Stability Detect and Suppress Methodology

Presentation for
BWROG/NRC Management Meeting

February 13, 2003

Mike May
Exelon

Purpose of the Committee

- Develop an acceptable set-point methodology for detect and suppress stability solutions

D & S Program Phases

- Phase 1: Identify methodology success path
- Phase 2: Define new stability limit to show compliance to fuel design criteria
- Phase 3: Develop the technical bases for new stability limit and develop the framework for licensing submittal
- Phase 4: Perform all analyses, submit LTR, and obtain NRC approval

Background - Phase 1

- Committee re-established to resolve Part 21 issue of non-conservative DIVOM curves
  - DIVOM relates change in CPR to oscillation magnitude
- Committee determined that generic DIVOM correlation not feasible
  - Requires setpoints too low for effective operation at some plants

Background - Phase 1 (Continued)

- Committee pursued new approach
  - Establishes generic setpoints and uses TRACG to calculate best-estimate CPR response to oscillations and initiating events
  - Received favorable response from NRC at 5/1 meeting, but NRC cautioned uncertainties must be quantified
- Searched for more robust alternative
  - Committee decided to pursue new stability limit instead of SLMCPR
  - Requires licensing basis change for stability

New Stability Limit - Phase 2

- More realistic characterization of oscillation event
- Approach permits oscillations that take fuel into and out of boiling transition
  - Evaluate fuel response relative to applicable fuel design limits appropriate for stability
  - Define new stability limit to ensure negligible impact on fuel

Summary of Feasibility Study Phase 2 (Continued)

- ✶Results indicate negligible impact on fuel
  - Preliminary TRACG analysis shows acceptable temperature oscillation
  - Limiting issue is annealing of irradiation hardening
  - Need to establish oscillation temperature limit that ensures negligible annealing

NRC Nov 2002 Meeting Summary

- ✶Meeting was positive
- ✶Solution based on fundamental fuel parameters
- ✶Program is right way to go
- ✶Ambitious - Need to qualify fuel performance methods for oscillation events

Present Activities - Phase 3

- Developing licensing framework document
  - Defines all necessary licensing elements
  - Establishes work scope
  - Provides roadmap
- Technical discussion with NRC Staff set for February 20th

Major Milestones

Analysis to confirm assumptions, analysis scope, and schedule	2Q 2003
Complete engineering analysis	4Q 2004
Submit Licensing Topic Reports	1Q 2005
Receive NRC approval	1Q 2006

Risk Informed Part 50 Option 3

BWROG/NRC Management Meeting
Rockville, MD
February 13, 2003
Lewis Sumner (SNC)

Purpose of Committee & Presentation

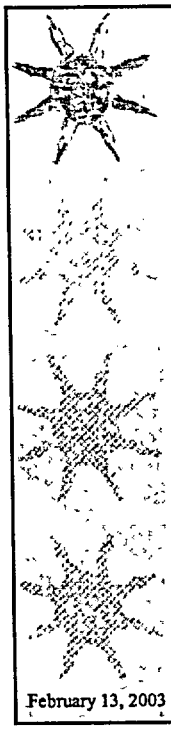
- ✶Purpose of the committee
  - Original: Develop RIP-50 Option 3 programs (SECY- 2001-133) - focus on §50.46 and App. K.
  - Current: Pursue LOCA/LOOP and monitor the others
- ✶Purpose of the presentation
  - Review results of last meeting with the Staff
  - Ensure agreement on expected results from the next meeting.

November 2002 NRC Meeting

- ✶BWROG presented its "safety case"
  - Substantial reduction in complexity
  - Separating LOCA from LOOP is expected to improve safety
  - NRC commented favorably
- ✶Discussed need for near-term progress
  - Staff suggested LTR as basis for §50.12 exemption to §50.46
- ✶BWROG has outlined specific information for the LTR

Next NRC Meeting

- ✶ Scheduled for February 27, 2003
  - BWROG outline has been transmitted to the Staff for review
  - BWROG expectation is that meeting will have a positive impact on the LTR content
    - Minimize Requests for Additional Information
  - BWROG requests confirmation from NRC management regarding success path



Summary

- ✶LOCA/LOOP is important
  - It is a cornerstone for risk-informed regulations
- ✶BWROG has struggled to identify a success path
  - Lead plant exemption request has potential
  - BWROG prefers rulemaking, if timely
- ✶Continued BWROG efforts are based upon milestone accomplishments

Reduction of Unnecessary Regulatory Burden:

Removal of Safety Limit MCPR From Tech. Specs.

Presentation for BWROG/NRC Management Meeting
February 13, 2003

Tom Silko (Entergy VY)

Removal of Safety Limit MCPR From Tech. Specs.

- Safety Limit Minimum Critical Power Ratio (SLMCPR) Numeric Value Routinely Changes Cycle-to-Cycle Requiring Multiple Tech Spec Submittals.
- Large Number of SLMCPR Changes Results in Significant Industry / NRC Burden.

Objective: Relocate SLMCPR Value to the COLR.

Removal of Safety Limit MCPR From Tech. Specs.

- Original BWR Tech Specs Contained Numeric Values of Core Thermal Limits - Caused Frequent Tech Spec Changes.
- GL 88-16 Allowed Removal of Core Thermal Limits Numeric Values from Tech Specs to the COLR.
- SLMCPR Numeric Value is in Safety Limits Section of Tech Specs and was Not Relocated. At the Time, SLMCPR did not Routinely Change Cycle-to-Cycle.

Removal of Safety Limit MCPR From Tech. Specs.

- Advent of Advanced Core Design Methods Has Resulted in SLMCPR Values Routinely Changing.
- 1999 – TSTF-357 Proposed to Relocate Numeric Value to the COLR.
- Fall 2002 – Exelon/AmerGen Submit Exemption Request to Relocate SLMCPR.
- Fall 2002 – Draft TSTF-357, Revision 1 Placed on Hold Pending Exemption Disposition.

Removal of Safety Limit MCPR From Tech. Specs.

- Closure Options
  - Generically Apply Exelon Exemption Request
  - BWROG Prefers Generic Tech Spec Change (TSTF-357, Revision 1)

Joint Owners' Group (JOG) Motor-Operated Valve (MOV) Periodic Verification (PV)

PRESENTATION FOR BWR OWNERS' GROUP/NRC Management Meeting

February 13, 2003

Tom Green (GENE) for

Glenn Warren (SNC)

JOG MOV Periodic Verification

OBJECTIVES

- **PARTICIPATION**
  - B&WOG, BWROG, CEOG & WOG
    - 62 plants; 98 units
- **OBJECTIVES**
  - Support JOG MOV PV Program to address GL 96-05
- **PRESENTATION**
  - Brief NRC Management on JOG Program Status

JOG MOV Periodic Verification

PROGRAM SUMMARY STATUS

- ~ 190 MOVs assigned for testing
- 3-Phase JOG MOV PV Program:
  - Interim (static testing while dynamic testing conducted)
  - Dynamic testing (3 consecutive tests per assigned MOV)
  - Individual plant implementation (i.e., recommendations)
- 5-yr testing program (Phase 2) ended-October 2002 with ~ 570 dynamic tests conducted
- Final report in preparation (age-related degradation conclusions and recommendations from testing)

JOG MOV Periodic Verification

JOG COMMUNICATIONS WITH INDUSTRY

- JOG has presented a status update at annual MUG (MOV Users' Group) meetings since 1997
- JOG has presented a status update at NRC/ASME Valve Symposiums since 1998
- JOG Feedback Notices have shared relevant dynamic testing information with participating utilities from program start (NRC has reviewed)

JOG MOV Periodic Verification

PROGRAM SCHEDULE

- OCT 02: Dynamic testing completed
- DEC 02: All test results to MPR Associates for evaluation
- APR 03: Draft report for JOG Core Group review
- JUL 03: Status meeting with NRC Staff
- JUL 03: Draft report to utilities for review
- NOV 03: Final Report issued to OGs for approval
- DEC 03: Final report submitted to NRC
- JUN 04: Expected NRC SER

JOG MOV Periodic Verification

NRC INTERACTION

- 10 JOG status meetings have occurred with NRC since program start in 1997; meetings have been amiable and constructive
- NRC has indicated acceptance of JOG program schedule for final report submittal
- NRC GL 96-05 SER issues and related open items will be addressed in JOG Final Report
- Expectation of both JOG and NRC is for "clean" JOG MOV PV SER to facilitate ease of utility implementation
- JUL 17-18, 2003 meeting planned for JOG to discuss preliminary test results with NRC Staff
- JOG will seek waiver for "NRC Review Fees" consistent with current NRC guidelines

JOG MOV Periodic Verification

UTILITY IMPLEMENTATION

JOG to most likely recommend a utility implementation schedule similar to that endorsed by NRC for the BWROG DC Motor Methodology implementation

- **"Clock-start" upon SER issue**
- **Plant-specific MOV PV program response within "X" years or "Y" Refueling Outages**

Hydrogen Accumulation Committee Status

Presentation For
BWROG/NRC Management Meeting

February 13, 2003

Rockville, MD

Jack Gray (Entergy NE)

H2 Accumulation Background

- Two hydrogen detonation events
  - RHR/SCM Rupture – November 2001
  - Head Spray Rupture – December 2001
- GE "Blue Ribbon" task force defined potential risk
- Hydrogen Accumulation committee developed managed approach to address this risk

H2 Accumulation Background (Continued)

- BWROG communicated with Japanese and European utilities that experienced detonation events
- Extensive discussion with affected European utility at October 2002 BWROG European Conference
- Multiple discussions with affected Japanese utility at BWROG General Meetings

H2 Accumulation Committee Accomplishments

- Reviewed GE task force report and key technical references
- Benchmarked Japanese utility screening methods
- Studied mitigation methods to reduce potential for hydrogen accumulation
- GE provided "tool chest" to BWROG
  - GE hydrogen design methods
  - Detonation pressure information

H2 Accumulation Committee Accomplishments (Continued)

- Issued Guidance Document "BWR Piping and Component Susceptibility to Hydrogen Detonation"
  - Management logic chart for evaluating system susceptibility
  - Generic "susceptibility" classifications ("bins") as part of screening criteria
  - Identified 2 high priority piping runs for evaluation and potential action during upcoming refueling and maintenance outages
    - RHR Steam Condensing Mode
    - Head Spray System

Information Made Available to the Nuclear Industry

- Distributed Guidance Document to the BWROG Executives and Primary Representatives in December 2002
  - Lewis Sumner letter requesting action
- Sent Guidance Document (Proprietary and Non-Proprietary versions) and Steam Condensing Mode survey results to NRC December 2002
- Guidance Document is being provided to INPO
- Survey is in progress to determine plant specific actions taken to date

BWR Owners' Group Licensing Topical Report/ Other Submittals of BWROG Interest

INTEGRATED BWROG/NEI SUBMITTAL- NRC REVIEW SCHEDULE

Document Number	Title	LTR (to NRC)	OG Tech Spec Traveller No.	Open RAI Date	Open RAI Response Due Date	NEI TSTF Number	TSTF TO NRC	NRC APPROVAL TOPICAL/TSTF	CLIIP	CLIIP ISSUE DATE	COMMENTS
NEDO-33003	Regulatory Relaxation for the H2/O2 Monitors and Combustible Gas Control System	BWROG-01036 6/22/01 A							NO		BWROG requested NRC to suspend review in Jan 02
NEDC-31951P	Implementation of IWC and Technical Basis for Revised Piping Inspection Schedules	BWROG-98037 4/8/98 A				NA	NONE	11/08/01 (letter) A	NO		COMPLETE
	Joint Owners' Group MOV Response to GL 96-05 (Final Report)	12/31/03 E	NA				NONE	6/04(TOPICAL)E	NO		
	Containment Atmospheric Control Valves	2003 E							YES		
RITS-1	Risk Informed Tech spec (RITS) -1 Modified End States	E-mail to NEI and NEI ltr to NRC, 1/5/01: NEDC 32988, R2	CEOG-152, BWROG-87	7/31/01 A	10/02 A	TSTF-422 TSTF-423	422 6/02A 423 1Q03E	9/02 (SER) A 2Q03 (TSTF) E	YES	3Q03E	BWROG and CEOG TSTFs bundled. Approved report submitted to NRC 1/03
RITS-2	Missed Surveillances	Developed by NEI RITSTF and submitted	CEOG-140, R3	NA	NA	TSTF-358	9/14/00, R5	6/01 (TSTF)A	YES	9/28/01 A	90% of plants have or will apply for it
RITS-3	Flexible Mode Restraints	OG00-0443-236, GE-NE A13-00464-002, 12/00, R2	CEOG-141, R3	8/14/01A		TSTF-359 R8	2/4/02 A	3Q02 (TSTF) A	YES	3Q02 A FRN 1Q03 Notice of availabilit y	Late comments being addressed in CLIIP FRN
RITS-4a	CIV AOT Extention	BWROG LTR 2/21/02A	CEOG-160	4Q02A	1Q03E	Not Assigned	2Q03E	2Q03 (SER) E 4Q03 (TSTF) E	YES	1Q03 E	BWROG submittal, will require review fees
RITS-4b	Risk Informed AOTs with Backstop	NEI position paper 10/12/01A, revised white paper 2/27/02A									NA for BWROG No pilot
RITS-5b	Transfer SRs/Optimize STIs	NEI position paper 6/01 A, revised position paper 4/03E	BWROG-88	Comments on position paper 9/21/01 A	5/31/02 A	TSTF-425	2Q03E	3Q03(TSTF) E	YES	1Q04 E	BWROG lead. Next revision of method estimated for 1Q03
RITS-6	Modify LCO 3 0 3 to 24 Hours	2003 E	CEOG-373								Based on CEOG work, may consider 6a approach using (A)(4) to have a floating LCO 3 0 3 action statement
RITS-7a		Barriers	White paper to be submitted to NRC 1Q03			TSTF-372					
RITS-7b	Define Not Operable/Functional	NEI revised position paper to NRC 2Q03	NA						YES		
RITS-8	Eliminate TS-Not Meet Criteria	2003E White paper on method							YES		
NEDC-33036	Option 2 Pilot Program for Quad Cities	OG 01-0241-244 7/27/01 A							NO		Draft report transmitted for information
	Option 3, Elimination of LOOP Requirements with LB LOCA	12/03 E									Potential petition for rule making
	Pipe Break Inside Containment for SEP III Plants (GSI 156 6 1) NEDC-33054P	11/15/01A							NO		COMPLETE
NEDC-XXXXX	Revised Detect and Suppress Methodology	1Q05E	N/A			N/A	N/A	1Q06 (Topical) E	NO		

A=Actual Date
E=Expected or target date
NA=Not Applicable
Updated 2/12/2003