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A Duke Energy Company

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
Centrifugal Charging Pump Modifications and Catawba PRA Update (Revision 2b)

Reference:

1. Letter from M.S. Tuckman, Duke Power Company, to Nuclear Regulatory Commission, "Duke Power Company Comments of Draft NUREG-1560" dated March 3, 1997.

2. Letter from G.R. Peterson, Duke Energy Corporation, to Nuclear Regulatory Commission, "Probabilistic Risk Assessment (PRA), Revision 2 Summary Report, January 1998" dated February 25, 1998.

3. Letter from G.R. Peterson, Duke Energy Corporation, to Nuclear Regulatory Commission, "Probabilistic Risk Assessment (PRA) Studies" dated June 8, 1998.

This letter is to inform the NRC that a voluntary initiative at the Catawba Nuclear Station to provide backup cooling to the high head safety injection Centrifugal Charging (NV) Pumps has been completed. In conjunction with the completion of these plant modifications, the Catawba PRA Level 1 analysis has also been updated.

Specifically, the modifications have installed piping connections to allow the manual alignment of the Drinking Water (YD) System to provide an alternative cooling water source for NV Pump 1A and NV Pump 2A. This modification provides a reduction in the core damage frequency for postulated accidents initiated by either the loss of the Nuclear Service Water (RN) System or the loss of the Component Cooling (KC) System.

This modification was determined to be a more cost-effective alternative to provide backup cooling than earlier proposed modifications to provide this new cooling function. See Reference 3 for a summary of earlier correspondence regarding these modifications and their affect on earlier PRA updates.

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With the incorporation of this modification and other minor model updates, the Catawba PRA core damage results have been re-evaluated. These results replace earlier core damage risk information provided to the NRC in Catawba's IPE Submittal Report transmitted in a September 10, 1992 letter, and information provided in References 2 and 3.

The updated core damage frequency, considering both internal and external initiating events, is estimated to be approximately 5.8E-05 per year. Additional details of updated Catawba PRA results are provided in Attachment 1.

Please direct any questions regarding the updated PRA results to H. D. Brewer at (704) 382-7409.

Sincerely,

Gary R. Peterson

Attachment (Catawba PRA Revision 2b Summary Results)

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Catawba PRA Revision 2b
Summary Results

The following table provides a summary of the Catawba core damage frequency categorized by initiating event.

Accident Sequence Results

Initiating Event	Percentage	Frequency
Small LOCA	26.6%	1.55E-05
Internal Flood	24.6%	1.43E-05
Seismic	14.6%	8.50E-06
Loss of Instrument Air (VI)	4.3%	2.48E-06
Loss Of Component Cooling (KC)	4.2%	2.44E-06
Loss Of 4kV Essential Bus	4.0%	2.35E-06
Tornado	3.6%	2.09E-06
Loss of Off-Site Power (LOOP)	3.4%	1.96E-06
Fire	2.1%	1.24E-06
Large/Medium LOCA	1.9%	1.13E-06
Loss of Main Feedwater	1.9%	1.11E-06
Loss of Nuclear Service Water (RN)	1.7%	1.00E-06
RPV Rupture	1.7%	1.00E-06
Other Internal Events	5.3%	3.11E-06
	Total =	**5.82E-05**

One of the dominant core damage sequences consists of a small break LOCA with successful high pressure injection but a failure to establish high pressure recirculation ("piggyback" onto the Residual Heat Removal (ND) system in the recirculation mode).

Another dominant sequence is internal flooding in the Turbine Building. The main and standby 6900/4160-volt transformers are located in the basement of the Turbine Building. Critical parts of these transformers would be submerged if subjected to a large flood. Loss of these transformers would result in a loss of off-site power on both Catawba units.

From the PRA model, an evaluation of plant systems was made to rank the systems based on the increase in risk caused by removing a train from service. This evaluation produced the following ranking:

Important Plant Systems

Most Important	• Fueling Water Storage Tank (FWST) • Component Cooling (KC) • 4kV Essential Bus
Very Important	• Nuclear Service Water (RN) • Turbine-Driven Aux. Feedwater Pump • Emergency Diesel Generator • Standby Shutdown Facility (SSF)
Important	• Residual Heat Removal (ND) • Safety Injection (NI) • Centrifugal Charging (NV) • Motor-Driven Aux. Feedwater Pump • Drinking Water (YD) (NV backup cooling)

In the area of human reliability, the following operator actions were found to play an important role in plant risk.

Operator Action	Accident Sequence(s)
Alignment of High Pressure Recirculation	SB LOCA, Med. LOCA
Establishment of Feed & Bleed Cooling	Loss of CA following Plant Transient
Restoration of Main Feedwater To S/Gs	Loss of CA following Plant Trip or Loss of CF
Refill UST From Condensate Grade Sources	Loss of CF, VI, Rx Trip, Loss of Load, Inadvertent SS Actuation
Manually Throttle the CA Flow To S/Gs	Loss of RN or KC, TB Flood, Fire, LOOP
Establishment of SSF seal injection	Loss of RN or KC, TB Flood, Fire, LOOP
Restoration of Off-Site Power	Loss Of Off-Site Power Event (LOOP)
Alignment of YD Cooling to NV Pump 'A'	Loss of KC, Loss of RN
Containment Isolation (Close VUCDT Line)	Station Blackout