

Nebraska Public Power District

GENERAL OFFICE
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October 8, 1979

Office of Nuclear Reactor Regulation
Mr. Harold R. Denton, Director
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Potential Unreviewed Safety Question on Interaction Between
Non-Safety Grade Systems and Safety Grade Systems
Cooper Nuclear Station
NRC Docket No. 50-298, DPR-46

Reference: 1. Letter from Harold R. Denton to
All Operating Light Water Reactors,
September 17, 1979

Dear Mr. Denton:

Per your request contained in Reference 1, enclosed is an assessment of Cooper Nuclear Station (CNS) relating to the effect of non-safety system failures on safety system performance. The enclosed report also contains the more specific and comprehensive information and analysis requested by the NRC Staff during a briefing on September 20, 1979. Efforts on the part of NPPD, General Electric Company and the GE BWR Owners Groups were utilized in making this assessment.

The assessment has not identified any impact on safety actions or analysis conclusions which would increase the consequences (i.e., calculated peak cladding temperature, peak containment pressure, peak suppression pool temperature, or radiological release) of any FSAR events. In particular, the assessment concludes that:

1. No previously identified safety actions would be negated by the failure of non-safety equipment due to environmental effects of high energy pipe breaks (HEPB's);
2. No previously identified safety limits would be violated by the subject effects; and
3. Some additional operator actions could be helpful to more quickly mitigate the subject postulated effects.

In fully assessing this issue, it should be noted that:

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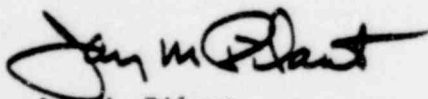
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1. An extensive evaluation of plant safety as regards HEPB's was submitted as Amendments 20 and 25 to the Cooper Nuclear Station FSAR. As a result of this previous evaluation, modifications to the station were made including pipe replacement, installation of pipe whip restraining structures, and installation of area high temperature alarms annunciated in the control room. In light of the more severe criteria established in Reference 1, the Architect-Engineer for CNS has re-evaluated the previous safety audit and has confirmed that safe shutdown capability will be maintained in the event of a HEPB.
2. The General Electric BWR includes a number of inherent characteristics which are specifically important in assessing this issue:
 - a) Thorough evaluation of outside containment line breaks for radiological reasons has resulted in a set of comprehensive sensitive leak detection and isolation systems on BWR's;
 - b) The BWR does not depend to a great extent on non-safety equipment for safety actions;
 - c) The separation of protection systems from control systems has long been a rule relative to safety function reliability, and there exists almost a complete decoupling of the BWR nuclear steam supply and containment system from non-safety BOP equipment and functions;
 - d) As previously noted, HEPB analyses have been performed and verified physically at BWR facilities;
 - e) The BWR has treated intersystem relationships in considerable detail in a standard SAR section entitled Plant Nuclear Safety Operational Analysis. This systematic evaluation of the BWR system has proven to be very valuable relative to environmental impact effects analysis;
 - f) Transient and accident analyses of BWR's are conservatively bounded in most cases with respect to non-safety system performance.

In summary, this submittal is a complete and comprehensive re-evaluation of the potential impact of non-safety systems on safety functions. The previously approved safety evaluations for Cooper Nuclear Station remain valid.

Sincerely,



Jay M. Pilant
Director of Licensing
and Quality Assurance

JDW/cmk
Enclosure

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STATE OF NEBRASKA)
) ss
PLATTE COUNTY)

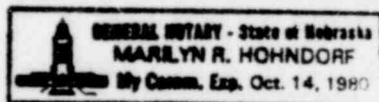
Jay M. Pilant, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this information on behalf of Nebraska Public Power District; and that the statements in said application are true to the best of his knowledge and belief.

Ray M. Pilant
Ray M. Pilant

Subscribed in my presence and sworn to before me this 8th day of October, 1979.

Marilyn R. Kohnholz
CLERK OF THE COURT

My Commission expires Oct. 14, 1980



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ENCLOSURE

EFFECT OF NON-SAFETY SYSTEM FAILURES (POSTULATED DUE TO ADVERSE ENVIRONMENT) ON PERFORMANCE OF SAFETY EQUIPMENT

The following table identifies the non-safety systems at Cooper Nuclear Station, and the effect of their postulated failure on safety system performance for a variety of postulated high-energy pipe breaks, locations, and sizes. No "1" entries were identified which would denote a possible adverse effect.

TABLE LEGEND

- 1 - Environmental Induced Malfunction May Provide Adverse Response
(i.e., increase in: calculated peak cladding temperature, peak containment pressure, peak suppression pool temperature, or radiological release)
- 2 - Environmental Induced Malfunction Will Not Provide Adverse Response
- 3 - System Is Qualified For Adverse Environment
- 4 - System Will Not Experience Adverse Environment

COOPER NUCLEAR STATION
ENVIRONMENTAL INTERACTION TABLE

SYSTEMS	LOCATION	MAIN STEAM				FEEDWATER			LOCA		RWCU	RCIC	HPCI
		INSIDE SMALL	INSIDE LARGE	REACTOR BLDG.	TURBINE BLDG.	INSIDE	REACTOR BLDG.	TUPBINE BLDG.	SMALL	LARGE	REACTOR BUILDING	REACTOR BUILDING	REACTOR BUILDING
Recirculation System:													
Pumps	DW	2	2	4	4	2	4	4	2	2	4	4	4
Valves & Oper.	DW	3	3	4	4	3	4	4	3	3	4	4	4
MG Set	RB	4	4	4	4	4	4	4	4	4	4	4	4
MCC	RB	4	4	4	4	4	4	4	4	4	4	4	4
Flow Control Sys.	CR/RB	4	4	4	4	4	4	4	4	4	4	4	4
Control Inst. Trans.	RB	4	4	4	4	4	2	4	4	4	4	4	4
Feedwater Delivery System:													
Flow Elements	TB	4	4	2	2	4	4	2	4	4	4	4	4
Level	DW/RB	2	2	4	4	2	4	4	2	2	4	4	4
Pumps	TB	4	4	4	2	4	4	2	4	4	4	4	4
Valves & Oper.	TB	4	4	4	2	4	4	2	4	4	4	4	4
Flow Control Sys.	CR	4	4	4	4	4	4	4	4	4	4	4	4
Feedwater Heating	TB	4	4	4	2	4	4	2	4	4	4	4	4
Instrument Air	TB	4	4	4	2	4	4	2	4	4	4	4	4
Control Inst. Trans.	RB/TB	4	4	2	2	4	2	2	4	4	4	4	4

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COOPER NUCLEAR STATION
ENVIRONMENTAL INTERACTION TABLE

SYSTEMS	LOCATION	MAIN STEAM				FEEDWATER			LOCA		RWCU	RCIC	HPCI
		INSIDE SMALL	INSIDE LARGE	REACTOR BLDG.	TURBINE BLDG.	INSIDE	REACTOR BLDG.	TURBINE BLDG.	SMALL	LARGE	REACTOR BUILDING	REACTOR BUILDING	REACTOR BUILDING
Turbine Pressure Control:													
By Pass Valves	TB	4	4	4	2	4	4	2	4	4	4	4	4
Pressure Sensors	TB	4	4	4	2	4	4	2	4	4	4	4	4
Control System	CR	4	4	4	4	4	4	4	4	4	4	4	4
Neutron Monitoring System:													
LPRM's & Cables	DW/RB	2	2	2	4	2	2	4	2	2	2	4	4
APRM's & Cables	DW/RB	2	2	2	4	2	2	4	2	2	2	4	4
RPIS/Rod Block Mon.	DW/RB	2	2	2	4	2	2	4	2	2	2	4	4
TIP	DW/RB	2	2	2	4	2	2	4	2	2	2	4	4
Reactor Protection System:													
Turbine Scram	TB	4	4	4	2	4	4	2	4	4	4	4	4
MG Set	CB	4	4	4	4	4	4	4	4	4	4	4	4
Reactor Manual Control System	RB/CR	4	4	4	4	4	4	4	4	4	4	4	4
SRV System (Non ADS)	DW	3	3	3	4	3	3	4	3	3	4	4	4
RBCCW System	RB	4	4	2	4	4	2	4	4	4	2	4	4
RWCU	DW/RB	3	3	2	4	3	2	4	3	3	2	2	2

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The following non-safety grade systems/equipment cannot conceivably fail so as to impact the safety analysis and the adequacy of the protective functions performed by safety grade equipment:

- Station Lighting
- Communications
- Service Air
- Equipment Drain Piping
- Drywell Temperature Monitoring
- Under Vessel Maintenance Equipment
- Process Computer
- Area Radiation Monitoring
- Process Radiation Monitoring (Non-Safety Part)
- Plant Process Sampling
- Maintenance Monorails & Hoists
- Potable Water
- Screen Wash
- Turbine Building Closed Cooling Water
- Generator Cooling (Generator)
- Offgas
- Radwaste
- Fuel Pool Cooling and Cleanup
- Generator Seal Oil
- Plant Heating
- Make Up Water Treatment
- Turbine Oil Purification and Transfer