

CASE STUDY / **DARLINGTON REFURBISHMENT OVERSIGHT**

COORDINATING IMPROVEMENTS AT A NUCLEAR POWER PLANT

When a Canadian utility was preparing to spend billions of dollars on a 10-year refurbishment of a vital nuclear station, it sought independent oversight of the program development and execution efforts.

Thorough gap analysis using industry best practices and thoughtful recommendations helped keep the project on track for success.



CAREFUL PROJECT OVERSIGHT YIELDS PROCESS IMPROVEMENTS

A sequential refurbishment effort benefits from gap analysis to optimize approach and refine reporting.

PROJECT STATS

CLIENT

Ontario Power Generation

LOCATION

Clarington, Ontario

PROJECT COMPLETION

Definition phase: 2016
Execution support: 2020

12.8B

CANADIAN DOLLARS IN
PROGRAM BUDGET

3,500+

MW OF GENERATION

4

REACTOR UNITS

200+

RECOMMENDATIONS FOR
PROJECT IMPROVEMENTS

CHALLENGE

The 3,512-megawatt Darlington Nuclear Generating Station has been providing affordable, carbon-free, reliable power to Ontario since 1990. It supplies 20% of the province's electricity. After decades of service, the plant's four nuclear reactors were due to be refurbished to extend their life for another 30 years of service.

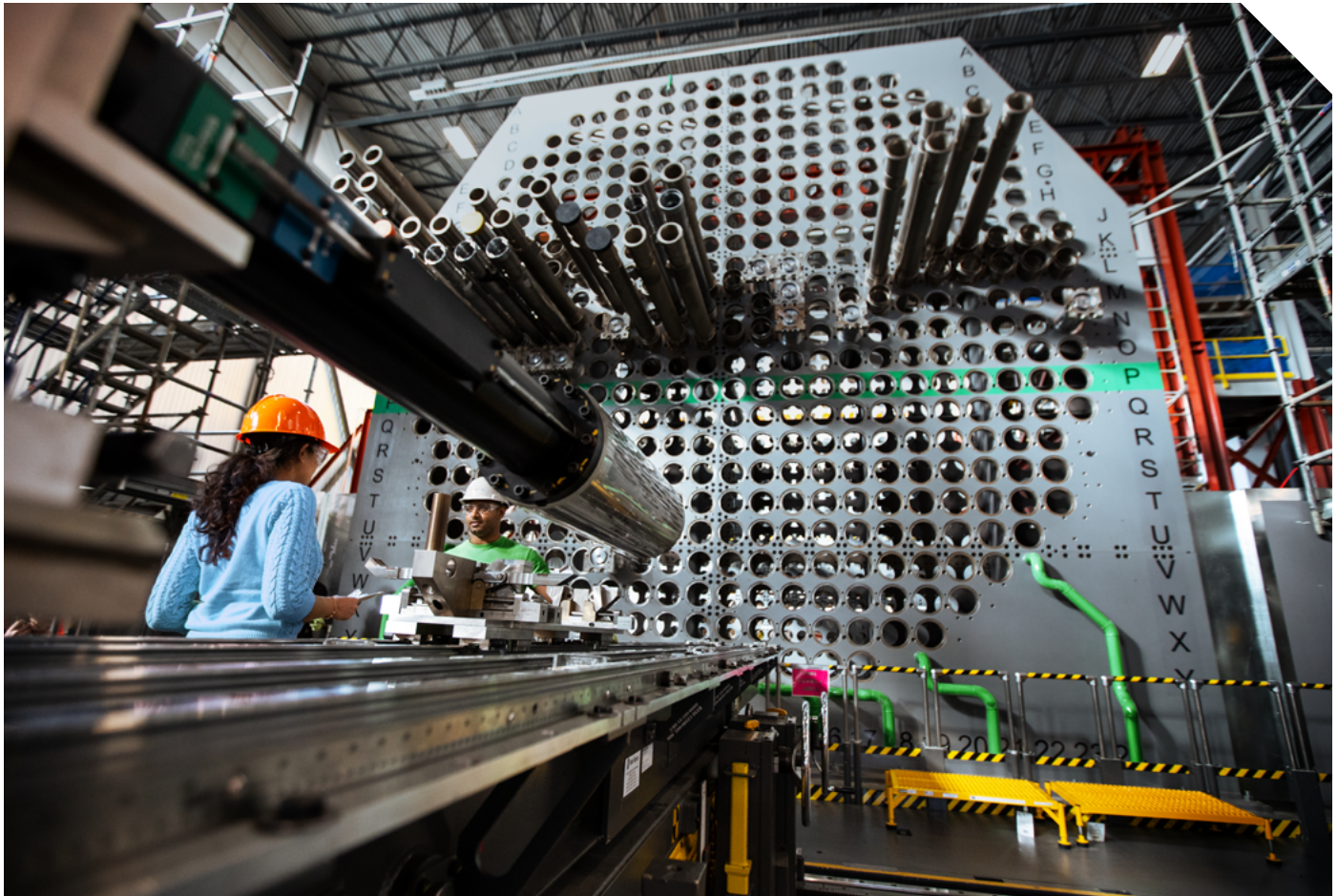
The Darlington Refurbishment project constitutes a thorough process for planning and executing on necessary improvements on all four units at the plant. The execution phase would need to be planned and coordinated to sequentially refurbish the units over the course of 10 years.

Given the extent and expense of the multibillion-dollar project, the Ontario Power Generation (OPG) board of directors determined that, in addition to OPG's direct oversight, the project would benefit from independent oversight. After a request for proposal, the utility selected the Burns & McDonnell team to provide that oversight.

SOLUTION

During the definition phase of the project, we performed a gap analysis, examining the strategies for governance, contracting and project controls. We looked at the processes and programs being developed and implemented, the financial reporting models, and





then reported on our findings to the OPG board of directors.

Throughout that phase of the refurbishment, from 2013-16, we provided quarterly reports to the board. We brought a sharp and independent view on how processes and programs were designed and executed, ultimately issuing more than 200 recommendations for program and project improvements. These spanned everything from team organizational effectiveness to vendor control, estimating, scheduling, commissioning and reporting metrics.

We also provided special assessments regarding performance of infrastructure and prerequisite work, risk program development and implementation, and preparations for site integration. Another key element of the project was development of

the Release Quality Estimate (RQE); our team oversaw execution of the process to develop it, seeing that it was as robust as possible.

In 2016, the utility started the execution phase for the first of the four reactors — Unit 2 — and Burns & McDonnell was again selected to provide independent oversight for the next stage of the program. In this phase we oversaw the execution of processes we had helped curate, monitoring performance metrics and the fidelity of the project team's reports to actual project status. Our goal was to collaborate with the project team and the vendors to make them successful, not to tear anyone down, and see that the board was getting concise and accurate information from a prepared project team.

RESULTS

The definition phase for the refurbishment effort was completed on schedule. We provided critical oversight as the first reactor unit refurbishment was completed in 2020, keeping the overall four-unit project on time and on budget.

Between the process improvements made during the definition phase and the example of implementation on the first reactor, we were able to set an approach that can be applied to the three remaining units as the utility continues to successfully prepare the nuclear plant for decades of ongoing reliable service.



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