USNRC Region IV

Regulatory Conference

with

Entergy Operations Inc.
Arkansas Nuclear One

July 10, 2003

K112

OPENING REMARKS, ACTING DEPUTY REGIONAL ADMINISTRATOR

Good morning.

My name is Dwight Chamberlain, Acting Deputy Regional Administrator for NRC Region IV. The finding and associated apparent violation that are the subject of this conference were described in NRC Inspection Report 50-313;368/2001-006, issued on August 20, 2001, in a letter we sent to you dated April 15, 2002 (where we denied your backfit claim), and in a March 25, 2003 letter from us to you that described the preliminary safety significance determination. Our preliminary Greater-than-Green risk assessment representing a finding whose safety significance is greater than very low was documented in the March 25th letter. We also included in that letter a discussion of the influential assumptions for our preliminary risk significance determination.

In accordance with our normal practice, any written material you provide us today will be placed in the NRC's Electronic Public Document Room. If you believe any of the information you plan to provide us should be withheld from public disclosure, you should provide us with a written basis for withholding that material.

We have provided you a copy of the draft apparent violation and I will read that to you now.

As you know we have had significant communication and dialogue on the circumstances associated with the apparent violation, the fire modeling and the preliminary risk assessment for the apparent violation. This included the backfit analysis discussed by Mr. Gwynn. Our goal for the meeting today is to hear from you and gain an understanding of your perspective on the risk significance of this issue and where your influential assumptions may differ from ours. We also want to hear what corrective actions you have taken or plan to correct the apparent violation. Consequently we plan for our discussion to be brief and then turn the meeting over to you for presentation of your perspectives on the issue.

Now I will turn the meeting over to See-Meng Wong, NRR Senior Reactor Analyst, who will summarize the process we used to determine our preliminary risk assessment.

SEE-MENG WONG

Unless there are any questions at this time, we now want to give Entergy Operations an opportunity to provide its perspective on the risk significance of the finding.

DISCUSS PROTOCOL FOR Q & As

PUBLIC COMMENTS

LMPC AGENDA
DRS ORG
AWARDS

INSPECTABLE AREA: Fire Protection

CORNERSTONES: Initiating Events (10%)
Mitigating Systems (90%)

INSPECTION BASES: Fire is generally a significant contributor to reactor plant risk. In many cases, the risk posed by fires is comparable to or exceeds the risk from internal events. The fire protection program shall extend the concept of defense in depth (DID) to fire protection in plant areas important to safety by (1) preventing fires from starting, (2) rapidly detecting, controlling, and extinguishing those fires that do occur, and (3) providing protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent the safe shutdown of the reactor plant. If DID is not maintained by an adequately implemented fire protection program, overall plant risk can increase.

This inspectable area verifies aspects of the Initiating Events and Mitigating Systems cornerstones for which there are no performance indicators to measure licensee performance.

For those fire protection structures, systems, and components installed to satisfy NRC requirements designed to NFPA codes and standards, the code edition in force at the time of the design and installation is the code of record to which the design is evaluated.

Deviations from the codes should be identified and justified in the FSAR or FHA. A licensee may apply the equivalency concept in meeting the provisions of the NFPA codes and standards. When the licensee states that its design "meets the NFPA code(s)" or "meets the intent of the NFPA code(s)" and does not identify any deviations from such codes, the NRC expects that the design conforms to the codes and the design is subject to inspection against the NFPA codes.

The "Authority Having Jurisdiction" as described in NFPA documents refers to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, or designee, consistent with the authority specified in 10 CFR 1.43.

LEVEL OF EFFORT: Routine Inspection: The resident inspector will tour six to twelve plant areas important to reactor safety (on a plant specific basis) each calender quarter to observe conditions related to: (1)

licensee control of transient combustibles and ignition sources; (2) the material condition, operational lineup, and operational effectiveness of fire protection systems, equipment and features; and (3) the material condition and operational status of fire barriers used to prevent fire damage or fire propagation.

Annual Inspection: In addition, for approximately two hours each year, the resident inspector will observe a plant fire drill.

Triennial Inspection: Every 3 years, an inspection team consisting of a fire protection specialist, a reactor systems engineer, and an electrical engineer will select three to five fire areas (fire zones where applicable) and conduct a design-based, plant specific, risk-informed, onsite inspection of the DID elements used to mitigate the consequences of a fire. Additionally, in the selection process of the areas to be inspected consider the licensee uses of manual actions in lieu of full implementation of Section III.G.2 requirements. Manual actions will be evaluated using guidance provided in Enclosure 2 to this procedure.

Identification and Resolution of Problems: Effort will include a review of licensee's problem identification and resolution of fire protection program.

CHANGES IN SCOPE: For triennial inspections starting March 2001, the scope of this procedure has been temporarily reduced while criteria for review of fire-induced circuit failures of associated circuits is the subject of a voluntary industry initiative. Temporarily, the inspector is not required to address associated circuits issues as a direct line of inquiry nor develop associated circuits inspection findings (with certain exceptions contained in Section 02.03 of this procedure). However, in certain instances associated circuits issues may arise unavoidably and indirectly during the inspector's review of safe shutdown system selection, redundant train separation, and the provision of independent alternative shutdown capabilities ("byproduct" associated circuits issues). These byproduct associated circuits issues shall be documented. The inspection report should reflect the temporary limitation in inspection scope, and the potential for "byproduct" associated circuits issues to exist as long-term (>180 day) unresolved items (URIs).

For triennial inspections starting November 2002, the scope of this procedure was changed to integrate inspection guidance for manual actions associated with licensee commitment to 10 CFR 50. Appendix R, Section III.G.2 (hence referred to as Section III.G.2). The background, objectives and specific guidance are provided in Enclosure 2 to this document.

If the inspectors determine that manual actions are reasonable and are expected to meet the criteria outlined in Enclosure 2,

then the inspection report will identify this issue as a Green finding pending the Commission's acceptance of the proposed staff initiative to incorporate the use of manual actions into Section III.G.2.of the code. (The Green finding is an indicator that while compensatory measures in the form of manual actions have been implemented and are acceptable, the licensee continues to be in violation of the code requirements).

If the inspectors determine that the manual actions are not reasonably accomplishable and therefore implementation may not lead to a safe plant condition, the preliminary finding will be identified as potentially greater than Green and entered into the SDP.

71111.05-01 INSPECTION OBJECTIVES

01.01 The resident inspector inspection objective is to determine if the licensee has implemented a fire protection program that adequately controls combustibles and ignition sources within the plant, provides effectively maintained fire detection and suppression capability, maintains passive fire protection features in good material condition, and puts adequate compensatory measures in place for out-of-service, degraded or inoperable fire protection equipment, systems or features. The resident inspector approaches this effort from an operational status and material condition point of view.

01.02 The triennial team inspection objective is to assess, whether the licensee has implemented a fire protection program that adequately controls combustibles and ignition sources within the plant, provides adequate fire detection and suppression capability, maintains passive fire protection features in good material condition, puts adequate compensatory measures in place for out-of-service, degraded or inoperable fire protection equipment, systems or features, and ensures that procedures, equipment, fire barriers, and systems exist so that the post-fire capability to safely shut down the plant is ensured. The triennial team approaches this effort from a design point of view, as well as from the operational status and material condition points of view.

71111.05-02 INSPECTION REQUIREMENTS

02.01 Routine Inspection. The resident inspector will tour six to twelve plant areas important to safety (not necessarily limited to the top few contributors to overall plant fire risk) to assess the material condition of reactor plant active and passive fire protection systems and features, their operational lineup and operational effectiveness. For the areas selected, as applicable to the area of concern, conduct the following lines of inspection inquiry:

a. Control of Transient Combustibles and Ignition Sources

1. Observe if any transient combustible materials are located in the area. If transient combustible materials are observed, verify that they are being controlled in accordance with the licensee's administrative control procedures.

2. Observe if any welding or cutting (hot work) is being performed in the area. Verify that hot work is being done in accordance with the licensee's administrative control procedures.

b. Fire Detection Systems. Observe the physical condition of the fire detection devices and note any that show physical damage. Determine from licensee administrative controls the known material condition and operational status of the system, and verify that any observed conditions do not affect the operational effectiveness of the system (see compensatory measures section below).

c. Fire Suppression Systems

1. Sprinkler Fire Suppression Systems. Observe that sprinkler heads are not obstructed by major overhead equipment (e.g., ventilation ducts). Verify through visual observation or surveillance record review that the water supply control valves to the system are open and that the fire water supply and pumping capability is operable and capable of supplying the water supply demand of the system. Observe any material conditions that may affect performance of the system, such as mechanical damage, painted sprinkler heads, corrosion, etc.

2. Gaseous Suppression Systems. Observe that the gaseous suppression system (e.g. Halon or CO2) nozzles are not obstructed or blocked by plant equipment such that gas dispersal would be significantly impeded. Observe and verify that the suppression agent charge pressure is within the normal band, extinguishing agent supply valves are open, and that the system is in the automatic mode. Observe and verify that the dampers/doors are unobstructed so that they will be permitted to close automatically upon actuation of the gaseous system. Observe and verify that the room penetration seals are sealed and in good condition. Observe and note any material conditions that may affect performance of the system, such as mechanical damage, corrosion, damage to doors or dampers, open penetrations, or nozzles blocked by plant equipment.

d. Manual Fire fighting Equipment and Capability

1. Fire Extinguishers. Ensure that portable fire extinguishes are provided at their designated locations in or near the area being inspected, and that access to the fire extinguishers is unobstructed by plant equipment or other work related activities. Observe and verify that the general condition of fire extinguishes is satisfactory (e.g., pressure gauge reads in the acceptable range, nozzles are clear and unobstructed, charge test records indicate testing within the normal periodicity).

2. Hose Stations and Standpipes. Observe that fire hoses are installed at their designated locations. Observe and verify that the general condition of hoses and hose stations is satisfactory (e.g., no holes in or chafing of the hose, nozzle not mechanically damaged and not obstructed, valve hand wheels in place). Observe and verify that the water supply control valves to the standpipe system are open and that the fire water supply and pumping

capability is operable and capable of supplying the water flow and pressure demand. Ensure that access to the hose stations is unobstructed by plant equipment or work-related activities.

e. Passive Fire Protection Features

1. Electrical Raceway Fire Barrier Systems. Observe the material condition of electrical raceway fire barrier systems (e.g. cable tray fire wraps) and determine if there are any cracks, gouges, or holes in the barrier material, that there are no gaps in the material at joints or seams, and that banding, wire tie, and other fastener pattern and spacing appears appropriate. Where the fire barrier is a wrap or blanket-type material, observe that the material has no tears, rips, or holes in any of the visible layered material, that there are no gaps in the material at joint or seam locations, and that banding spacing is such that the material is held firmly in place. If plant modifications have recently been conducted, establish that fire barriers removed as interference have been restored.

2. Fire Doors. Observe the material condition of the fire door in the area being inspected. Observe that selected fire doors close without gapping (e.g. due to fire door damage from previous obstructions), and that the door latching hardware functions securely.

3. Ventilation System Fire Dampers. To the extent practical and safe, directly observe the condition of the accessible ventilation fire dampers in the areas being inspected (to ensure fusible link fire dampers are not prematurely shut or obstructed). For those dampers which can not be readily observed in the selected plant areas, review the licensee's surveillance efforts directed towards verifying the continuing operability of ventilation fire dampers.

4. Structural Steel Fire Proofing. Observe the material condition of the structural steel fire-proofing (fibrous or concrete encapsulation) within the areas being inspected. Observe that this material is installed and that the structural steel is uniformly covered (no bare areas).

5. Fire Barrier and Fire Area/Room/Zone Electrical Penetration Seals. Tour plant areas being inspected and observe accessible electrical and piping penetrations. Observe whether any seals are missing from locations in which they appear to be needed to complete a fire barrier or area/room/zone wall, and determine that seals appear to be properly installed and in good condition.

6. Reactor Coolant Pump Oil Collection Systems. If applicable, verify that the licensee has installed a reactor coolant pump oil collection system which is designed to and does collect oil leakage and spray from all potential reactor coolant pump oil system leakage points.

f. Compensatory Measures. Verify that adequate compensatory measures are put in place by the licensee for out-of-service, degraded or inoperable fire protection equipment, systems or features (e.g. detection and suppression systems and

equipment, passive fire barrier features, or safe shutdown functions or capabilities). Short term compensatory measures should be adequate to compensate for the degraded function or feature until appropriate corrective action can be taken. Review licensee effectiveness in returning the equipment to service in a reasonable period of time (typically days or weeks).

02.02 Annual Inspection. During the annual observation of a fire brigade drill in a plant area important to safety, evaluate the readiness of the licensee's personnel to prevent and fight fires, including the following aspects:

a. Protective clothing/turnout gear is properly donned.

b. Self-contained breather apparatus (SCBA) equipment is properly worn and used.

c. Fire hose lines are capable of reaching all necessary fire hazard locations, that the lines are laid out without flow constrictions, the hose is simulated being charged with water, and the nozzle is pattern (flow stream) tested prior to entering the fire area of concern.

d. The fire area of concern is entered in a controlled manner (e.g., fire brigade members stay low to the floor and feel the door for heat prior to entry into the fire area of concern).

e. Sufficient fire fighting equipment is brought to the scene by the fire brigade to properly perform their firefighting duties.

f. The fire brigade leader's fire fighting directions are thorough, clear, and effective.

g. Radio communications with the plant operators and between fire brigade members are efficient and effective.

h. Members of the fire brigade check for fire victims and propagation into other plant areas.

i. Effective smoke removal operations were simulated.

j. The fire fighting pre-plan strategies were utilized.

k. The licensee pre-planned the drill scenario was followed, and that the drill objectives acceptance criteria were met.

02.03 Triennial Inspection. Every three years, an inspection team will conduct risk-informed inspection of selected aspects of the licensee's fire protection program. The inspection will emphasize the review of post-fire safe shutdown capability, including the fire protection features provided to ensure that selected aspects the post-fire safe shutdown success path is maintained free of fire damage.

On a temporary basis, while certain associated circuits issues are the subject of an ongoing, voluntary industry initiative, the inspection team leader shall direct the triennial team inspectors, to NOT conduct direct and purposeful inspection of associated circuits

issues. Associated circuits are defined in the "Associated Circuits of Concern" section of the Generic Letter 81-12 Clarification Letter: Mattson to Eisenhut of March 22, 1982 "Fire Protection Rule - Appendix R." Certain exceptions to this temporary restriction are discussed in Section 02.03b.3 below.

a. Inspection Preparation. Select three to five fire areas (fire zones where applicable) important to risk for review. Obtain necessary information for determining post-fire safe shutdown capability and the fire protection features for maintaining post-fire safe shut down path free of fire damage.

b. Inspection Conduct. For the plant areas selected for review, conduct the following inspection efforts:

1. Systems Required to Achieve and Maintain Post-fire Safe Shutdown

Consider whether the licensee's shutdown methodology has properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire area, room and/or zone selected for review. Specifically determine the apparent adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.

If the above high level performance criteria are not met, review the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, SERs, exemptions, deviations).

To the extent that it is confirmed that a postulated fire in an area under consideration can cause the loss of offsite power, verify that hot and cold shutdown from outside the control room can be achieved and maintained with off-site power not available.

2. Fire Protection of Safe Shutdown Capability

Evaluate the separation of systems, including power, control and instrumentation cables necessary to achieve safe shutdown, and verify that fire protection features are in place to satisfy the separation and design requirements of Section III.G of Appendix R (or, for reactor plants reviewed under the Standard Review Plan, license specific separation requirements).

Verify that the fire detectors and automatic fire suppression systems, associated with 1-hour fire barriers and/or 20 foot areas free of intervening combustibles required by Section III.G.2 of Appendix R (or, for reactor plants reviewed under the Standard Review Plan, license specific requirements), have been adequately installed. Review licensee evaluations which confirm, and verify through observation in the reactor plant, that selected installed automatic detection and suppression systems are installed in accordance with the code of record and would adequately control and suppress fires associated with the hazards of each selected area.

For the plant areas selected, when applicable, verify that redundant trains of systems required for hot shutdown located in the same fire area are not subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Determine each of the following:

(a) How the licensee has addressed whether a fire in a single location may, indirectly, through the production of smoke, heat, or hot gases, cause activation of potentially damaging fire suppression for all redundant trains,

(b) How the licensee has addressed whether a fire in a single location (or inadvertent actuation or rupture of a fire suppression system) may, through local fire suppression activity, indirectly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train), and

(c) How the licensee has addressed whether a fire in a single location may cause damage to all redundant trains through the utilization of manually controlled fire suppression systems.

For the plant areas selected, review the adequacy of the design (fire rating) of fire area boundaries (i.e., able to contain the fire hazards of the area), raceway fire barriers, equipment fire barriers, and fixed fire detection and suppression systems.

Evaluate licensee operator recovery action capabilities, plans and timing estimates for smoke removal, dewatering of spaces, controlled re-energization, and return to service of equipment in fire-affected areas) for fires in each plant area under consideration.

If a fire brigade drill is observed, consider the lines of inspection inquiry of Section 02.02 above.

3. Post-fire Safe Shutdown Circuit Analysis

Verify that safety-related and non-safety-related cables for selected post fire safe shutdown equipment in selected fire areas have been identified by the licensee and analyzed to show that they would not prevent safe shutdown because of hot shorts, open circuits, or shorts to ground.

The inspector is not precluded from developing findings related to purely deficient licensee performance in these areas. Thus for example, findings are not precluded where they are associated with mathematical errors or invalid plant configuration assumptions. Neither is the inspector precluded from developing findings in the specific associated circuits area of fuse/breaker coordination. However, the restriction does extend to IN 92-18 and multiple high impedance fault (MHIF) concerns (subjects of the current voluntary industry initiative).

Inspect the licensee's electrical systems and electrical circuit analyses with respect to the following:

(a) Common Power Supply/Bus Concern

(1) On a sample basis, for the safe shutdown equipment and cables located in the fire area, verify that circuit breaker coordination and fuse protection have been analyzed, provided and are acceptable as means of protecting the power source of the designated redundant or alternative safe shutdown equipment.

4. Alternative Shutdown Capability

Determine whether the licensee's alternative shutdown methodology has properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire area, room and/or zone selected for review. Specifically determine the apparent adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.

If the above high level performance criteria are not met, review the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, SERs, exemptions, deviations).

Verify that hot and cold shutdown from outside the control room can be achieved and maintained with off-site power available or not available.

Verify that the transfer of control from the control room to the alternative location has been demonstrated to not be affected by fire-induced circuit faults (e.g. by the provision of separate fuses and power supplies for alternative shutdown control circuits).

5. Operational Implementation of Alternative Shutdown Capability

Verify that the training program for licensed and non-licensed personnel has been expanded to include alternative or dedicated safe shutdown capability.

Verify that personnel required to achieve and maintain the plant in hot shutdown following a fire using the alternative shutdown system can be provided from normal onsite staff, exclusive of the fire brigade.

Verify that adequate procedures for use of the alternative shutdown system exist. Verify the implementation and human factors adequacy of the alternative shutdown procedures by independently "walking through" the procedural steps. Ensure that adequate communications are available for the personnel performing alternative or dedicated safe shutdown. Verify that the operators can reasonably be expected to perform the procedures within applicable shutdown time requirements.

Establish whether the licensee conducts periodic operational tests of the alternative shutdown transfer capability and instrumentation and control functions. In addition, establish whether these tests are adequate to show that if called upon, the alternative shutdown capability would be functional upon transfer.

6. Communications

Verify through inspection of the contents of designated emergency storage lockers and review of alternative shutdown procedures, that portable radio communications and/or fixed emergency communications systems are available, operable, and adequate for the performance of alternative safe shutdown functions. Assess the capability of the communication systems to support the operators in the conduct and coordination of their required actions (e.g., consider ambient noise levels, clarity of reception, reliability, coverage patterns, and survivability). If specific, risk-significant issues arise relating to alternative shutdown communications adequacy, then, on a not-to-interfere with operational safety basis, observe licensee conducted communications tests in the subject plant area or areas.

7. Emergency Lighting

Review emergency lighting provided, either in fixed or portable form, along access routes and egress routes, at control stations, plant parameter monitoring locations, and at manual operating stations:

(a) If emergency lights are powered from a central battery or batteries, verify that the distribution system contains protective devices so that a fire in the area will not cause loss of emergency lighting in any unaffected area needed for safe shutdown operations.

(b) Review the manufacturer's information to verify that battery power supplies are rated with at least an 8-hour capacity.

(c) Determine if the operability testing and maintenance of the lighting units follow licensee procedures and accepted industry practice.

(d) Verify that sufficient illumination is provided to permit access for the monitoring of safe shutdown indications and/or the proper operation of safe shutdown equipment.

(e) Verify that emergency lighting unit batteries are being properly maintained (observe the unit's lamp or meter charge rate indication, and specific gravity indication).

8. Cold Shutdown Repairs

Verify that the licensee has dedicated repair procedures, equipment, and materials to accomplish repairs of damaged components required for cold shutdown, that these components can be made operable, and that cold

shutdown can be achieved within time frames specified by Appendix R to 10 CFR Part 50 (or, for reactor plants reviewed under the Standard Review Plan, license specific requirements). Verify that the repair equipment, components, tools, and materials (e.g., pre-cut cable connectors with prepared attachment lugs) are available on site.

9. Fire Barrier and Fire Area/Zone/Room Penetration Seals

Selectively verify through review of installation records that material of an appropriate fire resistence rating (equal to the overall rating of the barrier itself) has been used to fill the opening/penetration .

10. Fire Protection Systems, Features and Equipment

In selected plant locations, review the material condition, operational lineup, operational effectiveness and design of fire detection systems, fire suppression systems, manual fire fighting equipment, fire brigade capabilities, and passive fire protection features. Establish that selected fire detection systems, sprinkler systems, gaseous suppression systems, portable fire extinguishers and hose stations are installed in accordance with their design, and that their design is adequate given the current equipment layout and plant configuration.

11. Compensatory Measures

Verify that adequate compensatory measures are put in place by the licensee for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems or features (e.g. detection and suppression systems and equipment, passive fire barrier features, or pumps, valves or electrical devices providing safe shutdown functions or capabilities). Short term compensatory measures should be adequate to compensate for the degraded function or feature until appropriate corrective action can be taken. Review licensee effectiveness in returning the equipment to service in a reasonable period of time (typically days or weeks).

02.04 Identification and Resolution of Problems. During routine (quarterly and annual) resident inspection and triennial team inspection, verify that the licensee is identifying issues related to this inspection area at an appropriate threshold and entering them in the corrective action program. For a sample of selected issues documented in the corrective action program, verify that the corrective actions are appropriate. See Inspection Procedure 71152, "Identification and Resolution of Problems," for additional guidance.

71111.05-03 INSPECTION GUIDANCE

General Guidance

Routine Inspection. See Attachment 1.

The main focus of the resident inspector's activities is on the material condition and operational status of fire detection and suppression systems and equipment, and fire

barriers used to prevent fire damage or fire propagation. The six to twelve plant areas to be inspected should be selected on the basis of site-specific risk worksheets.

Triennial Inspection

Objective. The triennial inspection is primarily a risk-informed look at the mitigation elements of fire protection defense in depth (DID) (i.e., detection, suppression, and confinement of fires through passive barriers, and the fire protection features and procedures which establish the licensee's ability to achieve and maintain post-fire safe shutdown conditions during and after a fire). The triennial inspection is that portion of the baseline inspection program that focuses on the design of reactor plant fire protection and post-fire safe shutdown systems, features, and procedures. The inspection team leader will manage and coordinate the conduct of an inspection emphasizing post-fire safe shutdown. The team will use plant-specific risk, event, and technical information (including the results of licensee self-assessments) to confirm that selected aspects of one train of safe shutdown equipment (capable of providing reactivity control, reactor coolant makeup, reactor heat removal, and process monitoring and support functions) is free of potential fire damage.

Inspection Team and Responsibilities. The team assigned to conduct the multi-disciplinary triennial fire protection inspection would include a fire protection inspector, an electrical inspector, and a reactor systems/mechanical systems inspector.

1. Reactor Systems/Mechanical Systems Inspector (RSI). The reactor systems/mechanical systems inspector (RSI) will assess the capability of reactor and balance-of-plant systems, equipment, operating personnel, and procedures to achieve and maintain post-fire safe shutdown and minimize the release of radioactivity to the environment in the event of fire. Therefore, the inspection team leader will ensure that he is knowledgeable regarding integrated plant operations, maintenance, testing, surveillance and quality assurance, reactor normal and off-normal operating procedures, and BWR and/or PWR nuclear and balance-of-plant systems design.

2. Electrical Inspector (EI). The EI will identify electrical separation requirements for redundant train power, control, and instrumentation cables. He will review alternative shutdown panel electrical isolation design to establish the panels' electrical independence from postulated fire areas. Therefore, the inspection team leader will ensure that he is knowledgeable regarding reactor plant electrical and instrumentation and control (I&C) design and is familiar with industry ampacity derating standards.

3. Fire Protection Inspector (FPI). The FPI will work with other team members in determining the effectiveness of the fire barriers and systems that establish the reactor plant's post-fire safe shutdown configuration and maintain it free of fire damage. He will determine whether suitable fire protection features (suppression, separation distance, fire barriers, etc.) are provided for the separation of equipment and cables required to ensure plant safety. Therefore, the inspection team leader will ensure he is knowledgeable regarding reactor plant fire protection systems, features and procedures.

Regulatory Requirements and Licensing Bases. The regulatory requirements and licensing bases against which post-fire safe shutdown capability is assessed are as follows:

1. Plants licensed before January 1, 1979. Effective February 17, 1981, the NRC amended its regulations by adding Section 50.48 and Appendix R to 10 CFR Part 50 to require certain provisions for fire protection in nuclear power plants licensed to operate before January 1, 1979. This action was taken to resolve certain contested generic issues in fire protection safety evaluation reports (SERs), and (1) to require all applicable licensees to upgrade their plants to a level of fire protection equivalent to the technical requirements in Sections III.G, J, L, and O of 10 CFR Part 50, Appendix R, and (2) to require all applicable licensees to meet all other requirements of Appendix R to the extent that comparable items had not been closed out in pre-Appendix R SERs (under Appendix A of the Branch Technical Position). Licensees were required to meet the separation requirements of Section III.G.2, the alternative or dedicated shutdown capability requirements of Sections III.G.3 and III.L, or to request an exemption in accordance with 10 CFR 50.48. Alternative or dedicated safe shutdown capabilities were required to be submitted to the Office of Nuclear Reactor Regulation (NRR) for review. NRR approvals are documented in SERs.

2. Plants licensed after January 1, 1979. These plants are subject to requirements similar to those in 10 CFR part 50, Appendix R, as specified in the conditions of their facility operating license, commitments made to the NRC, or deviations granted by the NRC. These reactor plants licensed after January 1, 1979, are subject to 10 CFR 50.48 (a) and (e) only.

   The fire hazards analysis (FHA) ("Fire Protection Review, Fire Protection Evaluation") document of the reactor plants licensed after January 1, 1979, may have been reviewed under Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear power Plants Docketed Prior to July 1, 1976," of August 23, 1976 (in which case, the licensee conducted an Appendix R comparison and justified final safety analysis report (FSAR) or FHA differences from the specific provisions of Appendix R). It is possible also that licensee submittals for plants licensed after January 1, 1979, were reviewed under the Standard Review Plan, NUREG-0800, and Branch Technical Position (BTP) CMEB 9.5-1 (formerly BTP ASB 9.5-1), "Guidelines for Fire Protection for Nuclear Power Plants," Rev. 2 (July 1981) (in which case, licensee submittals were reviewed according to requirements that closely paralleled the provisions of Appendix R).

   The actual fire protection requirements applicable to a given reactor plant licensed after January 1, 1979, arise from the specific license conditions in the facility operating license. These license conditions possibly refer to SERs and their supplements. Section 9.5 of such an SER delineates which licensee submittals were reviewed (e.g., a fire hazards analysis would be such a submittal).

3. The licensee may make changes to the approved fire protection program without prior approval by the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. In addition the licensees are required to retain the fire protection plan and each change to the plan as a record pursuant to paragraph 50.48(a).

Inspection Process

1. Licensee Notification Letter. The licensee should be notified of the triennial inspection in writing at least three months in advance of the onsite week. The information gathering visit shall be conducted no fewer than three weeks in advance of the onsite inspection week. The letter should discuss the scope of the inspection, request an information-gathering visit to the licensee reactor site/engineering offices, discuss documentation and licensee personnel availability needs during the onsite inspection week, and request a pre-inspection conference call to discuss administrative matters and finalize inspection activity plans and schedules. A template for an NRC to licensee triennial fire protection baseline inspection notification letter is provided as Attachment 2.

2. Information-gathering Site Visit. The inspection team leader should conduct a two to three day information gathering site visit. The purposes of the information gathering site visit are to (1) gather site-specific information important to inspection planning, and (2) conduct initial discussions with licensee representatives regarding administrative items and inspection activity plans and schedules. In advance of the information-gathering site visit, the team leader should provide the licensee with a list of information and documents that may be needed for the team to prepare for and conduct the triennial inspection, as well as a list of any planned requests for licensee conducted evolutions (e.g., emergency lighting tests, communication tests, fire drills, shutdown walkthroughs, etc.).

3. Information Required/Preparation. The team members should gather sufficient information to become familiar with the following during preparation period:

   (a) The reactor plant's design, layout, and equipment configuration.

   (b) The reactor plant's current post-fire safe shutdown licensing basis through review of 10 CFR 50.48, 10 CFR Part 50 Appendix R (if applicable), NRC safety evaluation reports (SERs) on fire protection, the plant's operating license, updated final safety analysis report (UFSAR), and approved exemptions or deviations.

   (c) The licensee's strategy and methodology, and derivative procedures, for accomplishing post-fire safe shutdown conditions. Among the sources of information are the updated final safety analysis report (UFSAR), the latest version of the fire hazards analysis (FHA), the latest version of the post-fire safe shutdown analysis (SSA), fire protection/post-fire safe-shutdown related changes that used 10 CFR 50.59, 50.48(a) or other criteria, and Generic Letter 86-10 review documentation and modification packages, plant drawings, emergency/abnormal operating procedures, and the results of licensee internal audits (e.g., self assessments and quality assurance (QA) audits in the fire protection and post-fire safe shutdown areas).

   (d) The historical record of plant-specific fire protection issues through review of plant-specific documents such as previous NRC inspection results, internal audits performed by the reactor licensee (e.g., self-assessments and quality

assurance audits), corrective action system records, event notifications submitted in accordance with 10 CFR 50.72, and licensee event reports (LERs) submitted in accordance with 10 CFR 50.73.

(e) The safe shutdown systems and support systems credited by the licensee's analysis for each fire area, room, or zone for accomplishing of the required shutdown functions (e.g., reactivity control, reactor coolant makeup, reactor heat removal, and process monitoring and support functions) as necessary to comply with the safe shutdown requirements of 10 CFR 50.48(a) and plant-specific licensing requirements. The shutdown logic for each area, room, or zone to be inspected must be thoroughly understood by the team members.

(f) The licensee's analytical approach for electrical circuits separation analyses, and the licensee's methodology for identification and resolution of associated circuits of concern. The team's electrical review should include addressing the assumptions and boundary conditions used in the performance of the licensee's analyses.

Specific Guidance

03.01 Routine Inspection. The resident inspector should not attempt to address all plant areas each inspection. The routine plant tour should focus on six to twelve plant areas important to risk. The resident inspector should note transient combustibles and ignition sources (and compare these with the limits provided in licensee administrative procedures). The resident inspector should also note the material condition and operational status (rather than the design) of fire detection and suppression systems, and fire barriers used to prevent fire damage or fire propagation.

03.02 No specific guidance provided

03.03 Triennial Inspection

1. Prior to the inspection information gathering trip, the team leader should contact the regional senior reactor analyst (SRA) to obtain summary of plant specific fire risk insights (e.g., fire risk ranking of the rooms/plant fire areas, conditional core damage probabilities (CCDPs) for those rooms and areas, and transient sequences for these rooms). After considering the focus of past fire protection and post-fire safe shutdown inspections, the team leader should select three to five fire areas important to risk for inspection.

2. The fire protection and post-fire safe shutdown information gathered should focus on the samples selected.

3. After the information gathering site visit, the team leader should use the SRA developed fire risk insights, as well as technical input from the other team members, to develop an inspection plan addressing (for the selected three to five fire areas, zones, as applicable) post-fire safe shutdown capability and the fire protection features for maintaining one success path of this capability free of fire damage.

03.03b.2 Short term compensatory measures should be adequate to compensate for the degraded function or feature until appropriate corrective action can be taken.

03.04 Identification and Resolution of Problems. No specific guidance is provided.

71111.05-04 RESOURCE ESTIMATE

The resource to perform this inspection procedure is estimated to be, on average, 45 hours per year for routine inspection including time allocated for annual observation of a fire drill; and 200 hours every 3 years for the triennial inspection regardless of the number of reactor units at the site.

71111.05-05 REFERENCES

The SDP Guideline "Appendix 4 - Determining Potential Risk Significance of Fire Protection and Post-fire Safe Shutdown Inspection Findings."

Appendix H of the Fire Protection Supplemental Inspection Procedure (FPSI) "Guidance for Making a Qualitative Assessment of Fire Protection Inspection Findings, Fire Protection Risk Significance Screening Methodology" [FPRSSM])

Inspection Procedure 71152, "Identification and Resolution of Problems."

Generic Letter 91-18 "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Non-conforming Conditions and on Operability."

Information Notice 97-48 "Inadequate or Inappropriate Interim Fire Protection Compensatory Measures," July 9, 1997

NRC Internal Memorandum dated August 17, 1998, from John N. Hannon to Arthur T. Howell titled "Response to Region IV Task Interface Agreement (TIA) (96TIA008) - Evaluation of Definition of Continuous Fire Watch (TAC No. M96550).

Individual Plant Examination of Externally Initiated Events(IPEEE)

Regulatory Guide 1.189 "Fire Protection for Nuclear Power Plants."

END

ATTACHMENT 1
ROUTINE INSPECTION GUIDANCE TABLE

CORNERSTONE	RISK PRIORITY	EXAMPLES
INITIATING EVENTS	Equipment or actions that could cause or contribute to initiation of fires in plant areas important to safety or near equipment required for safe shutdown.	Transient combustibles (rags, wood, ion exchange resin, lubricating oil, or Anti-Cs) are not in areas where transient combustibles are prohibited. Transient combustible amounts in other areas do not exceed administrative controls. Ignition sources (welding, grinding, brazing, flame cutting) have a fire watch. Planning includes precautions and additional fire prevention measures where these activities are near combustibles.

MITIGATING SYSTEMS	Functionality of fire barriers in plant areas important to safety. Functionality of detection systems in plant area important to safety. Functionality of automatic suppression systems in plant areas important to safety. Fire brigade manual suppression effectiveness. Compensatory measures for degraded fire detection systems, fire suppression features, and barriers to fire propagation.	Doors and dampers that prevent the spread of fires to/or between plant areas important to safety remain in place and are functional. Electrical raceway fire barriers and penetration seals that protect the post-fire safe-shutdown train are not damaged. Fire detection and alarm system is functional for plant areas important to safety. Automatic suppression system sprinklers are functional and their sprinkler head patterns are not blocked by plant equipment. Fire brigade performance indicates a prompt response with proper fire fighting techniques for the type of fire encountered. Manual fire suppression equipment is of the proper type and has been tested. Degraded fire detection equipment, suppression features and fire propagation barriers are adequately compensated for on reasonably short-term bases.

Mr. , President
Licensee Nuclear Department
Licensee Corporation or Company
Address

SUBJECT: SELECTED NUCLEAR POWER STATION, UNITS 1 AND 2 - NOTIFICATION OF CONDUCT OF A TRIENNIAL FIRE PROTECTION BASELINE INSPECTION

Dear Mr. :

The purpose of this letter is to notify you that the U.S. Nuclear Regulatory Commission (NRC) Region # staff will conduct a triennial fire protection baseline inspection at Selected Nuclear Power Station, Units 1 and 2 in Month, 20##. The inspection team will be lead by First Last, a fire protection specialist from the NRC Region # Office. The team will be composed of personnel from NRC Region #, and Contracted National Laboratory. The inspection will be conducted in accordance with IP 71111.05, the NRC's baseline fire protection inspection procedure.

The schedule for the inspection is as follows:

- Information gathering visit - Month ##-##, 20## [Note - this date is pre-coordinated with the licensee]
- Week of onsite inspection - Month ##, 20##.

The purposes of the information gathering visit are to obtain information and documentation needed to support the inspection, to become familiar with the Selected Nuclear Power Station, Units 1 and 2 fire protection programs, fire protection features, and post-fire safe shutdown capabilities and plant layout, and, as necessary, obtain plant specific site access training and badging for unescorted site access. A list of the types of documents the team may be interested in reviewing, and possibly obtaining, are listed in Enclosure 1.

During the information gathering visit, the team will also discuss the following inspection support administrative details: office space size and location; specific documents requested to be made available to the team in their office spaces; arrangements for reactor site access (including radiation protection training, security, safety and fitness for duty requirements); and the availability of knowledgeable plant engineering and licensing organization personnel to serve as points of contact during the inspection.

We request that during the onsite inspection week you ensure that copies of analyses, evaluations or documentation regarding the implementation and maintenance of the Selected Nuclear Generating Station, Units 1 and 2 fire protection program, including post-fire safe shutdown capability, be readily accessible to the team for their review. Of

specific interest are those documents which establish that your fire protection program satisfies NRC regulatory requirements and conforms to applicable NRC and industry fire protection guidance. Also, personnel should be available at the site during the inspection who are knowledgeable regarding those plant systems required to achieve and maintain safe shutdown conditions from inside and outside the control room (including the electrical aspects of the relevant post-fire safe shutdown analyses), reactor plant fire protection systems and features, and the Selected Nuclear Power Station fire protection program and its implementation.

Your cooperation and support during this inspection will be appreciated. If you have questions concerning this inspection, or the inspection team's information or logistical needs, please contact First Last, the team leader, in the Region # Office at ###-###-####.

Sincerely,

Docket Nos.: 50-###
and 50-###

Enclosure: As stated (1)

Reactor Fire Protection Program Supporting Documentation

[Note: This is a broad list of the documents the NRC inspection team may be interested in reviewing, and possibly obtaining, during the information gathering site visit.]

1. The current version of the Fire Protection Program and Fire Hazards Analysis.

2. Current versions of the fire protection program implementing procedures (e.g., administrative controls, surveillance testing, fire brigade).

3. Fire brigade training program and pre-fire plans.

4. Post-fire safe shutdown systems and separation analysis.

5. Post-fire alternative shutdown analysis.

6. Piping and instrumentation (flow) diagrams showing the components used to achieve and maintain hot standby and cold shutdown for fires outside the control room and those components used for those areas requiring alternative shutdown capability.

7. Plant layout and equipment drawings which identify the physical plant locations of hot standby and cold shutdown equipment.

8. Plant layout drawings which identify plant fire area delineation, areas protected by automatic fire suppression and detection, and the locations of fire protection equipment.

9. Plant layout drawings which identify the general location of the post-fire emergency lighting units.

10. Plant operating procedures which would be used and describe shutdown from inside the control room with a postulated fire occurring in any plant area outside the control room, procedures which would be used to implement alternative shutdown capability in the event of a fire in either the control or cable spreading room.

11. Maintenance and surveillance testing procedures for alternative shutdown capability and fire barriers, detectors, pumps and suppression systems.

12. Maintenance procedures which routinely verify fuse breaker coordination in accordance with the post-fire safe shutdown coordination analysis.

13. A sample of significant fire protection and post-fire safe shutdown related design change packages and Generic Letter 86-10 evaluations.

14. The reactor plant's IPEEE, results of any post-IPEEE reviews, and listings of actions taken/plant modifications conducted in response to IPEEE information.

15. Temporary modification procedures.

16. Organization charts of site personnel down to the level of fire protection staff personnel.

17. If applicable, layout/arrangement drawings of potential reactor coolant/recirculation pump lube oil system leakage points and associated lube oil collection systems.

18. A listing of the SERs which form the licensing basis for the reactor plant's post-fire safe shutdown configuration.

19. Procedures/instructions that control the configuration of the reactor plant's fire protection program, features, and post-fire safe shutdown methodology and system design.

22. A list of applicable codes and standards related to the design of plant fire protection features and evaluations of code deviations.

23. Procedures/instructions that govern the implementation of plant modifications, maintenance, and special operations, and their impact on fire protection.

24. The three most recent fire protection QA audits and/or fire protection self-assessments.

25. Recent QA surveillances of fire protection activities.

26. A listing of open and closed fire protection condition reports (problem reports/NCRs/EARs/problem identification and resolution reports).

27. Listing of plant fire protection licensing basis documents.

28. A listing of the NFPA code versions committed to (NFPA codes of record).

29. A listing of plant deviations from code commitments.

30. Actual copies of Generic Letter 86-10 evaluations.

END

INSPECTION CRITERIA FOR FIRE PROTECTION MANUAL ACTIONS

BACKGROUND

Licensees not in compliance with 10 CFR 50 Appendix R, Section III.G.2 require fire protection of safe shutdown capability. Section III.G.2 requires that circuits that could prevent the operation or cause misoperation of redundant trains of safe shutdown equipment have one of the specified fire protection features. Manual actions to respond to misoperations are not listed as an acceptable method for satisfying this requirement. However, the NRC has previously accepted plant-specific manual actions in formal exemption/deviation requests and in safety evaluation reports (SERs).

Based on inspection results and industry comments the NRC determined that licensees have, without request for exemption/deviation from the code, implemented manual actions where the specified requirements of Section III.G.2 cannot be met. The staff concluded that rulemaking would be required to allow licensees committed to Appendix R to substitute manual actions in lieu of Section III.G2 compliance. For an interim period, while rulemaking is in progress, the staff determined that acceptance criteria can be developed which would facilitate evaluations of certain manual actions. Authority to approve a licensee methodology that does not meet NRC regulations is not delegated to the inspectors. However, inspectors will ensure that plant specific manual actions meet the guidelines of this enclosure.

APPLICABILITY

This guidance is provided for the assessment of manual actions implemented in conjunction with licensee commitment to Section III.G.2.

Verify that the licensee is committed to meet the requirements of Section III.G.2. Determine whether the requirements are met with or without the use of manual actions. If manual action are not invoked this guidance is not applicable.

If manual actions were previously approved by the staff and exemption/deviation has been issued, verify that the licensee continues to meet the basis of the staff action.

INSPECTION PLANNING

See LEVEL OF EFFORT section at the beginning of the main procedure.

DIAGNOSTIC INSTRUMENTATION

Determine whether adequate diagnostic instrumentation, unaffected by the postulated fire, is provided for the operator to detect the specific spurious operation that occurred. Some licensees may have protected only those circuits specified in Information Notice 84-09. Additional instrumentation may be needed to properly assess a spurious operation. Annunciators, indicating lights, pressure gages, and flow indicators are among those

instruments typically not protected from the effects of a fire. Instrumentation should also be available to verify that the manual action accomplished the intended objective.

ENVIRONMENTAL CONSIDERATIONS

Review environmental conditions the operator may encounter while accessing and performing the manual action. Radiation levels should not exceed normal 10 CFR Part 20 limits. Emergency lighting should be provided as required in Appendix R, Section III.J or by the licensee's approved fire protection program. Temperature and humidity conditions should be reviewed to ensure that temperature and humidity do not affect the capability to perform the manual action. Fire effects should be reviewed to ensure that smoke and toxic gases from the fire do not affect the capability to perform the manual action.

STAFFING

Review licensee shift staffing to determine whether that adequate qualified personnel are available to perform the required manual actions and to safely operate the reactor.

COMMUNICATIONS

If manual action coordination with other plant operations is required, then communications capability must be protected from effects of a postulated fire.

SPECIAL TOOLS

If special tools are required, determine whether tools are dedicated and available from accessible nearby location.

TRAINING

Determine whether operator training on the manual actions and the procedure is adequate and current.

ACCESSABILITY

Review accessability. If a ladder or other special access equipment is needed, verify the availability. Determine whether an operator can reach the required location without personal hazard.

PROCEDURES

Review procedural guidance to ensure that it is adequate and contained in an emergency procedure. Operators should not rely on having time to study normal plant procedures to find a method of operating plant equipment that is seldom used.

VERIFICATION AND VALIDATION

Determine whether the manual actions have been verified and validated by plant walkdowns using the current procedure. Ensure that the licensee has adequately evaluated

the capability of operators to perform the manual action in the time available before the plant will be placed in an unrecoverable condition.

END

§50.48 Fire protection.

(a)(1) Each operating nuclear power plant must have a fire protection plan that satisfies Criterion 3 of appendix A to this part. This fire protection plan must:

(i) Describe the overall fire protection program for the facility;
(ii) Identify the various positions within the licensee's organization that are responsible for the program;
(iii) State the authorities that are delegated to each of these positions to implement those responsibilities; and
(iv) Outline the plans for fire protection, fire detection and suppression capability, and limitation of fire damage.

(2) The plan must also describe specific features necessary to implement the program described in paragraph (a)(1) of this section such as--

(i) Administrative controls and personnel requirements for fire prevention and manual fire suppression activities;
(ii) Automatic and manually operated fire detection and suppression systems; and
(iii) The means to limit fire damage to structures, systems, or components important to safety so that the capability to shut down the plant safely is ensured.

(3) The licensee shall retain the fire protection plan and each change to the plan as a record until the Commission terminates the reactor license. The licensee shall retain each superseded revision of the procedures for 3 years from the date it was superseded.

(b) Appendix R to this part establishes fire protection features required to satisfy Criterion 3 of appendix A to this part with respect to certain generic issues for nuclear power plants licensed to operate before January 1, 1979.

(1) Except for the requirements of Sections III.G, III.J, and III.O, the provisions of Appendix R to this part do not apply to nuclear power plants licensed to operate before January 1, 1979, to the extent that--

(i) Fire protection features proposed or implemented by the licensee have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1 reflected in NRC fire protection safety evaluation reports issued before the effective date of February 19, 1981; or
(ii) Fire protection features were accepted by the NRC staff in comprehensive fire protection safety evaluation reports issued before Appendix A to Branch Technical Position (BTP) APCSB 9.5-1 was published in August 1976.

(2) With respect to all other fire protection features covered by Appendix R, all nuclear power plants licensed to operate before January 1, 1979, must satisfy the applicable requirements of Appendix R to this part, including specifically the requirements of Sections III.G, III.J, and III.O.

(c) [Reserved].

(d) [Reserved].

(e) [Reserved].

(f) Licensees that have submitted the certifications required under Sec. 50.82(a)(1) shall maintain a fire protection program to address the potential for fires that could cause the release or spread of radioactive materials (i.e., that could result in a radiological hazard).

(1) The objectives of the fire protection program are to--

(i) Reasonably prevent these fires from occurring;
(ii) Rapidly detect, control, and extinguish those fires that do occur and that could result in a radiological hazard; and
(iii) Ensure that the risk of fire-induced radiological hazards to the public, environment and plant personnel is minimized.

(2) The licensee shall assess the fire protection program on a regular basis. The licensee shall revise the plan as appropriate throughout the various stages of facility decommissioning.

(3) The licensee may make changes to the fire protection program without NRC approval if these changes do not reduce the effectiveness of fire protection for facilities, systems, and equipment that could result in a radiological hazard, taking into account the decommissioning plant conditions and activities.

U.S. NUCLEAR REGULATORY COMMISSION

April 2001

REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 1.189

(Draft was issued as DG-1097)

FIRE PROTECTION FOR OPERATING NUCLEAR POWER PLANTS

Regulatory guides are issued to describe and make available to the public such information as methods acceptable to the NRC staff for implementing specific parts of the NRC's regulations, techniques used by the staff in evaluating specific problems or postulated accidents, and data needed by the NRC staff in its review of applications for permits and licenses. Regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

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GLOSSARY

Alternative Shutdown — The capability to safely shut down the reactor in the event of a fire using existing systems that have been rerouted, relocated, or modified.

Approved — Tested and accepted for a specific purpose or application by a recognized testing laboratory.

Associated Circuits — Circuits that do not meet the separation requirements for safe shutdown systems and components and are associated with safe shutdown systems and components by common power supply, common enclosure, or the potential to cause spurious operations that could prevent or adversely affect the capability to safely shut down the reactor as a result of fire-induced failures (hot shorts, open circuits, and short to ground).

Automatic — Self-acting, operating by its own mechanism when actuated by some monitored parameter such as a change in current, pressure, temperature, or mechanical configuration.

Combustible Material — Any material that will burn or sustain the combustion process when ignited or otherwise exposed to fire conditions.

Common Enclosure — An enclosure (e.g., cable tray, conduit, junction box) that contains circuits required for the operation of safe shutdown components and circuits for non-safe shutdown components.

Common Power Supply — A power supply that feeds safe shutdown circuits and non-safe shutdown circuits.

Control Room Complex — The zone served by the control room emergency ventilation system.

Dedicated Shutdown — The ability to shut down the reactor and maintain shutdown conditions using structures, systems, or components dedicated to the purpose of accomplishing post-fire safe shutdown functions.

Emergency Control Station — Location outside the main control room where actions are taken by operations personnel to manipulate plant systems and controls to achieve safe shutdown of the reactor.

Exposure Fire — A fire in a given area that involves either in situ or transient combustibles and is external to any structures, systems, and components located in or adjacent to that same area. The effects of such fire (e.g., smoke, heat, or ignition) can adversely affect those structures, systems, and components important to safety. Thus, a fire involving one success path of safe shutdown equipment may constitute an exposure fire for the redundant success path located in the same area, and a fire involving combustibles other than either redundant success path may constitute an exposure fire to both redundant trains located in the same area.

Fire Suppression — Control and extinguishing of fires (firefighting). Manual fire suppression is the use of hoses, portable extinguishers, or manually actuated fixed systems by plant personnel. Automatic fire suppression is the use of automatically actuated fixed systems such as water, Halon, or carbon dioxide systems.

Fire Watch — Individuals responsible for providing additional (e.g., during hot work) or compensatory (e.g., for system impairments) coverage of plant activities or areas for the purposes of detecting fires or for identifying activities and conditions that present a potential fire hazard. The individuals should be trained in identifying conditions or activities that present potential fire hazards, as well as the use of fire extinguishers and the proper fire notification procedures.

Fire Zones — Subdivisions of fire areas.

AND says manual actions

Free of Fire Damage — The structure, system, or component under consideration is capable of performing its intended function during and after the postulated fire, as needed, without repair.

Hazardous Material — A substance that, upon release, has the potential of causing harm to people, property, or the environment.

High Impedance Fault — A circuit fault condition resulting in a short to ground, or conductor to conductor hot short, where residual resistance in the faulted connection maintains the fault current level below the component's circuit breaker long-term setpoint.

Hot Short — Individual conductors of the same or different cables come in contact with each other and may result in an impressed voltage or current on the circuit being analyzed.

Hot Work — Activities that involve the use of heat, sparks, or open flame such as cutting, welding, and grinding.

Impairment — The degradation of a fire protection system or feature that adversely affects the ability of the system or feature to perform its intended function.

Important to Safety — Nuclear power plant structures, systems, and components "important to safety" are those required to provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

Interrupting Device — A breaker, fuse, or similar device installed in an electrical circuit to isolate the circuit (or a portion of the circuit) from the remainder of the system in the event of an overcurrent or fault downstream of the interrupting device.

In situ Combustibles — Combustible materials that constitute part of the construction, fabrication, or installation of plant structures, systems, and components and as such are fixed in place.

Isolation Device — A device in a circuit that prevents malfunctions in one section of a circuit from causing unacceptable influences in other sections of the circuit or other circuits.

ANO/NRC Appendix R Compliance Meeting
Agenda

1.	Opening remarks – NRC	
2.	Opening remarks – ANO	(Craig Anderson)
3.	History	(Glenn Ashley)
4.	Chronological Presentation of Relevant Appendix R Manual Action Manual Action Documents	(Woody Walker)
5.	Industry Survey Results	(Dale James)
6.	Backfit Discussion	(Glenn Ashley)
7.	Potential Resolution Paths	(Sherrie Cotton)
8.	Question/Answer	
9.	Final Remarks ANO	(Craig Anderson)
10.	Final Remarks NRC	

ANO Appendix R Implementation Timeline

-- Pre-Appendix R
1980 -- 10CFR50.48 and Appendix R issued
1981 -- GL 81-12 issued
1982 -- NUFPG formation
-- Vollmer memo
-- ANO compliance submittal
-- NRC/ANO meeting on manual actions, etc.
-- Additional submittal
-- Revised Exemption requests
1983 -- NUFPG meeting with NRC
-- SER issued for exemptions
-- SECY 83-269
-- GL 83-33
1984 -- Regional Workshops
-- NRC/ANO meeting
-- Reanalysis submittal
1987 -- Compliance audit performed by NRR
1988 -- SER issued for additional exemptions

Regulatory Conference Agenda

CONFERENCE WITH ENTERGY OPERATIONS, INC.,
ARKANSAS NUCLEAR ONE

JULY 10, 2003

NRC REGION IV, ARLINGTON, TEXAS

1. Introduction and Opening Remarks	Pat Gwynn, Acting Regional Administrator
2. Apparent Violation and Goals of the Regulatory Conference OVERVIEW OF CRITICAL ASSUMPTIONS BY LICENSEE	Dwight Chamberlain, Acting Deputy Regional Administrator
3. Significance Determination Influential Assumptions	See-Meng Wong, Senior Reactor Analyst, NRR; Troy Pruett, Chief, Plant Support Branch, Division of Reactor Safety
4. Licensee Presentation	
5. NRC Caucus	
6. Resume Conference → PUBLIC QUESTIONS	
7. NRC Closing Remarks	Pat Gwynn

CRAIG ANDERSON
DEVELOPED SPECIFIC PROCEDURES - VALIDATED
FIRE PLAN / AOPs / EOPs WERE IN PLACE PREVIOUSLY

Risk Assessment Methodology

Dale James

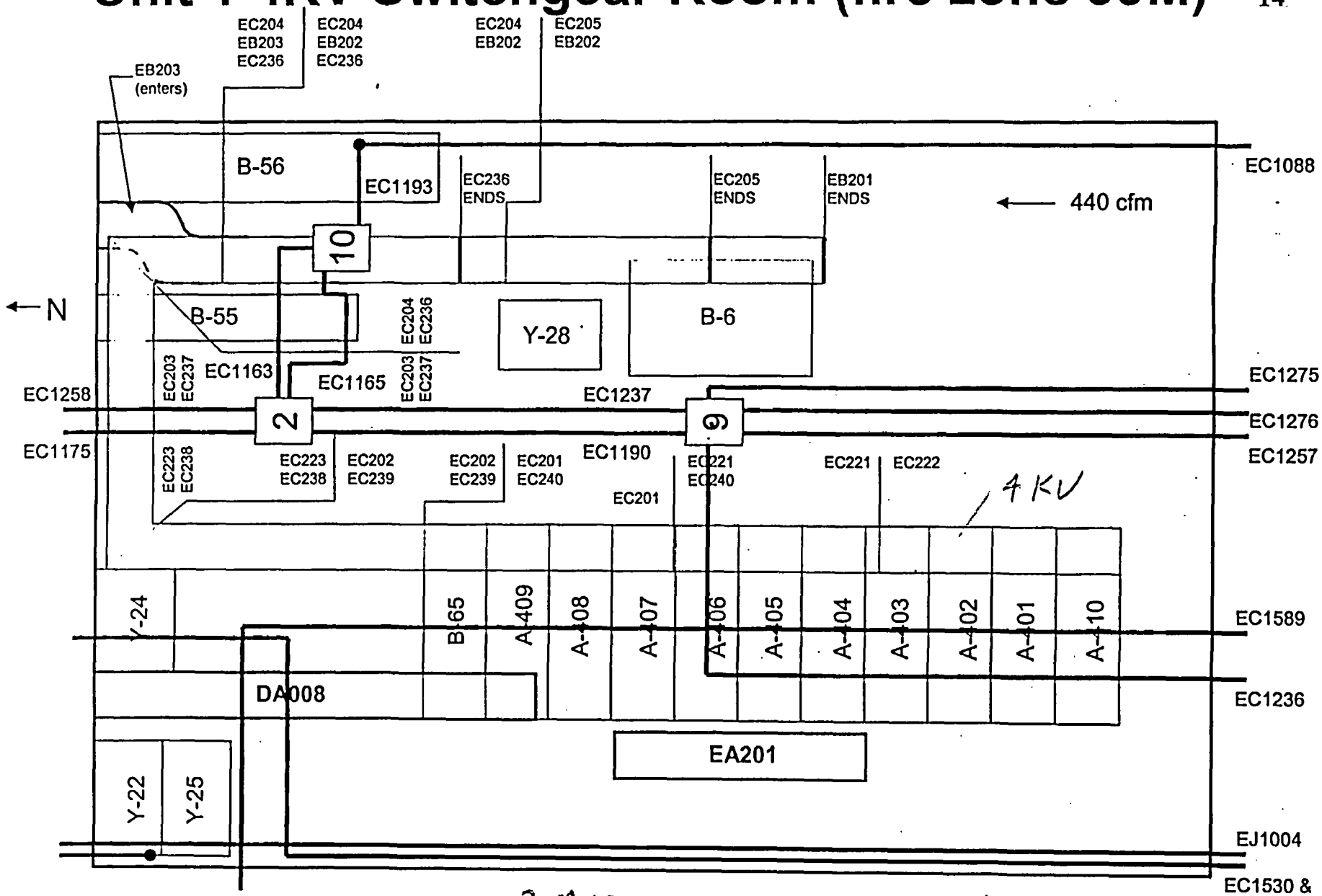
Manager, Engineering Programs and

Components

Risk Assessment Overview

- NRC's preliminary SDP evaluation concluded unacceptable (greater than green) increase in core damage frequency
- Key assumptions in NRC evaluations vs ANO's preliminary assessment
  - Heat release rate 200 - 500 KW Vs 100 KW
  - Human error probability > ANO # MANUAL COMPLEXITY PROCEDURE ADEQUACY
- Subsequent site-specific in-depth assessment
  - Results incorporated into Unit 1 PSA model to derive ΔCDF

Unit 1 4KV Switchgear Room (fire zone 99M)

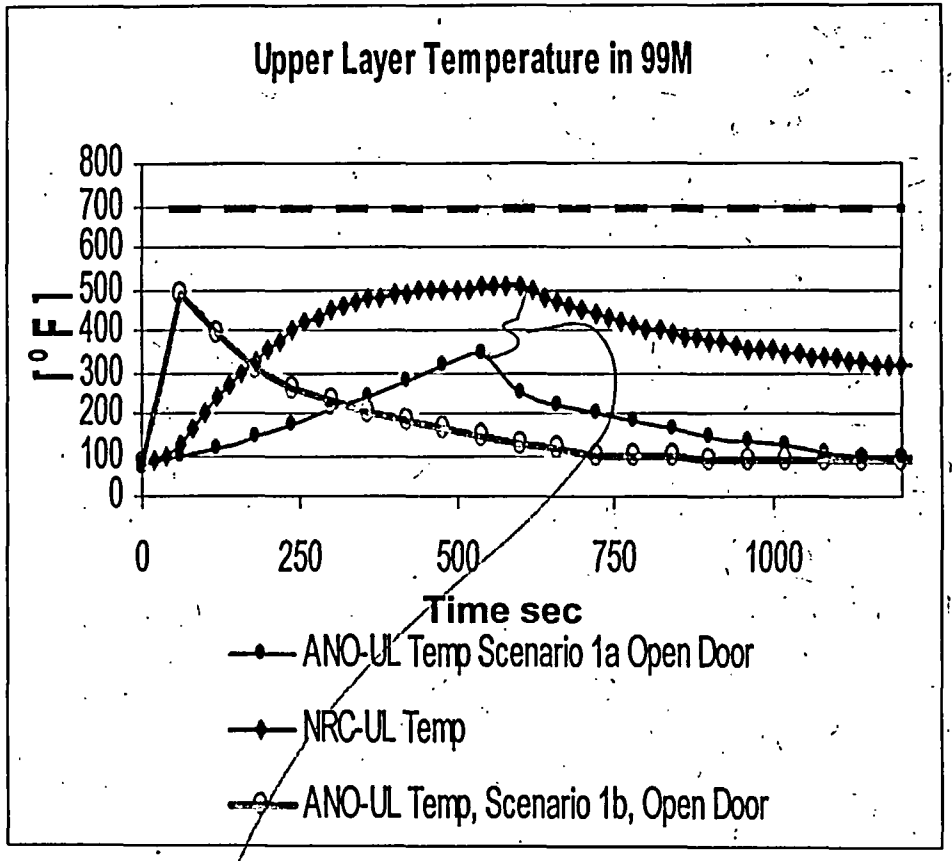


3 MCCs
4 INVERTERS
VCMD

CABLE TRAY STACKS

Results (cont.)
Comparison of NRC and ANO Results

- Damage threshold
  - NRC: 425°F
  - ANO: 700°F
- Heat release rate
  - NRC: 500KW fire peaking in 105 sec.
  - ANO: 100KW peaking in 12 min (Scenario 1a) + cable fires and high energy fault in A4 switchgear and cable fires (Scenario 1b)
- High energy arcing fault in the 4KV switchgear
  - NRC: Not analyzed
  - ANO: Limiting scenario in terms of its consequence, i.e., affected circuits and timing
- Neither analysis reaches 700°F



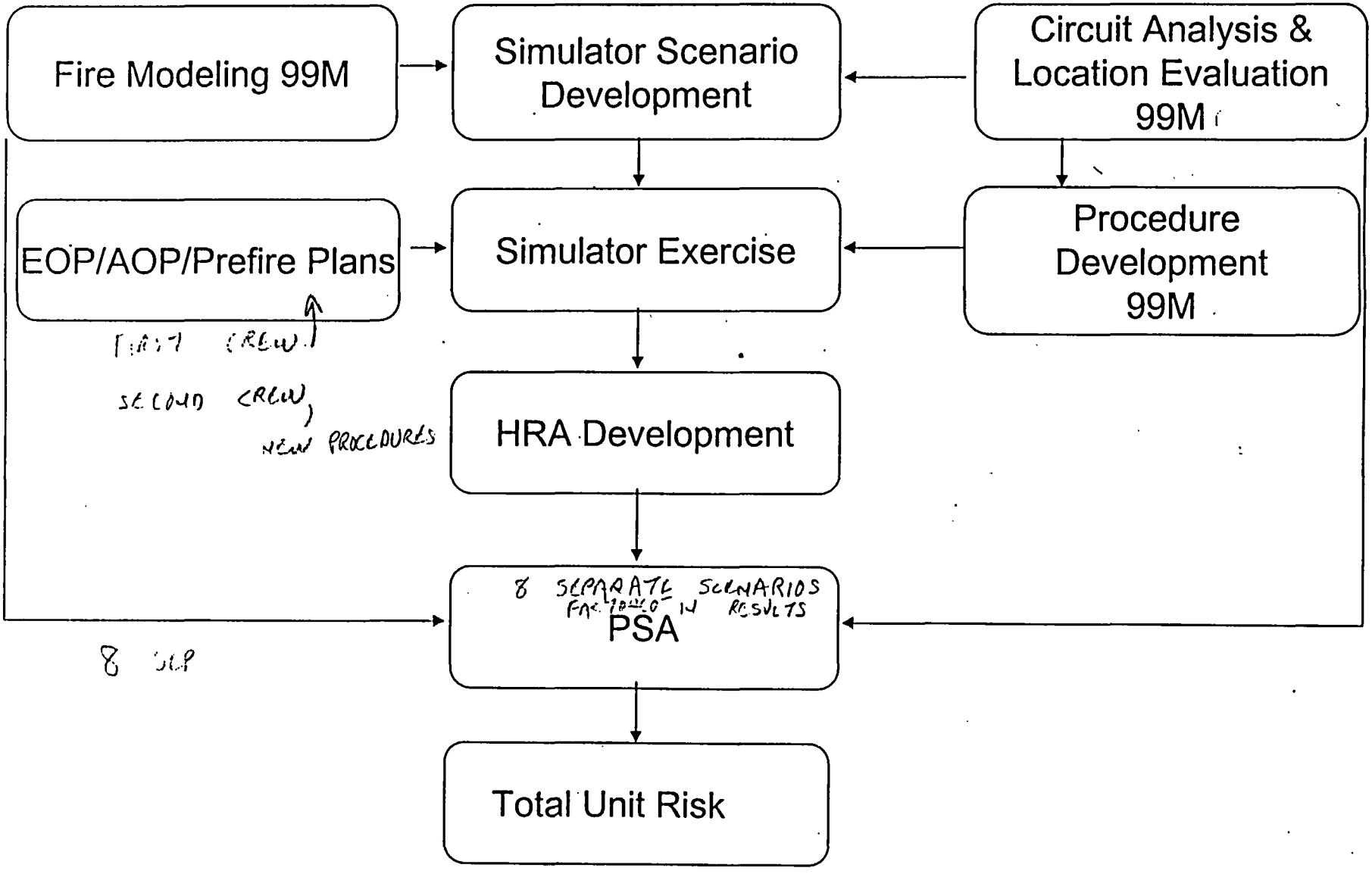
100 KW
vs
500 KW.

Simulator Scenario for Zone 99M

- Three crews ran simulator with previous procedures
- Two crews ran simulator with training on zone specific fire procedure
- One crew with each procedure contained operators in the plant simulating local actions
- Controllers were present in the field to evaluate local manual actions
    - Time to location
    - Potential hazards
    - Communication barriers
- Observers in the simulator to evaluate control room actions
    - Including time to perform in control room actions
    - Procedure usage
    - Work practices due to loss of indications

USE OF AUXILIARY OPERATORS

Risk Informed Strategy for Zone 99M



Risk Assessment Comparison

NRC	ANO
• 425° F cable failure temperature	• 700° F cable failure temperature NEVER APPROACHES 700°F HOT GAS LAYER
• Zone wide prompt damage	• Limited time phased damage
• Generic HRA – Based on zone wide prompt damage – Included LOOP	• Plant specific HRA – Scenario specific operator actions evaluated – No LOOP
• Greater than Green finding	• Green finding