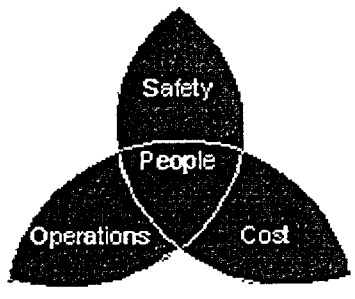
Team Pilgrim

Press for Success

Entergy

# Pilgrim Nuclear Power Station

July 24, 2002




Attachment 2

# Overview

- 1.5% feedwater flow uncertainty reduction Amendment Request submitted 7/5/02
- Implementation during April 2003 Refueling Outage
- Amendment Request developed in conjunction with Grand Gulf and River Bend
- Amendment Request scope limited to items necessary for uprate

# Modifications

- Design changes to implement uprate
  - Enhanced Feedwater Flow Measurement
  - New High Pressure Turbine
  - New Turbine Control Valves
  - New Moisture Separator Internals
  - Relief Valve Capacity Increase

# SRV Capacity Increase

- Current SRV capacity inadequate with the 2% Main Steam Flow increase necessary for the requested power uprate
- SRV throat sizes are to be increased by 7%
- Current analytical margins do not support the increased loads due to the higher SRV flow

# Approval Requested

- Operating License changes
- Application of the Independent Support Motion (ISM) methodology described in UFSAR 12.2.3.5.5 for piping/support analysis for the increased SRV flow

# History

- Current methodology for this piping is the Enveloped Response Spectra (ERS) Method described in UFSAR 12.2.3.5.4
- ISM was previously used for the seismic analysis of the Recirculation, RHR and RWCU systems in conjunction with IGSCC piping replacement and is described in UFSAR 12.2.3.5.5
- NRC SER was focused on IGSCC issues
- NRC performed inspection including review of the Owners Specification

# Benefits

- ISM provides a more complete and accurate analytical approach
- Performing the analysis using ISM will reduce the required scope of modifications
- Current walk down information is insufficient to support the significant modifications required if ISM is not used
- Substantially reduced worker dose

# Independant Support Motion

- Requires simultaneous application of the three dimensions of seismic motion
- Only applied to piping systems between separate floor levels, and/or individual structures
- The number of support groups are kept to a minimum and spectra within a support group shall be enveloped and used for all supports within that group
- Current licensing basis seismic response spectra are peak broadened to ± 15%

# Independant Support Motion

- Modal Combination per Regulatory Guide 1.92, February 1976
- Piping modal damping shall be in accordance with Regulatory Guide 1.61
- High frequency modes are included in the analysis to reasonably obtain the full mass contribution
- ISM group responses for each direction are combined by the SRSS method

# Independant Support Motion

- Seismic inertial responses are to be combined with the seismic anchor motion and other dynamic event responses by the Absolute Sum method
- The stresses and reactions from rapid valve closure or opening are to be combined with seismic inertial stresses and reactions by the SRSS method
- Design evaluation are in accordance with the requirements of ASME B&PV Code Section III 1977 Edition through Summer 1977 addenda

# Summary

- PNPS will be implementing a small power uprate that includes TPO and efficiency improvements
- Increased SRV capacity is required resulting in increased piping loads
- Proposed use of the ISM methodology as described in FSAR 12.2.3.5.5 with realistic models of the piping systems

# Summary

- The method exhibits both increases and reductions in conservatism
- Minimizes the modifications in the drywell and a large ALARA benefit
- Approval is necessary to implement the power uprate

# THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

## THAT CAN BE VIEWED AT THE RECORD TITLED:

## DRAWING HANDOUT FROM 6-24-2002 MEETING RE PILGRIM PROPOSED SAFETY-RELIEF VALVE SEISMIC ANALYSIS METHODOLOGY

## WITHIN THIS PACKAGE

**NOTE: Because of these page's large file size, it may be more convenient to copy the file to a local drive and use the Imaging (Wang) viewer, which can be accessed from the Programs/Accessories menu.**

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