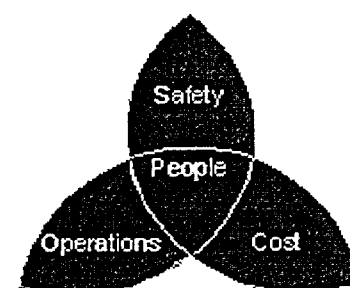


# Pilgrim Nuclear Power Station

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**



# Background



## 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**



# Background



## **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  $\pm 15\%$**





# 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.

**D-01.**