



Senior leaders from CANDU Owners Group member companies shared lessons from mid-life refurbishments at the recent COG General Business Meeting. L-R: OPG's Bill Owens, NB Power's Michael Hare, Bruce Power's Chris Elliott and COG's Sergio Russomanno (sharing lessons from Nucleoeléctrica Argentina's Embalse station) as well as COG's Macit Cobanoglu, the panel moderator.

Lessons from the front

COG's spring 2019 General Business Meeting brought industry leaders together to share insights on all stages of CANDU refurbishment from planning and preparation through execution, restart and the years of continued operation that follow

Middle-age can suit a CANDU well.

That was the good news New Brunswick Power's Mike Hare brought to the COG General Business Meeting (GBM), April 8. NB Power's deputy chief nuclear officer said the 36-year-old Point Lepreau plant is performing at the top of its game, six years after the plant's refurbishment.

The Lepreau team has seen a steady rise to its place today as a top-quartile performer by adhering to a post-refurbishment plan, with clear goals, milestones and related actions. The performance belies a shaky start out of the gate after the station's 2013 restart and Hare talked

about the lessons learned in those early days.

Hare's fellow-panelists shared experience on refurbishment work at all project stages at Ontario Power Generation's Darlington plant, at Bruce Power and at Nucleoeléctrica Argentina's Embalse plant.

OPG Senior Vice President, Nuclear Refurbishment Bill Owens provided a detailed analysis of OPG's Darlington Unit 2 refurbishment execution phase and what lessons learned there will mean for the Unit 3 execution. Unit 3 begins execution in January 2020, about the same time Unit 2 is synchronized back to the grid.

Trading up... Training and partnership key to skilled trade workforce

Trade workers are at the heart of the nuclear industry's refurbishment and life extension projects. Sufficient supply of skilled workers is an on-going challenge the industry faces. From unions to colleges and government, the industry is working with many partners to develop training programs and to encourage participation from people of all walks of life including youth, women and Indigenous peoples.

"I would encourage everyone to talk to their MPs and MPPs. They want to help. We've had some really good meetings with both the provincial and federal governments and they want to leverage each other's work."

**CARLA CARMICHAEL, Ontario Power Generation
VP Commercial Management and Project Assurance**



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COG's Sergio Russomanno shared up-to-the minute news from the recent Argentina one-unit life extension project. The reactor reached 100 per cent power on April 12 following its return to critical, Jan. 4.

Bruce Power's Chris Elliott shared Bruce Power's strategy to implement lessons catalogued and detailed in the

company's past projects, as well as from others, into the upcoming Major Component Replacement (MCR) Project. Quarterly, COG holds business meetings for member and supplier participant executives to exchange information on topical issues and to learn about COG's and the industry's most recent activities and operating experience.

Four projects - four perspectives on refurbishment and life extension

PREPARATION



Chris Elliott, Bruce Power MCR Oversight and Regulatory Support Manager

- Lessons learned from past projects (Units 3&4, restart 2003, 2004 and Units 1&2, restart 2012) have been binned into seven areas (governance, strategies, planning and setup, oversight and management, skills and resources, infrastructure and integration) to be applied to the upcoming Major Component Replacement Projects, the first of which begins in 2020
- From past refurbishments, several overarching principles have also been adopted including: Establish clear scope and don't change it; get site infrastructure in place early; have a detailed schedule and work to it; integrate with the operating plant early; work as an integrated project team with execution contractors; have clear accountability and close documentation in real time - *not* at the end of the project.

EXECUTION



Bill Owens, Ontario Power Generation, Senior Vice President, Nuclear Refurbishment

- Safety is always first priority: "Seven Life Saving Rules" require non-negotiable compliance with the same commitment from OPG, employees, unions and vendors
- The preparation for Unit 3 (the next unit to start execution) will be completed in October 2019 and execution begins mid-January, 2020
- **"One OPG, one team, project first"** -- OPG has shifted the execution model to bring the EPC (engineer, procure and construct) contractor and OPG management as a single project management team ensuring OPG's prior experience on refurbishments and the contractors' expertise create a whole greater than the sum of the parts
- Innovation is ongoing: As challenges and opportunities are discovered, continuous refurbishment performance improvement

RESTART



Sergio Russomanno, COG Relationship Manager speaking for Nucleoeléctrica Argentina

- Life extension project was declared complete, Sept. 6, 2018 after last feeder weld was approved
- The plant was synchronized to the grid, Feb. 14 at 30 per cent power and is undergoing routine testing (editor's note: Full power achieved April 12)
- Lessons learned during the power rate ramp up were documented for future projects
- Assistance with some of the re-start challenges was received through the COG OPEX program demonstrating the COG vision of excellence through collaboration

OPERATION



Michael Hare, Deputy Chief Nuclear Officer, New Brunswick Power

- The Fix-It-Now Team will be invaluable during and into operation to get to immediate jobs done while keeping your team on track critical path
- Oversight at re-start from senior groups and advisory boards on safety and technical areas will be invaluable (even if it doesn't feel that way at the time)
- Moving into operation, set good targets and stick to them
- Lepreau came back with a low nuclear performance index and has worked up to a Nuclear Performance Index score of 91 with a 97 equipment reliability score -- its best ever; the plant just entered an outage following its first breaker-to-breaker run in 25 years; Post-refurbishment, Lepreau isn't getting older, it's getting better.