EDO Principal Correspondence Control

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FINAL REPLY:

John D. Runkle, Attorney at Law
North Carolina Waste Awareness and
Reduction Network (WARN),
Nuclear Information & Resource Services
Union of Concerned Scientists (UCS),
NC Fair Share, and
Students United for a Responsible
Global Environment

TO:

Luis Reyes, EDO

FOR SIGNATURE OF : ** GRN ** CRC NO:

Dyer, NRR

DESC:

2.206 - Recurring Fire Protection Issues at Sheron Harris Nuclear Plant

ROUTING:

Reyes
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SPECIAL INSTRUCTIONS OR REMARKS:

Templat: EDO-001

Elds: EDO-01

From: "John Runkle" <jrunkle@mindspring.com>
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Date: 09/20/2006 3:53:25 PM
Subject: 2.206 Petition -- Shearon Harris Nuclear Power Plant

VIA MAIL AND EMAIL

To: Luis A. Reyes
Executive Director for Operations

Attached please find the 2.206 Petition submitted by NC WARN et al. to the Nuclear Regulatory Commission regarding the Suspension of Operating License No. NPF-63 for Shearon Harris Nuclear Power Plant Until Recurring Fire Protection Issues are Brought Into Compliance.

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CC: "Len Anthony" <Len.S.Anthony@pgnmail.com>

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Subject: 2.206 Petition -- Shearon Harris Nuclear Power Plant
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NC WASTE AWARENESS AND REDUCTION NETWORK
NUCLEAR INFORMATION AND RESOURCE SERVICE
UNION OF CONCERNED SCIENTISTS
NC FAIR SHARE
STUDENTS UNITED FOR A RESPONSIBLE GLOBAL ENVIRONMENT

September 20, 2006

VIA MAIL AND E-MAIL

TO: Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

FROM: John D. Runkle
Attorney at Law
Post Office Box
Chapel Hill, NC 27515, for Petitioners

RE: Petition for Energy Enforcement Action Pursuant to 10 CFR §2.206 – Suspension of Operating License No. NPF-63 for Shearon Harris Nuclear Plant Until Recurring Fire Protection Issues are Brought Into Compliance

Pursuant to §2.206 of Title 10 of the Code of Federal Regulations, now come the North Carolina Waste Awareness and Reduction Network, the Nuclear Information and Resource Services, the Union of Concerned Scientists, NC Fair Share, and the Students United for a Responsible Global Environment, by and through the above counsel, with a petition for the Nuclear Regulatory Commission ("NRC") to take the following emergency enforcement actions against Progress Energy and its Shearon Harris Nuclear Power Plant:

Issue an Order requiring the immediate suspension of the operating license for the Shearon Harris Nuclear Power Plant until such time that all fire safety violations affecting safe shutdown functions as designated under current law are brought into compliance. This shall be accomplished without reliance on regulatory bypasses, such as indefinite compensatory measures.

OR IN THE ALTERNATIVE

Issue penalties to the Shearon Harris Nuclear Power Plant for the maximum allowable amount of $130,000 for each and every violation for each day the plant operates until compliance with the fire protection regulations is achieved and verified by NRC.

THE PETITIONERS. The Petitioners are public interest groups concerned about the health and safety of their members, and the members of the public. The Petitioners are bringing this Petition on behalf of and to protect the interests of their members. The Petitioners are as follows:

a. The North Carolina Waste Awareness and Reduction Network is a grassroots nonprofit using science and activism to tackle climate change and reduce hazards to public health and the environment from nuclear power and other polluting electricity production, and working for a transition to safe, economical energy in North Carolina. It has more than 1,000 members and supporters in North Carolina, many near the Shearon Harris Nuclear Power Plant. Its address is P.O. Box 61051, Durham, NC 27715-1051.

b. The Nuclear Information and Resource Services is the information and networking center for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues. It has 11,000 members in the United States and is affiliated with organizations worldwide.
Its office is 6930 Carroll Avenue, Suite 340, Takoma Park, MD 20912.

c. The Union of Concerned Scientists is an independent nonprofit alliance of more than 100,000 concerned citizens and scientists. We augment rigorous scientific analysis with innovative thinking and committed citizen advocacy to build a cleaner, healthier environment and a safer world. Its Washington Office is
1707 H St NW, Suite 600, Washington, D.C. 20006-3962.

d. NC Fair Share is a statewide, membership, multi-issue advocacy organization that works to promote political participation and leadership of low income people for a fairer North Carolina. It has more than 1300 members in North Carolina. Its address is 3824 Barrett Drive Suite 312, Raleigh NC 27609.

e. Students United for a Responsible Global Environment is a coalition of 75 student groups across the country dedicated to protecting the environment. Its address is PO Box 1188, Chapel Hill, NC 27514.

SUPPORT FOR PETITION. The emergency enforcement action is warranted

based on the current public health and safety hazard posed by the continued operation of the Shearon Harris Nuclear Plant without reasonable assurance against cable and conduit fires and consequential impairment of the ability of the plant to safely operate, and in particular, to safely shutdown in emergency situations.

This action will replace the currently used "blanket enforcement discretion policy" with one that requires immediate compliance with the fire protection rules at 10 CFR Part 50, Appendix R, III.G.2. It is entirely consistent with actions taken by the NRC in the withdrawal of the rulemaking this spring on disallowing operator manual actions and comes after the issuance of many Confirmatory Orders, guidance documents, reports and enforcement actions.

The factual basis for this Petition is provided in the enclosed report, "Delaying with Fire: The Shearon Harris Nuclear Plant and 14 Years of Fire Safety Violations." The report contains attachments providing additional documentation for the serious allegations in the Petition. It is important to note the Shearon Harris Fire Protection Abridged Chronology document the lack of compliance with fire safety rules in Attachment 1 to the report, as well as the listing of electrical fires and other documentation.

If the NRC had followed its own rules, Shearon Harris' fourteen-year violation of fire safety regulations would not have been allowed. Correction of the problems would have added another instance to the long list of U.S. nuclear plant outages required to restore minimum safety margins. But despite the 2002 near-miss at the Davis Besse Nuclear Plant, in which the NRC apparently prioritized utility profits over public safety, the agency remains poised to become a regulator whose neglect of its mandated duty leads to widespread harm.

It seems clear that NRC's intention is to "correct" the fourteen-year noncompliance at the Shearon Harris plant by allowing more years of delay under a different regulatory guise. Any further "study" of the Harris fire problem, such as pursuing the NFPA 805 regulatory scheme, constitutes an irresponsible delay and a violation of both federal regulation and the NRC's mandate under federal law. Progress Energy has known of the lack of compliance with the NRC's fire protection rules since at least 1992; it has obviously made a business decision to not correct the violations.

Progress Energy has relied on impaired and inadequate fire safety systems for at least fourteen years at the Shearon Harris Nuclear Power Plant. In recent submittals, it has indicated that it may resolve some of the fire protection problems by 2015. People living around the Shearon Harris plant are subject to severe and yet unnecessary risk from these practices. It is time for this risk to end, the NRC has allowed Shearon Harris to operate unsafely for far too long.

PROCEDURAL MATTERS. The goals of the Petition are the resolution of all uncertainties regarding the agency's agenda for protecting the public against fire safety

violations, and in particular, the lack of compliance with the fire protection rules at the Shearon Harris plant. The Petitioners thereby request that deliberations on this Petition are conducted in open and public proceedings that include hearings in the vicinity of the Shearon Harris plant.

Although the Petitioners are willing to enter into negotiations allowing the plant to remain operating for a short term, any continued operation must be based on the establishment of a firm timetable. One possibility may be to move up the next refueling outage, now scheduled for the third quarter of 2007, to the first quarter of 2007. Replacing faulty fire barriers and rerouting electrical circuitry could prolong the outage for several months, but the danger from electrical fires would be, and must be, significantly minimized. Since Progress Energy responds more readily when revenues are at stake, the penalties should expedite action and finally lower the risks to the regional public.

Finally, we put NRC on notice that to even accept an application from Progress Energy seeking to add 20 years or more to Harris' operating license without first resolving all open violations of federal safety regulations flies in the face of the NRC's mandate to protect public health and safety. It is contrary to common sense, state law governing corporate activities, and basic public values.

The Petitioners therefore urge the NRC to act with due haste in taking this emergency enforcement action. Fourteen years is long enough to "delay with fire" at Shearon Harris.

FOR PETITIONERS:

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Shearon Harris Emergency Enfo

ENCLOSURE

"Delaying with Fire: The Shearon Harris Nuclear Plant and 14 Years of Fire Safety Violations"

Attachments:

1. "Shearon Harris Fire Protection Abridged Chronology," Union of Concerned Scientists, July 2006. (Also see 16-page chronology at www.ncwarn.org).

2. "N-Plants Keep Watch On Fire-Retardant Material," Raleigh NEWS & OBSERVER/AP Article, August 25, 1992.

3. Partial listing of electrical fires at Harris and Brunswick plants.

4. INSIDE NRC article on major fire at Harris in 1989.

5. Licensee Event Report, October 28, 2005. (Also see the report on www.ncwarn.org).

6. Shearon Harris OMA procedures: sample listing of "Local Manual Action Steps to be Performed Outside of the Control Room to Achieve and Maintain Hot Standby."

7. New York Times: NRC Ponders Rule Change (reflecting industry lobbying and heroic actions/OMAs), November 29, 2003.

Delaying With Fire:

The Shearon Harris Nuclear Plant

and 14 Years of Fire Safety Violations

September 20, 2006

NC WARN: NC Waste Awareness & Reduction Network
Nuclear Information & Resource Service
Union of Concerned Scientists

DELAYING WITH FIRE: THE SHEARON HARRIS NUCLEAR PLANT AND 14 YEARS OF FIRE SAFETY VIOLATIONS

SUMMARY

Fire represents up to 50% of the risk for catastrophic accidents in the U.S. nuclear power industry.[1] That risk calculation assumes fire regulations are being obeyed. Fire can cause operators to lose control of the nuclear reactor and its complex safety systems, leading to overheating of the reactor fuel and large releases of radioactivity.

The U.S. Nuclear Regulatory Commission (NRC) has allowed the Shearon Harris Nuclear Plant in Wake County, NC, and others, to operate in clear violation of federal fire safety regulations put into place following a seven-hour fire at Alabama's Browns Ferry plant in 1975, where only heroic action and sheer luck averted a catastrophic radiation accident.

"In recent years, it's one of the most serious problems to come along," *said Steven Sholly, senior consultant at MHB Tech. Associates, a San Jose, Calif. firm that advises [NRC] regulators.* ***"It's something that will have to be dealt with in the short-term, not the long-term."*** Raleigh News & Observer August 25, 1992

Note the date of that statement. It refers to serious design flaws at dozens of nuclear plants, and a widely deployed fire protection material deemed "inoperable" by the NRC in 1992 after being exposed by an industry whistleblower years earlier. Later, additional fire barrier materials – which are designed to slow the spread of fire, and protect electrical cables that operate hundreds of valves, pumps and motors – were also found to be ineffective.
The regulatory response by the NRC has been irresponsible and dangerous. Industry influence over Congress and NRC management has kept the agency playing along with plant owners as they have routinely disregarded efforts to coax them into compliance. The challenges of fire safety are compounded by the risks posed by intentional acts, whether by sabotage, outside attack, or a deranged insider. Compliance with existing fire protection regulations is a matter of national security.

Some plant owners have corrected fire vulnerabilities. However Harris has been in violation of federal fire regulations since at least 1992, and ranks worst in the nation in at least two critical fire safety criteria.

At Shearon Harris, commitments to correct the fire vulnerabilities have been made, then ignored, in a cycle of endless delay over the years, even as more violations continue to be discovered. A 2005 inspection became at least the 10th time Harris reported new violations, adding to a list totaling scores of unprotected components needed to safely shut down and cool the reactor in the event of a plant fire.

Shearon Harris has already had several fires in its 19 years. One, called a "major fire" by an industry publication, was caused by an electrical short. It required 30 firefighters, and caused a plant outage lasting for weeks.

But instead of protecting its electrical cables (and the plant has hundreds of miles of cabling), Harris owner Progress Energy has used illegal, unapproved "interim compensatory measures" that rely on workers to detect fire and perform heroically to save the reactor. Just like the small, "temporary

use" spare tire on a car, such actions were intended to be used for hours or days – not 14 years. NRC admits these measures add risk, but still allows plants to operate without restoring full fire protections as required by law.

Meanwhile, the nuclear industry has vigorously lobbied NRC to relax the fire regulations. But despite years of pressure, since late 2005 some NRC fire engineers have insisted it is too dangerous to allow continued use of illegal "interim" measures that had neither been verified nor authorized. One NRC engineer told Harris officials at that time: ***"We are concerned that your plant might not be safe."***[2]

Now, however, rather than finally order compliance with the current fire safety rules by requiring the replacement of faulty fire barriers, the NRC is poised to allow plant owners to work toward a new regulatory scheme based on the statistical likelihood of a serious fire.

Progress Energy proposes to seek a license amendment in 2008 that would allow years to study Harris' fire vulnerabilities, and to make unspecified modifications that would bring the plant into compliance with the new regulations by 2015. That would make a total of 23 years that Harris has failed to obey regulations that supposedly govern a leading risk factor for a severe nuclear accident.

By comparison, problems affecting electricity generation (revenue) are corrected promptly. After each of the nine sudden reactor shutdowns at Harris between 2002 and 2005, Progress worked quickly to restore operations within days or weeks.

It is apparent that safety is *not* the $9 billion/year corporation's "top priority" as is so often claimed by its officers and 50-person public relations team. Each year, Progress spends more – on executive compensation, public relations, lobbying and targeted philanthropy to polish its corporate image than the $10 million one-time cost to replace faulty fire barriers.

And for the NRC – which spends only 22 months to approve license extensions for aging nuclear plants but years to enforce safety rules – it seems that keeping owner revenue flowing takes priority over correcting vulnerabilities that could render entire states uninhabitable.

That places NRC among the growing list of federal agencies which, in recent years, have neglected to protect the public against weakened levees, poor emergency planning, mine disasters, leaking oil pipelines, and other hazards. Will the NRC lead the nation's next post-disaster "lessons learned" exercise?

Although its current operating license runs until 2026, Shearon Harris plans to apply late this year for a 20-year extension without having corrected its fire safety violations. After 14 years of delay, we believe the company has no intention of correcting the vulnerabilities.

As industry watchdog organizations, we today file for Emergency Enforcement action demanding the NRC: 1) immediately suspend Shearon Harris's license until all fire safety violations are corrected, OR; 2) fine Harris $130,000 per violation each day it operates until compliance with current law is verified by NRC – without relying on regulatory bypasses such as "interim" fire watches and operator actions.

We are willing to negotiate allowing the plant to remain open based on a firm timetable for Harris to correct its multiple fire violations no later than its next refueling outage in the fall of 2007. This allows sufficient time for

planning the work needed to correct fire violations, and may require an extended outage.

Any further "study" of the Harris fire problem is irresponsible, and violates both federal regulation and the NRC's mandate. It seems clear that NRC's intention is to "correct" the 14-year noncompliance by Harris by allowing more years of delay under a different regulatory guise.

We insist that all deliberations on this petition must exceed NRC's normal, closed process, with hearings in the vicinity of the Harris plant.

Finally, we put NRC on notice that to even accept an application from Progress Energy seeking to add 20 years to Harris' operating license without first resolving all open violations of federal safety regulations will be resisted to the fullest extent via all available legal and civic avenues.

Fourteen years is long enough to "delay with fire" at Shearon Harris.

BACKGROUND ON FIRE RISK

The risk of a radiation catastrophe caused by fire at nuclear plants has been quantified repeatedly by the NRC since the 1970s. The primary danger is not that fire would collapse buildings that house reactors, nuclear waste or other radiation sources. The hazard is that fire could cause operators to lose control of the nuclear reactor and/or its complex cooling and safety systems, leading to overheating of the reactor fuel and potentially large releases of radioactivity. As early as 1990, NRC staff reported that:

"... based on plant operating experiences over the last 20 years it has been observed that typical nuclear power plants will have three to four significant fires over their operating lifetime. Previous probabilistic risk assessments (PRA) have shown that fires are significant contributors to the overall core damage frequency, contributing anywhere from seven percent to 50 percent of the total, considering contributions from internal, seismic, flood, fire, and other events. There are many reasons for these findings. ***The foremost reason is that like many other external events, a fire event not only acts as an initiator but can also compromise mitigating systems because of its common-cause effect.*** *[emphasis added]"* [3]

The "safe shutdown" of a nuclear plant occurs when control rods are inserted properly into the core of the reactor, halting the nuclear reaction. It is dependent on more than 20 different systems that must function correctly. A number of these same systems are required to operate for days afterward to remove residual decay heat from the core and prevent the incorrect operation of equipment, which could also cause a severe accident.

Electrical cables that these systems depend upon are spread out among many different fire zones of the plant, most of them funneling back through a "cable spreading room" and to the control room. Redundancy of safe shutdown electrical circuits is required. U.S. nuclear plants each have hundreds of miles of electric cables, much of it running side-by-side in cable trays (metal channels) that are open on top.

Maintaining the functionality of these electrical systems is critical to ensuring the safe operation of hundreds of valves, pumps, motors and other safety equipment. According to NRC fire protection regulations, when both the primary and redundant electrical circuits appear in the same fire zone, one is required to be protected by either:

1) a qualified 3-hour fire barrier system;
2) a qualified 1-hour fire barrier system in conjunction with smoke detectors and automated sprinkler systems, or;
3) a minimum distance of twenty feet of separation between the electrical cable trays or conduits, with no intervening combustibles, in conjunction with the placement of detection and automated suppression between the electrical systems.[4]

These provisions are in place so that no single fire can completely disable reactor safe shutdown equipment. Alternately, a plant owner must submit a safety analysis, along with a request for exemption from these required physical fire protection features, for NRC approval.

For fire protection planning, the Harris plant – a large industrial facility – is separated into 32 fire areas. Thus, there are myriad challenges to protecting a nuclear plant from fire, and each plant has an onsite, part-time fire brigade that trains with local fire departments.

Power cables run through trays, conduits and tunnels, impeding the ability to inspect them, and to detect and suppress fires.

Visual and physical access to fire areas is often problematic – for humans, mechanical systems and physical fire protection features designed to detect and suppress fires. For example, many tiers of electrical cables run through tunnels, are buried behind pipes, or in cable trays stacked one behind the other.

CAUSES OF NUCLEAR PLANT FIRES

Human error has caused many of the nuclear industry's fires, which can be initiated and fed by flammable fluids such as fuel and lubricant oils, paints and other transient materials, and by hydrogen gas. Perhaps the greatest risk is a fire caused by electrical equipment – including the power cables themselves. The Union of Concerned Scientists has concluded that fires become more likely in aging nuclear plants as protective materials for electrical cables – the jacketing, or insulation – deteriorate.

Factors impacting the longevity of cable jacketing include: original quality of manufacturing and installation; exposure to steam, pressure, heat, and radiation; physical stress at corners and in narrow openings; and electrical loads. Many cables at Harris, such as those operating large pumps, valves and other safety equipment, are high amperage, which creates high heat loads that add stress to cable jacketing. Even very small holes or splits in the jacketing – at seams or junctions – can be problematic because they get worse as the material oxidizes. Inspection is impossible over many of the miles of cabling.

Any openings in the jacketing can lead to an electrical short, which creates an unregulated circuit that, if not corrected by circuit breaking equipment, can lead to power surges many times higher than normal, resulting in intense heat and ignition of combustible materials. Cable jacketing at Harris is made from different substances, some of which can become flammable with sufficient heat. If cables catch fire due to a short or other reason, the cable jacketing can ignite and rapidly spread the fire down the cables and

into other areas.

Similarly, a fire that breaches inoperable fire barriers can burn away cable jacketing, exposing energized circuits, creating electrical shorts and the maloperation of safe shutdown equipment.

The greatest danger posed by fire – or even "shorts" on their own – is that it can cause loss of the ability by plant operators to immediately shut down the reactor from the control room, or to operate the hundreds of cooling system components necessary to prevent the fuel in the reactor core from overheating. Damage to electrical circuits can cause a valve or other component to not open on remote command; it can also cause "spurious actuation," for example, valves opening when they should remain closed. Either malfunction can lead to loss of core cooling. A June 9, 2006 document by Progress Energy lists 23 plant systems having a role in the ability to safely shut down the reactor, with two additional systems vital to protecting the reactor core from overheating following shutdown. (See Attachment 1)

At Shearon Harris, multiple reports and other documents referenced in Attachment 1 reveal scores of inspection findings where critical cooling system equipment is left unprotected. A Licensee Event Report on October 28, 2005 repeatedly refers to the potential for "hot-induced shorts." It contains dozens of references to unprotected primary and/or emergency equipment-spread across dozens of fire areas, which, in the event of fire, could lead to a severe nuclear accident.

The NRC has identified but not solved what is termed a "circuit analysis" problem: Under certain conditions an electric current can arc from one cable to an adjacent one. The circuits are more likely to cross connect, causing false positive or false negative readings, or rendering shutdown controls useless. As nuclear plants age, this problem is likely to become more prevalent.

The challenges of fire safety are compounded by the risk posed by intentional acts, whether by sabotage, outside attack, or a deranged insider. Since 9-11, national security experts have consistently identified nuclear plants as potential targets, and critics warn that despite industry pretenses, defense requirements have been limited to unrealistic levels due to plant owners' pressure on NRC to minimize costs. It does not take an in-depth knowledge of the rules for nuclear safeguards to realize that even if the direct action of an attacker were thwarted, in many scenarios an attack could lead to fires. The problem could be compounded by loss of lighting, smoke, explosions and gunfire, impeding the ability of plant workers to mitigate damage to unprotected safety systems (inability to open locked doors, access critical tools, etc). In the event of an attack by air, there is no way to predict how jet fuel would flow and burn as a transient combustible inside various Vital Areas within a nuclear plant.

A recent decision by the Federal 9th Circuit Court of Appeals stated that the NRC must begin considering the consequences of acts of terrorism in all licensing proceedings as part of the review under the National Environmental Policy Act (NEPA). The decision concludes:

"NRC's position that terrorist attacks are 'remote and highly speculative' as a matter of law is inconsistent with the government's efforts and expenditures to combat this type of terrorist attack against nuclear facilities."[5]

Subsequent to that decision, other challenges of NRC actions have included a demand for an assessment of the risk from terrorism. It is reasonable for the NRC to now consider the unpredictable dangers of fire during a terrorist attack when addressing Shearon Harris' longstanding non-compliances with federal

requirements.

IGNORING REGULATORY REQUIREMENTS AND SAFETY

Federal law mandates that nuclear power station operators physically protect emergency backup electrical systems (power, control and instrumentation cables) needed to remotely shut down the reactor and maintain safety systems from the control room.[6] The regulatory provision requires the physical fire protection of electrical cabling to be independently tested to American Society for Test and Measurement standards for rating as qualified fire barriers. Such fire protection systems are to be designed, installed and maintained to resist the passage of flame and hot gas, thus protecting encased electrical cables from excessive temperatures and allowing them to operate for safe shutdown.

As previously stated, federal regulations administered by the NRC require "redundant" control systems. This prescriptive fire code was put in place for U.S. plants following the fire at Alabama's Browns Ferry plant in 1975, and was intended to provide the best assurance than no single fire can destroy control room operators' ability to safely and remotely shut down the reactor and continue operating the motors, pumps, valves and other equipment necessary to continue cooling the core.

The Browns Ferry fire demonstrated that a high number of circuit failures can occur in a relatively short time period, in that case within 15 minutes from the ignition of insulating material in the cable trays.
As stated, regulatory requirements provide for only three accepted methods of protecting at least one shutdown cable train during a postulated fire when the two trains are located in the same fire area.

In 1992, the majority of US nuclear power plants, including Shearon Harris, were found to have installed "inoperable" Thermo-Lag 330-1 fire barriers to protect safe shutdown systems.[7] The company manufacturing the bogus fire barrier material had falsified its independent testing reports for the fire rating of the material; subsequent independent testing conducted by NRC determined that combustible Thermo-Lag fire barriers failed standardized industry fire tests in half the required time, rendering reactor safety systems unprotected against fire. In plant safety evaluations, many Thermo-Lag installations must now be counted as part of some rooms' combustible loading – fuel for a fire.

In 1997, Shearon Harris made commitments to the NRC staff to remove and replace, or upgrade, the inoperable fire barrier material and re-route redundant trains of electrical cable from fire zones containing the primary electrical trains.[8] Subsequent NRC inspections in 1998 determined that Harris had missed multiple opportunities to identify the problem earlier.[9]

In late 2000, NRC identified additional Thermo-Lag fire barriers in the cable spreading room that also did not meet the requirements for either three-hour or one-hour rated fire barriers Additional violations were noted in 2001 for inoperable Thermo-Lag fire barriers still remaining between the B Train Switchgear Room and the Auxiliary Control Panel Room. Similarly, in 2002, Shearon Harris was discovered to have left "unprotected redundant shutdown components in an alternative shutdown room" in lieu of operator manual actions.[10]

"The Individual Plant Examination of external events indicated the ignition frequencies in these areas are significant"
NRC to Shearon Harris, Feb. 3, 2000 [11]

In 1999, in the course of identifying the adequacy of other fire barriers in addition to Thermo-Lag 330-1 the NRC found two more questionable fire barrier systems – HEMYC and MT – that also did not provide adequate protection as required by standardized fire endurance tests. Its finding in a 2000 report after inspecting Shearon Harris was that HEMYC was not qualified to protect cable trays or conduits and MT was not qualified for conduits.[12] Instead of being qualified as a fire barrier for a one-hour fire endurance rating, HEMYC barriers failed by allowing the passage of fire and hot gas to cables systems within as early as fifteen minutes in standardized tests.[13]

HEMYC failed two lab tests in 2005, leading an NRC fire engineer to tell Harris officials during a September meeting, ***"Our concern is that your plant might not be safe."***[14]

"Shearon Harris, about 25 miles southwest of Raleigh, has more of the insulation than any other nuclear plant in the nation – a 6,500 linear feet – and faces spending $6.5 million to $9.75 million to replace it, said Rick Kimble, a spokesman for Progress Energy."
Raleigh News & Observer, June 10, 2005

That one-time expense is far exceeded by Progress' annual charitable contributions; fixing fire violations is feasible, it's just not a business priority.

Over the years, Progress Energy has repeatedly promised the NRC that it would fix these failures to comply with the fire safety requirements. In January 2002, it reported to the agency that *"Harris is committed to restoring compliance in a timely manner.*[15]

An October 28, 2005 Licensee Event Report to the NRC became at least the 10th time that Harris reported new violations of fire regulations. In that report, Progress Energy told NRC that it plans to correct the violations by November, 2010 – three years later than promised in a March 21 report – saying it will rely on "design changes or other methods approved by NRC to restore compliance." The report also refers to many "original design issues," violations that have existed at Harris since it opened in 1987.

Harris' commercial operating license was issued on January 12, 1987, and in condition 2.F. of that license, it states that *"the company shall implement and maintain in effect all provision of the approved fire protection program as described in the Final Safety Analysis Report (FSAR) for the facility ... 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 fire."* This expressly included the III.G.2 provisions for cable separation and fire barriers in association with detection and suppression.

During the 1999 triennial inspection, the utility relied on different fire barriers, HEMYC and MT, to comply with the one-hour and three hour fire endurance requirements. Even though HEMYC had been qualified by its manufacturer at that time, the NRC Staff expressed reservations about its effectiveness and concluded that both barriers were insufficient to meet the III.G.2 standards. The NRC notified Shearon Harris, and the entire industry, that HEMYC/MT was not effective. MT is used as a three-hour fire barrier at Shearon Harris and only one other plant in the country.

"INTERIM" MEASURES FOREVER

Many plants such as Harris have been in flagrant violation of fire regulations since 1992, basically a case of industry's "civil" disobedience and an embarrassment for the

NRC – being a federal agency wielding essentially no authority over the industry it supposedly regulates. The response by many plant owners to the various fire barrier deficiencies was basically to stonewall corrective actions for years and, in the end, to decide to sacrifice the electrical systems to fire and instead rely on sending somebody into potentially hazardous fire zones in last ditch efforts to manually operate safe shutdown equipment. Rather than spend the funds to upgrade or replace the fire barriers or reroute cables, Progress and other reactor operators chose to gamble with public health and safety with inappropriate compensatory actions and unapproved and largely unanalyzed manual actions.

1. Fire Watch Patrols

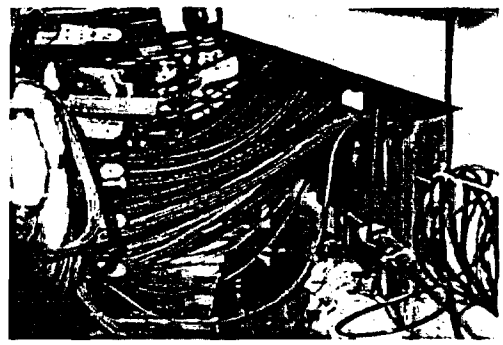
To compensate for failed physical fire barrier systems throughout the plants, between 1992 and roughly 1998, Harris and other plants began hiring personnel as round-the-clock roving patrols to look out for smoke and fire along safety related cable trays and conduits throughout their facilities.

NRC originally intended that fire watches be stationed temporarily, for example as "extra eyes" during welding operations. They were never intended to be used as extensively and indefinitely as is being done at Harris.

Former NRC Commission Chairman Ivan Selin testified before Congress that fire watches are intended for no more than six months and certainly not over a period of years.[16]

Fire watch patrols are inappropriate as a replacement for a fire barrier because a person cannot compensate for the absence of a physical fire protection feature that is designed and positioned to prevent damage to electrical circuits by resisting the passage of fire. A fire watch is more appropriately put into place to compensate for lack of smoke detection. Even then, roving fire watch patrols (24/7) are only in any given fire zone for minutes in an hour.

Fire watches over extended periods of time have been the subject of numerous failures even as "compensatory" actions, including: falsification of fire watch reports; "nesting," (evidence that roving fire watch personnel have hunkered down during their shift with drugs and alcohol); and even a heroin overdose at the Turkey Point nuclear power station in Florida.



Hundreds of miles of electrical cables run through dozens of fire zones in a typical U.S. nuclear plant.

The October 28, 2005 report from Harris also said the plant would continue using "interim" measures, including fire watches in at least 14 fire areas to compensate for ***"some of the potential safety consequences ... pending permanent resolution of the identified conditions" in 2010.*** (See Attachment 5)

2. Heroic Actions

Another measure used for years at Harris, in lieu of compliance with fire regulations, is called Operator Manual Action (OMA). If a safe shutdown circuit fails, control room operators would direct someone into one or more fire areas to perform detailed, written procedures to manually turn on or off equipment – pumps, valves, motors – needed to shut down the reactor and maintain cooling, possibly for several days. Such actions could be required in areas involving fire, smoke, darkness, radiation,

and gunfire or explosions.

NRC discovered in 1999 that Harris and others were using OMAs – without prior approval – to compensate for the failed fire barriers or lack of minimal cable separation between redundant systems. There is nothing in the fire regulations that would accommodate these procedures without prior NRC approval; NRC confirmed to the industry on May16, 2002 that OMAs were allowable only when pre-approved through the license exemption process.

Harris never gained such exemptions, but NRC continues allowing it and other plants to operate with these unapproved and largely unanalyzed measures that have never been authorized, verified, nor subjected to timed trials that would help gauge their effectiveness.

The Shearon Harris plant illegally relies on over 100 sets of complex manual procedures designed to prevent a meltdown in the event of a fire, the most in the U.S. One such set of actions at Harris would require the successful completion of 55 separate steps by one worker. (See Attachment 6 for a sample of OMA procedures)

It is clear that reliance on operator manual actions substantially increases the risk of reactor core damage from a fire. The NRC's 2003 rulemaking plan acknowledged that ...

"replacing a passive rated fire barrier or automatic suppression system with human performance activities can increase risk." [17] It further states that *"where operator manual actions are relied upon to ensure safe shutdown capability,* ***these operator manual actions may not be feasible when factors such as complexity, timing, environmental conditions, staffing and training are considered."***

The National Fire Protection Association refuses to support OMAs in place of prescriptive qualified fire barriers, and as the fire risk leading to unsafe shutdown became more and more likely, one NRC official characterized the widespread problem: ***"this condition is similar to the condition Browns Ferry was in prior to the 1975 fire."***[18]

The December 20, 2002, NRC triennial fire inspection of Harris found that Progress Energy's blanket method for dealing with problem electrical cables was to allow for the circuits required for control room operation of safe shutdown equipment to remain unprotected.

Instead of providing physical fire protection, Progress had substituted the required actions with unapproved OMAs – illegal measures that may not work if called upon:

"Only if no operator manual action could be found would Harris physically protect the cables. Consequently, the licensee had over 100 [sets of] local manual operator actions that they relied upon for hot shutdown. The licensee did not request deviations from the NRC for these actions." [19]

In recent years, the NRC has cited numerous examples when even these compensatory measures themselves were not being applied adequately. (See Attachment 1: 8/14/01, 1/28/02, 1/31/03, 5/5/03)

A REGULATORY END-RUN THAT MUST BE STOPPED

In 2003, under pressure from the industry, the NRC proposed to issue a "Direct Final Rule" that would relax the enforcement of current prescriptive fire protection regulations for safe shutdown systems without public comment, and essentially codify the years of 10 CFR 50 Appendix R III.G.2 violations

retroactively.[20]

The actions of Nuclear Information and Resource Service and the Union of Concerned Scientists stopped the direct final rule from being issued, forcing the agency to instead issue a proposed rule for public comment. The agency received hundreds of public comments in opposition to the industry substituting dubious manual actions for passive physical fire protection systems. The industry opposed the rulemaking because it did not go far enough in granting blanket approval to licensees' manual actions without time trials to determine their reliability. The NRC staff had no choice but to recommend that the proposed rule making be dropped. In February 2006, the Commission withdrew the proposal.[21]

Meanwhile, the Commission has allowed the "interim" compensatory measures until compliance is achieved through "alternative shutdown methods" requiring NRC review and approval of exemptions from 10 CFR 50 Appendix R III.G.2.

NRC is now offering the industry another deal. Last year, two plants – Shearon Harris and Duke Power's Oconee – became pilot plants for a method to establish fire protection procedures developed by the National Fire Protection Association (NFPA) Standards Council in 2001. The NFPA Standard 805 set forth a risk-informed fire protection standard.[22] NRC issued a regulatory guide setting forth how nuclear plants could voluntarily adopt the NFPA standard. By April 2006, some 40 nuclear plants intended to transition to the new rules over a period of several years, putting off fire safety compliance even further.

A number of concerns have surfaced regarding reliance on a risk-informed, performance-based standard instead of a prescriptive standard. One chief example is that fire modeling is still widely and professionally disputed for its reliability. For example, it depends on reliably accounting for all the combustibles that can burn in any given fire area. Deliberate acts of arson and terrorist attacks on reactors that introduce transient combustibles like jet fuel can not be reliably risk informed. So while the new approach can reduce the number of exemptions – and consequently the regulatory requirements – on the industry and the NRC, it potentially raises safety and security risks by abandoning prescriptive fire protection regulations that would otherwise make up a central part of the plant security infrastructure.

Rather than requiring compliance with federal safety regulations, the NRC continues to rely on issuing a blanket enforcement discretion policy in which recalcitrant utilities receive "non-cited" violations but are not required to comply with the rules. NRC now says it intends to "work with" utilities during the indefinite period of transitioning to new fire risk informed regulation:

"In addition to the 3-year discretion period, the staff may grant additional extensions to the discretion policy item for a specific plant item(s) with adequate justification (e.g., modification can only be implemented during an outage) on a case-by-case basis." [23]

In the case of Shearon Harris, on June 10, 2005 Progress Energy told NRC it plans to submit a request in May 2008 to amend its license to comply with the new 805 regulations. On August 11, 2005, it told NRC the transition to 805 would be "completed" in 2009. But on March 27, 2006, Progress' updated schedule shows that 34% of plant modifications to comply with the new 805 regulatory scheme would not be completed until the plant's 16th fueling cycle, scheduled for 2015 (Attachment 1).

But the industry is not content just to gain years of further delay, nor to fully analyze fire

risks. In December 2005, NRC staff reported that "industry representatives" (apparently referring to Progress Energy, Duke Energy, and/or the Nuclear Energy Institute] intend to limit their "risk-based" analysis, and that if NRC persists in requiring analyses that include risks of cooling system failures following reactor shutdown, it would be a "show stopper."

Apparently the industry is confident that it can continue to veto or ignore NRC policy.

SERIOUS FIRES AT HARRIS

At least three serious fires at Harris have apparently been related to electrical equipment. On October 9, 1989, a major fire at Shearon Harris – caused by an electrical short – burned for three hours and required response by 30 firefighters. The fire ran 100 feet down an electrical cable, causing a hydrogen leak and explosion, and damaging transformers and three floors of the turbine building.

In addition, Progress Energy's Brunswick plant suffered a September 2000 fire that destroyed one of two main transformers. (See Attachment 3 for more on Harris fires)

These fires – and scores of others at U.S. plants -- prove that electrical malfunctions do cause serious safety problems. However, what should have been a wake up call for Shearon Harris, and the entire nuclear industry, has never been addressed head-on. Fire safety remains a continuing, unresolved and unnecessary vulnerability at these industrial facilities, which are complex and dangerous even when all regulations are adhered to.

CONCLUSION

It seems clear that if NRC followed its own rules, Shearon Harris' fourteen-year violation of fire safety regulations would add another instance to the long list of U.S. nuclear plant outages required to restore minimum safety margins. But despite the 2002 near-miss at the Davis Besse Nuclear Plant, where NRC prioritized utility profits over public safety, the agency remains poised to become yet another federal regulator whose neglect of its public duty leads to widespread harm.

As industry watchdogs on behalf of the public, we hereby submit a 2.206 Emergency Enforcement Petition, concluding and demanding that the U.S. Nuclear Regulatory Commission must:

Issue an Order requiring the immediate suspension of the operating license for the Shearon Harris Nuclear Power Plant until such time that all fire safety violations affecting safe shutdown functions as designated under current law are brought into compliance. This shall be accomplished without reliance on regulatory bypasses, such as indefinite compensatory measures.

OR IN THE ALTERNATIVE:

Issue penalties to the Shearon Harris Nuclear Power Plant for the maximum allowable amount of $130,000 for each and every violation for each day the plant operates until compliance with the fire protection regulations is achieved and verified by NRC.
We have notified NRC of our willingness to consider negotiation allowing the plant to remain open, but based only on establishment of a firm timetable – not to exceed 12 months – to finally and completely correct its multiple fire violations in accordance with current law.

Such a timetable would accommodate Harris' next refueling outage, now scheduled for the

fall of 2007, allowing sufficient time for planning the work needed to correct fire violations. Replacing faulty fire barriers and rerouting electrical circuitry could prolong the outage for several months, but the danger from electrical fires would be, and must be, significantly minimized. Since Progress Energy management responds when revenues are at stake, financial penalties should expedite action and finally lower the risks to the regional public.

Any further "study" of the Harris fire problem – such as pursuing the NFPA 805 regulatory scheme, constitutes an irresponsible delay, and a violation of both federal regulation and the NRC's mandate under federal law. It seems clear that NRC's intention is to "correct" the 14-year noncompliance by Harris by allowing infinite delay under a different regulatory guise.

Progress Energy has known of the fire protection violations since at least 1992; it has obviously made a business decision not to fix them. Other plants have made the corrections. For a $9 billion/year corporation such as Progress Energy, correcting fire violations must become a priority.

As shown in the cover letter to this report, NC WARN, the Nuclear Information & Resource Service, and the Union of Concerned Scientists are petitioning the NRC to take this Emergency Enforcement Action pursuant to 10 CFR § 2.206 to this effect. We are also requesting separate investigation by the NRC Inspector General, the Government Accountability Office and Congressional oversight committees into NRC's negligence in enforcing fire protection regulations at US nuclear plants.

We insist that deliberations on this petition must exceed NRC's normally closed, industry-friendly proceedings, and be conducted with a full public process. This must include hearings in the vicinity of the Harris plant, and resolution of all uncertainties regarding the agency's agenda for protecting the public against fire safety violations.

Finally, we put NRC on notice that to even accept an application from Progress Energy seeking to add 20 years to Harris' operating license without first resolving all open violations of federal safety regulations flies in the face of common sense, state law governing corporate activities, and basic public values. Any such efforts will be resisted to the fullest extent via all available legal and civic avenues.

Fourteen years is long enough to "delay with fire" at Shearon Harris.

List of Attachments

1. Shearon Harris Fire Protection Abridged Chronology, Union of Concerned Scientists July 2006 (See entire 16-page chronology at www.ncwarn.org)
2. News & Observer/AP Article August 25, 1992 "N-Plants Keep Watch On Fire-Retardant Material"
3. Partial listing of electrical fires at Harris and Brunswick plants
4. Inside NRC article on major fire at Harris in 1989
5. Licensee Event Report October 28, 2005 (See the report on www.ncwarn.org)
6. Shearon Harris OMA procedures: sample listing "Summary of Number of Local Manual Action Steps to be Performed Outside of the Control Room to Achieve and Maintain Hot Standby"
7. New York Times: NRC Ponders Rule Change (reflecting industry lobbying and heroic actions/OMAs). November 29, 2003

Notes (see additional references in Attachment 1)

1. US NRC, NUREG-1150, Vol 2, Appendix C October 1990
2. http://www.ncwarn.org/media/NR-10-05-2005-FireTestFails.htm/. NRC confirmed to a reporter with the Raleigh News & Observer that the statement was made by an NRC engineer, but could not confirm it was the person identified in the release.
3. US NRC, NUREG-1150, Vol 2, Appendix C October 1990
4. Code of Federal Regulations, 10 CFR 50 Appendix R II. G.2
5. San Luis Obispo Mothers for Peace et al v. NRC and Pacific Gas and Electric Company No. 03-746 28,_ F.3d_(9th Cir. June 2, 2006)
6. Code of Federal Regulations, 10 CFR 50 Appendix R II. G.2
7. Bulletin No. 92-01, "Failure of Thermo-Lag 330 Fire Barrier systems to Maintain Cable in Wide Cable Trays and Small Conduits Free From Fire Damage", NRC, June 24, 1992.
8. "Completion of Licensing Action for Generic Letter 92-08 'Thermo-Lag 330-1 Fire Barriers', dated December 17, 1982 for Shearon Harris Nuclear Power Station, Unit 1", U.S. NRC, June 3, 1997, and "Closeout Documentation Regarding NRC Generic Letter 92-08, 'Thermo-Lag 330-1 Fire Barriers." CP&L, August 28,1997.
9. "Shearon Harris Nuclear Power Plant-NRC Supplemental Inspection Report 50-400/02/08", page 4 in an undated attachment to an email from NRC to NRC Region 2, July 25, 2002.
10. Ibid p. 5
11. http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/REPORTS/har_1999013.pdf.
12. NRR Response to Task Interface Agreement (TIA) 99-0028, Shearon Harris Nuclear Power Plant, Unit 1 – Resolution of Pilot Fire Protection Inspection Fire Barrier Qualification Issues (TAC No. MA 7235), August 1, 2000.
13. Information Notice 2005-07, "Results of HEMYC Electrical Raceway Fire Barrier System Full Scale Fire Testing", US NRC, Attachment 1 page 1 of 3
14. http://www.ncwarn.org/media/NR-10-05-2005-FireTestFails.htm/. NRC confirmed to a reporter with the Raleigh News & Observer that the statement was made by an NRC engineer, but could not confirm it was the person identified in the release.
15. Slides dated January 31, 2002, by Carolina Power & Light Company for pre-enforcement conference with NRC.
16. "Fire Safety at Nuclear Power Stations", Hearing Before the Subcommittee on Oversight

and Investigations of the Committee On Energy and Commerce, House of Representatives, 103rd Congress, March 3, 1993
17. SECY03-100, "Rulemaking Plan on Post-Fire Operator Manual Actions," NRC, June 17, 2003, p. 4
18. "White Paper for Manual Actions", John Hannon, Chief PSB/DSA/NRR, NRC, Letter to Alex Marion, Nuclear Energy Institute, November 29, 2001 and Report No. 50-400/02-11, Facility: Shearon Harris, NRC Inspection Report, US NRC, 2003
19. Report No. 50-400/02-11, Facility: Shearon Harris, NRC Inspection Report, US NRC, 2003
20. "Draft Criteria for Determining Feasibility of Manual Actions to Achieve Post-Fire Safe Shutdown", Federal Register, Vol. 68, No. 228, pp. 66501-66503 (November 26, 2003).
21. RIN 3150 SECY 06-0010 Withdraw Proposed Rulemaking – Fire Protection Program Post-Fire Operator Manual Actions, US NRC February 8, 2006.
22. "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants, 2001 Edition", NSPA 805, January 2001.
23. NRC Regulatory Issue Summary 2006-10

NC WARN: NC Waste Awareness & Reduction Network

is a grassroots non-profit using science and activism to tackle climate change and reduce hazards to public health and the environment from nuclear power and other polluting electricity production, and working for a transition to safe, economical energy in North Carolina.

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Nuclear Information & Resource Service

NIRS/WISE is the information and networking center for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues.

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Union of Concerned Scientists

UCS is an independent nonprofit alliance of more than 100,000 concerned citizens and scientists. We augment rigorous scientific analysis with innovative thinking and committed citizen advocacy to build a cleaner, healthier environment and a safer world.

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Delaying With Fire: Attachment 1
Union of Concerned Scientists
July 2006

Shearon Harris Fire Protection Abridged Chronology	
Date	**Event**
11/19/1980	The NRC published in the Federal Register a revised 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection requirements for new and existing nuclear power plants, respectively.[1]
02/17/1981	The revised 10 CFR 50.48 and new Appendix R to 10 CFR 50 became effective.[2]
02/20/1981	The NRC notified all power reactor licensees that the fire protection regulations in the revised 10 CFR 50.48 and new Appendix R to 10 CFR 50 are in force.[3]
07/1981	The NRC issued Revision 3 to Section 9.5.1, "Fire Protection Program," to NUREG-0800, the Standard Review Plan for nuclear power reactors.[4]
04/24/1986	The NRC issued Generic Letter 86-10 to power reactor licensees to clarify the agency's expectations regarding fire protection requirements.[5]
02/04/1988	CP&L declared an emergency (Unusual Event) when the reactor auxiliary building supply fan motor S-3B was reported to be smoking. The electrical breaker for the fan was opened to de-energize the motor.[6]
10/10/1989	CP&L declared an emergency (Alert level) at Harris due to a fire in the main generator and "B' main transformer.[7]
04/28/1997	Workers called the Holly Springs fire department for assistance due to a fire in the A-SA battery room. The plant was in a refueling outage at the time.[8]
08/18/1997	According to the NRC: *...the licensee [Carolina Power & Light Company] made changes to the approved fire protection program without prior Commission approval, that adversely affected the ability to achieve and maintain safe shutdown in event of a fire. In Safety Evaluation 97-255 the licensee accepted the condition of a degraded Thermo-Lag fire barrier assembly between the B Train Switchgear Room/ACP Room and the A Train CSR [Cable Spreading Room] in lieu of the intended 3-hour fire rating. ... The licensee went from full compliance with the fire protection safe shutdown system separation criteria to less than full compliance which increased the likelihood that both redundant divisions or trains of safety-related systems could be damaged by a single fire.*[9]
11/05/1999	The NRC performed a pilot fire protection inspection using a procedure revised for the new Reactor Oversight Process (ROP) and identified two violations: (1) fire resistance ratings and qualification testing of Thermo-Lag, and (2) Heymc [sic] one-hour and Promatec "MT" three-hour fire barrier systems not being qualified to meet safe shutdown separation requirements. Thermo-Lag was installed as a three-hour fire barrier between Switchgear Room B, Cable Spreading Room A, and Cable Spreading Room B. CP&L performed Thermo-Lag testing in 1994 and 1995 that demonstrated the Thermo-Lag fire barrier would function for only one hour and 48 minutes instead of three hours. CP&L performed an evaluation that accepted the reduced performance capability of the Thermo-Lag fire barrier. The NRC inspection revealed the Harris Final Safety Analysis Report (FSAR) indicated a three hour fire severity loading existed in the area adjacent to the Thermo-Lag fire barriers and that no backup means of fire protection (e.g., automatic fire sprinklers)

Shearon Harris Fire Protection Abridged Chronology	
Date	**Event**
	existed for the areas. Heymc [sic] and Promatec fire barrier wraps were applied for cables on redundant trains of safe shutdown related functions throughout the plant and both trains of the emergency diesel generators power cables routed through fire zone 4-A-CHLR. CP&L's fire barrier tests CTP-1026 for Heymc [sic] and CTP-1071 for Promatec "MT" indicated that the tests used the acceptance criteria of American Nuclear Insurers Bulletin No. 5 (1979) for fire barrier systems. The NRC inspection team discovered that the cover letters for each test report specifically stated the methodology was not considered an equivalent endurance qualification method for rating fire barriers. NRC Region II asked the NRC's Office of Nuclear Reactor Regulation to review these fire protection findings and determine if they constituted violations.[10]
12/17/1999	The NRC notified CP&L of the two fire protection issues identified during the pilot fire protection inspection conducted at Harris.[11]
04/25/2000	The NRC issued a GREEN finding for a violation, with six examples, of fire protection program requirements for fire barrier wraps.[12]
08/01/2000	The NRC's Office of Nuclear Reactor Regulation (NRR) responded to the NRC Region II request to evaluate issues identified during the November 1999 pilot fire protection inspection at Harris. NRR concluded: *The licensee has not clearly demonstrated that the as-installed Thermo-Lag fire barriers and associated penetration seals are adequate to withstand the hazards associated with the area(s) to protect important equipment from damage. The use of Thermo-Lag in this application appears to conflict with the NRC's fire protection requirements as specified in GDC [general design criterion] 3.* *The information documented in Final Report CTP 1026 is insufficient to qualify the Hemyc fire barrier system as a 1-hour-rated electrical raceway fire barrier system.* *The information documented in Final Report CTP 1071 is insufficient to qualify "MT" fire barrier systems as 3-hour-rated conduit fire barrier systems.*[13]
08/08/2000	CP&L identified "Oversight of the Transient Combustible Program" as an improvement initiative at Harris.[14]
09/15/2000	CP&L challenged the NRC NRR position about Thermo-Lag at Harris. CP&L informed the NRC about evaluations it performed of the fire hazards in the areas where Thermo-Lag was installed. CP&L stated: *These evaluations, in conjunction with the upgrades performed, demonstrate that although the Thermo-Lag fire barriers do not fully meet the originally intended fire endurance capability, they are adequate to ensure a postulated fire on one side of the fire barrier would not induce damage to redundant safe shutdown circuits located on the other side of the barrier. This conclusion is based on the credible fire hazards and scenarios that are in accordance with the guidance provided in Generic Letter 86-10.*[15]
09/25/2000	NRC Region II forwarded CP&L's letter of September 15, 2000, to the NRC Office of

Shearon Harris Fire Protection Abridged Chronology	
Date	**Event**
	Nuclear Reactor Regulation and asked if the letter presented any information that would alter NRR's position documented in its August 1, 2000, letter.[16]
10/24/2000	The NRC's Office of Nuclear Reactor Regulation (NRR) responded to the NRC Region II request to re-evaluate issues identified during the November 1999 pilot fire protection inspection at Harris based on "new" information provided by CP&L. NRR reported: *Based on its review, the staff concluded that the licensee's September 15, 2000, letter did not provide any additional technical information to change the conclusions NRR made in its August 1, 2000, response to TIA 99-028.*[17]
11/06/2000	NRC informed CP&L that its position on fire barriers at Harris was not altered by the information provided by the company in its September 15, 2000, letter.[18]
02/26/2001	The NRC Office of Nuclear Reactor Regulation informed NRC Region II about conclusions from its review of test reports for Thermo-Lag fire barriers separating Switchgear Room A, Cable Spreading Room A, and Cable Spreading Room B at Harris. NRR reported: *The 1-hour wall assembly satisfied the acceptance criteria specified in Supplement 1 to Generic Letter (GL) 86-10 for a wall assembly to achieve a 1-hour fire resistive rating to meet NRC fire protection requirements.* *The 3-hour wall and ceiling assemblies fire tests did not satisfy the acceptance criteria in Supplement 1 to GL 86-10 to achieve a 3-hour fire resistive rating, and therefore should not be used as the basis for determining the adequacy of the fire barriers for satisfying NRC fire protection requirements.*[19]
03/19/2001	The NRC informed CP&L that the Nuclear Energy Institute (NEI) had informed the agency that Harris, Arkansas Nuclear One Units 1 and 2, Catawba Units 1 and 2, Ginna, Indian Point Units 2 and 3, Robinson 2, Waterford, FitzPatrick, McGuire Units 1 and 2, and Vermont Yankee relied on Hemyc and/or MT fire wrap to comply with 10 CFR 50, Appendix R safe shutdown separation requirements. The NRC informed CP&L that it had asked NEI to coordinate a generic industry initiative to address the non-conforming fire barrier issues, but NEI refused to do so. Consequently, the NRC informed CP&L it would be working directly with the company and the owners of the other non-conforming plants to resolve the issues.[20]
03/21/2001	During a public meeting on fire protection issues, CP&L restated its position that the as-installed fire protection configuration at Harris was technically and legally adequate.[21]
04/17/2001	ShawPittman, CP&L's outside legal counsel, informed the NRC that the agency's conclusions regarding fire barriers at Harris was wrong for three reasons: *First, Harris is not licensed to Appendix R.* *Second, the Hemyc fire barrier systems were qualified to testing requirements specifically endorsed by the NRC Atomic Safety and Licensing Board and explicitly made part of the licensing basis of Harris. The fire rating of the installed fire wrap at Harris is demonstrated by the qualifications testing, as approved by the NRC at the time for a number of nuclear plants, and is not indeterminate simply because it does not meet the testing requirements favored by NRC today.*

Shearon Harris Fire Protection Abridged Chronology	
Date	**Event**
	Third, before attempting to require the "affected licensees" to discuss an approach for resolving the issue, NRR must complete the analysis and justification as set forth in 10 C.F.R. § 50.109.[22]
05/10/2001	CP&L and the NRC have a conference call to discuss the Thermo-Lag fire barriers used in the Cable Spreading Rooms at Harris. During the call, CP&L provided additional information to support its position that the configuration "*meets the original intent of the three hour fire barrier design requirements based on withstanding 1.8 hours of ASTM E119 fire exposure, and through additional engineering analysis of the as-installed configurations (fire barrier plus a 1" air gap between the fire barrier surface and cable tray).*" [23]
06/15/2001	CP&L submitted a licensee event report to the NRC about a design deficiency involving inadequate fuse coordination affecting safe shutdown train separation.[24]
07/27/2001	The NRC informed CP&L about its inspection of the fuse coordination issue. The NRC reported: *If certain fires occurred in the "A" switchgear room, the potential existed for a PORV [power operated relief valve] and its associated block valve, in the opposite safe shutdown division, to be open at the same time without the ability to shut either valve. With the existence of the identified deficiency, the occurrence of any of several fires could have resulted in an unisolable stuck-open PORV (small-break loss-of-coolant accident).*[25]
08/14/2001	CP&L provided the NRC with the company's position that the fire brigade at Harris fully complies with existing regulations and guidance and requested additional information from the NRC for the agency's determination that the Harris fire bridge is "moderately degraded." [26]
08/21/2001	CP&L submitted its calculation titled "Assessment of Tested and As-Built Thermo-Lag Fire Barrier Configurations," and dated August 17, 2001, to the NRC as a follow-up to the May 10th conference call.[27]
09/26/2001	The NRC responded to CP&L's letter about fire brigade performance. The NRC reported: *We do not interpret this characterization [fire brigade effectiveness in conjunction with a fire protection inspection finding] as a finding in its own right based on a determination of compliance or non-compliance of the fire brigade with regulations.*[28]
10/25/2001	The NRC issued a GREEN finding to CP&L for the design deficiency involving inadequate fuse coordination resulting in the potential for the pressurizer power operated relief valves (PORVs) and associated block valves failing open in event of a fire in Switchgear Room A.
12/03/2001	In response to the company's request, the NRC conducted a public meeting with CP&L in the NRC's Region II offices to discuss Thermo-Lag fire barrier adequacy.[29]
12/18/2001	The NRC identified two apparent violations involving fire protection regulations. The NRC issued a Preliminary WHITE finding for an apparent violation involving the Thermo-Lag fire barrier between Switchgear Room B and Cable Spreading Room A not meeting its three-hour requirement. The NRC stated this violation was significant because:

Shearon Harris Fire Protection Abridged Chronology	
Date	**Event**
	This degraded condition increased plant risk because, if a severe fire occurred in Fire Area 1-A-SWGR-B and breached the Thermo-Lag fire barrier, both trains of post-fire safe shutdown capability could be damaged or lost due to the same fire. The second apparent violation involved CP&L using an analysis for the degraded Thermo-Lag fire barrier that had not been reviewed and approved by the NRC.[30]
01/28/2002	The NRC issued a GREEN finding for an apparent violation involving two examples of failing to properly implement the fire protection program in Cable Spreading Room B. The first example involved the failure to have automatic sprinklers in the cable spreading room tunnel area where multiple safety-related cable trays contain safe shutdown cables. NRC inspectors pointed out that Section 9.5.1 of the Harris Final Safety Analysis Report indicated that all of the cable spreading rooms had automatic fire suppression and that CP&L's Engineering Service Request 95-00620 acknowledged that Cable Spreading Room B lacked automatic fire sprinklers. The second example was the use of Thermo-Lag as a three-hour fire barrier on the ends of the Cable Spreading Room B tunnel. The Thermo-Lag barrier itself had a rating of only 1.8 hours, and it along with an assumed 1-inch gap on one side of the barrier were credited with meeting the three-hour requirement. The NRC inspectors looked for either physical or administrative protection of the 1-inch air gap but found none. The NRC inspectors did not find the 1-inch air gap mentioned in any FSAR descriptions of the barrier for the cable spreading room fire areas and did not see the 1-inch air gap included on any design drawings. The NRC inspectors concluded that the unverified assumption had not been properly validated as required by plant procedures.[31]
01/31/2002	During the pre-enforcement conference for NRC's apparent violations involving Thermo-Lag fire barriers at Harris, CP&L stated that the core damage frequency (CDF) related to fire events could be expressed as: CDR = IF x PP x MS x BD x SSD, where IF = ignition frequency (i.e., chance of a fire starting) PP = propagation probability (i.e., chance that fire damage propagates to impair both safe shutdown trains) MS = manual suppression (i.e., chance that workers successfully mitigate the fire consequences) BD = barrier degradation (i.e., chance that fire barriers fail to confine fire) SSD = safe shutdown equipment (i.e., chance that safe shutdown equipment fails to safely shutdown the reactor) [32]
01/31/2002	CP&L promised the NRC: *Harris is committed to restoring compliance in a timely manner.* [33]
03/18/2002	The NRC revised its risk assessment for the Thermo-Lag apparent violation based on information provided by CP&L during the January 31st pre-decisional enforcement conference. The preliminary WHITE finding remained a WHITE finding after the mathematical revision.[34]
04/16/2002	The NRC issued a Final WHITE finding for an apparent violation involving the Thermo-Lag fire barrier between Switchgear Room B and Cable Spreading Room A not meeting

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	its three-hour requirement.[35]
05/16/2002	NRC informed the Nuclear Energy Institute (NEI) in writing of its position that operator manual actions could be credited for fires involving 10 CFR 50, Appendix R III.G.2 fire areas ONLY when pre-approved by the NRC via exemptions or deviations.[36]
08/12/2002	The NRC reported results from its follow-up inspection into the WHITE finding for fire protection and a subsequent WHITE finding for debris impairing the post-accident performance of the emergency core cooling systems. With regard to the fire protection issue, the NRC identified: *The potential problem with the Thermo-Lag fire barrier material was identified to industry by the NRC in 1992. Licensee [CP&L] actions to address Generic Letter (GL) 92-08 resulted in the acceptance of an inadequate Thermo-Lag fire barrier in 1997 (ESR 95-00620, Thermo-lag Fire Protection Issues Resolution, Revision 1). There were several opportunities to find this problem. The final response to the GL provided the Harris final plan and included the safety evaluation for the modification. The GL response was routed through licensee management and was signed out by the site vice president. The 1998 triennial fire protection Nuclear Assessment Section (NAS) audit inspected a sample of Thermo-lag and included the required independent evaluation performed by a contractor. Self-assessments of the fire protection program after 1997 also had the opportunity to find the problem. However, they were dominated by the individuals responsible for the Thermo-lag evaluation.*[37]
09/09/2002	The NRC issued its report for the supplemental inspection performed at Harris to assess CP&L's corrective actions for the violation involving Thermo-Lag fire barrier in the Cable Spreading Rooms which had resulted in a WHITE finding. The NRC reported: *....the inspector identified that the licensee intended to use local manual operator actions in lieu of one of the methods identified in NRC Position C.5.b.(2) of Branch Technical Position (BTP) CMEB 9.5-1.*[38]
10/04/2002	The NRC informed CP&L that actions taken at Harris to physically separate the auxiliary control panel room from the B Train switchgear room had lowered the risk of a fire challenging the Thermo-Lag barrier by a factor of 10, which lowered the overall significance of the condition from its original WHITE finding level to the GREEN finding level. Consequently, the NRC was considering the WHITE finding closed.[39]
01/23/2003	Workers at Harris, responding to findings during last month's triennial fire protection baseline inspection determined that simultaneous multiple spurious opening of certain valves caused by hot shorts during a fire could result in transferring the Refueling Water Storage Tank (RWST) inventory to the containment recirculation sump. If that transfer occurred, the water needed to inventory makeup to the reactor coolant system would not be available from a source credited in the safe shutdown analysis.[40]
01/31/2003	The NRC reported that the triennial fire protection baseline inspection at Harris identified nine (9) violations: 1. *Physical and procedural protection for equipment that was relied on for safe shutdown (SSD) during a fire in safe shutdown analysis (SSA) areas 1-A-BAL-B1, 1-A-BAL-B2, and 1-A-EPA of the reactor auxiliary building were inadequate. Motor-operated valve 1CS-165, volume control tank outlet to charging/safety*

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	injection pumps was not protected physically or procedurally from maloperation due to a fire. Consequently, a fire in one of the three SSA areas could result in a reactor coolant pump seal loss of coolant accident (LOCA) with no high pressure safety injection available. 2. *Physical and procedural protection for equipment that was relied on for SSD during a fire in SSA area 1-A-BAL-B-B5 of the reactor auxiliary building were inadequate. Motor-operated valves 1CS-169, charging/safety injection pump (CSIP) suction cross-connect; 1CS-214, CSIP mini-flow isolation; 1CS-218, CSIP discharge cross-connect; and 1CS-219, CSIP discharge cross-connect; were not protected physically or procedurally from maloperation due to a fire. Consequently, a fire in SSA area 1-A-BAL-B-B5 could result in a loss of all charging and high pressure safety injection.* 3. *Physical and procedural protection for equipment that was relied on for SSD during a fire in SSA area 1-A-BAL-B-B4 of the reactor auxiliary building were inadequate. Motor operated valves 1CS-166, volume control tank outlet to CSIPs; and 1CS-168, CSIP suction cross-connect; were not protected physically or procedurally from maloperation due to a fire. Consequently, a fire in SSA area 1-A-BAL-B-B4 could result in a loss of all charging and high pressure safety injection.* 4. *Physical and procedural protection for equipment that was relied on for SSD during a fire in SSA area 1-A-BAL-C of the reactor auxiliary building were inadequate. Motor operated valves 1CC-208, component cooling water (CC) supply to reactor coolant pump (RCP) seals; and 1CC-251, CC return from RCP seals; were not protected physically or procedurally from maloperation due to a fire. Consequently, a fire in SSA area 1-A-BAL-C could potentially result in an RCP seal LOCA.* 5. *Many local manual operator actions were used in place of the required physical protection of cables for equipment relied on for SSD during a fire, without obtaining NRC approval for these deviations from the approved fire protection program. This condition applied to all areas that were inspected, including the new auxiliary control panel fire area that had been recently created as corrective action for previous Violation 50-400/02-08-01. This reliance on large numbers of local manual actions, in place of the required physical protection of cables, could potentially result in an increased risk of loss of equipment that was relied upon for SSD from a fire.* 6. *Procedure steps for safe shutdown (SSD) from a fire and related corrective action for previous Violation 50-400/02-08-01 were inadequate. For a fire in the new auxiliary control panel fire area, certain cables were not physically protected from the fire and certain SSD procedure steps, that were used in place of physical protection of cables, involved excessive challenges to operators. Consequently, a fire in the ACP fire area could result in a loss of all auxiliary feedwater.*

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	7. *A procedure for SSD from a fire and related corrective action for previous Violation 50-400/02-08-01 were inadequate. For a fire in certain safe shutdown analysis areas of the reactor auxiliary building, including the new auxiliary control pane fire area, there were too many SSD procedure contingency actions to respond to potential spurious actuations for the one designated SSD non-licensed operator to perform. Consequently, equipment that was relied on for SSD may not be available.* 8. *A procedure for SSD from a fire was inadequate. For a fire in safe shutdown analysis areas near the boric acid tank (BAT) in the reactor auxiliary building, the SSD procedure directed operators to take CSIP suction from the BAT even if BAT level indication were lost. However, the charging volume needed for reactor coolant system cooldown would have emptied the BAT and damaged the CSIP.* 9. *Required battery-backed emergency lights were not provided in locations where operators were required to perform actions for SSD from a fire. This condition affected SSD during fires in all of the areas inspected in the reactor auxiliary building, including the new auxiliary control panel fire area that was created as corrective action for previous Violation 50-400/02-08-01. The lack of required lighting could result in an increased risk of operators failing to perform the SSD actions in a timely and accurate manner.*[41]
02/13/2003	CP&L called NRC disputing the findings from the January 31st inspection report. Among other objections, CP&L told NRC that "*They don't think a loop [loss of offsite power] would occur for a fire in the room.*"
02/18/2003	CP&L submitted a licensee event report to the NRC for violations involving unprotected spurious action of equipment relied upon for safe shutdown as identified by the NRC during its triennial fire protection inspection in December 2002. CP&L reported: *The cause of this condition if inadequate original Safe Shutdown Analysis. Specifically, certain conductor-to-conductor interactions (i.e., hot shorts) were not adequately evaluated in the initial Safe Shutdown Analysis.*[42]
03/10/2003	The NRC conducted a public meeting with Progress Energy on fire protection issues at Harris. Progress Energy informed the NRC: • Cable separation issues had been resolved using manual actions as the primary choice. • Failure to properly distinguish between acceptance criteria for manual actions used for remote shutdown function and for Appendix R III.G.2 areas. • Failure to validate manual actions used for Appendix R III.G.2 areas. • Corrective actions include assigning one additional auxiliary operator to each operating shift. • Corrective actions include de-energizing, where possible, motor-operated valves to eliminate hot short potential. • Safe Shutdown Analysis validation effort expected to be completed in mid 2004. • Commitment to "*Reduce operator manual actions to the greatest extent possible.*"[43]

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05/05/2003	After the NRC identified non-conforming conditions involving fire protection requirements for the cable spreading rooms and other plant areas, Progress Energy implemented continuous fire watches as a compensatory measure pending resolution of the non-conforming conditions. NRC inspectors subsequently inspected efforts taken and underway to resolve the fire protection problems, including the use of fire watches as compensatory measures. The NRC inspectors identified a non-conformance with the process used by Progress Energy to administer compensatory measures while the other NRC-identified non-conformances were resolved. Specifically, Progress Energy (then operating under the name Carolina Power & Light) revised two procedures controlling fire watch activities. The procedure changes allowed the fire protection program manager to approve the use of a single fire watch to survey multiple fire areas. Contrary to the requirements of 10 CFR 50.59, CP&L had not performed an evaluation of these procedure changes to determine if prior NRC approval was required. After the NRC identified this non-conformance, Progress Energy reverted to the practice of using a fire watch to monitor a single fire area.[44]
07/23/2003	During the validation of the Harris Safe Shutdown Analysis by an external party, it was determined that simultaneous multiple spurious opening of certain valves caused by hot shorts during a fire could result in transferring the Refueling Water Storage Tank (RWST) inventory to the containment recirculation sump. If that transfer occurred, the water needed to inventory makeup to the reactor coolant system would not be available from a source credited in the safe shutdown analysis.[45]
07/28/2003	The NRC documented its review of Progress Energy corrective actions in an inspection report. The NRC's inspection report stated: *AR 85136, During the last completion of the fire door surveillance procedure, relatively many fire doors were identified with deficiencies.*[46]
07/31/2003	The NRC conducted a public meeting with Progress Energy on fire protection issues at Harris. Progress Energy informed the NRC of its plans to complete modifications of cable protection for the auxiliary control panel room by December 15, 2003, and of cable protection for the charging system (RWST transfer problem) by December 31, 2003.[47]
08/01/2003	The NRC staff reported the final risk value for the accident sequence precursor program for the Thermo-Lag fire barrier problems at Harris was a ΔCDF [delta core damage frequency] of 5.6×10^{-6}.[48]
11/18/2003	The NRC issued two GREEN findings for apparent violations of fire protection requirements identified during the triennial fire protection baseline inspection and documented in the January 31st inspection report.[49]
01/07/2004	The NRC conducted a public meeting with Progress Energy on fire protection at Harris, HB Robinson, and Crystal River Unit 3. Progress Energy informed the NRC that it "Initiated Safe Shutdown Analysis" for Harris in June 2003. With regard to operator manual actions, Progress Energy informed the NRC: *Progress Energy will use NRC interim feasibility criteria as provided in recent Federal Register Notice to assess manual actions.*

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	Remaining manual operator actions for III.G.2 not specifically approved by the staff will be submitted for approval per latest regulation. [50]
02/13/2004	Workers determined that a fire in any one of four additional fire areas could result in spurious operation of certain valves that would result in loss of the charging/safety injection pump and transfer of water from the Refueling Water Storage Tank to the containment recirculation sump. If that transfer occurred, the water needed to inventory makeup to the reactor coolant system would not be available from a source credited in the safe shutdown analysis.[51]
04/20/2004	The NRC conducted a public meeting with Progress Energy on fire protection issues at Harris. Progress Energy informed the NRC of its plans to complete modifications of cable protection for the auxiliary control panel room by May 31, 2004, and of cable protection for the charging system (RWST transfer problem) by the end of refueling outage 12. Progress Energy informed the NRC about its plans to complete the Harris Safe Shutdown Analysis by June 2005.[52]
08/13/2004 09/14/2004 09/15/2004	Workers determined that multiple spurious opening of certain valves could result in loss of the charging/safety injection pump. This scenario could result in a reactor coolant pump seal loss of coolant accident (RCP seal LOCA) without the credited charging/safety injection pumps providing credited makeup water flow.[53]
09/27/2004	It was identified that cables for redundant components credited in the Safe Shutdown Analysis lacked the required degree of separation in one fire area, creating the potential for spurious opening of multiple valves in the reactor coolant system that could transfer some coolant inventory to the containment. Progress Energy reported the "*most probable cause of this historical condition is that the drawing change requiring these cables to be protected by fire barrier material was apparently never issued during plant construction.*" [54]
10/04/2004 10/20/2004 10/26/2004 10/29/2004	During the Safe Shutdown Analysis validation effort, it was determined that a fire could cause spurious action of certain valves or components that could result in inadvertent pressurizer spray or could impact indication used to monitor Reactor Coolant System pressure and level.[55]
11/05/2004	Progress Energy implemented Engineering Change 51444 that replaced active solenoid valves in the Essential Services Chilled Water (ESCW) System with passive check valves. As long as the Service Air System was in operation, the ESCW expansion tank would be pressurized, ensuring the check valves would close to prevent water inventory loss. If the Service Air System failed, EC 51444 added actions to plant procedures for the operators to monitor the pressure in the ESCW expansion tank and take certain steps if the Service Air System was not immediately restored. But the manual actions added under EC 51444 did not conform to the guidance provided by the NRC in Information Notice 97-78, "Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times." This non-conformance was remedied on March 5, 2005, by temporary modification EC 60425.[56]
01/18/2005	During the Safe Shutdown Analysis validation effort, it was determined that a fire in any one of eight fire areas could cause spurious action of valves or other components with adverse implications. For example, a fire in fire area 1-A-ACP (286' elevation) could prevent valve 1SW-39 from closing, or could cause it to open if already closed, leading to failure to isolate the nuclear service water system from the emergency service water system.[57]

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05/12/2005	NIRS, NC WARN, and others petitioned the NRC pursuant to 10 CFR 2.206 for emergency enforcement action at Harris and 13 other nuclear power reactors. The petition involved test results showing that Hemyc/MT fire barrier materials did not support 1-hour and 3-hour fire resistant ratings.[58]
06/10/2005	Progress Energy informed the NRC of its intention to adopt National Fire Protection Association (NFPA) Standard 805 in accordance with 10 CFR 50.48(c) at Harris. Progress Energy stated: *During the review of the Safe Shutdown Analysis (SSA) for the PEC and PEF plants, issues have been identified that clearly have alternative means to ensure safety, but no clear path exists to approve deviations. NFPA 805 provides an alternative method to comply with NRC Fire Protection requirements.* Progress Energy informed the NRC that it planned to submit the license amendment request for transition to NFPA 805 in May 2008.[59]
08/11/2005	The NRC conducted a public meeting with Progress Energy on fire protection issues. Progress Energy outlined its plans for transitioning to NFPA 805 at Harris. Progress Energy's schedule had the transition completed in mid-2009.[60]
08/30/2005	During the Safe Shutdown Analysis validation effort, it was determined that a fire in a fire area in the reactor auxiliary building could result in loss of cooling water flow to the air handler (AH-13-1B) for switchgear room "B". In that event, the loss of cooling to the switchgear room could affect the performance of equipment credited in the Safe Shutdown Analysis.[61]
10/14/2005	The NRC issued its report on the triennial fire protection baseline inspection conducted at Harris in August 2005. This inspection produced no findings.[62]
12/2005	The NRC reported observations from visits to the two pilot plants in the NFPA 805 transition process. The NRC reported that "*The industry representatives indicated that any requirement for a shutdown modes PRA would be a "show stopper." There is no current or planned guidance/methods for performing a shutdown PRA. Resources are not likely to be committed by utility management, and the development of methods and performance of the PRA would not support the transition schedules. Implementing guidance for meeting 10 CFR 50.48(cc) should be clarified to explicitly indicate the expectations for assessing fire risk in shutdown modes.*"[63]
01/09/2006	The NRC denied the petition by NIRS, NC WARN, and others for emergency enforcement action related to the Hemyc/MT fire barrier test results.[64]
03/27/2006	The NRC visited Harris to observe activities related to the transition to NFPA 805. Progress Energy provided the NRC with updated status on scheduled items: • The license amendment request for NFPA 805 at Harris is scheduled to be submitted to NRC in June 2008. • The validation of the Safe Shutdown Analysis at Harris is scheduled to be completed by May 31, 2006. • 5 modifications necessary for NFPA 805 are scheduled for implementation during cycle 12. • 7 modifications necessary for NFPA 805 are scheduled for implementation during cycle 13. • 17 modifications necessary for NFPA 805 are scheduled for implementation

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	during cycle 14. • Approximately 15 modifications necessary for NFPA 805 are scheduled for implementation during cycles 15 and 16. • Harris has about 6,500 feet of Hemyc fire barrier and about 1,250 feet of MT fire barrier. Hemyc is considered inoperable with hourly fire watches in places as compensatory measures. MT is not considered inoperable, but fire watches are applied as conservative measure.[65]
04/10/2006	NRC issued Generic Letter 2006-03, "Potentially Nonconforming Hemyc and MT Fire Barrier Configurations," to Progress Energy and other plant owners requiring responses within 60 days.[66]
06/09/2006	Progress Energy responded to the NRC's Generic Letter 2006-03, "Potentially Nonconforming Hemyc and MT Fire Barrier Configurations." Progress Energy informed the NRC: *HNP [Harris Nuclear Plant] has determined that the Hemyc ERFBS [electrical raceway fire barrier systems] installed at HNP is not fully capable of keeping the protected electrical circuits free of fire damage for one (1) hour when subjected to an ASTM E-119 fire in accordance with GL 86-10, Supplement 1 guidance.* *HNP's position on the MT ERFBS installations is that the previous NRC fire testing is not directly applicable due to variations in the material tested from the material used at HNP. HNP is planning to perform proprietary fire testing in accordance with GL 86-10, Supplement 1 guidance to determine the fire ratings for the installed MT ERFBS.* Attachment 2, page A2-1 of 23, to the Progress Energy response listed 23 plant systems having a role to play in the Safe Shutdown Analysis. For two systems (RHR pump area HVAC and Residual Heat Removal), the role is defined as exclusively cold shutdown related.[67]

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[56] Letter dated September 9, 2005, from Eric McCartney, Plant General Manager – Harris Nuclear Plant, Progress Energy, to Nuclear Regulatory Commission, "Shearon Harris Nuclear Power Plant Unit 1 Docket No. 50-400/License No. NPF-63 Licensee Event Report 2005-004-00."
[57] Letter dated March 21, 2005, from B. C. Waldrep, Plant General Manager – Harris Nuclear Plant, Progress Energy, to Nuclear Regulatory Commission, "Shearon Harris Nuclear Power Plant Unit 1 Docket No. 50-400/License No. NPF-63 Licensee Event Report 2002-004-07."
[58] Letter dated May 12, 2005, from Paul Gunter, Nuclear Information and Resource Service, Jim Warren, North Carolina Waste Awareness and Reduction Network, and others to Luis A. Reyes, Executive Director for Operations, Nuclear Regulatory Commission, "Request for Emergency Enforcement Action under 10 CFR 2.206 to address inoperable Hemyc/MT fire protection systems at Shearon Harris, H.B. Robinson Unit 2, McGuire Units 1 and 2, Catawba Units 1 and 2, Ginna, Fitzpatrick, Indian Point Units 2 and 3, Vermont Yankee, Waterford, Arkansas Nuclear One Unit 1 and 2."
[59] Letter dated June 10, 2005, from C. S. Hinnant, Senior Vice President and Chief Nuclear Officer, Progress Energy, to Nuclear Regulatory Commission, "Letter of Intent to Adopt NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition.""
[60] Slides dated August 11, 2005, by Progress Energy (formerly Carolina Power & Light Company) for meeting with Nuclear Regulatory Commission, "Progress Energy Input to NFPA 805 Pilot Planning Meeting."
[61] Letter dated October 28, 2005, from Eric McCartney, Plant General Manager – Harris Nuclear Plant, Progress Energy, to Nuclear Regulatory Commission, "Shearon Harris Nuclear Power Plant Unit 1 Docket No. 50-400/License No. NPF-63 Licensee Event Report 2002-004-09."
[62] Letter dated October 14, 2005, from D. Charles Payne, Chief – Engineering Branch 2, Nuclear Regulatory Commission, to James Scarola, Vice President – Harris Plant, Carolina Power & Light Company, "Shearon Harris Nuclear Power Plant – NRC Triennial Fire Protection Inspection Report 05000400/2005007."
[63] Trip report dated December 2005 by Nuclear Regulatory Commission, "NFPA 805 Transition Pilot Program Observation Visit Trip Report."
[64] Letter dated January 9, 2006, from J. E. Dyer, Director – Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission, to Paul Gunter, Nuclear Information and Resource Service.
[65] Slides dated March 27, 2006, by Progress Energy (formerly Carolina Power & Light Company) for meeting with Nuclear Regulatory Commission, "NFPA 805 Pilot Observations Meeting Progress Energy Transition Status."
[66] Letter dated June 9, 2006, from Cornelius J. Gannon, Jr., Vice President – Harris Nuclear Plant, Progress Energy, to Nuclear Regulatory Commission, "Shearon Harris Nuclear Power Plant, Unit No. 1 Docket No. 50-400/License No. NPF-63."
[67] Letter dated June 9, 2006, from Cornelius J. Gannon, Jr., Vice President – Harris Nuclear Plant, Progress Energy, to Nuclear Regulatory Commission, "Shearon Harris Nuclear Power Plant, Unit No. 1 Docket No. 50-400/License No. NPF-63."

N-plants keep watch on fire-retardant material

The Associated Press

CHARLOTTE — Carolina Power & Light Co. has begun round-the-clock fire watches at its two nuclear plants while the Nuclear Regulatory Commission investigates the reliability of a fire-retardant material intended to protect key safety equipment.

The nuclear power industry became concerned this summer after the material, Thermo-Lag, failed government and industry tests and burned. An independent federal investigation last week concluded that regulators ignored reports of problems for nearly a decade.

Two weeks ago, an anti-nuclear group petitioned the NRC to close seven plants nationwide, including CP&L's Shearon Harris plant just southwest of Raleigh.

In June, the NRC ordered all plants that use Thermo-Lag in sensitive areas to post regular fire watches while the agency examines the material.

Of 111 U.S. commercial nuclear reactors, regulators say about 80 use varying amounts of Thermo-Lag.

In addition to the one-unit Harris plant, CP&L's Brunswick plant and Duke Power Co.'s McGuire plant near Charlotte use the material, The Charlotte Observer reported Monday.

Harris and Brunswick, which has two units, have mounted round-the-clock, seven-day-a-week fire watches indefinitely.

Those plants use Thermo-Lag on safety equipment, such as cable conduits, which the material failed to protect during tests. A CP&L spokesman said the areas are protected by sprinkler and fire detection systems.

"Because we already have fire protection systems ... we feel there is no safety threat currently with this issue," spokesman Elizabeth Bean said. "Clearly we support the research that's being done."

The McGuire station uses Thermo-Lag only around a few motors and a small electrical cable tray, uses that fall outside the tests.

"We were able to prove there was not a need for a fire watch," said Duke spokesman Guynn Savage. An NRC spokesman confirmed that no watches are required at McGuire.

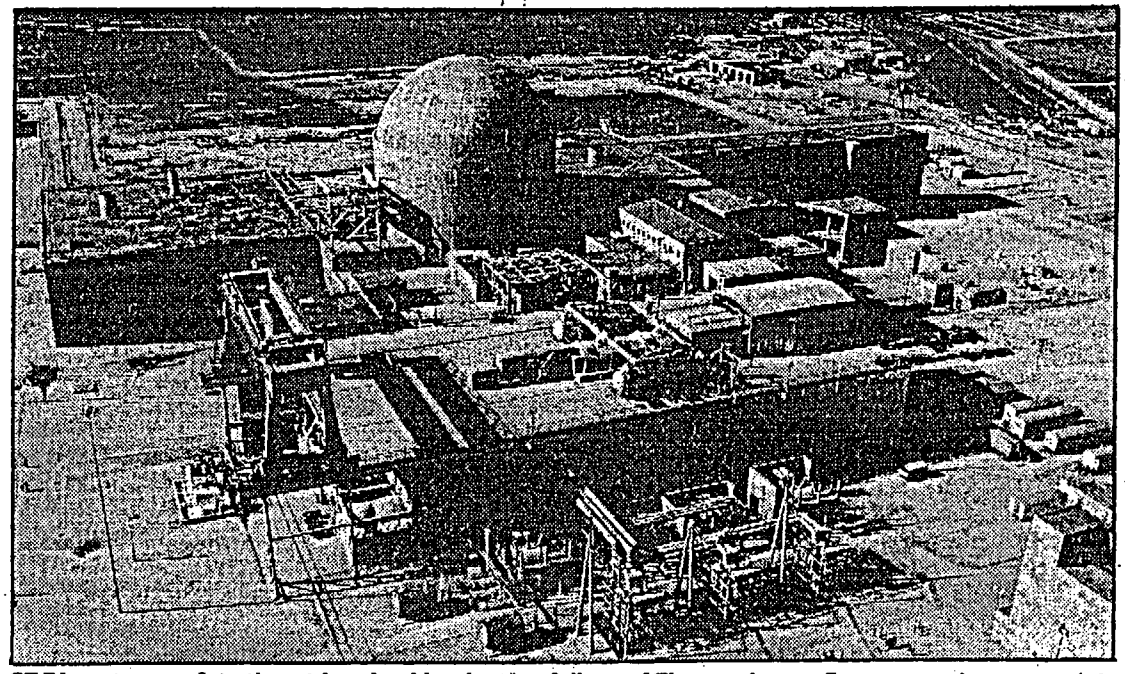
Design engineer James Oldham said Thermo-Lag worked when Duke engineers did a test in which they simulated the burning of Thermo-Lag used in an area not protected by a sprinkler system.

The material is key to nuclear safety. The federal government estimates that a typical nuclear plant will have three to four significant fires in its lifetime.

Thermo-Lag comes in two kinds. One protects electrical systems from fire damage for three hours. The other, for areas with sprinkler systems, protects for one hour.

But in June and July, the substance failed a series of tests, either burning through too quickly or reaching unacceptably high temperatures. The NRC said Thermo-Lag has never failed in an actual nuclear plant fire.

"In recent years, it's one of the most serious problems to come along," said Steven Sholly, senior consultant at MHB Technical Associates, a San Jose, Calif., firm that advises regulators. "It's something that will have to be dealt with in the short-term, not the long-term."



CP&L says no safety threat is raised by the test failure of Thermo-Lag, a flame-retardant material used on equipment at the Shearon Harris Nuclear Plant near New Hill

Thermal Science Inc. of St. Louis makes Thermo-Lag, a rigid material that looks like gypsum wallboard. The company says it is effective if properly installed.

The industry began using Thermo-Lag after the 1975 fire at the Browns Ferry plant in Alabama, the worst U.S. nuclear plant fire ever.

Earlier this month, a Washington-based anti-nuclear group, the Nuclear Information & Resource Service, demanded that federal regulators suspend the operating license of Harris and six other plants because of Thermo-Lag safety problems.

Michael Mariotte, the group's executive director, called Thermo-Lag a "clear and present danger to our citizens." The NRC rejected the request last week.

The regulators said they haven't determined whether Thermo-Lag is an effective fire barrier. But because typical fires aren't as severe as those in tests, the NRC said questions about the fire barriers pose no "immediate threat to public health and safety."

Last week, in an unusual report, the NRC inspector general faulted regulators for failing to respond to reports of problems with Thermo-Lag between 1982 and 1991.

Nuclear consultant Sholly estimates utilities would have to spend "millions to tens of millions" of dollars for replacement, depending on the amounts at their plants.

Bean of CP&L said the issue may be solved in one of two ways. Companies probably will have to alter the way Thermo-Lag is used or replace it entirely, she said.

Delaying With Fire: Attachment 3

At Least Four Serious Fires at Shearon Harris

02/04/88 Harris declared an emergency (Unusual Event) when the reactor auxiliary building supply fan motor S-3B was reported to be smoking. The electrical breaker for the fan was opened to de-energize the motor. *(NRC Daily Event Report No. 11414, February 4, 1988.)*

10/10/89 MAJOR FIRE AT SHEARON HARRIS: Harris declared an emergency (Alert level) at Harris due to a major fire in the main generator and "B' main transformer caused by electrical shorts. The fire ran 100 feet down an electrical cable, causing a hydrogen leak and explosion, and damaged three floors of the turbine building. Two local fire departments aided the small on-site fire brigade, and about 30 firefighters fought the blaze, which took 90 minutes to bring under control, and over three hours to extinguish. Staffers said "it is unknown at this time if the fire could have caused impedance of safely-related equipment or operator action." The fire caused the plant to be out of commission for at least two weeks; repairs continued during a previously scheduled refueling outage, which began October 21. *(Brian Jordan, "NRC Still Assessing Safety Significance of Major Fire at Shearon-Harris," Inside N.R.C., October 23, 1989. See also Attachment D)*

04/28/97 FIRE IN BATTERY ROOM: Harris workers called the Holly Springs fire department for assistance due to a fire in the A-SA battery room. The plant was in a refueling outage at the time. *(NRC Daily Event Report No. 32233, April 28, 1997)*

12/11/02 PUMP FIRE: Officials said a fire started about 3:45 a.m. near one of the pumps used to draw water to fight fires at the nuclear plant. The fire was quickly put out by someone at the facility. The cause was not reported at that time, but it was possibly a short-circuit in an electrical cable.

... and at least one electrical fire at Progress Energy's Brunswick plant:

"FLAMES DESTROY 1 OF 2 TRANSFORMERS; Fire cuts output at Brunswick plant
The Brunswick Nuclear Plant in Southport was operating at about half capacity Friday after an early-morning fire destroyed one of its two main transformers."
Wilmington Morning Star, September 23, 2000

Inside N.R.C. Copyright 1989 McGraw-Hill, Inc. October 23, 1989

NRC STILL ASSESSING SAFETY SIGNIFICANCE OF MAJOR FIRE AT SHEARON-HARRIS

Brian Jordan, Washington

NRC is continuing to review a major fire that burned for three hours at Carolina Power & Light Co.'s (CP&L) Shearon-Harris October 9, but staffers said so far they have not found any nuclear-related safety concerns.

Staffers in NRC's Region II office and in the division of operational events assessment in the Office of Nuclear Reactor Regulation said they have not reached any final determination on the safety significance of the fire, but have not yet identified any particular threats the fire posed in terms of nuclear safety. "Fires at nuclear plants always cause concern," said one headquarters staffer. "So far, no particular safety concerns have been identified, but no final determination has been reached on the safety significance."

NRC headquarters has not yet determined whether the fire constitutes a significant event in terms of operating events that count in performance indicators used by NRC to rate plant safety performance.

The Region II office dispatched a fire protection specialist and an electrical systems expert to the plant October 10 to investigate the cause of the fire and the response to it. "We're interested in determining what happened," said one Region II staffer, "but preliminary reports indicate they handled it very well." Staffers noted the unit was tripped without any apparent complications and that the fire was confined to the switchyard and the turbine deck and did not lead to a loss of off-site power.

NRC staffers, in discussing the fire at the weekly significant operating events meeting, said that the turbine was taken off the turning gear about 30 minutes after the fire started because of concerns about an oil leak. The oil did not ignite, however. Staffers said on briefing slides distributed at the meeting that "it is unknown at this time if the fire could have caused impedance of safely-related equipment or operator action."

CP&L spokesman Roger Hannah said October 19 that the fire started when there was a short in the duct that surrounds electrical cables that carry power produced in the main generator from the generator to one of three main transformers. The cable in effect is surrounded by two ducts, and an insulator failure allowed the two ducts to come in contact, causing the short. CP&L said such an insulator failure is apparently quite rare. Harris is a 955-MW Westinghouse PWR that began commercial operation in May 1987.

There was also a second short in the neutral grounding transformer underneath the main generator, Hannah said, and the fault currents traveled through the plant grounding system and the structural steel in the plant. Part of the fault current arched and caused leaks in the hydrogen piping that supplies hydrogen to cool the turbine-generator, igniting the hydrogen.

The fire began about 11:15 p.m. October 9 and took almost 90 minutes to bring under control, according to CP&L. Two local fire departments responded to aid the small on-site fire brigade, and about 30 firefighters fought the blaze, which was completely out by 2:43 a.m. The unit was tripped from 100% soon after the fire started. The utility declared an alert soon after the fire broke out and terminated it at 2:43, after confirming the fire was out and the hydrogen leaks were contained.

CP&L emphasized in prepared statements that the fire was confined to the non-nuclear side of the plant and did not damage any primary system equipment. CP&L also said the fire had not resulted in any danger to the public and/or radioactive release. There were no injuries, in part, because no one was in the switchyard or on the turbine deck when the fire broke out.

Hannah said October 19 that CP&L did not yet have a preliminary estimate of the damage. But he said the generator, the turbine, and the main power transformer were largely undamaged.

The unit was in its 208th consecutive day of operation, its longest continuous run since it entered commercial service in May 1987. Harris will begin an eight- to 10-week refueling outage that was scheduled to begin October 21. It is unclear what, if any, effect repairs from the fire will have on the outage schedule, Hannah said, but CP&L still hopes to do those repairs simultaneously with refueling activities and avoid extending the outage.

With Harris off line, three of CP&L's four reactors are shut. Robinson-2 has been shut for a pipe replacement to correct potential design deficiencies, and Brunswick-2 is in a refueling outage that began September 9. However, CP&L still has sufficient generation, and beginning the Harris refueling outage earlier than scheduled will not force the utility to purchase any replacement power, Hannah said. Harris supplies about 9% of CP&L's generating capacity.
URL: http://www.platts.com

Progress Energy

OCT 2 8 2005

U.S. Nuclear Regulatory Commission
ATTN: NRC Document Control Desk
Washington, DC 20555

Serial: HNP-05-113
10 CFR 50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2002-004-09

Ladies and Gentlemen:

The enclosed Licensee Event Report (LER) 2002-004-09 is submitted in accordance with 10 CFR 50.73. This report is a revision to a previously submitted LER that describes an unanalyzed condition due to inadequate separation of associated circuits. Previous revisions to this report, LER 2002-004-00, submitted on February 18, 2003; LER 2002-004-01, submitted on March 26, 2003; LER 2002-004-02, submitted on September 19, 2003; LER 2002-004-03, submitted on April 12, 2004; LER 2002-004-04, submitted on October 12, 2004; LER 2002-004-05, submitted on November 15, 2004; LER 2002-004-06, submitted on December 20, 2004; LER 2002-004-07, submitted on March 21, 2005; and LER 2002-004-08, submitted on September 20, 2005, described similar unanalyzed conditions. The revised information includes an additional condition in a previously identified fire area.

Corrective actions underway in response to the previously identified conditions include a validation of the safe shutdown analysis. This validation is a detailed analysis of the routing of cables affecting equipment credited in response to a fire. The commitments and associated completion dates identified in Section VI remain the same. Similar to the previous revision, the new condition identified by this revision of the LER is targeted for completion by Refueling Outage (RFO) 16 (currently scheduled for November 05, 2010). Compensatory actions, including fire watches, ensure safety pending permanent resolution of the identified conditions.

Please refer any questions regarding this submittal to Mr. Dave Corlett, Supervisor – Licensing/Regulatory Programs, at (919) 362-3137.

Sincerely,

FOR

Eric McCartney
Plant General Manager
Harris Nuclear Plant

EAM/jpy

Enclosure

IE22

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P. O. Box 165
New Hill, NC 27562

c: Mr. R. A. Musser (HNP Senior NRC Resident)
Mr. C. P. Patel (NRC-NRR Project Manager)
Dr. W. D. Travers (NRC Regional Administrator, Region II)

Enclosure to HNP-05-113

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Harris Nuclear Plant – Unit 1	05000400	1 OF 23

4. TITLE
Unanalyzed Condition Due to Inadequate Separation of Associated Circuits

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	05000
08	30	2005	2002	- 004 -	09	10	28	2005	FACILITY NAME: N/A	DOCKET NUMBER: 05000

9. OPERATING MODE
1

10. POWER LEVEL
100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☒ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
John Yadusky – Licensing Engineer	(919) 362-2020

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On December 20, 2002, inspection of the Harris Nuclear Plant (HNP) Safe Shutdown Analysis (SSA) identified that postulated fires could cause spurious actuation of certain valves. Valve actuation in the flowpath for the protected Charging/Safety Injection Pump (CSIP) could result in loss of the pump. Similarly, simultaneous spurious closure of multiple valves in the flowpaths to the Reactor Coolant Pump (RCP) seals could result in the loss of RCP seal cooling. HNP implemented interim compensatory actions upon discovery.

During review and validation, HNP identified other postulated fires could cause spurious actuation of certain valves or components that could also result in the conditions described above and other similar conditions. These additional conditions were discovered on January 29 and July 23, 2003; February 13, August 13, September 14 & 15, October 4, 20, 26 & 29, 2004; and January 18, July 22, August 4 & 30, 2005.

The cause of these conditions is inadequate original Safe Shutdown Analysis of certain conductor-to-conductor interactions or certain operator manual actions. Design changes or other methods approved by the NRC will be used to restore compliance.

NRC FORM 366AU.S. NUCLEAR REGULATORY COMMISSION
(1-2001)

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2002	- 004 -	09	2 OF 23

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

I. DESCRIPTION OF EVENT

The Harris Nuclear Plant (HNP) discovered that a condition exists with the lack of separation of cables for redundant components credited by the Safe Shutdown Analysis (SSA). This condition was discovered on December 20, 2002 and reported in LER 2002-004-00, dated February 18, 2003. Revision 1 to this LER describes another condition, which was discovered on January 29, 2003. Revision 2 to this LER describes another condition, which was discovered on July 23, 2003. Revision 3 to this LER describes another condition, which was discovered on February 13, 2004. Revision 4 to this LER describes additional conditions, which were discovered on August 13, September 14, and September 15, 2004. Revision 5 to this LER describes additional conditions, which were discovered on September 15 and October 4, 2004. Revision 6 to this LER describes additional conditions, which were discovered on October 20, October 26, and October 29, 2004. Revision 7 to this LER describes additional conditions, which were discovered on January 18, 2005. Revision 8 to this LER describes additional conditions, which were discovered on July 22 and August 4, 2005. Revision 9 to this LER describes an additional condition, which was discovered on August 30, 2005.

On December 20, 2002, with the Unit in Mode 1 at 100% power, inspection of the Harris Nuclear Plant (HNP) Safe Shutdown Analysis (SSA) in Case of Fire identified that for postulated fires in three SSA fire areas, the design and compensatory actions credited by the SSA would not ensure a protected train of equipment would remain available. Specifically, the inspection identified that postulated fires could cause spurious actuation of components potentially resulting in loss of the Charging/Safety Injection Pump (CSIP) [CB-P] or loss of Reactor Coolant Pump (RCP) [AB-P] seal cooling credited by the SSA. The fires were postulated to cause spurious closure of valves in the flowpaths for the protected CSIP, prior to implementation of the preplanned actions designed to preserve these flowpaths, resulting in loss of the protected CSIP if it was in service at the time of the postulated fire. Similarly, the fires were postulated to cause spurious closure of valves in the flowpath of Component Cooling Water (CCW) [CC] to the RCP thermal barrier heat exchangers, resulting in loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP cooling.

On January 29, 2003, with the Unit in Mode 1 at 100% power, HNP identified that simultaneous spurious opening of multiple valves could result in transferring of Refueling Water Storage Tank (RWST) [BE-, BP-, & BQ-TK] inventory to the containment recirculation sump. A roving fire watch has been posted in fire areas of concern.

On July 23, 2003, with the Unit in Mode 1 at 100% power, HNP identified that spurious opening of certain valves could result in transferring of RWST inventory to the containment recirculation sump. A roving fire watch was already posted in fire areas of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. This discovery of an old design issue was made during validation of the HNP safe shutdown analysis. This validation was being performed as a corrective action to the previously reported conditions.

NRC FORM 366AU.S. NUCLEAR REGULATORY COMMISSION
(1-2001)

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2002	- 004 -	09	3 OF 23

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

I. DESCRIPTION OF EVENT (Continued)

On February 13, 2004, with the Unit in Mode 1 at 100% power, HNP identified four additional fire areas where spurious actuation of multiple valves could result in loss of the CSIP in service at the time of the postulated fire and in transferring of RWST inventory to the containment recirculation sump. The fire areas of concern are protected by detection and suppression systems, and they are on the path of a roving fire watch already posted as interim compensatory actions for other safe shutdown related issues. The fire watch remains posted. These additional fire areas were inadvertently missed during the investigation for the previously reported conditions (reference December 20, 2002 and July 23, 2003 discoveries). Similar to the previous discoveries, the discovery on February 13, 2004, is an old design issue that was identified during a review of the HNP safe shutdown program. This review and other validations are being performed as corrective actions to the previously reported conditions.

On August 13, September 14, and September 15, 2004, with the Unit in Mode 1 at 100% power, HNP identified that spurious opening of multiple valves could potentially result in the loss of the CSIP in service at the time of the postulated fire. A roving fire watch was already posted in fire areas of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. These discoveries are old design issues that were identified during a review of the HNP safe shutdown program. This review and other validations are being performed as corrective actions to the previously reported conditions.

On September 15, 2004, with the Unit in Mode 1 at 100% power, HNP identified that spurious actuation of multiple valves could potentially result in the loss of the CSIP in service at the time of the postulated fire. Additionally, HNP identified that spurious valve opening concurrent with spurious start of a Containment Spray (CT) pump [BE-P] could potentially result in the transfer of the RWST inventory to containment. On October 4, 2004, with the Unit in Mode 1 at 100% power, HNP identified that spurious closure of a certain valve could potentially result in the loss of RCP seal cooling credited by the SSA. Additionally, HNP identified that a postulated fire could result in a loss of indication of both Reactor Coolant System (RCS) wide range pressure transmitters [AB-PT] credited to monitor RCS pressure and level. A roving fire watch was already posted in these fire areas of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. These discoveries are old design issues that were identified during a review of the HNP safe shutdown program. This detailed review and other validations are being performed as corrective actions to the previously reported conditions.

On October 20, 26, and 29, 2004, with the Unit in Mode 6 at 0% power, HNP identified discoveries in four additional SSA fire areas and discoveries of components or combinations of components not previously reported in five previously identified SSA fire areas. These discoveries included spurious actuation of multiple components that could potentially result in mal-operation of components similar to previously reported conditions. A roving fire watch was already posted in these fire areas of concern as interim compensatory actions for other safe shutdown related issues, except for fire area 1-C since the containment is closed during normal operations. Additional walkdowns of fire area 1-C in the area of interest were performed to ensure that no in situ ignition sources and no intervening or transient combustibles were in the area. For the other areas, the fire watch remains posted. These discoveries are old design issues that were identified during a review of the HNP safe shutdown program. This detailed review and other validations are being performed as corrective actions to the previously reported conditions.

NRC FORM 366AU.S. NUCLEAR REGULATORY COMMISSION
(1-2001)

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Harris Nuclear Plant – Unit 1	05000400	2002	- 004 -	09	4 OF 23

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

I. DESCRIPTION OF EVENT (Continued)

On January 18, 2005, with the Unit in Mode 1 at 100% power, HNP identified discoveries in two additional SSA fire areas and discoveries of components or combinations of components not previously reported in eight previously identified SSA fire areas. These discoveries included spurious actuation of multiple components that could potentially result in mal-operation of components similar to previously reported conditions. A roving fire watch was already posted in these fire areas of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. These discoveries are old design issues that were identified during a review of the HNP safe shutdown program. This detailed review and other validations are being performed as corrective actions to the previously reported conditions.

On July 22 and August 4, 2005, with the Unit in Mode 1 at 100% power, HNP identified discoveries of components or combinations of components not previously reported in two previously identified SSA fire areas. These discoveries included a potential loss of components resulting from a manual operator action which may not be feasible due to the presence of postulated smoke or resulting from damage under certain conditions by a postulated fire in the area (similar to previously reported conditions). A roving fire watch was already posted in these fire areas of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. These discoveries are old design issues that were identified during a review of the HNP safe shutdown program. This detailed review and other validations are being performed as corrective actions to the previously reported conditions.

On August 30, 2005, with the Unit in Mode 1 at 100% power, HNP identified a discovery of a component not previously reported in a previously identified SSA fire area. This discovery included the potential loss of cooling to a room, which could potentially affect equipment credited in the SSA similar to previously reported conditions. A roving fire watch was already posted in the fire area of concern as interim compensatory actions for other safe shutdown related issues, and the fire watch remains posted. This discovery is an old design issue that was identified during a review of the HNP safe shutdown program. This detailed review and other validations are being performed as corrective actions to the previously reported conditions.

These findings of unanalyzed conditions are being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B). No systems, structures, or components were inoperable at the time of discovery that significantly contributed to the event.

The previous four SSA fire areas identified included:
1. 1-A-BAL-B, located in the Reactor Auxiliary Building (RAB) Elevations 261' and 286'
2. 1-A-BAL-C, located in the RAB Elevation 286'
3. 1-A-EPA, located in the RAB Electrical Penetration Room "A" Elevation 261'
4. 1-A-EPB, located in the RAB Electrical Penetration Room "B" Elevation 261'

The discoveries on February 13, 2004 identified the following four additional SSA fire areas:
1. 1-A-CSRA, located in the RAB Elevation 286'
2. 1-A-CSRB, located in the RAB Elevation 286'
3. 12-A-CR, located in the RAB Elevation 305'
4. 12-A-CRC1, located in the RAB Elevation 305'

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

I. DESCRIPTION OF EVENT (Continued)

The discoveries on August 13, September 14, and September 15, 2004 included new valves in the following five previously identified SSA fire areas:
1. 1-A-BAL-B, located in the RAB Elevations 261' and 286'
2. 1-A-BAL-C, located in the RAB Elevation 286'
3. 1-A-EPA, located in the RAB Electrical Penetration Room "A" Elevation 261'
4. 1-A-CSRA, located in the RAB Elevation 286'
5. 1-A-CSRB, located in the RAB Elevation 286'

The discoveries on September 15 and October 4, 2004 included new components in the following two previously identified SSA fire areas:
1. 1-A-BAL-B, located in the RAB Elevations 261' and 286'.
2. 1-A-CSRB, located in the RAB Elevation 286'

The discoveries on October 20 and October 29, 2004 identified the following four additional SSA fire areas:
1. 1-A-BAL-A, located in the RAB Elevations 190', 216', 236', and 261'
2. 1-A-SWGRA, located in the RAB Elevation 286'
3. 1-A-SWGRB, located in the RAB Elevation 286'
4. 1-C, located in the Containment Elevation 261'

The discoveries on October 26 and October 29, 2004 included new components or combinations of components in the following five previously identified SSA fire areas:
1. 1-A-BAL-B, located in the RAB Elevations 261' and 286'
2. 1-A-BAL-C, located in the RAB Elevation 286'
3. 1-A-EPA, located in the RAB Electrical Penetration Room "A" Elevation 261'
4. 1-A-CSRA, located in the RAB Elevation 286'
5. 1-A-CSRB, located in the RAB Elevation 286'

The discoveries on January 18, 2005 identified the following two additional SSA fire areas:
1. 1-A-ACP, located in the RAB Elevation 286'
2. 12-A-BAL, located in the RAB Elevation 286' and 305'

The discoveries on January 18, 2005 also included new components or combinations of components in the following eight previously identified SSA fire areas:
1. 1-A-BAL-B, located in the RAB Elevations 261' and 286'
2. 1-A-BAL-C, located in the RAB Elevation 286'
3. 1-A-EPA, located in the RAB Elevation 261'
4. 1-A-EPB, located in the RAB Elevation 261'
5. 1-A-CSRA, located in the RAB Elevation 286'
6. 1-A-CSRB, located in the RAB Elevation 286'
7. 12-A-CR, located in the RAB Elevation 305'
8. 12-A-CRC1, located in the RAB Elevation 305'

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

I. DESCRIPTION OF EVENT (Continued)

The discoveries on July 22 and August 4, 2005 included new components or combinations of components in the following two previously identified SSA fire areas:

1. 1-A-BAL-A, located in the RAB Elevation 236'
2. 1-A-BAL-B, located in the RAB Elevation 261'

The discovery on August 30, 2005 included a new component in the following previously identified SSA fire area:

1. 1-A-CSRA, located in the RAB Elevation 286'

The specific conditions for each of the fire areas identified above or for a combination of the fire areas identified above, as applicable based on the routing of cables for the various components are detailed below.

For a postulated fire in SSA fire areas 1-A-BAL-B or 1-A-EPA (261' elevation), certain cabling [CBL3] for the two outlet valves (1CS-165 or 1CS-166) of the Volume Control Tank (VCT), the CCW supply valve to RCP thermal barriers (1CC-207), the outlet isolation valve (1SI-4) of the Boron Injection Tank (BIT), and the safety injection to the Reactor Coolant System (RCS) isolation valves (1SI-52 and 1SI-107) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for charging system Motor Operated Valve (MOV) [20] 1CS-165 and CCW system MOV 1CC-207 are routed through SSA fire areas 1-A-BAL-B and 1-A-EPA with no fire barrier. Similarly, the control power cables for safety injection system MOVs 1SI-4, 1SI-52, and 1SI-107 are routed through SSA fire areas 1-A-BAL-B and 1-A-EPA with no fire barrier. In addition, the control power cable for charging system MOV 1CS-166 is unprotected for about one foot above its Motor Control Center (MCC) [MCC] and inside its MCC in SSA fire area 1-A-BAL-B. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. The charging system valves are required to remain open to provide CSIP suction from the VCT during a postulated fire in these fire areas. As a result, a fire in any of these areas could result in spurious closure of one of the VCT outlet valves, loss of suction flow to the running CSIP, and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling. The CCW system valve is required to remain open to provide CCW flow to RCP thermal barrier heat exchangers. As a result, a postulated fire in this area could result in spurious closure of this valve and loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling. The safety injection system valves are normally closed, so a postulated fire in this area resulting in spurious opening of multiple valves could result in damage to the running CSIP due to run out conditions. Simultaneous spurious actuation of multiple valves in the charging system and the component cooling water system could result in degradation of the RCP seals, possibly leading to an RCP seal loss of coolant accident (LOCA) without credited CSIPs.

For a postulated fire in SSA fire area 1-A-BAL-C (286' elevation), the control power cables for the CCW return valve from RCP thermal barriers (1CC-251) and the CCW supply valve to RCP seals and motor coolers (1CC-208) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for the CCW system MOVs 1CC-251 and 1CC-208 are routed through SSA fire area 1-A-BAL-C and into their MCC in this area with no fire barrier. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. The CCW system valves are required to remain open to provide CCW flow to RCP thermal barrier heat exchangers. As a result, a postulated fire in this area could result in spurious closure of these valves and loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling. However, RCP seals would still be protected by the normal seal injection function of the redundant charging/safety injection trains.

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

I. DESCRIPTION OF EVENT (Continued)

For a postulated fire in SSA fire area 1-A-BAL-B (261' elevation), the control power cables for the CSIP suction cross-connect valves (1CS-168 and 1CS-169), the CSIP mini-flow isolation valve (1CS-214), and the CSIP discharge cross-connect valves (1CS-217, 1CS-218, and 1CS-219) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cable for charging system MOVs 1CS-168 and 1CS-217 are unprotected inside their MCC in SSA fire area 1-A-BAL-B. The control power cables for charging system MOVs 1CS-169, 1CS-214, 1CS-218, and 1CS-219 are unprotected for about one foot above their MCC and inside their MCC in the same fire area. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts.

MOVS 1CS-168 and 1CS-169 valves are required to remain open to provide CSIP suction during a postulated fire in these fire areas. As a result, a fire in this area (1-A-BAL-B, 261' elevation) could result in spurious closure of one of the CSIP suction valves, loss of suction flow to the running CSIP, and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling. MOV 1CS-214 provides mini-flow for the CSIPs. As a result, a fire in this area could result in spurious closure of the mini-flow isolation valve and subsequent loss of mini-flow to the CSIPs. However, this loss of function would be recoverable since the CSIPs would not be damaged. MOVs 1CS-217, 1CS-218, and 1CS-219 are required to remain open to provide charging flow from the running CSIP. As a result, a postulated fire in this area could result in spurious closure of one of the CSIP discharge valves, and subsequent loss of flow to charging or high head safety injection credited by the SSA. However, this loss of function would be recoverable since the CSIPs would not be damaged.

Simultaneous spurious actuation of multiple valves in the charging system (i.e., MOVs 1CS-214, 1CS-217, 1CS-218, and 1CS-219) could result in loss of mini-flow to the CSIPs and loss of flow to charging or high head safety injection, and subsequent damage to the running CSIP.

Upon discovery, interim compensatory actions were implemented to minimize the impact of the postulated fires. These measures included de-energizing the CSIP suction cross-connect valves to minimize susceptibility to mal-operation of components, and posting a roving fire watch in fire areas of concern.

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

I. DESCRIPTION OF EVENT (Continued)

For a postulated fire in SSA fire areas 1-A-BAL-B or 1-A-BAL-C (286' elevation), certain cabling for eight safety injection MOVs, three MOVs in each area, (1SI-300, 1SI-310, and 1SI-322; or 1SI-301, 1SI-311, and 1SI-323, respectively); and two MOV's in both areas, the outlet isolation valve (1SI-3) of the Boron Injection Tank (BIT) and the safety injection to the RCS isolation valve (1SI-86), are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for MOVs 1SI-300, 1SI-310, and 1SI-322 are unprotected inside their MCCs in SSA fire area 1-A-BAL-B. Similarly, the control power cables for MOVs 1SI-301, 1SI-311, and 1SI-323 are routed through SSA fire area 1-A-BAL-C and into their MCCs in this area with no fire barrier. In addition, the control power cables for safety injection system MOVs 1SI-3 and 1SI-86 are routed through SSA fire areas 1-A-BAL-B and 1-A-BAL-C with no fire barrier. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. These valves are required to shut to prevent transfer of inventory from the RWST to the containment recirculation sump. Simultaneous spurious opening of these multiple valves from a fire in either of these areas could result in inadvertently transferring inventory from the RWST to the containment recirculation sump. If this transfer of inventory were to occur, the water normally used for inventory makeup to the Reactor Coolant System (RCS) would not be available from a suction source (i.e., the RWST) credited by the SSA. The safety injection system MOVs 1SI-3 and 1SI-86 are normally closed, so a postulated fire in these areas resulting in spurious opening of these multiple valves could result in damage to the running CSIP due to run out conditions.

For a postulated fire in SSA fire areas 1-A-EPA, 1A-EPB, or 1-A-BAL-B (261' elevation), certain cabling for two containment spray MOVs (1CT-102 and 1CT-105) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for MOV 1CT-102 are routed in SSA fire area 1-A-EPB with no fire barrier. Similarly, the control power cables for MOVs 1CT-105 are routed through SSA fire areas 1-A-EPA and 1-A-BAL-B with no fire barrier. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. These valves are required to remain shut to prevent transfer of inventory from the RWST to the containment recirculation sump. Spurious opening of either of these valves from a fire in any of these fire areas could result in inadvertently transferring inventory from the RWST to the containment recirculation sump. If this transfer of inventory were to occur, the water normally used for inventory makeup to the Reactor Coolant System (RCS) would not be available from a suction source (i.e., the RWST) credited by the SSA. However, back-up sources would be available, and the ability to achieve and maintain cold shutdown would not be affected.

For a postulated fire in SSA fire areas 1-A-CSRA (286' elevation), 1-A-CSRB (286' elevation), 12-A-CR (305' elevation) or 12-A-CRC1 (305' elevation), certain cabling for the two outlet MOVs (1CS-165 or 1CS-166) of the Volume Control Tank (VCT) and for two containment spray MOVs (1CT-102 and 1CT-105) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for charging system MOVs 1CS-165 and 1CS-166 are routed through SSA fire areas 1-A-CSRA, 1-A-CSRB, 12-A-CR, and 12-A-CRC1 with no fire barrier. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. The charging system valves are required to remain open to provide CSIP suction from the VCT during a postulated fire in these fire areas. As a result, a fire in any of these areas could result in spurious closure of one of the VCT outlet valves, loss of suction flow to the running CSIP, and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling.

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I. DESCRIPTION OF EVENT (Continued)

In addition, the control power cables for MOVs 1CT-102 and 1CT-105 are routed through SSA fire areas 1-A-CSRA, 1-A-CSRB, 12-A-CR, and 12-A-CRC1 with no fire barrier. Therefore, the unprotected cables for these MOVs are vulnerable to fire-induced hot shorts. These valves are required to remain shut to prevent transfer of inventory from the RWST to the containment recirculation sump. Spurious opening of either of these valves from a fire in any of these fire areas could result in inadvertently transferring inventory from the RWST to the containment recirculation sump. If this transfer of inventory were to occur, the water normally used for inventory makeup to the Reactor Coolant System (RCS) would not be available from a suction source (i.e., the RWST) credited by the SSA. However, back-up sources would be available, and the ability to achieve and maintain cold shutdown would not be affected.

For a postulated fire in SSA fire areas 1-A-CSRA (286' elevation) or 1-A-CSRB (286' elevation), certain cabling for the four safety injection MOVs (1SI-3, 1SI-4, 1SI-86, and 1SI-107) are not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Specifically, the control power cables for safety injection MOVs 1SI-4, 1SI-86, and 1SI-107 are routed through SSA fire area 1-A-CSRA with no fire barrier, and the control power cables for safety injection MOVs 1SI-3 and 1SI-86 are routed through SSA fire area 1-A-CSRB with no fire barrier and therefore, are vulnerable to fire-induced hot shorts. These safety injection system valves are normally closed, so a postulated fire in either of these areas resulting in spurious opening of these multiple valves could result in damage to the running CSIP due to run out conditions.

For a postulated fire in SSA fire area 1-A-CSRB (286' elevation), certain cabling is not protected in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b and therefore is vulnerable to fire-induced hot shorts.

The C CSIP suction cross-connect valve with the A CSIP (1CS-168) is required to remain open to ensure the credited A CSIP is aligned to its suction source. Therefore, a postulated fire resulting in a spurious closure of this valve could result in damage to the running CSIP.

The B CT pump and its associated discharge valve (1CT-88) are required to remain off and shut, respectively, to ensure that the RWST inventory is not discharged to the containment via the containment spray ring header. Therefore, a postulated fire in this area resulting in spurious actuation of these multiple components could result in the water normally used for inventory makeup to the RCS not being available from a suction source (i.e., the RWST) credited by the SSA.

The RCP Thermal Barrier Flow Control Valve (1CC-252) is required to remain open to provide CCW flow to the RCP seals. As a result, a postulated fire in this area could result in spurious closure of this valve and loss of RCP seal cooling credited by the SSA.

The RCS wide range pressure transmitters (PT-402 and PT-403) provide the Operator with an indication of RCS pressure and level. Therefore, a postulated fire in this area could result in the loss of RCS pressure and level indication credited by the SSA.

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

I. DESCRIPTION OF EVENT (Continued)

For a postulated fire in SSA fire area 1-A-BAL-B (261' and 286' elevations), certain cabling is not protected in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b and therefore is vulnerable to fire-induced hot shorts. The "A" CT pump is required to remain off and its associated discharge valve (1CT-50) is required to remain shut to ensure that the RWST inventory is not discharged to the containment via the containment spray ring header. Therefore, a postulated fire in this area resulting in spurious actuation of these multiple components could result in the water normally used for inventory makeup to the RCS not being available from a suction source (i.e., the RWST) credited by the SSA.

For a postulated fire in SSA fire area 1-A-SWGRB (286' elevation), certain cabling for the RCP thermal barriers flow control valve (1CC-252) and the CCW supply valve to RCP seals and motor coolers (1CC-208), certain cabling for the Boron Injection Tank outlet isolation valve (1SI-3) and the safety injection to the RCS isolation valve (1SI-86), and certain cabling for the "B" reactor coolant pump (1RC-RCPB) and the pressurizer spray valve loop "B" (1RC-103) is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore this cabling is vulnerable to fire-induced hot shorts. The CCW system MOVs 1CC-208 and 1CC-252 are required to remain open to provide CCW flow to the RCP thermal barrier heat exchangers. As a result, a postulated fire in this area could result in spurious closure of either of these valves and loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling. The safety injection system MOVs 1SI-3 and 1SI-86 are normally closed, so a postulated fire in these areas resulting in spurious opening of these multiple valves could result in damage to the running CSIP due to run out conditions. A postulated fire in this areas resulting in the simultaneous spurious start of the "B" reactor coolant pump (after it had been secured) and the spurious opening of pressurizer spray valve loop "B" valve 1RC-103 could result in an inadvertent pressurizer spray and subsequent depressurization.

For a postulated fire in SSA fire area 1-A-BAL-A (190', 216', 236', and 286' elevations), certain cabling for the Auxiliary Feedwater (AFW) [BA] motor pump "A" discharge valve (1AF-19) and the VCT outlet isolation valve (1CS-166) is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore this cabling is vulnerable to fire-induced hot shorts. The AFW valve 1AF-19 is required to remain open while its associated pump is in service. As a result, a fire in this area could result in spurious closure of this valve and therefore the loss of AFW flow to the "A" and "C" steam generators credited by the SSA. The charging system valve is required to remain open to provide CSIP suction from the VCT during a postulated fire in these fire areas. As a result, a fire in this area could result in spurious closure of the VCT outlet valve, loss of suction flow to the running CSIP, and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling.

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

I. DESCRIPTION OF EVENT (Continued)

For a postulated fire in SSA fire area 1-A-CSRA (286' elevation), certain cabling for the charging system flow control valve (1CS-231); for the pressurizer power-operated relief valve (PORV) (1RC-114) and its associated isolation (block) valve (1RC-113); for the "A" containment spray pump (1CT-E004) and its associated discharge valve (1CT-50); and for the switchgear room "B" air handler (AH-13-1B) is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore this cabling is vulnerable to fire-induced hot shorts. The charging system valve 1CS-231 is required to remain open for RCP seal cooling and as a boration flowpath. As a result, a fire in this area could result in spurious closure of this valve and therefore the loss of RCP seal cooling and a boration flowpath credited by the SSA. The pressurizer PORV 1RC-114 is closed and its associated isolation valve 1RC-113 is open during normal plant operation. As a result, a fire in this area could result in spurious opening of the pressurizer PORV and its associated isolation valve could not be closed resulting in the transfer of some RCS inventory to the Pressurizer Relief Tank (PRT). The "A" CT pump 1CT-E004 is required to remain off and its associated discharge valve (1CT-50) is required to remain shut to ensure that the RWST inventory is not discharged to the containment via the containment spray ring header. Therefore, a postulated fire in this area resulting in spurious actuation of these multiple components could result in the water normally used for inventory makeup to the RCS not being available from a suction source (i.e., the RWST) credited by the SSA. The air handler AH-13-1B provides cooling to the "B" switchgear room for a postulated fire in this SSA fire area. Therefore, a fire in this area resulting in loss of cooling could affect the performance of equipment credited in the SSA and subsequently the ability to achieve and maintain safe shutdown.

For a postulated fire in SSA fire area 1-A-ACP (286' elevation), certain control cabling for the normal service water (NSW) [KG] supply valve (1SW-39) to the "A" emergency service water (ESW) [BI] header and the "B" emergency diesel generator (EDG) (1DG-E003) [EK] is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore, this cabling is vulnerable to fire-induced hot shorts. The NSW system valve 1SW-39 is required to close to provide isolation between NSW and ESW. A postulated fire in this area resulting in spurious actuation of these multiple components could result in a failure of the "B" EDG with the NSW supply valve (1SW-40) to the "B" ESW header subsequently open. With both NSW supply valves open, the ESW system flow would be split between the "A" and "B" trains. Thus, this diminished cooling capacity could affect the performance of equipment credited in the SSA and subsequently the ability to achieve and maintain safe shutdown.

For a postulated fire in SSA fire area 12-A-BAL (286' and 305' elevation), certain control cabling for the 1FB-8 (seal water injection filter backwash outlet valve), 1NI-107 (seal water injection filter backwash nitrogen supply valve), and 1PM-87 (seal water injection filter backwash primary water supply valve) is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore, this cabling is vulnerable to fire-induced hot shorts. If the plant has reached cold shutdown conditions and is depressurized below 200 psig with the charging system seal water injection inlet valve closed, then a postulated fire in this area resulting in spurious actuation of these multiple components could result in an inadvertent dilution or nitrogen injection to the RCS potentially reducing RCS inventory and natural circulation capability.

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

I. DESCRIPTION OF EVENT (Continued)

For a postulated fire in SSA fire area 1-A-BAL-A (236' elevation), the SSA credits the use of local operator manual action in lieu of separation or enclosure of certain control cabling for MOV 1CS-291 (CSIP suction valve from the RWST). Access may not be feasible to manually operate 1CS-291 due to the presence of postulated smoke under certain conditions. Therefore, one of the redundant trains credited by the SSA may not be free from fire damage for a postulated fire in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. The opening of this valve provides support for normal charging operation for RCS inventory control.

For a postulated fire in SSA fire area 1-A-BAL-B (261' elevation), certain control cabling for the "A" EDG (1DG-E002) is not protected from spurious actuation in accordance with the requirements of NUREG 0800, Attachment 1 (Branch Technical Position CMEB 9.5-1) Section C.5.b. Therefore, this cabling is vulnerable to fire-induced hot shorts. In addition, the SSA credits the use of the "A" train chiller and its associated ventilation system to provide cooling to certain "B" train pumps credited for a postulated fire in SSA fire area 1-A-BAL-B. However, further review has identified that sustained operation of these pumps may not be supported by this configuration. Therefore, a postulated fire in this area resulting in loss of the "A" EDG in this cooling configuration could affect the performance of equipment credited in the SSA.

Comprehensive matrices of components by fire area are presented in the tables below. Matrix 1 lists the components that have been corrected or will be corrected on or before Refueling Outage 13 (RFO-13). Matrix 2 lists the components that will be corrected on or before RFO-16.

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [ ].

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I. DESCRIPTION OF EVENT (Continued)

Matrix 1
Components by Fire Area (RFO-13)

1-A-BAL-B (261')	1-A-CSRA (286')	12-A-CR (305')
1CC-252	1CC-252	1CS-165
1CS-165	1CS-165	1CS-166
1CS-166	1CS-166	12-A-CRC1 (305')
1CS-168	1CS-169	1CS-165
1CS-169	1CS-243	1CS-166
1CS-170	1-A-CSRB (286')	1-A-SWGRA (286')
1CS-243	1CC-208[a]	1CC-249[b]
1CS-250	1CC-251[a]	1CS-243[b]
1CS-254	1CC-252	1-A-SWGRB (286')
1CS-257	1CH-279	1CC-208[a]
1CS-261	1CH-660	1CC-251[a]
1-A-BAL-B (286')	1CS-165	1CS-166
1CS-165	1CS-166	1CS-168
1RC-115	1CS-168	1CS-243[a]
1-A-BAL-C (286')	1CS-217[a]	1CS-341[a]
1CC-208[a]	1CS-220[a]	1CS-382[a]
1CC-251[a]	1CS-240[a]	1CS-423[a]
1CS-166	1CS-243[a]	1-A-BAL-A (190', 216', 236', & 261')
1CS-243[a]	1CS-341[a]	1CS-166
1CS-341[a]	1CS-382[a]	
1CS-382[a]	1CS-423[a]	
1CS-423[a]	1-A-EPA (261')	
	1CC-207	
	1CS-165	
	1CS-166	

[a] Condition of 1CC-208 and 1CC-251 has been corrected by modification #56427.

[b] Upon further review, 1CC-249 and 1CS-243 meet the >20 ft. separation criterion and are resolved.

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I. DESCRIPTION OF EVENT (Continued)

Matrix 2
Components by Fire Area (RFO-16)

1-A-BAL-B (261')	1-A-BAL-B (261') (Continued)	1-A-BAL-B (286') (Continued)
1CC-207	1RC-RCPA	1SI-301
1CC-249	1RC-RCPB	1SI-310
1CH-115	1SI-107	1SI-311
1CH-116	1SI-4	1SI-322
1CH-125	1SI-52	1SI-323
1CH-126	1-A-BAL-B (286')	1SI-86
1CS-182	1CC-207	1-A-BAL-C (286')
1CS-214	1CC-249	1MS-58
1CS-217	1CS-243	1MS-59
1CS-218	1CT-50	1MS-60
1CS-219	1CT-E004	1MS-61
1CT-102	1MS-58	1MS-62
1CT-105	1MS-59	1MS-63
1CT-50	1MS-60	1-A-CSRA (286')
1CT-E004	1MS-61	AH-13-1B
1MS-58	1MS-62	1CC-207
1MS-59	1MS-63	1CC-249
1MS-60	1RC-103	1CS-170
1MS-61	1RC-107	1CS-231
1MS-62	1RC-RCPA	1CT-102
1MS-63	1RC-RCPB	1CT-105
1RC-103	1SI-3	1CT-50
1RC-107	1SI-300	1CT-E004
1RC-116		

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I. DESCRIPTION OF EVENT (Continued)

Matrix 2
Components by Fire Area (RFO-16) (Continued)

1-A-CSRA (286') (Continued)	1-A-CSRB (286') (Continued)	1-A-EPB (261') (Continued)
1RC-103	1CT-102	1MS-58
1RC-107	1CT-105	1MS-59
1RC-113	1CT-88	1MS-60
1RC-114	1SI-107	1MS-61
1RC-900	1SI-3	1MS-62
1RC-901	1SI-4	1MS-63
1RC-902	1SI-86	12-A-CR (305')
1RC-903	PT-402	AH-6B-SB
1RC-904	PT-403	AH-7B-SB
1MS-58	1-A-EPA (261')	1CH-115
1MS-59	1CT-102	1CH-116
1MS-60	1CT-105	1CH-125
1MS-61	1MS-58	1CH-126
1MS-62	1MS-59	1CT-102
1MS-63	1MS-60	1CT-105
1RC-RCPA	1MS-61	1SW-1171
1RC-RCPB	1MS-62	1SW-1204
1SI-107	1MS-63	12-A-CRC1 (305')
1SI-3	1SI-107	1CH-115
1SI-4	1SI-4	1CH-116
1SI-86	1SI-52	1CH-125
1-A-CSRB (286')	1-A-EPB (261')	1CH-126
1AF-49	1CT-102	1CT-102
1AF-51	1CT-105	1CT-105

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I. DESCRIPTION OF EVENT (Continued)

Matrix 2
Components by Fire Area (RFO-16) (Continued)

12-A-CRC1 (305') (Continued)
1SC-E011
1SC-E014
1SW-1171
1SW-1204
1SW-1208

1-A-SWGRA (286')
1RC-107
1RC-RCPA

1-A-SWGRB (286')
1CS-171
1CS-217
1CS-220
1CS-240
1RC-103
1RC-RCPB
1SI-3
1SI-86

1-A-BAL-A (190', 216', 236', & 261')
1AF-19

1-A-BAL-A (236')
1CS-291

1-C (261')
1RC-900
1RC-901
1RC-902
1RC-903
1RC-904
1RC-905

1-A-ACP (286')
1SW-39
1DG-E003

12-A-BAL (286' & 305')
1FB-8
1NI-107
1PM-87

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II. CAUSE OF EVENT

The cause of these conditions is inadequate original Safe Shutdown Analysis. Specifically, certain conductor-to-conductor interactions (i.e., hot shorts) or certain operator manual actions were not adequately evaluated in the initial Safe Shutdown Analysis.

III. SAFETY SIGNIFICANCE

All of the findings are based on scenarios that have not actually occurred. Therefore, there are no actual adverse safety consequences.

Potential safety consequences for postulated fires in fire areas 1-A-BAL-B and 1-A-EPA (261' elevation) that also result in spurious closure of certain SSA MOVs may include:

- Loss of suction flow and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling,
- Loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling,
- Loss of charging or high head safety injection flow credited by the SSA,
- Simultaneous spurious actuation of multiple valves in the charging system could result in loss of mini-flow to the CSIPs and loss of flow to charging or high head safety injection, and subsequent damage to the running CSIP,
- Simultaneous spurious actuation of multiple valves in the charging system and the component cooling water system could result in degradation of the RCP seals, possibly leading to an RCP seal LOCA without credited CSIPs.

Potential safety consequences for postulated fires in fire areas 1-A-BAL-B and 1-A-EPA (261' elevation) that also result in spurious opening of certain SSA MOVs may include:

- Spurious opening of valves in the containment spray system could result in transfer of RWST inventory to the containment recirculation sump. However, this water inventory would still be available for use, if needed, from the containment recirculation sump.
- Simultaneous spurious opening of multiple valves in the safety injection system could result in damage to the CSIP in service due to run out conditions.

Potential safety consequences for a postulated fire in fire area 1-A-BAL-B (286' elevation) that also results in spurious opening of certain SSA MOVs may include:

- Simultaneous spurious opening of multiple valves in the safety injection system could result in transfer of RWST inventory to the containment recirculation sump. However, this water inventory would still be available for use, if needed, from the containment recirculation sump.
- Simultaneous spurious opening of multiple valves in the safety injection system could result in damage to the CSIP in service due to run out conditions.

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III. SAFETY SIGNIFICANCE (Continued)

Potential safety consequences for a postulated fire in fire area 1-A-EPB (261' elevation) that also results in spurious opening of certain SSA MOVs may include:

- Spurious opening of valves in the containment spray system could result in transfer of RWST inventory to the containment recirculation sump. However, this water inventory would still be available for use, if needed, from the containment recirculation sump.

Potential safety consequences for a postulated fire in fire area 1-A-BAL-C (286' elevation) that also results in spurious actuation of certain SSA MOVs may include:

- Loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling. However, RCP seals would still be protected by the normal seal injection function of the redundant charging/safety injection trains.
- Simultaneous spurious opening of multiple valves in the safety injection system could result in transfer of RWST inventory to the containment recirculation sump. However, this water inventory would still be available for use, if needed, from the containment recirculation sump.
- Simultaneous spurious opening of multiple valves in the safety injection system could result in damage to the CSIP in service due to run out conditions.

Potential safety consequences for a postulated fire in fire areas 1-A-CSRA (286' elevation), 1-A-CSRB (286' elevation), 12-A-CR (305' elevation) and 12-A-CRC1 (305' elevation) that also results in spurious actuation of certain SSA MOVs may include:

- Loss of suction flow and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling.
- Spurious opening of valves in the containment spray system could result in transfer of RWST inventory to the containment recirculation sump. However, this water inventory would still be available for use, if needed, from the containment recirculation sump.

Potential safety consequences for a postulated fire in fire areas 1-A-CSRA (286' elevation) and 1-A-CSRB (286' elevation) that also results in spurious opening of certain SSA MOVs may include:

- Simultaneous spurious opening of multiple valves in the safety injection system could result in damage to the CSIP in service due to run out conditions.

Potential safety consequences for a postulated fire in fire area 1-A-CSRB (286' elevation) that also results in spurious actuation of certain components include:

- Subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling.
- Discharge of RWST inventory to the containment via the containment spray ring header, resulting in the water normally used for inventory makeup to the RCS not available from a suction source (i.e., the RWST) credited by the SSA.
- Loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling.
- Loss of RCS pressure and level indication credited by the SSA which could potentially impact pressure and level monitoring.

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III. SAFETY SIGNIFICANCE (Continued)

Potential safety consequences for a postulated fire in fire area 1-A-BAL-B (261' and 286' elevations) that also results in spurious actuation of certain components include:

- Discharge of RWST inventory to the containment via the containment spray ring header, resulting in the water normally used for inventory makeup to the RCS not being available from a suction source (i.e., the RWST) credited by the SSA.

Potential safety consequences for a postulated fire in fire area 1-A-SWGRB (286' elevation) that also results in spurious actuation of certain components include:

- Loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling.
- Simultaneous spurious opening of multiple valves in the safety injection system could result in damage to the CSIP in service due to run out conditions.
- Simultaneous spurious start of the "B" reactor coolant pump (after it had been secured) and the spurious opening of a pressurizer spray valve could result in an inadvertent pressurizer spray and subsequent depressurization.

Potential safety consequences for a postulated fire in fire area 1-A-BAL-A (190', 216', 236', and 286' elevations) that also results in spurious actuation of certain components include:

- Loss of AFW flow to the "A" and "C" steam generators credited by the SSA.
- Loss of suction flow and subsequent damage to the running CSIP credited by the SSA for charging flow and RCP seal cooling.

Potential safety consequences for a postulated fire in fire area 1-A-CSRA (286' elevation) that also results in spurious actuation of certain components include:

- Loss of flow to RCP thermal barrier heat exchangers for RCP seal cooling and loss of a boration flowpath credited by the SSA.
- Spurious actuation of multiple valves could result in transfer of some RCS inventory to the Pressurizer Relief Tank (PRT).
- Spurious actuation of multiple components could result in discharge of RWST inventory to the containment via the containment spray ring header, resulting in the water normally used for inventory makeup to the RCS not being available from a suction source (i.e., the RWST) credited by the SSA.
- Loss of cooling potentially affecting equipment credited in the SSA.

Potential safety consequences for a postulated fire in the two additional SSA fire areas 1-A-SWGRA (286' elevation) and 1-C (261'elevation in containment) and the discoveries of components or combinations of components in the previously identified SSA fire areas that also results in spurious actuation of certain components identified on October 20, October 26, and October 29, 2004 of this LER include:

- Simultaneous spurious start of the "A" reactor coolant pump (after it had been secured) and the spurious opening of a pressurizer spray valve could result in an inadvertent pressurizer spray and subsequent depressurization.
- Loss of flow to RCP thermal barrier heat exchangers credited by the SSA for RCP seal cooling.

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III. SAFETY SIGNIFICANCE (Continued)

- Transfer of some RCS inventory to containment atmosphere. However, the RCS high point vent system is designed to ensure that any transfer of coolant inventory is less than the make-up capacity of one charging pump in the event of a Safety Class 2 pipe break or inadvertent valve actuations. In addition, the path from the reactor vessel head utilizes a 3/8-inch diameter orifice, which also limits flow to less than the make-up capacity of one charging pump in the event of a Safety Class 2 pipe break or inadvertent valve actuations.

Potential safety consequences for a postulated fire in the two additional SSA fire areas 1-A-ACP (286' elevation) and 12-A-BAL (286' and 305' elevations) and the discoveries of components or combinations of components in the previously identified SSA fire areas that also results in spurious actuation of certain components identified on January 18, 2005 of this LER include:

- Diminished cooling capacity potentially affecting the ability to achieve and maintain safe shutdown as credited by the SSA.
- An inadvertent dilution or nitrogen injection to the RCS potentially reducing RCS inventory and natural circulation capability.
- An unexpected RCS reduction in RCS pressure potentially affecting the ability to achieve and maintain safe shutdown as credited by the SSA.
- Loss of mini-flow to the "A" CSIP, which is credited by the SSA for providing charging system flow.
- A spurious opening of "A" AFW flow control valve could result in an inadvertent filling of the "A" steam generator (SG).
- Loss of chilled water to the "A" switchgear room, loss of cooling fans to 236' RAB north hallway area, or loss of make-up capability or cooling water flow to certain chillers potentially affecting equipment credited in the SSA.
- An unexpected diversion of chilled water to the non-running chiller could result in an inadvertent filling of the chiller surge tank and lifting of its associated relief valve.
- Loss of auxiliary reservoir ESW traveling screens potentially affecting ESW cooling capability.
- Simultaneous spurious opening of one or more SG power-operated relief valves (PORVs) and mal-operation of its related SG PORV block valve could require manually closing the block valve.

Potential safety consequences for a postulated fire in two previously identified SSA fires areas, 1-A-BAL-A (236' elevation) and 1-A-BAL-B (261' elevation), that also results in a potential loss of components due to a manual operator action which may not be feasible with the presence of postulated smoke or due to damage by a postulated fire in the area include:

- One of the redundant trains credited by the SSA may not provide support for normal charging operation for RCS inventory control.
- Loss of the "A" EDG, which in a certain cooling configuration could affect the performance of equipment credited in the SSA.

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III. SAFETY SIGNIFICANCE (Continued)

The defense-in-depth provided by the fire protection program mitigates some of these potential safety consequences by:

- Prevention of fire initiation,
- Prompt detection of fires or incipient fire conditions by installed automatic detection systems,
- Effective suppression of fires by installed automatic fire suppression systems with fire brigade backup.

Opening and de-energizing the CSIP suction cross-connect valves (1CS-168 and 1CS-169) also mitigates the potential safety consequences of a postulated fire in fire area 1-A-BAL-B.

These findings of unanalyzed conditions are being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B). No systems, structures, or components were inoperable at the time of discovery that significantly contributed to the event.

IV. CORRECTIVE ACTIONS

Upon discovery, interim compensatory actions were implemented to minimize the impact of the postulated fires. These measures included de-energizing the CSIP suction cross-connect valves (1CS-168 and 1CS-169) to minimize susceptibility to mal-operation of components, and posting a roving fire watch in fire areas of concern.

The additional fire areas have been added to the roving fire watch as interim compensatory action for the condition identified on February 13, 2004. For the conditions identified on October 20, October 26, and October 29, 2004 of this LER, a roving fire watch was already posted in the fire areas of concern as interim compensatory actions for other safe shutdown related issues, except for fire area 1-C since the containment is closed during normal operations. Additional walkdowns of fire area 1-C in the area of interest were performed to ensure that no in situ ignition sources and no intervening or transient combustibles were in the area. For the other areas and the condition identified on August 30, 2005, the fire watch remains posted.

Complete a validation of the HNP safe shutdown analysis.

Restore the identified conditions of this LER to compliance by design changes or other methods approved by the NRC. The previously reported condition of 1CC-208 and 1CC-251 has been corrected (HNP Modification #56427).

These actions are scheduled to be completed by refueling outage (RFO) 13 (Currently scheduled for May 15, 2006) for the components listed on Matrix 1 of this LER. For the conditions listed on Matrix 2 of this LER, these actions are scheduled to be completed by RFO 16 (Currently scheduled for November 5, 2010).

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V. PREVIOUS SIMILAR EVENTS

NRC Inspection Report 50-400/00-09 (dated February 3, 2000)

This inspection identified two unresolved items (URIs) concerning adequacy of a Thermo-Lag fire barrier to meet plant licensing basis requirements and the adequacy of the 10 CFR 50.59 for changes made to the FSAR to revise the fire rating of selected Thermo-Lag fire barriers. The identified fire barrier serves as the fire area separation barrier between the "B" Train Switchgear Room/Auxiliary Control Panel (ACP) Room and the "A" Train Cable Spreading Room. Based on Thermo-Lag barrier fire resistance tests conducted in 1994 and 1995, this fire barrier did not have the required three-hour fire resistance rating. Therefore, a single fire in the "B" Train Switchgear Room, of significant intensity and duration, could breach the Thermo-Lag fire barrier assembly and damage certain redundant "A" train cables and their associated functions of safe shutdown systems. The final significance determination for these two items was one notice of violation (White finding). The root cause was inadequate fire testing of the installed fire barrier. The corrective actions included modifications to the affected rooms and establishing review criteria to ensure that future fire barrier modifications do not invalidate test results. The root cause for this previous event is not significant in relation to the subject event, therefore, the previous corrective actions would not be expected to identify or prevent the deficiencies identified by this LER.

HNP LER 97-006-00 (reported 4/17/97)

This LER reported that an undocumented breach was identified in the thermo-lag wall while sealing penetrations through the Thermo-Lag Wall in the 286' Cable Spreading Room "A." Follow-up investigation revealed an additional thermo-lag fire barrier deficiency in a floor drain assembly in the cable spread room. These conditions do not comply with the 3-hour fire-rated barrier requirements specified in the HNP FSAR. The root cause was identified to be incomplete design, incomplete construction, and incomplete final construction walkdown. The penetration was modified per ESR 95-00715. The root cause investigation (CR 97-01123) stated, "Nothing indicates a common trend to the fact of an area of a Thermo-lag panel being missed both in design and in the final construction walkdown." The root cause for this previous event is not significant in relation to the subject event, therefore, the previous corrective actions would not be expected to identify or prevent the deficiencies identified by this LER.

HNP LER 97-020-00 (reported 9/12/97)

This LER reported that design discrepancies were identified during an Engineering review of the Safe Shutdown Analysis in Case of Fire. These discrepancies pertain to safety-related electrical cables in 261' elevation of the RAB for the EDG Fuel Oil Transfer Pumps "A" and "B". These cables did not comply with separation requirements to maintain safe shutdown capability. These deficiencies were caused by engineering oversight and inadequate design verification during initial plant construction. A plant modification was installed to provide the required protection for the cited cables. The root cause investigation (CR 97-03861) stated, "A review of the safe shutdown cables in the unit 2 areas north of column line 43 was performed and no additional cable protection discrepancies were found. Also, an in-depth review of an additional fire area (1-A-EPB) was performed ... and no similar deficiencies were identified." The root cause for this previous event is significant in relation to the subject event. The previous corrective action did not identify or prevent the deficiencies identified by this LER because the valve identified in this fire area (1CT-102) was not included in the SSA. The root cause for the previous event performed a review in the additional fire area only of associated cables credited in the SSA.

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VI. COMMITMENTS

The actions committed to by Carolina Power & Light Company doing business as Progress Energy Carolinas, Inc. (PEC) in this document are identified below. Any other actions discussed in this submittal represent intended or planned actions by PEC. They are described for the NRC's information and are not regulatory commitments.

Commitment(s)	Scheduled Completion Date
1. Complete a validation of the HNP safe shutdown analysis.	June 30, 2006
2. Restore the conditions identified in Matrix 1 of this LER to compliance by design changes or other methods approved by the NRC.	Refueling Outage 13 (Current schedule May 15, 2006)
3. Restore the conditions identified in Matrix 2 of this LER to compliance by design changes or other methods approved by the NRC.	Refueling Outage 16 (Current schedule November 5, 2010)

LOCAL MANUAL OPERATOR ACTION STEPS REVIEWED FOR ACHIEVING HOT STANDBY

Summary of Number of Local Manual Action Steps to be Performed Outside of the Control Room to Achieve and Maintain Hot Standby

Fire Area / Zone	Number of Manual Action Steps		
	Generic Steps in AOP-36 for All Fire Areas	Area Specific Steps in AOP-036 and Other Procedures Referenced by AOP-36	Total Steps by Fire Area/Zone
1-A-BAL-B	10	29	39
1-A-BATB	10	14	24
1-A-EPA	10	14	24
1-A-ACP	10	45	55

- ONLY 4 ZONES INCLUDED HERE *

Listing of AOP-036 Manual Action Steps Reviewed for Safe Shutdown Following a Fire

AOP-36 Section 3.0 Actions (Generic Steps for All Fire Areas/Zones):	
Step 12.c RNO	**MONITOR** AFW pump suction pressure indicators as an alternative to CST level indication: (Refer to Attachment 4, AFW Suction Pressure vs. CST level) • PI-2271 (at TDAFW Pump)
Step 13.b(3)	**Locally PERFORM** the following (248' RAB): (a) **SHUT** 1CS-228, Normal Charging FCV Inlet Isolation Valve. (b) **THROTTLE** 1CS-227, Normal Charging FCV Bypass, as necessary to control charging flow.
Step 13.c RNO	**ESTABLISH** flow through the Hi Head SI Line, as follows: (1).....*(MCR action)* (2).....*(MCR action)* (3) **OPEN** ONE of the following breakers: • 1B31-SB 4C, 1SI-3 BIT Outlet • 1A31-SA 4C, 1SI-4 BIT Outlet (4) **WHEN** directed by MCR, **THEN locally THROTTLE** the de-energized valve to maintain PRZ level:

Step 22	**IF** BOTH 1SW-270 AND 1SW-276 shut, **THEN CROSS-CONNECT** ESW Discharge Headers as follows:
Step 22.a	**VERIFY OPEN** 1SW-274, ESW Return Header B to NSW.
Step 22.b	**VERIFY OPEN** 1SW-275, ESW Return Header A to NSW.
Step 22.c	**VERIFY OPEN** 1SW-271, ESW Header B Return to Aux Reservoir.
Step 22.d	**WHEN** time permits, **THEN:** **(1) DE-ENERGIZE** 1SW-270, ESW Header A Return to Aux Reservoir, at breaker 1A35-SA-9C (RAB 261). **(2) OPEN** 1SW-270 locally (RAB 261). **(3) WHEN** 1SW-270 has been opened, **THEN SHUT** 1SW-274, ESW Return Header B to NSW.

AOP-36 Attachment 1 (Area Specific) Actions for Fire Area 1-A-ACP:		
Step 1b	SECURE Rod Drive MG sets using OP-104, Rod Control System	
	OP-104 Step Number	Description
	7.3.2.02	Place GENERATOR CIRCUIT BREAKER CONTROL switch 1A to TRIP
	7.3.2.03	Place MOTOR CIRCUIT BREAKER CONTROL switch 1A to TRIP
	7.3.2.04	Open Reactor Trip Breakers, if not already open.
	7.3.2.05	Place GENERATOR CIRCUIT BREAKER CONTROL switch 1B to TRIP
		Place MOTOR CIRCUIT BREAKER CONTROL switch 1B to TRIP
Step 2	If BOTH MDAFW pumps are disabled, THEN:	

Step 2c	Obtain a transfer panel key 33, 34, 35, 36, 99 or 106 (MCR or ACP key locker)...	
	... and de-energize the TDAFW Pump Trip and Throttle Valve by removing fuses 1A-11/1976 and 1A-12/1976	
Step 2d	De-energize 1MS-70 by opening disconnect switch on DP-1A2-SA-2B.	
Step 2f	IF TDAFW Pump is NOT operating properly, THEN locally...	
	...VERIFY OPEN TDAFW Pump Trip and Throttle Valve	
	...VERIFY OPEN 1MS-70, Main Steam B to Aux FW Turbine	
Step 2g	IF MCB CST level indication is NOT available,	
	THEN locally monitor AFW pump suction pressure using Attachment 4.	
Step 4	REMOVE the fuse for 1BD-30 SA at panel ARP-19A	
	REMOVE the fuse for 1BD-49 SA at panel ARP-19A	
Step 6	OPEN the power supply breaker for 1CS-235 at breaker 1B31-SB-10A	
Step 7	ISOLATE AND VENT IA to 1CH-279	
Step 7a	SHUT "1IA-871-I1"	
Step 7b	OPEN air filter drain petcocks on Instrument Air Filter	
Step 7c	CHECK 1CH-279, AH-12 1ASA valve OPEN	
Step 8	OPEN the power supply breaker for 1CS-171 at breaker 1B35-SB-4D	
Step 9	Locally VERIFY OPEN 1CS-171, B CSIP Suction X-Conn valve	
	Locally VERIFY OPEN 1CS-235, Charging Line Isolation valve	
Step 10	Locally verify shut 1BD-30, SG 1B Blowdown Isolation valve	
	Locally verify shut 1BD-49, SG 1C Blowdown Isolation valve	
Step 13	IF SG C PORV cycles erroneously, THEN:	
Step 13c	IF SG C PORV manual/automatic station does <u>not</u> function properly,	
	THEN locally OPERATE SG C PORV using OP-126 for desired cooldown rate.	
	OP-126 <u>Step Number</u>	<u>Description</u>
	8.2.1.2.01	Obtain pliers, flashlight, head set, extension cord

	8.2.1.2.02	Open Servo Valve Solenoid feeder breaker PP-1A312-SA-3
		Open Servo Valve Solenoid feeder breaker PP-1B312-SB-3
		Open Servo Valve Solenoid feeder breaker IDP-1A-SIII-11
	8.2.1.2.03	Remove the cover from the side of the PORV
	8.2.1.2.04	Establish communications with the Control Room
	8.2.1.2.07	To throttle open the PORV,
	8.2.1.2.07a	Rotate Solenoid B manual override approximately 3/4 turn in the clockwise direction
	8.2.1.2.07b	As directed by the Control Room, slowly rotate Solenoid A manual override approximately 3/4 turn in the clockwise direction
	8.2.1.2.07c	When the PORV is at its desired position, place Solenoid A manual override back to its original position
	8.2.1.2.08	To partially shut the PORV,
	8.2.1.2.08a	Check Solenoid A manual override in the fully counterclockwise position.
	8.2.1.2.08b	As directed by the Control Room slowly rotate Solenoid B manual override to its original position by rotating it approximately 3/4 turn in the counterclockwise direction, until the PORV starts to shut.
	8.2.1.2.08c	When the PORV is at the desired position, rotate Solenoid B manual override approximately 3/4 turn in the clockwise direction.
Step 14	IF FCV-2071C, Aux FW C Regulator 1AF-131, spuriously CLOSES, THEN	
Step 14a	REMOVE fuse 1A-5/1952 at Transfer Panel 1B	
Step 14b	THROTTLE 1AF-149, Stm Turb Aux FW C Isolation, to maintain SG C level	

AOP-36 Attachment 2 Actions For SSD 1 Equipment Powered by SSD 2:	
Step 2	**IF** control power is lost to 1CS-231, Charging Flow controller, **THEN PERFORM** the following locally:

NRC ponders rule change

Agency changes stance on fire-safety proposal for reactors

BY MATTHEW L. WALD
THE NEW YORK TIMES

WASHINGTON – After 10 years of struggling to make reactor owners modify their plants to protect electrical cables from fire, the Nuclear Regulatory Commission is now proposing to amend its own rules, retroactively legalizing an alternate strategy used by many plants but never formally approved.

The change involves the cables that connect the control room with pumps, valves and other equipment needed to shut down a plant safely.

Previously, the commission wanted the reactors to separate the control cables for redundant equipment, or install fire-detection and -suppression equipment or fire barriers, so a single fire could not disable all the cables. It now proposes to accept letting the plants designate technicians who would run through the plant and operate equipment by hand if the control cables had burned away.

Under a proposal published in the Federal Register on Wednesday, the commission's staff would not evaluate the feasibility of such a solution; instead, the reactor operators would draw up the plans, test them and keep the results on file for the inspections conducted every three years by the commission's staff.

Among the questions raised by the new strategy is whether workers could get to the equipment through the heat, smoke, radiation and steam that might be present in a fire.

The reason for the proposal, said Sunil Weerakkody, the section chief for fire protection and special studies, is that over the years the commission's inspectors in the field had informally approved such plans or that reactor owners had made such arrangements without asking permission. According to commission documents, some reactor owners simply asserted that they could use such alternate means under the terms of their licenses.

The commission's attorneys recently concluded that these approvals were not legal. The commission could require an application in each case and then evaluate each one, Weerakkody said, but it lacks the resources to do so and still keep up with its other work.

Paul Gunter of the Nuclear Information and Resource Service, a group generally critical of the nuclear industry, said, "The NRC took the word of a noncompliant and noncooperating industry, and set the bar low enough so they could step over it."

Fire has been a concern since March 1975, when a worker at one of the Tennessee Valley Authority's three Brown's Ferry reactors in northern Alabama accidentally set a fire with a candle that he was using to search for an air leak. The fire made it difficult to operate the equipment needed to shut down the plant and to monitor its condition.

'Manual action'

In response, some plants installed a material called "Thermo-lag" as a fire barrier, but in the early 1990s, the commission determined that the material was not effective. To compensate, for a time, many plants assigned employees to watch for fire. But many made plans for sending workers directly to the affected equipment, a strategy called "operator manual action."

But the idea of substituting humans for physical protections has attracted some skepticism. In September, at a meeting of the commission's Advisory Committee on Reactor Safeguards, Dana A. Powers, the committee's vice chairman asked: "Is there any hope? It's not like you can set up a simulator and test an operator action."

"How do you simulate smoke, light, fire, ringing bells, fire engines, crazy people running around?" he asked.

A commission staff member, Eva Brown, replied that in some cases, lights could be turned off to make a drill seem more realistic, and inspectors could check preparations by seeing whether air packs were available.