



Introduction to the AECL Meeting with the USNRC and the CNSC on Fuel Channels

Marc Léger
Director, Materials Engineering
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Objectives of the Meeting

- **Continue the process of familiarization of the USNRC with CANDU fuel channels in general and the basic design of the ACR fuel channel**
- **Identify any initial issues of the USNRC with respect to both the fuel channel design and the codes and standards used in its design**
- **Continue to demonstrate the depth of fuel channel knowledge developed for CANDU in major technology areas through overview presentations for each area**
- **Provide a view of R&D to support specific ACR design features**
- **Get input from the USNRC**



Agenda

Today

- **CANDU / ACR Fuel Channel Design**
- **Fuel Channel Codes and Standards**
- **Rolled Joint Design and Performance**
- **Fuel Channel Inspection**
- **Lab Tours**



Agenda

Tomorrow

- **Introduction to Fuel Channel Technology Base**
- **Fuel Channel Fitness for Service**
- **Delayed Hydride Cracking and Fracture**
- **Irradiation Damage and Deformation**
- **Corrosion and Hydrogen Ingress**
- **Fuel Channel Anticipated R&D**
- **Lab Tours**
- **Wrap-up**



Potential Areas for Discussion

- **Zr-2.5Nb as a pressure boundary material**
 - CSA standards
- **Pressure tube to end fitting rolled joint as part of the pressure boundary**
 - CSA standards
- **Fuel channel removable closures**
- **Inspection requirements**
 - CSA standards
- **Fuel channel deformation during service**



Fuel Channel Performance

- **Zr-2.5Nb pressure tube maximum operational experience is about 150,000 EFPH (Effective Full Power Hours) or about 17 EFPY**
 - **Material surveillance database**
- **Materials irradiated under higher flux conditions extend database to neutron doses beyond current operation**
- **Initial predictions for ACR tubes have been made**
- **Areas requiring additional confirmation of predictions have been identified**



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