



**ENERGY
NORTHWEST**

Columbia Generating Station

Pre-Submittal Meeting

License Amendment Request for
Measurement Uncertainty Recapture (MUR)
Power Uprate

May 2, 2016

EN Participants:

- ✦ Dave Kettering - Design Engineering Manager
- ✦ Alex Javorik - VP Engineering
- ✦ Dave Brown – System Engineering Manager
- ✦ Lisa Williams - Licensing Supervisor
- ✦ Dan Moon - MUR Project Technical Representative
- ✦ Jim Brownell - MUR Project Manager

Agenda

- ✦ Background
- ✦ License Amendment Request (LAR) overview
- ✦ Leading Edge Flow Meter (LEFM)
- ✦ LAR schedule
- ✦ Conclusions
- ✦ Questions

Background

Columbia is a BWR-5, Mark II containment

Columbia Power Levels	
Original Licensed Thermal Power	3323 MWt
Current Licensed Thermal Power	3486 MWt
Proposed MUR Thermal Power	3544 MWt

LAR Overview

- ✦ LAR technical evaluation based on NRC approved Topical Reports:
 - NEDC-32938P-A, *Generic Guidelines and Evaluations for General Electric Boiling Water Reactor Thermal Power Optimization*, May 2003
 - ER-80P, *Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM $\sqrt{}$ ™ System*, March 1997
 - ER-157P-A, *Supplement to Caldon Topical Report ER-80P: Basis for Power Uprates with an LEFM Check or an LEFM CheckPlus System*, May 2008

LAR Overview (continued)

✦ Completeness of information

- Addresses the criteria contained in the NRC Safety Evaluations for LEFM Topical Reports that are required to be addressed as part of the MUR request
- Contains a cross-reference matrix showing the location of information required by Attachment 1 of RIS 2002-03, *Guidance on the Content of MUR Uprate Applications*
- Incorporates responses to applicable requests for additional information from other MUR submittals

Leading Edge Flow Meter (LEFM)

- ✦ Cameron Check Plus™
- ✦ Two LEFM systems installed in R22 (2015)
 - One on each feedwater line
- ✦ Uncertainty values determined by Alden Labs
- ✦ Commissioned through the Cameron Process
- ✦ Columbia specific operating experience using LEFM

LEFM – Modes of Operation

LEFM Modes of Operation	Power Level	LEFM Uncertainty
Both in Check Plus	Normal operation at 3544 MWt	$\leq 0.3\%$
One in Check Plus and one in Check OR Both in Check	Return to Check Plus OR Reduce power to 3537 MWt	$\leq 0.5\%$
One or more in Fail	Return to Check OR Reduce power to 3486 MWt	N/A

LAR Schedule

✦ Outage implementation is preferred

- LAR Technical Review Complete
- Pre-submittal Meeting 5/2/2016
- Bonneville Power Administration Grid Stability Report 7/1/2016
- Submit Amendment Request 7/15/2016
- Implement during refueling outage (R23) - starts 5/13/2017
- Request approval prior to R23 (May 2017)

Conclusions

- ✦ Columbia MUR amendment request is based on NRC approved guidance
 - Not accompanied by other (unrelated) requests or changes
 - All required information is included in LAR submittal
- ✦ Includes a proposed power level for LEFM Check Mode
- ✦ Outage implementation is preferred
- ✦ Request 10-month NRC review period

Questions or Feedback?