



# The defining decade: three challenges for the nuclear industry

## Challenge #1:

### Governments have great ambitions, but limited budgets

At COP30, a coalition of 33 countries and over 140 companies pledged to triple global nuclear energy capacity by 2050.

Achieving this objective will not be easy. It will require building a large number of new reactors on-time and on-budget, a challenge that has proven particularly complex in the past. Today, over 75 reactors are under construction globally, and about further 120 reactors are planned.

New technologies such as Small Modular reactors (SMRs) can play a role, but their contribution remains difficult to quantify.

x3

33 governments have committed to triple nuclear energy capacity by 2050

31

The median age of the world's nuclear plants

## Challenge #2:

### Aging plants will represent a financial burden on operators

If the average nuclear plant is 32.4 years old globally, this number hides important regional disparities: 80% of China's plants have been built in the last 10 years, while more than 80% of reactors in the EU and the US are over 30.

In Western countries, challenges related to maintenance, extension, corrosion and decommissioning will therefore take center stage, placing a significant financial burden on operators: more than 200 reactors are due to start decommissioning by 2050.

## Challenge #3:

### The great retirement will worsen skill shortages

According to McKinsey, achieving global nuclear capacity objectives would require the nuclear industry's global workforce to grow to 5 million people.

Several major challenges stand in the way. First, the industry's current workforce is rapidly aging, with one in four worker due to retire in the next decade. Second, finding large numbers of specialized workers with industry experience, such as welders or pipefitters, is nearly impossible – a situation that has led several operators to start large training programs.

25%

of workers in the nuclear industry globally are above 55

# 3 digitalization challenges for companies in the space

	Possible Symptoms	Consequences
<p><b>Complexity of new projects, leading to delay and budget overruns</b></p>	<ul style="list-style-type: none"> <li>• Highly complex projects that involve complex supply chains, rare skills and specialized manufacturing</li> <li>• Varying nuclear-specific regulations and complexities make it difficult to leverage learnings from other projects</li> <li>• Large number of stakeholders with contractual arrangements that do not match the risks</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent delays and cost overruns</li> <li>• Poor public perception</li> <li>• Low replicability across projects</li> </ul>
<p><b>Lack of software integration across the plant lifecycle</b></p>	<ul style="list-style-type: none"> <li>• Specialized, scattered industry-specific software</li> <li>• Different evolving codes and regulations</li> <li>• Risk of information loss between project phases</li> <li>• Difficulty in connecting various sources of data, such as SCADA systems, PLCs or the company's ERP</li> </ul>	<ul style="list-style-type: none"> <li>• Silos and challenges in accessing important information, leading to waste of time and resources</li> <li>• Difficulties in measuring performance, improving maintenance practices or conducting change</li> </ul>
<p><b>Lack of digitalization in operations and maintenance</b></p>	<ul style="list-style-type: none"> <li>• Limited digitalization of, and difficult access to, critical procedures</li> <li>• Maintenance interventions are reactive and not data-driven</li> <li>• High volumes of manual and clerical work and low levels of automation (e.g. for work orders)</li> <li>• Communication issues between teams leading to delays and errors</li> </ul>	<ul style="list-style-type: none"> <li>• Poor maintenance scheduling</li> <li>• Increased outages, downtime and reliability issues</li> <li>• Low productivity of maintenance workers</li> <li>• Subject-matter experts acting as bottlenecks</li> </ul>

# 3 key solutions for a data-driven nuclear plant

## Enterprise project performance addresses the nuclear industry's project woes



Enterprise project performance and controls software integrates all project portfolio management and project management processes, including risk analysis, resource planning, estimating and cost control, into one single product. Sequence Enterprise (formerly EcoSys) helps address issues that commonly plague nuclear projects, such as data silos, lack of visibility across multiple projects with common resources and low collaboration.

It also helps avoid waiting until construction to identify issues that originated during the design or procurement phases of the project. As a result, it contributes to effectively bridging strategy and execution, maximizing returns and margins, and avoiding project delays.

## Predictive maintenance helps address skill shortages and empower mobile workers



Addressing the shortage of maintenance workers requires optimizing schedules and interventions while providing mobile access to relevant asset information to save time and resources.

Attune EAM (formerly HxGN EAM) supports the shift to a data-driven nuclear plants and predictive maintenance – delivering 30 to 50% gains in maintenance overtime, labor, and contractor costs.

## Operational processes such as shift handovers get a much-needed update



Even as older generations exit the workforce, some operational processes, such as inspections and shift handovers, remain firmly steeped in the 20th century.

Tempo Operations Management (formerly j5 Operations Management Solutions) is the perfect solution for power companies struggling to abandon a culture of paper and spreadsheets. Its intuitive and flexible interface helps achieve rapid user adoption, improved information flows and reduced risks.

**Learn more about how Octave can help to elevate quality, efficiency and safety of your nuclear power plant.**

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Octave provides enterprise software that helps organizations design, build, operate and protect critical industrial and infrastructure assets. Octave supports decisions across the full asset lifecycle where performance, safety and reliability matter and failure is not an option. Octave connects engineering, operational and safety workflows, enabling customers to convert complex operational data into decisions that improve performance, resilience and incident response across real-world environments. Octave has more than 7,000 employees in 45 countries. Learn more at [octave.com](https://octave.com) and follow us on [LinkedIn](#).