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MITSUBISHI NUCLEAR ENERGY SYSTEMS, INC.

Comanche Peak Units 3 and 4

Risk-Informed Technical Specifications Methodology

October 20, 2011

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Agenda

- Introductions and Opening Remarks
- Background
- TS Methodology for RMTS and SFCP
- Acronyms
- Summary and Conclusion

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Background – Conservatism in Plant Operation

- Luminant uses many tools to ensure safe plant operation
  - Conservative operations decision making policies
  - Maintenance work schedule – Train Week concept
  - Maintenance Rule a(4)
- Risk-Informed TS is an additional tool to manage risk
  - Promotes situational awareness of EOOS
  - Prevents unnecessary plant shutdowns
  - Reduces likelihood for requesting an NOED

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Background: RITS

- Adoption of RITS is an option in the US-APWR GTS
  - NEI 06-09, Initiative 4b, RMTS / AOTs
  - NEI 04-10, Initiative 5b, SFCP
- Luminant requested RITS in COLA Rev 0 (9/19/08)
- US-APWR DCWG meeting with NRC (4/2/09)
  - ISG-8: Technical Specifications must be complete at COL
  - Introduced Concept of NRC review of RITS methodology
  - Risk Metrics?

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Background: RITS

- Commission issued SRM SECY 10-0121 (3/2/11)
  - No change in risk metrics for new reactors
  - Allow use of inherent additional operational flexibility
  - Ensure no significant decrease in enhanced margin of safety
- NRC tabletop with stakeholders on RITS for new plants
  - Initiative 4b: 5/26/11 and 6/1/11
  - Initiative 5b: 6/29/11
- Luminant submitted TS methodology (6/30/11)

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Background: SRM-SECY-10-0121

"The Commission reaffirms that the existing safety goals, safety performance expectations, subsidiary risk goals and associated risk guidance (such as the Commission's 2008 Advanced Reactor Policy Statement and Regulatory Guide 1.174), key principles and quantitative metrics for implementing risk-informed decision making, are sufficient for new plants.

...the Commission continues to expect... at least the same degree of protection of the public and the environment that is required for current-generation light water reactors."

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Background: US-APWR GTS

- GTS provides framework for RMTS and SFCP
- Adoption of risk-informed programs is COL item

US-APWR GTS example (safety injection system)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required train inoperable.	A.1 Restore three trains to OPERABLE status.	72 hours
	[OR A.2 Apply the requirements of Specification 5.5.18.	72 hours]
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

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TS Methodology for RMTS and SFCP

- NEI 06-09 and NEI 04-10 are applicable to new plants
- NEI 06-09 IBR in TS 5.5.18 and NEI 04-10 IBR in TS 5.5.19 with modifications
- Special considerations on PRA technical adequacy
  - Key sources of uncertainty and key assumptions of DCD PRA will be reviewed
  - Uncertainty associated with lack of operating experience and reliability data on innovative designs should be considered
  - PRA technical adequacy requirements must be consistent and compatible with NRC-endorsed consensus standards on PRA and updates to RG 1.200 in effect one year prior to initial fuel load

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TS Methodology (cont'd)

- Functionality of safety systems inherent to US-APWR design is not degraded
  - Risk-informed completion times are applied only to second train (of four) declared inoperable
  - Loss of system safety function not allowed by RMTS
  - SFCP may affect reliability of equipment, but will not affect functionality of safety features
- Same degree of protection of public and environment required for current-generation LWRs is ensured

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RITS case studies

5 cases considering combinations of EOOS have been evaluated

- **One case which does not violate LCO (case 1)**
- **Three cases for which RICT can be applied (cases 2, 3 and 4)**
- **One case which RITS cannot be applied (case 5)**

	Class 1E GTG (gas turbine generator)				Safety Injection System				Containment Spray System				Emergency Feed Water System				Alternate AC Power Source		TS limit (front stop)
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	P1	P2	
Case 1				X				X				X				X		X	-
Case 2			X	X				X				X				X		X	72 hrs
Case 3				X			X	X				X				X		X	72 hrs
Case 4				X				X			X	X				X		X	72 hrs
Case 5				X				X				X	X			X		X	6 hrs[1)]

1) Initiative 4b does not apply to case 5 **X: Component out of service**

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RITS case studies - Results

	Level 1			Level 2		
	⊿CDF	Calc. RICT (days)	ICDP (backstop applied)	⊿LRF	Calc. RICT (days)	ILRP (backstop applied)
Case 1	3.7E-6	983	-	9.0E-7	404	-
Case 2	3.2E-5	113	2.7E-6	1.9E-5	20	1.0E-6
Case 3	1.1E-4	33	9.1E-6	2.2E-6	165	1.8E-7
Case 4	6.2E-6	590	5.2E-7	3.3E-6	110	2.8E-7
Case 5	4.1E-5	89	3.4E-6	4.4E-6	80	3.8E-7

- **Case 2 (two GTGs out of service) results in RICT shorter than the 30 days back stop**
- **ILRP the limits the calculated RICT for cases 2, 4 and 5**

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Acronyms

AOT	Allowed Outage Time
COLA	Combined License Application
EOOS	Equipment Out of Service
GTS	Generic Technical Specifications
IBR	Incorporated by Reference
NOED	Notice of Enforcement Discretion
PRA	Probabilistic Risk Assessment
RITS	Risk-Informed Technical Specifications
RMTS	Risk-Managed Technical Specifictaions
SFCP	Surveillance Frequency Control Program
SRM	Staff Requirements Memorandum
TS	Technical Specifications

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Summary and Conclusion

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