Clinton Power Station Application of GE Hitachi Simplified Stability Solution (GS3)

Pre-Submittal Meeting

April 9, 2014

Exelon Generation®

Meeting Agenda

- Objectives
- Key Project Personnel
- Key Aspects of GS3
- Application of GS3 to CPS
- GS3 Benefits for CPS
- GS3 Motivation and Basis
- SAR Content and Sample Demonstration Results
- Conclusion
- Project Schedule

Objectives

- The purpose of this meeting is to discuss the Clinton Power Station (CPS) license amendment request (LAR) for application of the GE Hitachi Simplified Stability Solution (GS3) methodology
  - Address key aspects of the GS3 methodology
  - Address technical topics associated with the proposed LAR
  - Discuss licensing activities and schedule
- Obtain NRC input on the proposed application of this methodology at CPS

Key Project Personnel

- Exelon Technical Lead: Andy Olson
- Exelon Licensing Lead: Tim Byam
- Exelon Core Design: Dale Bradish
- GEH Technical Lead: Juswald Vedovi
- GEH Licensing Lead: Jim Harrison
- GEH Project Manager: Charles Lamb

Key Aspects of GS3

- GS3 is a TRACG methodology alternative to the DIVOM methodology used for the calculation of the stability based OLMCPRs in the stability long-term solution (LTS) Option III implemented at CPS
- GS3 is a methodology improvement rather than a new LTS and it is built on a Best Estimate Plus Uncertainty (BEPU) methodology
- GS3 does not include any change to the backup stability protection aspect of the current Option III solution implemented at CPS
- GS3 uses TRACG to calculate the MCPR at the time of oscillation suppression to show that the SLMCPR is protected
- GS3 does not calculate the Decay Ratio nor use frequency domain analysis

Application of GS3 to CPS

- GS3 implementation at CPS does not require any hardware or software changes in the plant
- GS3 application to CPS uses the existing detection algorithm, the Period Based Detection Algorithm (PBDA)
- The best-estimate TRACG code is used to determine the MCPR margin during reasonably limiting instability event simulations for GS3 applications to CPS
- The GS3 methodology generic Licensing Topical Report (LTR), NEDE-33766, Rev. 0, was submitted for NRC review in September 2013
- The proposed CPS LAR is based on a plant-specific GS3 SAR for CPS and does not require NRC approval of the generic LTR
- The GS3 methodology used in the plant-specific SAR for CPS is identical to the methodology documented in the generic GS3 LTR NEDE-33766, Rev. 0

GS3 Benefits for CPS

- Improve plant safety through better understanding of simulated phenomena
  - More realistic analyses
  - Comply with applicable GDC (i.e., GDC 10 and 12)
- Eliminate/reduce impact on plant operation
  - Reduce chances of spurious scram or alarms – CPS currently operating with minimum recommended OPRM setpoints
  - Optimize core reload design and improve thermal limit margins – excess conservatism in current stability methodology results in stability analyses establishing the MCPR operating limit
- Use of the integrated TRACG approach will vastly simplify the MCPR protection basis versus the current multi-step DIVOM based process
- Cycle-specific confirmation check will be used to select the OPRM setpoint

GE Hitachi Presentation

Project Schedule

- Submittal of the CPS GS3 LAR is currently scheduled for mid-June 2014
- Exelon will request approval of the amendment by April 30, 2015
  - Expedited NRC review is required to support the CPS refueling outage in May 2015
  - The core design will be completed using the GS3 methodology
- Exelon will implement the approved amendment prior to startup from refueling outage C1R15 (startup is currently scheduled for May 13, 2015)
- Implementation will include updating the following documents:
  - CPS Technical Specification (TS) 5.6.5, Core Operating Limits Report, to reflect the new approved methodology
  - Cycle 16 Core Operating Limits Report (COLR) to reflect OPRM setpoint and OLMCPRs
  - TS Bases, as required

Questions