

**NUCLEAR TRAINING
TRAINING MATERIALS COVERSHEET**

**GENERAL EMPLOYEE TRAINING
PROGRAM**

**PLANT ACCESS TRAINING
COURSE**

**PAT010
COURSE NO.**

**PLANT ACCESS TRAINING
LESSON TITLE**

**PAT010
LESSON PLAN NO.**

INPO ACCREDITED

YES NO

MULTIPLE SITES AFFECTED

YES NO

PREPARED BY T. H. Sawyer	Signature	Date
PROCESS REVIEW T. E. Anderson	Signature	Date
LEAD INSTR./PROGRAM MGR. REVIEW M. C. Peterson	Signature	Date
LINE OWNER APPROVAL N/A	N/A Signature	Date
TVA NPG CONCURRENCE (If applicable) R. L. Coleman / S. S. Reed	Concurrences made by e-mails BFN / WBN	Date

Receipt Inspection and Distribution:

Training Materials Coordinator Date

Standardized Training Material Copies To:

SQN Technical Training Manager, STC 2T-SQN
WBN Technical Training Manager, WTC 1D-WBN
BFN Technical Training Manager, BFT 2A-BFN
COC Nuclear Support, LP 4J-C

NUCLEAR TRAINING REVISION/USAGE LOG				
Rev. #	Description of Changes	Date	Pages Affected	Reviewed By
0	New lesson plan to coincide with implementation of CBT GET. Lesson material follows guidance of ACAD 93-009. <u>Training Process Comment:</u> This LP is primarily for CBT use. The standard format requirements are waived for "user friendly" purposes.	01-01-1996	All	N.E. Scott, J. R. Waldrep
1	General revision (Incorporated all non-intent changes since last revision).	04-20-1998	All	Randy Waldrep
2	General revision to incorporate change requests received since last revision.	02-09-2001	All	S. Reed, T. Sawyer, R. Waldrep
3	General revision (Incorporated all non-intent changes since last revision).	06-03-2002	All	Tom Sawyer, Randy Waldrep
4	Revised to add hostage situation directions, review questions on doors, adjust sequencing of information, and correcting typos.	07-22-2002	All	Randy Waldrep, Sarah Reed, Tom Sawyer
-	Non-intent change deleting: "Long sleeve shirts shall be worn when working on electrical equipment."	07-30-2002	28	T. H. Sawyer
-	Non-intent to change requirement for harness from 5 to 4 feet.	09-23-2002	38	A. E. Burzese
5	General revision	12-18-2002	All	T. H. Sawyer
6	Added abnormal work indicators, special medical need information, and adjusted pagination of lesson plan.	05-01-2003	All	T. H. Sawyer
7	Added Visitor/Escort P.A. entry and vehicular responsibilities, clearance change to Danger Tag, Independent Verification adjustment per SQN PER 03-11940, Housekeeping adjustment for climbing per BFN PER 02-12310, cell phone use per BFN PER 03-20128, TVA Safety Manual title change, Scaffold inspection frequencies, Human Performance Tool Box and Pre-Job Briefing addition, and Concerns Resolution phone/pager number deletion and Webpage addition.	03-01-2004	All	T. H. Sawyer
8	Added instructions as to clearance orders and human hold orders. Clarified Interagency Agreement on Tritium production, and added Independent Spent Fuel Storage Installation facility information.	03-01-2005	26 & 33	T. H. Sawyer
9	Revised lesson to coincide with NEI 03-04 Revision 2. Clarified Independent Spent Fuel Storage Installation facility information to include BFN. Changed site maps. Added SQN PER 82769 information for Negative and Common Cause Trends. Added instructions to close and lock security delay gates.	11-18-2005	4, 6, 21, 25-29, 31, 37, 48-49, & 68-69	T. H. Sawyer

NUCLEAR TRAINING REVISION/USAGE LOG				
Rev. #	Description of Changes	Date	Pages Affected	Reviewed By
10	Revised lesson to account for Emergency Classification definition changes per NRC Bulletin 2005-02 (Hostile Action). Added text in support of Quality Programs Audit SSA0503 and related PER 91666 for the purpose, scope, and implementation of the NQAP. Added description of Rules and Tools from recent revision to TVAN Human Performance Pocket Guide for PER 93803. Replaced 'RadCon' with 'Radiation Protection' throughout. Revised Security text for site changes to Sallyport and road delay gates, for extra provisions on controlling vehicles on site, and for updated information on Safeguards Information.	01-20-2006	4, 6, 8, 16-19, 55-56, 63, 66-68, 71, 73-74	M. C. Peterson
11	Identified TVA Form 7908 as the Bomb Check List. Added safety culture information. Added for course credit TVA Safety Procedure 613 Clearance Procedure Training for "Affected Employee-00059199". Revised to include Rapid Evacuation of the Protected Area actions.	07-10-2006	3, 4, 30-32, 34-36, 75, 80-81.	T. H. Sawyer
12	Updated References. Added 'Welcome' screen at start of module. Adjusted Objectives for STAR. Added new Objectives ADM-11 and PDS-03, 04, 05, 06 and 07 for existing material added over the years. Added new Objectives PDS-08, 09, 10 and 11 for details on the Boric Acid Corrosion Control Program for SQN and WBN for PER 96562. Added new Objective INS-10 for existing Safety Culture material. Expanded materials for TVA Safety Procedure 613 Clearance Procedure Training for "Authorized Employee" (credit now possible for both 59199 and 59196 courses). Removed 5-day inspection reference to MMDP-11 in Scaffold section. Revised title of RADChem Manager to Chemistry Manager. Updated Negative Trend data for death during SAM-11 movement. Added note for restriction on wearing a TLD after medical isotope treatment in 2 places. Added OE from BFN PER 106812 for Tailgating issue.	09-11-2006	3-4, 6-7, 18, 21-23, 25-28, 32, 36-41, 52-53, 56, 70, 75-76, 88	M. C. Peterson
13	Made minor editorial changes update procedure references and to match some text with that in PAT000 revision 12; added additional information concerning how ONLY installed plant phones can reach 3911; restrictions on use of cell phone cameras; clarification of text from SPP-1.5 for overtime limitations; SQN PER 90041 for addition of the Status Control program; BFN PER 120796 for clarification of PER use to correct plant problems; removal of redundant arrest notification requirements; editing of site assembly text; addition of changes from MMTP-102 for Scaffold Inspection frequency; WBN PER 116477 for interlocks on boundary doors; WBN OE on challenges to Radiography postings; and, WBN PER 123158 for updating of BACCP requirements.	08-31-2007	4-5, 8, 12, 18, 20, 25-29, 32-33, 35, 52, 57-61, 63, 67-68, 83-85, 89, 90	T. H. Sawyer

NUCLEAR TRAINING REVISION/USAGE LOG				
Rev. #	Description of Changes	Date	Pages Affected	Reviewed By
14	Updated references. Reduced bulk of text to meet SQN PER 131527 by selective removal of content that did not have objectives that aligned to NEI 03-04, including Boric Acid Corrosion Control, Reactivity Management, Human Performance Initiative, etc. (page length was cut from 91 to 80). Added clarification that installation of temporary plant equipment must be evaluated for potential unauthorized modifications for SQN PER 128345. Moved Status Control section to the Procedure section. Expanded the CO ₂ section for BFN PER 127823. Added Load Drop Zone for SQN PER 133412. Replaced 'TVAN' with 'TVA NPG' throughout the document.	1/18/08 at BFN and SQN, and 2/15/08 at WBN	All	M. C. Peterson

REFERENCES

NRC:

1. Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure (June 1999)
2. Regulatory Guide 8.29, Instruction Concerning Risks from Occupational Radiation Exposure (Feb 1996)
3. Bulletin 2005-02, Emergency Preparedness and Response Actions For Security-Based Events (July 18, 2005)
4. 10 CFR 26, Fitness for Duty Programs (2003)
5. 10 CFR 50.70, Inspections (01-01-1994)
6. 10 CFR 73.56, Physical Protection of Plants and Materials (2003)
7. 29 CFR 1910.1200, Hazard Communications (02-09-1994)
8. 40 CFR 261, Identification and Listing of Hazardous Waste (07-01-1995)
9. Bulletin 2005-02, Emergency Preparedness and Response Actions for Security Based Events

INPO:

10. SER 13-88, Revision 1, Safety System Actuations Resulting from Bumping or Jarring of Equipment (05-19-1988) DO NOT DELETE
11. SOER 82-9, Turbine Generator Exciter Explosion (09-03-1982) DO NOT DELETE
12. SOER 82-10, Fire Barrier Degradation (12-01-1982) DO NOT DELETE
13. SOER 82-13, Intrusion of Resin, Lubricating Oil, and Organic Chemicals into Reactor Coolant Water (12-27-1982)
14. SOER 85-05, Internal Flooding of Power Plant Buildings (01-13-1986)
15. SOER 90-03, Nuclear Instrument Miscalibration (09-25-1990)
16. SOER 92-01, Reducing the Occurrence of Plant Events Through Improved Human Performance (10-30-1992)

NEI:

17. NEI 03-04 [Revision 3], Guideline for Plant Access Training (October 2006)

TVA:

18. TVA Safety Manual, Revision 10 (04-25-2007)

Nuclear Assurance:

19. NADP 1, Conduct of Quality Assessment and Inspection (07-31-2007)
20. NADP 3, Managing the Operating Experience Program (08-30-2007)
21. TVA-NQA-PLN89, TVA Nuclear Quality Assurance Plan (11-30-2007)

Problem Reports:

22. BFN PER 02-012310-000, Climbing On Plant Equipment
23. PER 90041, Status Control Program
24. PER 91666, Quality Programs Audit SSA0503
25. PER 106812, Tailgating
26. PER 116477, Interlocks on Boundary Doors
27. PER 120796, PER Use to Correct Plant Problems
28. PER 127823, CO2 Discharge Alarm
29. PER 128345, Unauthorized Modifications
30. PER 133412, Load Drop Zone

Procedures:

31. 0-TI-DXX-000-013.0, Temporary Equipment Control (03-14-2006)
32. 0-TI-OPS-000-061.0, Control and Use of Portable Radio Equipment (10-16-2007)
33. BP-213, Managing TVA's Interface with NRC (03-19-2007)
34. MMTP-102, Erection of Scaffolds/Temporary Work Platforms and Ladders (03-23-2007)
35. MMTP-103, NPG Movement of Items Using Overhead Handling Equipment (09-24-2007)
36. MMDP-12, Lockout/Tagout (11-09-2006)
37. NEDP-4, Q-List and UNID Control (06-14-2007)
38. SPP-1.0, Organization and Administration (03-14-2002)
39. SPP-1.3, Plant Access and Security (09-25-2006)
40. SPP-1.4, Safeguards and Sensitive Information (12-23-2005)
41. SPP-1.5, Overtime Restrictions (Regulatory) (05-04-2007)
42. SPP-2.1, Administration of SPPs/SDPs (04-16-2004)
43. SPP-2.2, Administration of Site Technical Procedures (03-05-2007)
44. SPP-2.3, Document Control (02-08-2006)
45. SPP-3.1, Corrective Action Program (03-23-2007)
46. SPP-3.5, Regulatory Reporting Requirements (08-17-2007)
47. SPP-5.1, Radiological Controls (11-12-2003) [SQN Only]
48. SPP-5.1, Radiological Controls (10-17-2007)
49. SPP-5.4, Chemical Traffic Control (05-11-2007)
50. SPP-5.5, Environmental Control (01-09-2006)
51. SPP-6.5, Foreign Material Control (04-11-2007)
52. SPP-9.2, Equipment Environmental Qualification (EQ) Program (06-30-2006)
53. SPP-10.1, System Status Control (06/30/2005)
54. SPP-10.2, Clearance Procedure to Safely Control Energy (10-09-2007)
55. SPP-10.3, Verification Program (11-14-2003)
56. SPP-10.7, Housekeeping/Temporary Equipment Control (09-27-2006)
57. SPP-10.8, Nuclear Fuel Management (03-06-2007)
58. SPP-10.9, Control of Fire Protection Impairments (07-06-2000)
59. SPP-10.10, Control of Transient Combustibles (05-12-2006)
60. SPP-10.11, Control of Ignition Sources (Hot Work) (08-31-2005)
61. SPP-10.12, Fire Protection Quality Assurance (01-29-1999)

Screen spec1

WELCOME

Welcome to the module for Plant Access Training for the nuclear plants in the Tennessee Valley Authority (TVA) fleet. The plants in the TVA Nuclear Power Group (TVA NPG) fleet include:

- Browns Ferry Nuclear plant (BFN)
- Sequoyah Nuclear plant (SQN)
- Watts Bar Nuclear plant (WBN)

Screen intro

INTRODUCTION

Plant Access Training (PAT) is mandatory for all personnel who require unescorted access to TVA NPG plants. PAT is designed for both new employees and personnel already familiar with nuclear power stations. The purpose of PAT is to inform and familiarize personnel with the policies being used. The guidelines provided in Nuclear Energy Institute (NEI) 03-04, Guideline for Plant Access Training, have been used to provide an industry standard for this training. An examination with a score of 80% or greater is required to receive credit for this course.

STATION ORGANIZATION AND ADMINISTRATION

Screen paobj

OBJECTIVES

ADM-01

State the function of each of the following station departments or groups: Operations, Maintenance, Radiological Control (Radiation Protection), Training, Security, Site Quality, Emergency Preparedness, and Industrial Safety.

ADM-02

State individual responsibilities regarding the following policies: operating plant equipment, working on plant equipment without authorization, reporting of problems for resolution, company smoking policy, reading of non-technical material, and complying with Radiation Protection and Security rules (oral and written).

Screen paobj1

ADM-03

State the company policy regarding procedural compliance and use of controlled documents.

ADM-04

Identify the appropriate communication system to be used for: reporting emergencies, locating an individual in the plant, lengthy discussions.

ADM-05

State individual responsibilities regarding station cleanliness and housekeeping.

Screen paobj1a

ADM-6a

State conditions that require self-checking.

ADM-6b

Identify steps involved with self-checking.

Screen GET

Plant Access Training (PAT) is required for all personnel who need unescorted access to our nuclear plant.

Screen GET1a Upon completing this course, you will be able to demonstrate the skills and knowledge necessary to safely carry out assigned tasks within the Protected and Vital Areas of our nuclear plant.

Screen depart Some of the departments or groups you may have to work with include:

- Screen depart1a*
- Operations
 - Radiation Protection
 - Security
 - Emergency Preparedness
 - Maintenance
 - Training
 - Site Quality
 - Industrial Safety

Screen depart 1b FUNCTIONS OF VARIOUS STATION DEPARTMENTS/GROUPS

Screen Operat1a Operations
State the function of the Operations group. Operators are responsible for the “hands-on” control of the plant. They also staff the Control Room and respond first to most in-plant problems.

Screen Operat1b The operators are involved in many plant activities, such as:

- operating plant equipment
- placing safety tags and Danger Tags
- approving most types of plant work
- controlling reactor power

Operations and/or the Shift Manager (SM) can be reached by calling **7860**.

Screen Maint Maintenance
State the function of the Maintenance Department. Maintenance personnel maintain the plant in good operating condition. They perform all types of maintenance activities such as repairing plant equipment (instruments, pumps, valves, security equipment, motors etc.) and performing preventive maintenance on equipment.

Screen HlthPh Radiological Control
State the function of the Radiological Controls group. The function of the Radiological Control (Radiation Protection) group is to assist workers in minimizing personnel radiological exposure and the spread of radioactive contamination.

Screen HlthPh2 Radiation Protection performs activities such as:

- escorting personnel into High Radiation Areas if needed
- monitoring various areas of the plant for radiation levels
- monitoring plant surfaces for contamination
- preparing Radiation Work Permits (RWPs)
- controlling access to and from the Radiologically Controlled Area (RCA)

Radiation Protection Lab/desk can be reached by calling **7865**

Screen Train Training
State the function of the Training Department. The Training Department assists the plant in training and qualifying personnel to perform their jobs. Training performs activities such as:

- working with plant groups in setting up training programs for plant personnel
- presenting training courses
- maintaining training and qualification records

Screen Secur

Nuclear Security

State the function of the Industrial Safety Group.

Security protects the plant from nuclear sabotage. Security performs activities such as controlling:

- access to and from the Protected Area
- issuance of all badges for site access
- security doors within the plant

Security can be reached by calling extension **7959**.

Screen QualPr

Site Quality

State the function of the Site Quality Group.

The Site Quality Group provides oversight to ensure quality is maintained.

The Site Quality (Nuclear Assurance) organization is responsible for developing and administering the Nuclear Quality Assurance Plan.

Site Quality performs activities such as:

Screen QualPr1a

- monitoring some plant activities to ensure they are done correctly
- performing program reviews to ensure they are being done according to plant procedures
- inspecting safety-related parts and supplies to ensure they meet all requirements

Screen EmerPl

Emergency Preparedness

State the function of the Emergency Preparedness Group.

In case of a plant emergency, it is important and is federally required to have adequate plans and enough trained personnel to deal with the situation. The purpose of Emergency Preparedness is to ensure that both of these requirements are met.

Screen Safety

Industrial Safety

State the function of the Industrial Safety Group.

Industrial Safety provides oversight of the industrial safety program. They may become involved with activities such as checking air quality, evaluating industrial accidents, and evaluating heat stress concerns.

Screen depquiz

Question: Operations is responsible for maintaining the power plant in good operating condition.

True? or False?

Screen depquizz

Answer: False. The Operations Department is responsible for the “hands-on” control of the plant.

Screen GenRul

Individual Responsibilities

State individuals' responsibilities regarding the following policies: operating plant equipment, working on plant equipment without authorization, reporting of problems for resolution, company smoking policy, reading of non-technical material, and complying with Radiation Protection and Security rules (oral and written).

As in any industrial organization, several general rules must be followed when working in the plant. Some of these are as follows:

Screen EqpRul

- Work on equipment must be APPROVED prior to starting the job.
- Operate plant equipment ONLY if you are qualified to operate it, and you are authorized by the Control Room or by procedure.
- Problems in the plant must be REPORTED using the problem-reporting programs.

Screen EqpRul2

Screen ProbRp

- Screen Smoking*
- Smoking is prohibited in most plant areas and is allowed ONLY IN DESIGNATED AREAS. These areas are outside any company buildings or vehicles, and must comply with safety policies and procedures.
- Screen Smoking*
- Materials which are not related to the design, operation, or maintenance of the plant should not be used while on site, except during designated breaks or meal periods.
 - Comply with all instructions (oral or written) from Security or Radiation Protection.

Screen ProCmp
SOER 92-01
State the company policy regarding procedural compliance and use of controlled documents.

Procedural Compliance

Procedures ensure that a job is performed consistently, in a quality manner, and in a logical sequence.

Screen ProCmp1a

If the job you are performing requires a procedure, COMPLIANCE WITH THE PROCEDURE IS MANDATORY; you must follow the procedure exactly as it is written or get the procedure changed!

Screen ProCmp2
Screen ProCmp2a
Screen ProCmp2b
Screen ProCmp2c

If you feel that a job can't be performed the way the procedure is written, then:

- stop the job
- place the job in a safe condition
- contact your supervisor - resolve the problem

Screen ProCmp3

It is always your responsibility to:

Make sure the procedures and drawings you are using are the CURRENT REVISION. Management Services is responsible for storing, maintaining, and controlling plant drawings and documents. They should be contacted if there is any question whether a document you are using is the latest revision.

Screen ProCmp3a

Levels of Use for Procedures

Technical procedures are classified according to one of the following three "Levels of Use". (Technical procedures are those involving manipulation, monitoring, or analysis of plant equipment or processes.)

Screen ProCmp3b

Continuous Use

- All technical procedures are Continuous Use unless otherwise designated on the procedure's cover sheet.
- Read each step of the procedure prior to performing the step.
- Perform each step exactly as written and in the exact sequence specified.
- Where sign-offs of steps are required, sign off each step as complete before proceeding to the next step.
- If a reader is used, then the performer shall acknowledge completion of each step to the reader before the reader proceeds to the next step. Exception: Emergency Operating Instructions (EOIs) are performed per the EOI Program Manual.

Screen ProCmp3c

Reference Use

- The procedure indicates Reference Use on the cover sheet.
- Refer to the procedure periodically during performance to verify that each segment of the procedure has been performed. A segment is a portion of a procedure that accomplishes a complete function, such as alignment of a pump to the system, or disassembly of a pump.
- Where required, sign appropriate blocks to verify that each segment is complete before proceeding to the next segment.
- The procedure is readily available for reference at the work location.
- The procedure user remains responsible for results obtained when not referring to the procedures.

Screen ProCmp3d

Information Use

- The procedure indicates Information Use on the cover sheet.
- The procedure may be performed from memory.
- The procedure is readily available for reference, but is not necessarily at the work location.
- The procedure user remains responsible for results obtained when not referring to the procedure.
- Each user who performs the procedure from memory should review the procedure periodically (for example, prior to performance or during continuing training). Also, the procedure shall be reviewed following revisions that affect performance of the activity. These reviews ensure that the activities are being performed correctly and that no procedure revisions have been overlooked.

Screen ProCmp4

Always REVIEW THE PROCEDURE before beginning the job. If the procedure is not correct, talk to your supervisor, or have the procedure revised. Above all, make sure the procedure is correct before you begin the job.

Screen ProCmp5

The review of the procedure and job should include a WALKDOWN OF THE JOB SITE whenever possible. You should be aware of any safety-related equipment in the area and how your work could affect the equipment around you.

Screen WhitOut

When working with plant documents:

For QA documents always use legible ink. Do not use correction fluid or tape.

Screen WhitOut2

CHANGES OR CORRECTIONS to information on the documents are made by drawing a single line through the error and adding the correct information as close as possible to the incorrect information. The change is initialed and dated. The original incorrect information should still be readable.

Screen WhitOut3

NOTE: SIGNING OR INITIALING a work document to indicate completion of work means that you are taking RESPONSIBILITY for verifying the work has actually been completed in accordance with the requirements.

Screen nucov12

Relationship of Procedure Use to the Status Control Program

All TVA and contract personnel and all plant systems and equipment are governed by TVA NPG procedure SPP 10.1, System Status Control.

Changing **status** (position of a valve, breaker, switch, filter, etc.) can ONLY be done by:

- a Procedure,
- a Clearance,
- a Work Order, or
- a Temporary Alteration (rarely used)

Screen nucov13

These work documents must restore systems and equipment to the correct status.

Each individual should question themselves and come up with the right answer:

1. "What allows me to change this component?"
2. "What will return it to normal?"

Screen SiteCom

Identify the appropriate communication system to be used for: reporting emergencies, locating an individual in the plant, lengthy discussions.

SITE COMMUNICATIONS

To locate an individual within the plant, first try to contact them at their personal or department phone. Plant phones can be used to access the paging system for personal pagers assigned to individuals by dialing:

- **650** at BFN
- **350** at SQN
- **450** at WBN

To report a fire or medical emergency, dial **3911**.

NOTE - Cell phones CANNOT call in to 3911 - you MUST do so on an installed plant phone.

Screen SiteCom2

Some designated groups also use radio communications (walkie-talkies). However, certain signals emitted from radios can pass through electrical equipment and cause plant malfunctions or scrams (shutdowns). Therefore, portable radio equipment should be tested prior to use in the plant (radio check).

There are certain areas that are susceptible to radio frequency interference (RFI). To the extent practical, do not key hand-held radios within ten feet of electronic panels/cabinets. For any lengthy discussions, the phone system should be used.

Screen SiteCom3

TVA NPG policy permits bringing personal cell phones into the Protected Area, including those with embedded cameras, but prohibits the use of personal cell phones in operational areas (control room, turbine building, reactor building, control building, auxiliary building, transformer yard, or switchyard). However, any use of the camera to take pictures must have Nuclear Security permission.

Screen SiteQuiz Question: What number would you dial to report a fire or medical emergency at your site, on an installed plant phone?

- A. 2300
- B. 3911
- C. 650

Screen Ovquiz3c Answer: B. Extension **3911** is dialed to report emergencies at the site, but remember that you cannot do so from a cell phone.

Screen HsKeep

HOUSEKEEPING

State individual responsibilities regarding station cleanliness and housekeeping.

YOU are expected to keep your own workspace as neat as possible and to clean up after yourself when a job is finished in the plant. Your goal should be to leave an area cleaner than you found it. Prompt removal of debris, tools and equipment is necessary for personnel safety and the integrity of plant systems. Equipment in the process of being used and left for an extended period of time shall be posted.

Screen HsKeep2 If a housekeeping problem is discovered that you can't take care of, contact your supervisor.

Screen HsKeep2a Good housekeeping is recognized as being fundamental to safety. Housekeeping encompasses all activities related to the cleanliness of facilities, material, and equipment, the storage of tools, materials, and combustible items, and the disposal of debris.

Screen HsKeep2a_1 Good housekeeping practices protect:

1. people from injury from safety hazards, and
2. plant equipment from damage due to foreign material.

Housekeeping at a work site is a good indicator of the quality of work performed, and the level of commitment, involvement and pride in the workplace.

Screen HsKeep2a_2 Your Responsibility:

- Keep all work areas clean and orderly at all times:
 - * Keep surfaces and floors clear of debris and liquids.
 - * Protect painted floors, walls, and other equipment.
 - * Maintain control of tools, parts, waste, and PPE in the work area.
 - * Stow items to remove hazards to personal safety.
 - * Route temporary hoses and cables to prevent trip, slip, and shock hazards.
 - * Minimize contaminated waste.

Screen HsKeep2a_3

- Leave the work site cleaner than you found it.
- Correct housekeeping deficiencies on the spot.
- Report poor material conditions that cannot be corrected to your supervisor.

Screen HsKeep2a_4 Plant equipment such as piping, cable trays, snubbers, instrument tubing and electrical connectors are not capable of supporting personnel and can be easily damaged, and **SHOULD NEVER BE USED FOR CLIMBING**. Insulated piping or ducts **SHOULD NOT BE USED FOR ACCESSING EQUIPMENT**. Use scaffolding or ladders when working on equipment that is not easily accessible from the floor.

Screen HsKeep2b During maintenance activities, personnel need to exercise caution around any systems, components or equipment that are opened. Debris, or foreign material, left or dropped into components and systems could result in plant shutdowns, extended shutdown periods, increased radiation exposure, and/or equipment damage. Foreign material includes items such as tools, equipment, materials, or personal items. Foreign Material Exclusion Areas are established and posted to preclude inadvertent introduction of foreign material into components and systems.

Screen HsKeep2c Foreign material control (SPP-6.5) is focused on preventing unwanted material from getting into plant systems or components, including fuel. Foreign material affects fuel in two ways. Small pieces of metallic foreign material can enter the fuel assembly and wear through fuel rod cladding during operation, forming a leaker. The size of foreign material causing a leaker has been as small as 0.1 inch.

Screen HsKeep2d The size of foreign material causing fuel handling incidents can range from a nut on the core plate that prevents a fuel assembly from seating to a tool inside a spent fuel rack that prevents a fuel assembly from entering its assigned rack cell. It is important to keep foreign material of all sizes out of the reactor vessel, spent fuel pool, and connecting systems.

Screen Selfck
State conditions that require self-checking.

SELF-CHECKING

Self-checking assists you in preventing mistakes. It helps you focus on the immediate situation and the task at hand. Self-checking includes distinct thoughts and actions designed to enhance your attention to detail at a specific moment before performing a task.

Screen Selfck2

The steps for this process are:

Identify steps involved with self-checking.

- **Stop** - Pause before performing operation/manipulation, especially at critical steps, decision points, or touch points (electrical). Eliminate distractions, if necessary.
- **Think** - Focus attention on the step to be performed. Verify the action is appropriate for equipment/system status. Anticipate expected result(s) of the action and its indications. Consider what actions to take should an unexpected result occur (contingency). If uncertain, STOP and ASK.

Screen Selfck2a

- **Act** - Perform the task carefully and safely:
 - Without losing eye contact, touch the component, label, etc.
 - Compare component label, etc., with checklist, procedure step, or drawing.
 - State the component name or Unit Identification (UNID) aloud (without distracting others).
 - Without losing physical contact established earlier, perform the action.
- **Review** - Verify anticipated result obtained. Perform contingency, if expected result does not occur.

Screen Selfck3

S.T.A.R.

Remember this process by using the first letter in each step to form the word **STAR**.

Industry experience has shown that these conditions frequently occur and could alert you to the need to self-check:

- hurrying
- poor labeling
- first day back at work after days off
- boring task
- tired
- interruptions

Screen Proquiz

Question: The review of the procedure and job should include a walk down of the job site whenever possible.

True? or False?

Screen ProquizC

Answer: True. This will allow you to become aware of any safety-related equipment in the area and how your work could affect the equipment around you.

Screen adsum

SUMMARY

- Operations is responsible for the hands-on control of the plant.
- Radiation Protection controls access to and from the Radiologically Controlled Area.
- Security protects the plant from sabotage and controls access to the Protected Area.
- Site Quality monitors plant activities to ensure they are done correctly.
- Emergency Preparedness ensure adequate plans and trained personnel are available in the event of a nuclear emergency.
- Operate plant equipment only if qualified and approved by the Control Room or by procedure.
- Smoking is allowed only in designated areas.
- If a procedure problem is discovered: stop, place the job in a safe condition, and contact your supervisor to resolve the problem.
- Review all procedures prior to use.
- The steps for self-checking are Stop, Think, Act, and Review.
- Use plant phones or the personal paging system to reach others in the plant. Report fire or medical emergencies by dialing **3911** from an installed plant phone immediately.

Screen adsum1

Screen adsum2

NUCLEAR PLANT OVERVIEW

Screen nucovobj

OBJECTIVES

PDS-01

(Non-Testable) Identify locations of major plant buildings, including:

- Turbine Building
- Reactor Building
- Security access points
- Radiologically Controlled Area
- Drug screening reporting site
- At Sequoyah and Watts Bar, identify the location of the Auxiliary Building
- At Browns Ferry and Sequoyah, identify the location of the Independent Spent Fuel Storage Installation (ISFSI)
- Assembly areas

Screen NuCov

PDS-02

Describe the basic process used to produce electricity at a nuclear facility.

Screen NuCov3

Identify locations of major plant buildings, including:

- Turbine Building
- Reactor Building
- Security access points
- Radiologically Controlled Area
- Drug screening reporting site
- At Sequoyah and Watts Bar, identify the location of the Auxiliary Building
- At Browns Ferry and Sequoyah, identify the location of the Independent Spent Fuel Storage Installation (ISFSI)
- Assembly areas

You are responsible for finding out from your supervision the location of your assembly area upon reporting to the plant for work assignment.

Drug screens at BFN, SQN and WBN are performed at Medical.

Radiologically Controlled Areas are identified at each site by Radiation Protection marking/postings.

Maps of the sites are included as an overview of plant areas, building, and locations.

(Non-Testable)

Screen NuCov3a

- Browns Ferry (BFN)

Screen NuCov3a1

Screen NuCov3a2

Screen NuCov3b

- Sequoyah (SQN)

Screen NuCov3c

- Watts Bar (WBN)

Screen nucov6

Describe the basic process used to produce electricity at a nuclear facility.

NUCLEAR ELECTRICAL GENERATION

To better understand our plant, let's explore how electricity is generated.

The basic nuclear generating process involves creating heat from nuclear fission (splitting atoms) and the conversion of that heat into steam to turn a turbine-generator.

Screen nucov7

Fission occurs when a neutron strikes the nucleus of a uranium atom.

Screen nucov7a

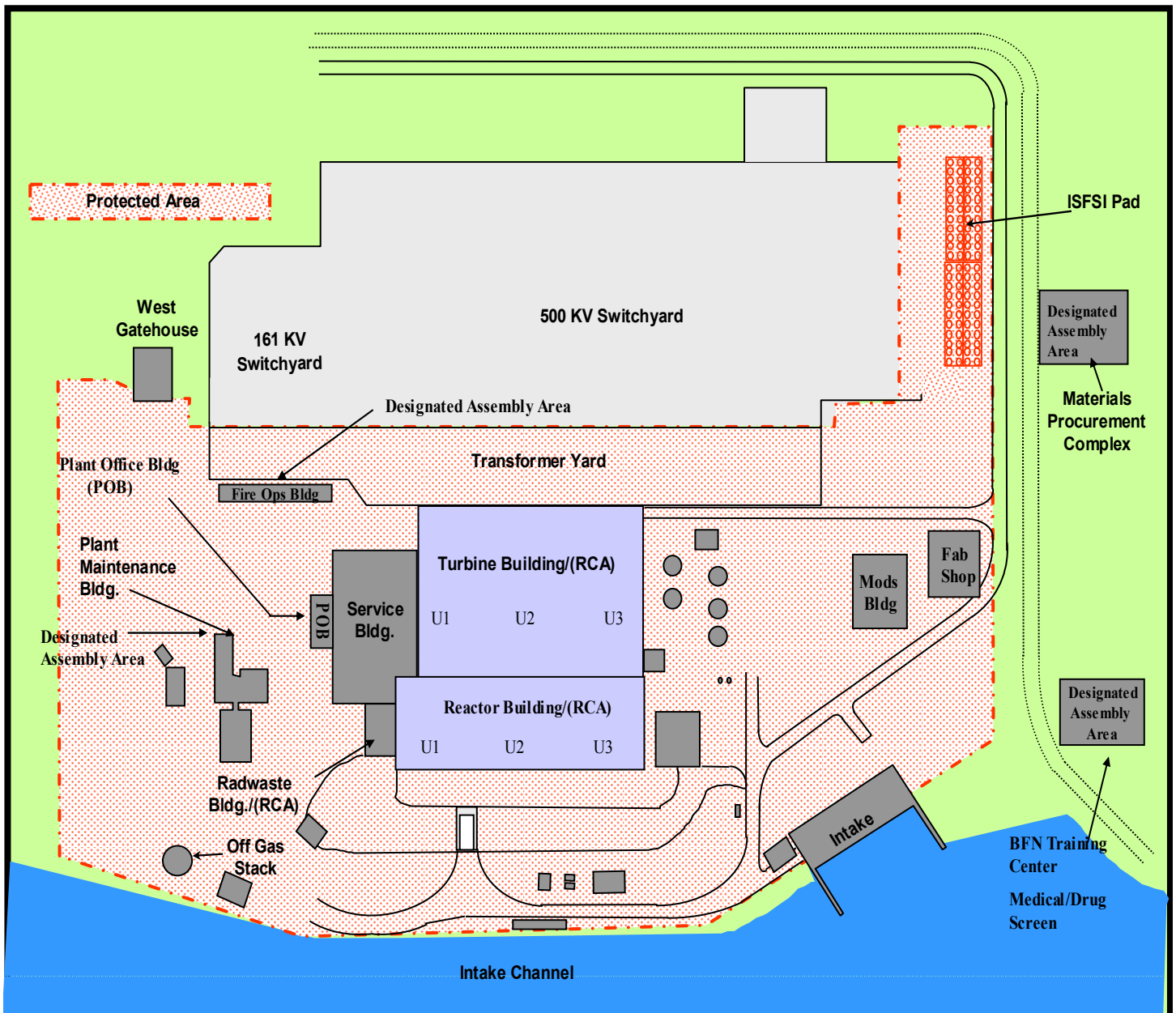
The uranium atom usually splits into two smaller atoms and releases two or three free neutrons...

Screen nucov8

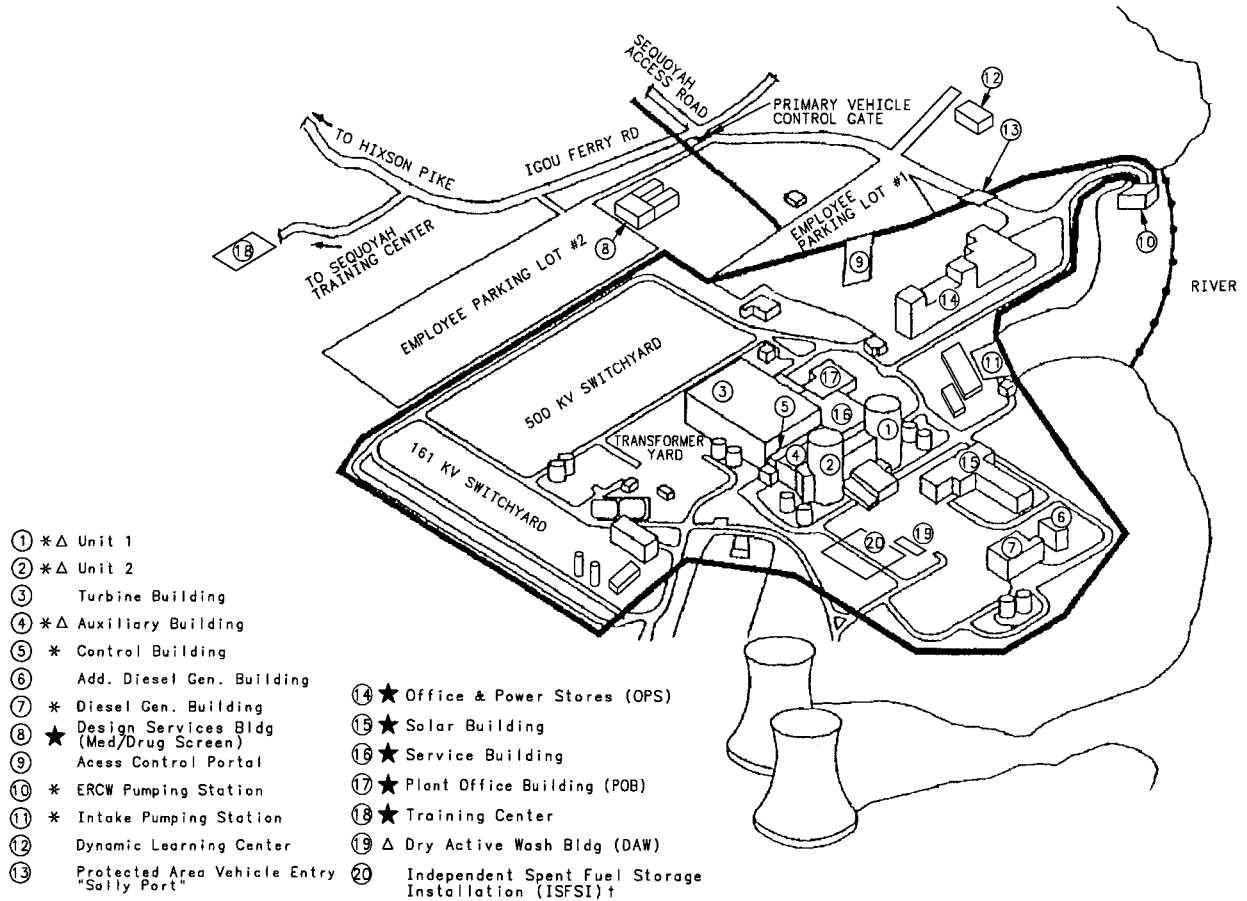
which continue the chain reaction.

- Screen nucov9* When fission occurs, heat is released. Water circulates through the reactor to capture the heat.
- In the case of a PWR (pressurized water reactor) the heat from the reactor water is transferred to a secondary circulation loop that uses non-radioactive water.
- Sequoyah and Watts Bar are Pressurized Water Reactors.
- Screen nucov10* In a PWR system, the isolated secondary loop absorbs the heat from the primary loop. This forms large amounts of high pressure steam, which is piped from the reactor building to the turbine.
- Screen nucov11* After the steam turns the turbine blades, it is cooled back to a liquid in the main condenser and returned to the reactor building as feedwater.
- Screen nucov11a* A BWR (boiling water reactor) system is simpler, creating steam at the top of the reactor vessel and sending it directly to the turbine instead of a secondary loop.
- But this means that the BWR turbine is radioactively contaminated because of its primary system interaction.
- Browns Ferry Nuclear Plant is a BWR in the TVA NPG system.
- Screen nucov11aa* Both systems use the control rods to control the chain reaction. The rods are inserted among the fuel bundles in the reactor core and absorb or “soak up” the free neutrons, thus slowing or stopping the process.
- Screen Ovquiz2* Question: During fission, what causes the nucleus of the uranium atom to split?
- A. Control Rods
 - B. Primary Water
 - C. Free Neutrons
- Screen Ovquiz2c* Answer: C, Free neutrons. Free neutrons collide with uranium atoms in a controlled chain reaction.
- Screen nucovsum* SUMMARY
- The nuclear fission process creates heat, which is converted to steam for driving the turbine. Control rods absorb the neutrons in the reactor, slowing or stopping the chain reaction.
 - The major site buildings include the Turbine Building, Reactor Building, security access points, Radiologically Control Area, drug screening reporting site, and, at Sequoyah and Watts Bar, the Auxiliary Building.
 - Use plant phones or the personal paging system to reach others in the plant. Report emergencies by dialing **3911** from an installed plant phone immediately.

Browns Ferry Nuclear Plant Site Layout

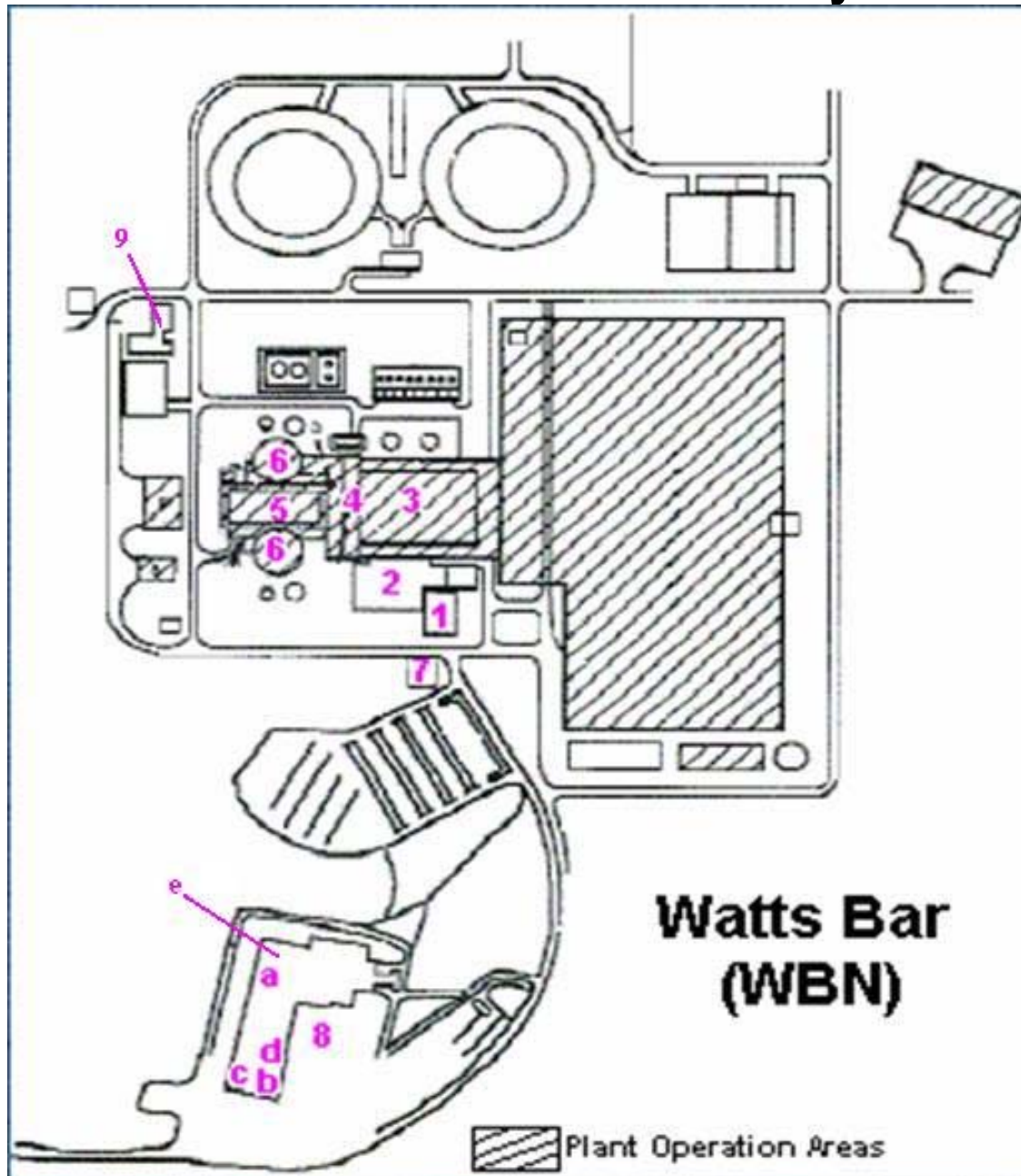


Sequoyah Nuclear Plant Site Layout



- | | |
|---|--|
| ① *△ Unit 1 | ⑭ ★ Office & Power Stores (OPS) |
| ② *△ Unit 2 | ⑮ ★ Solar Building |
| ③ Turbine Building | ⑯ ★ Service Building |
| ④ *△ Auxiliary Building | ⑰ ★ Plant Office Building (POB) |
| ⑤ * Control Building | ⑱ ★ Training Center |
| ⑥ Add. Diesel Gen. Building | ⑲ △ Dry Active Wash Bldg (DAW) |
| ⑦ * Diesel Gen. Building | ⑳ Independent Spent Fuel Storage Installation (ISFSI)† |
| ⑧ ★ Design Services Bldg (Med/Drug Screen) | |
| ⑨ Access Control Portal | |
| ⑩ * ERCW Pumping Station | |
| ⑪ * Intake Pumping Station | |
| ⑫ Dynamic Learning Center | |
| ⑬ Protected Area Vehicle Entry "Sally Port" | |

Watts Bar Nuclear Plant Site Layout



Legend:

- | | |
|-----------------------|---|
| 1. Office Building | 8. Training Center |
| 2. Service Building * | a. Dosimetry |
| 3. Turbine Building | b. Medical (drug screening check in) |
| 4. Control Building | c. Badging |
| 5. Auxiliary Building | d. Training Check-in |
| 6. Reactor Building | e. Cafeteria * |
| 7. Security Portal | 9. Engineering and Quality Building (EQB) * |

* Note: Refer to WBN EPIP-8 for a list of assembly areas. Discuss your assembly area with your supervisor. The map shows typical assembly areas in the Service Building (Plant Assembly Room), EQB (vending area), and Training Center (cafeteria).

INDUSTRIAL SAFETY

Screen isobj

OBJECTIVES

INS-02

Describe individual industrial safety responsibilities regarding:

- reporting of unsafe working conditions
- reporting of industrial safety near misses
- reporting of work-related injuries/accidents
- administration of first aid (if qualified)
- adherence to safety instructions
- observation of safety postings, barriers, tags and signs
- use of personal protective equipment
- general use of safety equipment such as eyewash stations, first aid kits, and safety showers

Screen isobj1

INS-03

State plant policy regarding the use of the following personal protective equipment:

- hard hats
- safety glasses
- hearing protection
- protective footwear
- hand protection

INS-04

State when and how hard hats, safety glasses, hearing protection, protective footwear, and hand protection will be worn.

Screen lesobj2

INS-07

Recognize the following as potential health hazards:

- use of asbestos on some plant components
- electrical equipment
- steam leaks
- confined spaces
- trip and fall hazards
- heat stress
- compressed gases
- moving/rotating equipment
- high noise areas
- falling objects
- eye hazards
- hazardous chemicals

Screen lesobj2a
INS-06

Describe methods for reducing the risk involved with the following industrial hazards:

- chemical products
- electrical equipment
- steam leaks
- confined spaces
- trip and fall hazards
- heat stress
- compressed gases
- moving/rotating equipment
- high noise areas
- asbestos
- eye hazards
- falling objects

Screen lesobj3
INS-08

State the worker's rights and responsibilities under the hazard communication standard.

INS-09

State the purpose of the company's hazard communication program.

INS-05

State where information may be obtained explaining the risks, hazards, and handling associated with a chemical or toxic substance.

Screen inres

INDIVIDUAL RESPONSIBILITIES

Potential hazards exist just about everywhere - in the home, at work, or on vacation. Plant operating areas are areas of the nuclear plant site used for activities other than office or administrative in nature, including reactor, turbine, diesel generator, and warehouse buildings, intake and pump stations and structures, shop areas, water and waste treatment, processing, and packaging areas.

Screen inresa

In any industrial setting and when least expected, injury or even DEATH can occur!

The power plant environment has many areas that are potentially dangerous. Temperatures as high as 2700 Degrees Fahrenheit and system pressures up to 4000 (PSI) pounds per square inch are present. Also, the equipment that is remotely operated can start up unexpectedly.

Therefore, when it's necessary for you to be in these operating areas, remain on the main walkways whenever possible.

Screen inres2

To guard against such tragedies, plant management expects YOU to follow all safety rules and requirements.

Screen inres2_a

Always wear the required Personal Protective Equipment to include hard hat, safety glasses with side shields, gloves, and hearing protection.

Refrain from touching equipment such as pumps, valves, controllers, push buttons, control switches, electrical distribution boards, and conduits.

Screen inres2d

All work is to be performed in the manner prescribed by our plant procedures and the TVA Safety Manual.

Screen inres3 If you are not sure of a safety policy, or have a safety question, talk to your supervisor and ask for clarification BEFORE starting to work.

Screen inres4 Any intentional disregard for safety WILL NOT be tolerated and could result in disciplinary action.

Screen inres5a Describe individual industrial safety responsibilities regarding reporting of unsafe working conditions. You are responsible for recognizing unsafe conditions in the plant. If you should discover an unsafe working condition, correct it if you can or report it to your supervisor. Just a few examples of reportable problems are:

- Missing safety signs
- Trip or fall hazards
- Frayed electrical cords
- Overloaded electrical circuits
- Missing guardrails or handrails

Screen inres6 Describe individual industrial safety responsibilities regarding reporting of industrial safety near-misses. Additionally, if you are ever involved in or observe a “near-miss” incident (an occurrence, which given slightly different circumstances, could have resulted in an injury) plant management needs to know so they can evaluate and take action to prevent recurrences.

To report this type of problem, contact your supervisor. Also promptly report all injuries, unsafe practices, and all incidents with injury potential.

Screen PerInj Describe individual industrial safety responsibilities regarding reporting of work related injuries/accidents.

PERSONNEL INJURIES

You and your supervisor are expected to work together to prevent injuries and to strive for a safe work environment free of hazards. However small the chance, you must be prepared for the possibility of an on-the-job injury. If there is a serious injury, your response time must be as short as possible.

Screen PerInj2 Let’s look at the actions to take if someone is ill or injured...

Screen NonEm Non-emergency Injuries

When non-emergency injuries or illnesses occur that need minor medical attention, report to Medical Services.

Screen NonEm1a ALL injuries, regardless of how small they seem, must be reported to your supervisor and site medical IMMEDIATELY.

Supervisors are to complete TVA Form 18120 in accordance with the TVA Safety Manual.

Screen Emerg Emergency

If you ever discover someone who is seriously ill or injured, you should immediately:

Screen Emerg2a

- Notify emergency personnel by dialing **3911 on an installed plant phone** and inform them of the nature of the emergency. Be certain to clearly state the victim’s location.

- Screen Emerg2b
Describe individual industrial safety responsibilities regarding administration of first aid, (if qualified).
- Render any immediate life saving aid that you are QUALIFIED to perform, consistent with work expectation of your position at TVA. Avoid additional harm. Do not move a person injured from a fall or in medical distress unless they are in a life-threatening environment.
- Screen Emerg2c
- When medical help arrives, offer assistance, and then stay clear of the area.

Screen Emerg3 Assistance Available

The Medical Emergency Response Team (MERT) are the on-site personnel who respond and provide medical help.

- Screen Emerg3a
- If further medical attention is required, the injured person will be transported to the proper medical facility.

- Screen emquiz
- Question: A frayed electrical cord on a power tool is an example of a problem that should be reported to supervision.

True? or False?

- Screen emquiz
- Answer: True. A frayed electrical cord could cause an unsafe condition if the tool was used. Report it to your supervision.

Screen Risks Methods for Lifting to Avoid Personnel Injuries:

People naturally tend to bend at the waist and lift loads with their hands and arms. This causes injuries.

- Screen Risks1a
- Instead, bend at the knees, and lift with your legs, holding the load close to the body. If you must turn, turn with your feet, not by twisting your back.

- Screen Risks2
- When setting the load down, bend at the knees, and keep fingers out from under the load.

If possible, avoid manually lifting objects overhead, and get help if needed.

Screen Signs COMPLIANCE WITH SAFETY POSTINGS AND PERMITS

- Describe individual industrial safety responsibilities regarding observation of safety postings, barriers, tags, and signs.
- Safety postings, barriers, ropes, tags, and signs, are used throughout the plant to warn you of potential safety hazards or dangers.

Examples include: Danger - No Smoking, Confined Space – Entry by Permit Only, Authorized Personnel Only.

- Screen Permit
- Some activities such as welding, propping open a fire door or entering a tank, require a permit. ALWAYS get the necessary permit and authorization BEFORE starting the job.

- Screen Permit2
- These postings and permits are needed for the protection of you and your co-workers.

Screen Permit2a Always read signs and postings and understand what they mean!

Screen Tags Protective Tags

Tags are another way of protecting you from potential danger, communicating special requirements or providing other types of information.

Temporary use hoses shall be labeled and controlled by the installing organization and should be removed upon completion of the test, task or process. Ensure all temporary equipment is properly restrained and identified according to plant procedure.

Screen Tags2 Clearance Tags

Clearance Tags are not to be used for any other purpose except that which is allowed by the clearance procedure. If you find a lost or misplaced clearance tag it should be turned in to your supervisor and remember, the Shift Manager **must** be notified. Never re-hang any tag.

Screen tags2a The Danger Tag is a red tag with white letters. It is used to identify the boundaries of a clearance. A Danger Tag is installed on all energy-isolating devices (e.g., valves and/or breakers) used to isolate equipment from all sources of energy and prevent transmission or release of energy, so that work may be safely performed on that equipment. Equipment with Danger Tags in place must never be energized or operated. A Danger Tag must never be placed on any equipment that is energized or in service.



Screen tags2b In addition to hanging a Danger Tag, there is a "tags plus safety device" placed at the energy isolation point to prevent accidental energizing of equipment under the clearance. Never handle or tamper with a tags plus safety device. Never operate equipment that is tagged. Regardless of the presence of a Danger Tag, all equipment must be considered energized unless it is known to be within the limits of a clearance that has been issued and not released.

Screen tags2c There are two Caution Order Tags (TVA Form 6273 and 19629). Both tags are yellow with black letters. The Caution Order Tag can be attached to plant equipment switches, or controls where a hazardous or abnormal condition exists. The Caution Order Tag identifies the existence of unusual circumstances and provides direction concerning these circumstances. A Caution Order Tag does NOT mean that the equipment is de-energized.



Screen tags2d

The Operating Permit Tag is a blue tag with black letters. The Operating Permit Tag may be attached to equipment or controls that are located away from main control panels and/or switch panels when the equipment is to be operated only by the person named on the operating permit. The presence of an Operating Permit Tag does NOT signify that the equipment is de-energized.



Screen Tags3_a

The Clearance Procedure is one of the most important safety procedures used at TVA. The Clearance Procedure applies to work on machines and equipment under site control. All employees must carefully and strictly follow the requirements of the Clearance Procedure to ensure the safety of those working on or in the vicinity of a clearance.

Screen tags3_aa

The Clearance Procedure also applies to personnel who work on generating plant machines and equipment including TVA, contractor, and staff augmented employees. When outside service personnel perform activities on equipment, the clearance procedure is used to establish the necessary safety boundary on equipment to be serviced.

Screen tags3_aaa

The purpose of a Clearance Procedure is to establish protection for personnel and plant equipment during operation, maintenance, and modification activities.

Screen tags3_aaaa

The Clearance Procedure uses the previously mentioned series of colored tags to indicate the boundaries of the clearance and to warn of hazards or unusual situations to all those that may work in the vicinity of the equipment.

Screen Tags3_b

The Clearance Procedure is used to isolate machines and equipment electrically and/or mechanically and to render them inoperative before performing service and maintenance work. This prevents unexpected energizing, or start up of equipment or release of stored energy that could occur and cause injury or property damage. Additionally, provisions of the procedure ensure that the status of safety-related and other important equipment is verified when the equipment is removed and restored to service.

Screen Tags3_c

Safety is the most important aspect of your work. It is more important than cost or schedule, and compromising safety by inattention or deliberate avoidance of safety rules is unacceptable. Actions like these place you and your coworkers at risk.

Safe work boundaries are established while work is being performed on plant equipment through the use of the Clearance Program and Hold Orders. The proper use of clearances is described in the governing procedure SPP-10.2, Clearance Procedure to Safely Control Energy, and in TVA Safety Procedure (TSP) 613, Clearance Procedure to Safely Control Hazardous Energy Using Group Tagout.

- Screen Tags3_d It is vital that anytime work is being performed the proper clearances are in place prior to starting the job. In cases where a clearance may not be required, the Clearance Program requires a justification be performed and documented in a Job Safety Analysis (JSA) and approved by management.
- Screen tags3_d1 There are specific roles, responsibilities, and safety rules for all personnel regarding the clearance procedure. Per the specific role requirements described below, individuals completing this course are considered an “**Authorized Employee.**”
- Screen tags3_d2 The first role is that of the “Responsible Employee.” The Responsible Employee is the owner of the clearance procedure and is accountable to ensure the procedure is being followed correctly. The Responsible Employee is the only employee who can write and issue a clearance in accordance with TSP 613.
- Screen tags3_d3 The second role is that of the “Qualified Employee.” The Qualified Employee implements the clearance procedure by operating energy-isolating devices in accordance with the clearance instructions to de-energize equipment and install clearance tags at each isolation point. The Qualified Employee is accountable to ensure that equipment is cleared, de-energized, depressurized, and tagged in accordance with the tagging instructions. The Qualified Employee must report back to the Responsible Employee any discrepancies with the clearance instructions or failure to make the equipment safe for the work to be performed.
- Screen tags3_d4 The third role is that of the “Primary Authorized Employee.” The Primary Authorized Employee (PAE) is authorized to hold a clearance (it is ‘held’ electronically by use of his name within the clearance software) on the equipment that maintenance and/or modification work will be performed. The Primary Authorized Employee also holds the clearance for the Authorized Employees who perform the maintenance and/or modification work. It is the responsibility of the Primary Authorized Employee to walk down the clearance to make sure it is safe to work on after the clearance is established.
- Screen tags3_d5 The fourth role is that of the “Authorized Employee.” The Authorized Employee (AE) is authorized to perform maintenance and/or modification work on equipment under a clearance. However, they must first sign on the clearance, as described below.
- Screen tags3_d6 The fifth and last role is that of the “Affected Employee.” Affected Employees are anyone in the vicinity of equipment under a clearance (for instance, on site), but not involved in the work activities covered by the clearance. Examples of Affected Employees include vendors and administrative professionals.
- Screen tags3_d7 Clearance Personnel Accountability Log (CPAL)
- The Primary Authorized Employee (PAE) maintains a “Clearance Personnel Accountability Log” (CPAL) for each clearance to indicate the Authorized Employees (AEs) who are working on the cleared equipment.

Screen tags3_d8

Each AE who will work on equipment under a clearance will take a personal action to sign their name on the CPAL form for that clearance, prior to starting work on the cleared equipment. This action may be accomplished by the AE signing on the CPAL either manually or using their unique identification electronically.

AEs will participate in Pre-Job Briefings by providing feedback on improving performance, efficiency, and reducing risk associated with work activities. The Pre-Job Briefing is a good time for AEs to sign the CPAL form.

IMPORTANT: Each AE must realize this -- your signature on the CPAL form is your personal block on that clearance, ensuring that no one may release the clearance without your approval. It is another level of safety for personnel working under the clearance.

Screen tags3_d9

The PAE is responsible for verifying the absence of hazardous energy prior to performing work. This includes energy in the form of:

- electrical
- hydraulic
- chemical
- motion
- mechanical
- pneumatic
- thermal
- gravity

If cleared equipment under a single clearance is located remotely from each other, the cleared equipment is tested for the absence of energy at the location where the work will be performed before beginning work.

Screen tags3_d10

The PAE may delegate the responsibility for testing to an AE. HOWEVER, under NO circumstances should a PAE or an AE perform tests for the absence of energy if you are not qualified to do so.

Example: A breaker is opened in the basement for work on a light socket on the roof.

Q1: Where is the test performed? ANSWER: on the roof.

Q2: Who can do the test using a voltmeter? ANSWER: a qualified electrician.

Screen tags3_d11

AEs test for the absence of energy prior to performing work on equipment under clearance by the following methods:

- testing electrical circuitry using the appropriate test equipment
- visually inspecting the position of devices
- observing bleeds, gauges, or indicators
- using other available means

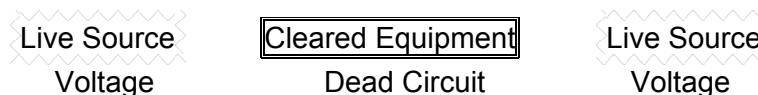
If hazardous energy is detected, then **STOP WORK** and immediately report the presence of hazardous energy to the PAE!

A Problem Evaluation Report (PER) will be submitted for this condition.

Screen tags3_d12 “Live-Dead-Live” Test

The PAE or AEs who are qualified to perform testing can test electrical conductors using an electrical test instrument.

Test the electrical test instrument on a known energized source to check proper operation before and after testing the electrical equipment for energy. The electrical test instrument can be either a voltmeter or a voltage detector.



Screen tags3_d13 An AE, after “signing-on” the CPAL and before starting to work, may request to walk down the applicable portion of the boundaries of the clearance.

Using the tagging list, AEs can determine if energy isolating devices are controlled to prevent introduction of hazardous energy inside the clearance boundary.

Screen tags3_d14 At times sources of energy for testing cleared equipment need to be applied to equipment involved in a clearance. When this occurs, Authorized Employees are responsible to comply with all clearance instructions and safety procedures during the application of energy, as directed by the Primary Authorized Employee, and to remain in the clear during application of energy.

NOTE: It is during these times that an Operating Permit (blue tag) may be in use.

Screen tags3_d15 Completion of Work

Upon completion of work, each Authorized Employee is responsible for the following:

1. Notify the PAE that work is complete.
2. Under direction of the PAE, AEs will remove equipment used during the work.
3. Clean the job site.
4. Sign-off the CPAL.

Screen tags3_d16 The PAE maintains the CPAL form by having each AE “sign-off” the CPAL upon completion of their work under the clearance, or whenever the AE does not plan to perform any additional work under the clearance.

When the equipment under clearance may need to be placed in operational status, the AEs may be requested to sign-off the CPAL before leaving the plant, and before returning the equipment to operational status.

REMEMBER: The PAE may not release the clearance until all AEs have personally signed-off the CPAL.

- Screen tags3_d17 The PAE is responsible for verifying that equipment is ready to return to operational status. This includes the following:
1. Inspecting the job site to determine that all employees are in the clear and signed off the CPAL.
 2. Verifying that all tools and equipment are removed.
 3. Verifying that the job site is clean.
- Screen tags3_d18 Review of Clearance Safety Rules:
- Do not operate equipment that is tagged.
 - Regardless of the presence of a Danger Tag, all equipment must be considered energized unless it is known to be within the limits of a clearance that has been issued and not released.
 - Always test for the absence of energy prior to performing work under a clearance.
 - Work must not be performed on an energy-isolation device used to establish a clearance that will make the device unable to function as an energy-isolation device for that clearance. [In other words -- Do not work on a tagged valve.]
 - No work may be performed on equipment under a clearance unless Authorized Employees are signed on to the Clearance Personnel Accountability Log (CPAL) form for that work.
 - AEs must sign-off the CPAL form when their work under the clearance is complete.
- Screen Tags3_e The use of standing hold order, human hold orders, or human protection is NOT an acceptable means to provide personnel and equipment protection. For example, having a worker open a breaker and standby the breaker to ensure no one comes along and closes it while their coworker terminates electric leads is NOT permitted.
- If you find yourself relying on a standing hold order to perform work, your safety is at stake. STOP IMMEDIATELY and contact your supervisor.
- Screen Tags3a Equipment that is NOT under the Shift Manager's control and that is NOT cleared through use of the Clearance Procedure is controlled (isolated, energy dissipated, and tagged or locked in safe configuration) through the use of the Lockout/Tagout procedure (MMDP-12) when the work activity requires a clearance.
- Screen Tags4 Violation of the Clearance Procedure can result in disciplinary action including termination. People can be injured or killed and there is no room for mistakes. In addition, equipment may be damaged or reactor operations adversely affected. Never violate a clearance. Failure to follow clearance procedures has also resulted in regulatory actions against TVA.
- Screen Tags5 Remember, Operations controls all plant equipment including managing and picking up Danger Tags.

Screen Injury

PERSONAL PROTECTIVE EQUIPMENT

Industrial safety experience has shown that the INDIVIDUAL has the most control over reducing on-the-job injuries. This experience also shows that most injuries will involve the:

Screen Injury1a
Screen Injury1b
Screen Injury1c
Screen injury1d

- head
- feet
- eyes
- hands

Screen Injury1e
Describe individual industrial safety responsibilities regarding adherence to safety instructions and use of personnel protection equipment.

For this reason, employees will be issued personal safety equipment and you are expected to use it as discussed in the following material.

Rings, Jewelry, Neckties, and Similar Items

Rings, dangling jewelry, loose neckties, and similar items that constitute a hazard while operating or working around machinery shall not be worn. Jewelry shall not be worn where contact with energized circuits may occur.

Ties will be tucked in the shirt or removed before entering a plant operating area or shop.

Neck lanyards used to hang or carry picture badges, dosimetry, ink pens, and similar items shall have at least two weak-link break points at divergent locations and be of a type or design approved by the site safety staff.

Additionally, rings are not worn while performing functions that would be made more hazardous if a ring was worn (e.g., climbing ladders, performing electrical or mechanical maintenance).

Screen injury1f

When working on or within reaching distance of exposed energized electrical equipment, exposed conductive articles, such as key and watch chains, rings, wrist watches, or wrist bracelets and bands and necklaces are not worn.

Clothing

Employees are responsible for wearing clothing in accordance with the site instruction and appropriate for the type of work you are doing.

Minimum attire is long pants and a T-shirt with sleeves. Shorts, cutoffs, tank tops, or mesh shirts are not allowed.

Screen injury1g

Secure long hair that could be caught in moving machinery.

Special fire retardant protective clothing for hot work may be available upon request.

Screen ProEq

Let's look at some of the personal protective equipment used at our nuclear power plant.

Screen Head
State plant policy regarding the use of the following personal protective equipment and state when and how these items will be worn: hard hats and safety glasses.

Head Protection

With few exceptions, hardhats are to be worn at all times within the plant.

Hardhats are worn with the peak (bill) facing forward, except when the use of other protective devices interferes with wearing the peak forward. Hard hats and suspensions must not be altered in any way. Suspensions must be reversed when the hardhat is worn backwards.

Screen Heada

Nothing is to be worn underneath hardhats except items specifically designed or approved for use under hardhats.

Screen Headb

Examples are:

1. winter liners
2. snug fitting welder's cap
3. contamination zone surgeon's caps
4. contamination zone canvas hoods

Baseball-type hats are not worn under hardhats.

Screen Head2

Eye and Face Protection

Protective eyewear consists of safety glasses with locking or fixed side shields. Protective eye/face wear must meet the requirements of ANSI Z87.1. This includes prescription eyewear worn as protective eyewear.

With few exceptions, safety glasses are to be worn at all times within the plant.

Screen Head2a

Face shields are required when performing work which produces flying particles or objects, or when working with hazardous liquids. Protective eyewear is worn under the face shield.

Visitors, contractors, and new employees who do not have prescription safety glasses with side shields wear standard goggles, or visitor's spectacles over their prescription eyewear.

Screen Foot

State plant policy regarding the use of the following personal protective equipment and state when and how these items will be worn: protective footwear.

Footwear

Foot protection for the plant operating area, Nuclear Stores dock, and warehouse areas shall be a sturdy, industrial grade leather or manmade leather substitute work shoe. The shoe may be a work shoe, walking shoe or boot, but must cover the entire foot.

Screen Foota

Open-toe shoes, canvas type deck shoes, sandals, loafers, athletic-type shoes, and high-heel shoes (more than 1-½ inches) are prohibited in plant operating areas. Appropriate foot protection shall be worn to protect against special hazards such as chemical, electrical, heat, puncture, and radiological contamination. This type of foot protection will be furnished by TVA NPG.

Screen Footb	Visitors and others without appropriate footwear must restrict their activities to administrative offices and other exempt areas. If you have any question regarding appropriate footwear, contact your supervisor.
Screen Ear	<u>Hearing Protection</u>
State plant policy regarding the use of the following personal protective equipment and state when and how these items will be worn: hearing protection.	Being exposed to excessive noise without protection can result in an immediate or a gradual hearing loss.
Screen Ear1a	Since the effects of not using hearing protection may not be immediately observable, don't assume that hearing protection is not needed because you don't feel like your ability to hear is being reduced. Some employees may be required to take periodic hearing test.
Screen Ear2	Let's examine the effects of noise on our hearing and the use of hearing protection.
Screen Ear3	Sound waves enter the outer ear and are channeled to the eardrum.
Screen Ear4 Recognize the following as potential health hazards: high noise areas.	The eardrum vibrates and transmits vibrations to rows of tiny hair cells in the inner ear. Hair cells transform sound frequencies to electrical impulses which are then transmitted to the brain.
Screen Ear4a	It is damage to or bending of these hair cells, after prolonged exposure to loud sound, that results in hearing loss.
Screen Ear4a	Other adverse effects that have been associated with prolonged exposure to loud sound include: <ul style="list-style-type: none">• annoyance• distraction• nervousness• headaches• fatigue
Screen Ear6	The INTENSITY of a particular sound wave is measured in decibels. Any sound that creates a decibel level of 90 or more can result in a permanent hearing loss over a period of time, IF some sort of protection is not used. Employees shall be protected from noise at or above 85 decibels.
Screen Ear7 Describe methods for reducing the risk involved with the following industrial hazards: high noise areas.	You must wear hearing protection (ear plugs or ear muffs) when working in a designated high-noise area. In addition, in areas where the noise level is 100 decibels or above, ear plugs <u>and</u> ear muffs are required to be worn. These areas are posted throughout the plant.
Screen Ear8	In addition to posted areas, areas where it is difficult to hear or converse should also be considered high-noise areas.

Screen Ear8b There are two basic types of hearing protection available; the ear plug and the ear muff. Hearing protection can be found in designated areas throughout the plant.

Screen Ear9 Hearing protection equipment is also available through the tool room or Nuclear Stores.

Screen Ear10 For maximum protection, the device must make a tight seal with the ear canal.

Screen Ear11 Use and Care of Hearing Protection Equipment

Screen Ear11 Disposable Foam Plugs -

Roll the plug between your fingers to reduce its diameter. Pull outwards and upwards on outer ear, then insert the compressed plug into the ear canal. Repeat these steps for the other ear. Foam plugs may be used more than once, but if they become soiled or worn, replace them.

Screen Ear11 Reusable Ear Plugs -

Insert in the same manner as the disposable plug with the exception of compressing the plug. Since this type is reusable they should be routinely washed with mild soap and warm water.

Screen Ear11 Muff Type -

The soft edges of the muff must completely seal around the ear. Adjust the head band for a snug, comfortable fit. Do not reshape the headband or poke holes in the muff for ventilation, or the effectiveness of the device will be lost.

Screen Ear12 NOTE:

Prior to inserting plug-type hearing protection, be sure your hands, ears and plugs are clean.

Screen Ear13 Tests show that hearing loss occurs naturally as we age.

Audiometric testing is conducted to determine an individual's hearing ability. Audiometric testing is performed on employees whose job requires them to routinely work in areas with high noise levels.

Screen Hand Hand Protection

State plant policy regarding the use of the following personal protective equipment and state when and how these items will be worn: hand protection.

All employees shall carry leather gloves with them when in plant operating areas, outside shop, fabrication areas, and wherever hand injuries are likely to occur.

Hand hazards include: chemicals, electricity, machines & equipment, extreme heat or cold, sharp tools, vibration, friction and dampness.

Gloves are worn when handling materials, operating portable tools/equipment, climbing ladders and placing hands where pinch points can contribute to an injury.

Screen Hand1 Gloves are not to be worn when working near rotating machinery. Wearing of gloves on a glove keeper could pose a hazard around rotating equipment.

Screen equiz Question: The plant is on-line producing power. You need to cross the Turbine Deck to get to the Control Room. Which personal protective equipment item would NOT be required to wear?

- A. Hard hat
- B. Hearing protection
- C. Gloves
- D. Eye protection?

Screen equizC Answer: C, Gloves. You would NOT be required to wear gloves in this situation.

Screen safeq
Describe individual industrial safety responsibilities regarding general use of safety equipment such as eyewash stations, first aid kits, and safety showers.

Emergency Safety Equipment

The plant contains many types of industrial hazards. In some areas of the plant, you will find safety equipment installed near specific hazards and other equipment strategically placed for emergency use.

DO NOT tamper with this equipment unless you really need it.

Screen ShowWash

Emergency showers and eyewash stations - examples of safety equipment - are located in the plant where there is a potential for exposure to chemicals.

They are used to wash spilled chemicals off your skin and out of your eyes. Make sure they are functional before starting or working around hazardous materials or chemicals. They should be positioned no greater than 100 feet where the individual can reach one within 10 seconds.

Screen Eyewash

Emergency Eyewash

If you need to use the eyewash station, place your face near the water fountain and activate it by depressing the handle.

Flush your eyes for 20 minutes.

Screen Shower

Emergency Shower

If you or coworkers need to use an emergency shower, enter the shower and pull the chain.

Stay in the shower for a least 20 minutes if chemicals are involved.

Screen iss2

If you are assigned to work in an area with a particular hazard, make sure you know where the safety equipment is and how to get to it before starting the job.

Screen haz

POTENTIAL HEALTH AND INDUSTRIAL HAZARDS

Let's recognize some potential health and industrial hazards and describe ways to reduce these risks.

Screen abs1
Recognize the following as potential health hazards: use of asbestos on some plant components.

Asbestos

Asbestos is a fiber that was once popular for use in the fabrication of lagging, insulation gaskets, and other applications.

After many years of use, it was discovered that asbestos could cause serious health problems.

Screen abs2
Describe methods for reducing the risk involved with the following industrial hazards: asbestos.

Much of the asbestos that was used during the construction of the plant has either been removed or labeled ASBESTOS. If you work on a component suspected of containing asbestos and have not had asbestos training, notify your supervisor.

Screen stlk1

Steam Leaks

Recognize the following as potential health hazards: steam leaks.

As discussed earlier, one of the main products produced in the plant is steam. Steam is used in a variety of applications at pressures that range from one pound to over a thousand pounds per square inch. Occasionally, a steam leak will develop from a plant component such as a valve or pipefitting.

Screen stlk2

Indications of steam leak:

- visible vapor coming out of a plant component
- whistling noise
- increased area temperatures
- moisture on walls or ceiling

Screen stlk3
Describe methods for reducing the risk involved with the following industrial hazards: steam leaks.

You should always use caution when in an area containing a steam leak. Steam can cause burns if it comes in contact with your body. Report steam leaks to the Shift Manager or your supervisor.

Screen elh1
Recognize the following as potential health hazards: electrical equipment.

Electrical Hazards

Many types of electrical power are used in the plant, and both alternating and direct current can cause injury. Electrical power used in the plant ranges from a few volts to thousands of volts.

Ground Fault Circuit Interrupters (GFCIs) are used with all 120-volt ac portable lights and electric tools in conductive environments (this includes lights used under temporary trailers, trucks, etc.). Individual GFCI protection is to be provided for each electrical circuit. GFCI for temporary lighting is to be located in a dry area or weather proofed. It is the user's responsibility to test the GFCI daily when in use, and before placing it in service. To test the GFCI, press the GFCI test button. If the test is satisfactory, the reset button will pop up. To reset the GFCI, press down on the reset button. If the test has failed to trip the circuit, the GFCI reset button will not pop up and the GFCI is deemed to be defective. All defective GFCIs are to be tagged with a defective equipment tag and removed from service.

Screen elh2
Describe methods for reducing the risk involved with the following industrial hazards: electrical equipment.

Potential Electrical Hazards:

- damaged electrical cords
- liquid leaking into electrical cabinets
- missing ground plugs
- exposed wiring

Exposed conductive articles such as rings, metal wrist watches, bracelets, metal necklaces, key chains, watch chains, and belt buckles are not worn while working on or within reaching distance of exposed energized conductors. Never touch an individual who is in contact with a live circuit.

Screen elh3

Always use caution when working around any component that uses electricity. Signs shall be used around areas of high voltage to warn of the electrical hazard.

Screen elh4

If assigned to work on or around any exposed conductors or equipment that uses electricity, make sure it has been removed from service and PROPERLY TAGGED!

Screen conf1
Recognize the following as potential health hazards: confined spaces.

Confined Spaces

When you think of a “confined space”, what comes to your mind? No clowning around - confined spaces could contain life-threatening atmospheres.

Screen conf2

An area is referred to as a confined space if it meets all three of the following criteria:

1. Any space not intended for continuous human occupancy.
2. Any space having a limited means of entry and exit.
3. Any space subject to the accumulation of an actual or potentially hazardous atmosphere or potential for engulfment.

Screen conf3

Some examples of potential confined spaces are:

- storage tanks
- ventilation ducts
- exhaust ducts
- manholes
- underground utility vaults
- acid tanks
- tunnels

Screen conf4

Describe methods for reducing the risk involved with the following industrial hazards: confined spaces.

All persons entering a confined space or acting as a standby person must receive formal training. Air testing shall be made by a trained and qualified person prior to entry into a confined space. A confined space entry permit shall be used to document confined space entries. The permit shall be posted at the entrance to the confined space, and returned to the Industrial Safety office at the completion of the entry. Many confined spaces have been tagged and posted as “Confined Space - Entry by Permit Only”.

Screen conf5

WARNING - Entry into a confined space is not permitted unless the requirements of the confined space permit are met and you have completed the confined space training course.

Screen conf6	Calvert Cliffs Nuclear Plant, September 15, 1988: Two divers entered a nitrogen blanketed condensate storage tank without wearing a SELF CONTAINED BREATHING APPARATUS (SCBA). The first diver lost consciousness and fell into the water. The second diver attempted to rescue the first diver and drowned, because he was not equipped with a tether line per the procedure to be pulled back to safety. The first diver was rescued by another person.
Screen conf6a	This is a significant event because the divers failed to follow STANDARD WORK PRACTICES and controls for confined space work and failed to make adequate rescue preparations.
Screen quest4	Question: You are about to enter a drained lube oil storage tank to perform an inspection. Does the storage tank fit the description of a confined space? Yes or No
Screen quest4a	Answer: Yes. The storage tank is not intended for occupancy, has one way in and out, and has a potentially hazardous atmosphere.
Screen heat1	<u>Heat Stress</u>
Recognize the following as potential health hazards: heat stress.	Some plant areas can get extremely warm. The stay time, or the length of time permitted at a work area, may be limited to protect you against heat stress. Additionally, special clothing may also be required.
Screen heat2	Heat stress concerns should be discussed with your supervisor.
Describe methods for reducing the risk involved with the following industrial hazards: heat stress.	Plant procedures provide guidance for stay times in these areas, based upon temperature and humidity. The job should be planned to minimize time and effort. Use the buddy system when appropriate.
Screen heat3	Heat stress is a potential health hazard. To minimize the risk of heat stress: <ul style="list-style-type: none">• Know your environment.• Drink plenty of water before entering the area.• Take appropriate breaks.• Wear proper clothing (ice vest, heat shield, etc.).• Acclimate yourself; warm up gradually to the environment.• Stay in good shape and get plenty of rest.• Minimize overexertion.• Eat wisely.• Be aware of special risks such as the effect of age, caffeine, medications, and alcohol.

Screen heat4

!!WARNING!!

If you are working in a hot and/or humid area and begin to feel overheated or dizzy, inform your coworkers and move to a cooler area and rest.

Notify your supervisor of the situation so that remedial actions can be taken.

Screen lead1

Lead Based Materials

Lead is a hazardous waste material. Lead can be hazardous to your health. If you are going to work with lead or lead-based coating, you must be trained. Contact your foreman, supervisor, or safety representative before proceeding with your work. Appropriate medical screening may be required.

Screen gas1

Recognize the following as potential health hazards:
compressed gases.

Compressed Gases

Compressed gas cylinders present safety hazards.

They contain compressed gas that may be flammable or displace oxygen.

These cylinders are stored outside whenever possible BUT should be protected from the weather and direct sunlight.

Screen gas2

When working with or around compressed gas cylinders...

Describe methods for reducing the risk involved with the following industrial hazards:
compressed gases.

- stay clear of any relief or blowoff valves
- move the cylinders by using a cart designed for compressed gas bottles or by rolling using the bottom of the cylinder as a rolling point
- store cylinders securely in an upright position with the valve cap on

Screen gas2b

Compressed gas cylinders (CGC) are to be secured to rugged building structures such as concrete columns, building steel, support steel (non-safety related), wall anchors etc. Do not secure CGCs to scaffolding within plant areas and CGCs are not to be tied off to items or features that could be damaged, such as: electrical panels, suspended conduit, control stations, etc. Securely chain, strap, or tie in such a manner that the cylinder will have no more than two inches of movement. Securing only the top of the cylinder is acceptable provided moving the bottom won't cause it to slip its tie. Carts are acceptable, provided they are properly secured while inside the plant. Nylon rope, chain, wire rope, and straps are examples of acceptable material for tie-off.

Screen gas3

When using compressed air for pneumatic tools or cleaning, be sure the hoses are in GOOD CONDITION, and do not direct compressed air at any part of the body!

Screen rot1

Moving/Rotating Equipment

Recognize the following as potential health hazards: moving/rotating equipment.

Many types of rotating or moving equipment are used in the plant such as:

- lathes
- pumps
- motor-operated valves
- cranes

Some of this equipment operates intermittently.

Screen rot2

Describe methods for reducing the risk involved with the following industrial hazards: moving/rotating equipment.

Your clothing and accessories should always be worn in a manner to avoid injury.

DO NOT wear loose clothing or jewelry that could get caught in moving machinery or equipment.

Screen rot3

!!WARNING!!

Pay attention to postings and DO NOT tamper with shrouds around moving shafts!

Screen drop1

Recognize the following as potential health hazards: falling objects.

Falling Objects

Falling objects could be a hazard in the plant.

Equipment such as scaffolding, tools, and other objects are examples of items that could fall and cause injury.

Screen drop2

Describe methods for reducing the risk involved with the following industrial hazards: falling objects.

In some areas, objects can be 30 or more feet in the air. These hazards can be minimized through the use of equipment such as hard hats, scaffold toe boards, tool lanyards, and good housekeeping.

Screen drop3

Also, when you are working in the overheads, remember that there may be people passing below you!

Screen drop4

Overhead Loads and Load Drop Zone

Management Expectations:

- You are always to remain outside the Load Drop Zone (LDZ) unless you have specific permission from the Person-in-Charge to be in the area of the lift.

Load Drop Zone (LDZ) -- Definition:

The LDZ is the hazardous area underneath a suspended load in which the load could fall causing injury to personnel.

If necessary, use DANGER tape (black text on red tape) to prevent entry to a LDZ.

Screen drop5

LDZ -- Practical Application:

If you see a pipe being carried by an overhead crane, you would naturally not want to walk under it. But how close would you want to come before you were unsafe?

The practical method that TVA uses is as follows:

1. how **Tall** is the load?
2. how **High** is it raised? (the maximum height used is 10 feet)

$$\text{LDZ} = \text{Tall} + \text{High}$$

3. stay that far away from under the load in all directions

Screen drop6

Question:

A 1-foot diameter pipe is being carried by an overhead crane 5 feet high. What is the LDZ?

Answer:

1. the load is **1-foot Tall**
2. it is raised **5-feet High**

$$\text{LDZ} = \text{Tall} + \text{High}$$

$$\text{LDZ} = 1 + 5$$

$$\text{LDZ} = \underline{\mathbf{6 \text{ feet}}}$$

3. stay **6 feet away** from under the load in all directions

Screen fall1

Recognize the following as potential health hazards: trip and fall hazards.

Trip and Fall Hazards

When working in the plant, special care must be taken regarding hazards that can cause you to trip or fall. Be aware of these hazards and use care. Examples of trip and fall hazards:

- steps at an unexpected place
- pipes close to the floor
- low conduit trays

Screen fall2
Describe methods for reducing the risk involved with the following industrial hazards: trip and fall hazards.

Safety harnesses shall be worn when working on surfaces that are more than **four (4) feet** off the floor or ground, that do not have guardrails, and that present a fall potential. Lanyards shall be as short as practical, and tied off above personnel, when possible to a strong anchorage point as equal as that of the breaking strength of the lanyard.

This is a popup box
BFN PER 02-012310-000

Plant equipment such as piping, cable trays, snubbers, instrument tubing and electrical connectors are not capable of supporting personnel and can be easily damaged, and **SHOULD NEVER BE USED FOR CLIMBING**. Insulated piping or ducts **SHOULD NOT BE USED FOR ACCESSING EQUIPMENT**. Use scaffolding or ladders when working on equipment that is not easily accessible from the floor.

Screen lad1

Ladders & Scaffolds

- Ladders must be tied or secured to a support point or be held by someone.
- Use only wood or fiberglass ladders near exposed electrical circuits.
- Workers **MUST** face the ladder when climbing ... do not forget to use both hands.
- Do not use a ladder at an angle which will endanger the user or cause slippage or overloading.
- Ladders are to be inspected before each use by the employee intending to use the ladder.
- Defective or damaged ladders should be immediately tagged with a "defective equipment" tag and reported to your supervisor.
- Stepladders must be fully opened when used, and never stand on the top two steps under any conditions.
- Do not climb on equipment. Use the appropriate ladder or scaffold.

Screen lad2

Screen lad3

NO scaffold shall be erected, moved, dismantled, or altered except under the direct supervision of Qualified Personnel who have been trained to the requirements of the site scaffold procedure.

Verify a scaffold is approved for use as indicated on the Scaffold Inspection Tag, follow all instructions and requirements noted on the tag, and (if applicable at your site) the Radiation Protection Survey Tag, before climbing.

Screen eyehaz1
Recognize the following as potential health hazards: eye hazards.
Describe methods for reducing the risk involved with the following industrial hazards: eye hazards.

Eye Hazards

Some activities in the plant can represent a serious eye hazard. Chipping, grinding, and welding are only a few examples of activities that require special eye protection. When involved in activities that may present a hazard to your eyes, wear your safety glasses and goggles or a face shield. If you have a need for other eye protection, discuss it with your supervisor.

Screen quest5

Question: What is the **CORRECT** way to store compressed gas cylinders in the plant?

- A. Laying on their side and stacked on top of each other
- B. Standing up and tied off to a permanent structure.

Screen quest5a	Answer: B, Compressed gas cylinders shall be stored in an upright position and secured to prevent falling.
Screen hazcom	<u>HAZARD COMMUNICATION</u>
Recognize the following as potential health hazards: hazardous chemicals. Describe methods for reducing the risk involved with the following industrial hazards: chemical products.	TVA NPG has established a hazard communication program to ensure all employees are familiar with their rights and responsibilities, as identified in the hazard communication standard, in regards to: <ul style="list-style-type: none">• Hazardous chemicals• Disposing of hazardous waste and chemical emergencies.
Screen hazcoma	<u>Hazardous Chemicals</u>
State the purpose of the company's hazard communication program.	Many types of chemicals are used on the site in a variety of applications. Examples of these include cleaning or degreasing solvents, acids or caustics, petroleum based lubricants and fuels, process treatments, and coating materials. All personnel should understand the hazards, protective measures, and the limitations of hazardous materials they use.
Screen hazcomb	<u>Chemical Traffic Control</u> (SPP-5.4) is designed to minimize the possibility of harmful chemicals contacting plant equipment, including the fuel. If these restrictions are violated and harmful chemicals are deposited on the fuel, accelerated corrosion of the fuel rods may occur, leading to leakers. Note that a chemical does not have to be directly placed on the fuel to cause damage. Contaminants in water from systems connected to the reactor vessel or spent fuel pool will reach the fuel as well. It is important to use and dispose of chemicals in the approved manner throughout the plant.
Screen hazcom1	Some chemicals are potentially harmful to workers, plant systems, or the environment, if not handled properly. Nuclear plants have the goal of not releasing any liquid radioactive waste. Since a harmful chemical may remain in some plant systems recycled heated water, the potential for damage to plant systems is increased. OSHA's right-to-know law says that you have the right to be informed of any hazards due to chemicals on the job.
Screen hazcom3	This is done by container labeling and this training; for further information, Material Safety Data Sheets (MSDS) are provided.
Screen hazcom4	Let's look at MSDSs and container labeling in more detail.

Screen hazcom5	MSDSs serve as the basic source of information on the chemical identity and dangers of a material.
Screen hazcom6	State where information may be obtained explaining the risks, hazards, and handling associated with a chemical or toxic substance.
Screen hazcom6a	<ul style="list-style-type: none">• MSDSs are kept on file and will be readily accessible to workers.• MSDSs are available from the Chemistry Manager or designee ... and at various locations around the plant.
Screen hazcom7	<p>NOTE:</p> <p>MSDSs should be considered an important resource to use during a pre-job brief involving work with hazardous substances.</p>
Screen hazcom8	<p>Manufacturers are required to attach warning labels to all containers of potentially hazardous substances. Make sure you review all labels before using any chemical.</p> <p>When these hazardous substances are transferred from the original labeled container to a receiving container, workers must ensure the receiving container is properly labeled.</p>
Screen hazcom9	All chemicals and hazardous materials on site must be approved by the Site Chemistry Manager or designee. All chemicals removed from the original manufacturer's containers and placed in any other container must be labeled with a transfer label. Chemicals in the original manufacturer's container must be labeled to indicate the Use Code and Approved Chemical Number unless specifically exempted by the Chemistry Manager or designee.
Screen hazcom9a	Chemicals and hazardous materials are labeled with Roman numerals. The numeral indicates the approved use code. Refer to the Chemical Approval Form for specific use and disposal instructions.
Screen hazcom9b	CODE I - This material is allowed for use on stainless steel or nickel-based alloys and will not cause damage to plant radwaste or wastewater processing systems.
Screen hazcom9c	CODE II - This material is allowed for use on stainless steel or nickel-based alloys but disposal restrictions apply.
Screen hazcom9d	CODE III - The product is restricted and is not allowed on stainless steel or nickel-based alloys. Disposal is restricted.
Screen hazcom9e	CODE IV - This product is restricted from the RCA. It is not allowed on stainless steel or nickel-based alloys. Disposal is restricted.
Screen hazcom9e	CODE V - This code indicates this product requires a special issue and labeling process.

Screen quest8	<p>Question: This document serves as the basic source of information on the chemical identity and dangers of a material.</p> <p>Is it a Plant Procedure, is it a Problem Evaluation Report, or is it a Material Safety Data Sheet?</p>
Screen quest8c	<p>Answer: Material Safety Data Sheet.</p>
Screen hazcom10	<p>Some indications of a potential chemical hazard in the work environment are:</p> <ul style="list-style-type: none">• liquid spills• labeled or unlabeled containers• unusual vapors or odors• posted chemical storage areas• personal or continuous work area monitoring device indications
Screen hazcom10	<p>Chemicals in the plant can pose two types of hazards: physical hazards and health hazards.</p>
Screen hazcom11	<p>PHYSICAL HAZARDS can produce dangerous situations outside the body, such as flammable or combustible situations or explosive hazards.</p>
Screen hazcom12	<p>Chemical Traffic Control (CTC) applies to everyone, and is important to protect the health and welfare of all employees, protect plant systems from the intrusion of harmful chemicals, and minimize hazardous and mixed waste generation. When not in use, all chemicals should be stored in accordance with safety and fire protection requirements.</p>
Screen hazcom12b	<p>HEALTH HAZARDS can cause health damage such as: irritation, poisoning, cancer, or exposure to toxic substances.</p>
Screen hazcom13	<p>Never remove a label unless you are replacing a defaced, illegible, or torn label. If you cannot identify a chemical due to a missing, defaced, or illegible label, immediately notify your supervisor and the cognizant site environmental personnel.</p>
Screen hazcom14	<p>NEVER mix chemicals and DO NOT use a chemical if you are not sure what it is!</p>
Screen hazcom15	<p>Workers HANDLING acids, caustics, or other corrosive or toxic chemicals shall wear adequate gloves, aprons, foot, eye, respiratory, and face protection; and shall take precautions to prevent personal injury and equipment damage.</p>
Screen hazcom17	<p>Bulk chemical storage areas MUST have highly visible and strategically located warning signs identifying that area.</p>
Screen menu8	<p><u>Disposing of Hazardous Waste and Chemical Emergency</u></p>

Screen hazwop	<h3>Hazardous Waste</h3> <p>Hazardous waste is a material that is ready for disposal and meets certain characteristics such as flammability, corrosivity, reactivity, or toxicity or is specifically designated as such. Hazardous waste must be disposed of properly according to EPA guidelines and the Resource Conservation and Recovery Act (RCRA).</p>
Screen hazwopp	This <u>may</u> include solvents, fuels, paint, lubricants, and outdated chemicals.
Screen hazwop1	<h3>Disposing of Hazardous Waste</h3> <p>To dispose of hazardous waste materials, place the waste in a designated properly labeled hazardous waste container and fill out the log sheet information concerning the contents of the waste product that is to be discarded. Shipping hazardous waste requires a hazardous waste manifest.</p>
Screen hazwop2	Guidance on the use, storage, and disposal of chemicals and hazardous materials may be obtained from the Site Environmental Staff.
Screen hazwop4	<h3>RCRA contains regulations with harsh penalties for violators.</h3> <p>To avoid any violations and to help keep our environment clean, be aware of the type of wastes generated from your work, the rules that regulate these wastes, and the need to properly dispose of any waste when the job is done.</p>
Screen hzwp5	<h3>Chemical Emergency</h3> <p>In the event of a chemical spill or a chemical emergency, you should notify the Shift Manager (SM) immediately. The SM will ensure that the Spill Prevention Control and Countermeasure Plan is implemented. This plan describes how to manage oil and hazardous substances to keep them from entering the environment in a detrimental manner.</p>
Screen issumm	<h3>SUMMARY</h3>
Screen issumm2	<ul style="list-style-type: none">• If you discover an unsafe working condition, correct it if you can or report it to supervision.• If you discover someone who is seriously hurt, check the scene and the victim, call 3911 <u>from an installed plant phone</u> immediately, and render aid if qualified.• Non-emergency illness or injury is treated at Medical Services.• Report ALL injuries to supervision immediately.
Screen issumm2	<ul style="list-style-type: none">• Wear hearing protection, hard hats, safety glasses, substantial footwear, and gloves when required.• Danger Tags are placed on a component when that component is NOT to be operated or moved from its tagged position.• If a Danger Tag is found that is not attached to a component or is attached to the wrong component, notify the Shift Manager immediately.• Emergency eyewash and shower stations are used where workers are exposed to chemicals.• In addition to hearing loss, other adverse effects that have been associated with prolonged exposure to loud sound include: annoyance, distraction, nervousness, headaches, and fatigue.

- Screen issumm4
 - Two basic types of hearing protection are available to plant personnel: ear plugs (disposable and reusable) and ear muffs.
 - Audiometric testing is performed on employees whose job requires them to routinely work in areas with high noise levels.
- Screen sum3
 - Asbestos is a potential health hazard. Working with asbestos requires special training and permits prior to starting work.
 - Always use caution when working around any component that uses electricity. Signs shall be posted around areas of high voltage.
 - If you discover a steam leak, report it to the Shift Manager or supervision. Indications of steam leaks include visible vapor, whistling noise, increased area temperatures, or moisture on walls or ceiling.
- Screen sum4
 - Confined spaces may contain life-threatening atmospheres. Entry requires a permit and special training.
 - Heat stress is a potential health hazard. If working in a hot area and you begin to feel overheated or dizzy, inform your coworkers, move to a cooler area, and rest.
 - Compressed gases may be a flammable or poison hazard. Compressed gas cylinders are usually stored outside, protected from direct sunlight and exposure to weather.
- Screen sum5
 - Do not wear loose-fitting clothing around any moving/rotating equipment.
 - MSDSs provide information on the chemical identity and dangers of a material.
- Screen sum6
 - All containers of hazardous substances must be properly labeled.
 - If you discover a spill of a hazardous chemical or substance, notify the Shift Manager immediately.

FIRE PROTECTION

- Screen fpob1 **OBJECTIVES**
- FPR-01 State individual responsibilities regarding fire barriers such as fire dampers, doors, and seals.
- FPR-02 State the actions an individual is required to take upon discovery of a fire.
- FPR-03 Recognize and state the response to a fire alarm.
- Screen fpob2
FPR-05 State examples of the types of hot work requiring a permit.
- FPR-04 State individual responsibilities regarding the control of fire loading and the disposal of flammable materials.
- Screen fp1 **FIRE PROTECTION**

Fire is one of the primary potential hazards faced in industrial facilities.

This section covers information about protecting workers and our plant from the hazards of fire.
- Screen fp2
SOER 82-10
DO NOT DELETE **Fire and Other Barriers**

Fire barriers are components of construction used to prevent the spread of fire.

State individual responsibilities regarding fire barriers such as fire dampers, doors, and seals.

Some examples are fire rated wall, floors, and roofs, penetration seals or closures, as well as fire doors and dampers. Whenever there is a need for a fire door or barrier to be blocked open, a fire watch or other precautions must be taken to prevent a fire from spreading.

Screen nucov11p
{SQN-NCO
910177001}

Nuclear plants are designed to contain radioactive or hazardous material. This is done with pressure boundaries. A pressure boundary is the physical barrier between an area of lower pressure and an area maintained at a higher pressure. If releases should occur, the flow of air, and thus the material, will be into areas where it can more easily be contained. Also, the control room must be used, even in an accident situation.

Screen nucov11q

Airlock doors and other pressure boundary doors must be kept closed except for normal entry and exit. Material or equipment can be passed through if the time for passage does not exceed site requirements. Otherwise, a Fire Protection Impairment Permit, FPIP, (impairment permit) must be obtained. Contact your supervisor if your job will require a fire or pressure boundary breach. Never have both doors of an airlock open at the same time. Having both doors open would be an example of violating a pressure boundary.

Screen fp2a

Auxiliary Building Secondary Containment Enclosure (ABSCE)

An additional type of barrier is the ABSCE (Auxiliary Building Secondary Containment Enclosure). The ABSCE maintains the Auxiliary Building at a slight negative pressure relative to the outside atmosphere (so air will leak INTO rather than OUT OF the building). This helps to contain any radioactive release from an accident by routing all exhaust air from Auxiliary Building fans through filters and monitors. If you open ABSCE doors at the same time, you bypass these filter systems.

Screen fp4

Since doors may serve multiple functions such as supporting fire protection, environmental qualifications, primary containment, secondary containment, etc., they may have multiple signs describing each function the door serves. Some doors may have interlocks to prevent opening two doors at one time. DOOR INTERLOCK OVERRIDES ARE ONLY TO BE USED IN AN EMERGENCY.

No plant doors will be propped open without authorization of the Shift Manager.

Any unauthorized breach of a fire or other barrier must be reported and documented immediately.

Screen fp5

Be aware of these barriers throughout the plant and avoid damaging them in any way.

Screen fp5a

All doors must be maintained in the proper configuration to properly function as an effective barrier in order to protect you, your co-workers, and the plant equipment.

- Screen fp5aa Never congregate or linger near a normally open door. Be aware that doors can be hazardous if not maintained or operated properly. Pinched fingers and hands, broken bones, contusions, etc. are common injuries caused by improper or careless operation of doors. Open doors can suddenly close rapidly with a great deal of force. Changes in ventilation can cause any door to suddenly slam open or closed, if the door is not properly latched.
- Careful operation of doors, keeping doors properly configured at all times when not in use, and maintaining doors in good operational condition will reduce the chance for injury to personnel and damage to plant equipment.
- Screen fp5b Doors must be closed and latched to be functional, or if the door is normally held open, it must be capable of being fully closed automatically. The following are some types of door designs and rules we are to follow concerning doors in the plant:
- Screen fp5c Single Swinging Doors
- After passing through one of these type doors, check to ensure that the door did close fully and that the latch is engaged.
- Screen fp5cc Question: A door can be considered functional as long as it **closes** once you pass through it.
- True? or False?
- Answer: False. A door must close fully and be latched to be functional.
- Screen fp5cd Double Swinging Doors
- Personnel must stay in attendance of the door the entire time the door is open. Personnel are to carefully inspect the door prior to unlatching any latch and after closing the door, and are to ensure all latches are re-latched.
- Screen fp5d Special Purpose Doors
- These doors must be manually closed and latched once opened. If the door uses a hand wheel operated dogging mechanism, personnel must ensure that the hand wheel is operated all the way to the closed position.
- Horizontally Sliding and Vertically Rolling Doors
- These doors are arranged to close automatically. Be aware and report the presence of foreign material or objects in the doors travel path that could prevent the doors from fully closing when required.
- Screen fp5e Special permits and/or procedures apply to some doors. Breaching and/or blocking open doors, running hoses, cords or other items through or under doors, or altering a door in any fashion must only be done after checking with supervision to ensure that all special requirements have been complied with.

Screen fp6	<p>A special permit must be obtained any time it becomes necessary to interfere with a fire barrier or with any fire detection or fire suppression system, in accordance with the site fire protection report or established procedures. These permits are called Impairment permits. Any material that runs around and/or under a fire door constitutes a fire barrier breach and requires a permit.</p>
Screen fpq1	<p>Question: Fire doors must remain shut to prevent the spread of fire through a fire barrier.</p> <p>True? or False?</p>
Screen fpq1t	<p>Answer: True. If you pass through a fire door, ALWAYS self-check to make sure the door closes and latches completely behind you.</p>
Screen fp9 Describe the appropriate response to a plant fire alarm.	<p><u>Fire Alarms</u></p> <p>Fire Operations personnel receive extensive, highly regulated training for fire, medical, rescue, and hazardous material emergencies. A rapid response, and quick extinguishment, helps keep a lower potential for injury from a fire.</p>
Screen fp10 State the actions an individual is required to take upon discovery of a fire.	<p>Early detection makes it possible for the fire to be put out in the early stages, before major damage can occur.</p> <p>If you see a fire in the plant, report it immediately by dialing 3911 on an installed plant phone. You should also ensure that others in the area are aware of the situation.</p>
Screen fp11 Recognize and state the response to a fire alarm.	<p>The type and location of the emergency will then be announced over the PA system. Do not hang up the phone until the person receiving the information frees you to do so.</p> <p>A bell ringing signal or rapid undulating siren will also be heard to alert personnel.</p> <p>In <u>high noise areas</u>, a honking intermittent horn and a RED light may be used to alert personnel.</p>
Screen fp12	<p>Remember:</p> <ul style="list-style-type: none">• Do not fight the fire if you don't have the proper training or equipment.• Do not use elevators during a fire.
Screen fp15	<p>Workers should stay alert to the announcements made over the plant PA system, and evacuate the area if necessary.</p>
Screen fp16	<p><u>Fire Suppression Systems</u></p> <p>Fire suppression systems are intended to control and extinguish fires. There are two types of fire suppression systems. They are either manual or automatic. Automatic fire suppression systems include Halon, Carbon Dioxide (CO₂), and water sprinklers. Manual fire suppression systems include fire hose reels and portable fire extinguishers.</p>

Screen fp17	If the CO ₂ or Halon systems discharge or the CO ₂ system alarm sounds, you must exit the area as safely and as quickly as possible.
	Be aware that CO ₂ protected areas may be equipped with abort switches to stop the CO ₂ from discharging, but activation must occur within the first 20 seconds. Even though an abort switch is used, the alarm may continue to sound. Also, be aware that Operations can operate valves and release CO ₂ into the area without a CO ₂ alarm sounding. Be sure to quickly follow any requests of Operations personnel when called upon to evacuate CO ₂ protected areas.
Screen fp18	CO ₂ displaces the oxygen in the air and can cause death. A wintergreen odor can indicate a CO ₂ discharge. Exit pathways are to be clear of obstruction and well lit. Visibility will be reduced to zero during a CO ₂ or Halon discharge.
	If the CO ₂ alarm sounds, CO ₂ will flood the area in about 20 seconds.
Screen fp33 State examples of the types of hot work requiring a permit.	<p><u>Hot Work</u></p> <p>Because of the potential for a fire, any job involving the following (“hot work”) must be closely controlled, and require a special permit:</p> <ul style="list-style-type: none">• welding,• cutting,• grinding,• open flame or spark-producing activities. <p>These permits must be obtained PRIOR to starting the work.</p> <p>If you are not sure if a job requires a permit or how to obtain a permit, discuss it with your supervisor.</p>
Screen fp34	Personnel may be assigned to Fire Watch duties whenever work activities present a fire risk or when a fire system is out of service. To be qualified for Fire Watch duties, further training is required.
Screen fp35 State individual responsibilities regarding the control of fire loading and the disposal of flammable materials.	<p><u>Fire Loading</u></p> <p>A TRANSIENT FIRE LOAD is any combustible or flammable material that is temporarily installed or stored in the plant.</p> <p>Before you move combustible material through the plant, you must comply with site procedures.</p>
Screen fp36	Flammable/Combustible liquids shall be placed in approved storage containers and labeled. They shall not be used or placed near heat, open flame, or sources of ignition. Do not use in areas without adequate ventilation.
	Compressed gasses must be legibly marked or coded and must be secured in an upright position in a designated storage area with the valve cap on. Keep cylinders away from heat or flames and avoid damaging or sliding compressed gas cylinders. In particular, be alert in areas of the plant containing hydrogen or acetylene.

Screen fp36a SOER 82-9 DO NOT DELETE	Plant systems potentially having hydrogen in them should be labeled indicating that spark sources must not be used until hydrogen detectors have indicated the area is safe for spark sources. The Volume Control Tank in PWRs and the Recombiners in BWRs are examples of these areas.
Screen fp37	Always follow the requirements of site procedures when moving any flammable material through the plant or disposing of any flammable material.
Screen fp38	<u>Disposal of Flammable Materials</u> Limit flammable/combustible material to the amount needed to do the job.
Screen fp39	Limiting the amount of flammable/combustible material will not only reduce the fire hazard but will also save on material that will need to be disposed.
Screen fp41	Wood used in the plant must be fire-retardant. Fire-retardant wood is distinctively marked, most often with a blue or green coating. Make sure you contact the Fire Protection Engineer before moving any non-fire retardant wood into or within plant operating areas.
Screen fpq4	Question: Qualified personnel may be assigned to Fire Watch duties whenever work activities present a fire risk. True? or False?
Screen fpq4t	Answer: True. Activities involving welding or grinding would require a Fire Watch to be posted.
Screen fpsum1	SUMMARY
Screen fpsum2	<ul style="list-style-type: none">• If you discover a damaged or out of position fire barrier, notify the Control Room.• When not in use fire doors must be fully closed.• Report all fires by dialing 3911 on the installed plant phone system.• If the station fire alarm sounds, listen for instructions and follow them.• Special permits are required for welding, grinding, and/or open flame work.• Combustible or flammable material that is not permanently installed or included in the fire hazard analysis describes a transient fire load.

QUALITY PROGRAM

Screen qpobj

OBJECTIVES

With regards to Quality Assurance:

QUA-03
QUA-05
QUA-06

- State the function of the Quality Assurance (QA) program.
- Identify individual responsibilities regarding QA.
- State the authority of QA personnel.
- State the purpose of QA audits and assessments.

QUA-11
QUA-12

Identify potential items of noncompliance, and state how to report items of noncompliance.

Screen qpobj2

With regards to Quality Control:

QUA-07
QUA-08
QUA-10

- State the function of the Quality Control (QC) Program
- State basic worker responsibilities regarding QC Hold Points.
- State the authority of QC inspectors.
- State company policy on harassment of QA/QC personnel.

QUA-13

Explain how to report nuclear safety concerns to the Nuclear Regulatory Commission.

Screen QAProg

OVERVIEW

The Code of Federal Regulations (10CFR50) requires a nuclear plant to have a Quality Assurance (QA) Program.

Screen QAProg2
State the function of the Quality Assurance (QA) program.

The function of the QA Program is to plan and perform activities to verify (or to provide adequate confidence) that the plant is meeting the requirements contained within the federal regulations, as well as NRC, state and utility management requirements.

Screen QAProg3

Quality Assurance is all those planned and systematic actions necessary to provide adequate confidence that an item or facility will perform satisfactorily in service.

Screen QAProg4

Quality Assurance activities include the review of written documentation, programs, procedures, and management involvement.

The goals of Quality Assurance are to assure conformance to valid requirements and confidence of satisfactory performance of structures, systems, and components.

Screen QAQCMenu

THE QUALITY PROGRAM

Screen QA

Quality Assurance

Identify individual responsibilities regarding QA.

What is the worker's responsibility when it comes to assuring quality?

In striving for excellence in nuclear power plant operations, ALL individuals are held responsible for the quality of their work.

Screen QA1a

Nuclear Quality Assurance Program

The TVA Nuclear Quality Assurance Plan (TVA-NQA-PLN89) defines and describes the nuclear quality assurance (QA) requirements for TVA and establishes responsibilities for their implementation. The principal objective of the Nuclear Quality Assurance Program (NQAP) is to provide confidence that activities affecting quality during design, construction, operation, and maintenance are accomplished in a manner to achieve compliance with pre-established quality objectives and acceptance criteria.

Screen QA1b

The requirements of the Nuclear Quality Assurance Plan apply to activities associated with structures, systems, and components which are safety-related or controlled by 10 CFR 72 (ISFSI), and take into account special equipment, environmental conditions, skills, or processes.

- Screen QA1c The requirements also apply to TVA identified quality-related programs (e.g., Radiation Protection, Emergency Preparedness, Security, Fire Protection) and features which are important to the continued reliable operation of TVA's nuclear facilities. Organizations responsible for these programs and features shall determine the extent to which these requirements apply and develop and document applicable Nuclear Quality Assurance Plan elements and the levels of verification required.
- Screen QA1d The requirements established by the Nuclear Quality Assurance Plan are implemented by TVA NPG documents (procedures and instructions). These procedures and instructions receive a documented review for adequacy by a qualified reviewer other than the preparer. One of the reasons for this review is to determine if the procedure fulfills requirements specified in the Nuclear Quality Assurance Plan.
- Screen QA2 Pride of craftsmanship and the desire to accept nothing less than a quality product should be your goal, as well as your supervisor's goal. Do the job right the first time. Self-checking, as well as pre-planning to ensure procedural requirements can be met and unnecessary delays are avoided, are ways to help accomplish this.
- Screen QA3 Audits, evaluations, and inspections may be performed by outside agencies such as: NRC, INPO, American Nuclear Insurers (ANI), or independent consulting firms contracted by senior management. This independent check may involve an inspection or an audit of all records.
- The line organizations are responsible for conducting self-assessments of programs and activities.
- Screen QA4a Nuclear Assurance (Site Quality) provides oversight of plant activities through audits, assessments, observations, and inspections. Nuclear Assurance personnel verify quality and accompanying documentation. They DO NOT supervise work but provide oversight of work quality through the observation of performance and review of paperwork.
- State the authority of QA personnel.
- Screen QA5a A comprehensive system of planned and periodic audits is carried out to verify compliance with all aspects of the QA Program and to determine the effectiveness of the program being audited.
- State the purpose of QA audits and assessments.
- QA assessments and observations are also conducted to observe activities and hardware and/or review documentation to verify conformance with specified requirements, and to evaluate their adequacy and effectiveness.
- Screen QA6 Quality/Nuclear Assurance personnel have the authority to stop a job if there are any questions concerning any aspect of quality.
- Screen QA7 Since the NRC requires the QA function, any threat, assault, or interference with an inspector while performing his job is a federal offense punishable by a fine, imprisonment, or both.
- Screen Qaquiz1 Question: All workers are responsible for quality work at the nuclear plant.

True? or False?

Screen QAanswer	Answer: True. All workers are held responsible for the quality of their work and pride of craftsmanship and the desire to accept nothing less than a quality product!
Screen QAquiz2	Question: QA personnel supervise work in the plant. True? or False? Answer: False. QA personnel do NOT supervise work but provide an independent check of work quality.
Screen QAquiz3	Question: QA personnel can stop work if there is a question concerning quality. True? or False?
Screen QAquiz3C	Answer: True. QA personnel have the authority to stop a job if there are ANY questions concerning ANY aspect of quality.
Screen QC State the function of the Quality Control (QC) Program.	<u>Quality Control</u> Quality Control (QC) is a function within the Quality Assurance Program.
Screen QC2	QC is the part of the Quality Program that comprises the actions related to the physical characteristics of a material, structure, component, or system. QC is concerned with characteristics that can be <u>measured</u> , such as torque values, dimensions, or cleanliness.
Screen QC2a	A Quality Control Inspector may observe the entire job or review the documentation of the job as well as inspect a specific step.
Screen QC3	QC inspections verify compliance with the documented instructions, procedures, and drawings for accomplishing an activity. To ensure quality work, activities may require a QC inspector to perform:
Screen QC3a	<ul style="list-style-type: none">• Examinations• Measurements• Tests of materials or products processed• Work observations
Screen QC4	Procedures have been established for the control of materials, parts, and components that do not conform to specified requirements to prevent their inadvertent use or installation. Non-conforming items may be identified:
Screen QC4a	<ul style="list-style-type: none">• by station personnel performing work in the plant.• during the receipt acceptance inspection process.• by receipt of an NRC Notice or Bulletin.
Screen QC Hold	QC Hold Points
State basic worker responsibilities regarding QC Hold Points.	A hold point is a place in a work order or procedure where work must stop until a QC inspection is completed. If you encounter a hold point, then STOP and contact QC so an inspector can monitor performance.

Screen QC6 Willful violation of a QC Hold point is a serious action and is subject to discipline up to termination of employment.

Screen QC7 Like the QA auditors, QC inspectors have the authority to STOP any job in progress if there is any concern with quality.
State the authority of QC inspectors.

State company policy on harassment of QA/QC personnel. Quality Control inspectors are protected by federal law from any threat, assault, or interference in the performance of their job.

Screen ProbRp1a REPORTING PROBLEMS

Identify potential items of noncompliance, and state how to report items of noncompliance. TVA NPG places special emphasis on resolving problems and concerns which are important to the safe and reliable operation of its nuclear plants. Employees are responsible to report safety and quality problems and assist in resolving them. The normal process for resolving problems is through your line management. Employees are encouraged to use the chain of command so that corrective actions can be handled promptly at the working level. Supervisors are responsible for listening, objectively evaluating, and taking prompt action to correct problems. When appropriate, use of Corrective Action Program (Problem Evaluation Reports, Work Requests, etc.) is the preferred avenue to identify, evaluate, and resolve problems related to the safe operation of TVA NPG plants.

Screen ProbRp Promptly report problems using a Work Request or Problem Evaluation Report (PER). If unsure about which document to use, document the problem using the PER process.

Screen ProbRp2 Problem Evaluation Report (PER)

Any employee can identify and document issues using a hard copy PER or electronically by using the Electronic Corrective Action Program (eCAP). If you discover a problem in the plant, you should:

Screen ProbRp2a

- Immediately discuss the problem in clear terms with your immediate supervisor. Supervisors are responsible for listening, objectively evaluating the situation, and taking prompt corrective action.

Screen ProbRp2b

- If required, DOCUMENT the problem with a PER.

Screen ProbRp2c A PER may be initiated, for example, if you think the parts you ordered do not meet specifications or if they do not work right. Another example would be if you were using a procedure and it did not address a situation you encountered. Still another example would be a procedure that is not being followed as written.

Screen spec53a To report issues or problems anonymously, you should:

EITHER

- Document the problem on a hard copy form and drop the form in a designated Anonymous PER drop box.
- OR***
- Electronically document using the new Anonymous eCAP login ID and Password. The new ID and password is totally anonymous and cannot be tracked to an individual:
 - ID = idanon
 - PW = idanon
 - When performing the review of PERs, supervisors are NOT to revise the initiator's Problem Description, rather, they may add information needed for full description below the original with the heading "Supervisor Comments."

Screen ProbRp2e Corrective Action

Corrective action must be taken once a problem has been identified. Four elements of corrective action are:

1. Determine the scope of the problem.
2. Identify the cause.
3. Correct the item/condition.
4. Take action to prevent recurrences.

We want to learn from our mistakes.

Screen NRC1 Concerns Resolution Program

TVA NPG maintains a Concerns Resolution Staff (CRS) and contractor Employee Concerns Programs (ECPs) as alternate avenues for reporting concerns which may not be resolved through the normal management processes or corrective action process. Accordingly, the CRS, which is independent of the normal management chain of command, manages the investigation and resolution of such issues and ensures that safety and quality concerns are effectively resolved.

Screen NRC1a CRS also provides an alternate avenue for the expression of differing views and opinions related to the safe operation of TVA NPG plants.

You can contact a CRS representative at the following locations:

LOCATION	ADDRESS	TELEPHONE
Chattanooga/Central Labs	BR 3B-C	423-751-8989
BFN/BLN/MS	BFT 3B-BFN	256-729-4569
SQN	POB 1C-SQN	423-843-6954
WBN	MOB 1J-WBN	423-365-3497

Additional information can be obtained from the Concerns Resolution Webpage located on the TVA NPG Intranet Homepage, and on Official TVA Bulletin Boards.

Screen NRC2b	<u>Other Avenues for Reporting Problems</u>
	<p>In addition to the above preferred methods, employees may always report problems directly to the TVA Office of the Inspector General (OIG) at 1-800-323-3835, other governmental agencies with jurisdiction, or the Nuclear Regulatory Commission (NRC) in accordance with NRC Form 3. NRC Form 3 is a "Notice to Employees" describing your rights and responsibilities as a nuclear worker, and is posted prominently at the sites. Any worker may contact the NRC at any time.</p>
Screen NRC3b	Acts of reprisal (such as intimidation, harassment, or discrimination) against
	<p>employees for documenting problems or expressing concerns or differing views will not be tolerated within TVA NPG. TVA NPG management, CRS, contractor ECPs, or the TVA OIG should be notified if such actions occur. Federal law and NRC regulations protect employees from such acts of reprisal.</p>
Screen NRC4b	<u>Communicating with the NRC</u>
Explain how to report nuclear safety concerns to the Nuclear Regulatory Commission.	<p>It is our policy to provide complete and accurate information to the NRC in all our communications and to do so in a timely manner. We expect all employees to conduct themselves with both openness and a cooperative spirit. Employees are not to communicate or otherwise forewarn the arrival and presence of an NRC Inspector, unless specifically requested to do so by the inspector.</p>
Screen NRC5b	No employee or contractor should ever take any action that would willfully violate
	<p>NRC requirements, or cause the company to be in violation of NRC requirements. These actions may include, but are not limited to:</p>
	<ul style="list-style-type: none">• Recognizing a violation of procedural requirements and not taking corrective action.• Falsifying records.• Willfully providing, or causing someone else to provide, the NRC with inaccurate or incomplete information.• Submitting false information to gain unescorted access to a nuclear station.
Screen miscon9	Willful misconduct by any employee or contractor will not be tolerated and may result
	<p>in disciplinary action up to and including termination, the imposition of fines, and/or imprisonment.</p>
Screen NROCQ	Question: The NRC Form-3 is a notice to workers describing their rights and
	<p>responsibilities at nuclear power stations.</p>
	<p>True? or False?</p>
Screen NROCQb	Answer: True. These forms are required to be posted in the plant.
Screen qpsum1	SUMMARY
	<ul style="list-style-type: none">• Planning and performing activities to verify the plant is meeting the requirements of Federal Regulations is the function of the Quality Assurance Program.• QA personnel do not supervise work but provide an independent check of work quality.• All individuals are responsible for assuring quality in the work place.

- Screen qpsum2
 - QA auditors and QC inspectors have the authority to stop work in progress.
 - Federal law allows workers the right to request a NRC inspection if it is believed that a violation of a regulation has occurred.
 - The act of checking, testing, and verifying that pre-established characteristics have been met is a function of Quality Control inspections.
- Screen qpsum3
 - All QC Hold Points must be observed.
 - A noncompliance item is any item that does not meet regulatory requirements.
 - Employees have a responsibility to report problems and assist in resolving them.
- Screen qpsum4
 - Employees are encouraged to use the corrective action process and management to resolve problems.
 - Supervisors have a responsibility to listen, evaluate, and take prompt action to resolve problems.
 - Alternate avenues for resolving concerns include CRS, contractor ECPs, TVA OIG, NRC, and other governmental agencies.

PLANT SECURITY

- Screen secsum1 **OBJECTIVES**
- SEC-01 State the purpose of the Plant Security program.
- SEC-02 Identify areas of the plant that are controlled by Security including the Owner-Controlled Area, Isolation Zones, Protected Area, and Vital Areas.
- SEC-03 Recognize the types and purpose of each photo Identification badge in use at the plant.
- Screen secsmu2
- SEC-06 Describe the procedure for entering and exiting the Protected Area including the use
- SEC-07 of security doors such as those found in Vital Areas.
- SEC-08 State when Security personnel may perform physical searches.
- SEC-09 State where and when photo identification badges will be worn and the actions to be taken if lost or found.
- Screen secsum3
- SEC-04 Describe escorting responsibilities.
- SEC-10 Identify material/items that are prohibited in the Owner-Controlled Area or the Protected Area.
- SEC-05 State actions to be taken upon discovery of an unescorted visitor or an individual without a security photo identification badge.
- Screen secsum4
- SEC-13 State the policy regarding Safeguards Information.
- SEC-11 Define “tailgating” and explain why it is not allowed.
- SEC-12 State individual roles and responsibilities regarding the plant security program.

Screen sec1

PURPOSE OF SECURITY

State the purpose of the Plant Security program.

The purpose of security at the station is to protect company assets, protect against radiological sabotage, and to protect plant personnel.

Be aware and sensitive to abnormal work indicators. If you observe anything that looks suspicious, evidence of tampering, sabotage, or malicious mischief, notify the Shift Manager and Nuclear Security immediately.

Screen sec2

Power station property is divided into three security areas:

- Owner-Controlled Area
- Protected Area
- Vital Areas

Screen sect1

Identify areas of the plant that are controlled by Security including the Owner-Controlled Area, Isolation Zones, Protected Area, and Vital Areas.

SECURITY AREAS

Screen sect1a1

Owner-Controlled Area

The OWNER-CONTROLLED AREA includes all of the land owned by TVA NPG in the immediate vicinity of the plant.

Screen sect1a1aa

Active pop-up barriers at the Sallyport are part of the security checkpoint for vehicular entry into the Owner Controlled Area (OCA) and Protected Area (PA). For safe operation and entry, each employee must process through the barriers and associated gates at a slow speed and follow security directions.

Screen sect1a1ab

When the barriers are DOWN or open, an opening in the vehicle barrier system is provided, allowing vehicles access to the OCA or PA. When barriers are UP or closed, they secure the site from unauthorized vehicles gaining proximity to the OCA or PA.

The barriers remain in the UP or closed position unless vehicles are processing into the OCA or PA.

Screen sect1a1a

The Owner-Controlled Area extends from the TVA NPG property line to the plant's Protected Area Boundary. Within the Owner-Controlled Area are the Protected Area and the Vital Area.

Screen sect1a2	Items Prohibited in the Owner-Controlled Area -
Identify material/items that are prohibited in the Owner-Controlled Area or the Protected Area.	<p>Contraband items are not allowed on TVA NPG property. Some examples of contraband items include:</p> <ul style="list-style-type: none">• Firearms (unless approved by Nuclear Security)• Explosives• Incendiary devices• Alcoholic beverages• Illegal drugs
Screen sect1b	<p><u>Protected Area</u></p> <p>The Protective Area is all the area INSIDE the fence line and is often thought of as the plant. Access to the Protective Area requires a security badge.</p>
Screen sect1b11	Report to Radiation Protection prior to entry if you have received medical isotopes regardless of how much time has passed since the treatment and returning to work.
Screen sect1b12	<p>This reporting requirement applies even if medical professionals assure you the treatment will not be a concern upon returning to work.</p> <p>Do not wear your Thermoluminescence Dosimeter (TLD) after receiving a medical isotope treatment, until authorized by Radiation Protection.</p>
Screen sect1b1	Unescorted access to the Protected Area is granted only to those personnel who have a satisfactory background check, a psychological evaluation, General Employee Training, and Site Management approval.
Screen sect1b2	Persons approved for unescorted nuclear plant access will be issued an identification badge from the Plant Access section.
Screen sect1c	<p><u>Vital Areas</u></p> <p>Vital Areas are located within the Protected Area. Failure of equipment and facilities in the Vital Area could lead to a radiological accident significantly affecting the health and safety of plant personnel. Vital Areas contain the equipment necessary for the safe operation and shutdown of the plant.</p>
Screen sec3	<p><u>Isolation Zone</u></p> <p>A 20-foot ISOLATION ZONE is established on each side of the Protected Area fence. It is kept clear of all objects to permit Security an unobstructed view. Stay out of the Isolation Zone! If entry is needed, notify Security FIRST.</p>
Screen sec4	Protected and Vital Areas must be SECURED at all times. Any maintenance activity that may cause a breach of the area boundary must be reported to Security in advance. A Security officer must be posted until the situation is corrected.
Screen sec5	Any worker who finds an opening in an area boundary that is not guarded should notify Security.

Screen secq1 Question: Area or areas which contain equipment important to the safe operation of the nuclear plant are known as:

- A. Vital Areas
- B. Protected Area

Screen secq1c Answer: A. Vital Areas. Vital Areas are found inside the fenced-in Protected Area.

Screen sec6 BADGES

Recognize the types and purpose of each photo identification badge in use at the plant. Access to plant Protected and Vital Areas is strictly controlled. You must be authorized to enter any of these areas. The station uses SECURITY IDENTIFICATION BADGES for access and identification purposes.

There are two types of security badges in use at TVA NPG sites. They are the picture badge and the visitor's badge.

Screen sec7 The visitor's badge allows access to the Protected Area if the visitor is escorted by an individual who has been granted unescorted access. Visitors may be allowed Vital Area access if authorized and are escorted by an individual who is authorized unescorted access to Vital Areas.

State where and when photo identification badges will be worn.

Screen sec8 The picture badge identifies the persons granted unescorted access to the Protected Area. It is programmed for the designated level of access to the Vital Area.

Screen sec8a Access is controlled by the use of a card reader. Swipe the security badge through the reader and the door or turnstile will unlock when the green light illuminates.

Screen sec9 Security badges must be displayed FACING OUT (visitor number must be facing outward if wearing a visitor's badge) on the upper FRONT PORTION of your body on the OUTER GARMENT at all times.

Screen sec10 If you lose your security badge, NOTIFY security immediately and WAIT for the security officer to arrive. If you should notice an unescorted visitor, or an individual without a security badge, notify Nuclear Security immediately.

State the actions to be taken if lost or found.

Screen sec11 SEARCHES

All employees on company property are subject to a search at any time.

Screen sec12 These searches are conducted to detect prohibited items such as:

Identify material/items that are prohibited in the Owner-Controlled Area or the Protected Area.

1. explosives
2. weapons
3. incendiary devices
4. alcohol and drugs
5. fixed blade knives not normally used in work
6. repellent spray such as Mace™
7. ammunition

Searches may be done electronically or physically by a "pat-down" conducted by a Nuclear Security officer. In some instances, both methods may be used.

- Screen sec13
State when Security personnel may perform physical searches.
- Screen sec15
Random searches may be conducted on badged individuals at the discretion of Security.
- Screen sec16
In addition, personal vehicles may be searched at any time while on company property.
- Screen secq2
Question: When climbing an outside ladder, a gust of wind tears your security badge from your chest and blows it away out of sight. What should you do?
- A. Continue to work and notify Security after you are done.
B. Notify Security and wait for an officer to arrive.
- Screen secq2b
Answer: B, You would notify Security and wait for an officer to arrive.
- Screen sec17
ENTERING AND EXITING THE PROTECTED AREA
- Screen sec18
Describe the procedure for entering and exiting the Protected Area including the use of security doors such as those found in Vital Areas.
- Entering the Protected Area
You must use the following procedure for entering the Protected Area:
- Screen sec19
A. Ensure that you have your security badge. Enter the security building through the Access Control Portal.
- Screen sec20
A. Proceed to the explosive detector. Place all hand carried items and metal objects in a tray to go through the x-ray monitor, before entering the explosive detector. Proceed with the tray through the explosive detector. Stop in the explosive detector for scanning.
- A RED light will illuminate while scanning.
 - A GREEN light and a chime sound will allow you to proceed.
- NOTE: There are three types of alarms:
1. Early step off alarm
 2. Late step off alarm
 - Occurs if you stay in the machine for more than **3 seconds** after the GREEN light appears (only SQN and BFN have the late step off alarm).
 3. Explosive alarm.
- IF ANY OF THESE ALARMS SHOULD OCCUR, FOLLOW SECURITY'S INSTRUCTIONS!

- Screen sec20b C. Place all hand-carried items such as packages or the tray on the X-ray monitor conveyer belt. Items too large or bulky must be hand searched.
- Screen sec21 D. Enter the metal detector and momentarily stop before exiting the detector, by placing both feet on the red stop sign / foot steps located at the base of the metal detector. If an alarm sounds, FOLLOW SECURITY'S INSTRUCTIONS. Proceed to the search area. Failure to clear detectors after two attempts requires that the individual be subjected to a hands-on search prior to entry.
- Screen sec22 NOTES:
1. If you wear shoes, belts, or other clothing with metal that alarms the metal detector, you may be asked to remove the items and process them through the x-ray machine prior to a pat down search.
 2. Chairs will be located in the Access Control Portal for your convenience in removing your shoes, as necessary. Cloth booties will be available to protect your feet.
 3. If you alarm either the metal or explosive detector and a hands on pat down search is required, but cannot be performed immediately the following steps will occur:
 - a. Security will take the individual's security badge and keep the individual under constant observation until a hands-on pat down search is completed.
 - b. After completion of the pat down search, the security badge will be returned to the individual and the individual can process through the turnstiles.
- Screen sec22a
- Screen sec22b
- Screen sec23 E. As you proceed towards the turnstiles, note that there are GREEN and RED lights. Also, approximately fifteen feet in front of each turnstile is a red line.
- If the light at the turnstile is RED, do not cross the red line.
 - If the light is GREEN and there is no one in front of you at the turnstile you may proceed to the hand geometry readers.
 - Check that the AMBER light on the hand geometry reader is illuminated.
 - Swipe your Security Badge through the reader and the hand geometry pad lights will illuminate.
 - Place your hand onto the pad.
 - After positive identification, a GREEN light will illuminate on the reader, and you may enter the Protected Area through the turnstile.
- Screen sec23a F. Escort and Visitor Information
- Describe escorting responsibilities.
- It is the escort's responsibility to ensure all regulatory requirements are complied with. The visitor sequence of events is a timed evolution; therefore, ensure that everyone being escorted understands the following steps to aid in their entrance into the Protected Area:
- Visitors and their escort will walk to the turnstile together.
 - The first visitor will swipe their badge and place their hand in the reader. The amber light will blink indicating the visitor process mode. The visitor will step away from the card reader.

- Screen sec23b
- The escort will then swipe their badge and place their hand in the reader. The light will turn green and the escort will enter the protected area and wait for the visitors to enter.
 - Each visitor in turn will swipe their badge, place their hand in the reader, and enter the protected area once the green light comes on.
- Screen sec23c
- This action can be completed up to 10 times (Escort ratio is **10 to 1** in the protected area).

Screen sec29a_1

G. Vehicle Information

Vehicles entering or operating in the Protected Area will be addressed as “designated,” “non-designated,” or “TVA leased or owned.”

- Designated vehicles can stay in the Protected Area without an escort.
 - Non-designated vehicles require a security escort when operated inside the Protected Area.
 - TVA leased or owned vehicles can stay in the Protected Area without an escort by displaying a 24 Hour pass, which requires the vehicle to be removed from the Protected Area within 24 hours.
- Screen sec29a_2
- All vehicles entering the Protected Area will be searched.
 - Personnel assigned a visitor’s badge shall NOT drive a vehicle inside the Protected Area, unless escorted by a member of the Security Force.
 - All vehicles in the Protected Area will be secured when not in use by ignition key removal or if not equipped with ignition key, immobilized to prevent use by unauthorized persons. Inform Nuclear Security when there is a need to leave a vehicle unattended.

Screen sec29b

Trailers, towed equipment, or temporary structures that could create a hiding place by shading will require temporary lighting in order to eliminate a possible hiding place in the Protected Area.

Screen sec30

Exiting the Protected Area

Personnel exit through the Access Control Portal. The security badge must be read by the reader on the way out of the Protected Area.

Screen 30a

Exit through the radiation portal monitor. If the portal monitor alarm sounds, stay where you are and call Radiation Protection or have someone call for you. Escorts should ensure all visitors have exited the Protected Area prior to their exit of the Protected Area. Visitors must leave the security badge at the Access Control Portal (drop in the slots provided).

Screen sec32

ENTERING AND EXITING VITAL AREAS

Screen sec33

Access to the Vital Area is strictly controlled by use of Nuclear Security personnel, physical barriers, locks, electronic devices, card readers, security badges, and administrative controls. Entry to these areas is electronically recorded. Certain areas within the Vital Area require higher levels of authorization for access.

Site Management requires individuals to have a reason to be in these areas prior to granting access authorization. After traveling through any security delay gate, personnel should close and lock the gate behind them.

Screen sec35 Personnel requiring unescorted entry to Vital Areas must possess a security badge with the appropriate clearance level.

Visitors needing to enter a Vital Area must be escorted by an authorized individual.

Screen sec35a **NOTE:**
If you are not certain you have authorization for unescorted entry into a Vital Area, check with Security BEFORE attempting to enter.

Screen sec37 Ensure all doors are closed by hand if necessary when passing through.

After traveling through any security delay gate, personnel should close and lock the gate behind them.

Screen seq3 Question: You will be subject to a hands-on search if you fail to clear the metal detector while entering the Protected Area.

True? or False?

Screen secq3a Answer: True. Failure to clear ANY of the explosives or metal detectors requires the individual be subject to a hands-on search prior to entry.

Screen secq31 Question: Employees are responsible to ensure that Vital Area doors are secured when entering/exiting Vital Areas.

True? or False?

Answer: True. Employees should close Vital Area doors by hand if necessary to ensure they are secured when entering/exiting Vital Areas.

Screen sec38 **SECURITY EVENTS AND VIOLATIONS**

Define "tailgating" and explain why it is not allowed. What is TAILGATING?

Tailgating is following another person into a Vital Area without properly using the card reader. TAILGATING IS STRICTLY FORBIDDEN.

Screen sec38a **Hurrying Results In Tailgating**

TVA NPG Site Security has identified excessive tailgating because employees have failed to properly use their security badge cards when entering and exiting security doors. Tailgating is a **VIOLATION** of security procedures and hampers our ability to locate and/or account for plant employees during emergency situations. This security violation will result in administrative actions, and may result in revoking an individual's security badge card.

Screen sec38b

Actions to Prevent Tailgating

- Be attentive when entering or exiting security areas, and use the security badge card correctly.
- Always make sure that the card reader light is AMBER in color before you swipe your card. You have to wait approximately 2-3 seconds after the person before you swipes their badge before an amber light comes on.

Amber Light



Screen sec38c

- Ensure that you have a valid card read **GREEN LIGHT** when using a security badge card before entering or exiting an area with a security card reader.
- If you receive a **RED LIGHT** on a security card reader, do not enter and contact Security immediately at **7959**.

Green Light



Screen sec39

Always use your security badge to access Vital Areas.

Screen sec40a

Security Events are generally described as adverse conditions directed toward the plant. Some examples are bomb threats, an explosion, hostage situations, and threat of an attack on site.

Screen sec40b

Security Violations normally deal with individual employees and their actions. Security violations would include improperly displaying a security badge, failing to control visitors, or leaving Safeguards Information unattended.

Screen sec48

VISITORS

Describe escorting responsibilities

How are "visitors" who need access to our plant handled?

Screen sec49

Visitors must be escorted at all times while in the plant's Protected Area. Escorts must have unescorted access clearance and be responsible for Continual Behavior Observation (CBOP) of their visitor.

Screen sec50

Escorting visitors is a serious obligation. Be responsible for the conduct and safety of all visitors under your control.

- Screen sec51 While escorting visitors ...
- Make sure the visitor is properly wearing the visitor's badge. The badge should be visible, on the front part of the body, and about chest high.
- Screen sec52
- Maintain BOTH visual and conversational voice control of the visitor at all times. The visitor may enter a bathroom, locker room, or other workspace unescorted if there is only one entry/exit and the entry/exit is observed by the escort.
- Screen sec53
- Ensure the visitor does not enter any radiological areas unless authorized.
- Screen sec54
- Ensure the visitor follows all plant policies and procedures.
- Screen sec55
- Escort no more than **5** visitors into a Vital Area. You may escort up to **10** visitors, if Vital Area access is NOT required.
- Screen sec57
- The escort should always enter every plant security area before a visitor, and not leave until the visitor has exited. Remember, "first in, last out".

Screen secq4 Question: What is the maximum number of visitors that a badged individual can escort into Vital Areas?

- A. 1
- B. 3
- C. 5
- D. 10

Screen secq4b Answer: C, A badged individual may escort **5** visitors into a Vital Area.

Screen sec60
State actions to be taken upon discovery of an unescorted visitor or an individual without a security photo identification badge.

If you ever find an individual with a visitor's badge who does not appear to have an escort, notify security immediately and keep the individual under observation.

Screen sec62 SAFEGUARDS INFORMATION

Screen sec63
State the policy regarding Safeguards Information.

Safeguards Information (SGI) is information which specifically identifies the plant's detailed security measures required for protection of special nuclear material and plant equipment vital to the safety of the facility and general public.

Screen sec64 Safeguards Information - Precautions

Safeguards Information will be MARKED as such on the top and bottom of each page. Documents received from agencies outside TVA NPG may not be marked the same way as TVA NPG documents. Such material may be copies and the lettering will be black. So all material received from outside agencies must be reviewed carefully to ensure that Safeguards documents are not overlooked.

Screen sec65 Access to Safeguards Information is limited to personnel with "a safeguards clearance and a need to know." Personnel with an active Protected Area (PA) photocard badge possess SGI clearance. It is possible for anyone to generate Safeguards Information. Anyone generating documents, drawings, etc. that details security measures or equipment vital for the safe operation or shut down of the plant must have that information reviewed by a SGI Designated Classifier to determine whether it should be classified as Safeguards Information.

Screen sec66 NEVER discuss Safeguards information in the presence of unauthorized individuals. Safeguards Information must be protected while it is being used to the extent that unauthorized individuals do not have access to it.

Screen sec67 Safeguards Information is stored in Safeguards Information Control Centers. These centers are normally located within the Security and/or Management Services departments. When left unattended, Safeguards Information shall be STORED in a locked, approved, security storage container. When Safeguards Information has been lost, stolen, disclosed to unauthorized individuals or left unsecured, any individual discovering or having knowledge of the incident must report all information to Nuclear Security immediately.

Screen sec68 If Safeguards Information is found, it should be hand-carried to Security.

Screen sec69 UNAUTHORIZED DISCLOSURE of Safeguard Information may result in civil and/or criminal penalties.

Screen saf1 Safeguard Information - Violations

The most common Safeguards Information Violations are:

- Screen saf2 • Leaving information unattended
- Screen saf3 • Leaving storage containers unsecured
- Screen saf4 • Leaving safeguards information on a personal computer
- Screen saf5 • Improper handling of safeguards information from outside TVA NPG
- Screen saf6 • Improper mailing of safeguards information

Screen sec69a Security Problems

State individual roles and responsibilities regarding the plant security program. The following are considered responsibilities of every individual on site:

- Stay alert to security issues, for example, unescorted visitors, unauthorized firearms, etc.
- Keep prohibited items off TVA NPG property.
- Screen sec69b • Properly handle and control Safeguards Information.
- Report bomb threats, or security violations immediately to Nuclear Security.
- Properly check in and out when beginning or ending employment at a TVA NPG site.

Screen secsumm1 SUMMARY

- The purpose of the Security Program is to protect company assets, protect against radiological sabotage, and to protect plant personnel.
- The three types of security areas are the Vital Areas, Protected Area, and the Owner-Controlled Area.
- Screen secsumm2 • Access to the Protected Area requires passing through security search devices and the use of a security badge.

- Screen secsumm3
- Signs are posted at the plant explaining that employees are subject to search at any time.
 - Security badges must be facing out on the upper front portion of your body on the outer garment.
 - Alcohol, firearms, weapons, and explosives are just some of the prohibited items not allowed on company property.
- Screen secsumm4
- All visitors must be escorted into the Protected Area and Vital Areas. Escorting visitors is a serious responsibility.
 - If you become separated from a visitor you are escorting, notify Security immediately.
 - Report all security violations to Security.

EMERGENCY RESPONSE/PREPAREDNESS

Screen emobj1 **OBJECTIVES**

EMP-01 State the purpose of the Radiological Emergency Plan.

EMP-02 State the classifications of plant emergencies.

EMP-03 Recognize the site emergency alarm(s) and state the proper response.

Screen emobj2

EMP-04 State the actions required during emergency plan implementation, including the
EMP-05 purpose of accountability during emergencies.

EMP-07 Discuss evacuation plans, including identification of evacuation routes.

EMP-08 State TVA's policy concerning the release of information to the public and news
media regarding an emergency.

Screen em1 RADIOLOGICAL EMERGENCY PLAN

State the purpose of the Radiological Emergency Plan. Each station has a Radiological Emergency Plan (REP) which describes how to respond to radiological emergencies.

The PURPOSE of the Radiological Emergency Plan is to provide for the radiological protection of the PUBLIC, EMPLOYEES, and the PLANT if an unplanned event occurs at the site.

Screen em2 The Code of Federal Regulations (10CFR50) requires nuclear power stations to have an approved emergency plan before an operating license is issued. The Emergency Plans for all United States Nuclear Plants are very similar with minor variations due to design, location, and organization.

Screen em3 EMERGENCY CLASSIFICATIONS

State the classifications of plant emergencies There are FOUR emergency classifications in the emergency plan.

These are listed in order from LEAST SEVERE TO MOST SEVERE:

- Screen em4
- Notification of Unusual Event
- Screen em5
- Alert

- Screen em6
Screen em7
- Site Area Emergency
 - General Emergency

Screen em8

Based on plant or security conditions, the Control Room staff will initially classify the emergency and assume the role of Site Emergency Director until relieved by management.

Screen em9
Recognize the site emergency alarms and state the proper response for each.

EMPLOYEE RESPONSE DURING EMERGENCIES

Let's look at how employees are to respond during declared emergencies in the plant.

Screen emtre1-7

Notification of Unusual Event

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected, unless further degradation of safety systems occur.

- Screen emt1b1c
- A Public Address (PA) announcement will be made for any declared emergency.
 - A Notification of Unusual Event declaration does not require any immediate response on the part of general employees in the plant.
- Screen emt1b1d
- Personnel directly involved in the incident will be given directions.
 - State and Local governments and the NRC are notified.

Screen emt1b2

Alert

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the Environmental Protective Agency (EPA) Protective Action Guideline exposure levels.

- Screen emt1b2a
- The Technical Support Center (TSC) and Operation Support Center (OSC) are manned to provide support to the Control Room.
- Screen emt1b2c
- Site assembly and accountability may be required when the plant is placed in the Alert emergency classification or at the discretion of the Site Emergency Director.

Screen emt1b3

Site Area Emergency

Events are in process or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts:

(1) toward site personnel or equipment that could lead to the likely failure of or;
(2) that prevent effective access to equipment needed for the protection of the public.
Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline dose levels beyond the site boundary.

- Non-emergency responders will report to designated assembly areas upon hearing the accountability alarm.
- Non-emergency responders may be evacuated from the site as directed by emergency management.

Screen emt1b4a

General Emergency

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

- Site evacuation of non-emergency responders will be initiated.

Screen em10

If ANY of the emergency classifications are declared, your responsibility is to LISTEN TO and RESPOND to the alarms or announcements that are made on the plant Public Address system.

Screen emq1

Question: The MOST SEVERE emergency classification which can be declared is the Site Area Emergency.

True? or False?

Screen emq1f

Answer: False. The most severe emergency classification is the General Emergency.

Screen em20

ACCOUNTABILITY PROCESS

State the actions required during emergency plan implementation, including the purpose of accountability during emergencies.

The purpose of accountability is to ensure that no one is hurt or injured in the event of an emergency condition.

A 3-minute undulating siren (assembly and accountability siren) will sound when an emergency condition exists that requires assembly and accountability of site personnel. In high noise areas, strobe lights may be used in addition to the siren.

Screen em20a1

Upon hearing the siren or observing the strobe lights, report to your designated assembly area or to the emergency response facility if you are an emergency responder. Place any equipment being used for a task in which you may be involved in a safe condition. If working in a contamination area, exit the area in accordance with Radiation Protection procedures, unless instructed otherwise by Radiation Protection.

Screen em20a	It is your responsibility to know your assembly location at all times. Find out from your supervisor the location of your assembly area upon reporting to the plant for work assignment.
Screen em21	If you have special needs such as medicine or food as part of diet-controlled diabetes, take them with you to the assembly area if possible.
Screen em18	Visitors should go with their escort and scan their badge. Each accountability area has one or more accountability card readers (similar to security card readers). During a site assembly and accountability, they are used to quickly and reliably account for persons in the Protected Area.
Screen em18a	Swipe your card through the reader. A GREEN light on the card reader means that the reader has read your badge. If the card reader will not accept your badge, immediately notify Nuclear Security.
Screen em18b	<u>Two Person (Line of Sight) Rule</u> During site assembly and accountability because of a security-related event, Nuclear Security may determine that a Two Person (Line of Sight) Rule is required for vital area entry. This rule requires that all persons in a vital area must remain in visual contact with another person unless personnel or plant safety would be adversely impacted. This does not require that the two persons possess similar skills or knowledge. The Two Person (Line of Sight) Rule will be conveyed by a public address system announcement .
Screen em12 Discuss evacuation plans, including identification of evacuation routes.	<u>Site Evacuation</u> If you are <u>not needed</u> during a site emergency, management may order you to evacuate the site. Notification will be given by verbal announcement .
Screen spec76b	The evacuation siren (at SQN and BFN only) is a three-minute solid siren - uninterrupted volume and pitch maintained for three minutes.
Screen em14	In this case for a SITE EVACUATION:
Screen em15	<ul style="list-style-type: none">You should go to the exit portal, swipe your badge in the card reader, go to your vehicle, and leave the site. Evacuation routes are identified by signs along public highways.Radiation Protection may survey vehicles for contamination before allowing you to take it from the site.Follow the guidance of state and local authorities and Nuclear Security, as applicable.

Screen em16

In the event of a RAPID EVACUATION OF THE PROTECTED AREA:

The Rapid Evacuation of the Protected Area may be initiated at any time during a security-threat event when the management considers it reasonable to protect the health and safety of site personnel.

The action enables Nuclear Security to open the sliding gate next to the Access Control Portal allowing large numbers of individuals to exit the PA rapidly.

Screen em17c

1. You will be notified by site-wide **public address announcements** and a **solid tone evacuation siren** (the evacuation sirens at BFN and SQN). Tell other individuals who may not be capable of hearing the public address announcement.

Screen em17

2. Nuclear Security will open the sliding gate next to the Access Control Portal to allow large numbers of individuals to quickly exit the Protected Area. This is one-way only -- no one may enter this way.

Screen em17a

3. Go to the Alternate Assembly Area:

Sequoyah: Alpine Village Classrooms 4, 8, or 9

Watts Bar: Training Center

Browns Ferry: North of the Access Control Portal just beyond the parking area, and near intersection of Nuclear Plant Road and Shaw Road.

Remain at the Alternate Assembly Area until receiving further instructions. Do not re-enter the plant protected area without clear instructions by Nuclear Security.

Screen spec76j

4. If you are escorting visitors, stay with visitors until they are outside the gate, at which time they also go to the Alternate Assembly Area.

Screen spec76k

5. All persons outside the PA but within the **Owner Controlled Area** (example: ball field or Live Well) upon initiation of a Rapid Evacuation of the Protected Area should follow Emergency Plan Implementing Procedure-8 (EPIP-8) and go to designated assembly areas identified in site EPIP-8.

Screen spec76i

6. Emergency Responders also exit the site through the same sliding gate, and then go to the Site Training Center.

Screen spec76m

7. Essential plant personnel (such as minimum Operations staffing, and Nuclear Security) remain in the PA during a Rapid Evacuation of the Protected Area. These individuals will be instructed to take cover or disperse as conditions warrant.

Screen spec76l

8. If a Site Evacuation is required, Nuclear Security and/or other designated law enforcement officials will release personnel from assembly areas in an orderly manner. Specific instructions may be given regarding routes to take. Follow the instructions provided by law enforcement officials.

Screen em22	<u>Emergency Information</u>
State TVA's policy concerning the release of information to the public and news media regarding an emergency	When an emergency is declared at a nuclear plant site, members of TVA's Nuclear Emergency Information Team will be at the plant site and staff the Central Emergency Control Center at the TVA Chattanooga Office Complex, and the Joint Information Center, as necessary to provide information to the media and the public.
Screen em23	Only authorized individuals are to release information to the media and public in the event of an emergency.
Screen em24	TVA NPG expects its Nuclear Plants to operate safely. However, if an incident occurs at the plant, TVA NPG will notify state and local officials at once. In-depth plans have been prepared by TVA NPG, the State, and local Emergency Management Agencies to protect the health and safety of the employees and the public.
Screen em25	In the event of an extended emergency, to receive information concerning the event, employees and their families may listen to the Emergency Alerting System (EAS) designated stations or call TVA Community Relations at 1-800-467-1388 . Media calls should be referred to 1-800-751-8388 . TVA Chief Spokespersons have been designated to handle questions.
Screen emsum1	SUMMARY <ul style="list-style-type: none">• The purpose of the Emergency Plan is to protect you, your fellow workers, and the general public in the event of the unplanned event.• The emergency classifications from least severe to most severe are: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.• If any emergency classifications are declared, listen and respond to all alarms and PA announcements.• Non-emergency responders will report to their designated assembly areas when the assembly and accountability siren is sounded and will be evacuated, if necessary.
Screen emsum2	<ul style="list-style-type: none">• During a site assembly and accountability, accountability card readers will be used to account quickly and reliably for personnel within the Protected Area.• The only individual authorized to release information about an emergency is the TVA Chief Spokesperson.

RADIOLOGICAL ORIENTATION

Screen robj1	OBJECTIVES
RAO-01 RAO-02	Define radioactive material, radiation, contamination, and dose; and state the difference between radioactive material, radiation, and contamination.
RAO-04	Contrast the average amount of radiation received by radiation workers and members of the general public.
RAO-03	Define the term "Background Radiation."

Screen robj2 RAO-05	State the purpose of the Thermo-Luminescence Dosimeter (TLD) and the Exit Portal Monitor.
RAO-06	Identify potential long-term effects from being exposed to low levels of radiation.
RAO-07	Contrast the risk of working in a nuclear facility to the risk in other industries.
Screen robj3 RAO-08 RAO-09	State the colors and symbols used on radiological postings, and Specify methods used to identify radiological areas.
RAO-10	State the actions to be taken if a radiological area or radioactive material is encountered.
RAO-11	Discuss the potential risk of prenatal exposure to radiation.
Screen ro1	<u>DEFINITIONS</u> All matter, such as trees, rocks, air, and water, is composed of atoms. These atoms combine to form different substances. Sometimes, however, an atom may become unstable.
Screen ro2	When this occurs, an atom will emit packets of energy or particles called IONIZING RADIATION, in an effort to become more stable.
Screen ro3 Define radioactive material, radiation, contamination, and dose; and state the difference between radioactive material, radiation, and contamination.	Ionizing Radiation - Defined as energy emitted from unstable atoms. Some additional definitions:
Screen ro4	Radioactive Material - Any material that emits radiation as it decays.
Screen ro5	Contamination - Radioactive material anywhere it is not wanted.
Screen ro6	Dose - The amount of radiation absorbed by the body or a particular organ.
Screen ro6a	Dosimeters - Devices that are worn by plant workers and measure the amount of absorbed dose; examples are Electronic Dosimeters and Thermo-Luminescent Dosimeters.
Screen ro7	<u>BACKGROUND RADIATION</u>
Define the term "Background Radiation".	Radioactive decay is part of nature. We are continuously being bombarded with low levels of radiation from both natural and man-made sources. This radiation is called BACKGROUND RADIATION.
Screen ro8	According to the National Council on Radiation Protection, the typical person in the United States receives an average of 360 millirem per year.

- Screen ro9 The actual amount of radiation received depends on the geographical location, the altitude, and other factors.
- Screen ro10 A few examples of things that contribute to background radiation exposure are:
- Screen ro11
- natural radioactive materials in the earth's crust (varies with geographic location)
 - Cosmic Radiation
 - man-made products (for example, luminous watch dials, gas mantle)
 - the amount of Potassium 40 in the body
- Screen ro12 Examples of man-made background radiation include medical and dental x-rays, household smoke detectors, and material released from nuclear and coal-fired power plants. The average dose to the general public from nuclear power is less than 1 millirem per year.
- Screen ro12a Anyone who receives medical TREATMENT involving radioactive material MUST contact Radiation Protection prior to entry into the Protected Area.
- Screen roq1 Question: Ionizing radiation is energy emitted from unstable atoms.
- True? or False?
- Screen roq1t Answer: True. In this case, the atom will emit packets of energy or particles in an effort to become more stable.
- Screen ro13 MONITORING DEVICES
- Several types of radiation monitoring devices are used in a nuclear power plant. Each has a particular purpose and application. For the non-radiation worker, there are only a few of these instruments that are of any concern.
- Screen ro14 Thermo-Luminescent Dosimeter
- State the purpose of the Thermo-Luminescent Dosimeter (TLD) and the Portal Monitor.
- Screen ro15 The Thermo-Luminescent Dosimeter (TLD) is a small device that is used to record the amount of radiation an individual is exposed to when in areas containing radiation. The TLD is used for the permanent dose records of all radiation workers on site.
- TLDs are normally worn on the front of the body between the waist and the shoulders.
- Do not wear your Thermoluminescence Dosimeter (TLD) after receiving a medical isotope treatment, until authorized by Radiation Protection.
- Screen ro16 Portal Monitor
- A PORTAL MONITOR is a device that you walk through in the Access Control Portal on the way out of the Protected Area. Some sites also use a portal monitor at the entrance to the Protected Area. This device checks all personnel for radioactive contamination.

HEALTH EFFECTS OF LOW LEVELS OF RADIATION

Screen ro17
Identify potential
long-term effects
from being exposed
to low levels of
radiation.

Research has shown that there is an increase in the risk of cancer and other potential illnesses due to exposures to HIGH LEVELS OF RADIATION.

Screen ro18

Therefore, scientists feel it is prudent to assume that there may be a RISK associated with low levels of radiation.

Screen ro19

Because of this, the Federal Government has established limits that are low enough to minimize this risk.

Screen ro20
Contrast the
average amount of
radiation received by
radiation workers
and members of the
general public.

A person who is a member of the general public receives an average of **360** millirem of background radiation per year.

This compares to about **660** millirem per year (**360** millirem background plus **300** millirem from working in a nuclear power plant) for a nuclear power plant worker.

Screen ro21

Radiation exposure is maintained As Low As Reasonably Achievable in the plant, but even long-term low levels of radiation may expose an individual to some health risks.

Screen ro22

The delayed effects of radiation exposure, such as cancer, are not a certainty but are expressed in terms of increased risk. Risk can also be expressed in terms of life expectancy.

Screen ro23

NUCLEAR POWER PLANT RISKS

Contrast the risk of working in a nuclear facility to the risk in other industries.

Health and Safety Risk

Estimates of Life Expectancy Loss (Average)**

Smoking 20 cigarettes a day	6 years	SHORTEST LIFE	
Overweight (by 15%)	2 years		
Alcohol consumption (U.S. average)	1 year		
All accidents combined	1 year		
Motor vehicle accidents	207 days		
Home accidents	74 days		
Drowning	24 days		
Agriculture	320 days		
Construction	227 days		
Mining and quarrying	167 days		
Transportation and utilities	160 days		
Government	60 days		
Occupational exposure (1 rem/yr from age 18 to 65)	51 days		LONGEST LIFE
Manufacturing	40 days		
Services	27 days		
Trade	27 days		
All industries	60 days		
Occupational exposure (0.3 rem/yr from age 18 to 65)	15 days		
Medical radiation	6 days		
All natural hazards (earthquake, lightning, etc.)	6 days		

** Adapted from Regulatory Guide 8.29, and Cohen and Lee, "Catalog of Risks Extended and Updated", Health Physics, Vol. 61, September 1991.

Screen ro24

State the colors and symbols used on radiological postings, and Specify methods used to identify radiological areas.

RADIOLOGICAL BARRIERS AND POSTINGS

Barriers will usually be posted with a **Yellow and Magenta** or **Yellow and Black** sign, with a three-bladed symbol on them. Barriers are not to be breached, except by trained and/or authorized personnel. Some signs designate a **Radiological Controlled Area (RCA)**, while other signs designate a **Radiography Area**. Radiography areas may also be equipped with a **flashing light**. If you see postings like these, it means that there is some type of radiological hazard behind the barrier, posting, or sign.

Screen ro26

The postings are usually in the form of signs but can also be in the form of a **Yellow and Magenta** rope or tape.

Screen ro28

REQUIRED ACTIONS

State the actions to be taken if a radiological area or radioactive material is encountered.

Unless you have had Radiation Worker Training for entry into a Radiologically Controlled Area, or have been authorized to enter a Radiography Area, **DO NOT enter the area.** This includes INAPPROPRIATE actions such as:

Screen ro29

Screen ro30

Screen ro31

- Reaching into one of these areas to retrieve a tool.
- Removing a manway cover with a Radiological Control sign on it.
- Working on a pipe that has yellow and magenta tape on it.

Screen ro32

- Entering a radiological area to pick up trash.

Screen ro33

!!WARNING!!

If you discover suspected radioactive material OUTSIDE a posted area, stay away from it and contact the Radiation Protection Group at **7865**.

Screen ro32a

With the approval from Radiation Protection supervision, persons escorted by a trained radiation worker are allowed entry into the RCA.

Screen roq3

Question: Which of the color combinations is used on radiological postings and ropes?

- A. Yellow and magenta
- B. Red and white
- C. Yellow and green.

Screen roq3a

Answer: A, Yellow and Magenta are the standard colors found on radiological postings and ropes in the plant.

Screen ro34

PRENATAL EXPOSURE TO RADIATION

Discuss the potential risk of prenatal exposure to radiation.

Finally...

these words about prenatal exposure to radiation:

Screen ro35

Fetuses/embryos of pregnant women are more sensitive to the effects of radiation due to their rapid fetal development.

Screen ro36

As a general rule, the younger a person is, the more sensitive he or she is to the effects of radiation.

Screen ro37

There are possible risks to the embryo/fetus from radiation exposure at occupational levels.

Screen ro38

TVA NPG Standard Programs and Processes SPP-5.1, Radiological Controls, outlines options available to PREGNANT WORKERS (or those intending to become pregnant in the near future).

Screen ro39

Any worker inside the Protected Area who is pregnant or intends on conceiving can request additional information from Radiation Protection management.

Copies of U. S. NRC Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure," and Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure," are available from the Training Department.

Screen ro40

Our company recognizes that it is the fundamental privilege and responsibility of the pregnant worker to decide when or whether she will formally declare her condition.

Screen ro41

Special precautions will be taken to limit the occupational dose of workers who declare they are pregnant or intend to become pregnant.

Screen rosum1

SUMMARY

Screen rosum2

Screen rosum3

- Ionizing radiation is energy emitted from an unstable atom.
- Radioactive contamination is radioactive material anywhere it is not wanted.
- Dose is the amount of radiation absorbed by the body or a particular organ.
- Low level radiation from natural sources and certain man-made products is referred to as background radiation.
- Signs with a magenta three-bladed symbol on a yellow background are used to post areas where radiological hazards exist.
- The average person in the U. S. receives about **360** millirem per year due to background radiation.
- The TLD is a small device used to record the amount of radiation an individual is exposed to when in areas containing radiation.
- Portal monitors are devices that you walk through when exiting (and entering, at some sites) the Protected Area through the Access Control Portal. They check for radioactive contamination.
- Most scientists assume there is a small degree of risk no matter how small the radiation dose.