Omnivise T3000 R9.2

Latest release of the proven control system

Agenda

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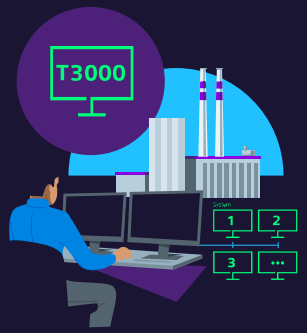
Lifecycle

2



T3000 SCADA

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T3000 Virtual

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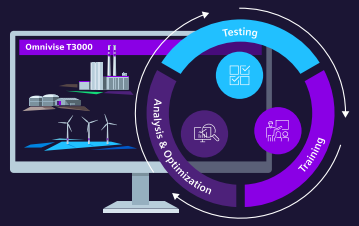

T3000 Simulator

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T3000 Cybersecurity

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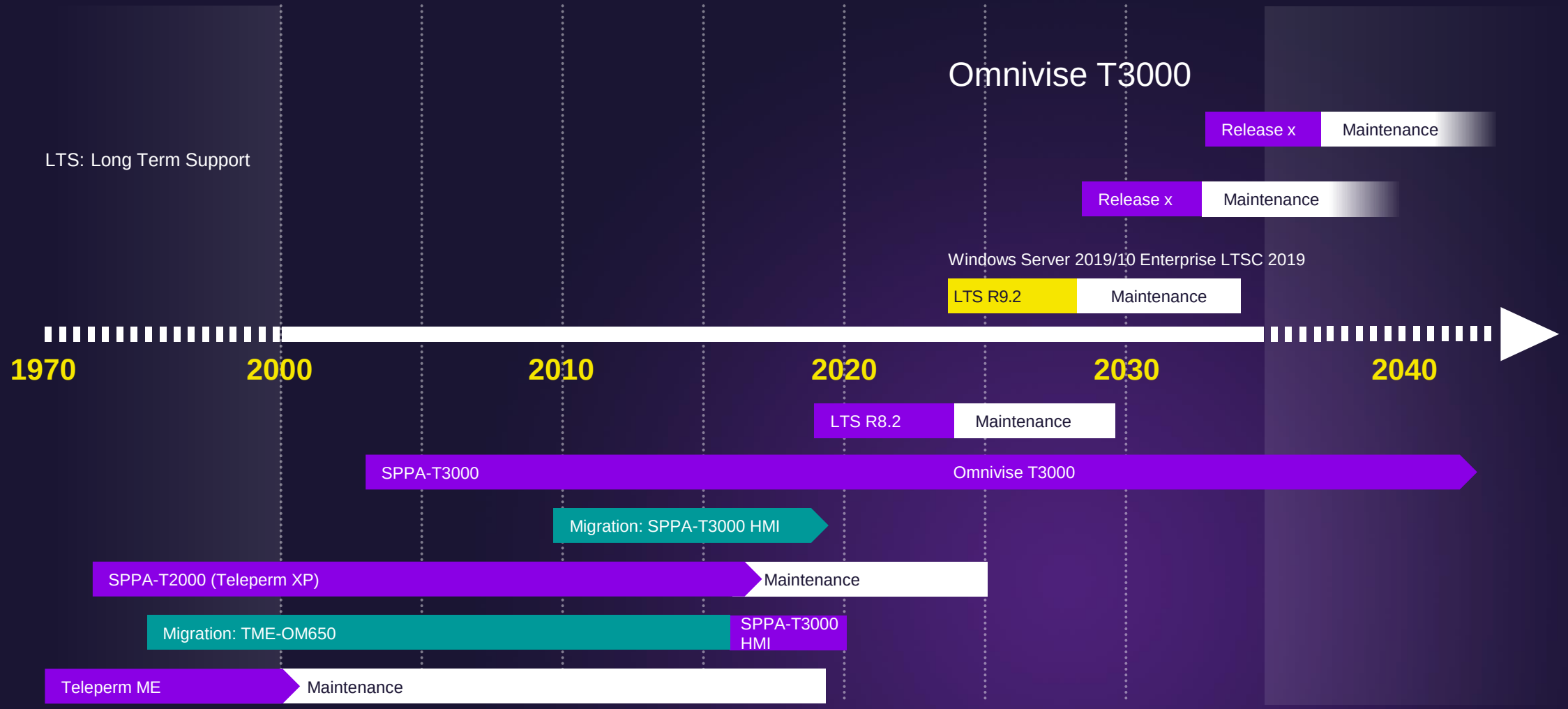
References

Lifecycle

Omnivise T3000 lifecycle ensures long-term support of installed base



T3000 SCADA

Central controls, central monitoring and integration of multiple units with T3000 SCADA

Omnivise T3000 integrates …

… different types of units ✓
from conventional
to renewables from
homogeneous to mixed

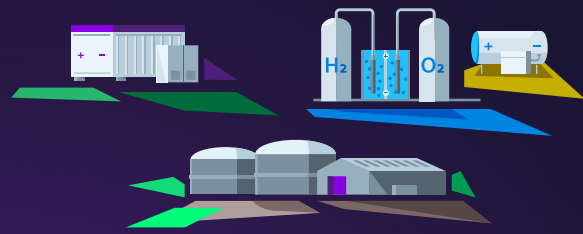
… different control and automation systems ✓
from T3000 to other I&C
systems and PLCs

Easy remote operation of distributed units

Conventional plants

Renewables

Hybrid plants



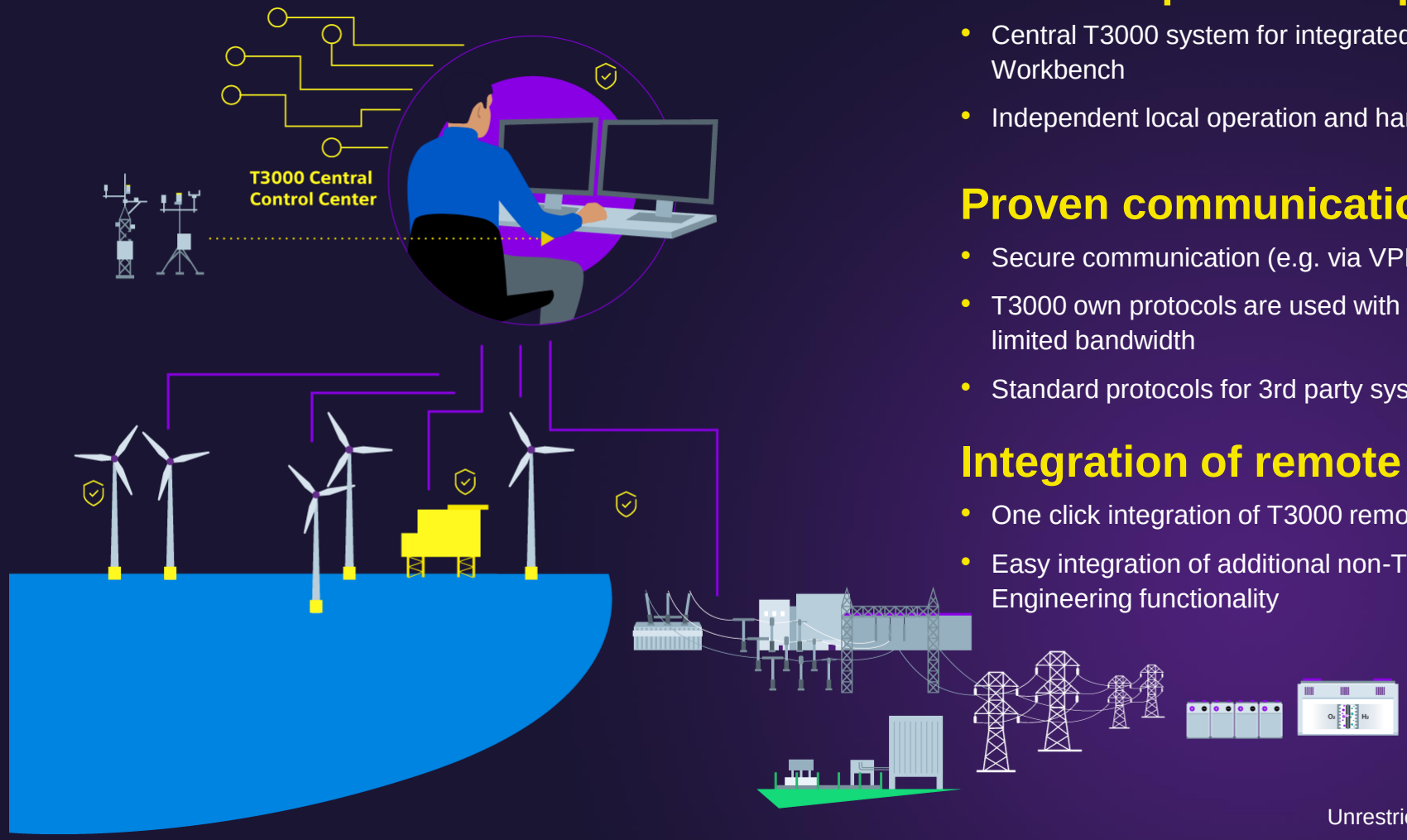
Central control room for central monitoring and control of remote units

Handling **big amount data points** for CSP, PV, wind farms incl. substations

Integration different assets, optimization, real-time **SCADA**

Single user interface ✓ One system ✓ Secure communication ✓ Easy engineering ✓ One-click unit integration ✓

Easy operation of multiple remote units from a Central Control Center with Omnivise T3000 SCADA



Remote operation capabilities

- Central T3000 system for integrated controls of the remote units from one central Workbench
- Independent local operation and handover process

Proven communication protocols

- Secure communication (e.g. via VPN)
- T3000 own protocols are used with optimized data transfer to operate with limited bandwidth
- Standard protocols for 3rd party system integration

Integration of remote units

- One click integration of T3000 remote units with Engineering import functionality
- Easy integration of additional non-T3000 remote units with standard T3000 Engineering functionality

T3000 Virtual

Virtualization eliminates customer pains and leverages value adds

Customer Pains

- Shorter lifecycles lead to faster obsolescence and exchange of the used IT HW components
- Different markets / application areas have different requirements on the HW, more flexibility is required
- Maintaining diverse systems is becoming increasingly difficult and cost intensive

Value Adds

- Easier system handling
- Independency of hardware lifecycles
- Homogeneous IT-Hardware infrastructure
- Increased availability
- Reduction of CAPEX (=TCO {total cost of ownership})
- More flexible investment planning

Meet Omnivise T3000 Virtual – your hardware-independent control system

Harmonized infrastructure and improved backup and recovery

Simplified hardware and software lifecycle management

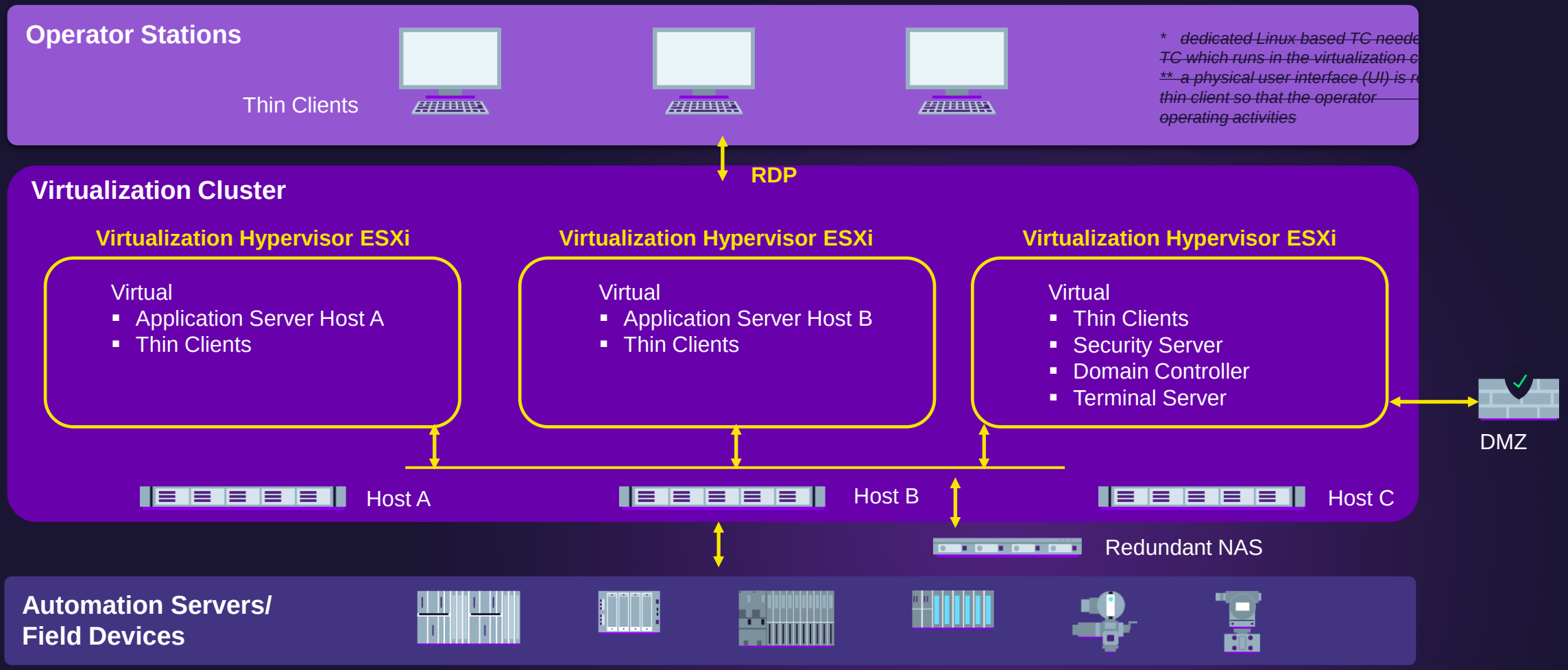
Independence from IT-Hardware components

Shortened service times for system updates

Innovative virtualization techniques

Omnivise T3000 Virtual generates independency of IT HW – and enables various advantages

Suitable for both new projects and upgrades and for customers with an own data center* in use

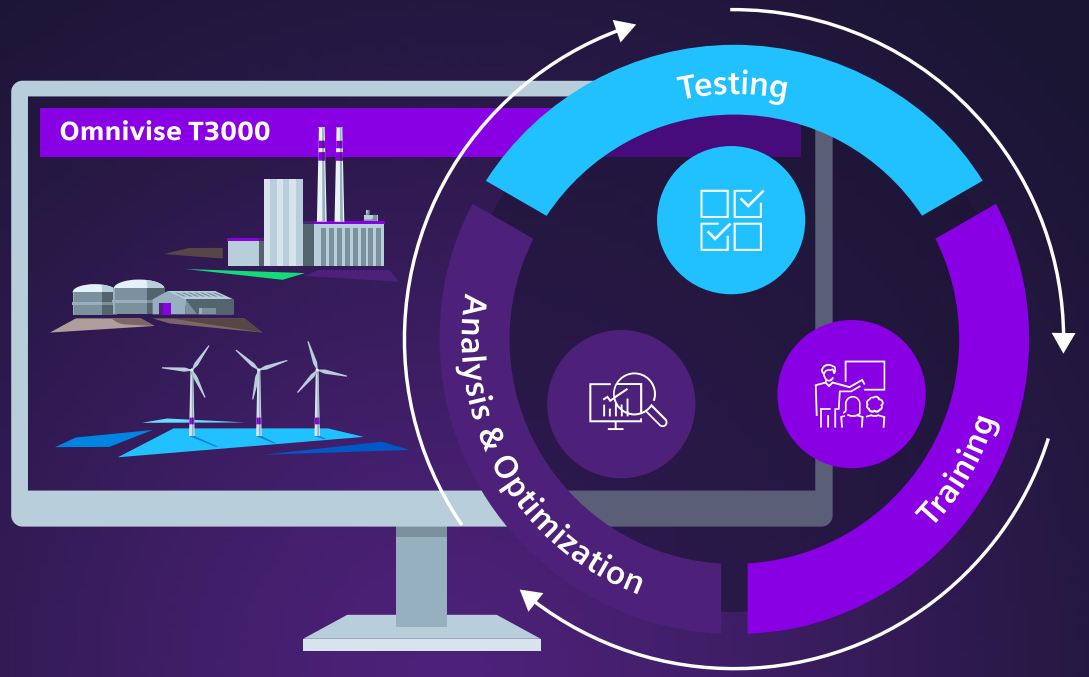


*Having Host and other H/W components with recommended specifications

T3000 Simulator

T3000 Simulator –
the simulation-based Digital Twin of your plant

Fully integrated in T3000

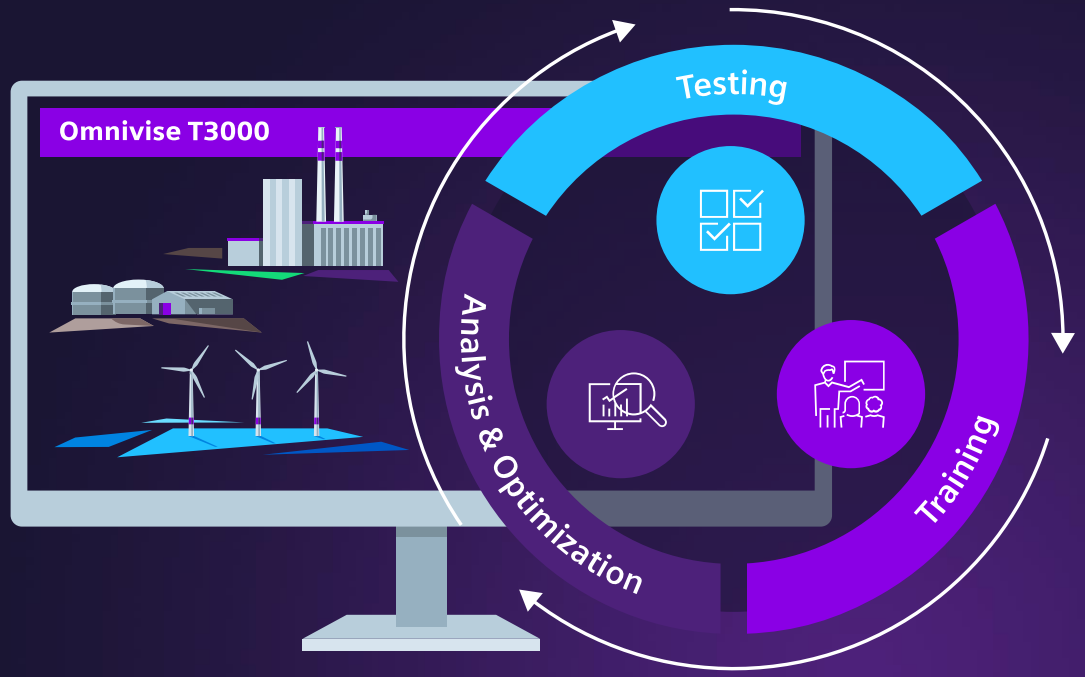


Test, train, analyze and optimize with T3000 Simulator – the safety net for reliable energy supply

Minimize risks in multiple cases

Commissioning
Virtual commissioning reduces failures before and during commissioning and significantly shortens go-to-market time.

Staff training
Efficiently qualify the control room team in the real operating system of your plant to gain and retain knowledge.



Engineering
Test changes in engineering (e.g. due to system modifications) and process optimization to know exactly what will happen before you adapt the “live” I&C system.

T3000 simulates what T3000 controls

Fully integrated digital process and automation twin

Train and test directly in T3000

Immediate and direct simulation of existing engineering data in the workbench

No additional hardware
No additional instructor station

- T3000 HMI
- T3000 Application Server
- T3000 Software
- Integrated Process models

T3000 Cyber

T3000 supports cybersecurity standards and regulations from design and development on

Cybersecurity **regulations**

enforce cybersecurity standards also in energy systems rated as critical infrastructure in almost any country

- NERC CIP (US and many countries in Americas)
- KRITIS (Germany)
- NIS (Europe)
- AESCSF (Australia)
- …

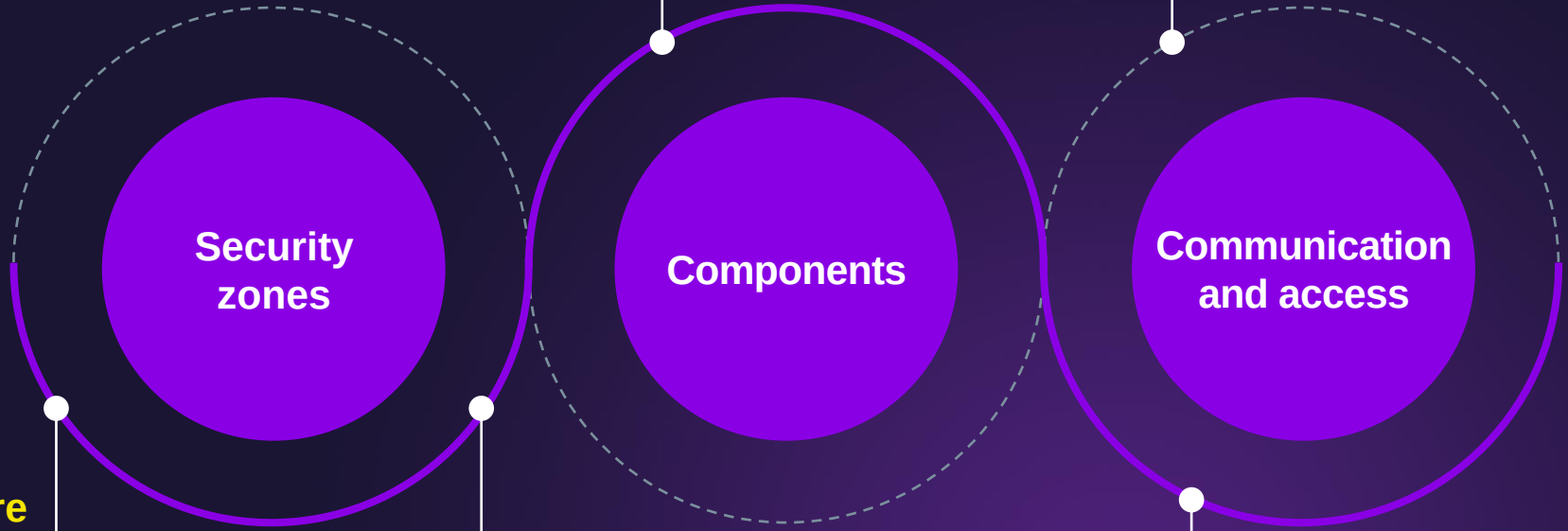
To comply with cybersecurity regulations, cybersecurity standards must be fulfilled

Cybersecurity **standards**

describe cybersecurity protection methods and techniques and best practice recommendations

- ISO/IEC 27001/27002/27019
- ISO 15408
- IEC 62443 4-1 & 3-3

The pillars of the secure Omnivise T3000 system architecture



Hardening
Component hardening based on CIS benchmarks

Remote Access
Remote support via cRSP (common Remote Service Platform) and VPN tunnel

Layer architecture
Components and systems with similar security requirements are combined into security zones

DMZ
Demilitarized zone protects T3000 from external factors

Communication standards
Communication between zones secured by e.g. firewalls, spatial separation and protocol change

Built-in cybersecurity from the ground up to keep your plant available

Protect

- System Hardening
- User Management
- Malware Protection Solution
- Application Whitelisting
- Secure Remote Access
- Secure Data Gateway
- Security Patch Management
- Asset Hardening
- Cybersecurity Training

Identify

- Cyber Gap Assessment
- Cyber Vulnerability & Regulatory Assessment

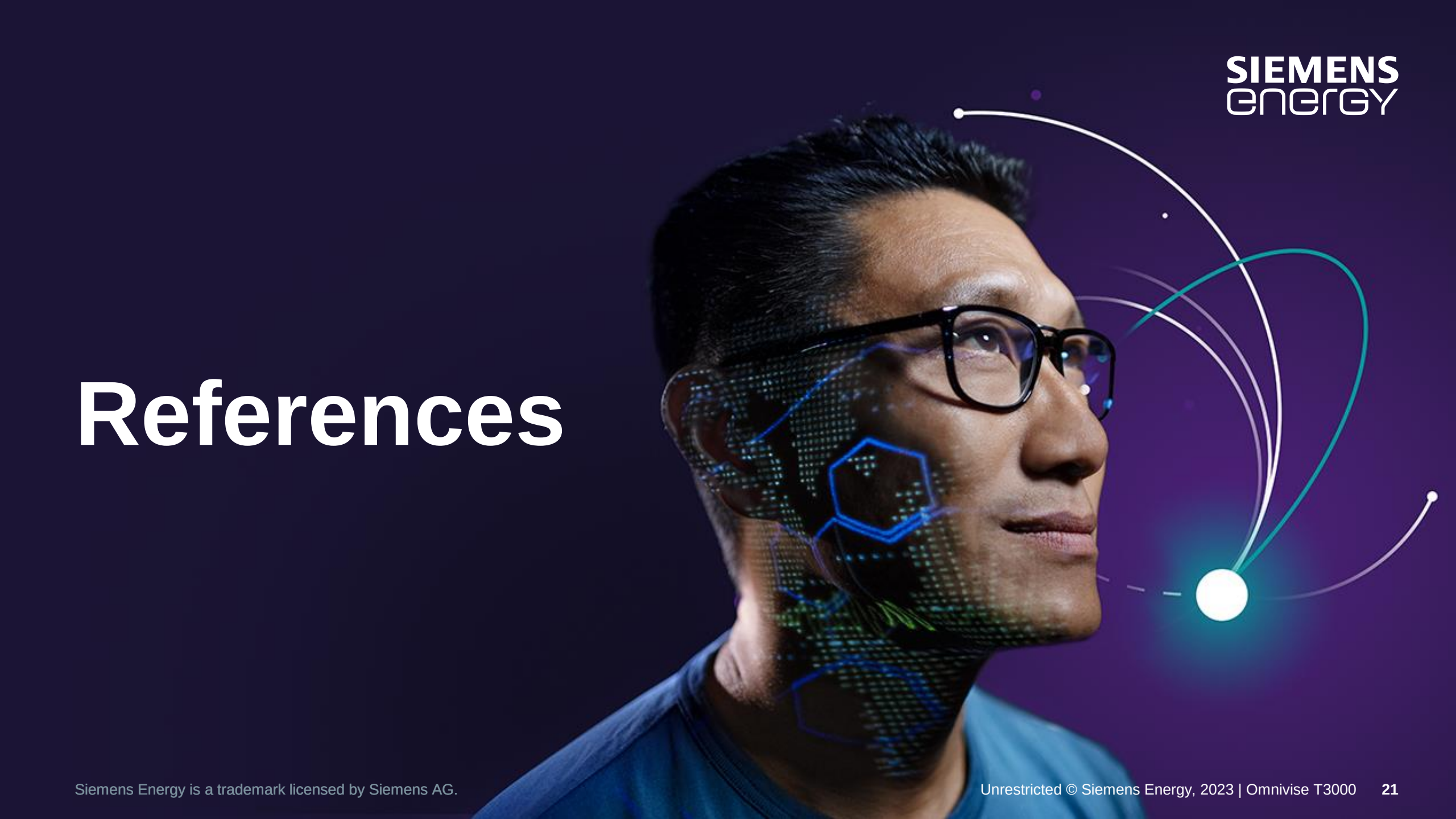
Detect

- Anomaly Detection
- Network Intrusion Detection System (NIDS)
- Security Information and Event Management (SIEM)
- Configuration Change Monitoring

Respond & Recover

- Incident Response Planning & Testing
- Disaster Recovery Planning
- Backup & Restore
- REC Cybersecurity

References



Reference

Main Automation Contractor for EnBW‘s He Dreiht Offshore Windfarm, Germany

The plant

The 900-MW He Dreiht wind farm will be built about 90 kilometers northwest of Borkum and 110 kilometers west of Helgoland in Germany. It is scheduled to start operating at the end of 2025. The subsidy-free offshore wind farm will provide energy to 1 million households.

The task

Along with the proven Omnivise T3000 control technology for switchgear and secondary systems, Siemens Energy is supplying the central IT network, including cybersecurity solutions, and has also signed a long-term service agreement with EnBW.

The solution

- Proven control system Omnivise T3000 SCADA integrating the automation of switchgear and many secondary systems including the interface to wind farm controller
- Certified cybersecurity standard: Omnivise T3000 is certified under the IEC 62443 cybersecurity standard, one of the leading standards for IT security
- Central IT infrastructure for connecting secondary systems
- Service level agreement for 5 years starting end of 2025

“We have an experienced partner for control systems in Siemens Energy, and we welcome them on board of the project for our first unsubsidized offshore wind farm.”

Hartwig Schnöckel, Project Manager for Offshore Wind at EnBW

Eneco

“The proven control system Omnivise T3000 from Siemens Energy helps us to keep our plants up and running in an effective way.”

Eneco Warmteproductie Utrecht B.V.

Reference

Resilience and high flexibility for BioWarmte Installatie Lage Weide (BWI), Netherlands

The plant

The BioWarmte Installatie Lage Weide (BWI) is the first plant for district heating realized in Utrecht, Netherlands that uses a sustainable source. The BWI processes Dutch residual streams of wood (biomass) and converts them into sustainable district heat.

The task

Annually, the BWI processes up to 180,000 tons of biomass. The T3000 system is used to control and monitor the complete process of converting biomass into energy.

The solution

The BWI is equipped with the proven automation system Omnivise T3000. The control system of the BWI is integrated in a Multi-Unit configuration with the T3000 systems of the two gas-fired district heating plants in Utrecht. This way a single control room with unform HMI has been realized for all three plants.

The result

Besides the innovative architecture for simplified lifecycle management T3000 offers:

- Effective support for the operators
- Efficient workflows in daily operations
- Built-in security for the control system to withstand external cyber attacks

voestalpine

This is a major step forward! The untraceable becomes traceable – thanks to digitization and end-to-end systems.“

Harald Rehberger, Group Coordinator
EMSR Power Plant, voestalpine

Reference

High flexibility and serviceability with T3000 Virtual for voestalpine Stahl, Austria

The plant

voestalpine Stahl is one of Europe's most modern steel mills located in Linz, Austria. The plant processes an annual total volume of more than 2 million tons of steel strip and heavy plate.

The task

The main objective of the project was to modernize the existing 35 MW GE gas turbine with the ultra flexible and highly available Siemens Energy control system T3000. Thereby, the T3000 system was meant to be integrated into the existing virtualization infrastructure of the customer.

The solution

The automation level of T3000 was implemented based upon the following modules: Automation Server AS-S7, PROFINET based E / A system ET 200SP HA Technology Modules for turbine control, Vibration & Protection with VIB3000. For the application layer of T3000, a virtualization cluster hosted by voestalpine Stahl was deployed. Not only does it include the redundant Application Server, but also the Security Server, Terminal Server and 4 Thin Clients.

The result

One of the compelling aspects in favor of T3000, in addition to the hardware-independent solution that facilitates lifecycle management, was

- the ease of integrated engineering, improved flexibility, scalability, and reduced service requirements
- the harmonized data infrastructure for IT and OT.

SWEC SEPCO

The benefit of the new control system is the stability of automation of the power plant plus the required and additional features of cyber security.”

Nabil Al Johani, I&C Manager, Shuaibah Water & Electricity Company (SWEC)

Reference

Short outage time and highest cybersecurity for Shuaibah 3 IWPP Plant, Saudi Arabia

The plant

Shuaibah 3 IWPP Power and Desalination Plant is the first IWPP developed in Saudi Arabia and represents a major development in Saudi Arabia’s water and power sector to help satisfy the increasing national demand for power and water. Shuaibah 3 IWPP generates 1.200 MW of power and 880.000 m³/day of water.

The task

Based on the obsolescence of some I&C components and security measures for critical infrastructure, SWEC chose to modernize the control systems. The goal was to have one DCS system for all technologies. growing requests for cyber

The solution

The modernization project was executed with only a 3-day outage in three consecutive steps: upgrade units 1, 2 and 3 for Power Island, Water Island and boiler for the T2000 DCS system, turbine control and BMS/BPS which originally had not been an integral part of the T2000 plant DCS. During the modernization of unit 1, the DCS for the common part of the plant was upgraded with no outage of other units, which was a truly remarkable feat.

The result

- Modernization achieved without power plant outage
- Extremely short unit outage time (3-5 days)
- Integrated DCS solution
- OEM improvements integrated in solution
- Future-ready
- No risk of schedule delay

HIF Es posible

The region is so proud to be at the center of this pioneering project. In a way, the people here are at the vanguard of an expedition that will energize the rest of the world.”

Cesar Norton, President of HIF board

Reference

Power-to-X “Fuel from wind and water” Haru Oni, Chile

The plant

World’s first integrated and commercial large-scale plant for the production of climate neutral e-fuel. Synthetic fuel is produced from water, wind energy and CO_2 captured from the air.

The task

Siemens Energy as the supplier and system integrator of wind energy will deliver apart from other components the proven control system. The goal is to install Omnivise T3000 for plant wide automation incl. advanced CMMS and distributed cybersecurity.

The solution

The automation level in Omnivise T3000 exists mainly of implementing the communication between the 18 black boxes by a unit coordination program including Energy Management via the functionality of a reduced microgrid controller. The whole system will only be controlled by one I&C operator in the plant. The greatest project challenge is to get the plant – the first of its kind in the world – running within only 19 months.

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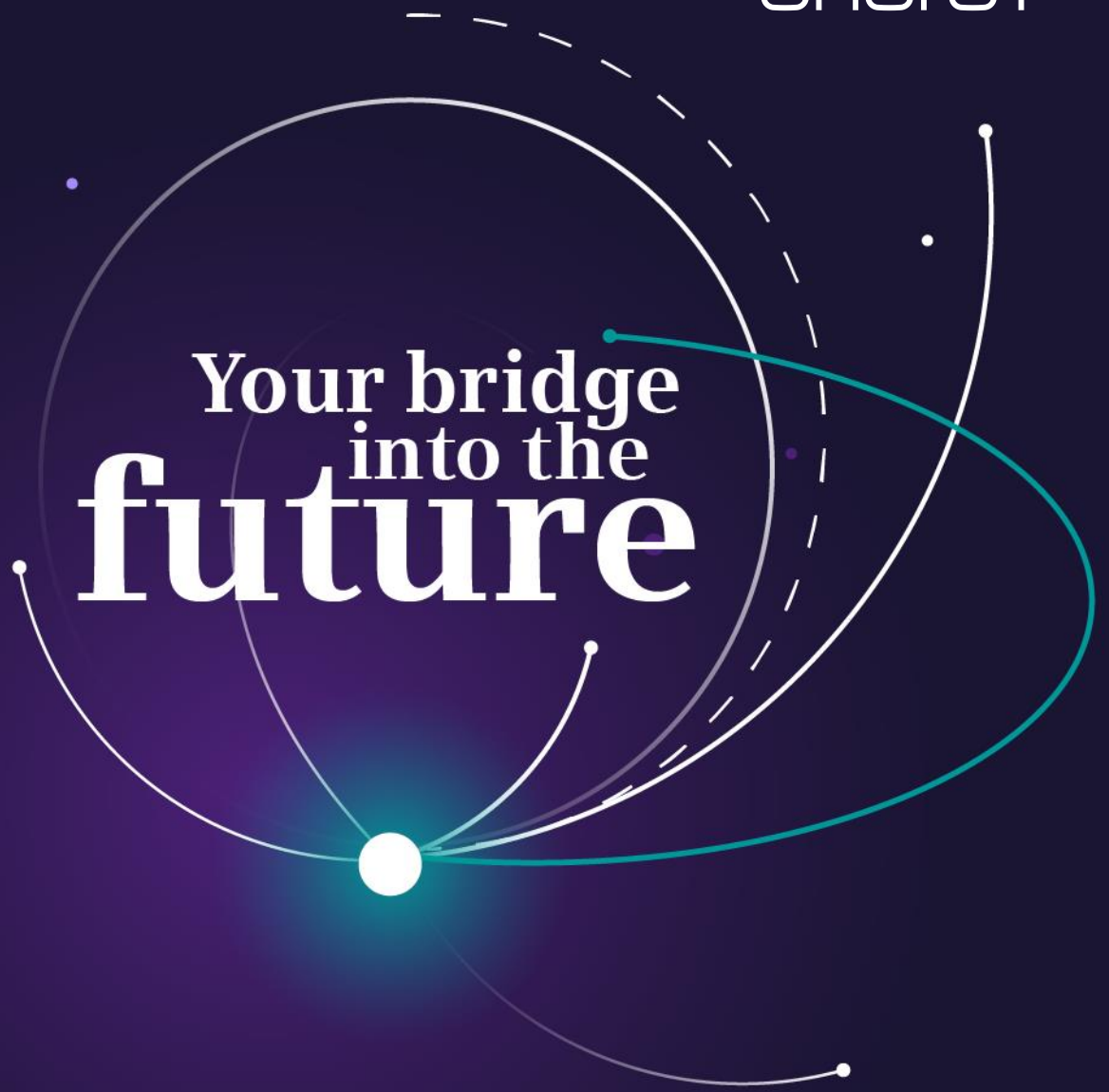

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