ACCELERATED DOCUMENT DISTRIBUTION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9406160104 DOC.DATE: 94/06/09 NOTARIZED: NO DOCKET #
FACIL:50-269 Oconee Nuclear Station, Unit 1, Duke Power Co. 05000269
50-270 Oconee Nuclear Station, Unit 2, Duke Power Co. 05000270
50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. 05000287
AUTH.NAME AUTHOR AFFILIATION
TUCKMAN,M.S. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards response to listed question re topical rept DPC-NE-3003, "Mass & Energy Release & Containment Response Methodology."

DISTRIBUTION CODE: A001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD2-3 LA	1	1	PD2-3 PD	1	1
	WIENS,L	2	2			
INTERNAL:	ACRS	6	6	NRR/DE/EELB	1	1
	NRR/DORS/ONDD	1	1	NRR/DRCH/HICB	1	1
	NRR/DRPW	1	1	NRR/DSSA/SPLB	1	1
	NRR/DSSA/SRXB	1	1	NUDOCS-ABSTRACT	1	1
	OC/LFDCB	1	0	OGC/HDS2	1	0
	REG FILE 01	1	1			
EXTERNAL:	NRC PDR	1	1	NSIC	1	1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 22 ENCL 20

R I D S / A D D S

R I D S / A D D S

mA4

Duke Power Company
P.O. Box 1006
Charlotte, NC 28201-1006

M. S. Tuckman
Senior Vice President
Nuclear Generation
(704)382-2200 Office
(704)382-4360 Fax

DUKE POWER

June 9, 1994

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
Attention: Document Control Desk

Subject: Oconee Nuclear Station
Docket Numbers 50-269, -270, and 287
Topical Report DPC-NE-3003, "Mass and Energy Release and Containment Response Methodology"; Response to RAI

In a telephone call on June 1, 1994 between Len Wiens of the NRC and Scott Gewehr of Duke, regarding the subject topical report, a question was put forth regarding main steam line break temperature and equipment qualification in containment. Attached please find Duke's response to this question.

If there are any questions, please call Scott Gewehr at (704) 382-7581.

Very truly yours,

M. S. Tuckman

M. S. Tuckman

cc: Mr. L. A. Wiens, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop 14H25
Washington, D. C. 20555

Mr. S. D. Ebneter, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
101 Marietta Street, NW - Suite 2900
Atlanta, Georgia 30323

A001

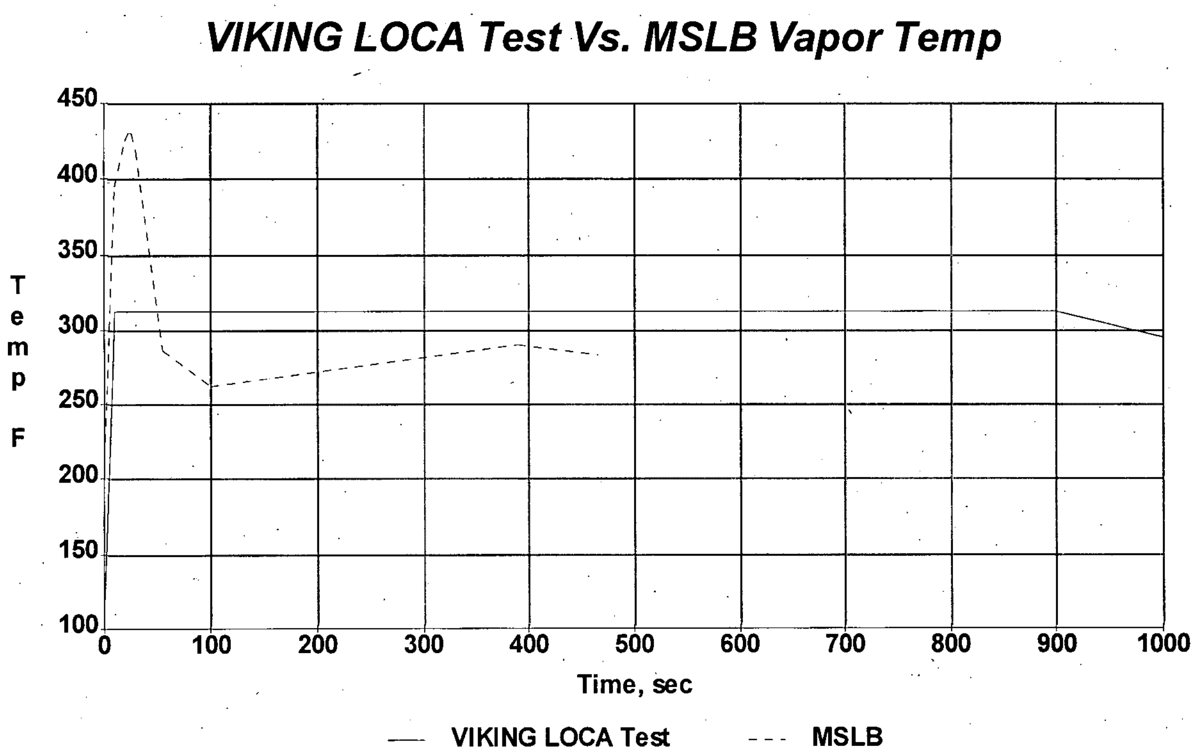
OCONEE MSLB/EQ ANALYSIS

An analysis was conducted under Oconee Calculation OSC-5460. The following is a summary of that calculation:

The attached table lists all equipment located inside containment required to mitigate and/or monitor a MSLB. This table also provides the required operability times and qualification parameters (temperature and pressure) to which the equipment was tested. For the purpose of this calculation, the "worse-case" test parameters have been selected to demonstrate adequacy of the equipment to perform its safety function. "Worse-case" is defined as the lowest test peak temperature over the shortest period of time tested. Review of the LOCA test profile indicates that the two "worse-case" pieces of equipment are the Viking penetration and BIW cable. For conservatism, LOOP 180 (highest temperature/longest period) , was used for comparison to the equipment test profiles.

VIKING PENETRATION :

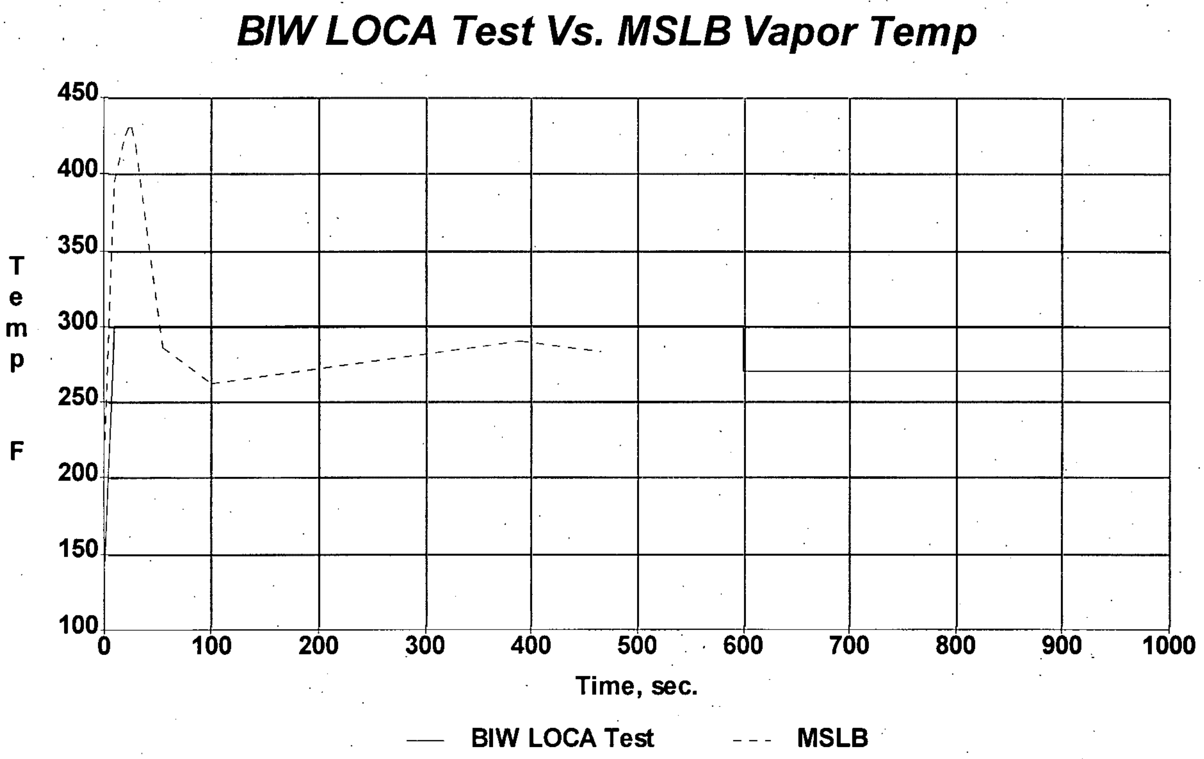
The Viking penetration was tested at a peak temperature of 312°F for the first 15 minutes, ramped down to 295°F for the next 45 minutes, and then held at 290°F for a further 23 hours. The Viking profile compared to the LOOP180 MSLB is shown below:



Additionally, the Viking penetration was thermally aged and irradiated prior to LOCA testing. The component parts were thermally aged to well over 60 years using Arrhenius methodology and irradiated to postulated LOCA doses (>10^8 rads) which are not present during a MSLB.

BIW CABLE:

The BIW cable was tested at a peak temperature of 300°F for the first 10 minutes, ramped down to 270°F from 10 minutes to 2 hours, ramped down to 240°F from 2 hours to 4 hours, ramped down to 210°F from 4 hours to 8 hours, and finally ramped down to 181°F from 8 hours to 30 days. The BIW profile compared to the LOOP180 MSLB is shown below:



The BIW cable was also thermally pre-aged and irradiated prior to LOCA testing. The cable was thermally aged at 121°C (250°F) for 375 hours and irradiated to $1.1X10^8$ rads.

These curves are only taken out to 1000 seconds because the MSLB profile begins to ramp down at approximately 400 seconds. Additionally, these curves are intended to illustrate the insignificance of those time periods for which the MSLB curve is above the tested curve when compared to the temperatures and duration of the testing.

Typical LOCA test profiles last for significantly longer periods of time as compared to MSLB profiles, minutes and hours versus seconds. As a result of thermal lag the internals of equipment will not experience the peak temperature associated with the MSLB. Because the LOCA test profiles are considerable longer and "soak" the equipment, the internal temperatures of the equipment reaches a higher temperature than would be expected during a MSLB. Therefore the LOCA testing subjects the equipment to a more severe environment than that of a MSLB.

This conclusion is supported by B&W Engineering Analysis 51-1158880-00. This analysis was conducted to demonstrate the effect of high SLB temperatures versus LOCA temperatures on equipment.

For example, the internal electronics temperature response for a transmitter to both a SLB and LOCA was examined. The SLB temperatures for the internal electronics was shown to be significantly lower compared to the LOCA response. This is due to the longer "soak time" at peak temperature for a longer period of time associated with the LOCA profile. Additionally, the same phenomena for a motor operator was also demonstrated. Similar analyses has been conducted modeling electrical penetrations, instrument enclosures, and cable jackets with the same results.

The conclusion of the B&W analysis indicates that "...the brief temperature spike due to super-heated steam following a Steam Line Break does not affect the internals of containment mounted equipment significantly. In every case examined, the long duration temperatures associated with a LOCA were more severe to equipment than the higher SLB spike."

This conclusion is also applicable to the installed Oconee equipment and additional margin can be realized due to the following:

- All containment cable listed is armored cable which is not taken into consideration in the B&W analysis. Additionally, the cable was tested without armor.

- The Viking penetration installed configuration utilizes a galvanized enclosure cover at the interface of the connectors to the penetrations

CONCLUSION: This analysis, in conjunction with the B&W analysis, demonstrates that equipment internals do not experience the peak temperatures associate with the MSLB vapor temperature spike. Even though the MSLB temperature may be higher for a short period of time, the equipment internal temperature is higher for each point in time when subjected to a LOCA. Additionally, LOCA testing of equipment assures that equipment has been tested to more severe conditions than would be experienced by the equipment during a MSLB. Therefore, the equipment required to mitigate the consequences of the MSLB is qualified and would perform its safety function.

OCONEE NUCLEAR STATION

MSLB EQUIPMENT/EQ PARAMETERS

TAG #	FUNCTION	MANU/MODEL	BUILDING	OP. TIME	QUAL. PARAMETERS TEMP.	QUAL. PARAMETERS PRESS.	COMMENTS
PT-17P, 18P, 19P, 20P	RCS Pressure NR	Rosemount 1152 (U1), 1154 (U2&3)	RB	2 min.	350°F 420°F	70 psig 110 psig	
NI-1, 3	Power Range NI's	Gamma Metrics	RB	2 min.	420°F	70 psig	
PT-21P, 22P, 23P	RCS Pressure WR	Rosemount 1153D	RB	15 min.	460°F	88 psig	
CF-1, 2, 5, 6	CF Iso. Valves		RB	10 days			These Valves are administratively controlled - Power is racked out during normal operation.
HP-3, 4, 20	HPI Active Valves	Limitorque	RB	10 days	340°F	105 psig	
	RBCU Fan Motors	Joy/Reliance	RB	10 days	330°F	78 psig	
MSPT-0277, 0278, 0279, 0280	OTSG Pressure Transmitters	Rosemount 1154	RB	10 days	420°F	110 psig	
LT-80, 81, 82, 83	S/G Level Transmitters	Rosemount 1154	RB	10 days	420°F	110 psig	
LPSW-565, 566	Aux. RB Coolers	Rotork NA-1	RB	30 min.	385°F	75 psig	
CABLES:							
1PSX16H.3	Pressure Transmitters	BIW	RB	15 min.	300°F	60 psig	
12XJ12G1 3XJ250G.2	Valves RBCU Motors	OKONITE	RB	10 days	324°F	80 psig	
19XJ12G.1	Valves	ANACONDA	RB	30 min.	346°F	113 psig	
1SPX16G.3	Level Transmitters	SAMUAL MOORE	RB	10 days	340°F	105 psig	
PENETRATIONS							
		VIKING	RB	10 days	312°F	65 psig	
		CONAX	RB	2 min.	390°F	80 psig	
MISCELLANEOUS							
	Sealing Material	Scotchcast 9	RB	10 days	398°F	61 psig	
	Splice Material	Raychem	RB	10 days	442°F	132 psig	