

ONTARIO POWER GENERATION



Safely Extending Candu Life  
Mark Elliott  
SVP – Nuclear Engineering and  
Chief Nuclear Engineer  
Ontario Power Generation  
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- Pickering A and B started Operation in 1971 and 1983.
- Stations now combined.
- Assumed 30 design life now surpassed and station is approved to run to planned 2020 closure date



Darlington started operation in 1990. Refurbishment starting in 2016 to extend life to 2055.

# Keys to Life Extension

- Comprehensive Aging Management Program
- Major Component Inspection and Maintenance
- Fuel Channel Life Management Research and Fitness for Service
- Heat Transport System Aging Effects Mitigated

# Comprehensive Aging Management Program

## Component Condition Reports

- Document degradation mechanisms
- Specify actions to extend life
- Maintenance/Replacements

Fund/Execute/  
Track/Monitor



# Major Component Inspection and Maintenance

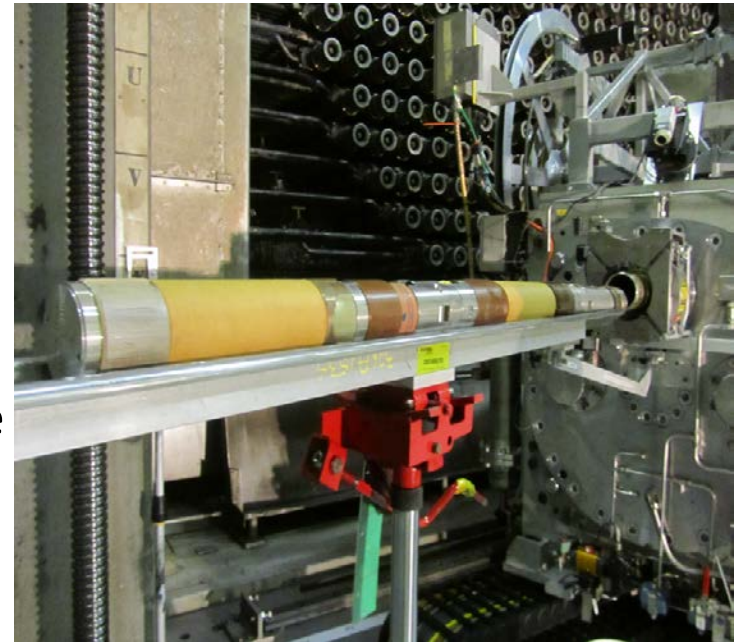
Feeders inspected for thinning

- Slow thinning rate and innovative stress analysis is preventing need for widespread replacements

Fuel Channels inspected flaws, Sag, PT/CT Gap, hydrogen pickup, spacer degradation

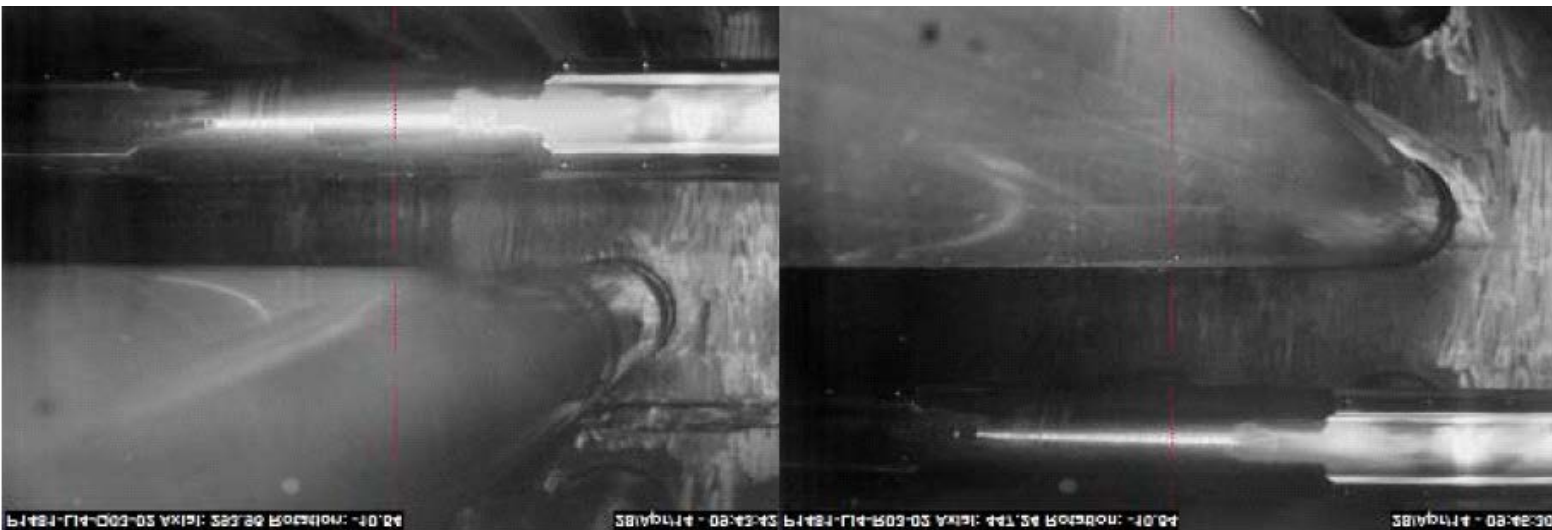
# Major Component Inspection and Maintenance

- Fuel Channel Maintenance includes Reconfiguration to maintain bearing support and Spacer Location and Relocation (SLAR)
- Steam Generator Inspection, cleaning and tube plugging to preserve Fitness for Service
  - No need to replace Darlington Steam Generators for second life



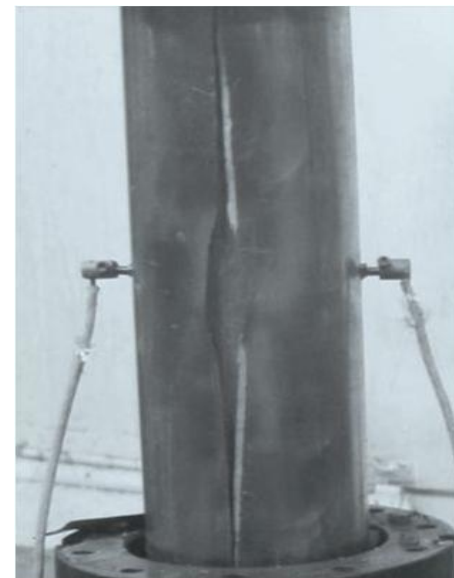
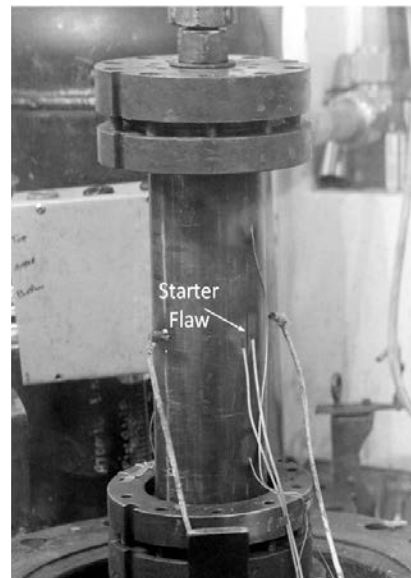
# Major Component Inspection and Maintenance cont.

- Reactor Components Inspected
  - Calandria Tube/Liquid Injection Shutdown System Nozzle spacing



# Fuel Channel Life Management Research

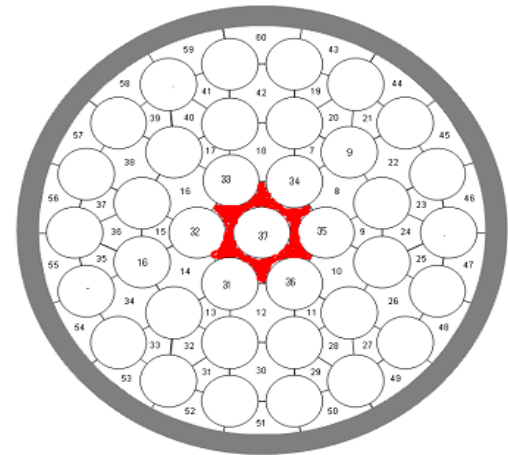
- Candu Owners Group (COG) Joint Project
- 5 years and 18 Research Projects and Reports
- Protocol signed with Regulator – scope and success criteria and milestone dates
- Fuel Channels Fit for
- Service beyond assumed design life
- Research codified into Fitness for Service Guidelines





# Heat Transport System Aging Effects Mitigated

- Pressure Tubes ‘creep’ diametrically changing coolant flow pattern
- Safety Margin on Loss of Regulation affected
- Redesigned Fuel Bundle utilized
- Sophisticated Neutron Overpower Analysis, Realistic Treatment of Uncertainties
- Allows full power operation of Refurbishment



# Summary

- Candu Reactors can be run at high power for an extended life thanks to Utility Partnerships and Advanced Research Facilities
- Highly capable dedicated Scientists and Technicians
- Strong Project Management

