

Siemens Energy supporting Nuclear new build in Europe

Daniel Morell, VP Nuclear I&C at Siemens Energy
BULATOM International Nuclear Conference
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Siemens Energy

A global leader in the energy business

~1/6

of global electricity generation is based on our technology.

We are present in

>90

countries.

96,000

employees work as a team to energize society.¹

We invest around

€1bn

annually

in research and development.



¹ Number of employees as of September 30, 2023

Siemens Energy

Excelling in Nuclear Power's non-nuclear part

- **Climate change** goals are a major global challenge, with nuclear power seen as a viable solution by many countries and customers.
- We are a **leading company** in the energy industry, assisting in achieving **decarbonization** targets, including those based on nuclear technologies.
- Our **portfolio** includes rotating equipment, components, and systems for the “Conventional Island”, qualified operational DCS, Power-to-Grid, eBOP, and Back-Up Power Solutions.
- We offer **long-term service support**, using state-of-the-art technologies that meet the highest safety and quality standards.
- We have **decades of experience in the nuclear industry**, ensuring compliance with **nuclear regulatory requirements**, making it a **reliable partner** for all involved in this sector.



SIEMENS
ENERGY

Making next
generation
NPPs a
success



Steam Turbine Set

Steam Turbine Generator Set | Auxiliary Systems



Water-Steam-Cycle

Condensers | MSR's | Pre-Heaters/Vessels | Pumps | Pump Drives



Distributed Control System (DCS)/Instrumentation & Controls (I&C)

Qualified operational DCS | Turbine controls | BoP and auxiliary control | Unit controls



eBOP

Electrical balance of plant (eBoP) | Electrical protection systems | Excitation systems



Back-Up Power/Alternative Use Cases

Aeroderivative Gas Turbines | Diesel | Batteries | Electrolyzers



Power to Grid

Transmission/Distribution | HV, MV, LV Switch gears



Service

Onsite Repairs | Testing | Modernizations & Upgrades

Nuclear I&C is driven by detailed codes and standards defining safety, reliability and security requirements



- IAEA Safety Standards (Safety requirements and Safety Guides)
- IEC standards implement and detail the principles/safety aspects in IAEA code

Siemens Energy's platform and process meets the European nuclear qualification requirements

International Standards for instrumentation and control systems important to safety



Design & Qualification

- **IEC 61513**
General requirements safety lifecycle I&C architecture and design Quality Management
- **IEC 62138**
Software and software development requirements
- **IEC 60987**
Hardware design requirements (class 2 only)
- **IEC60780**
Equipment qualification
- **IEC60980**
Seismic qualification
- **IEC 62003**
EMC testing

I&C Architecture

- **IEC 60709**
Separation
- **IEC 62340**
Coping with common cause failures (CCF)
- **IEC 61226**
Classification of Instrumentation & control functions
- **IEC 60671**
Surveillance testing

Control Rooms/HMI

- **IEC 60964**
Control room design
- **IEC 60965**
Supplementary control for reactor shut down
- **IEC 61772**
Application of visual display units
- **IEC 61227**
Control rooms – Operator controls
- **IEC 62241**
Alarm functions and presentation

Cyber Security

- **IEC 62645**
Security programs for computer-based systems
- **IEC 62859**
Coordinating safety and security
- **IEC 63096**
Security Controls

Obsolescence Mgmt.

- IEC 62402 Obsolescence management – application guide
- IEC 62342 Management of Ageing

Local rules and standards

European Union
European Utility Requirements



RCC-E

afcen



YVL



Nuclear Industries Security Regulations



Bulgaria Nuclear Regulatory Agency



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Siemens Energy

Strong and proven partner of the European Nuclear Industry



- European supplier/Global Supply Chain
- Partner in focus countries
- We know all codes and standards
- We work closely together with regulatory authorities
- We are part of the EU SMR Initiative



Location	Business field	Departments
Erlangen	I&C/GEN/STG	Sales, Engineering, Project Management, Service
Karlsruhe	I&C	Sales, Engineering, Project Management, Service
Frankfurt	I&C	Engineering, Project Management, Service
Mülheim	GEN/ STG	Manufacturing
Goerlitz	STG	Manufacturing
Erfurt	GEN	Manufacturing
Brno	STG	Manufacturing
Budapest	I&C STG I&C/GEN/STG	Engineering, Project Management; Manufacturing; Sales
Bucharest	GEN/ STG I&C/GEN/STG	Engineering, Project Management, Sales
Sofia	I&C/GEN/STG	Engineering, Project Management, Sales
Prague	I&C/GEN/STG	Sales
Bratislava	I&C I&C/GEN/STG	Service; Sales
Warsaw	I&C/GEN/STG	Sales
Ljubljana	I&C/GEN/STG	Sales
Helsinki	I&C I&C/GEN/STG	Service; Sales
Paris	I&C	Service
Manchester	I&C	Sales, Engineering, Project Management

NPP	Country	Siemens Energy
Mohovce	Slovakia	I&C
Krsko	Slovenia	STG
Kozloduy	Bulgaria	I&C
Flamanville 3	France	I&C
Olkiluoto 1+2+3	Finland	I&C, STG
Loviisa 1+2	Finland	I&C
Sizewell C	UK	I&C
Hinkley Point 3	UK	I&C
Hunterston B7+B8	UK	STG
Heysham 2+3+4	UK	I&C, STG
Forsmark 3	Sweden	I&C
Ringhals 2+3+4	Sweden	I&C
Research Reactor Garching	Germany	I&C
Borssele	Netherlands	I&C, STG
Doel 1+2	Belgium	I&C
Gösgen	Switzerland	I&C, STG
Leibstadt	Switzerland	I&C
Mühleberg	Switzerland	I&C
Vandellós 2	Spain	STG
Asco 1+2	Spain	STG
Almaraz 1+2	Spain	STG
Trillo	Spain	I&C, STG

● Strong European Footprint and Supply Chain

● Strong presence in Nuclear Power Plants

Summary

Conclusions and recommendations for successful Nuclear New Build in Europe

1
Establish a strong, experienced **owner's engineer**



2
Take European specifications, codes, and standards seriously and **team up with experienced partners**



3
Insist on proven European **references**



4
Ensure **IT security**



5
Leverage strong local/ **European footprint and supply chain**



6
Avoid first of a kind solutions

