

# Performance Report for the Darlington Refurbishment Project

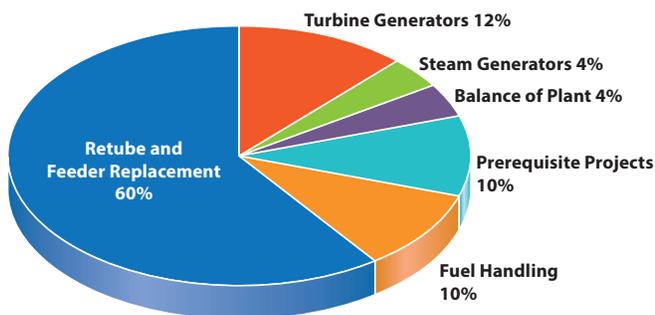
**As part of our commitment to keep you informed, this report tracks the performance of Ontario Power Generation’s (OPG’s) Darlington Refurbishment project in the areas of safety, cost and schedule as well as significant accomplishments and progress during the second half of 2014.**

OPG is the general contractor and project manager for all aspects of Darlington Refurbishment. In this role, OPG has direct oversight of all vendors performing work on the many projects that make up refurbishment. A project of this scale and complexity always has some areas where performance is better than others, but our overall program health at 2014 year-end is good. We are progressing work according to plan and staying within the approved budget. The details are below.

Other items of interest include:

- A key project need is labour — in collaboration with Bruce Power we’ve established agreements with most of the building trades unions which will help provide labour stability and clarity on work rules;
- We currently have approximately 1,000 people working on Darlington Refurbishment, 400 people at the Darlington Energy Complex on Energy Drive in Courtice and another 600 contractors working on the Darlington site and at various supplier locations across Ontario; and
- Over 3,500 people toured the reactor mock up training area and saw the new displays in the Information Centre as part of the first annual Darlington Refurbishment Open Doors event held in early November.

## Major Work Packages



Darlington Refurbishment is made up of many individual projects of various scales and size. Six major project work packages are:

- **Retube and Feeder Replacement (“RFR”):** This work includes the removal and replacement of pressure tubes, calandria tubes and feeders in each reactor. This is the largest work package and is the core to the success of refurbishment. It represents the majority of the refurbishment critical path schedule.
- **Turbine Generators:** This consists of inspections and repairs of the four turbine generator sets and the replacement of analog control systems with new digital control systems.
- **Fuel Handling:** This involves the defueling of the reactor and refurbishment of the fuel handling equipment.
- **Pre-requisite Projects:** Numerous projects on the Darlington site required to execute refurbishment.
- **Steam Generators:** This includes mechanical cleaning, water lancing, inspection and maintenance work of the generators.

- **Balance of Plant:** This work consists of a number of smaller projects to replace or repair components on the reactor side of the unit (such as heavy water and cooling systems) and on the conventional side of the unit (such as electrical system, piping and valve work).

## Key Milestones Achieved



The reactor mock-up with the retube tooling platform, heavy worktable and cutting tools.

A significant milestone was reached when the Retube Tooling Platform (RTP) arrived at the mock-up and was installed by September 30th. Other tooling that was delivered, installed and tested includes the Heavy Work Table, the Power Distribution System and the Generic Tool Control System. A key achievement this fall was successfully testing the full Pressure Tube Cut configuration as it will be utilized in the field. This consisted of having all required tooling in service including the RTP, the Heavy Work Table, the Pressure Tube Cut tooling mounted on the Heavy Work Table, and the remote control system which operates the automated tools from the Remote Control Centre. The results will feed into the overall schedule for execution and provide confidence in our work.

For more information, go to [www.opg.com/darlingtonrefurb](http://www.opg.com/darlingtonrefurb)

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## Overall Program Health



**Darlington Refurbishment is currently in the definition and preparation phase ahead of first unit execution starting in October 2016. The overall program health is good.**

## Cost



Cost – The total cost of the Definition Planning Phase, which began in 2010 and ends at the end of 2015, is forecast to be \$2.7 Billion. To date, actual costs are \$1.6 Billion which is on target.

## Schedule



Schedule – The program remains on track to begin the first unit refurbishment in October 2016. While some work is tracking behind schedule, OPG is managing that work to ensure key project dates are met. There is no impact to the overall schedule.

## Safety



Safety – The All-Injury Rate measures the number of workplace injuries per 200,000 hours worked. Our All-Injury Rate continues to be at zero for 2014. The Accident Severity rate measures the number of lost days. Since 2008, Darlington Refurbishment has worked over 2,000 days without a Lost-Time Injury.

## Pre-requisite Project Status



Eighteen prerequisite projects are underway to support the execution of refurbishment. Of those projects, three are in-service and thirteen are on plan. The Auxiliary Heating System will take longer to bring in-service, and construction challenges with the Heavy Water Storage Facility have increased cost and delayed the in-service date. The total cost is within the cost envelope established for this bundle of work.

## Refurbishment Project Status

### Retube and Feeder Replacement



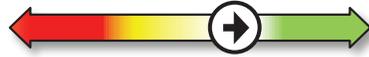
Tooling development is complete. Tool proving and testing is underway. To date the tooling performance is exceeding expectations.

### Turbine Generators



Turbine Generator work is on track, detailed engineering is in progress and will be complete early in 2015.

### Steam Generators



Detailed engineering is progressing and the processes that will be used to execute steam generator cleaning are being established and qualified.

### Fuel Handling



Defueling detailed design is nearing completion, and the project team will shift focus to testing and commissioning. Awarding of contracts for the Fuel Handling Refurbishment project was delayed to simplify the engineering approach. This will not impact the overall schedule.

### Balance of Plant Work



The balance of plant work program, which includes a number of smaller projects, was slightly behind schedule due to contract award delays. However, progress has been made in awarding contracts and detailed engineering is underway.

## Legend

- Excellent
- Marginal
- Poor
- Same as Last Report
- ↶ Trending Decline
- ↷ Trending Improvement