

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D. C. 20555

May 9, 1988

Docket Nos. 50-259/260/296

APPLICANT: Tennessee Valley Authority

FACILITY: Browns Ferry Nuclear Plant, Units 1, 2 and 3

SUBJECT: SUMMARY OF MEETING HELD ON APRIL 28, 1988 - FIRE PROTECTION

On April 28, 1988, members of the Office of Special Projects (OSP) staff met with representatives of the Tennessee Valley Authority (TVA or the licensee). The purpose of the meeting was to discuss TVA's April 4, 1988 Fire Protection Report, including Appendix R exemption requests and the Browns Ferry safe shutdown analysis. Enclosed is a list of attendees (Enclosure 1).

The licensee presented a short overview of the Fire Protection Report as well as future Fire Protection submittals forthcoming prior to restart. The slides used in the licensee's presentation are contained in Enclosure 2. In addition, TVA provided an overview of its planned implementation of a dedicated Browns Ferry fire brigade. The TVA supplied hand-outs on this topic are provided in Enclosure 3. A TVA submittal is being prepared on the new fire brigade.

After TVA's overview, the staff and TVA discussed specific issues concerning TVA's Fire Protection Report. These questions dealt with the requested technical exemptions from III.G to Appendix R, the safe shutdown analysis, and the potential for microbial induced corrosion (MIC) problems in fire protection systems.

Several issues were identified by the staff requiring further TVA assistance. TVA agreed to assist the staff by providing following :

- A list of Browns Ferry deviations from the NFPA (National Fire Protection Association) codes in nuclear safety related areas or for fire protection systems designed to protect nuclear safety related systems. Arrange the deviation list by fire protection system and specify location(s) of deviations.
- The justification for each specific deviation from the NFPA codes and an estimate of when modifications will be completed if code compliance will improve fire protection at Browns Ferry.
- 3. Identification of fire protection systems upgrade work already completed or planned for completion prior to Unit 2 restart. Upgrade work should include all work related to meeting the requirements of Appendix R or Browns Ferry Fire Protection Improvement Plan.

8805190125 880509 PDR ADOCK 05000259 4. Drawings of Fire Areas or parts of Fire Areas showing the location and coverage of fire protection and suppression systems. For systems which do not meet NFPA codes (on the basis of area coverage) show the location of individual sprinkler heads and detectors to the extent practicable. Drawings should be made for systems now in place as well as for the scheduled modifications. Where modifications will be made in stages, these stages should be clearly indicated so as to relate the drawings to the schedule.

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The staff indicated that the Fire Protection Report is still under review. The staff further indicated that the above information would be necessary to continue the review. A site visit would be scheduled in June to further discuss and review the overall fire protection program at Browns Ferry. The date for the Browns Ferry Appendix R audit was tentatively scheduled for August dependent upon TVA's completion of its Appendix R/Fire Protection modifications.

> Original Signed by Gerald E. Gears, Project Manager TVA Projects Division Office of Special Projects

Enclosures: As stated

cc w/enclosures: See next page

DISTRIBUTION Docket File NRC PDR Local PDR Those on Attached List

OSP: TVA/PM GGearsias 5/4/88



TVA:A/AD/P RAHermann 5/9/88 May 9, 1988

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Facility: Browns Ferry Nuclear Plant, Units 1, 2 and 3

Docket File NRC PDR Local PDR Projects Reading SEbneter JAxelrad SRichardson RHermann BDLiaw RII KBarr GGears DMoran JKelly JStang RPierson RWescott AMarinos PHearn JWatt 15-B-18 OGC 15-8-18 JRutberg FMiraolia EJordan JPartlow ACRS (10) Hon. M. Lloyd Hon. J. Cooper Hon. D. Sundquiest Hon. A. Gore PGwynn JScarborough GMarcus CMiller TElsasser CAder TVA-Rockv111e BFN Rdg. File

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ENCLOSURE 1

FIRE PROTECTION APRIL 28, 1988

Organization

Patrick Carier Steven D. Richardson M. J. May P. J. Polk Nick Fioravante Stuart Kammer Dale Merrick Robert T. Wimbrow Charles E. Anderson Dennis McClosky Larry Retzer Stew Ebneter Jane Axelrad Robert Hermann Jim Watt Pete Hearn Les Ginn Jim Kern John Stang B. D. Liaw G. Gears Rex Wescott Bob Pierson

TVA/Licensing NR/OSP TVA/Licensing TVA-Rockville TENERA TVA/Licensing TVA/DNE TVA/DNE TVA/DNE TVA/DNE TVA/Licensing NRC/OSP NRC/OSP NRC/OSP NRC/OSP NRC/OSP TVA/Licensing TVA/Fire Protection NRC/NRR NRC/OSP NRC/OSP NRC/OSP NRC/OSP

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ENCLOSURE 2

AGENDA FOR APRIL 28, 1988

NRC/TVA FIRE PROTECTION MEETING

INTRODUCTION

P.P. CARIER

APRIL 4, 1988 FIRE PROTECTION SUBMITTAL OVERVIEW DISCUSSION

FUTURE SUBMITTALS SCHEDULE AND SCOPE

FIRE DEPARTMENT D. MCCLOSKEY DISCUSSION

SUMMARY

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P.P. CARIER

P.P. CARIER

PLANNED BEN SUBMITTALS-

PRIOR TO RESTART

* LICENSE AMENDMENT

- A. AMEND "1975 FIRE RECOVERY PLAN"
- B. TECHNICAL SPECIFICATION REVISION
- * OVERALL TECHNICAL SPECIFICATION UPGRADE
- * UNIT 2 OPERABILITY ISSUE

POST RESTART

- * FSAR REVISION TO INCLUDE "FIRE PROTECTION REPORT"
- * GL 86-10 LICENSE AMENDMENT TECHNICAL SPECIFICATION DELETION

OVERVIEW OF

FIRE PROTECTION REPORT AND SUPPLEMENT

o Purpose

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- o Outline
- o Fire Protection Upgrade Program
- o Implementation

PURPOSE

- Supersede the 1975 Fire Recovery Plan and establish a new fire protection licensing basis
- Consolidate Fire Protection Program Documents and Commitments Into a Single Document
- Facilitate Referencing Fire Protection
 Program Documents in the FSAR
- Support the Removal of Fire Protection
 Features from the Technical Specifications
- o Satisfy Commitments Made in Volume III of the Nuclear Performance Plan

OUTLINE

1

A. FIRE PROTECTION REPORT

- o Fire Protection Plan
- o Appendix R Submittal and Supplemental Information
- o Fire Hazards Analysis

B. FIRE PROTECTION REPORT SUPPLEMENT

- o Branch Technical Position CMEB 9.5-1 Comparison
- o Fire Protection Upgrade Program
- o Prior Commitments Evaluation

FIRE PROTECTION UPGRADE PROGRAM

SUMMARY OF UPGRADES

o AUTOMATIC SUPPRESSION

Provide additional coverage, relocate and change sprinkler heads, provide air supervision etc.

o FIRE DETECTION

Replace existing control panels, provide supervised circuits. Add detectors and alarm systems.

o COMPARTMENTATION

Provide additional compartmentation in control and diesel buildings

o FIRE PROTECTION WATER SUPPLY

Install new tanks and fire pumps, separate raw and fire water systems, provide auto actuation of pumps on drop in pressure.

IMPLEMENTATION

Prior to restart from current outage:

- Complete Appendix R Modifications, programs, and procedures
- Submit license ammendment to reflect current status of compliance with Part X of the 1975 Fire Recovery Plan

After restart from current outage:

- Submit License ammendment deleting condition to Part X of the 1975 Fire Recovery Plan and replacing it with generic condition in Generic Letter 86-10
- Revise the FSAR to reflect Appendix R Modifications and to add reference to the Fire Protection Report

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- Remove fire protection requirements from the Technical Specifications
- Implement Fire Protection Upgrade Program
- Implement the new Fire Protection Plan

Fire Protection Prevention And Suppression Program Enhancements





Presentation to:

Nuclear Regulatory Commission

Bethesda, Maryland

Presentation by:

Office of Nuclear Power

Browns Ferry Nuclear Generating Station

APRIL 28, 1988

Defense in Depth Approach to Providing Fire and Emergency Medical Services

EXISTING

Manual Fire Protection

SQN - Brigade (Both Inside and Out) composed of 5 operations personnel

Apparatus - none

BFN - Inside - 5 operator brigade

Outside (protected area) - 3 Nuclear Security Service Officers assisted if necessary by the five operators

Apparatus -750 gpm front mount pumper

Emergency Medical Services

ALL provided by Nuclear Security SITES - Service Officers utilizing ambulances

PROPOSED

Fire and Emergency Medical Services

Brigade Composition

SQN, A dedicated fire brigade consisting BFN - of:

- (1) Fire Captain (Brigade Leader)
- (4) Fire Operators

Optimal Composition of New Brigade

- (1) Plant Operator
- (1) Electrician
- (1) Steamfitter

(1) Fire Operator (former paid firefighter)

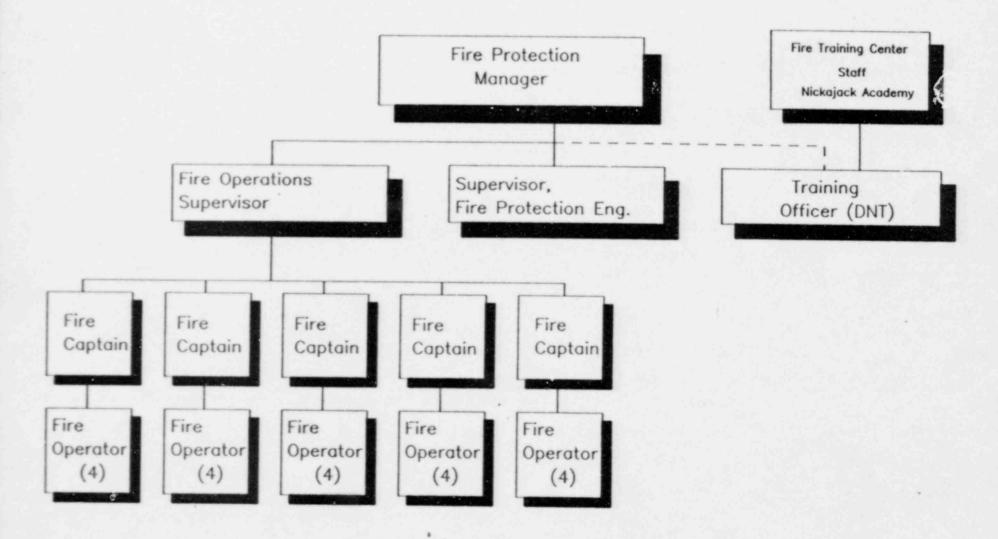
Incident Commander

Commanding the fire brigade on all power block and auxiliary equipment fire emergencies will be an Assistant Shift Operations Supervisor (ASOS). Plant personnel support and resources will be at his disposal. The Shift Operations Supervisor (SOS) in the Control Room will remain the Emergency Coordinator.

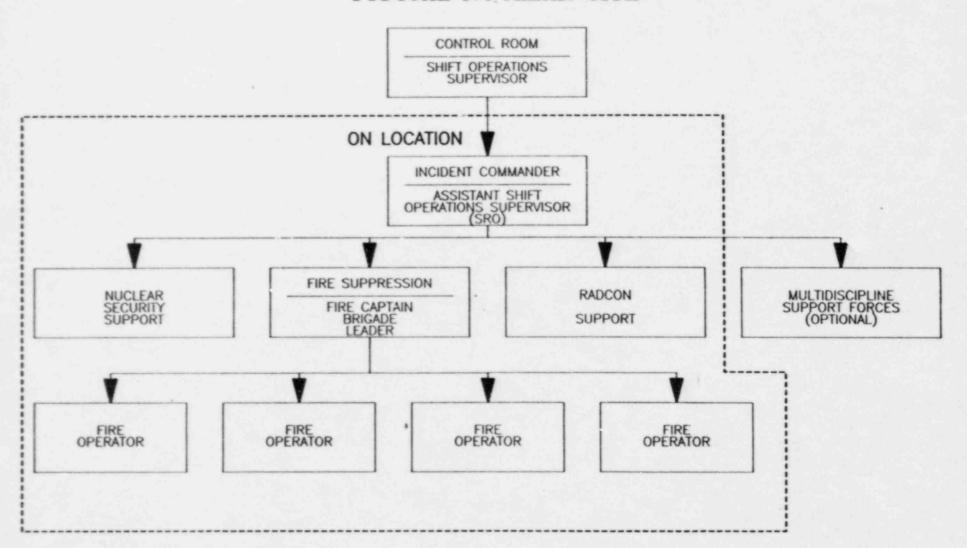
<u>NOTE:</u> Tech Specs remain unchanged. Fire brigade manned by a brigade leader (fire captain) and four fire operators (brigade members). The team composition may be less than the minimum requirements for a period of time not to exceed 2 hours, in order to accommodate unexpected absence. Immediate action will be taken to fill the required positions.

BROWNS FERRY NUCLEAR PLANT PROPOSED SITE FIRE PROTECTION ORGANIZATION

Non Emergency



FIRE EMERGENCY RESPONSE ORGANIZATION TYPICAL NUCLEAR SITE



Fire Truck

Each plant has a fire engine. Present apparatus is a 1000 gpm pumper with foam tank and 50 ft. telescopic waterway with attached ladder

EMS Transport Off-Site

(life and death cases only - on site personnel)

- When the fire brigade composition drops below the minimum required, immediate recall of personnel will be initiated

Fire Protection Non-Safety Related Areas

Additional TVA resources will be provided fire protection services with an estimated uninsured value in the millions to include areas on the TVA reservation such as:

Site Power Stores Warehouse

Site Training Facilities

Site Administrative Facilities

Temporary Structures

Transformers

Turbine Structures

Cooling Towers

Heavy Equipment (including Cranes)

Trailers

Vehicles

Power Operations Training Center (Simulators)

Mutual Aid

Offsite fire departments will provide the facility with mutual aid fire suppression assistance. Note: The five-man shift will not leave the reservation to render mutual aid to offsite agencies

Mission Essential

The fire operators and leadership understand that suppression of fires in the power block is mission essential. In the very unlikely event of a dual casualty, all fire forces will abandon the non-power block emergency assignment and respond immediately to the power block fire. The brigade is in radio contact with the Control Room at all times.

Reservation

For purposes of firefighting, the concept of resorvation will be used. At BFN, the terms "site" and "reservation" are used interchangeably. At SQN, the owner controlled area does not include all of the onsite facilities. For example, the department will respond to the Power Operations Training Center which is on the reservation but not in the owner controlled area.

FIRE INCIDENT RESPONSIBILITY ASSIGNMENTS

Shift Operations Supervisor

- Plant Emergency Coordinator
- Overall safety of plant and offsite personnel
- Overall safe operation of plant and plant equipment

Assistant Shift Operations Supervisor

- Ensures notification of fire brigade is accomplished for plant fire emergencies
- Responds to plant fire location and assumes duties as incident commander
- Coordinates mitigation of the fire emergency with the fire brigade leader
- Provides the necessary resources to assist the fire brigade with fire extinguishment
- From the scene coordinates control room manipulation of plant equipment and processes to limit fire damage, ensure safe plant operation, and maintain component operability
- Ensures the safety of personnel involved in the firefighting effort
- Ensures appropriate security and radiological controls are in place and maintained
- Terminates the incident

Nuclear Security Services

- Provides immediate, unrestricted access for fire brigade personnel to plant fire emergencies
- Provides crowd control
- Provides compensatory measures for breeched security barriers and inoperative security equipment during fire emergencies
- Provides escort of off-site firefighting personnel and equipment
- Provides security to fire area to preserve evidence for investigation

Radiation Control (RADCON)

- Provides radiological monitoring
- Advises emergency response personnel of protective actions required
- Provides for the safety of all emergency response personnel for the applicable radiological conditions

Fire Brigade

- Responds to all fire emergencies and performs firefighting operations in accordance with Fire Pre-plans
- Establishes and maintains command post and communications link to operations
- Conduct fire fighting operations utilizing an incident command system
- Maintains open communication with the Assistant Shift Operations Supervisor (ASOS), advising of all firefighting activities

Note: Takes direction for suppression activities that affect plant operating conditions from the Incident Commander

- After extinguishment, establishes compensatory measures, reflash watches
- Restores fire suppression systems to operable condition as soon as possible after fire
- Coordinates salvage and recovery operations
- Conducts investigations of all fires

INITIAL TRAINING OF CAPTAINS AND FIRE OPERATORS

Note: TVA's Fire School is a nationally accredited fire training center by the National Fire Protection Association's Professional Qualifications Board

Training far exceeds requirements of 10 CFR 50 Appendix R, Standard Review Plan NUREG 0800, BTP APCSB 9.5-1 Appendix A

Fire Operator (Electrician, Steamfitter, and Auxiliary Unit Operators)

- 3 weeks FireFighting National Certification as: FireFighter I & II
- 3 weeks Emergency Medical Technician State Certified EMT
- 2 weeks Nuclear Plant Safety Systems
- 1 week Rescue
- 1 week Hazardous Materials
- 1 week Intro to Vehicle Operations
- 1 week Site Specific Firefighting, Radiological Controls and Radiological Emergency Preparedness

Fire Operator (Previously experienced fire fighters and Fire Captains)

- 3 weeks Advanced FireFighting National Certification as:
 - FireFighter I, II, III
 - *Fire Instructor I
 - *Fire Officer I *Captains only
- 2 weeks Nuclear Plant Safety Systems
- 2 weeks Fire Protection Systems
- 1 week Fire Vehicle Operations National Certification as:

Vehicle Apparatus/Operator

- 1 week Hazardous Materials
- 1 week Incident Command
- 1 week Rescue

- 1 week Site Specific Firefighting, Radiological Controls and Radiological Emergency Preparedness

Requalification Shift

- Shifts will receive 1 week (32 hours) of training every 5 weeks based on a five-week shift rotation, ten cycle training schedule
- Shifts will receive quarterly training and participate in quarterly fire drills to meet regulatory requirements

Objectives:

- Maintain current fire and EMT qualifications
- Upgrade plant systems knowledge
- Vendor certification to maintain and repair equipment and systems
- Specialized training on Fire, Rescue, EMS, Hazmat Technology and Equipment
- Identify fire hazards and associated types of fires that could occur in the plant, and identify the location of such hazards.
- Identify the location of firefighting equipment for each fire area and become familiar with the layout of the plant including access and egress routes to each area.
- Understand the proper use of available firefighting equipment, and the correct method of fighting each type of fire. The types of fires covered will include electrical fires, fires in cables and cable trays, hydrogen fires, flammable liquid, waste/debris fires, and record file fires.
- Review of the plant firefighting plan with specific coverage of each individual's responsibilities.
- Understand the proper use of communication, lighting, ventilation, and emergency breathing equipment.
- Understand the Incident Command System (ICS) for direction and coordination of the firefighting activities (fire brigade leaders only).
- Understand the toxic characteristics of expected products of combustion.
- Understand the proper method for fighting fires inside buildings and tunnels.
- Provide a detailed review of firefighting procedures and procedure changes.
- Review of latest plant modifications and changes in firefighting plans.

BENEFITS OF THE DEDICATED TVA FIRE BRIGADE

- A limited number of brigade members (25-30) can maintain a compliant fire protection program at each site.
- Thirty per site, as opposed to 150 plus, brigade members receiving extensive training provides TVA the opportunity to develop expert level knowledge at a greatly reduced cost with minimum training resources.
 This program also dramatically reduces maining schedule and respirator qualification difficulties.
- All department members will be certified graduates of a National Fire Academy and State registered as Emergency Medical Technicians 1-A (EMT).
- EMTs are available to provide a sound basic first aid program and a professional ambulance/rescue service.
- One fire department for all TVA property.
- Knowledge of how to operate fire/medical apparatus in order to effectively serve all TVA personnel and protect our property interests.
- Nationally trained and certified personnel with state of the art equipment substantially minimizes the possibility of major property losses through reduced response times.
- Current insurance arrangements include a \$10,000,000 deductible for each incident at SQN and BFN and provide no coverage for WBN and BLN.
- Readily available professional fire, first aid, and rescue equipment in the event of a natural, man-made, or radiological emergency.
- Central location of all firefighting/medical equipment on the fire engine/ambulance to expedite an efficient attack.
- A limited amount of radios necessar; to provide effective response of firefighters, fully clothed and equipped to handle any emergency.

- Removal of Security and Operations from the fire department. Returning personnel to provide service in specific job functions.
- Use of the Assistant Shift Operations Supervisor to act as the Incident Command coordinator providing guidance on the effects of fire and fire suppressants on safe shutdown capability.
- Adherence to NRC mandate of no depletion of required security/operations forces by owner controlled area fire/medical responses.
- Provision of vital fire prevention activities by a unified force:
 - Maintain fire extinguishers
 - Hose/house cabinets, firefighting equipment
 - First aid kits
 - Emergency lockers
 - Implementation and management of LCO compensatory measures
 - Bulk flammable material escort
 - Emergency lighting
 - Housekeeping

None of these activities will deter from firefighting responsibilities (Mission Essential Concept)

- Hazardous material emergency response and cleanup.
- Completion of 41 required fire protection system and equipment inservice inspections.
- Reduction in the overall protective clothing procurement, storage, and requirements and an increase in protection factor by ensuring proper fit of clothing.
- Five Pierce 50-foot Telesqurt fire trucks provide a new dimension to TVA's fire protection program. The fire trucks have a 1000 GPM pump with foam/water capabilities complemented with 500\100 gallon water\foam tanks.
- Increased level of protection through intensive dedicated training on advanced firefighting, rescue, and Hazmat equipment.

In summation, TVA continues an aggressive approach to excellence in fire protection through a centralized, consolidated, and dedicated emergency response force. TVA has staffed, trained, and equipped the nation's first certified professional response force for protecting the public safety and facilities at a nuclear site.

PLANT SAFETY SYSTEMS TRAINING

FOR

FIRE PROTECTION PERSONNEL

PLANT SAFETY SYSTEMS TRAINING FOR BFN FIRE PROTECTION PERSONNEL

Day 1:	Introduction:	 Plant Systems & Components
	Plant Layout:	Buildings & Elevations
	Print Reading:	Flow, Control, Logic, Equipment Plan, Electrical
Day 2	Condensate System:	Flow Path, components, heaters & drains
Day 3	Feedwater System:	Flow Path and Components
	Plant Procedures:	SOI, GOI, AI, SI, MI, Tech. Specs.
Day 4	Steam System:	Main Steam, Extraction Steam, Turbine/Generator
	Electrical System:	Station Service (Unit, Common, Shutdown) Diesel Generators Battery Systems

Day 5 Reactor Theory Recirculation System Review Examination

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Day 6 Reactor Water Cleanup System Reactor Core Isolation Cooling System Standby Liquid Control System

Day 7 Reactor Core Cooling: Residual Heat Removal Emergency Core Cooling

Day 8 Containment System:

Containment Isolation, Containment Atmosphere Dilution, Ventilation, Standby Gas Treatment PLANT SAFETY SYSTEMS TRAINING FOR BFN FIRE PROTECTION PERSONNEL

Day 9 Auxiliary Water Systems: Condenser Circulating Water, Raw Cooling Water, Raw Service Water, High Pressure Fire Protection, Essential Equipment Cooling Water, Reactor Building Closed Cooling Water, Spent Fuel Pit Cooling, Residual Heat Removal Service Water

Radioactive Waste Management

Day 10 Compressed Air Systems: Control, Station, Auxiliary

Review

Examination

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PLANT SAFETY SYSTEMS TRAINING FOR SQN FIRE PROTECTION PERSONNEL

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Day 1	Introduction:	Plant Systems & Components (Primary & Secondary)
	Plant Layout:	Buildings & Elevations
	Print Reading:	Flow, Control, Logic, Equipment Plan, Electrical
Day 2	Condensate System:	Flow path, components, heaters & drains
Day 3	Feedwater System:	Flow path, components, Auxiliary Feedwater, Steam Generator
	Plant Procedures:	SOI, GOI, AI, SI, MI, Tech. Specs.
Day 4	Steam System:	Main steam, extraction steam, Turbine/Generator
	Electrical System:	Station Service (Unit, Common, Shutdown) Diesel Generators Battery Systems
Day 5	Reactor Theory	
	Reactor Coolant System	
	Review	
	Examination	
Day 6	Chemical & Volume Control S	System
Day 7	Reactor Core Cooling:	Residual Heat Removal Emergency Core Cooling
Day 8	Containment System:	Ice Condenser, Containment Sprays, Containment Isolation, Ventilation, Emergency Gas Treatment

PLANT SAFETY SYSTEMS TRAINING FOR SQN PERSONNEL

Day 9 Auxiliary Water Systems! Condenser Circulating Water, Raw Cooling Water, Raw Service Water, High Pressure Fire Protection, Essential Raw Cooling Water, Component Cooling System, Spent Fuel Pit Cooling

Radioactive Waste Management

Day 10

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Compressed Air Systems: Control, Station, Auxiliary

Review

Examination

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PLANT SAFETY SYSTEMS TRAINING FOR BLN FIRE PROTECTION PERSONNEL

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Day 1	Introduction:	Plant Systems & Components (Primary & Secondary)
	Plant Layout:	Buildings & Elevations
	Print Reading:	Flow, Control, Logic, Equipment Plan, Electrical
Day 2	Condensate System:	Flow path, components, heaters & drains
-	Electrical System:	Station Service (Unit, Common, Shutdown) Diesel Generators Battery Systems
Day 3	Feedwater System:	Flow path, components, Auxiliary Feedwater Steam Generator
	Plant Procedures:	SOI, GOI, AI, SI, MI, Tech. Specs.
Day 4	Steam System:	Main steam, extraction steam, Turbine/Generator
Day 5	Reactor Theory	그는 말했는 것이라 가슴을 물었다.
	Reactor Coolant System	
	Review	
	Examination	
Day 6	Makeup and Purification Syst	em
Day 7	Reactor Core Cooling:	Decay Heat Removal Emergency Core Cooling
Day 8	Containment System:	Containment Sprays, Containment Isolation, Ventilation, Emergency Gas Treatment
	Reactor Protection System	
	Essential Safety Features Ac	tuation System

PLANT SAFETY SYSTEMS TRAINING FOR BLN FIRE PROTECTION PERSONNEL

Day 9 Auxiliary Water Systems? Condenser Circulating Water, Raw Cooling Water, Raw Service Water, High Pressure Fire Protection, Essential Raw Cooling Water, Component Cooling System, Spent Fuel Pit Cooling

Radioactive Waste Management

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Day 10 Compressed Air Systems: Control, Station, Auxiliary

Review

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Examination

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PLANT SAFETY SYSTEMS TRAINING FOR WBN FIRE PROTECTION PERSONNEL

Day 1	Introduction:	Plant Systems & Components (Primary & Secondary)
	Plant Layout:	Buildings & Elevations
	Print Reading:	Flow, Control, Logic, Equipment Plan, Electrical
Day 2	Condensate System:	Flow path, components, heaters, & drains
Day 3	l'eedwater System:	Flow path, components, Auxiliary Feedwater, Steam Generator
	Plant Procedures:	SOI, GOI, AI, SI, MI, Tech. Specs.
Day 4	Steam System:	Main steam, extraction steam, Turbine/Generator
	Electrical Steam:	Station Service (Unit, Common, Shutdown) Diesel Generators Battery Systems
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Day 5	Reactor Theory	
	Reactor Coolant System	
	Review	
	Examination	
Day 6	Chemical & Volume Control S	System
Day 7	Reactor Core Cooling: Res	idual Heat Removal Emergency Core Cooling

Day 8	Containment System:	Ice Condenser, Containment Sprays,
		Containment Isolation, Ventilation,
		Emergency Gas Treatment

PLANT SAFETY SYSTEMS TRAINING FOR WBN FIRE PROTECTION PERSONNEL

Day 9 Auxiliary Water Systems? Condenser Circulating Water, Raw Cooling Water, Raw Service Water, High Pressure Fire Protection, Essential Raw Cooling Water, Component Cooling System, Spent Fuel Pit Cooling

Radioactive Waste Management

Day 10 Compressed Air Systems: Control, Station, Auxiliary

Review

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