant operator.

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- Information of the customer on the machine before the access takes place

Example Remote Access :

RECOMMENDATION

Only connect to the WWW as long as necessary i.e.

Hardware Disconnection / Deactivation of the Internet Connection after remote maintenance has been carried out

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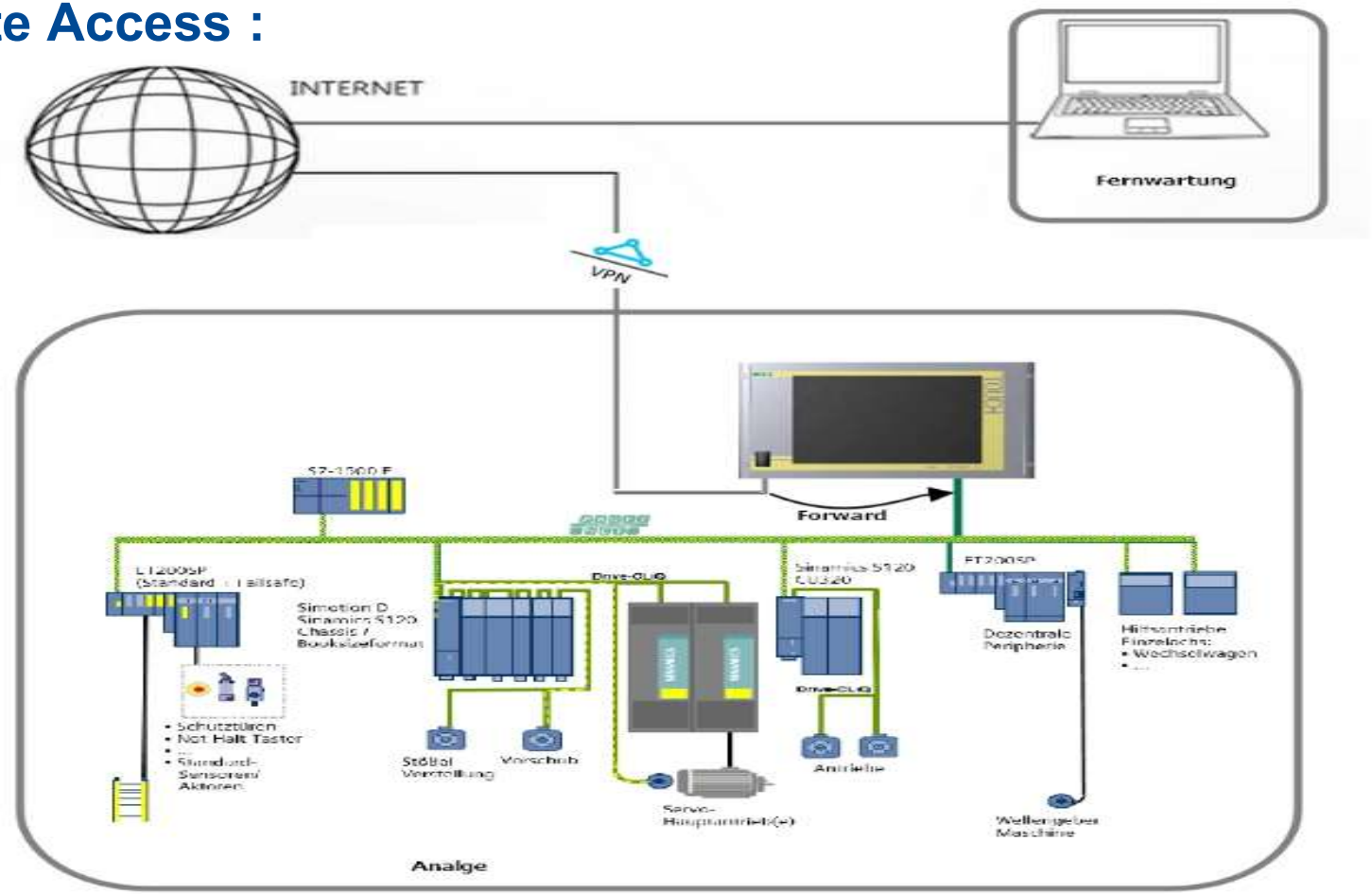
Example Remote Access :



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Literature

Fachbereich AKTUELL

FBHM-102

DGUV Fachbereich Holz und Metall
Berufsgenossenschaft Holz und Metall

Sachgebiet Maschinen, Robotik und Fertigungsautomation

Safety und Security in der vernetzten Produktion

Status: Oct. 1st, 2018

Safety and Security in Networked Production

Content:

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The safety of production systems is a central prerequisite for the success of the fourth industrial revolution "Industry 4.0". In contrast to English, the term "safety" is used in German for two different technical fields of work. On the one hand, this is the area of occupational safety or technical safety, but on the other hand it is also the area of IT or cyber safety. The German vocabulary does not provide for a clear distinction between the two terms "safety" and "security".

Thank you for your attention.

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