Ameren MISSOURI | Callaway Energy Center

NUCLEAR PROFESSIONAL & STANDARDS HANDBOOK

SAFELY. RELIABLY. EFFICIENTLY.

REV. 2023

Introduction

Welcome to the Callaway Energy Center. You are an important part of the team of Nuclear Professionals performing an essential function for the community, *To Power the Quality of Life.* In addition to adhering to the standards referenced in this handbook, I ask that in your time at Callaway you strive to continuously improve every day. Improve yourself, the way we get things done, and the station; generating condition reports is a great way to accomplish this. By working together as one team and striving to continuously improve, we will create a culture that supports providing this essential function to the community for the long term. Our behaviors each and every day are the key to creating that culture.

I'm confident that our team, through following the behaviors listed below and the standards referenced in this handbook, can sustain excellent performance for decades to come.

Kent Scott
Nuclear Site Vice President

LINE OF SIGHT TO THE CORE

To ensure **Reactor Safety,** we:

- Have effective Operations leadership and crew teamwork
- Are self-critical, recognizing behavioral warning signs signaling performance decline
- Apply Conservative Bias in all Operations decisions
- Actively mitigate proficiency shortfalls
- Leverage training to reinforce operator fundamental behaviors
- Have robust implementation of abnormal operating and alarm response procedures
- Utilize corporate oversight and engagement
- Identify and eliminate debris challenges to fuel-cladding integrity

Security

Security Expectations

- Follow directions given by Nuclear Security Force.
- Contact Security when evaluating changes or activities, to determine if they will affect security systems or activities.
- Contact Security if suspicious activities are observed at 573.676.8774.

Contraband/Prohibited Items

Do NOT bring, transport, or convey the following specifically prohibited items or facsimile of these items into the Protected Area:

- Firearms (including ammunition and shell casings)
- Explosives, Incendiary Devices, or any other items that could be used for Radiological Sabotage
- Alcohol or Illegal Drugs
- Biological or chemical agent used for the purpose of incapacitating personnel (i.e., pepper spray, cap -stun, mace, tear gas, etc.)

Processing Through Security Doors

- Use card reader doors for access and exit.
- Do NOT attempt entry into unauthorized areas.
- Place badges in proximity of card readers. The door strike will activate when the badge is removed from proximity of reader. Pay attention to card reader lights:
  - **YELLOW** light means wait.
  - **RED** light means that you do not have access or there is a problem with your badge.
  - **RED FLASHING** light means that you need to card into the reader a second time.
  - **GREEN** light means that you are clear to open the portal and enter/exit.

Security

Processing through the Search Train:

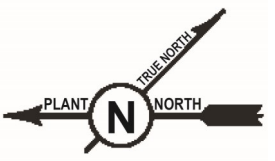
X-Ray:

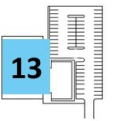
- Empty or seal beverage containers prior to placing them on the x-ray belt.
- Place all hand carried items on the x-ray belt.
- Remove laptops from bags and place in a separate bin by itself and run through x-ray.
- Remove all electronics larger than a cell phone from bags and purses and place in a separate bin from other items.
- Place all headwear on x-ray machine.
- Place all coats, jackets, windbreakers, zip up hooded sweatshirts on x-ray machine belt.
- Process through metal detector.
    - A physical pat down may be utilized any time after the first alarm if the individual has a medical condition that will not reasonably allow removal of the metal source.
- Process through explosive detector.
    - If explosive detector alarms; personnel will be directed to run shoes through x-ray. A pat down search will be performed, and shoes and hand carried items will be searched.

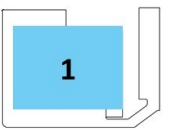
Security Badge Requirements

- Display badge in full view when inside the Protected Area, except where operational, safety, or radiation protection reasons dictate otherwise.
- Wear badges outside the outermost garment.
- When outside the Protected Area (PA), MAINTAIN control of the badge to ensure that it is NOT introduced into the PA by another individual.

Site Map



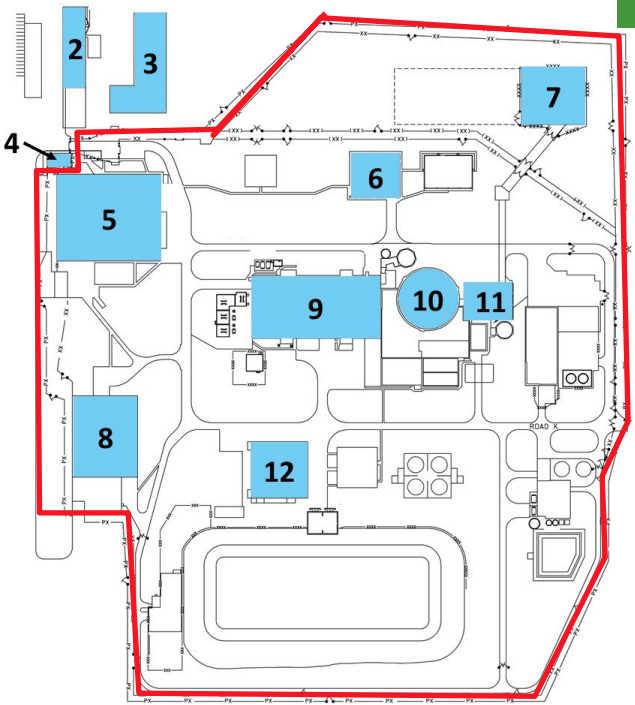




1. Callaway Learning Center (CLC)
2. Central Processing Facility (CPF)
3. Callaway Multipurpose Building
4. Main Access Facility (MAF)
5. Service Building/Cafeteria
6. Work Management Building (WMB)
7. Dry Cask Storage
8. Stores Warehouse
9. Turbine Building
10. Reactor Building/Containment
11. Fuel Building
12. Outage Maintenance Facility (OMF)
13. Training Center

Main Buildings

Protected Area



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Legal Action Reporting

REPORT any legal actions via verbal contact with the Access Authorization (AA)/Fitness-for-Duty (FFD) Supervisor or a qualified Reviewing Official (Security Shift Supervisor in their absence), **prior to beginning work on your next scheduled shift** (onsite or offsite work shift) and **prior to entering the protected area of the plant**. PROVIDE a copy of any documentation received in regard to the legal action, at the time of report. Also, **REPORT** the occurrence to your immediate supervisor upon return to work for the next scheduled shift for impact on Behavior Observation. Failure to comply with the requirements of legal action reporting may lead to unfavorable termination or denial of your unescorted access to the protected area.

Co-workers with Unescorted Access, MUST report the following legal actions:

- Any formal action taken by a law enforcement authority or court of law, as well as any court order that requires a court appearance.
- Financial judgments, wage garnishments, bankruptcies, and federal, state, or other tax liens.
- Being held, detained, taken into custody, charged, arrested, indicted, fined, forfeited bond, cited, or convicted for a violation of any law, regulation or ordinance.
- A felony, misdemeanor, serious traffic offense, order of protection, restraining order, serious civil or military charges.
- The mandated implementation of a plan for treatment or mitigation in order to avoid a permanent record of an arrest or conviction in response to: the use, sale or possession of illegal drugs (including controlled substances determined to be illegal under federal law, such as marijuana, but deemed legal under state law); the abuse of legal drugs or alcohol; or the refusal to take a drug or alcohol test.

Stopping Unsafe Work

Everyone has the right and responsibility to question the safety of work activities and to stop work that has a probability of resulting in injury or illness. Resolution should begin with the identifying individual and the work supervisor and additional assistance may be requested. Ultimately it is the work supervisor's responsibility, along with the workers performing the work, to ensure the work is performed safely. If any employee feels their safety concern has not been adequately addressed, they should take the concern to the next level of management.

If a safety concern is identified, take action and see page 8 of the Safe Work Practices Manual for instructions on handling immediate safety concerns.

Report work related injuries/illnesses as soon as possible to your supervisor so treatment can be provided and hazards can be promptly addressed.

Nuclear Professionals

1. Understand and manage the risk associated with the assigned jobs.
2. Be aware of your surroundings and anticipate the effects of your actions.
3. Question assumptions, identify anomalies, and stop work when you experience conditions different than those expected.
4. Focus and engage in preparation, ownership, and safe execution of the work activity.
5. Understand and apply error prevention techniques.
6. Understand and apply standards for procedure use and adherence.
7. Adhere to radiological work instructions and postings, and practice ALARA.
8. Demonstrate ownership of, and compliance with, the Safe Work Practice Manual.
9. Embrace continuous learning by providing and receiving feedback.
10. Nuclear professionals coach and provide feedback to each other.
11. Participate in training and perform tasks for which they are qualified.
12. Improve performance and knowledge through Operating Experience.
13. Engage supervisors and others with questions and concerns.
14. Be aware of your assigned emergency preparedness responsibilities and duties.
15. Maintain good housekeeping and control of work area.

Traits of a Healthy Nuclear Safety Culture

1. **Personal Accountability**

All individuals take personal responsibility for safety.

2. **Questioning Attitude**

Individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

3. **Effective Safety Communication**

Communications maintain a focus on safety.

4. **Leadership Safety Values and Actions**

Leaders demonstrate a commitment to safety in their decisions and behaviors.

5. **Decision-Making**

Decisions that support or affect nuclear safety are systematic, rigorous, and thorough.

6. **Respectful Work Environment**

Trust and respect permeate the organization.

7. **Continuous Learning**

Opportunities to learn about ways to ensure safety are sought out and implemented.

8. **Problem Identification and Resolution**

Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.

9. **Environment for Raising Concerns**

A safety-conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination.

10. **Work Processes**

The process of planning and controlling work activities is implemented so that safety is maintained.

AMEREN MISSOURI INJURY PREVENTION

BODY MECHANICS

EYES ON PATH/WORK

LINE OF FIRE

PRE-JOB INSPECTION

PROPER TOOL/EQUIPMENT

IMPLEMENT FOCUS 5 TO IMPROVE INDUSTRIAL SAFETY PERFORMANCE

Ameren MISSOURI

Immediate Safety Concerns

An Immediate Safety Concern is a safety concern that has a high potential of resulting in the injury of a co-worker the day the concern is noted.

Handling Immediate Safety Concerns

When an Immediate Safety Concern is identified, the discovering coworker or their supervisor will perform the following:

Address the immediate concern as soon as reasonably possible.

1. The actions may include such things as:
    a. Fixing or eliminating the hazard.
    b. Taking the equipment out of service, if applicable.
    c. Barricade the area to ensure personnel will not be injured.
    d. Initiating a Job and notifying the Shift Manager of the concern and requested actions.
2. Generate a CR for all Immediate Safety Concerns

All items that meet the definition of "Immediate Safety Concern" are to be e-mailed using the address in the email of "@CAL Immediate Safety Concerns".

What to do in an emergency:
Put your work in a safe condition, contact the Medical Emergency Response Team (MERT) Team via the Control Room at 573.676.8787 or Line 1 on Gaitronics.

Rules to Live By

Use Fall Protection

Use proper fall protection when working 6 feet or closer to an unprotected side or edge that is 4 feet or greater from a lower level.

Adhere to Workman's Protection Assurance and/or Facilities Lock Out Program

Do not violate a Hold Off tag, a personal Hold Off Device (PHOD), or any facilities lockout device.

Adhere to Electrical Safety Requirements

Do not violate personal protective equipment requirements for arc flash boundary and/or restricted approach boundaries as identified in the Electrical Safe Work Practices Manual.

Adhere to Confined Space Entry Requirements

Do not enter a confined space where atmospheric monitoring has not been performed.

Avoid Walking Under Suspended Load

Do not walk (or stand) under a suspended load.

If a Rules to Live By violation is observed:

1. Immediately stop the job.
2. Contact the individual's supervisor and advise them of the situation.
3. Supervisor should begin fact-finding.
4. Supervisor should inform the Safety Department.

Use Fall Protection

Fall Protection: a system used to arrest personnel in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. Use only approved fall protection equipment.

Restraint: when a person is physically restrained removing the potential for free fall. A safety belt may be used for restraint, but must not be used for fall protection.

Unprotected Side or Edge: any side or edge (except at entrances to points of access) of a walking/ working surfaces, (e.g. floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches high.

Personnel on a surface within 6 feet of an unprotected side or edge, (which is 4 feet or more above the lower level) shall utilize fall protection or restraint.

When ascending/descending fixed, scaffold, or portable ladders, where the climber reaches 20 feet or above, fall protection is required. Fall protection can consist of an installed cage, center ladder safety devices, or retractable lanyard.

Workman's Protection Assurance (WPA)

Power Generation/ Production Equipment

1.0 Purpose

1.1 Provide a program that standardizes work practices for the protections and safety of personnel from the hazards associated with periodic maintenance and repair of equipment.

1.2 Establish measures to prevent unauthorized operations of out-of-service equipment.

1.3 The WPA Program shall ensure that before any individual performs periodic maintenance or repair of equipment, conditions are established to prevent personal injury.

1.2 Facilities Lockout Program

1.2 This program, in conjunction with APA-ZZ-00305, Facilities Service and Maintenance will:

1.2.1 Standardize Callaway non-plant equipment work practices for the protection and safety of personnel from hazards associated with non-plant equipment service, maintenance, repair or modification.

1.2.2 Establish measures to prevent unauthorized operation of out-of-service non-plant equipment.

1.2.3 Ensure that before any individual performs servicing, maintenance, repair or modification of Callaway non-plant equipment, conditions are established to prevent personal injury.

2.1.1 Ameren Hazardous Risk Categories (AHRC): A standardized set of electrical PPE used for worker protection based upon varying levels of arc flash exposures.

2.1.2 Approach Boundaries: Approach Boundaries to Live Parts for Shock Protection.

2.1.2.1 Arc Flash Boundary (AFB): When an arc flash hazard exists, an arc flash boundary is an approach limit at a distance from a prospective arc source at which there is a likelihood of an onset of a second degree burn at an exposure of 1.2 cal/cm2. This is a PPE boundary (See Attachment 1, Limits of Approach). Due to a person working on an energy source that could cause an arc flash, the Electrical Qualified employee shall wear the appropriate arc flash protection based on the arc hazard.

2.1.2.2 Limited Approach Boundary (LAB): An approach limit at a distance from an exposed energized electrical conductor or circuit part, within which a shock hazard exists. This is a qualification-only boundary for Class B and E qualified employees.

2.1.2.3 Restricted Approach Boundary (RAB) or Minimum Approach Distance (MAD): An approach limit, at a distance from an exposed energized electrical conductor or circuit part, within which there is an increased likelihood of shock, due to an electrical arc-over combined with inadvertent movement, for personnel working in close proximity to the energized electrical conductor or circuit part. The RAB/MAD is the inner boundary classified as "working on" an exposed energized and unguarded electrical conductor or circuit part. This is a PPE boundary.

Confined Space Entry Requirements

Most people who die in confined space accidents are would-be rescuers who instead become victims.

A confined space is a space that:

1. Is large enough, and so configured that a person can bodily enter and perform work, and
2. Has limited or restricted means for entry or exit (for example tanks, vessels, vaults, heaters, and pits are spaces that may have limited entry), and
3. Is not designed for continuous employee occupancy.

A Permit Required Confined Space is a confined space that:

1. Has additional hazards associated with it such as an atmospheric hazard, downward sloping walls that could cause you to fall and become trapped, or other physical hazards such as exposed electrical conductors or fall hazards.
2. For Permit Required Confined Spaces a briefing will be conducted and the work will be carefully planned prior to any entry.

General Safe Work Practices

1. Entry into a confined space is governed by APA-ZZ-00802.
2. Safety and Chemistry personnel will assist you if any questions arise.
3. Follow the PPE requirements listed in the PPE matrix of the SWPM.
4. If rescue planning is necessary, see “Medical Emergency Response Team (MERT) and Fire Brigade” section of the SWPM for more information.

Actions upon Discovery of a Fire

Plant Personnel - WHEN a fire is discovered, CONTACT Control Room and PERFORM the following:

a. REPORT exact location of fire, including building, elevation and room number or name if known.

b. STATE nature and size of fire.

c. STATE your name.

d. REPORT any known injuries associated with fire.

e. ADVISE Control Room if an attempt will be made to extinguish fire with an extinguisher.

f. ANSWER any Control Room questions.

g. RECEIVE and ACKNOWLEDGE Control Room directives.

h. WHEN the Control Room has been supplied with the above information, Do NOT HANG up the phone until the Control Room breaks contact or hangs up.

Shift Manager/Control Room Supervisor - WHEN a fire report is received, immediately INITIATE OTO-KC-00001, Fire Response.

Heat Stress

Heat illness sneaks up on you. Symptoms may include feeling tired, dizziness, nausea, weakness, irritability or headaches. If you experience any of these symptoms while working in a hot area, do not push to finish!

Some actions that can be taken to prevent heat-related illness are:

- Condition yourself for working or being active in hot environments. Allow your body to adjust over several days.
- Stay hydrated with plenty of water and electrolyte drinks. **OSHA recommends taking a drink every 15 minutes.**
- If you start to feel overheated or begin to develop a headache, take a break for a few minutes before going back to work.
- Wear lightweight, light-colored, loose-fitting clothing when working in the sun.

If you believe you or a co-worker are experiencing heat-related illness, contact the Medical Emergency Response Team (MERT) Team via the Control Room at 573.676.8787, or Line 1 on Gaitronics.

If working in high heat where heat stress is a concern, work with your supervisor to obtain stay times for the work area and plan for other heat mitigating strategies.

Electric Extension Cords

- Use heavy duty extension cords everywhere but offices. Minimize cords becoming a tripping hazard, and minimize potential for cord damage.
- An attempt MUST be made to obtain an extension cord of the proper length for the job. Extension cords can be plugged together in tandem, provided they are rated for the expected loads in that configuration.
- Use a Ground Fault Circuit Interrupter (GFCI) when electric hand tools (such as drills, grinders, etc.) are plugged into an outlet of 15 or 20 amps. Devices or ext. cords plugged into outlets outside or in a potential water environment require GFCI. A GFCI does not remove the requirement to inspect the cord and tool prior to use. Multiple GFCI's should not be used in the same run.
- If GFCI device is separate from ext. cord it MUST be plugged in upstream of the extension cord. If more than one cord is used, the GFCI must be upstream of ALL cords.
- GFCI adapters used with extension cords and permanently installed receptacles must have their GFCI protection circuits tested before each use. Testing of must be per the manufacturer's instructions.
- Temporary lighting has no restriction on the length of time that it is in service.
- Temporary power and extension cords can only be used for 90 days except in: periods of construction; remodeling; maintenance; repair or demolition of buildings, structures and equipment; or similar activities. ENSURE requirement of MDP-ZZ-0STOR are met.
- Permanent plant equipment or electrical devices not in exempt categories listed above and in place longer than 90 days are required to have a permanent power supply consisting of fixed wiring of a structure. Use of temporary power and extension cord to power this equipment is acceptable when a Condition Report (CR) has been written to install permanent power. View the SWPM for details on what to include in CR and tagging.

Work Activity	Eye/Face	Foot	Body	Gloves
Abrasive Wheels & Tools (cutting, sanding wood or similar material)	Goggles	Safety Shoes	Standard	Min. ANSI A4 cut resistant
Abrasive Wheels & Tools (other)	Goggles & Face Shield	Safety Shoes	Standard	Min. ANSI A4 cut resistant
Aerial Work Platforms	Safety Glasses	Safety Shoes	Standard/Fall Protection	As required for task
Batteries (sealed)	Safety Glasses	Safety Shoes	Standard	N/A
Batteries (unsealed)	Hazard Permit	Safety Shoes	Hazard Permit	Hazard Permit
Batteries (adding water or taking hydrometer readings)	Hazard Permit	Safety Shoes	Hazard Permit	Hazard Permit
Blood borne pathogens (clean-up)	Safety Glasses	Safety Shoes	Per DDP-ZZ-03001	Per DDP-ZZ-03001
Chemical Handling (Cryogenic Liquids)	Hazard Permit	Hazard Permit	Hazard Permit	Hazard Permit

These are minimum required standards. Full details in the *Safe Work Practices Manual*.

Work Activity	Eye/Face	Foot	Body	Gloves
Compressed Air Cleaning	Goggles & Dust Mask	Safety Shoes	Disposable Coveralls	Min. ANSI A4 cut resistant
Concrete Drilling/ Cutting	Safety Glasses	Safety Shoes	Standard	Footnote 2
Cutting Tools (box cutters, knives, other cutting tools)	Safety Glasses	Dependent on work area requirements	Standard	Min. ANSI A4 cut resistant
Electrical (Exposed Energized Conductors)	See Electrical Safe Work Practices Manual	See Electrical Safe Work Practices Manual	See Electrical Safe Work Practices Manual	See Electrical Safe Work Practices Manual
Excavations (Work in)	Safety Glasses	Safety Shoes	Standard	As required for task
Hand and Portable Power Tools	Safety Glasses			

[1] Goggles may be substituted with safety glasses if the chemical are not in use

[2] If drilling/cutting concrete (greater than or equal to) 1.5" without a drill stop, wear gloves rated for the highest voltage that may be encountered or ground the housing/frame

Work Activity	Eye/Face	Foot	Body	Gloves
Hot Work (Welding)	Safety Glasses & Welding Shield	Safety Shoes	Long Sleeved Shirt or Welding jacket	Welding - Leather
Hot Work (Grinding)	Goggles & Face Shield	Safety Shoes	Long Sleeved Shirt or Welding jacket	Welding - Leather
Hot Work (Brazing)	As required for task	Safety Shoes	Long Sleeved Shirt or Welding jacket	Welding - Leather
Hot Work (Torch Cutting)	#4 or #5 Shade Eye Protection	Safety Shoes	Long Sleeved Shirt or Welding jacket	Welding - Leather
Hydro blasting / Hydro lazing (3000 PSI or greater)	[1]Goggles & Face Shield	Safety Shoes	Water Proof	Welding - Leather
Lab Safety (Chemical Labs)	Follow Chemical Hygiene Plan	Follow Chemical Hygiene Plan	Follow Chemical Hygiene Plan	Follow Chemical Hygiene Plan

These are minimum required standards. Full details in the *Safe Work Practices Manual*.

Work Activity	Eye/Face	Foot	Body	Gloves
Lead Handling	Safety Glasses	Safety Shoes	Standard	Leather
Legionella (Cooling Tower Entry at power, etc.)	Safety Glasses, 1/2 Face Respirator, HEPA or Type H Filter	Safety Shoes	Standard	Min. ANSI A4 cut resistant
General material handling where potential hazards to hands exist as identified by worker or supervisor.	Dependent on work area requirements	Safety Shoes	Standard	Min. ANSI A4 cut resistant
Nut Splitting	Safety Glasses/ Face Shield	Safety Shoes	Standard	Min. ANSI A4 cut resistant
Rigging Operations	Safety Glasses	Safety Shoes	Standard	Min. ANSI A4 cut resistant
Work around steam (thermal burns)	Safety Glasses	Safety Shoes	Standard and Thermal Sleeves	Thermal Gloves

What does the standard say?

Most of the activities we perform at Callaway Energy Center are directly tied to a standard that defines how that activity is to be conducted. A very important aspect of error prevention is knowing and following the associated standard for our activities. We need to endorse and promote a mindset and a culture that challenges "What does the standard say?"

KNOW the standard.

Have good "walking around knowledge" of the most applicable standards we implement every day.

REFER to the standard.

Refer to the applicable standard consistently, even when you think you know what it says. This ensures knowledge is current and correct.

DISCUSS the standard.

Talk with each other about what the standard says to ensure consistent understanding.

COACH to the standard.

Coach each other (up, down, and across the organization) on positives and deltas associated with following the standard.

CORRECT the standard.

When you find an error in a standard, take action to get the error corrected by telling your supervisor and writing a Condition Report (CR).

A strong understanding and utilization of standards is important to Callaway's culture. It helps drive us to make sure we are performing the right job, the right way, the first time.

Standard vs. Expectation

- **Standard -** A requirement that must be done 100% of the time. Standards are written requirements contained in procedures, policies, work instructions, WPA, RWPs, permits, Safe Work Practices Manual, Callaway Training Manuals and desktop instructions.
- **Expectation -** Behaviors and actions (verbal or written) that management communicates to the workforce and are to be followed.

Common Event Prevention Tools

APA-ZZ-01400 App. K is a reference point for the following Human Performance Tools:

- Questioning Attitude
- Stop When Unsure
- 2-Minute Drill
- Job Briefs (APA-ZZ-0100B)
- Clear Communication
- Self Checking
- Peer Checking
- Flagging

APA-ZZ-00100 is a reference point for the following standards:

- Written Instruction Use & Adherence
- Placekeeping
- Concurrent Verification
- Independent Verification

Questioning Attitude

A questioning attitude should be applied in every walk-down, job brief and task. Identifying and resolving issues lessens the likelihood that an error-likely situation will occur.

Use it:

- Before starting, and during every task.
- If you are uncertain that a product is in compliance with expectations, procedures, written instructions, codes, or regulations.
- If you do NOT understand, or have any questions about the task.
- During self-checking ("Think" step of STAR).
- When you have a "gut feeling" something's not right.
- When making a decision about an activity that is infrequently performed.
- When inconsistencies are noted during the performance of work.

How:

F **oresee** technical activities or tasks that involve one or more critical attributes.

A **sk** open-ended questions.

C **onfirm** knowns and unknowns.

T **est** the current situation.

S **top** when unsure.

CALLAWAY CORE 4

Stop When Unsure

Use it:

- Uncertainty, doubt, confusion, or questions exist.
- Something expected does not happen.
- Someone else expresses doubt or concern.
- You have a “gut feeling” that something isn’t right.
- Something doesn’t look right.

How:

- STOP the activity.
- Place work in a safe condition to ensure personnel and equipment safety is maintained.
- Contact supervision for guidance.
- Resolve questions and concerns using the process directed in the governing procedure or written instructions.

***NEVER** proceed when faced with uncertainty! Always **STOP** work and place equipment in a safe condition.*
***SEEK** guidance from supervision.*

2-Minute Drill

The **2-Minute Drill** is used to establish and maintain situational awareness by evaluating the work area (near the hands-on touch points) and adjacent surroundings. This allows individuals to become aware of the immediate work environment, to detect abnormalities and hazards.

Perform at beginning of task, after being interrupted, when job conditions change, when task is completed, and prior to entering a Configuration Control Zone per APA-ZZ-00099 "Plant Status Control Event Prevention."

When in the field/work location, individual actions are expected to be observable by verbalizing the CAPITALIZED and UNDERLINED words.

Items to look for during a 2-Minute Drill:

- ◊ **CORRECT COMPONENT**
- ◊ **SAFETY HAZARDS** – eliminate/mitigate ALL
- ◊ **BUMP HAZARDS** – eliminate/mitigate ALL
- ◊ **FME** – focus on prevention

For assistance with strategies to eliminate/mitigate **Safety Hazards,** reference the Safe Work Practices Manual and/or see the Immediate Safety Concerns page of this handbook (pg. 12).

For guidance on how to eliminate/mitigate **Bump Hazards**, reference APA-ZZ-00099 “Plant Status Control Event Prevention” and/or contact the Field Supervisor or Work Control Center Operating Supervisor to have a Robust Barrier installed.

For guidance on **FME,** reference APA-ZZ-0801.

Job Briefs

USE JOB BRIEFINGS PRIOR TO ANY ACTIVITY

USE a **Job Briefing form (CA2423)** before **ALL High Risk** activities **OR** when the level of the brief has been elevated by request. All medium risk jobs/tasks involving work on energized conductors require utilizing the CA 2423.

ALWAYS REVIEW the five OSHA subjects:

- Work instructions and procedures used.
- Hazards associated with the job.
- Special precautions.
- Energy source controls.
- Personal protective equipment requirements.

Identify and discuss questions applicable to the job:

- Have qualifications been verified in QualMaster?
- Review challenges to Proficiency (CA3241).
- Review and discuss critical/important steps.
- What is the most error-likely situation?
  - ◊ How will this be mitigated?
- What is the risk associated with the job?
- Discuss OE relevant to the job.
- What are the potential error precursors?
- What fundamentals or tech skills apply?
- How will we maintain Plant Status Control?
- Critical nature of maintenance on SPV components and ER coded job tasks.

Three-Way Communication

- Used for **GIVING INSTRUCTIONS.**
- The sender states the message clearly and concisely.
- The receiver acknowledges the receipt of the information or instructions by repeating back a summary demonstrating understanding.
- The sender confirms the accuracy of the message by saying “correct” or “wrong.”

Because many letters sound similar, the Phonetic Alphabet is used to spell out parts of the message containing letters to avoid confusion.

A **Alpha**	**B** **Bravo**	**C** **Charlie**	**D** **Delta**	**E** **Echo**	**F** **Foxtrot**
G **Golf**	**H** **Hotel**	**I** **India**	**J** **Juliet**	**K** **Kilo**	**L** **Lima**
M **Mike**	**N** **November**	**O** **Oscar**	**P** **Papa**	**Q** **Quebec**	**R** **Romeo**
S **Sierra**	**T** **Tango**	**U** **Uniform**	**V** **Victor**	**W** **Whiskey**	**X** **X-ray**
Y **Yankee**	**Z** **Zulu**				

Self-Checking

Self-Checking helps the individual focus attention on the appropriate component, think about the intended action, understand the expected outcome before acting, and verify the results after the action.

Touch STAR: Stop Think Act Review

Use it:

- Manipulating plant components.
- Component disassembly/reassembly/routine maintenance.
- Determining Technical Specification requirements.
- Performing calculations.
- Revising drawings, procedures, and written instructions.
- Reviewing and approving documents, regardless of whether or not an additional verification is performed.
- Recording data.
- After an interruption and when under time pressure (a hurried feeling).

How:

The following STAR actions are expected to be observable:

- Performer determines desired component in written instructions.
- Performer TOUCHES the component label of desired component and VERBAILIZES component ID.
- Performer verifies correct component by comparing written instructions to component label.
- Performer maintains physical contact (flagging may be used) with desired component until manipulation of component is complete, or re-performs verification.
- Performer pauses and understands the effect of manipulation (observable by hesitation of a second or two).
- Performer verifies expected results were obtained.

Peer-Checking

Peer-Checking is involving a knowledgeable co-worker when you perform work, to verify that the task to be performed is correct prior to the action. Peer-checking does NOT relieve the performer of performing good self-checking. The effective application of both tools provides two barriers to human error.

Use it:

Peer-checking can be applied in any work situation, including Critical Steps, identification of parts or components, administrative activities, and error-likely situations.

How:

- Performer performs an independent correct component verification or self-check.
- Performer verbalizes intended action of component.
- Peer checker verifies correct component.
- Peer checker verifies intended action, component and position identified, and verbalizes agreement/ or stops the performer action if inconsistent with intended action.
- Performer takes action in a manner to allow peer checker to stop an incorrect action.
- Perform the action or task.
- Performer and peer-checker confirm expected results occurred.

Peer-checking is used to ensure the right action is being performed on the right component **BEFORE** and **DURING** the action.

Flagging

Flagging is a method of self-checking where an individual distinctly marks the correct component with a flagging device that helps the co-worker visually return to the correct component during the activity or after a distraction or interruption.

Co-workers can also use flagging to shield components from inadvertent touching or manipulation, such as "trip-sensitive" equipment in the vicinity of the manual activity.

Use it:

- When locally manipulating a breaker.
- When manipulating a component near similar-looking components.
- While working on multiple trains in close proximity.
- While working on a component that will be manipulated multiple times.
- During work near "trip-sensitive" or otherwise risk-important equipment.
- When the need for flagging is identified during the pre-job briefing.

How:

- Using Touch-STAR, identify the component(s) to be flagged at the start of the field work.
- Flag the designated component to be handled or worked on using an approved device. Flagging remains in place while work is in progress.
- Perform work assignment or equipment manipulation.
- Remove flagging device(s) when work is complete.

Flagging

Written Instruction Use & Adherence

- Technical written instructions are considered Continuous Use unless otherwise designated.
- Administrative Controls, other than technical written instructions, are considered as Information Use unless otherwise designated.
- Written instructions where sections or subsections designate different levels of use are classified Multiple Use.
- Only one Level of Use can be designated for each section or sub-section.

Continuous Use

a. The performer has a copy of applicable pages/sections in their presence or is in direct communication with someone who has a copy (Reader – Doer).

b. Read and understand each step before performing the step.

c. Perform the step as written in the sequence specified.

d. Placekeep the step before continuing to the next step, except for certain circumstances below:

- Concurrent actions are necessary during the specified activity.
- To complete the evolution safely and successfully, the series must be completed in a timely manner.
- ALARA, equipment or personal safety may be compromised if step-by-step documentation of the procedure is performed during execution.

Written Instruction Use & Adherence

Reference Use

a. The performer has a copy of applicable pages/ sections at the worksite or is in direct communication with someone who has a copy

b. Review and understand the section or sub-section (the task) before performing any steps.

c. Multiple steps may be performed. However, each step is performed as written and in the sequence specified.

d. Review the steps performed.

e. Placekeep the completed steps when reviewing.

f. The supervisor may require using Reference Use as Continuous Use.

Information Use

a. To perform the task successfully review the written instructions as needed.

b. The user may complete the task from memory. However this does not relieve the user from performing in accordance with the written instructions.

c. Due to the nature of Information Use written instructions at times it may be necessary for steps/ sections to be performed out of order to achieve desired results. Often in administrative type written instructions the user will only need to perform a single step or section.

d. Instructions are NOT required at the task or activity location.

Placekeeping

Technique of clearly marking instructional steps in a document to indicate the completion status of a particular step.

How:

1. Circle the step designator (number, bullet, etc.), then read and understand the step; OR read and understand the step then circle the step designator.
2. Perform the step as written.
3. Mark the step complete by placing a slash through the circled step designator.
   - For signoffs, perform the circle/slash method on the step designator and the required signoffs.
   - For NOTEs and CAUTIONs, circle the word (NOTE or CAUTION) prior to reading; slash through the circled word (NOTE or CAUTION) when reading is complete.

If a step cannot be performed as written, stop and contact supervisor.

Written Instructions Turnover:

- If possible, discuss current status of written instructions.
- Off-going co-worker draw a horizontal line below the last step performed, write the word "STOPPED" and record printed name or PIN, date and time.
- On-coming co-worker should clearly place the word "CONTINUED" and record printed name or PIN, date and time.

Evolutions that are continuing in progress and relieved on station with a face-to-face turnover by the performers who discuss the current place in the written instructions are exempt from the requirements of this section.

Placekeeping

Mark steps N/A in the following cases:

- Where written instruction provide a choice, mark alternatives NOT used N/A. No supervisor approval is required.
- Conditional statements (e.g. IF. . .THEN steps) may be marked N/A if the condition is NOT met. No supervisor approval is required.
- For any other steps, mark the step N/A and have the supervisor approve.

Steps without conditional statements or specified conditions may be marked N/A if ALL of the following criteria are satisfied:

- Step is clearly not needed for current mode, condition, or configuration of the plant (e.g., equipment is out of service).
- Does not change the intent or results of the written instruction.
- Does not create an unsafe condition.
- Does not violate any applicable initial condition, precaution, or prerequisite that is applicable to the section or action being performed.
- Does not change the method by which processes are performed.
- Does not affect performance of subsequent steps.

The supervisor approves N/A steps as follows:

- Ensures they are technically cognizant of the written instruction, or obtain concurrence from another individual who is technically cognizant.
- Ensure the explanation for marking the step as N/A is documented and appropriate.
- Documents approval by initial, date and PIN.

*N/A on non-conditional steps is exception, **NOT** normal practice.*

A series of actions by two individuals working together at the same time and place to separately confirm the condition of a component before, during, and after an action, when the consequences of an incorrect action would lead to immediate and irreversible harm to plant or personnel. CV is mandated and documented in written instructions.

Concurrent Verification (CV)

NOTE: For the purpose of Concurrent Verification "independently" references thought/ conclusions not space or time.

4.7.1. Concurrent Verification (CV)

a. Prior to Concurrent Verification step, the performer and verifier read and understand the step.

b. Performer and Verifier independently locate the component.

c. Prior to performing the activity, the performer identifies and states the intention, and the verifier concurs.

d. Performer completes the step while the verifier ensures that the proper action is being performed.

e. Performer and verifier confirm expected results.

f. Performer and verifier record as specified in the controlling document.

Independent Verification (IV)

A series of actions by two individuals working independently, created by separating the actions of each individual by physical distance, time and thought, to confirm the condition of a component after the original act that placed it in that condition.

Independent Verification (IV)

A. User performs action
B. Verifier independently checks the action. Verification may be performed by one of the following:
   - Direct Independent Verification - Physical or visual confirmation of the component's condition local to the component being verified (indication is provided by direct feedback from the component, e.g., physical verification of valve or switch position).
   - Indirect Independent Verification - Observation of indications of the outcome or result of component conditions (e.g., flow downstream of an open valve or return of instrument signal).
C. The IV may be performed at completion of section or series of steps if designated within written instructions.
D. IV involving plant status control may be waived for ALARA or personnel safety hazard by SM/ CRS.
E. If a peer check or CV was performed, that person can not be the IV verifier for the action which the peer check or CV was performed.

Radiological Work Standards

Prior to entering the Radiological Controlled Area (RCA), ensure you know the following **BASIC RADWORKER EXPECTATIONS**:

- Job location (if above 7ft. Contact RP for additional survey).
- RWP requirements including the Special Instructions.
- Self Reading Dosimeter dose and dose rate alarm set points.
- Radiological postings in the work area.
- Range of dose rates and contamination levels in work area.
- Areas to avoid/Low Dose Wait Areas.
- SRD placement (SRD in a position where it can be self-monitored, e.g. outside the protective clothing).
- SRD Monitoring requirements (Approximately every 15 minutes while in the RCA, more frequently if necessary, and to exit the RCA prior to receiving a dose alarm).
- Act upon an SRD alarm (Place work in a safe condition, notify your co-workers, exit the area, and report the alarm to RP).
- If exiting a Contaminated Area, proceed to the nearest Personnel Contamination Monitor or the monitoring location directed in your RWP.
- Minimize Radwaste generation; Segregate Trash into the appropriate receptacles.

NOTIFY RP for the following:

- Known or potential radiological spills.
- Job scope changes.
- Receipt of any dose alarm or unanticipated dose rate alarms.
- Prior to removing equipment/material from the RCA.
- Prior to working greater than seven feet off the floor (per HDP-ZZ—01200).
- Failure/Need of HEPA filtered vacuum or ventilation unit.
- As specified on the RWP.
- Suspected contamination of self.
- Prior to using a fan in the RCA.
- Sealing bags of parts, equipment, or trash for survey and labeling.

Maintenance Fundamentals

Maintenance Worker Fundamentals and Technical Skills include those skills and behaviors that are necessary for safe and effective maintenance.

The Maintenance Fundamentals are:

Knowledge	Preparation	Performance
Conservative Actions	Ownership	

KNOWLEDGE - Acquire Technical Skills Through Experience and Education

Maintenance workers should possess adequate knowledge, skills and experience in order to perform quality maintenance. This is achieved through training/ education and working with other knowledgeable individuals. This knowledge will allow workers to communicate key aspects of the job to key stake holders such as Operations, Work Management, and others, as well as understand how components will respond to the planned activity.

PREPARATION - Understand Plant Conditions, Equipment Significance and Job Requirements

Maintenance workers should be prepared to perform required maintenance activities. This preparation will allow them to have the correct level of instruction, correct parts/tools, and understanding of work site conditions. In addition, preparation actions help to identify gaps in understanding of the task, as well as an understanding of past performance experiences and how they can affect the plant and workers.

PERFORMANCE - Perform High Quality Maintenance and Document Pertinent Technical Information

Maintenance workers should look for opportunities to contribute their expertise on plant systems, to provide feedback on programs (such as system health and preventive maintenance) and to become strong advocates for excellent equipment performance. Workers should make full use of **maintenance fundamentals** and exercise excellence in conducting maintenance.

CONSERVATIVE ACTIONS - Execute Conservative and Deliberate Actions

As nuclear professionals, maintenance should question plant conditions, identify technical concerns with plant equipment and take conservative actions. In addition, these concerns should be communicated quickly to supervisors. One way to accomplish this is by performing inspections (as-found, during disassembly/reassembly and as-left) – unexpected or abnormal conditions should be questioned, documented and promptly communicated to managers and engineers. In addition, when performing maintenance, workers should have a questioning attitude, looking for component conditions that may be outside of the written instructions to determine if additional actions are required to ensure the component can operate reliably.

OWNERSHIP - Accept ownership of personal and plant performance

Workers should demonstrate, through performance of fundamentals and technical skills, ownership when implementing maintenance tasks. Increased worker engagement results in improved equipment and plant performance and builds organizational and personal pride. It also gives workers a desire to improve communications and become better stewards of resources. This can be displayed in various settings, including classrooms, labs, and field activities.

Maintenance Technical Skills

TECHNICAL SKILLS– are defined as the ability to use knowledge effectively and readily in the execution or performance of high quality maintenance tasks. The skills support the execution of maintenance fundamentals. The required technical skills should be developed using the systematic approach to training. The following are examples of some technical skills, however, this list is not all inclusive.

MECHANICAL SKILLS

- Know the pump and valve repair standards and the risks associated with improper maintenance of these components.
- Understand piping fit-up requirements and the potential impact for improper pipe alignment.

ELECTRICAL SKILLS

- Understand the different breaker designs used at the plants and the critical attributes of each breaker design.
- Understand battery maintenance includes potential risks, battery degradation and battery monitoring.

INSTRUMENT AND CONTROLS

- Understand the system response and potential risks associated with performing surveillance tests.
- Understand hysteresis and how it affects equipment calibration and repeatability of calibration.
- Understand differential pressure instruments and the effects on the instrument from having air trapped in the test lines.
- Understand calibration methods, adjustment points and expected responses.

COMMON SKILLS

- Know how to read drawings, and vendor manuals and refer to the drawings in the field as appropriate.
- Understand aspects including design, operating instructions and applicability of test equipment/ tools used in maintenance.
- Understand tool use, and use the appropriate tool for the work task assigned.
- Know basic bolting and mechanical joint requirements to minimize the potential of leaks.
- Understand role in leak mitigation strategies.
- Understand the requirements for fitting installation and the limits for disassembly and reassembly of fittings, particularly compression fittings.
- Understand torque requirements and the importance of bolt lubrication, hardware makeup, and torquing patterns, as applicable.
- Know the different gasket materials and the appropriate gasket to be used for each application.
- Use insulating material as appropriate to minimize inadvertent contact with energized circuits.
- Understand the requirements for lifted and landed leads, and maintain high standards for configuration control of these leads.
- Understand the electrical terminations including lead bend radius, terminal lug installation and termination tightness requirements.
- Use appropriate test leads for the job to minimize inadvertent contact with energized circuits.

Observations & Coaching

Observations and follow-up coaching are a means of reinforcing and improving Standards and Expectations at Callaway Energy Center.

- Observations focus on co-worker safety and standards adherence. Work should be stopped if either are compromised.
- Observations provide prompt feedback, both positive and corrective, to the individual(s) being observed.
- Observations are performed at sufficient depth, duration and criticality to provide value.
- Observers solicit feedback from the individuals they are observing.

Documentation:

- Observations can be made electronically or hard-copy
- Electronically: Follow QR code on inside cover or by using the C2C button on the Callaway home page under Quick Links.
- Hard Copy: Find hardcopy templates within our dept. and/or form your supervisor.

Steps for coaching behaviors:

1. State what was observed.
2. Wait for a response.
3. Review the standard with the co-worked.
4. Ask for a solution.
5. Agree on a solution together.
6. Follow through.
    - Generate CRs, TRRQs, Jobs and Post-Job Routings, as needed, to ensure improvements are made.

The Corrective Action Program (CAP)

CAP: Identifies, documents, evaluates, and resolves issues that occur in our daily operations. This helps us to protect the health and safety of the public while ensuring long term viability for Callaway.

Identify and report conditions promptly using:

- The electronic CAP system
- Hardcopy form CA2529, Condition Report

If the condition may impact Operability, nuclear safety, plant or personnel safety, or may be reportable—**immediately** notify the Shift Manager and ensure a CR is initiated and sent to CR Screening **within 24 hours.**

When Generating a CR:

Thoroughly Document and Describe the issue

- What? Gap between expectation and performance
- Who? (position, not name),
- Where?
- When?
- How?
- Why? (if known)

Need Help?

Performance Improvement SharePoint Site—Find How to Guides, Templates, and FAQs

APA-ZZ-00500 and its Appendices for standards

Department Performance Coordinators

Performance Improvement Department—CAP Group

Error Precursors

Task Demands

* Time pressure (in a hurry)
* High workload
* Simultaneous, multiple tasks
* Repetitive actions, monotonous
* Irrecoverable acts
* Interpretation requirements
* Unclear roles, goals, and responsibilities
* Lack of or unclear standards

Work Environment

* Distractions/interruptions
* Changes/departures from routine
* Confusing displays or controls
* Workarounds/Out of Service instruments
* Hidden system response
* Unexpected equipment conditions
* Lack of alternate indications
* Personality conflicts

Individual Capabilities

* Unfamiliarity with task
* Lack of knowledge (mental model)
* New technique
* Imprecise communication
* Inexperience
* Indistinct problem-solving skills
* Unsafe attitude
* Illness/fatigue

Human Nature

* Stress
* Habit patterns
* Assumptions (inaccurate mental picture)
* Complacency
* Mindset (tuned to see)
* Inaccurate risk perception
* Mental shortcuts (biases)
* Limited short-term memory

*Understanding error precursors provides insight into the potential for error for a specific task. **TWIN** is a memory aid that stands for **T**ask demands, **W**ork environment, **I**ndividual capabilities, and Human **N**ature.*

WPA User Responsibilities

Workman's Protection Assurance (WPA) does NOT take the place of the individual's own safe work habits nor does it relieve the WPA User of the responsibility of determining if safe working conditions exist.

- Is the WPA adequate for the job to be performed? The equipment is:
  - ◊ Isolated?
  - ◊ Depressurized?
  - ◊ Drained?
  - ◊ De-energized?
- Are you signed onto the correct WPA for your job?
- Have you read the maintenance notes and precautions (if applicable) listed on the WPA?
- Are you signed onto the job?
- When work is complete, or at end of your shift, did you remember to signoff the WPA?
- Forgot to sign off your WPA? Call 573.676.8507 (or 573.676.8134 during refueling outages)

The (WPA) Program ensures that before any individual performs periodic maintenance or repair of equipment, conditions are established to prevent personal injury.

Plant Status Control

- Personnel may only operate equipment with approved controls such as work instructions, procedures, or authorization from the Control Room.
- Be aware of your surroundings. Identify component bump hazards and eliminate or mitigate by calling the Field Supervisor or Work Control Operating Supervisor to have a robust barrier installed (APA-ZZ-00099).
- If a component is bumped and may have changed position: ***STOP and notify the Control Room***.

DO NOT re-position the component!

- If your work document allows operation of a component, ensure the document also restores the component or there is another process to restore (WPA, PMT, CA2789 Status Control Form, 2884 Maintenance Status Control Log, etc.).
- Plant Status Control is <u>YOUR</u> responsibility.
- Provide Work Control Center Operating Supervisor or CRS a brief, along with a working copy of the page of the procedure or work instruction that requires manipulation of plant components by Operations, when not covered by WPA (APA-ZZ-00320).

Configuration Control Zones (CCZ)

- Individuals walking through the plant should remain outside of the boundaries whenever possible.
- Personnel performing work in the plant should have concurrence of the associated work group supervisor in order to work within the boundaries. Additionally, while briefing jobs to be performed within these boundaries, a discussion specific to inadvertent bumping of components must occur.
- A 2-Minute Drill shall be performed prior to entering these zones. If an individual needs to breach a boundary they will conduct a “pat down” of themselves to check for loose or protruding items that could get caught on equipment and cause a mispositioning.
- Carried equipment such as ladders, push carts and scaffold poles shall remain outside the zone unless specifically approved by Operations Shift Management.

Foreign Material Exclusion (FME)

The FME program provides guidance for inspection of work areas, cleanliness, and control requirements to PREVENT introduction of foreign material (i.e. dirt, debris, and tools) into open systems or components.

FME-1/HIGH-RISK CONTROLS
Precautions used IF Foreign Material (FM) entering a system or component is NOT "immediately retrievable", or WHEN final close-out inspection of internal areas is extremely difficult or NOT possible upon completion of work. Adds personnel and material accountability to the control requirements of FME-2/Standard Risk controls not used anywhere else.

FME-2/STANDARD RISK CONTROLS
Precautions used IF FM entering a system or component is "immediately retrievable", and WHEN final close-out inspection of internal areas is possible upon completion of work.

What actions should be taken if there is an actual (or suspected) loss of FME Integrity?

- Stop - Place work in a safe condition.
- Clear Communications - NOTIFY:
  - Shift Manager/Control Room Supervisor (SM/CRS)
  - FME Monitor (If posted)
  - Work Group Supervisor or Project Coordinator
  - FME Coordinator
- Ensure that a Condition Report (CR) is generated to document the issue.

Housekeeping & Storage

- Take pride in our plant!
- If you see a housekeeping issue that requires immediate attention, please contact the appropriate department to correct the situation.

  Inside the RCA – RP Access

  Outside the RCA – Maintenance Plant Helpers

  Office Buildings – ABM at 573.220.4737
- All items brought into the Power Block for a short-term (3 months or less) basis require In-process Material Control Tags. All items brought into the Power Block for a long-term (more than 3 months) basis require In-process Material Control Tags and tracking per MDP-ZZ-0STOR, Staging and Storage of Materials, Attachment 1.
- In NO case should any storage of materials, equipment or tools be attached or secured to safety related piping, conduit, cable trays, supports, or any other safety-related components without an approved Engineering evaluation.
- Ensure combustible material is NOT stored in stairwells. Personnel egress through stairwells must NOT be blocked due to storage of equipment or materials. Storage in stairwells is prohibited without a CA0712, Transient Combustible Permit.
- Ensure adequate clearance, free of combustible material, is maintained around energized electrical equipment.
- APA-ZZ-00741, Control of Combustible Materials, Attachment 1 maintains a list of exempted combustible materials.
- Refer to MDP-ZZ-0STOR, Attachment 2, for a graduated approach to the distance items are allowed to be stored next to safety related equipment.

Commonly Used References

Accident, Injuries, Illness Reporting	APA-ZZ-00835
Confined Space	APA-ZZ-00802
Concurrent Verification (CV)	APA-ZZ-00100
Corrective Action Program	APA-ZZ-00500
Cyber Security	APA-ZZ-01108
Event Prevention Tools	APA-ZZ-01400, App. K
Foreign Material Exclusion	APA-ZZ-00801
Haz. Chem. Control Program	APA-ZZ-00831
Hot Work	APA-ZZ-00742
Independent Verification (IV)	APA-ZZ-00100
Lifting and Rigging	APA-ZZ-00365
Nuclear Professional	WANO PO&C 2019-1
Operating Philosophy	ODP-ZZ-00001, Add. 10
Place-keeping	APA-ZZ-00100
Plant Status Control	APA-ZZ-00099
Radiological Work Standards	APA-ZZ-01004
Risk	INPO-12-008 | INPO 15-011 | APA-ZZ-00322 App. F
Safe Work Practices Manual (SWPM)	
Training as Core Business	APA-ZZ-00925, Att. 2
Traits of a Nuclear Safety Culture	APA-ZZ-00932
WPA User Responsibilities	APA-ZZ-00310
Written Instruction Use & Adherence	APA-ZZ-00100

Fatigue Management Work Hour Rule Limits

The following limits apply to covered co-workers at all times:

- Limit hours worked to NO MORE THAN:
  - 16 hours in any 24-hour period
  - 26 hours in any 48-hour period
  - 72 hours in any 7-day period
- Observe a minimum break period of 10 hours between work periods except when transitioning between schedules, in which case an 8-hour break is acceptable.
- Observe a minimum break period of 34 hours in any 9-day period.
- Observe the minimum day off requirements applicable to current plant status.

ON-LINE (Breaker Closed)

Work Group/ Job Duties	8-Hour Schedule	10-Hour Schedule	12-Hour Schedule
Maintenance	1 day/week (average)	2 days/week (average)	2 days/week (average)
Ops, Chem, RP	1 day/week (average)	2 days/week (average)	2.5 days/week (average)
Security	1 day/week (average)	2 days/week (average)	3 days/week (average)

OFF-LINE (Breaker Open)

Work Group/Job Duties	All Schedules
Maintenance	1 day off per week
Ops, Chem, RP	3 days off in each successive (non-rolling) 15 day period of the outage
Security	4 days off in each successive (non-rolling) 15 day period of the outage

Phone Numbers

Emergency	
Cell Phone	**573.676.8787**
Desk Phone	**68787**
Safety	
Nurse	**573.676.8127** **573.818.4722**
Safety	**573.338.3183** **314.285.8651**
Operations	
BOP Operator	**573.676.8232**
Circ & Service Building	**573.676.4354**
Control Room Supervisor	**573.676.8233**
Demin Plant	**573.676.8484**
Working Foreman Ops Tech	**573.676.8507**
Intake	**573.676.8361**
Ops Tech Ready Room	**573.676.8235**
Operations Shift Clerk	**573.676.8265**
Polishers	**573.676.4239**
Radwaste Control Room	**573.676.8750**
Reactor Operator	**573.676.8231**
Shift Manager	**573.676.8234**
Shift Technical Advisor	**573.676.8459**
Switch Yard Control House	**573.676.8313**
Field Supervisor	**573.676.8527**

Phone Numbers

Chemistry	*Chemistry*
Atmospheric Hazard	573.676.6251
Cold Lab	573.676.8442
Hot Lab	573.676.8337
WPA	
On Shift WPA RO	573.676.8619
WCC WPA RO	573.676.8816

Maintenance	
FME Coordinator	573.659.6068
I&C Shop	573.676.8308
Insulator Shop	314.974.9790
Plant Helper Supervisor	573.590.9653 573.590.9923
Tool Room – Aux Building	573.676.4209
Tool Room – Service Building	573.676.8221
Valve Team	314.225.1122 573.220.7312
Weld Shop	573.676.8938
Weld Test Shop	573.676.4519
BHI	
Payroll Office/Business Office	573.676.4244
Site Manager	406.203.2582
Site Superintendent	573.291.2906

Phone Numbers

Security	
Central Alarm Station (CAS)	**573.676.8774**
Key Issue	**573.676.8839**
Locksmith	**573.676.8770** **573.676.4612**
Main Access Facility (MAF)	**573.676.8776**
Sally Port	**573.676.4380**
Secondary Alarm Station (SAS)	**573.676.8785**
Security Shift Supervisor (SSS)	**573.676.8780**
Emergency Preparedness	
Emergency Coordinator	**573.676.8662**
EP Manager	**573.676.8504** **573.239.0023**
Recovery Manager	**573.676.4910**
Unit Threat Response Center	
Engineering	**573.676.8328**
Maintenance	**573.676.8324**
Operations	**573.676.8326**
Shift Outage Manager (SOM)	**573.676.8327**
Areva	
Site Manager	**423.463.9449**
Nuclear Oversight Nuclear Oversight	
Nuclear Oversight (Director)	**573.676.4082**
Quality Control	**573.676.8285**

Phone Numbers

Miscellaneous	
Access Authorization	800.348.0142
Corrective Action Program (CAP)	573.826.7206
Fatigue Management	573.676.8561
Cyber Security	573.220.5933
Document Control	@CAL Document Control
Work Packages	573.676.8438 573.676.6063
Employee Concerns Program (ECP)	866.676.8500
Engineering WAR Room	573.676.8635
Fitness for Duty	573.676.4300
Fuel Building FME Desk	573.676.4083
Fuel Building 2047' (CPH)	573.676.4173
HELP Desk	314.554.4357
Inclement Weather	573.676.4189
Nuclear Regulatory Commission (NRC)	573.676.8667
Reference Counter	573.676.4284
Reproduction	@CAL Document Request
Stores	
Stores II	573.676.8532
Stores Issue Desk	573.676.8273
Stores – Night	573.676.4720
Stores Receiving Dock	573.676.8441

Phone Numbers

Outage Control Center	
Chemistry	573.676.6235
Clerk	573.676.4240
Conference Room Speaker Phone	573.676.8861
Engineering	573.676.8427 573.676.6240
Maintenance	573.676.6239 573.676.6236
Operations	573.676.6238 573.676.6241
Outage Manager	314.225.1563
Radiation Protection	573.676.6231
Safety Train Coordinator	573.676.6242
Shift Outage Director	573.676.6232
Shift Outage Manager (SOM)	573.676.6234
WMB First Floor Fax	573.676.4657
WMB Second Floor Fax	573.676.8345
Workstations	573.676.4079
Outage WPA Supervisor	573.676.8134 573.676.8371

Phone Numbers

Work Control Center	
Clerk	**573.676.4779**
Fix It Now (FIN) Team	**573.676.8340 573.676.8783**
WCC Ops Techs	**573.676.8883**
Work Control Center	**573.676.8552 573.676.8737**
Work Week Manager	**573.676.8555 573.676.8749**
Radiation Protection	
ALARA	**573.676.8939**
Count Room	**573.676.8791**
Dosimetry	**573.676.8436**
RP Access	**573.676.8269**
RP Supervisor	**573.676.8554**
Rad Chem Helpers	**573.676.8610**
Human Resources	
HR Associate	**573.676.6480 573.310.7015**
Director, HR	**314.541.1524**
Senior HR Client Consultant	**573.676.8211 573-220-2878 573.301.5474 573.676.8358**
Labor Relations Rep.	**314.399.7025 314.215.8920**
Labor Relations Admin.	**314.554.3993**

Plant System Designators

SYS	DESCRIPTION
AB	MAIN STEAM
AC	MAIN TURBINE
AD	CONDENSATE
AE	FEEDWATER
AF	FEEDWATER HEATER EXTRACTION & DRAINS
AK	CONDENSATE DEMINERALIZER
AL	AUXILIARY FEEDWATER
AN	DEMINERALIZED WATER STG & TRANSFER
AP	CONDENSATE TRANSFER & STORAGE
AQ	CONDENSATE & FEEDWATER CHEMICAL ADD
BB	REACTOR COOLANT
BG	CHEMICAL & VOLUME CONTROL
BL	REACTOR MAKEUP WATER
BM	STEAM GENERATOR BLOWDOWN
BN	BORATED REFUELING WATER STORAGE
CA	STEAM SEALS
CB	MAIN TURBINE LUBE OIL
CC	GENERATOR HYDROGEN & CO2
CD	GENERATOR SEAL OIL
CE	STATOR COOLING WATER
CF	LUBE OIL STORAGE, TRANSFER & PURIFICATION
CG	CONDENSER AIR REMOVAL
CH	MAIN TURBINE CONTROL OIL
DA	CIRCULATING WATER
DB	COOLING TOWER MAKEUP & BLOWDOWN

Plant System Designators

SYS	DESCRIPTION
DD	COOLING WATER CHEMICAL CONTROL SYSTEM
DE	INTAKE STRUCTURE & WATER TREATMENT
DG	CIRC WATER HYDRAULIC
EA	SERVICE WATER
EB	CLOSED COOLING WATER
EC	FUEL POOL COOLING & CLEANUP
EF	ESSENTIAL SERVICE WATER
EG	COMPONENT COOLING WATER
EJ	RESIDUAL HEAT REMOVAL
EM	HIGH PRESSURE COOLANT INJECTION
EN	CONTAINMENT SPRAY
EP	ACCUMULATOR SAFETY INJECTION
FA	AUXILIARY STEAM GENERATOR
FB	AUXILIARY STEAM
FC	AUXILIARY TURBINES
FE	AUX STEAM CHEMICAL ADDITION
GA	PLANT HEATING
GB	CENTRAL CHILLED WATER
GC	SERVICE & STORE BLDG HVAC
GD	ESW PUMPHOUSE
GE	TURBINE BUILDING HVAC
GF	MISC. BUILDING HVAC
GG	FUEL BUILDING HVAC
GH	RADWASTE BUILDING HVAC
GJ	ESSENTIAL CHILLED WATER

Plant System Designators

SYS	DESCRIPTION
GK	CONTROL BUILDING HVAC
GL	AUXILIARY BUILDING HVAC
GM	DIESEL BUILDING HVAC
GN	CONTAINMENT COOLING
GP	CONTAINMENT ILRT
GR	CONTAINMENT ATMOSPHERE CONTROL
GS	CONTAINMENT HYDROGEN CONTROL
GT	CONTAINMENT PURGE
HA	GASEOUS RADWASTE
HB	LIQUID RADWASTE
HC	SOLID RADWASTE
HD	DECONTAMINATION
HE	BORON RECYCLE
HF	SECONDARY LIQUID WASTE
HG	Dry Cask System
IS	TRAINING CENTER SIMULATOR
JA	AUX OIL STORE & TRANSFER
JE	EMERGENCY FUEL OIL
JF	Nuclear Fuel
KA	COMPRESSED AIR
KB	BREATHING AIR
KC	FIRE PROTECTION
KD	DOMESTIC WATER
KE	FUEL HANDLING, STORAGE & REACTOR VESSEL SERVICE

Plant System Designators

SYS	DESCRIPTION
KF	CRANES, HOISTS & ELEVATORS
KH	SERVICE GAS (CO2 - H2)
KJ	STANDBY DIESEL ENGINE
KS	CHEMICAL STORAGE & HANDLING
LA	SANITARY DRAINAGE
LB	ROOF DRAINS
LC	YARD DRAINS
LD	CHEMICAL WASTE
LE	OILY WASTE
LF	FLOOR & EQUIPMENT DRAINS
MA	MAIN GENERATOR
MB	EXCITATION & VOLTAGE REGULATION
MD	EHV SWITCH YARD BUS
ME	EHV SWITCH YARD 125 VDC
MF	EHV SWITCH YARD LIGHTING
MR	STARTUP OR RESERVE TRANSFORMER
NB	4160 VAC
NE	STANDBY GENERATION - DIESELS
NF	LOAD SHEDDING & EMERGENCY LOAD SEQUENCING
NG	480 VAC
NK	125 VDC
NN	INSTRUMENT AC POWER

Plant System Designators

SYS	DESCRIPTION
PA	13.8 K VAC
PB	4160 VAC
PG	480 VAC
PJ	250 VDC
PK	125 VDC
PN	INSTRUMENT AC POWER
PQ	UNINTERRUPTIBLE AC POWER
QA	NORMAL LIGHTING & 120/208 V POWER
QB	STANDBY LIGHTING AC
QD	EMERGENCY LIGHTING DC
QE	TELEPHONE SYSTEM
QF	PUBLIC ADDRESS SYSTEM (INTERCOM)
QG	GROUNDING (POWER BLOCK GROUNDING GRID)
QH	CATHODIC PROTECTION
QJ	FREEZE PROTECTION
QN	MISC. EQUIPMENT SYSTEM
QT	PERMANENT ROAD LIGHTING
RC	BOP DCS
RD	METEOROLOGICAL INSTRUMENTATION
RH	CLOSED CIRCUIT TV
RJ	PLANT COMPUTER
RK	PLANT ANNUNCIATOR
RL	MAIN CONTROL BOARD

Plant System Designators

SYS	DESCRIPTION
RM	PROCESS SAMPLING
RP	MISC. CONTROL PANELS
RR	RADIOACTIVITY RELEASE INFORMATION
RT	EMERGENCY RESPONSE FACILITY INFORMATION SYSTEM
RU	COMMUNICATIONS (COMPUTER)
SA	ENGINEERED SAFETY FEATURE ACTUATION
SB	REACTOR PROTECTION
SC	REACTOR INSTRUMENTATION
SD	AREA RADIATION MONITORING
SE	EX-CORE NEUTRON MONITORING
SF	REACTOR CONTROL
SG	SEISMIC INSTRUMENTATION
SH	POST ACCIDENT MONITORING
SJ	NUCLEAR SAMPLING
SK	PLANT SECURITY
SL	MAIN TURBINE CONTROL
SM	CONTAINMENT ISOLATION
SP	PROCESS RADIATION MONITORING
SQ	LOOSE PARTS MONITORING
SR	IN-CORE NEUTRON MONITORING
SS	ATWS MITIGATION SYSTEM ACTUATION CIRCUITRY
UB	OUTSIDE BUILDINGS & EQUIPMENT

The Operator Fundamentals are:

- Monitor Closely
- Precise Control
- Conservative Bias
- Effective Teamwork
- Knowledge

In order for the Operator Fundamentals to benefit the individual operator, crew and station, these elements must be used during normal, abnormal and transient conditions. In addition to the above fundamentals, two over-arching characteristics are necessary to achieve excellence in operator fundamentals—operational proficiency and operator engagement.

Proficiency is defined as the individual or team mastery of a specific task or job skill demonstrated by consistently acceptable performance, in accordance with established standards. A more simplistic definition for proficiency is, “the state or art of achieving competency.” Proficiency in a task or job skill requires several attributes such as knowledge, skill, understanding, familiarity, repetition, and time since last performed. For individuals and teams, there is a varying spectrum of proficiency based on these attributes. It is a balance of the use of fundamentals and human performance tools. These factors, challenges and mitigating actions must be considered before starting any operational activity.

M-1 Frequency	• Operators monitor plant parameters at a frequency based on importance and plant conditions, and they communicate to other crewmembers when needed by describing the parameter—its value, trend and action needed or taken. • Operators establish increased monitoring, as appropriate, for any disabled alarm function.
M-2 Transients	• Operators increase the frequency of monitoring key parameters during transients.
M-3 Trend	• Operators identify adverse parameter and equipment trends. • Operators validate the accuracy and proper function of indications through multiple independent means, if available, avoiding undue focus on any single indicator. • Field operators perform detailed rounds and take prompt actions to address abnormal conditions. • Important information from monitoring field equipment and parameters is reported promptly to Control Room operators.
M-4 Validate	• Operators validate expected system response to equipment operation and status changes. • Operators investigate to understand unexpected trends and alarms, take action to restore systems and parameters to normal, and request assistance when needed.

PC-1: Control Bands	• Operators establish limits for controlling parameters within specified bands and at specified rates. • Supervisors clearly communicate action points to all crewmembers.
PC-2: Operator Action	• Operators anticipate automatic trips and equipment protective features, pre-emptively taking manual actions or ensuring expected automatic actions occur where appropriate. • Operators verify and report automatic system actuations or responses, including operator actions if the plant has not responded as expected.
PC-3: Procedures	• Operators verify that indication and initial plant conditions are appropriate for the procedure before implementing a procedure section or step. • Operators know the objective of the procedure and the basis for procedure steps prior to manipulation. • Operate the plant in accordance with approved, up-to-date operating procedures and information. • Operators identify steps that could result in undesirable consequences if not performed correctly. • They ensure appropriate contingencies are established.
PC-4: Labels	• Operators use appropriate equipment labels and lineups for equipment manipulations and verifications.
PC-5: Human Perform.	• Operators apply human performance tools effectively when operating plant equipment.

CB-1: Equipment Availability	• Operators ensure the equipment needed to support effective plant operation is available and is operating properly, including that backup indications are available, controllers are tuned and in automatic, and redundant equipment is operational.
CB-2: Work/Risk Management	• Operators manage scheduled activities and emergent work to avoid simultaneous evolutions that have the potential to overload control room personnel and hamper plant monitoring. • Operators establish contingency plans, commensurate with the associated risk, to mitigate potential adverse consequences during plant evolutions.
CB-3: Questioning Attitude	• Operators understand plant conditions and know the appropriate action to take when plant or component control cannot be maintained, including stopping the evolution and involving supervision. • Operators question conditions and situations that are out of the ordinary, that are unexpected, or that could erode margins to operating the plant conservatively. Operators resolve issues before continuing.
CB-4: Margins	• Operators set conservative bands for critical parameters to ensure that operating margins to undesirable states are maintained. • Operators control operating bands and rates to create and maintain sufficient operating margins.

T-1: Question	• Operating crewmembers ask questions to obtain necessary information. • Operating crewmembers question when an action is being taken that doesn't appear appropriate or when the expected action for a given condition is not being taken.
T-2: Conflict	• Operating crewmembers resolve conflicts to achieve the best solutions and to improve team effectiveness.
T-3: Critical	• Operating crewmembers are critical of team performance so that they can identify performance improvements .
T-4: Turnover	• Operators provide thorough and accurate turnovers when relieved during or at the completion of a duty shift.
T-5: Roles	• Operating crewmembers fulfill their assigned role and do not assume another team role without a proper turnover.
T-6: Communications	• Operators communicate the status of parameters to the operating crew when needed by describing the parameter, its value, trend and action needed or taken. • Perform briefings and updates to keep crewmembers aware of plant conditions and upcoming operations. • Effectively communicate in a precise and concise manner.

K-1: Operation	• Before operating a component, operators confirm an understanding of its function and interactions with other components. • Operators regularly evaluate crewmember knowledge of plant design, engineering principles and sciences. • Operators discuss expected system and parameter changes and their bases during pre- job briefings.
K-2: Risk	• Operators understand the risk profile for the existing plant configuration, including the collective risk of having multiple, diverse components out of service.
K-3: Learning	• Operators establish a culture of intellectual curiosity — a learning environment — among crewmembers that encourages questioning, challenging, and knowledge reviews.
K-4: Simulator	• Operators ask for simulator scenarios that challenge fundamental knowledge of sciences, engineering principles, and plant design.
K-5: Fundamentals	• Licensed operators have a strong understanding of the basic core fundamental principles of reactor theory, electrical theory and thermodynamics. • Operators apply this knowledge to anticipate expected responses as they operate the plant.

Ops-Specific Briefs

Status Briefs

CA3221 Status Brief

- What has happened
- Where we are now
- Where we are going
- What method we are using to get there
- Prudent Operator Action & why required
- Risk Challenge and mitigation strategies
- Priorities
- Transient Rules

End of Shift Briefs

- What went well or didn't go well during shift
- Major activities planned for next shift
- Plant Status Control items
- Training items

Reactivity Briefs

Beginning of each shift, a Reactivity Brief is held with the SM, CRS, FS, URO, BOP, STA & WPA RO to discuss planned reactivity manipulations using ODP-ZZ-00001 ADD10.

Ops-Specific Briefs

Impact Briefs

Held to focus on the impact to plant operations and actions needed to be performed by CR operators, when jobs:

- Require constant communication or monitoring by CR.
- Require > two operations & resets of CR annunciator.
- Require > two CR personnel support communications, monitoring or manipulations.
- Require non-Ops personnel in the "At The Controls Area."

Most Error Likely Task (MELT) Briefs

Beginning of shift, crew discussion on risks involved with the day's scheduled work affecting Operations. Attendees will determine what jobs will be considered Most Error Likely Tasks for the day and determined mitigation strategies for the identified risks.

(Work Authorization) Risk Awareness Challenge Briefs

Using CA3296, OS discusses with craft the potential risks with jobs requiring CR authorization. If not answered satisfactorily, the Job will NOT be authorized and WGS should be contacted to assist craft in determining information.

CHEMISTRY FUNDAMENTALS

CHEMISTRY KNOWLEDGE

- Chemistry personnel are knowledgeable of chemical degradation mechanisms and integrate strategies for normal and abnormal conditions, including startup and shutdown.
- Chemistry personnel understand the bases, capabilities, and limitations of chemistry sampling and analytical methods.
- Chemistry personnel use diverse information sources to understand technical issues and provide recommendations for decisions that affect plant chemistry.
- Chemistry personnel are knowledgeable of industry technical concerns, advances in technology, and industry operating experience. They use this knowledge to optimize chemistry controls that protect plant assets.
- Supervisors understand chemistry must-know significant operating experience and the importance of using significant operating experience and job-related operating experience to prevent events.

COMMUNICATE AND ADVOCATE

- Chemistry personnel identify and report adverse chemistry trends in a timely manner and communicate to operations and engineering personnel those trends that can adversely impact plant system operation. Preemptive actions are taken to maintain system chemistry contaminants as low as reasonably achievable, anticipating potential results of adverse trends.
- Chemistry personnel advocate prompt resolution for critical chemistry equipment issues.

CHEMICAL CONTROL

- Chemistry personnel work with other station groups to control the use of chemicals throughout the station.
- Station personnel ensure laboratory chemicals are labeled, dated, segregated, and properly disposed.
- Chemistry personnel prevent system chemistry excursions by verifying chemical quality specifications and key parameters upon receipt through on-site laboratory analysis or by reviewing the certificate of analysis from the vendor.
- Station personnel minimize the generation of radioactive and chemical waste by properly following the aspects of the chemical control program.

CHEMISTRY FUNDAMENTALS

CHEMISTRY PERSONNEL APPLY THE ESSENTIAL KNOWLEDGE, SKILLS, BEHAVIORS, AND PRACTICES NEEDED TO IMPLEMENT CHEMISTRY ACTIVITIES THAT SUPPORT SAFE AND RELIABLE PLANT OPERATION.

SAMPLE AND ANALYZE

- Chemistry technicians obtain representative samples, at the correct frequency, from plant systems and the environment.
- Chemistry technicians analyze samples accurately using the laboratory quality control practices with the appropriate analytical chemistry method.
- Chemistry technicians review, evaluate, and document chemistry data in a manner such that adverse trends are identified and promptly corrected before station goals and limits are exceeded.

MONITOR, ASSESS & RESPOND

- Chemistry personnel accurately monitor system chemistry conditions and coordinate chemical additions or dilutions to minimize material corrosion rates.
- Chemistry personnel identify degrading conditions and act to improve chemical treatment programs and materials.
- Chemistry personnel routinely evaluate chemistry strategies, operating practices, and evaluation techniques (such as hideout return and impurity mass balance studies) for effectiveness and to ensure these are integrated into station performance monitoring and corrosion control initiatives.
- Monitoring techniques are established to verify the effectiveness of closed loop and raw water chemical treatment programs.

Annunciator Response

EXPECTED ALARMS

Part of planned operator manipulations, planned maintenance or planned testing that are discussed with the CRS or SM in advance of the activity causing the alarm.

- ✓ Announced to CRS/SM by window description and/or title, followed by "expected". Multiple alarms may be grouped into one general announcement. 3-way communications are used for announcing alarms.
- ✓ CRS/SM may suspend announcing repeat alarms or alarms associated with a planned test or evolution in progress.
- ✓ OTA review is not required.
- ✓ Expected Alarms over extended period should be tracked so crew member maintain awareness (alarm list from surveillance procedures, listed on turnover or listed on status board).

UNEXPECTED ALARMS

- ✓ Alarms that do not meet the definition of expected alarms.
- ✓ Announced to CRS/SM by window description and/or title, followed by "unexpected". Multiple alarms may be grouped into one general announcement. 3-way communications are used for announcing alarms.
- ✓ The OTA is reviewed for guidance. For repeat alarms, OTA reviewed for first occurrence only.
- ✓ Announcing repeat alarms may be suspended by CRS after the OTA is reviewed.
- ✓ Annunciators 65F and 66F do not require OTA review. Annunciators 104D and 134D do not require OTA review if alarm is due to routine operations.
- ✓ Blue Alarm Windows do not require OTA review, due to only required action is dispatching OT.

Licensed Power Limits (ODP-ZZ-00001 ADD10, Att.3)

AT POWER

Reactor Power Level	< 3565 MWth
RCS Temperature	Tref ± 3°F
Pressurizer Avg Pressure	2220 to 2250 psig
Pressurizer Level	Program Level ± 5%
Steam Generator Level	Program Level ± 5%

- ✓ Other modes as established by CRS.
- ✓ RO notifies CRS if outside or approaching a critical parameter limit.
- ✓ CRS ensures action is initiated to restore the parameter.

Critical Parameters (ODP-ZZ-00001 ADD10, Att 2)

- ✓ RJU0229 two Hr. Avg < 3565 MWth
- ✓ If RJU0096 ten Min Avg continuously exceeds > 3565 MWth take action to reduce power.
- ✓ If RJU0096 ten Min Avg exceeds > 3590 MWth, write a CR to evaluate.
- ✓ REU1118 one Min Avg < 3636 MWth
- ✓ Target full power 3563 +1/-2 MWth
- ✓ If thermal power program is unavailable >4 hours, then perform OSP-SE-00004.

Prudent Operator Actions

Operators should NOT normally take actions unless directed by procedure. Prudent actions may be taken if:

- pressing operational need, AND no procedural guidance exists, OR
- need will not be addressed by procedure in a timely manner.

When improper operation of a controller/component is apparent, RO may place in Manual prior to direction by OTO:

- RO notify CRS prior to taking manual control.
- Once parameter stabilized, CRS establish & communicate appropriate control band while in manual.
- When parameter restored to desired value & condition that caused malfunction is cleared, equipment should be returned to Auto with CRS concurrence.

Manually initiating Rx Trip, SI or other ESFAS Actuation when plant parameters indicate actuation is:

- required & did not actuate, RO shall manually actuate & inform CRS.
- imminent, RO shall obtain concurrence from CRS then manually actuate.

Operators may take comp actions for failed equipment or to prevent undesired plant condition. Obtain concurrence from CRS/FS prior to taking action.

Operators may take actions to stop or isolate failed equipment that poses immediate danger to personnel. Actions may be taken without obtaining concurrence from CRS/FS. CRS/FS should be promptly notified of actions taken.

When performing Prudent Operator Actions, existing procedure direction should be used, if available and time permits. This may include bringing forward existing procedure steps in the same procedure, or performing steps from another procedure.

Areas of Confinement

- The on-shift Control Room Supervisor and two Unit Reactor Operators responsible for Control Room duties must remain within the Protected Area.
- The Shift Manager or Safe Shutdown Operator may leave the PA for limited periods of time to support business needs but must limit travel to CPF, Training Center, CLC and CMB. The Incident Assessor may leave the PA but must limit travel to OCA fence. Only one (SM, SSO or IA) may be outside the PA at any time.
- The individuals designated as the Fire Brigade Leader or Fire Brigade members must remain within the Owner Controlled Area fence and contractor parking lot.
- The Control Room shall be occupied by at least one licensed Unit Reactor Operator and one licensed Senior Reactor Operator.
- One Unit Reactor Operator is normally in the "IMMEDIATELY ADJACENT TO THE CONTROL PANELS AREA."

Control Board Monitor/Board Walkdown

- URO normally designated as Control Board Monitor (CBM).
- CBM should be in “At the Controls Area”, with exception of SM office, at all times. Limit time out of “Immediately Adjacent to the Control Panels Area.”
- CBM maintains awareness of plant parameters & trends.
- CBM will minimize distractions which draw attention away from monitoring plant parameters. CBM is not allowed to perform complex procedures, wear headsets, have extended phone calls, perform procedure reviews or perform WPA preparation, including IVs.
- CBM is allowed to perform simple procedure actions, peer-checks, IVs, answer phone calls, computer trending for plant parameters & use computer to look up status of equipment.
- If required to transfer responsibility of CBM duties, CBM will make formal statement to CRS & other RO as to who responsibility of CBM has been transferred to.
- All subsequent transfers of CBM responsibilities should also include updates on any changes in plant conditions that have occurred during the absence of the individual assuming the responsibility.
- Each CR RO will perform full board walkdown every three hours.
- SM & CRS will perform a full board walkdown at least once each half of the shift.

Peer Check Flow Chart

Notes

Notes

Enter a C2C Observation

Leadership Resources