Oconee Nuclear Station

Regulatory Conference

Inspection Report 00-11 Potential White Finding

September 7, 2000

Agenda

- Overview of Issue
- Risk Perspective
- Calculation Deficiency
- Regulatory Perspective
- Conclusions
- Closing Remarks

Inspection Report 00-11 Issue

- NRC Inspection Report 00-11 concluded:
  - » Calculation OSC-3873 did not adequately consider all design inputs associated with alignment of a High Pressure Injection (HPI) pump to the Spent Fuel Pool (SFP)
  - » Consequently, there was not reasonable assurance that the HPI pump could operate for the necessary timeframe following certain tornado scenarios

ONS Philosophy

- Systematic processes assessing design basis and risk significant areas
- Issues prioritized using risk insights
- Infrastructure to manage resolution of issues
  - » Corrective Action Program
  - » Design Basis Group
  - » Design Review Board
  - » Nuclear Excellence Team
- Focus on design basis health continues

Overview of Issue

- Calculation deficiency identified by Duke
  - » Entered into site corrective action program
  - » Risk evaluation conducted
- HPI/SFP flowpath credited during certain tornado-induced Reactor Coolant Pump (RCP) seal LOCAs
  - » Low risk significance for Unit 1
  - » Even lower risk significance for Units 2 & 3
- Unit 1 seal replacement will resolve issue

Risk Perspective

- Duke has analyzed risk significance of specific sequences in the ONS PRA that credit the HPI/SFP flow path
- Potential risk significance of HPI/SFP flow path tied to RCP seal LOCAs
- Duke is taking actions to reduce overall plant risk associated with RCP seal LOCAs

Background on RCP Seal LOCAs

- Seal LOCAs generically identified in 1980 via GSI-23, "Reactor Coolant Pump (RCP) Seal Failure"
  - » Original ONS design did not consider RCP seal LOCAs
- Diverse RCP seal cooling provided by
  - » HPI Seal Injection
  - » Component Cooling
  - » Standby Shutdown Facility (SSF) Reactor Coolant Makeup System
- NRC closed GSI-23 for Oconee in 1995

Risk Perspective on RCP Seal LOCAs

- ONS IPE model for RCP Seal LOCA based on Unit 1 Westinghouse RCPs
- Unit 1 Westinghouse seal package scheduled to be replaced with Bingham seal package this fall
- Overall CDF reduction associated with Bingham seals is substantial
  - » ~ 30% reduction in ONS CDF using NRC-accepted Rhodes seal LOCA model
  - » ~ 40% reduction in ONS CDF using recently developed Bingham-specific seal LOCA model

Risk Assessment of HPI/SFP Flow Path

- HPI/SFP flow path contribution to tornado annual CDF:

Unit	Delta CDF
ONS 1	~ 3E-6
ONS 2	~ 5E-7
ONS 3	~ 5E-7

- Units 2 and 3 risk insights based on conservatively applying Rhodes model to Bingham seals
- HPI/SFP flow path CDF less than 1E-8 using Bingham-specific seal LOCA model

Calculation Deficiency

- Calculation OSC 3873 created in 1990
- Duke identified calculation deficiencies
  - » Duration of suction source varies depending on SFP temperature, decay heat load, and HPI flow rate
- Calculation has been revised

Calculation Program

- Calculation program significantly upgraded since 1990
- Reviews continue in conjunction with design basis efforts
- Issues associated with OSC-3873 do not warrant broader corrective actions
- Corrective action program sufficient to drive resolution of identified issues

Future Corrective Actions

- Risk insights factored into corrective actions
- Best use of resources is to replace Unit 1 Westinghouse seal package with Bingham seal package
- Participation in recently developed Bingham seal LOCA model
- Actions underway to eliminate credit for SFP as an HPI suction source
  - » Risk importance of this flow path will be less than 1E-8

Regulatory Perspective

- Duke has taken aggressive action to address HPI/SFP issue
- Safety significance has been thoroughly evaluated and does not meet criteria for enforcement
  - » No actual safety consequences
  - » Potential safety consequences low
- Duke continues to pursue improvement of design basis
- Enforcement not necessary

Conclusions

- Issue example of Duke's continued use of risk insights for improving the design basis
- Risk associated with issue applicable to Unit 1 only
- Duke resolving issue by replacement of RCP seals
- Calculation program significantly improved

Closing Remarks