

June 2, 2005

MEMORANDUM TO: Cathy Haney, Program Director
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

FROM: Joseph L. Birmingham, Project Manager */RA/*
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

SUBJECT: SUMMARY OF MAY 24, 2005 PUBLIC MEETING ON THERMAL
FATIGUE GUIDELINES

On May 24, 2005, Nuclear Regulatory Commission (NRC) staff met with representatives of the Nuclear Energy Institute (NEI), the Material Reliability Program, and industry in a public meeting at NRC headquarters in Rockville, Maryland. The meeting was an opportunity for industry to present the status of industry actions to develop thermal fatigue management guidelines for normally stagnant non-isolable branch lines. Attachment 1 is a list of the meeting attendees. Attachment 2 provides the presentation slides used by industry (Accession No. ML051460067).

After introductions were completed, industry presented a brief history of thermal fatigue events and of the interim guidelines which were issued in 2001. At that time, the interim guidelines were based on industry operating experience and limited experimental work. Those guidelines primarily addressed safety injection (SI), drain, and excess letdown lines. Details of the interim guidelines and a flowchart of the then evaluation process are in attachment 2.

The MRP then provided a detailed presentation of the development of the final thermal fatigue management guidelines. Industry's approach was to develop a screening process that would determine where thermal cycling would and would not occur and also to determine what thermal loads would result from the various mechanisms of thermal cycling. Industry used scaled phenomenological testing to assist in the thermal fatigue model development. Industry believes that the outcome of this effort is the development of a comprehensive evaluation methodology that expands on previous work ((the EPRI thermal stratification cycling and striping (TASCS) program)).

Industry discussed in detail the scaled testing it had performed, the model for screening and evaluation it had developed, and described the various configurations for which the model was applicable. The testing simulated thermal leakage through a valve or other orifice and using thermistors on the exterior of the piping, recorded the thermal cycling frequency. Configurations included up-horizontal, down-horizontal, and horizontal piping configurations. The testing provided information on where in the piping thermal cycling occurred, pipe sizes affected, as well as the frequency.

Industry discussed the conservatism it had included in the model and also the results of benchmarking the model against the Farley SI configuration as well as against data obtained from foreign plants.

Based on the above work, industry developed a screening tool which would assist licensees to screen for piping susceptible to significant stress from thermal cycling and, based on the evaluation criteria, implement appropriate levels of recommended inspections and if needed, repair, replacement, or other needed mitigation actions. Details of the evaluation criteria are in the presentation handout (Attachment 2).

Industry concluded that its Thermal Fatigue Management Guideline (MRP-146) and the supporting documentation provide an effective approach to managing thermal fatigue in normally stagnant non-isolable branch lines that were connected to the reactor coolant system (RCS). The actions recommended in MRP-146 were classified as "needed" in accordance with the NEI 03-08 protocol and were to be implemented over a two-year period beginning July 2005. Training in the screening, evaluation, inspection, and implementation of MRP-146 was to be provided to all pressurized water reactor (PWR) utilities.

The NRC staff asked questions throughout the presentation about the conservatism, the configurations used for testing, the comparison to known events particularly among domestic PWR facilities. The staff felt that the presentation had been helpful in informing the staff of the status of the thermal fatigue management guidelines and in providing the staff the opportunity to ask questions on the development and background of the guidelines. The staff did not present any conclusion about the adequacy of the guidelines as it had not reviewed MRP-146 and its supporting documents. The MRP had recently provided a near-final draft of the guidelines (MRP-XX) and a supporting document MRP-132 to the NRC. The MRP agreed to work with the staff to make MRP-146 and its supporting documents available to the staff.

Industry summarized its completed/ongoing fatigue management guideline activities concluding that finishing those efforts would complete its work on thermal fatigue. Having discussed all of the agenda and as there were no comments from the public, the meeting was adjourned.

Project No. 689

Attachments: As stated

Cc: Jim Riley, NEI via email to jhr@nei.org

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Distribution: Summary of Mtg. w/NEI regarding Thermal Fatigue Guidelines 5/24/05

ADAMS/PUBLIC OGC ACRS

Email

MMayfield	DMatthews/FGillespie	CHaney	EMcKenna	KManoly
WBateman	KChang	MHartzmann	KRHsu	HGonzales
WCullen	JFair			

Nuclear Energy Institute

Project No. 689

Accession: #ML051460061

OFFICE	RPRP	EMEB	RPRP
NAME	JBirmingham	KManoly	EMcKenna
DATE	6 / 2 / 2005	5 / 27 / 2005	6 / 2 / 2005

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**List of Attendees for May 24, 2005
Meeting on Thermal Fatigue Mgt Guidelines**

NAME	ORGANIZATION
Kamal Manoly	NRC/NRR/EMEB
Keith Wichman	NRC/NRR/EMEB
Mark Hartzmann	NRC/NRR/EMEB
John Fair	NRC/NRR/EMEB
Joe Birmingham	NRC/DRIP/RPRP
Kaihwa R. Hsu	NRC/DRIP/RLEP
Chang Ken	NRC/DRIP/RLEP
Bill Cullen	NRC/RES/DET/MEB
Hippolito Gonzalez	NRC/RES/DET/MEB
John Carey	EPRI
Jeff Keller	Continuum Dynamics Inc.
Art Deardorff	Structural Integrity Assoc.
Les Spain	Dominion Generation
J. Michael Davis	Duke Energy
Alan Bilanin	Continuum Dynamics
Paul Donavin	AEP/Cook Plant