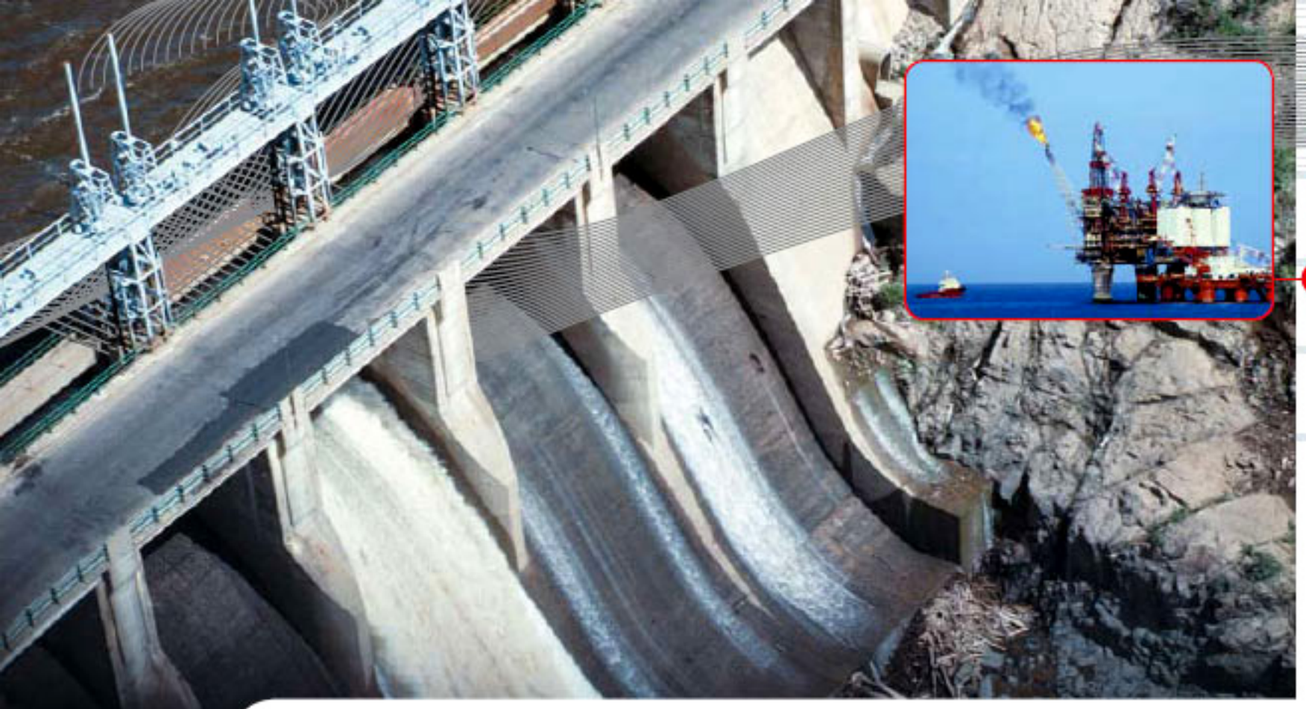

DS Solutions for the Booming Energy Industry

By **Rolf Gibbels**

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The global energy industry is under pressure from every direction. Demand is growing exponentially, creating pressure for new, sustainable energy sources. New construction and maintenance projects are increasingly complex. Aging infrastructure must be upgraded and modernized to meet stringent quality, health, safety and environmental regulations. And all of these challenges must be met more efficiently than ever before, keeping the industry profitable despite increasing demands from regulators and consumers.

Given the nature of these challenges, the energy industry is actively searching for more efficient ways of working. Increasingly, leaders across the energy spectrum are coming to the same conclusion: The same Product Lifecycle Management (PLM) solutions that help manufacturers operate more efficiently are equally effective in designing, building, operating and maintaining *plants* – from nuclear and hydroelectric power to oil refineries and from offshore production platforms to solar and wind-energy farms.

REFURBISHING PROJECTS ON THE RISE

The need to extend, modernize and refurbish existing power plants offers significant challenges. Many upgrade projects involve hundreds of workers in unique or infrequent operations. Equipment weighing tons often must be moved through spaces with clearances measured in inches. Scheduling requires precise choreography to ensure each step occurs on time and in sequence – critical in limiting outages and meeting budgets. Safety considerations are paramount.

PLM technology manages complexity and puts lifelike experience at users' fingertips to minimize risk. DELMIA allows project managers to visualize their maintenance and installation activities and schedules as 3D simulations, helping to identify unexpected issues and determine optimal sequences. Reducing outage time pays off; each day of outage costs $1 million for replacement power at nuclear plants and $7 million for non-productive time at oil and gas installations. At Entergy Nuclear's Waterford 3 plant, for example, DELMIA simulations of a motor-replacement project identified a previously unrecognized obstruction that could have added one to two days to a planned outage (**see page 12**).

Once activities are planned, training with 3DVIA Virtools offers workers lifelike experience in a virtual, immersive setting. Crane operators, for example, can experience the actual "feel" of moving a heavy piece of equipment in virtual reality, allowing infrequent operations to be practiced efficiently and safely. Virtual training ensures worker readiness for project startup at the physical jobsite, without interrupting ongoing operations.

NUCLEAR POWER PLANTS: COMPLEX, LARGE-SCALE PROJECTS

Nuclear power is experiencing a renaissance, with more than 230 plants planned or proposed worldwide. Highly complex and costing as much as $10 billion each, plant construction requires efficient management of multi-disciplinary projects to meet budget and delivery obligations. The handover process from construction to the owner/operator is critical, requiring a mature, scalable collaboration and information-management platform.

Owner/operators, major equipment vendors and Engineering, Procurement and Construction (EPC) firms increasingly rely on fully integrated DS PLM environments to support a design-to-operations approach that concurrently optimizes design, construction and resources. The DS PLM virtual construction portfolio offers comprehensive capabilities for plant construction planning, scheduling and sequencing in a multi-CAD environment. Virtual definition and simulation reduces construction delays and improves collaboration. In-work product structures, digital mockups and engineering bills of material (BOMs) provide valuable early insights to project developers and construction planners.

MANAGING PROJECT COMPLEXITY AND GLOBALIZATION

To bridge the interoperability issues that complicate collaboration in a fragmented environment and achieve efficient collaboration with dozens of stakeholders, the energy industry needs a centralized and structured approach to managing data in all its forms.

At Lawrence Livermore National Laboratory (**see page 16**), for example, ENOVIA manages massive amounts of planning and construction data, while collecting and organizing data on daily operations and maintenance spanning decades. ENOVIA coordinates engineering data and processes across the complete product lifecycle and maintains consistency by propagating changes to related documents. ENOVIA also tracks project progress and overall productivity, and manages change orders and workflows to ensure milestones are met and projects progress efficiently.

DIVERSIFYING ENERGY SOURCES

The drive for energy independence and greenhouse gas reductions, wild swings in oil and gas prices, and rapid increases in total energy demand, are driving the development of local, sustainable energy sources such as hydro, wind, solar, wave and geothermal. From enabling advanced composites technologies for wind-turbine blades, to managing the vast resources required to develop reliable fusion technology or keep pace with soaring demand for solar panels, PLM helps alternative energy producers innovate, develop, manage and replicate projects while managing vast networks of installations. Pelamis Wave Power (ocean wave farms), ITER (nuclear fusion), Vestas Wind Systems (wind farms) and Solar Century (environmental energy system design) are just a few of the alternative energy leaders meeting the unique demands of their markets with DS PLM.

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www.3ds.com/solutions/energy/overview

www.plmv5.com/delmiaenergy