

Online field trials in Bulgaria

Whitepaper
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ENERGY SHIELD

Implement the online field trials in Bulgaria

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The demo situated in the Bulgarian electricity network shows that EnergyShield captures the needs of Electrical Power and Energy System (EPES) operators and safeguard them against attacks”

*Nikolay Palov,
General Manager,
Software Company*

IN A NUTSHELL

The EnergyShield’s consortium partners' coordinated initiatives to test the performance of the EnergyShield toolkit with Bulgarian end-users are presented in this whitepaper. At the hydropower plant, the EnergyShield toolbox is housed on a dedicated Workstation. To prevent disturbing the network's uninterrupted power supply, this workstation is connected in parallel with the plant's normal operations. The EnergyShield toolbox may then utilize all the plant's running data to assess its security processes without compromising supply security.

CONTEXT

As the world's expanding energy demand collides with the digitization and Internet of Things revolution, the old energy value chain is fast changing. Each year, electricity networks around the world connect and digitize substations, control centers, energy meters, and controllers, providing enormous benefits to the entire ecosystem: real-time tracking of energy production and consumption data, optimized load balancing systems, generation plant control, substation automation, streamlined operations, and billing systems, to name a few.

As connection grows and the landscape digitalizes, new distributed energy resources (DERs) and stakeholders are able to integrate into and extend the grid. DERs provide non-carbon resources that reduce the energy sector's overall carbon footprint, which is a win-win situation for everybody.

The smart energy ecosystem is fast evolving into a huge and complex IoT network that connects (Smart) meters, assets, and backends, and the data they share must be protected

TECHNICAL DETAILS

Three conceptual 'stories' of essential Operational Technology (OT) assets were defined throughout the EnergyShield project in order to execute the relevant penetration tests:

- the generation plant scenario, where the critical device is the PLC, which controls the various operations that generate electricity energy;
- the substation scenario, where the critical device is the RTU, which controls the circuit breakers and transformers in the substations for the delivery of energy to the various lines; and
- the prosumers scenario, where the critical device is the Smart Meter, which measures and provides active and reactive power feedback to the system.

ENERGYSHIELD DEMONSTRATOR

The Bulgarian partners provided the consortium with these three devices, namely the RTU, PLC, and smart meter, which are similar to the ones used in the EnergyShield field testing in Bulgaria. In addition, a demonstration campaign for the Security Behaviour Analysis tool was performed in Bulgaria, including all players in the energy value chain.

Also, the Siga Box device was shipped to the Lenisthta hydro plant and placed on site in order to collect operational data, train the models, and deploy the Anomaly Detection tool to safeguard the generating infrastructure.

In addition, the EnergyShield toolbox has been deployed on a dedicated Workstation in the hydro power plant. This workstation is linked in parallel with the plant's usual operation in order to avoid disrupting the network's uninterruptible power supply. As a result, the EnergyShield toolbox may take use of all of the plant's operating data and evaluate its security systems without endangering supply security.

BEST PRACTICES & LESSONS LEARNED

With the integration of EnergyShield toolkit on the Workstation and the establishment of communications, the cybersecurity technology providers of the consortium were able to test their tools on the hydro plant infrastructure.

DISSEMINATION & COMMUNICATION

On the 23rd of June 2022, the activities of the Bulgarian Pilot activities are presented in the Online Final event of EnergyShield “Building upon cyber resilience in energy sector”.



ABOUT THE COMPANY

Software Company Ltd (SC) is a Bulgarian private firm that specializes in software development. Since 1996, the company has offered a wide range of high-quality services in the development, delivery, and maintenance of software in Europe and USA.

SC's key market advantage is the ability to leverage a wealth of experience in this sector, a network of local and international partners, and a very competitive pricing strategy to deliver quality software solutions. The company is also ISO 9001:2015 certified.

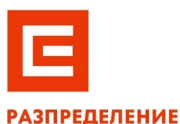
We have worked with a number of partners from Europe and USA in the following areas:

- Green Energy and Energy Efficiency software
- Transmission and distribution grids applications/software
- Database management software, Data Warehousing, Business Intelligence

Software Company has successfully participated in several FP7 projects and participates in Horizon2020 projects related to transmission and distribution grids.



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Website: www.energy-shield.eu

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