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July 25, 2002

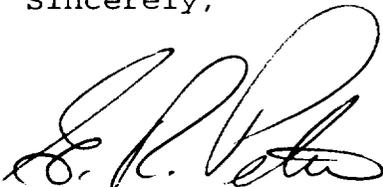
U. S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Duke Energy Corporation
Catawba Nuclear Station Units 1 & 2
Docket Nos. 50-413, 50-414
Licensee Event Report 413/02-004 Revision 0
Pipe Spray Interaction Affecting Safety Related
Equipment

Attached please find Licensee Event Report 413/02-004
Revision 0, entitled "Pipe Spray Interaction Affecting
Safety Related Equipment."

This Licensee Event Report does not contain any regulatory
commitments. This event is considered to be of no
significance with respect to the health and safety of the
public. Questions regarding this Licensee Event Report
should be directed to R. D. Hart at (803) 831-3622.

Sincerely,



G. R. Peterson

Attachment

IE2.2

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INCENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2002	004	00	2 OF 7

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

BACKGROUND

Catawba Nuclear Station Units 1 and 2 are Westinghouse Pressurized Water Reactors [EIIS: RCT]. The onsite Class 1E AC electrical power distribution system [EIIS: EB] is divided by train into two redundant and independent electrical power distribution subsystems. The AC electrical power subsystem for each train consists of a primary Engineered Safety Feature (ESF) 4.16 kV bus [EIIS: BU] and secondary 600 volt buses, distribution panels [EIIS: PL], motor control centers (MCCs) and load centers. The 4.16 kV essential auxiliary power system physically consists of two independent and redundant 4.16 kV switchgear assemblies [EIIS: SWGR], designated 2ETA and 2ETB. Each of the MCCs is single fed except 1EMXG and 2EMXH, each of which have two incoming breakers [EIIS: 52], one from a Unit 1 essential source and one from a Unit 2 essential load center. These two incoming breakers are also Kirk-Key and electrically interlocked which prevent paralleling the two sources. The transfer of power supply from Unit 1 to Unit 2 and vice versa is accomplished manually.

UFSAR section 3.6, Protection Against Dynamic Effects Associated with the Postulated Rupture of Piping, describes the requirements for protection against dynamic effects associated with the postulated rupture of piping. Specifically the general design requirements for postulated piping breaks other than reactor coolant system requires that the design be of a nature to mitigate the consequences of the break so that the reactor can be shutdown safely and eventually maintained in a cold shutdown condition. Consideration is given to the potential for a random single failure of an active component subsequent to the postulated pipe rupture.

During review of a plant modification it was noted that 600 volt MCC 2EMXH may not have been adequately protected from a potential moderate energy spray interactions in the B train chilled water (YC) [EIIS: KM] chiller room. It was noted that some sections of YC piping in the YC chiller rooms had spray shields installed and other sections did not. A section of fire protection system [EIIS: KP] piping was identified as a potential source for moderate energy spray onto the MCC. An additional field review revealed that the demineralized water (YM) [EIIS: KC] piping in both train A and B chiller rooms could be a potential source of water spray for either 1EMXG or 2EMXH.

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Engineering performed an evaluation of both the spray distances assumed in the moderate energy spray criteria (30 feet) and the requirement to postulate moderate energy cracks in non-safety related piping at every weld location. The fire protection system and YM pipe in question is low pressure, low temperature and designed and supported per ANSI B31.1 requirements. This evaluation concluded that a moderate energy pipe rupture (crack) in the fire protection system piping could lead to a loss of the MCC. A single failure (concurrent with the pipe rupture) of the opposite train MCC could prevent the fulfillment of safety function of systems or structures. Engineering also reviewed the YC piping in the areas and determined the YC piping had been analyzed and proper spray shields had been installed in the necessary locations.

Therefore, MCCs 1EMXG and 2EMXH have not been adequately protected from the effects of a moderate energy pipe break associated with the YM or fire protection systems inside the Train A and B YC chiller rooms.

There are several essential loads associated with the subject MCCs. A loss of one MCC and an assumed single failure of the other MCC results in a loss of both Control Room Air Handling Units [EIIS: VI], Control Room Area Air Handling Units [EIIS: VI], several valves in the nuclear service water system [EIIS: BI], YC Pump Motors A and B, Auxiliary Building Filtered Exhaust [EIIS: VF] Fan Motors ABFXF 1A, 1B, 2A, and 2B, etc.

Limiting Condition for Operation (LCO) 3.8.9 requires two operable AC electrical power distribution subsystems with the associated buses, load centers, motor control centers, and distribution panels. If one or more AC electrical power distribution subsystem(s) become inoperable, it must be restored to operable status within 8 hours or the plant must be shutdown.

A complete review of the other areas in the Auxiliary Building that contain MCCs (MCC rooms, switchgear rooms, electrical penetration rooms and battery rooms) and other water spray sensitive equipment was conducted to determine if this condition existed elsewhere. 2ETA in the 577 foot elevation switchgear room was determined to be a water spray target from fire protection piping to the hose rack cabinet in the area. This interaction was identified at 1200 on June 13, 2002 and Operations was notified. Operations declared 2ETA inoperable and applied TS 3.8.9, Required Action A.1. A spray deflector was installed and 2ETA was declared operable at 1531 on June 13, 2002.

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This event is being reported under 10 CFR 50.73(a)(2)(v) (any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to shutdown the reactor and maintain it in a shutdown condition), 10 CFR 50.73(a)(2)(i)(B) (any operation or condition prohibited by the plant's Technical Specifications (TS)), and 10CFR50.36(c)(2)(i) (Limiting Condition for Operation (LCO) not met).

At the time these conditions were identified, Unit 1 and Unit 2 were operating in Mode 1, Power Operation. No structures, systems, or components were out of service at the time of this event that contributed to the event.

EVENT DESCRIPTION

(Dates and times are approximate)

Date/Time	Event Description
3/04/02	Engineering wrote PIP C-02-01091 to document a potential issue concerning pipe spray effects on safety related equipment MCC 1EMXG and 2EMXH.
5/03/02	Engineering review of PIP C-02-01091 determined that per UFSAR criteria an additional single failure may have to be considered and notified Operations that an Operability Evaluation had been commenced for this issue with 1EMXG and 2EMXH.
5/09/02	Engineering completed their operability evaluation. Since, temporary spray shields had been installed between the referenced fire protection and YM moderate energy spray sources and the MCCs during this evaluation period, no current operability issue existed. Engineering continued their evaluation of the as found configuration to determine its effect on MCC 1EMXH and 2EMXG.

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5/28/02 Engineering completed their evaluation of the as found condition of pipe spray effects on MCC 1EMXG and 2EMXH and determined that the MCCs had not been adequately protected from moderate energy pipe break effects. Based on this, Regulatory Compliance determined that this event was reportable as an LER.

6/13/02~1200 Engineering notified operations about a pipe spray issue with 4160 volt bus 2ETA. Operations declared 2ETA inoperable and entered TS 3.8.9, Required Action A.1.

6/13/02~1531 Maintenance completed installation of a spray deflector on the affected area of pipe. Engineering reviewed the configuration and determined it to be acceptable. Operations declared 2ETA operable and exited TS 3.8.9, Required Action A.1.

CAUSAL FACTORS

The most probable cause was inadequate design analysis of moderate energy spray piping during the original construction of Catawba. Failure of this piping can adversely affect safety related Motor Control Centers which are not designed to withstand water spray. Spray shields should be installed wherever unacceptable interactions occur with safety related equipment.

The original design analysis that reviewed these cabinets for moderate energy spray interactions was performed during plant construction. The results for this area of the Auxiliary Building are documented in two calculations: CNC 1206.03-00-0108 and -0189, Units 1 and 2 respectively. These calculations list YC system piping as the only source of water spray for the MCCs. Protection was provided to protect the cabinets from YC water spray sources.

The fire protection piping and portions of YM pipe (main header) have been located in the "B" YC chiller pump room since initial construction. The original water spray review failed to document the MCCs as potential targets for water spray from these systems. This is considered an historical event. Due to the amount of time

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that has passed since the review, it was not possible to reconstruct the circumstances that lead to the failure to identify these interactions.

CORRECTIVE ACTIONS

Immediate:

1. 4160 volt bus 2ETA was declared inoperable on June 13, 2002 at 1200 and appropriate TS actions were followed.

Subsequent:

1. A complete review of the other areas in the Aux Building that contain MCCs (MCC rooms, switchgear rooms, electrical penetration rooms and battery rooms) and other water spray sensitive equipment was conducted to determine if this condition existed elsewhere. This review identified only one additional area for 4160 volt bus 2ETA which is discussed in this LER.
2. Temporary modifications have been implemented which installed spray shields between the referenced fire protection system and YM moderate spray sources and the motor control centers.
3. Work Request 98239124 added a pipe clamp around the unprotected weld per the construction support specification to divert any potential spray away from the safety related equipment in the area. This satisfied the pipe rupture criteria per CNS 1206.03-00-0001.

Planned:

1. The temporary modifications for the MCCs will be replaced with permanent spray shields.

The planned corrective actions as well as any future corrective actions will be addressed via the Catawba Corrective Action Program. There are no NRC commitments contained in this LER.

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SAFETY ANALYSIS

The Catawba PRA was used to evaluate the risk significance of the potential spray interaction. The consequence of losing accident mitigation equipment was combined with the likelihood of having a pipe failure. The increased probability of causing an initiating event was also considered. The results indicated that the increase in core damage frequency is negligible. The probability of having a pipe break is remote. In addition, there is only a small population of unprotected piping. These are the primary factors that lead to the conclusion that the increased risk is negligible. In conclusion, the overall safety significance of this event was determined to be minimal and there was no actual impact on the health and safety of the public.

ADDITIONAL INFORMATION

A review of LERs from the last three (3) years found no LERs written for plant design issues concerning pipe spray interactions. Therefore, this event was determined to be non-recurring in nature.

Energy Industry Identification System (EIIS) codes are identified in the text as [EIIS: XX]. This event did not involve an equipment failure and is not considered reportable to the Equipment Performance and Information Exchange (EPIX) program.

Although the safety significance of this issue was minimal, this condition met the reporting criteria of 10 CFR 50.73(a)(2)(v) and therefore will be recorded under the NRC Performance Indicators for both units as a safety system functional failure. The safety systems affected are 600 volt MCCs and 4160 volt buses. There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.