



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 15, 2015

Mr. Kelvin Henderson
Site Vice President
Duke Energy Corporation
Catawba Nuclear Station
4800 Concord Road
York, SC 29745-9635

**SUBJECT: CATAWBA NUCLEAR STATION - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT 05000413/2015012 AND 05000414/2015012**

Dear Mr. Henderson:

On June 18, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results which were discussed on June 18, 2015, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The enclosed report documents two NRC-identified findings of very low safety significance (Green) that were determined to involve violations of NRC requirements. One of these violations was determined to be Severity Level IV under the traditional enforcement process. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violation or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Catawba Nuclear Station.

You are not required to respond to this letter. In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the

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Sincerely,

/RA/

Scott M. Shaeffer, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos.: 50-413 & 414
License Nos.: NPF-35, NPF-52

Enclosure: Inspection Report 05000413/2015012
and 05000414/2015012 w/Attachment:
Supplementary Information

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Letter to Kelvin Henderson from Scott M. Shaeffer dated July 15, 2015.

SUBJECT: CATAWBA NUCLEAR STATION - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT 05000413/2015012 AND 05000414/2015012

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U.S. NUCLEAR REGULATORY COMMISSION (NRC)

REGION II

Docket Nos.: 50-413 & 414

License Nos.: NPF-35, NPF-52

Report Nos.: 05000413/2015012, 05000414/2015012

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station, Units 1 and 2

Location: York, SC 29745

Dates: June 1 - 5, 2015 (Week 1)
June 15 - 18, 2015 (Week 2)

Inspectors: O. López-Santiago, Senior Reactor Inspector (Lead Inspector)
D. Jones, Senior Reactor Inspector
P. Braxton, Reactor Inspector
J. Dymek, Reactor Inspector
P. Braaten, Reactor Inspector (Training)

Approved by: Scott M. Shaeffer, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000413/2015012 and 05000414/2015012; 06/01 - 05/2015 and 06/15 – 18/2015; Catawba Nuclear Station Units 1 and 2; Fire Protection (Triennial).

This report covers an announced two-week inspection by a triennial fire protection inspection team composed of five regional inspectors of which one was a trainee. Two Green non-cited violations (NCVs) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated 09/20/13. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated 12/04/14. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated 02/04/15. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

Cornerstones: Initiating Events and Mitigating Systems

- Green: The NRC identified an NCV of the Unit 1 and 2 Catawba Nuclear Station (CNS) Facility Operating License, Condition 2.C.5, for the failure to analyze the spurious operation of two motor operated valves (MOVs) in the control room area ventilation system (CRAVS) and the adverse impact on control room habitability. The licensee entered the issue in its correction action program as action request (AR) 01930126 and a continuous fire watch was already in place due to deficiencies identified during the site's ongoing NFPA 805 licensing activities.

The failure to analyze the spurious operation of two MOVs in the CRAVS and the adverse impact on control room habitability was a performance deficiency (PD). The performance deficiency was more than minor because it was associated with the protection against external events (i.e. Fire) attribute of the Initiating Events Cornerstone and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the finding could be reasonably viewed as a precursor to a significant event based on smoke migration into the control room that could challenge control room habitability and lead to an evacuation of the control room. This PD was the result of degraded defense-in-depth features that limit the effects of a fire to one fire area. The finding was screened as Green because the reactors would be able to reach and maintain safe shutdown utilizing the standby shutdown facility. No cross cutting aspect was assigned because the finding was not indicative of current licensee performance. (Section 1R05.02)

- Green: The NRC identified a non-cited Severity Level IV violation of the Unit 1 and 2 CNS Facility Operating License, Condition 2.C.5, for the failure to implement and maintain in effect all provisions of the approved fire protection program (FPP). Specifically, the licensee made a change to the approved FPP which involved the de-rating of a credited three hour fire barrier between the control room and the cable spreading room(s) to only a pressure and smoke barrier. The licensee entered the issue in its corrective action program as AR 01932211 and it was added to existing fire watches for the area.

The failure to comply with the CNS Operating License Condition 2.C.5 for a change to the approved FPP involving the de-rating of a credited three hour fire barrier between the

control room and the cable spreading room(s) was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of protection against external events (i.e. Fire.) The performance deficiency negatively affected the cornerstone objective in that the change to the FPP had the potential to adversely affect the availability of the control room to achieve and maintain stable plant conditions due to the increased likelihood of control room abandonment in the event of a fire in the cable spreading rooms. The licensee's failure to submit the FPP change to the NRC was determined to impede the regulatory process because the FPP change required NRC review and approval prior to implementation.

The finding was screened as Green because based upon inspection of the affected barriers, the inspectors determined that the barriers would provide a 1-hour or greater fire endurance rating. This violation was determined to be a Severity Level IV violation because the associated finding was evaluated by the SDP as having very low safety significance (i.e., Green finding). No cross cutting aspect was assigned because the finding was not indicative of current licensee performance. (Section 1R05.11)

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection

This report presents the results of a triennial fire protection inspection of the Catawba Nuclear Station (CNS) Units 1 and 2. The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," issued January 31, 2013. The objective of the inspection was to review a sample of four risk-significant fire areas to verify implementation of the fire protection program (FPP) and to verify site specific implementation of one B.5.b mitigating strategy as well as the storage, maintenance, and testing of B.5.b mitigating equipment. The four fire areas (FAs) were selected after reviewing risk information analyzed by a Senior Reactor Analyst from Region II, as well as previous inspection results, plant walk downs of FAs, relational characteristics of ignition sources to targets, and location of equipment needed to achieve and maintain safe shutdown (SSD) of the reactor. In selecting the B.5.b mitigating strategy sample, the inspectors reviewed licensee submittal letters, safety evaluation reports, licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. The IP specifies a minimum sample size of three fire areas and one B.5.b implementing strategy for addressing large fires and explosions. This inspection fulfilled the requirements of the procedure. The specific FAs chosen for review were:

1. Fire Area 5 – Unit 2 Electrical Penetration Room (Elevation 560')
2. Fire Area 22 – General Auxiliary Building Area. (Elevation 594')
3. Fire Area 45 – Cable Room Corridor (Elevation 574')
4. Fire Area TB1 – Unit 1 Turbine Building (Elevation 568')

The inspectors evaluated the licensee's FPP against applicable requirements, including Catawba Unit 1 and 2 Operating License Condition 2.C.5, "Fire Protection"; 10 CFR 50.48; commitments to Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5.1, Fire Protection for Nuclear Power Plants; Catawba Units 1 and 2 Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation reports (SERs); Technical Specifications and Selected Licensee Commitments (SLC). The review of the B.5.b mitigating strategies was based on the Catawba B.5.b submittal letters, related NRC SERs, licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. The inspectors evaluated all areas of this inspection, as documented below, against these requirements. Specific licensing bases documents reviewed are listed in the Attachment.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

For the selected FAs, the inspectors performed physical walk-downs to observe: (1) the material condition of fire protection systems and equipment; (2) the storage of permanent and transient combustibles; (3) the proximity of fire hazards to cables relied upon for SSD; and (4) the licensee's implementation of procedures and processes for limiting fire hazards, housekeeping practices, and compensatory measures for inoperable or degraded fire protection systems and credited fire barriers. The specific documents reviewed are listed in the Attachment.

Methodology

The inspectors evaluated the potential for fires, the characteristic of combustible materials and loading, and the potential fire severity exposure for the selected FAs. The inspectors reviewed Design Basis Documents (DBD), the UFSAR, applicable SERs, and plant administrative procedures that (1) established and implemented controls and practices to prevent fires and (2) controlled ignition sources and the storage of permanent and transient combustible materials. These evaluations were performed to ensure that the objectives established by the NRC approved FPP were satisfied and to ensure that the licensee had properly characterized in-situ combustible fire loads and limited transient fire hazards in a manner consistent with the plant administrative and FPP procedures.

For each of the selected FAs the inspectors reviewed the fire hazards analysis (FHA), SSD analyses and supporting drawings and documentation to verify whether the shutdown methodology had properly identified and protected the components necessary to achieve and maintain SSD conditions for equipment in the FAs selected for review.

Operational Implementation

The inspectors reviewed AP-0-A-5500-045, "Plant Fire," Revision 10, to verify that the shutdown methodology properly identified the systems and components necessary to achieve and maintain SSD conditions. The inspectors performed a walk-through of abnormal procedure steps to verify implementation and human factors adequacy of the procedures. The inspectors verified that licensee personnel credited for procedure implementation had procedures available, were trained on implementation, and were available in the event a fire occurred. The inspectors also reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

For the selected FAs, the inspectors verified the adequacy of fire walls, ceilings, floors, mechanical and electrical penetration seals, fire doors, and fire dampers. The inspectors walked down accessible portions of the selected FAs to observe material condition of the passive barriers and to identify degradation or non-conformances. The inspectors compared the installed configurations to the approved construction details and supporting fire endurance test data to assure that the respective fire barriers met the requirements of BTP CMEB 9.5.1, "Fire Protection for Nuclear Power Plants." In addition, the inspectors reviewed licensing bases documentation to verify that passive fire protection features met license commitments. A sample of completed surveillance and maintenance procedures for selected fire doors, fire dampers, and penetration seals were reviewed to ensure that these passive fire barriers were being properly inspected and maintained. Specific barriers reviewed are listed in the Attachment.

b. Findings

- .01 Introduction: The NRC identified a Green NCV of the Unit 1 and 2 CNS Facility Operating License, Condition 2.C.5, for the failure to analyze the spurious operation of two motor operated valves (MOVs) in the control room area ventilation system (CRAVS) and the adverse impact on control room habitability.

Description: The inspectors performed walkdowns and reviewed basis document, CNS-1578.VC-00-0001, Design Bases Specification for the VC/YC System, Rev. 36 to understand the operation of the CRAVS. The inspectors noted that MOVs 1VC7B and 2VC8A functioned as intake dampers and were located in FA 22. These valves were located on the intake side of the pressurizer fan and air handling unit of the "A" and "B" train of the control room ventilation system. UFSAR section 9.4.1, "Control Room Area Ventilation," stated that "Pressurization of the control room envelope is provided to prevent entry of dust, dirt, smoke, radioactivity and toxic gases originating outside the pressurized zones." In the event that one of these valves was opened on its associated train; this opening would represent a secondary intake source for that train and draw air into the ventilation system, which discharges into the control room.

Based on walkdowns and review of the FHA, the inspectors determined that a fire in FA 22 (VC HVAC Equipment Rooms for "A" and "B" Trains) could cause a hot short and subsequent spurious opening of these valves. The spurious opening of the valves would allow smoke to be drawn into the ventilation system and migrate into the control room. The inspectors concluded that this flow path of smoke into the control room was not analyzed by the licensee nor was the spurious operation of these valves. The admission of smoke into the control would have likely resulted in the abandonment of the control room. This breach of the control room envelope was in contrast to the BTP position 9.5-1 that states "Ventilation system openings between the control room and peripheral rooms should have automatic smoke dampers that close on operation of the fire detection or suppression system," and "The outside air intake(s) for the control room ventilation system should be provided with smoke detection capability to alarm in the control room to enable manual isolation of the control room ventilation system and thus prevent smoke from entering the control room." The inspectors determined that scenario described above would have bypassed these design features.

Analysis: Failure to analyze the spurious operation of two MOVs in the CRAVS and the adverse impact on control room habitability was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (i.e. Fire) attribute of the Initiating Events Cornerstone and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the finding could be reasonably viewed as a precursor to a significant event based on smoke migration into the control room that could challenge control room habitability and lead to an evacuation of the control room. This performance deficiency was the result of degraded defense-in-depth features that limit the effects of a fire to one fire area. The finding was screened in accordance with NRC IMC 0609, "Significance Determination Process, dated April 29, 2015, Attachment 4, "Initial Characterization of Finding" dated June 19, 2012, which determined that an IMC 0609, Appendix F, "Fire Protection Significance Determination Process, dated September 20, 2013, was required as the finding involved Post Fire Safe Shutdown. The team evaluated the finding using the guidance in IMC 0609, Appendix F. Step 1.3, "Ability to Achieve Safe Shutdown" question 1.3.1-A "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" was answered "Yes" based upon the credited safe shutdown path utilizing the standby shutdown facility and the finding was screened to Green, with no further analysis required. No cross cutting aspect was assigned because the finding was not indicative of current licensee performance.

Enforcement: Catawba Nuclear Station Unit 1 Renewed License No. NPF-35 and Unit 2 Renewed License No. NPF-52 Conditions 2.C.5., Fire Protection Program, states, in part, that Duke Energy Carolinas, LLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report, as amended, for the facility and as approved in the SER through Supplement 5.

Section 9.4.1, Heating, Ventilation, and Air Conditioning (HVAC) Systems, of the SER states, in part, that the control room area ventilation system is shared by both Units 1 and 2, and is designed to maintain a suitable environment for equipment operation and safe occupancy of the control room under all plant operating conditions.

Contrary to the above, since initial plant construction, the licensee failed to ensure that the control room area ventilation system would maintain a suitable environment for equipment operation and safe occupancy of the control room under all plant operating conditions. Specifically, a fire in FA 22 could result in bypassing the built in duct work smoke detection system and provide a pathway for smoke to enter the control room from a fire source outside the control room. The licensee entered the issue in its correction action program as AR 01930126 and a continuous fire watch was already in place due to deficiencies identified during the site's ongoing NFPA 805 licensing activities. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. NCV 05000413, 414/2015-012-01, Failure to Analyze the Spurious Operation of Control Room Area Ventilation Valves and the Adverse Impact on Control Room Habitability.

.03 Active Fire Suppression

a. Inspection Scope

For the selected FAs, the inspectors performed in-plant observations to verify the material condition and operational lineup of the fire water intake structure; the electric motor driven fire pumps; the fire protection water supply distribution piping including sprinklers, manual fire hoses, detection systems, and installed fire extinguishers. The inspectors reviewed engineering drawings and specifications to verify that the as-built configuration of fire suppression equipment was adequately maintained. Internal standpipe and hose stations, and heat and smoke detection systems were reviewed against specifications, drawings and engineering calculations to verify that the fire detection and suppression methods were appropriate for the types of fire hazards that existed in the FAs. The inspectors also verified that the suppression equipment met applicable National Fire Protection Association (NFPA) standard(s). The inspectors reviewed completed surveillance testing and maintenance procedures to verify that the equipment was adequately maintained. The inspectors reviewed fire fighting pre-plans to verify that the strategies were adequate. The inspectors observed the fire brigade staging and dress out areas to assess the condition of fire fighting and smoke control equipment. In addition, the inspectors verified the capabilities of the fire brigade by reviewing staffing, qualification, and training records. The "Letters of Agreement" with off-site emergency responders were reviewed to verify the availability of additional resources to combat fires. Fire hose stations and permanently installed fire extinguishers that were inspected are listed in the attachment.

b. Findings

No findings were identified.

.04 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

The inspectors evaluated whether manual water-based fire fighting activities or heat and smoke migration from fires within the selected FAs could adversely affect credited SSD equipment, inhibit access to alternate shutdown equipment, or adversely affect local operator actions required for SSD. Fire Strategies (pre-fire plans); fire brigade training procedures; HVAC drawings; and abnormal procedures for fires were also reviewed to verify that inter-area migration of water or the ventilation of heat and smoke were addressed and would not adversely affect SSD equipment or the performance of operator manual actions. The inspectors also reviewed calculations and analysis addressing the inadvertent operation or postulated failure of water based suppression systems, including water hammer from rapid system depressurization to determine impact on SSD equipment.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

Methodology

The licensee credited an alternative shutdown capability for a postulated fire in FAs 22 and 45. The inspectors reviewed UFSAR Section 9.5.1, the Catawba FPP, and corresponding abnormal procedures to ensure that appropriate controls provided reasonable assurance that alternative shutdown equipment remained operable, available, and accessible when required. In cases where local operator manual actions (OMA) were credited in lieu of cable protection of SSD components, the inspectors performed a walk-through of the procedures to determine if the operators could reasonably be expected to perform the alternative safe shutdown procedure actions and that equipment labeling was consistent with the alternate safe shutdown procedures. The inspectors reviewed applicable process and instrumentation diagrams to gain an understanding of credited equipment's flow path and function. The inspectors reviewed applicable licensee calculations to ensure the alternative shutdown methodology properly identified systems and components to achieve and maintain safe-shutdown for the FAs selected for review.

The inspectors reviewed procedures, work orders, and completed surveillances to verify that the alternative shutdown transfer capability was periodically tested. Additionally, the inspectors reviewed electrical schematics and one line diagrams to ensure that the transfer of safe shutdown control functions to the alternate shutdown facility included sufficient instrumentation to safely shutdown the reactor. This review also included verification that shutdown from outside the main control room could be performed both with and without the availability of offsite power.

Operational Implementation

The inspectors reviewed procedure AP-45, "Plant Fire", Revision 10, to verify the adequacy of this procedure to mitigate a fire in each of the selected FAs. The inspectors reviewed selected training materials for licensed and non-licensed operators to verify that training reinforced the shutdown methodology that is utilized in the FPP and abnormal procedures for fires.

The inspectors performed a walk-through of selected procedure steps with operations personnel to assess the implementation and human factors adequacy of the procedures and shutdown strategy to evaluate the ambient conditions, difficulty, and operator familiarization associated with selected OMAs. The inspectors reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage. The inspectors reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

b. Findings

No findings were identified.

.06 Circuit Analyses

a. Inspection Scope

The inspectors reviewed the licensee's post-fire safe shutdown analysis to verify that the licensee had identified both required and associated circuits that may impact safe shutdown. On a sample basis, the inspectors verified that the cables of equipment required for achieving and maintaining shutdown conditions, in the event of a fire in the selected FAs, had been properly identified. In addition, the inspectors verified that these cables had either been adequately protected from the potentially adverse effects of fire damage or analyzed to show that fire induced faults (e.g. hot shorts, open circuits, and short to ground) would not prevent safe shutdown. In order to accomplish this, the inspectors reviewed electrical schematics and cable routing data for power and control cables associated with each of the selected components. In addition, on a sample basis, the adequacy of circuit protective coordination for safe shutdown systems' electrical power and instrumentation busses were evaluated.

b. Findings

No findings were identified.

.07 Communications

a. Inspection Scope

The inspectors reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties. The inspectors verified that portable radios, repeaters, the plant address system, and fixed emergency communications systems were available, adequate, and operable for the performance of the designated activities. The inspectors also verified that the electrical power source for the emergency sound powered phone system would allow it to remain functional following a fire in the selected fire areas.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The inspectors reviewed maintenance and design aspects of the fixed 8-hour battery pack emergency lighting units (ELUs) required by the licensee's approved FPP. The inspectors performed plant walkdowns of the post-fire SSD procedures for the selected FAs to observe the placement and coverage area of the ELUs throughout the selected FAs. The inspectors also evaluated the adequacy of the ELUs to illuminate access and egress pathways, and any equipment requiring local operation and/or instrumentation monitoring for post-fire SSD. The inspectors reviewed preventive maintenance procedure IP/0/B/3540/002, "Emergency Battery Lighting Periodic Maintenance and Testing," Revision 38 to verify that adequate surveillance testing was in place. The

inspectors reviewed the completed 8-hour capacity test records to verify that the ELUs were capable of meeting their mission time.

b. Findings

No findings were identified.

09. Cold Shutdown Repairs

a. Inspection Scope

The inspectors reviewed the Catawba FPP and abnormal procedures to verify that the licensee identified repairs needed to reach and maintain cold shutdown and had dedicated repair procedures, equipment, and materials to accomplish these repairs after a fire event, assuming no offsite power was available. The inspectors verified that the fire damage repair procedures were current and adequate. The inspectors reviewed procedure IP-0-A-3890-027 C, "Procedure for Inventory of Fire Damage Control (FDC) Kit," Revision 19 to verify that the required repair materials and inventory were on hand and in good condition.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The inspectors reviewed administrative controls for out-of-service, degraded and/or inoperable fire protection features (e.g. detection and suppression systems and passive fire barriers) as well as hot work from cutting, welding and grinding activities. The inspectors reviewed the operator compensatory actions log (dated June 01, 2015) and the fire protection impairment log for RF/RV systems (dated June 01, 2015). The inspectors observed performance of a fire protection continuous fire watch activity in the General Auxiliary Building Area (FA 22). Fire Watch personnel were interviewed for familiarity with job requirements.

The inspectors reviewed a listing of compensatory measures that credited fire watches in various fire areas; this review was performed to verify that deficiencies identified during the site's ongoing NFPA 805 licensing activities were adequately mitigated.

b. Findings

No findings were identified.

.11 Review and Documentation of Fire Protection Program Changes

a. Inspection scope

The inspectors reviewed modifications associated with the FPP to verify that changes were in accordance with the fire protection license condition and had no adverse effect on the ability to achieve SSD. Modifications reviewed are listed in the Attachment.

b. Findings

- .01 Introduction: The NRC identified a Green non-cited Severity Level IV violation of the Unit 1 and 2 CNS Facility Operating License, Condition 2.C.5, for the failure to implement and maintain in effect all provisions of the approved FPP. Specifically, the licensee made a change to the approved fire protection program which involved the de-rating of a credited three hour fire barrier between the control room and the cable spreading room(s).

Description: During the inspectors' review of the February 1983 SER (NUREG 0954), the inspectors noted the NRC had granted a deviation from the guidelines of BTP CMEB 9.5-1 for not having automatic suppression in the cable spreading rooms. The February 1983 SER (NUREG 0954) stated the following: *"There are two cable spreading rooms (one for each unit). Each cable spreading room contains cables from redundant divisions. The rooms are separated from the remainder of the plant and each other by three-hour-fire-rated walls and floor/ceiling assemblies. All penetrations through fire-rated barriers are fitted with three-hour-fire-rated fire dampers and/or penetration seals. The cables are of an interlocked armor, galvanized steel design as described in Section 9.5.1.5. The cable spreading rooms are not protected by a fixed fire suppression system as required. Fire protection consists of automatic fire detectors, supplemented by manual hose stations and portable fire extinguishers. In the event of a fire in the cable spreading rooms, the dedicated standby shutdown system (discussed in Section 9.5.1.5) is available to achieve safe shutdown. This protection provides an acceptable level of safety and is an acceptable deviation from the guidelines of BTP CMEB 9.5-1, Item C.7.c."*

The inspectors also reviewed CNS-1465.00-00-0006, CNS Fire Protection Program Design Basis Specification for the Plant Fire Protection, Rev. 25. The design basis specification stated the following: *"The Control Room is separated from the remainder of the plant by three-hour barriers. Exception: The boundary between the Control Room (floor) and the Unit 1 and 2 Cable Spreading Rooms (ceiling) is not required to be a committed three hour fire barrier (reference Modification CNCE-9584). The Control Room floor is maintained as a pressure and smoke barrier."*

The inspectors reviewed change package, CNCE 9584, "Remove Control Room Floor from Committed Fire Boundaries, dated 07/17/1998," which provided the basis for de-rating the credited three hour fire barrier that separated the cable spreading rooms from the control room. The change package stated that the licensee had identified several penetrations seals in the control room floor that had inadequate depth of foam. The licensee used the findings of a 1993 study performed by Duke Power as part of a "Cost Beneficial Licensing Action" initiative to determine that the barrier could be de-rated and that the seals did not need to be fixed. The intent of the study was to focus resources on features which were important to nuclear safety and reduce commitments and

requirements which were marginal to nuclear safety, and thus were not cost beneficial. The study identified technical criteria for maintaining committed fire barriers based on the requirements of the BTP CMEB 9.5-1. The inspectors noted that the criteria did not consider fire protection features that were part of the approved FPP and that were the basis for a licensee deviation.

The inspectors reviewed the guidance provided in Regulatory Guide 1.189, Fire Protection for Nuclear Power Plants, Revision 2, and IP 71111.05T to determine whether the licensee needed prior NRC approval to not require the cable spread room(s) ceiling to be a credited three hour fire barrier. The inspectors determined that the change degraded a fire protection defense-in-depth feature which was part of the basis for a deviation from the guidelines of BTP CMEB 9.5-1, Item C.7.c. as described above. The inspectors also determined that the change adversely affected the ability to achieve and maintain safe shutdown due to the increased likelihood of control room abandonment in the event of a fire in the cable spreading rooms. Therefore, the inspectors concluded that the change evaluation was inadequate and the change required prior NRC approval.

Analysis: Failure to comply with the CNS Operating License Condition 2.C.5 for a change to the approved FPP involving the de-rating of a credited three hour fire barrier between the control room and the cable spreading room(s) was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of protection against external events (i.e. Fire.) The performance deficiency negatively affected the cornerstone objective in that the change to the FPP had the potential to adversely affect the availability of the control room to achieve and maintain stable plant conditions due to the increased likelihood of control room abandonment in the event of a fire in the cable spreading rooms. Such abandonment would require use of the dedicated standby shutdown system. The licensee's failure to submit the FPP change to the NRC was determined to impede the regulatory process because the FPP change required NRC review and approval prior to implementation.

The finding was screened in accordance with NRC IMC 0609, "Significance Determination Process, dated April 29, 2015, Attachment 4, "Initial Characterization of Finding" dated June 19, 2012, which determined that an IMC 0609, Appendix F, "Fire Protection Significance Determination Process, dated September 20, 2013, was required as the finding involved the ability to confine fires. The finding was screened as Green on Question 1.4.3-B, because based upon inspection of the affected barriers, the inspectors determined that the barriers would provide a 1-hour or greater fire endurance rating.

This violation is associated with a finding that has been evaluated by the significance determination process (SDP) and communicated with an SDP color reflective of the safety impact of the deficient licensee performance. The SDP, however, does not specifically consider the regulatory process impact. Thus, although related to a common regulatory concern, it is necessary to address the violation and finding using different processes to correctly reflect both the regulatory importance of the violation and the safety significance of the associated finding.

The severity level of the traditional enforcement violation was assigned based upon the significance determination of the associated finding. This violation was determined to be a Severity Level IV violation per Section 6.1.d.2 of the NRC Enforcement Policy, dated January 28, 2013, because the associated finding was evaluated by the SDP as having

very low safety significance (i.e., Green finding). The finding is not an immediate safety concern based upon the remaining FPP defense-in-depth features of implementing roving fire watches as well as existing administrative controls, installed fire detection, manual suppression and a dedicated standby shutdown system. The cause of the finding was determined to not have a cross-cutting aspect because the program change, made in July 1998, was not indicative of current licensee performance.

Enforcement: Catawba Nuclear Station Unit 1 Renewed License No. NPF-35 and Unit 2 Renewed License No. NPF-52 Conditions 2.C.5., Fire Protection Program, states that Duke Energy Carolinas, LLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report, as amended, for the facility and as approved in the SER through Supplement 5., subject to the following provision:

The licensee may make changes to the approved Fire Protection Program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

Contrary to the above, on July 20, 1998, the licensee made a change to the approved Fire Protection Program without prior approval of the Commission that adversely affected the ability to achieve and maintain safe shutdown in the event of a fire. Specifically, the licensee made a change to the approved Fire Protection Program which involved the de-rating of a credited three hour fire barrier between the control room and the cable spreading room(s) which was part of the basis for a deviation from the guidelines of BTP CMEB 9.5-1; and adversely affected the ability to achieve and maintain safe shutdown due to the increased likelihood of control room abandonment in the event of a fire in the cable spreading rooms. The licensee entered the issue in its corrective action program as AR 01932211 and it was added to existing roving fire watches for the area. This violation is being treated as a NCV consistent with Section 2.3.2 of the Enforcement Policy. NCV 05000413, 414/2015-012-02, Fire Protection Program Change did not meet CNS License Condition Requirement C.5 for Units 1 and 2.

.12 Control of Combustibles and Ignition Sources

a. Inspection Scope

The inspectors conducted walkdowns of numerous plant areas that were important to reactor safety, including the selected FAs, to verify the licensee's implementation of fire protection requirements as described in procedures AD-EG-ALL-1520, Transient Combustible Control, Revision 3, and AD-EG-ALL-1521, Hot Work Permits, Revision 3. The inspectors verified that the licensee had properly evaluated transient fire hazards, controlled hot-work activities, and maintained general housekeeping consistent with administrative control procedures and the fire hazards analysis. For the selected FAs, the inspectors evaluated the potential for fires and explosions, and potential fire severity. Fire watch and craft personnel were interviewed for familiarity with job requirements. No hot work was observed as part of the inspection activities within the selected fire areas.

b. Findings

No findings were identified.

.13 B.5.b Inspection Activities

a. Inspection Scope

The inspectors reviewed procedures to verify the adequacy of procedural guidance for the flooding of containment using containment spray and portable pump strategy. The inspectors performed walkdowns to verify the feasibility of implementing the guidance provided in the procedures; and to verify that the apparatus required by the procedure was adequately staged. The inspectors reviewed records to verify that personnel were appropriately trained; and to verify that appropriate preventive maintenance was performed on a recurring basis. The inspectors reviewed a calculation to verify that the minimum required flow for the strategy was achievable.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed recent independent audits and evaluations to verify that the licensee was performing appropriate assessments of the FPP. In addition, a sample of fire protection non-conformances were reviewed to verify that deficiencies were identified, entered into, and resolved by the licensee's corrective action program. The problem identification reports were reviewed with regard to the adequacy of the evaluation, appropriateness of the proposed corrective actions, and the timeliness of implementing the corrective actions.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On June 18, 2015, the preliminary inspection results were presented to Mr. K. Henderson and other members of the licensee's staff. The licensee acknowledged the results. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: Supplementary Information

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

P. Simbrat, Regulatory Affairs Lead
T. Pasour, Regulatory Affairs
M. Hogan, Fire Protection Program Manager
G. Carpenter, Fire Protection Engineer
R. Smith, Safe Shutdown/NFPA 805 Contract Support
B. Weaver, PRA Engineer
A. Miller, Operations
J. Maloney, Operations
K. Henderson, Site Vice-President
L. Swacley, Engineering
J. Lukowski, Engineering

NRC personnel

S. Shaeffer, Chief, Engineering Branch 2, Division of Reactor Safety, Region II
A. Hutto, Senior Resident Inspector, Catawba Nuclear Station

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000413&414/2015-012-01	NCV	Failure to Analyze the Spurious Operation of Control Room Area Ventilation Valves and the Adverse Impact on Control Room Habitability (Section 1R05.02)
05000413&414/2015-012-02	NCV	Fire Protection Program Change did not meet CNS License Condition Requirement 2.C.5 for Units 1 and 2. (Section 1R05.11)

Discussed

None

LIST OF DOCUMENTS REVIEWED

LIST OF FIRE BARRIER FEATURES INSPECTED (Refer Report Section 1R05.02 and 1R05.03)

Fire Damper Identification

Description / Location

1CRA-FD32	Fire Area 22
1CRA-FD18	Fire Area 45
1CRA-FD22	Fire Area 45
1CRA-FD23	Fire Area 45
1CRA-FD24A	Fire Area 45
1CRA-FD24B	Fire Area 45
1CRA-FD25A	Fire Area 45
1CRA-FD25B	Fire Area 45

Fire Door Identification

Description

AX394	Fire Area 5
AX416	Fire Area 5
AX515	Fire Area 45
AX533C	Fire Area 45
AX534B	Fire Area 45
AX536A	Fire Area 45
AX656	Fire Area 45

Fire Barrier Penetration Seal Identification

Description

F-AX-354-W041	Fire Area 5
F-AX-354-W042	Fire Area 5
F-AX-354-W043	Fire Area 5
J-AX-533-F007	Fire Area 5
K-AX-653-F001	Fire Area 45
K-AX-653-F015	Fire Area 45
K-AX-653-F016	Fire Area 45
K-AX-653-F032	Fire Area 45

Wall, Ceiling, Floor Identifications

Description

Unit 2 Electrical Penetration Room FA 5	Walls, Floor & Ceiling
Unit 1 Cable Room Corridor FA 45	Walls, Floor & Ceiling
Common General Auxiliary Building (B Train HVAC)	Walls, Floor & Ceiling

Fire Extinguishers Inspected

Aux 560-21	15LB CO2	Fire Area 5
Aux 560-28	10LB CO2	Fire Area 5
Aux 560-29	10LB CO2	Fire Area 5
Aux 560-30	10LB CO2	Fire Area 5
Aux 594-7	10LB CO2	Fire Area 22
Aux 574-1	15LBCO2	Fire Area 45
Aux 574-6	15LBCO2	Fire Area 45
Aux 574-30	2.5 Gallon Pressurized Water	Fire Area 45

Description**Fire Hose Stations Inspected**

1RF245	Fire Area 22
1RF253	Fire Area 22
1RF56	Fire Area TB1

Description

LIST OF COMPONENTS REVIEWED
(Refer to Report Sections 1RO5.05- and 1RO5-.06)

Components Sampled

2NCVA0031B, - 33A, -35B	Pressurizer PORV Block Valve
2NVVA0188A, -189B	CCP Suction From VCT
2NIVA0010B	NV Pump Cold Leg Inject Isolation
2CAVA0062A	CA Pump 2A Discharge to S/G 2A Isolation
2NVVA0252A, -253B	CCP Suction from RWST
ORF PUB	Fire Pump B
ORF PUC	Fire Pump C
1WLVA0847	TDCAP Sump Pump Discharge
2WLVA0847	TDCAP Sump Pump Discharge
2NI009A	NV Pump Cold Leg Injection Isolation Valve
2FW27A	Boundary Isolation Alternate NV Suction
2CA062A	CA Pump 2A Discharge to S/G 2A Isolation
1, 2 WL847	Floor Drain Sump D Discharge to FDT
1, 2 WL848	Floor Drain Sump D Discharge to TB Sump
1 CA174, -5, -8	RC to CA Suction Isolation

LIST OF DOCUMENTS REVIEWED

Audits and Self Assessment Reports

2014-CNS-FP-01, Nuclear Oversight- Audit, Catawba Fire Protection Program Audit, dated 3/20/14

Organization and Control of Transient Combustible Materials, C-ENG-B-12-04
Program Health Report, RF/RV (Fire Protection), 01/01/2014 to 3/30/2014
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Program Health Report, RF/RV (Fire Protection), 07/01/2014 to 9/30/2014
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System Health Report, EFA/EBG (Fire Detection) 01/01/2014 to 3/30/2014
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System Health Report, RF/RV (Fire Protection), 10/01/2014 to 12/31/2014

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CNC-1112.11-00-0031, Unit 1 Associated Circuits Analysis for Post Fire Safe Shutdown, Rev. 4
CNC-1112.11-00-0032, Unit 2 Associated Circuits Analysis for Post Fire Safe Shutdown, Rev. 5
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CNC-1206.03-00-0001, Flood Levels for Structures Outside of the Reactor Building, Rev. 22
CNC-1223.02-00-0022, Pressure Drop Calculation for Alternate Make-up/Spray Capabilities
CNC-1223.49-00-0007, RF/RV SLC TR 16.9-1.8, System Flow Test Acceptance Criteria (Attachment 17 Cable Room Corridor Demand with Hose Stream), Rev. 5
CNC-1381.05-00-0251, U1/2 NFPA 805 Circuit Breaker and Fuse Coordination Study, Rev. 9
CNC-1435.00-00-0001, Fire Stop Pressure Calculation, Rev. 0
CNC-1435.00-00-0009, Fire Endurance Test of Seismic Concrete Block Walls, Rev. 1
CNC-1435.00-00-0067, NFPA 805 Transition Fire Risk Evaluations (FREs), Rev. 0
CNC-1435.00-00-0067, NFPA 805 Transition, Fire Risk Evaluations (FREs), Rev. 1
CNC-1435.00-00-0067, NFPA 805 Transitions, Fire Risk Evaluation, Rev. 2
CNC-1435.00-00-0071, NFPA 805 Transition- Deterministic Safe Shutdown Analysis, Rev. 0
CNC-1435.00-00-0074, IN 92-18 Component Disposition List, Rev. 2
CNC-1435.00-00-0076, Fire Safe Shutdown Compensatory Action Review, Rev. 1
CNC-1435-00.00-0031, Calculation for the Technical Basis of Fire Barrier Penetration Seals, Rev. 2
CNC-1435-00.00-0035, CNS Penetration Seal Database and 86-10 Evaluations, Rev. 9
CNC-1435-00.00-0036, Evaluation of Changes/Deviations to the Fire Protection Program, Rev. 6
CNC-1552.08-00-0269, Rev. 2, FSAR Section 15.6.1 - Inadvertent Opening of a Pressurizer Safety or Relief Valve
CNM-1206.09-0051, Grinnell Hydraulic Design Information Sheet, CNS Turbine Building, Rev 1
CNS Fire Protection Review, Rev. 07/1983
CNS-1435.00-00-0002, Post Fire Safe Shutdown, Rev. 25
CNS-1435.00-00-0067, Attachment – FRE for Fire Area 02 – Unit 2 CA Pump Room, Rev. 2

CNS-1435.00-00-0067, Attachment – FRE for Fire Area 03 – Unit 1 CA Pump Room, Rev. 2
 CNS-1435.00-00-0074, IN 92-18 Component Disposition List, Rev. 2
 DPC-1435.00-00-0006, Section 13.7, Penetrations with a Portion of the Required Seal Material
 Installed in a Sleeve extension Above the top of Floor Fire Barriers, rev. 2
 U1, Rev. 001

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 Exterior Fire Protection Functional Capability Test, PT/0/A/4400/001A, dated 05/28/2015
 Fire Brigade Equipment Inspection/Inventory, PT/0/B/4600/032 (Protected Area), dated 03/03/2015
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 Fire Pump Functional Test, PT/0/A/4400/001D, 01/17/2015 (A Pump)
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 Fire Pump Functional Test, PT/0/A/4400/001D, 02/28/2015 (B Pump)
 IP/0/B.3540/002, Emergency Battery Lighting (ELD) Periodic Maintenance and Testing, dated 12/10/14
 IP/0/B/3540/002, Emergency Battery Lighting (ELD) Periodic Maintenance and Testing, dated 12/8/14
 PT/1/A/4200/008F, CA Pump Suction Check Valve Partial Stroke Test, Rev 21, dated 06/18/2014
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 PT/1/A/4400/014, RN to CA Suction Piping Flow Measurement, Rev 17, dated 01/30/2014
 PT/1/A/4700/012, Unit 1 Standby Shutdown Facility (SSF) Control Panel Functional Verification, dated 6/1/14
 PT/2/A/4350/023, Sound Powered Phone System Emergency Circuit Verification, dated 3/19/15
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 WO 2114789-01, Installation and Removal of Duct, Duct Work Accessories and Access Doors/Covers, MP/0/A/7450/082, dated 11/19/2014
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 CN-1201-4.15, Architectural, IVANY Seismic Block Wall Details, Rev. 6
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 CN-1209-10.15, Fire Protection Equipment Auxiliary Building Elevation 605+10 & 619+6, Rev. 12
 CN-1209-10.16, Fire Protection Equipment Diesel Generator Building Elevation 556+0, Rev. 04

CN-1209-10.17, Fire Protection Equipment Nuclear Service Water Pump Structure Elevation
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 CN-1553-01.08, Flow Diagram of Chemical and Volume Control System (NV), Rev 9
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 CN-1605-01.14, Flow Diagram of Instrument Air System (VI), Rev 6
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 CN-1702-05.01, Unit 1 One Line Diagram Normal Auxiliary Power System 6.9kV/600V, Systems
 EPB, EPD, EPW, ETL, Rev. 13
 CN-1702-05.02, Unit 1 One Line Diagram Essential and Blackout Auxiliary Power System
 4.16kV/600V, Systems EPC, EPE, ETC, Rev. 8
 CN-1704-07.01, Three line Diagram 208/120VAC Blackout Aux. Power System (ETE) power
 Panelboard 1KPW
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 Fire Strategy Fire Area 45 Section 1.16
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Miscellaneous Documents

CNS Equipment History Report, Penetration Seal Repairs (06/01/2013 to 06/01/2015)
 CNS Extensive Damage Mitigation Guidelines, ADMINDOC-EDMG, Rev. 8
 DATATRAK Report, Components: 1CA VA0174, 175 and 178, dated 06/04/2015
 Duke Letter, CNS Docket Nos. 50-413 and 50-414, dated 04/14/1983
 Enclosure 22, Pressurize RY System Using EDM Hale Portable Pump
 Enclosure 25, U1 Containment Flooding
 Enclosure 26, U2 Containment Flooding
 Enclosure 42, EDMG Strategy Diagrams
 Hot Work Permit (WO 02058913) Chiller Room, dated 6/17/2015
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 ILC82, IL Series Emergency Light
 Impairment IMP-CN-2015-00211, Fire Area 22, Replacement of EFA, dated 06/01/2015
 Letter of Agreement, Duke Energy and Bethel Volunteer Fire Department, dated May 07, 2014
 MotoTrbo MTR3000 PM, Repeater Reference Alignment, completed 3/25/14
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 Multiple Assigned Job Status Report, Fire Brigade Training Program CNF 001, dated 06/01/2015
 Open Impairment Log, dated 06/01/2015
 Ops Guide: 15-17, 1VC7B/2VC8A Vulnerability during Fires in the VC Room, Rev. 0
 Overly Manufacturing Company, Letter 833 dated May 01, 1980, RE Certification of Fire Resistant Construction, Door AX 416

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 Repeater Battery Preventative Maintenance, completed 8/27/14
 Ruskin Fire Damper Installation Instructions for DIBD23, DIBD23SS 3-Hour Rated Dynamic and Static Curtain Fire Dampers
 USFAR Chapter 8 Electric Power, Rev. 17
 USFAR Chapter 9 Auxiliary Systems, Rev. 17

Licensing Documents

Catawba Nuclear Station SER, Section 9.5-1, Fire Protection Program including SSER2, SSER3, SSER 4, and SSER 5
 Catawba Nuclear Station SLC Test Requirements, Section 16.9-2, Sprinkler Systems, Rev.5
 Catawba Nuclear Station SLC Test Requirements, Section 16.9-5, Fire Rated Assemblies, Rev.6
 Catawba Nuclear Station Updated Final Safety Analysis Report, Section 9.5-1, 17 October 2013
 Catawba Nuclear Station, Unit 1 Renewed Facility Operating License NFP 35, Section 2.C.5
 Catawba Nuclear Station, Unit 2 Renewed Facility Operating License NFP 52, Section 2.C.5

LIST OF PROBLEM IDENTIFICATION REPORTS (PIP) REVIEWED DURING INSPECTION

C-13-01960, C-14-1427, C-07-2736, C-97-2021, C-97-3630, C-98-3331, C-15-0895, C-14-9219, C-14-8529, C-14-11404, C-13-0996

List of PROBLEM IDENTIFICATION REPORTS (ARs) Generated as a Result of this Inspection

01930126, Spurious Opening of Valve 2VC-8A (1VC-7B)
 01930607, NRC TFPI Inspection team item
 01932167, NFPA Main Drain testing Requirement for Flow Path Verification
 01932211, 50.59 for Modification CNCE9584 downgrade of fire barrier
 01932305, DataTrak Component Fire Area Summary
 01932511, Enhancements to the Inspection Criteria for HEMYC Cable Wrap
 01932556, 2015 NRC Triennial Observation - Partial Transfer to SSF

LIST OF ACRONYMS AND ABBREVIATIONS

AR	Action Request
BTP	Branch Technical Position
CMEB	Chemical Electrical Branch
CNS	Catawba Nuclear Station
DBD	Design Bases Document
ELU	Emergency Lighting Unit
FA	Fire Area
FDC	Fire Damage Control
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
HVAC	Heating, Ventilation, and Air Condition
IP	NRC Inspection Procedure
NCV	Non Cited Violation
NFPA	National Fire Protection Association
NRC	United States Nuclear Regulatory Commission
OMA	Operator Manual Actions
SDP	Significance Determination Process
SER	Safety Evaluation Report
SLC	Selected Licensee Commitments
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report