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U.S. Nuclear Regulatory Commission
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Subject: Catawba Nuclear Station
Docket No's. 50-413 and 50-414
Special Report

Gentlemen:

Attached is a 30 Day Special Report, **Selective Licensee Commitment for Operability of Fire Protection Sprinkler System Not Maintained.**

This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

W. R. McCollum, Jr.

Attachment

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DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
DOCKET NUMBERS 50-413 and 50-414

30 DAY SPECIAL REPORT

SELECTIVE LICENSEE COMMITMENT FOR OPERABILITY
OF FIRE PROTECTION SPRINKLER SYSTEM NOT MAINTAINED

ABSTRACT

This special report documents non-compliance with the remedial action requirements for fire protection (sprinkler) system inoperability per Selected Licensee Commitment (SLC) 16.9-2. Catawba Units 1 and 2 were operating at 100% power on 10/08/96 when the sprinkler system for the auxiliary feedwater system pump rooms was removed from service for cleaning of the sprinkler system piping. An hourly firewatch was established in those rooms at that time. A continuous firewatch should have been established per the remedial action of SLC 16.9-2 because the sprinkler system inoperability affected the ability to protect all three safe shutdown paths.

The terminology used in SLC 16.9-2 has specific meaning when applied to fire protection systems. That terminology, as most often used for other nuclear safety related systems, typically has a different meaning. Plant personnel were not aware of the different intent implied for fire protection systems. This is attributable to a program-to-program interface failure because some information from the fire protection program was not communicated to the operating procedure and training program.

A continuous fire watch was established at 1220 hours on 10/09/96. SLC 16.9-2 will be revised to provide specific guidance regarding determinations for continuous versus hourly fire watches. Operators have been instructed to establish continuous fire watches for all inoperable SLC committed sprinkler systems pending revision of the SLC.

BACKGROUND

The required remedial actions for inoperable fire protection (RF) [KP] sprinkler [SRNK] systems are stated in SLC 16.9-2, "With one or more of the above required Spray and/or Sprinkler Systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas in which redundant systems or components

could be damaged; for other areas, establish an hourly fire watch".

The intent of this statement is to assure that when sprinkler systems in areas where the analyzed redundant methods of achieving safe shutdown following a fire are inoperable, a continuous fire watch is established to minimize the possibility of fire damage to both trains of equipment.

The typical and most frequent use of the term "redundant" applies to nuclear safety related equipment delineated by trains (A and B) or channels (I, II, III, and IV). The term "redundant" in SLC 16.9-2 applies to divisions of plant safe shutdown systems and instrumentation used to ensure safe shutdown of both units following a fire. This safe shutdown equipment may or may not be train related.

There are three redundant methods for achieving a shutdown condition following a fire event: a) use of A train equipment, b) use of B train equipment, and c) use of the Standby Shutdown System (SSS) in conjunction with damage control measures. Thus, continuous fire watches are required in areas where all three trains are located, or in areas containing both train A & B equipment when the SSS is inoperable.

The SSS is part of a plan to assure the ability to achieve cold shutdown following a fire that affects operability of both Train A & B. The plan includes use of the SSS to maintain a hot standby condition and damage control measures to restore components of either Train A or B to attain the ability to achieve cold shutdown within 72 hours. The auxiliary feedwater (CA) [BA] pump [P] room and the reactor building annulus are the only areas where all three trains are located.

SLC 16.9-2 is part of the Catawba fire protection program and subject to the provisions of the Catawba facility operating license conditions C.(8) for NPF-35 (unit 1) and C.(6) for NPF-52 (unit 2).

EVENT DESCRIPTION

Part of the fire protection system auxiliary building header piping was scheduled for cleaning on 10/09/96. The required system alignment for this cleaning resulted in degraded or inadequate flow to several SLC committed sprinkler systems, including the unit 1 and unit 2 CA pump room sprinkler

systems. The CA pump rooms contain components related to both Trains A and B, and related to the Standby Shutdown System (SSS). This area should have been placed under a continuous fire watch. Instead, hourly fire watches were established on 10/8/96 at 2036 hours for the unit 2 CA pump room and at 2042 hours for the unit 1 CA pump room.

A review of the affected SLC on 10/09/96 generated questions regarding the meaning of the term "redundant" in that SLC. A review of the design bases of the fire protection systems revealed train A components, train B components, and the standby shutdown systems (SSS) constitute the redundant systems referenced in SLC 16.9-2. Since the inoperable sprinkler system affected all three redundant shutdown paths, a continuous fire watch should have been established.

Both hourly fire watches were terminated at 1220 hours on 10/9/96 and replaced with continuous fire watches.

CORRECTIVE ACTIONS

IMMEDIATE

A continuous fire watch was established within one hour following the identification of the incorrect remedial action.

SUBSEQUENT

Operators were instructed to establish continuous fire watches for all inoperable SLC committed sprinkler systems pending revision of the SLC to provide more detailed guidance.

PLANNED

SLC 16.9-2 will be revised to include the dependencies between plant systems relative to the requirements for remedial actions.

SAFETY ANALYSIS

Once this problem was identified (10/9/96 at 1100 hours) a continuous fire watch was established within one hour. Follow-up investigation of the event determined the remedial action requirements had been inappropriately evaluated in previous scenarios involving sprinkler system inoperability. Rather than attempting to recreate each past event, the

following safety analysis is intended to address those inoperabilities from a generic perspective.

CA PUMP ROOMS

There is no high energy electrical equipment which may start a fire in the CA pump room. Energized electrical cables have a protective armor shield and are grounded such that a internal short would not start a fire. The quantity of combustible materials in the room is very low. Considering these features, there is low probability of a fire in the CA pump room.

The only routine maintenance activity involving combustible materials is pump maintenance which occurs in the pits. The pits are protected by a fixed carbon dioxide fire suppression system. Also, the turbine driven CA pump is located in a 3 hour fire rated enclosure such that fire which originates in one pump pit would not propagate to the redundant pump pit.

In the event of a fire in the CA pump room, the fire detection system would provide prompt notification. The station fire brigade would respond with portable fire extinguishers and fire hoses.

Cables associated with the turbine driven CA pump are protected with a radiant energy shield consisting of a fire resistive blanket material. Should a fire occur in the CA pump room while the sprinkler system is inoperable and the station fire brigade be unable to control it, the fire resistive radiant energy shield would protect the turbine driven pump cables. Operators could achieve safe shutdown from the control room using the turbine driven CA pump.

REACTOR BUILDING ANNULUS

There is no high energy electrical equipment which may start a fire in the annulus. Energized electrical cables have a protective armor shield and are grounded such that an internal short would not start a fire. The quantity of combustible materials in the annulus is very low. Considering these features, there is low probability of a fire in the Annulus.

The only routine activity involving combustible materials is maintenance of the standby make-up pump. The standby make-up pump is not located near train A or B safe shutdown cables.

In the event of a fire in the Annulus, the fire detection system would provide prompt notification. The station fire brigade would respond with portable fire extinguishers and fire hoses.

The analyzed safe shutdown components in the annulus are cables and instruments associated with primary system and steam generator instruments and pressurizer heaters. They typically are located about 10 feet (or more) above floor level. In addition, there is typically about 15 feet (or more) of vertical separation between Train A & B cables. (Train A cables enter the annulus on elevation 577, Train B cables enter the Annulus on elevation 560.) Floor elevation of the Annulus is 552 feet. Cable failure temperature is above 700°F. Should a fire occur in the Annulus while the sprinkler system is inoperable and the station fire brigade be unable to control it, the fire would have to generate 700°F at an elevation about 20 feet above the floor to damage redundant cables of safe shutdown components. There is no credible fire scenario in the Annulus which could generate sufficient heat to damage redundant safe shutdown cables or instruments.

ND, NV, and KC PUMP AREAS

Sprinkler systems installed in the decay heat removal (ND) [BP] and centrifugal charging (NV) [CB] pump [P] rooms, and over the general area of component cooling (KC) [CC] pumps [P] are provided to assure redundant pumps and motors are not damaged by fire. Thus, damage control measures for this equipment only involves installing power cables rather than replacing pumps and motors.

The quantity of combustible materials in each of these pump rooms/areas is very low. Each of the pump motors is rated at 4160 volts. A motor high energy fault could be a potential fire source.

The only routine activity, in these areas, involving combustible materials is maintenance of the respective pumps. Each of these pumps is separated from it's redundant train by a three hour fire rated barrier. In the event of a fire in these areas, the fire detection system would provide prompt notification. The station fire brigade would respond with portable fire extinguishers and fire hoses. Because of the fire rated barrier between redundant components, fire would have to propagate around the barrier to damage redundant pumps and/or motors. Due to the low quantity of combustible material in these areas and prompt alarm and

response, the possibility of redundant pumps and/or motors being damaged by a single fire while the SSS is inoperable is considered low.

CABLE ROOM AND BATTERY ROOM CORRIDORS

Sprinkler systems in the cable and battery room corridors are provided to protect unprotected cable trays and their supports to prevent collapse and subsequent damage to the fire rated barriers (reference letter dated 2/10/84 from H.B. Tucker to H.R. Denton). There is no energized electrical equipment, which may start a fire, adjacent to locations where these cable tray supports penetrate fire rated barriers. Energized electrical cables have a protective armor shield and are grounded such that an internal short would not start a fire. There are no in situ combustible materials and storage of combustible materials is programmatically controlled in these areas. Considering these features, there does not appear to be potential fire hazards in these areas which could damage these supports to the point of collapse.

SUMMARY

Considering the above, failure to establish continuous fire watch in these areas is considered to be of no significance with respect to the health and safety of the public. There has been no damage to safety related systems or components due to such failures.