FINAL

STATUS REPORT

FOR

1980 TRIENNIAL FIRE PROTECTION AUDIT

Conducted By

Professional Loss Control, Inc.

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Prepared by

Nuclear Central Office Fire Protection Engineering Section

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Introduction

The 1980 Triennial Fire Protection Audit conducted by Professional Loss Control, Inc. (PLC), divides fire protection system, administrative control, and program deficiencies into two categories--those that are safety related and those that are nonsafety related. The safety-related deficiencies are contained in section 4 of the audit report. This response is limited to those deficiencies which have been identified as safety related by PLC (i.e., section 4 of the audit report).

4.0 Recommendations--Safety Related Areas

4.1 Administrative Control of Fire Hazards

4.1.1 A review should be conducted to re-identify areas where smoking should not be permitted. Existing procedures, such as F 15 and BF 14.3, should then be rigidly enforced to control smoking in unauthorized areas.

TVA Response

The Division Procedures Manual (DPM) has been reviewed to re-identify areas where smoking should not be permitted and applicable revisions to the DPM have been completed. In addition, plant administrative action to be taken when personnel are smoking in unauthorized areas has been escalated and is being rigidly enforced.

4.1.2 Remove the rubber hose and untreated wood from the area near the escape hatch in the service water intake building. In addition, the treated wood partitions in the center and east areas of the building should be replaced with partitions of noncombustible construction.

TVA Response

The rubber hose and wood partitions have been removed.

4.1.3 An administrative procedure should be established to monitor installation of new electrical cables to ensure that, where required, cables are provided with fire retardant coating (see Appendix H for specific examples).

TVA Response

Administrative Procedures Mechanical Maintenance Instruction (MMI) 75 was revised on February 1, 1981 to ensure that proper coating procedures are initiated promptly for all applicable uncoated cables.

4.1.4 Housekeeping should be improved by more rigidly enforcing existing procedures, such as BF 14.3 and BF 14.14. Areas of specific concern include the following:

a. Several combustible rags found in cable trays within unit 3 cable spread room.

b. Three (3) coveralls found in cable trays EG, VE, and KG above platform in unit 1 drywell area.

TVA Response

Existing plant procedures provide adequate controls for housekeeping, and a strict enforcement policy will be followed by plant personnel.

4.1.5 A detailed study should be conducted to verify commitments regarding fire barrier walls. After completion of the study, all affected walls should be inspected to verify integrity of fire doors and dampers.

Unapproved doors should be replaced with doors specifically approved for use as fire barriers. (See Appendix E for a list of existing fire door deficiencies.)

TVA Response

A study of the fire compartmentalization at Browns Ferry has been conducted by the Division of Engineering Design (EN DES) as part of the analysis required to comply with 10 CFR Part 50, Appendix R, Section III.G. The fire compartmentalization study has been forwarded to the plant for verification of the integrity of fire doors and dampers in the affected walls. In addition, door Nos. 602, 606, 608, 612, 614, 615, 616, 617, 622, and 473 have been replaced by UL-labeled fire doors.

4.1.6 The fire protection review of plant modifications (DPM Procedure F 13) should be expanded to include a review of all modifications which could directly or indirectly affect fire protection. (See Appendix G for guidance in this review).

TVA Response

The existing plant procedures and DPM N78S2, Section VII, F13, meet the intent of this recommendation; and no further action is planned.

4.1.7 The damaged safety can in the central portion of the service water building and the gasoline can with the missing flame arrestor in the Power Stores flammable liquid storage room should be replaced or repaired.

TVA Response

This item has been completed.

4.1.8 The plastic ceiling in the control rooms should be demonstrated to be noncombustible or should be replaced in accordance with BTP APCSB 9.5-1 (D1f).

TVA Response

Replacement of the ceiling tiles in the control rooms has begun and will be completed during the next planned outage of each affected unit or during a forced outage of the unit lasting one week or longer, whichever occurs first. Replacement of the ceiling tiles in the unit 3 control room is completed. The replacement material has been approved by NRC-NRR.

4.1.9 Two existing 3-inch openings in the wall from 480V electrical switchgear room (door 654, Elev. 621') to rooms 3A and 3B should be closed. In addition, install approved dampers in the ducts penetrating this wall.

TVA Response

The 3-inch openings have been sealed. Approved dampers were installed in the ducts penetrating the wall during the original design.

4.2 Fire Protection Equipment Surveillance Procedures

4.2.1 MMI-66 should be revised to include a more appropriate reporting form. In addition, the procedure should discuss the flush test in more detail and should include verification of pressure reducer settings where provided.

TVA Response

MMI-66 has been revised to include a new reporting form, discussion of the flush test, and verification of pressure reducer settings.

4.2.2 A surveillance instruction (SI) should be developed to require annual cycling of all valves in the water supply and distribution system. (This is required by current model technical specifications issued by the NRC.)

TVA Response

Since numerous and frequent system tests are conducted, system modifications are frequently required, and normal operating procedures often require valve manipulation, the need for a separate annual valve cycling program is not warranted. The benefits derived from the establishment of a separate surveillance instruction to annually cycle all water supply and distribution valves would not support the additional manpower required to implement the surveillance instruction. Therefore, the present valve maintenance program at Browns Ferry is considered adequate.

4.2.3 A surveillance instruction should be developed to provide verification of operability and integrity of all required fire doors and dampers at least every 18 months. (This is required by current model technical specifications issued by the NRC.)

TVA Response

Surveillance instructions are being developed to provide verification of operability and integrity of all required fire doors and dampers at least every 18 months.

4.2.4 Personnel involved in implementation of surveillance procedures for fire protection systems and equipment should be given formal training, such as that available at off-site courses, to acquaint them with all necessary particulars of the equipment. The existing fragmentation of procedure implementation and use of untrained personnel is undesirable.

TVA Response

Craft personnel (electrical, mechanical, etc.) are involved in the implementation of surveillance procedures for fire protection systems and equipment. They perform the surveillance procedures respective to their craft and are properly trained in their craft. There have not been any major problems associated with the procedures being implemented in this manner; therefore, we believe that no additional training of craft or operations personnel is required.

4.2.5 Procedures should be rigidly adhered to by implementation personnel. Any deficiencies found should be recorded on the data sheets. Deficiencies should be resolved only by issuing corrective work orders (with numbers recorded on data sheet). The implementation personnel should not be allowed to judge which portions of the procedure should be enforced (e.g., MMI-64, hydrant outlets above grade). In cases where a specific procedure is in error, a revision should be issued.

TVA Response

MMI-64 has been revised and procedures are in effect which require deficencies to be corrected by the initiation of a work order.

4.2.6 Revise procedure SI 4.11.A.1.b to require a minimum run time of fifteen (15) minutes for each electric motor driven fire pump.

TVA Response

Procedure SI 4.11.A.1.b has been revised to require a minimum run time of 15 minutes for each electric motor-driven fire pump.

4.2.7 Revise procedure SI 4.11.A.1.b(a) to require a minimum run time of 30 minutes for the engine driven fire pump.

TVA Response

Procedure SI 4.11.A.1.b(a) has been revised to require a minimum run time of 30 minutes for the diesel engine-driven fire pump.

4.2.8 Revise procedure SI 4.11.A.1.h to include a "C factor" test of the underground piping. This would provide information regarding the deterioration of the interior of the fire water supply piping.

TVA Response

Procedure SI 4.11.A.1.h has been revised to include a "C factor" test of the underground piping which will provide information regarding the deterioration of the interior of the fire water supply piping.

4.3 Fire Protection Systems and Equipment

4.3.1 The existing fire water supply arrangement should be revised to discontinue providing service water supply from the fire water system. The fire pumps and underground piping should be dedicated solely for fire protection use. The raw service water pumps and associated roof tanks should be isolated from the fire protection system.

TVA Response

The existing shared raw service water/high-pressure fire protection system has been designed such that normal raw service water loads and the maximum fire water demands can be satisfied simultaneously. For example, the fire pumps and yard distribution system have been sized to provide adequate fire water flow and pressure to the largest single plant fire hazard, i.e., three main transformers in the transformer yard, as well as normal

raw service water loads. This capability provides considerable pressure and flow margin for the single largest fire suppression system protecting safety-related areas of the plant. Redundant isolation valves have been provided to isolate the roof-mounted raw service water head tanks from the fire protection distribution system when any fire pump receives a start signal.

An impairment analysis has been performed for the high-pressure fire protection system as a part of the Browns Ferry recovery effort following the March 22, 1975 fire. This analysis considered all portions of the fire protection system which are required to protect essential safeguard equipment or circuits, and all modifications resulting from the analysis have been completed. It is therefore TVA's position that the existing water supply arrangement is adequate and that the recommended modifications will not significantly enhance the overall safety of the plant. This arrangement has been reviewed by the NRC and found to be acceptable.

4.3.2 Each fire pump should be provided with a "fire pump controller" specifically approved for fire service use. Each pump should be arranged to start automatically upon loss of system pressure.

TVA Response

Since the fire protection system is shared with raw service water as described in the response to item 4.3.1 and the existing pumps are not UL listed or Factory Mutual approved, a listed or approved fire pump controller is not adaptable to the fire pumps. Pressure start logic typical of UL-listed fire pump units is also not adaptable to the existing pumps due to the shared fire protection/raw service water function. It is TVA's position that the present fire pump controller arrangement is highly reliable and adequate for the intended service and that implementation of this recommendation would not significantly improve reliability nor enhance overall plant safety. The existing fire pump controller arrangement has been previously reviewed and approved by NRC.

4.3.3 The diesel fire pump enclosure should be provided with an automatic sprinkler system.

TVA Response

Automatic sprinkler protection should be provided in the diesel fire pump enclosure due to the presence of combustible diesel fuel; however, this would be considered a property protection measure and is not

required to ensure safe plant shutdown assuming a single postulated fire anywhere in the plant. The diesel fire pump was installed to mitigate the effect of a postulated fire in the cable tunnel between the intake pumping station and the powerhouse. During the recovery effort after the March 22, 1975 fire, it was determined that an uncontrolled fire in this cable tunnel could damage the power supplies to all three electric-motor-driven fire pumps. The diesel fire pump has been designed and installed with sufficient separation such that the above postulated fire cannot result in the simultaneous loss of the electric-motor-driven pumps and the diesel-driven pump. Consequently, a fire associated with the diesel fire pump enclosure cannot affect operability of the electric-motor-driven pumps.

4.3.4 All key-operated isolation valves in the distribution piping system should be replaced with post-indicating valves (PIV) specifically approved for fire service use. As an alternative, the existing key valves should be modified to provide positive indication of valve position. Each exposed valve should be protected from vehicular damage by installing appropriately located guard posts around each valve.

TVA Response

Our evaluation of this item has determined that the present key-operated isolation valves provide sufficient system control with adequate administrative controls in place to provide assurance of the position of each valve. Guard posts have been installed to protect exposed valves.

4.3.5 Additional measures should be instituted to provide improved control of the clam problem associated with the fire water supply and distribution system. One alternative which should be considered is to provide a separate fresh-water supply reservoir designated for fire protection use only. The reservoir could be filled from the connection to the city of Athens. If the electric and diesel fire pumps draw their supply from fresh water, then the problem of the clams would be eliminated.

TVA Response

The existing strainer arrangement on all raw water systems is effective in preventing the introduction of adult clams into the systems. In addition, sodium hypochlorite is periodically injected into the fire protection system during the implementation of Surveillance Instruction 4.11.A.1.f.b, and an improved flushing procedure (MMI-122) has been written and implemented. TVA considers the above measures to be adequate and effective.

4.3.6 Additional sway bracing should be provided for the sprinkler piping located above the unit 1 drywell entrance and along the north wall of the 593' elevation.

TVA Response

Pipe supports for all fire protection piping systems have been provided in accordance with ANSI B31.1, and some have been analyzed for seismic loading. Sprinkler piping located above the unit 1 drywell entrance and along the north wall of the reactor building at elevation 593' has been designed considering safe shutdown earthquake loading. TVA considers the above design requirements to be conservative when compared to the hanger requirements specified in applicable NFPA codes.

4.3.7 Install smoke detection to provide for early warning of a fire in electric board rooms 1, 2, and 3 (480-volt switchgear) in the control building.

TVA Response

The 480- and 250-volt reactor MOV boards are located in the reactor buildings at elevations 593.0 and 621.25 for each of units 1, 2, and 3. The provision of smoke detection in these rooms would provide prompt notification of a fire in the equipment which would help to reduce the amount of equipment damage resulting from a fire. The 480-volt RMOV boards 1A, 1B, 1D, 1E, 2A, 2B, 2D, 2E, 3A, 3B, 3D, and 3E are required for safe shutdown along with the 480-volt shutdown boards 1A, 1B, 2A, 2B, 3A, and 3B and the 4-kv shutdown boards A, B, C, D, 3EB, and 3EC. These boards are located in shutdown board rooms A, C, and E. Therefore, TVA will provide total flooding Halon 1301 and smoke detectors in shutdown board rooms A, C, and E.

4.3.8 Install fire detectors and/or automatic sprinklers for the laundry areas of unit 3 reactor building (elevation 621').

TVA Response

The laundry areas of unit 3 reactor building (elevation 621') have been removed.

4.3.9 Relocate thermal detectors over the unit 1 HPCI pumps to the center of the hazard.

TVA Response

The heat detectors are located over the most hazardous area of the unit 1 high-pressure coolant injection (HPCI) pumps and will provide sufficient detection and activation of the protection system. Therefore, the present location of the detectors is considered satisfactory.

4.3.10 Extend smoke detectors to cover the area near R-17N of the unit 3 reactor bulding (elevation 565') where preaction sprinklers are already installed.

TVA Response

The detectors are located near the cable trays to provide early detection and quick activation of the suppression system in the event of a fire in the cable trays. The low combustible loading in the surrounding areas does not justify the installation of additional detectors.

4.3.11 Existing smoke detectors in auxiliary instrument rooms 1, 2, and 3 (control building, elevation 595') should be relocated to the ceiling as indicated below:

Room 1 - detectors 3915D and 3915E
Room 2 - detector 3917D
Room 3 - detectors 3919D and 3919E

In addition, more detectors should be installed in rooms 2 and 3 to ensure coverage of all beam pockets in accordance with NFPA 72E.

TVA Response

To ensure detection of smoke in all beam pockets, the referenced detectors should be relocated to the ceiling in the beam pockets which do not have detectors. Therefore, TVA will relocate the detectors as indicated above and additional detectors will be provided where needed.

4.3.12 Replace damaged smoke detector 105DB in the communications battery room (elevation 593').

TVA Response

This item is complete.

4.3.13 Install additional smoke detectors in unit 3 reactor building (elevation 593') near column R16T-T to provide coverage of all beam pockets.

TVA Response

The preaction system in unit 3 reactor building (elevation 593') near column R16T-T does not extend into the referenced beam pocket. Due to the lack of combustible loading and the absence of a preaction system in the beam pocket, no additional detectors are needed.

4.3.14 Because of the brigade access problems and fire hazard potentials associated with the reactor building corner rooms (elevation 519'), fire detection and/or suppression should be provided for each area.

TVA Response

The provision of fire detection and suppression would enhance property protection; however, the reactor building "corner rooms" on elevation 519 which contain the core spray pumps do not contain a significant fire hazard potential as determined by the fire hazard analysis performed during the post-fire recovery effort. The calculated fuel load associated with lube oil contained in the equipment within the rooms is 452 Btu/ft^2 for the core spray pump rooms. Sufficient fire rated separation exists between each of the rooms in each unit such that a fire in any one room would not spread to the adjacent room containing redundant equipment. It is therefore our position that the addition of the fire detection and/or suppression systems would not enhance overall plant nuclear safety and the absence of detection and/or suppression systems in the core spray pumprooms does not constitute an impairment to safe plant shutdown. TVA will install a preaction sprinkler system in the RHR pumprooms at elevations 519' and 541' of the reactor building.

4.3.15 A determination should be made by management as to whether or not standpipe nozzle pressures should be limited to 125 psi as required by OSHA. If this is the desire, each standpipe should be evaluated and an appropriate pressure reducer provided only where needed. The pressure reducer should be calibrated, sealed and verified as being in the proper setting as a part of the MMI-66. Standpipes which now have two pressure reducers should have at least one removed.

TVA Response

A survey of all hose stations in the plant has been completed to determine pressure reducer settings necessary to obtain a 75-psi nozzle pressure. Pressure reducers will be installed or removed as necessary. MMI-66 has been revised to indicate pressure reducer settings.

4.3.16 Access to standpipes R1-19 in unit 1 reactor building (elevation 565') adjacent to stair, R3-51 unit 3 reactor building (elevation 621') near the laundry, and R3-19 in unit 2 drywell access (elevation 565') are obstructed and should be corrected.

TVA Response

The present access to standpipe R1-19 in unit 1 reactor building (elevation 565') has been evaluated, and the existing access provided is adequate to allow access during normal and emergency conditions. The accesses to the standpipes at R3-51 unit 3 reactor building (elevation 621') near the laundry and R3-19 in unit 2 drywell access (elevation 565') have been cleared.

4.3.17 All sprinkler, water spray, and preaction system control valves should be locked or sealed in the normally open position to ensure correct orientation at the time of a fire. Similar controls should be provided for isolation valves on the yard loop.

TVA Response

Operation of all sprinkler, water spray, and preaction system control valves along with isolation valves on the yard loop is strictly controlled by existing administrative procedures. These existing procedures ensure the correct orientation of the valves at the time of a fire. The provision of locks or seals would not provide a significant increase in the control of the valves.

4.3.18 Identification signs should be provided for all water suppression system control valves and manual actuation stations presently lacking such signs. Specific attention should be directed to the manual actuation station for unit 3 south lube oil tank and the four sprinkler systems in unit 3 reactor building (elevation 565') near column R-17 U.

TVA Response

Plant personnel have evaluated each area and have installed identification signs where needed.

4.3.19 Water flow alarm devices should be provided for all water suppression systems which supply more than 20 sprinkler heads in accordance with provisions of NFPA 13.

TVA Response

All fixed water spray systems and preaction sprinkler systems are provided with pressure switches downstream of the deluge or preaction valve to annunciate the introduction of water into the normally dry portions of the system regardless of the number of heads served by the system. In addition, all water suppression systems have smoke and/or heat detection with a central alarm; therefore, adequate notification of system activation is presently provided.

4.3.20 All preaction sprinkler systems supplying more than 20 heads should be provided with air supervision in accordance with paragraph 5-3.5.2 of NFPA 13.

TVA Response

The intent of the air supervision requirement stated in paragraph 5-3.5.2 of NFPA 13 is to provide a degree of assurance that one or more sprinkler heads have not been opened or damaged such that, in the event the preaction valve opens, water damage would not occur as a result of the inadvertently opened head.

The design of preaction sprinkler systems at Browns Ferry employs cross-zoned ionization smoke detector logic which provides adequate assurance the preaction valve will not open due to spurious actuation on a single smoke detector.

Inadvertent actuation of the sprinkler systems has been analyzed, and it has been determined that safe shutdown capability will not be jeopardized by the inadvertent actuation of any sprinkler system within the plant.

This arrangement has been reviewed and approved by NRC during the post-fire recovery effort. The addition of air supervision in accordance with NFPA 13 will not significantly improve the overall safety of the plant.

4.3.21 A curb should be provided around HPCI to confine the oil hazard to the area protected by water spray or the spray system should be expanded to protect the probable oil spill area.

TVA Response

The HPCI pump rooms are separated from each other and from other areas of the plant such that a fire in the pump room will not spread to adjacent areas. Curbs are provided at the doorway to each HPCI pump room. Loss of the HPCI pump capability is acceptable since other flow paths are available to maintain reactor coolant inventory.

4.3.22 All adjustable spray nozzles should be replaced with fixed water spray nozzles which are listed or approved for use in fire protection systems.

TVA Response

Except for the HPCI pumproom, the use of nonlisted or unapproved adjustable spray nozzles is restricted to nonsafety-related areas which do not contain systems or equipment required for safe plant shutdown. The adjustable spray nozzles in the HPCI pumprooms will be replaced with fixed-spray nozzles.

4.3.23 Existing sprinkler heads presently installed an excessive distance below the ceiling (see Appendix A) should be relocated in accordance with the requirements of NFPA 13 or tests should be conducted to verify the validity of the existing design.

TVA Response

Refer to the responses given in Appendix A for specific areas where sprinkler heads are presently installed an excessive distance below the ceiling when compared to the requirements contained in the applicable sections of NFPA 13.

4.3.24 Pendent sprinkler heads installed in the upright position should be replaced with appropriate directional water spray nozzles or upright heads or tests should be conducted to verify the water distribution achieved by the present system (see Appendix A).

TVA Response

The intent of the sprinkler systems installed during the post fire recovery effort as stated in Part X, Section 5.2, of the Recovery Plan was to provide a nominal water density of "0.3 gpm/ft^2/5000 ft^2 over the area of application. Additional sprinklers were located as required to ensure thorough wetting of conduit at locations where divisional conduit cross divisional cable trays." During the detail design of the sprinkler systems, it was determined that upright heads could not be located so as to provide the desired coverage to ensure thorough wetting of conduit as stated above. TVA therefore elected to use pendent heads in the upright position so as to ensure a sprinkler pattern which would accomplish the desired conduit coverage. Comparison of discharge patterns using manufacturers' data was made between approved directional nozzles and the pendent heads which were installed. The results of the comparison indicated that the discharge pattern of the directional nozzles installed in the pendent position were essentially identical to the discharge pattern of the pendent sprinklers installed in their approved position. It was therefore concluded that the pendent heads installed in an upright position would exhibit a spray pattern essentially identical to the pattern exhibited by the approved directional nozzles installed in an upright position.

TVA therefore believes the existing installation to be adequate and that it satisfies the requirement for coverage of divisional conduit as required by the commitment in Part X, Section 5.2, of the Recovery Plan.

4.3.25 The sprinkler design philosophy for areas containing cables should be reevaluated to determine the validity of present installations in light of the tests conducted by Sandia Labs.

TVA Response

The sprinkler design philosophy for areas containing cables was based upon the principle of providing direct protection for the cable trays. This philosophy differs from the current philosphy of providing protection from an exposure fire by the provision of general area sprinkler coverage. While the sprinkler design may not provide the same degree of protection for the cables from an exposure fire when compared to an area coverage sprinkler system, it is TVA's position that an adequate degree of exposure protection due to thorough wetting of the cables is provided. The existing configuration has been reviewed and approved by NRC during the recovery effort after the March 22, 1975 fire.

4.3.26 To reduce the probability of heads becoming clogged by debris during use, small orifice sprinkler heads and spray nozzles should not be used on new systems or when modifying existing preaction systems.

TVA Response

It is current TVA philosophy to use 1/2-inch orifice sprinkler heads. Current philosophy for the selection of fixed water spray nozzles considers location of strainers and strainer screen perforation size in accordance with NFPA 15.

4.4 Fire Brigade

4.4.1 One individual should be assigned the responsibility of coordinating all fire brigade activities to ensure uniform training of all shifts. He should determine that appropriate fire brigade equipment is provided and maintained. This person would critique all fire drills and provide documentation of the drills. Finally, he should see that sufficient pre-fire plans are developed and kept current with changing plant conditions.

TVA Response

The existing plant procedures ensure that all the duties specified in the recommendation are charged to specific individuals. The procedures presently established provide supervision equivalent to that which is recommended.

4.4.2 The existing off-site brigade training course should be supplemented at the plant. Plant fire hazards, fire equipment locations, pre-fire plan familiarity, proper use of available equipment, operation of the fire truck, etc., should be included in this training. (See Attachment No. 2 of the NRC Supplementary Guidance on Nuclear plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance for additional details.)

TVA Response

Plant fire hazards, fire equipment locations, pre-fire plan familiarity, proper use of available equipment, operation of the fire truck, etc., are currently included in the fire brigade member training sessions held at the plant.

4.4.3 Classroom instruction for the fire brigade members should be conducted quarterly and scheduled such that all subjects are repeated over a two-year period. The length of time allowed for the refresher training should be expanded to allow for more complete coverage of the necessary subject matter.

TVA Response

Classroom instruction for the fire brigade members is currently being conducted quarterly and scheduled such that all subjects are repeated over a 2-year period. The length of time allowed for the refresher training has been expanded to allow for more completed coverage of the necessary subject matter.

4.4.4 Additional quarterly training should be provided for brigade leaders in the direction and coordination of firefighting activities.

TVA Response

Quarterly drills are being conducted to provide brigade leaders training in the direction and coordination of firefighting activities.

4.4.5 Improved physical firefighting facilities should be provided at the plant so that typical plant fire hazards can be simulated during the annual firefighting practice session. As a part of this practice, SCBA should be worn during all firefighting exercises rather than during the specific SCBA training only.

TVA Response

The central training facility provides simulation of plant fire hazards, and additional training is given at the plant site. Self-contained breathing apparatus (SCBA) is worn during firefighting exercises in which it is deemed necessary by simulated conditions.

4.4.6 The annual physical exam currently given to each AUO should verify that he is capable of performing necessary firefighting tasks under physical stress. Similar physicals should be given to all brigade support personnel as well, if they are to be involved in actual firefighting.

TVA Response

All Level I fire brigade members are given annual physical evaluations to verify that they are capable of preforming necessary firefighting tasks under physical stress.

4.4.7 Critiques of quarterly fire drills should be improved and expanded to describe the brigade response (list specific names), problems that were encountered, and actions taken by the brigade. The drills should be carefully pre-planned and made as realistic as possible. SCBA and firefighting equipment, such as charged hose lines, should be utilized to simulate actual fire conditions. The use and evaluation of existing procedures should be stressed. (See Appendix F for additional suggestions on fire drills.)

TVA Response

Critiques of quarterly fire drills list the brigade members who responded, problems that were encountered, and actions taken by the brigade. The drills are carefully preplanned using existing procedures and made as realistic as possible.

4.4.8 Specific training should be provided to brigade personnel on the proper use of the fire department type pumper which is provided at the plant.

TVA Response

Training on the proper use of the fire department type pumper has been provided to all of the fire brigade members. This item is complete.

4.4.9 The annual Athens Fire Department training program should include a joint drill for brigade and fire department personnel. This will improve awareness of each group's capabilities.

TVA Response

Presently, no offsite agreement exists.

4.4.10 Brigade personnel should wear full protective equipment for their safety during all firefighting operations.

Turnout coats, SCBA, gloves, and helmets should be worn as an absolute minimum for all interior fire incidents.

TVA Response

Present procedures requiring brigade personnel to wear appropriate protective equipment for the particular situation simulated are considered adequate.

4.4.11 Brigade communications should be improved through the purchase and proper use of new portable radios (now on order).

TVA Response

This item is complete.

4.4.12 Pre-fire plans should be developed for all important areas of the plant but with special emphasis on safety-related areas or areas which expose safety-related areas (e.g., refuel floor, control rooms).

TVA Response

Plant personnel have reviewed and updated the existing pre-fire plans. New pre-fire plans will be developed where necessary.

4.4.13 Brigade members should be cautioned about the use of fog nozzles on the refueling floor when the new fuel vault is open.

TVA Response

This item is complete.

Appendix A

Specific Locations of

Representative Water Suppression System Deficiencies

Deficiency	Location
Sprinkler heads and/or spray nozzles are obstructed	a. Battery Board Rooms 1, 2, and 3 (Control Building, elevation 593') b. Carpenters Shop in Service Bldg. c. Unit 3 Air Handling Room (elevation 617')

TVA Response

a. Some of the sprinkler heads in battery board rooms 1, 2, and 3 (control building, elevation 593') are obstructed and may not perform their intended function; however, the sprinkler system is fully operable. TVA will modify these systems to ensure that the sprinkler head discharge patterns will not be obstructed in such a manner as to prevent the systems from performing their intended function.

b. This item has no nuclear safety significance.

c. The sprinkler heads in the unit 3 air handling room (elevation 617') are obstructed and may not perform their intended function; however, protection of this room is not required to ensure safe shutdown as determined by the recently completed 10 CFR 50, Appendix R, Section III.G, analysis. Therefore, TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

Deficiency	Location
Closed head sprinklers are located excessive distances from the ceiling	a. Battery Rooms 1-3 (elevation 593') b. Battery Board Rooms 1, 2, and 3 (elevation 593') c. Unit 1, MG Set d. Mechanical Equipment Room (west end, elevation 617') e. Unit 3, Air Handling Room (elevation 617')

f. Cable Spread Units 1, 2, and 3 (rooms A and B)

g. Reactor Building Units 1, 2, and 3 (elevation 565')

h. Units 1, 2, and 3 (elevation 593')

TVA Response

a. The closed-head sprinklers in battery rooms 1-3 (elevation 593') are located excessive distances from the ceiling and will have a delayed response time; however, the sprinkler system is fully operable. TVA will install heat collectors over these heads to entrap the heat required to fuse the heads.

b. Some of the closed-head sprinklers in battery board rooms 1, 2, and 3 (elevation 593') are located excessive distances from the ceiling and will have a delayed response time; however, the sprinkler system is fully operable. TVA will either install heat collectors over these heads to entrap the heat required to fuse the heads or relocate the heads closer to the ceiling in order to reduce the response time.

c. The closed-head sprinklers over the unit 1 MG set are located an excessive distance from the ceiling and will have a delayed response time; however, the sprinkler system is fully operable. TVA will install heat collectors over these heads to entrap the heat required to fuse the heads.

d. The closed-head sprinklers in the mechanical equipment room (west end, elevation 617') are located an excessive distance from the ceiling; however, protection of this room is not required to ensure safe shutdown as determined by the recently completed 10 CFR 50, Appendix R, Section III.G, analysis. Therefore TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

e. The closed-head sprinklers in the unit 3 air handling room (elevation 617') are located an excessive distance from the ceiling; however, protection of this room is not required to ensure safe shutdown as determined by the 10 CFR 50, Appendix R, Section III.G, analysis. Therefore TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

f. Refer to the responses to 4.3.24 and 4.3.25.

g. Refer to the responses to 4.3.24 and 4.3.25.

h. Refer to the responses to 4.3.24 and 4.3.25.

Deficiency	Location
Sprinklers are too far from room walls	a. Control Building Locker Room (door 602, elevation 617')

b. Control Building Rest Room (door 622)

c. Unit 3 Air Handling Room (elevation 617')

TVA Response

a. Some sprinklers in the control building locker room (door 602, elevation 617') are located an excessive distance from the room walls; however, due to the light combustible loading in this area, relocating the sprinkler heads to achieve literal compliance with NFPA 13 requirements will not significantly enhance the overall safety of the plant and is therefore not warranted.

b. Some sprinklers in the control building rest room (door 622) are located an excessive distance from the room walls; however, due to the light combustible loading in this area, relocating the sprinkler heads to achieve literal compliance with NFPA 13 requirements will not significantly enhance the overall safety of the plant and is therefore not warranted.

c. Some sprinklers in the unit 3 air handling room (elevation 617') are located an excessive distance from the room walls; however, protection of this room is not required to ensure safe shutdown as determined by the 10 CFR 50, Appendix R, Section III.G, analysis. Therefore, TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

Deficiency	Location
Sprinklers are too close together without baffles	a. Control Building rest rooms (elevation 617', doors 602 and 622) b. DPO Engineering Office (doors 616, 617) c. Corridor adjacent to unit 1 diesel generator cells

TVA Response

a. The sprinklers are too close together in the control building rest rooms (elevation 617', doors 602 and 622) which may delay operation of sprinklers adjacent to the operating sprinkler; however, due to the light combustible loading in this area, relocating the sprinkler heads or installing baffles to achieve compliance with NFPA 13 requirements will not significantly enhance the overall safety of the plant and is therefore not warranted.

b. Some sprinklers in the DPO engineering office (doors 616, 617) (now designated as the Technical Support Center) are too close together which may delay operation of sprinklers adjacent to the operating sprinkler; however, protection of this room is not required to ensure safe shutdown as determined by the 10 CFR 50, Appendix R, Section III.G, analysis. Therefore, TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

c. The sprinklers are too close together in the corridor adjacent to unit 1 diesel generator cells which may delay operation of sprinklers adjacent to the operating sprinkler; however, protection of this corridor is not required to ensure safe shutdown as determined by the 10 CFR 50, Appendix R, Section III.G, analysis. Therefore, TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

Deficiency	Location
Sprinkler supply piping is too small	a. Near detector 103BS in Room B Cable Spread b. DPO Engineering Office (Control Building)

TVA Response

The sprinkler system in both areas has been hydraulically calculated in accordance with NFPA 13, and the calculations have indicated that design densities will be achieved with the pipe sizes presently installed. Increasing pipe sizes for literal compliance with NFPA minimum pipe size requirements will not significantly enhance the overall safety of the plant and is therefore not warranted.

Deficiency	Location
Fixed spray nozzles are needed	a. Reactor Building HPCI b. Hydrogen Seal Oil c. Turbine Oil Tanks d. Feed Pumps

TVA Response

Refer to the response to item 4.3.22.

Deficiency	Location
Protection is not complete	a. Unit 3 Air Handling Room (elevation 617')
	b. Beneath turbine oil tanks
	c. Beneath outside transformers
	d. Unit 1 HPCI pumps (elevation 619')

TVA Response

a. The present ceiling sprinkler system does not provide sprinkler protection for all areas of the unit 3 air handling room (elevation 617'); however, protection of this room is not required to ensure safe shutdown as determined by the 10 CFR 50, Appendix R, Section III.G, analysis. Therefore, TVA will modify this system only if it is determined to be cost beneficial on a property protection basis.

b. This item has no nuclear safety significance.

c. This item has no nuclear safety significance.

d. Refer to the responses to 4.3.9 and 4.3.21.

Deficiency	Location
Improper spray nozzle orientation	a. Directed toward bushings on second and third transformers from the east

TVA Response

This item has no nuclear safety significance; however, the nozzle spray patterns have been observed during a flow test of the systems and the existing spray nozzle orientation is correct.

Deficiency	Location
Pendent heads in the upright position	a. Reactor Units 1, 2, and 3 (elevation 565')
	b. Units 1 and 2 (elevation 593')
	c. Cable Spread Rooms A and B

TVA Response

Refer to the response to 4.3.24.

Deficiency	Location
Deluge valves are not approved for fire service use	a. H_2 cylinder storage area-Coppus Sentry valves used b. Unit 2B feedwater pumps

TVA Response

This item has no nuclear safety significance.

Standpipe and Hose Stations

Deficiency	Location
Fire protection supply used for service water	a. Standpipe TB3-12 in unit 3 Turbine Building b. South wall of unit 2 Reactor Building (elevation 565')

TVA Response

Refer to the response to 4.3.1.

Deficiency	Location
Standpipe riser needs additional pipe support and swag bracing	a. Standpipe T-10C Turbine Building (elevation 586')

TVA Response

This item has no nuclear safety significance.

Deficiency	Location
Insufficient fire hose to cover all areas	a. Power Stores Room

TVA Response

This item has no nuclear safety significance.