

# Virtualization of Ovation™ Workstations Reduces Lifecycle Costs and Maintenance Time for Engie's Maasvlakte Power Station

## RESULTS

- 70% reduction in workstation hardware and associated maintenance costs
- 90% faster inspection of control system health
- 75% decrease in control system patch installation time
- Two-year control system hardware lifecycle extension

## APPLICATION

800-MW biomass power plant equipped with a Hitachi steam turbine generator and Hitachi ultra-supercritical boiler capable of burning anthracite coal and coal waste

## CUSTOMER

Engie Energy, Maasvlakte Power Station located in Rotterdam, Netherlands. The plant began commercial operation in 2015.

## CHALLENGE

Engie contracted Emerson to supply an Ovation™ control system for the new-build Maasvlakte power plant during the construction procurement process. The system was delivered to site in 2012; however, it did not become operational until the plant was commissioned in 2015. The three-year delay placed the system's commercially available workstation hardware towards end-of-life at the same time software updates were to be implemented, thus straining a tight maintenance budget that was only half-way through its cycle.

Balancing concerns about replacing outdated hardware, installing software updates and budget constraints along with limited resources for system maintenance was proving to be a challenge. Engie required a creative solution that would keep pace with changing technology while economically enhancing the process control environment at the Maasvlakte station.



***“We immediately recognized the benefits of virtualizing our Ovation workstations. Not only did we lower our maintenance costs but we also gained the flexibility to easily grow our system with minimum cost impact.”***

***Our two-man staff can now manage the company's assets, either from a centralized location or using secure remote connections, in a time-efficient manner.”***

Rob Petie  
Senior Technical Specialist  
Industrial Control Systems  
Engie Energie Netherlands

### SOLUTION

To resolve the conflicting timelines for hardware and software updates and budgeting, Engie worked with Emerson to implement a virtualization project that economically upgraded the control system's architecture to the latest technology.

Virtualization decouples the Ovation workstation hardware from the operating system and applications by replicating the operation of the physical CPU, hard drive and network interface on a virtual machine. Each virtual machine runs its own operating system and can be loaded with various software applications. The physical hosts are equipped with a hypervisor software layer that allows multiple virtual machines to run concurrently on one server.

The original Maasvlakte control system configuration, delivered with Ovation 3.3.1 software, included 11 physical workstations that supported operations, engineering, domain control, database server and historical applications. The virtualized Ovation system replaced the physical workstations with one cluster of three physical hosts supporting 33 virtual machines and 12 thin clients. Additionally, the Ovation system level was upgraded to level 3.5.1 during the project. Virtualizing the workstations rather than upgrading the physical hardware saved three days of outage time.

The benefits of virtualization were immediate:

- Engie realized a 70% reduction in hardware by condensing four network cabinets full of rack-mounted workstations into one network cabinet with highly available virtual machines. Less hardware minimizes the frequency and impact of operating system and hardware changes which significantly reduces maintenance costs.
- Saved maintenance time by reducing regular system health inspections from more than two hours to less than 15 minutes.
- Time and resource challenges previously associated with system patching were virtually eliminated. Before virtualization, patching of the traditional hardware-based system took over a week which contributed to longer lag-times between system patching. Because virtual machines can be rebooted within seconds, the overall system patching time has decreased by more than 75% and system patching can now be completed within a day. Alleviating the resource demand for patching increased the frequency of updates which in turn strengthens the system against potential cyber-threats.
- The control system's hardware lifecycle was extended by two years since virtual machine software can be upgraded without replacing the physical host hardware.
- Hardware independence using virtual machines make the control system more flexible to technology and plant process changes. By expanding both the virtual and physical memory, Engie can add third-party systems to the cluster without increasing capital expenditures for new hardware.

Additional benefits include faster disaster recovery as virtual machines can be immediately restored to the last known configuration, an extended software upgrade period, smaller footprint, reduced energy consumption and a more resilient control system.