		Number: EA CRAD 30-02 Revision: 0 Effective Date: October 06, 2015
Review of Conduct of Operations Criteria Review and Approach Document		
Authorization and Approval	Director, Office of Environment, Safety and Health, EA-30 Date: 10/8/15	Director, Office of Nuclear Safety and Environmental Assessments, EA-31 Date: 10/8/2015

1.0 PURPOSE

Within the Office of Enterprise Assessments (EA), the Office of Environment, Safety and Health Assessments (EA-30) mission is to assess the effectiveness of those safety and emergency management systems and practices used by line and contractor organizations in implementing Integrated Safety Management; and to provide clear, concise, and independent evaluations of performance in protecting our workers, the public, and the environment from the hazards associated with Department of Energy (DOE) activities and sites.

In addition to the general independent oversight requirements and responsibilities specified in DOE Order 227.1, *Independent Oversight Program*, this criteria review and approach document (CRAD), in part, fulfills the responsibility assigned to EA in DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to conduct independent appraisals of high consequence activities.

A key to success is the rigor and comprehensiveness of our process; and, as with any process, we continually strive to improve and provide additional value and insight to field operations. Integral to this is our commitment to enhance our program. We continue to make CRADs available for use by DOE line and contractor assessment personnel in developing effective DOE oversight, contractor self-assessment, and corrective action processes; the current revision is available at:

http://www.energy.gov/ea/criteria-review-and-approach-documents

2.0 APPLICABILITY

The following CRAD is approved for use by the Office of Nuclear Safety and Environmental Assessments (EA-31) for use at DOE Hazard Category 1, 2, and 3 nuclear facilities. It may also be used by other offices within the Office of Environment, Safety and Health to review other DOE operations that invoke the principles of Conduct of Operations.

3.0 FEEDBACK

Comments and suggestions for improvements on this CRAD can be directed to the Director, Office of Environment, Safety and Health Assessments, at (301) 903-5392.

4.0 CRITERIA REVIEW AND APPROACH

This CRAD focuses on the requirements of DOE Order 422.1, *Conduct of Operations*. The requirements apply to these 18 areas:

- 2.a. - Organization and Administration
- 2.b. - Shift Routines and Operating Practices
- 2.c. - Control Area Activities
- 2.d. - Communications
- 2.e. - On-Shift Training
- 2.f. - Investigation of Abnormal Events, Conditions, and Trends
- 2.g. - Notifications
- 2.h. - Control of Equipment and System Status
- 2.i.1 - Lockout and Tagouts
- 2.i.2 – Caution Tags
- 2.j. - Independent Verification
- 2.k. - Logkeeping
- 2.l. - Turnover and Assumption of Responsibilities
- 2.m. - Control of Interrelated Processes
- 2.n. - Required Reading
- 2.o. - Timely Instructions/Orders
- 2.p. - Technical Procedures
- 2.q. - Operator Aids
- 2.r. - Component Labeling

4.1 OBJECTIVES AND CRITERIA

Objectives are numbered and labeled to correspond with those used in DOE O 422.1. The criteria then follow for each objective.

OBJECTIVE 2.a. - Organization and Administration

The operator has established the policies, programs, and procedures that define an effective operations organization.

CRITERIA

1. The operator has established and implemented the organizational roles, responsibilities, authority, and accountability.
   - Do written policies state goals for operations, safety, and security, the means to achieve them, and the controls instituted for the Conduct of Operations Program?
   - Do policies and procedures implement DOE requirements for operations?
   - Do policies and procedures implement DOE safety requirements?
   - Do policies and procedures implement DOE security requirements?
   - Are personnel and organizations assigned responsibilities for implementing policies?
   - Do policies clearly define operations personnel authority, accountability, and relationships with other groups, including Stop-Work authority?

2. The operator has established and implemented the adequate material and personnel resources to accomplish operations.
   - Are sufficient qualified operators available to complete assigned tasks without excessive overtime?
   - Are adequate technical personnel assigned to support operations?
   - Are staff development, retention, and succession managed under a long-range staffing plan?
   - Are adequate material, tooling, equipment, safety gear, and facilities available for safe operations?

3. The operator has established and implemented the monitoring and self-assessment of operations.
   - Are operating problems documented and evaluated, and are corrective actions taken?
   - Do supervisors and managers directly observe operations frequently and provide feedback?
   - Do appropriate outside organizations such as Quality Assurance or other oversight organizations observe operations and provide feedback?
   - Are assessment and observation issues tracked and corrected?
   - Are auditable, measurable, realistic, and challenging safety, environmental, and operations goals set? Examples are safety system operability; radiological or other exposure; facility operational availability; unscheduled shutdowns; overtime; staffing; qualification, and training; waste production; and plant instrumentation alarms and warnings.
   - Do facilities develop an action plan to achieve safety, environment, and operations goals with input from operations personnel, and review and approval by management?
   - Do facilities monitor and report to line and DOE management their progress on completing the action plan and achieving goals? Are goals and plans adjusted and modified as needed?

4. The operator has established and implemented the management and worker accountability for the safe performance of work.
   - Are management systems designed to minimize the effects of human performance failures?
   - Are personnel involved in repeated or willful violations of operating practices counseled, retrained, or disciplined as appropriate?
   - Are personnel recognized for notable safety improvement actions or ideas?
   - Do supervisory performance appraisals and promotions take operational and safety performance into consideration?

5. The operator has established and implemented the management training, qualification, succession, and, when appropriate, certification.
   - Is formal supervisory and management training provided for first-line and shift supervisors?

- Are development, qualification, retention, and succession for supervisors managed under a long-range staffing plan?
- Do supervisors achieve certification when required for their duties?

6. The operator has established and implemented the methods for the analysis of hazards and implementation of hazard controls in the work planning and execution process.
   - Is the DOE Integrated Safety Management System used to plan work?
   - Are operations personnel trained in, and understand, integrating safety into work planning?

7. The operator has established and implemented the methods for approving, posting, maintaining, and controlling access to electronic operations documents (procedures, drawings, schedules, maintenance actions, etc.) if electronic documents are used.
   - Does management approve electronic document accessibility on both internal and public computer systems, considering security and privacy concerns?
   - Do procedures define the methods and positions responsible for approving, revising, and posting electronic documents?

OBJECTIVE 2.b. - Shift Routines and Operating Practices

The operator has established and implemented operations practices to ensure that shift operators are alert, informed of conditions, and operate equipment properly.

CRITERIA

1. The operator has established and implemented the prompt notification to operating personnel and supervisors of changes in the facility status, abnormalities, or difficulties encountered in performing assigned tasks.
   - Do supervisors and operators keep each other informed of facility status changes, abnormalities, or difficulties?
   - Do operators keep supervisors informed of unexpected situations?
   - Do operators keep control rooms and central monitoring rooms informed of status changes, abnormalities, or difficulties?

2. The operator has established and implemented the adherence by operating personnel and other workers to established safety requirements.
   - Do operators comply with safety programs, e.g. industrial, chemical, explosive, pressure, temperature, confined space, or others applicable to the facility?
   - Do operators use proper personal protective equipment (PPE)?
   - Do operators use ladders or other approved means for overhead access in the absence of permanent ladders or catwalks?
   - Do operators refrain from climbing or walking on components?
   - Do operators use appropriate electrical safety procedures?

3. The operator has established and implemented the awareness by operating personnel of the status of equipment through inspection, conducting checks, and tours of equipment and work areas.
   - Do operators regularly tour their assigned areas on a frequency determined by management, normally early in each shift? Are tours thorough enough to provide detailed equipment status?
   - Do routine security concerns not override tour responsibilities?
   - Do operators inspect equipment status and condition during tours for proper operation, operability of standby equipment, and any work planned or in progress?

- Do operators recognize, document, and report abnormal conditions and take action to correct the conditions? Examples include leaks, out of specification readings, abnormal trends, fire or safety hazards, clogged drains, cleanliness issues, or building deficiencies.
- Do operators periodically check alarm and annunciator functionality?

4. The operator has established and implemented the procedures for completing round sheets or inspection logs, responding to abnormal conditions, and periodic supervisory reviews of round sheets or inspection logs.
   - Does management approve round sheets, including frequency and time of instrument readings and allowable delay (normally one hour or less)?
   - Do round sheets cover the operator's area and equipment parameters; and do data entry blocks follow the tour route?
   - Do round sheets provide normal and max/min expected equipment instrumentation readings where appropriate?
   - Do round sheets provide safety limits where appropriate?
   - Are data readings outside the normal or max/min range circled or otherwise highlighted and reported to the supervisor? Do operators, and supervisors when appropriate, take corrective action to restore proper function?
   - Do operators make narrative records of important events, abnormal conditions and corrective actions, on round sheets or logbooks?
   - Are data entries on round sheets made at the specified time? If readings are delayed beyond the allowable range, are the actual time and explanation for the delay recorded?
   - Do supervisors review round sheets for trends, abnormalities, and proper data and narrative entries during each shift?
   - Do supervisors periodically monitor operator rounds for proper execution and for any changes needed for changed facility conditions?

5. The operator has established and implemented the procedures for protecting operators from personnel hazards, e.g. chemical, radiological, laser, noise, electromagnetic, toxic or nano-scale materials.
   - Are operators appropriately qualified for expected hazards and do they know protection practices to maintain personnel exposure as low as reasonably achievable and within facility controls for radiation, chemicals, electromagnetic fields, toxic materials, and other personnel hazards?
   - Do operators comply with all posted personnel protection requirements and precautions?
   - Do operators properly use appropriate monitoring instruments when required?
   - Do operators remain aware of their radiological, toxic, or other exposures and take action to minimize them?
   - Do operators properly use appropriate administrative controls such as work permits, radiological work permits, and confined space permits?
   - Do operators promptly report and take corrective action for radiological or hazardous material protection deficiencies?
   - Do operators and supervisors notify protection personnel prior to activities that affect the protection status? (Industrial Hygiene, Radiological, etc.)
   - Do supervisors periodically review exposure trends of operators to detect and correct adverse factors that contribute to personnel exposures?

6. The operator has established and implemented the prompt response to instrument indications, including the use of multiple indications to obtain parameters.
   - Do operators believe their indications unless proven otherwise?
   - Do operators check other indicators when possible to confirm unexpected readings?

- Do operators take prompt action to investigate and correct abnormal conditions and trends?
- Do operators identify inaccurate or malfunctioning instruments and inform appropriate supervisors and repair organizations?

7. The operator has established and implemented the procedures for resetting protective devices.
   - Do operators attempt to determine the cause of protective device trips (Breakers, fuses, relief valves, safety systems, etc.)?
   - Do supervisors and management provide guidance on addressing protective device trips? Normally, are devices reset only after assuring that no abnormal condition exists that would cause a trip?
   - Does management investigate protective system trips and unplanned shutdowns?

8. The operator has established and implemented the authorization to operate facility equipment.
   - Do designated supervisors direct the overall operation of the facility, including load changes?
   - Do personnel operating equipment have appropriate qualification and certification?
   - Are operators and supervisors aware of all activities affecting equipment?
   - Does management designate routine operations that do not require permission for performance?
   - Do supervisors approve non-routine operation of facility or process controls?
   - During emergencies, do operators take immediate actions for worker, public, and environmental protection without permission? In such cases, do operators inform supervisors promptly?
   - Do operators achieve plant safety over production for normal, emergency and abnormal operations?

9. The operator has established and implemented the designating shift operating bases and the shift operating base are provided the necessary equipment and supplies.
   - Are shift operating bases, the normal location for operator(s) when not otherwise performing evolutions, established for all feasible shift positions?
   - Are shift operating bases equipped with communications, references, and office materials and equipment needed for facility operations, and are they conveniently located within the operating area?
   - Do shift turnovers normally occur at the operating base and do operators return there when not performing operations at equipment locations or touring?

10. The operator has established and implemented the professional and disciplined operator performance of duties.
    - Are potential distractions such as electronic devices (radio, TV, music players, games), personal telephone calls, game playing, and horseplay prohibited?
    - Are non-work-related written materials prohibited? Operators may read training bulletins, technical manuals, or operating experience information or review other written, audible, or visual materials that relate to operator duties.
    - Do supervisors ensure operators' primary duties are not compromised and do they provide guidance on potentially distracting materials and devices?

OBJECTIVE 2.c. - Control Area Activities

The operator has established and implemented operations practices that promote orderly, business-like control area operations.

CRITERIA

1. The operator has established and implemented control area access.
   - Are control areas and at the controls areas clearly identified and are boundaries understood?
   - Is control area access limited to persons on official business only? Is access to the at the controls area further limited to persons who need to be in the area?
   - Is entry to control and at-the-controls areas granted by designated persons whose identity and/or position is known to persons desiring entry?

2. The operator has established and implemented the formality and discipline in the control and at-the-controls area.
   - Do all persons in the area display professional and disciplined behavior? Are only activities essential to operations and authorized by management permitted in the area?
   - Are potential distractions such as electronic devices (radio, TV, music players, games), personal telephone calls, game playing, and horseplay prohibited?
   - Are non-work-related discussions minimized?

3. The operator has established and implemented the surveillance of control panels and timely response to determine and correct the cause of abnormalities/out-of-specification conditions.
   - Are operators alert and attentive to control panel indicators and alarms and do they monitor panels frequently?
   - Do operators closely monitor indications and conditions and trend them to detect problems early?
   - Are concurrent operations that affect control panel indications limited so that operators' ability to detect and respond to abnormal conditions is not compromised?
   - Are operators ready to take backup control of automated or computer systems?

4. The operator has established and implemented the limitation of the number of concurrent evolutions and duties.
   - Are operator ancillary duties limited to prevent interference with monitoring control panel indicators and alarms?
   - Is it true that tasks such as tagouts, work authorizations, procedure review, maintenance, or required reading do not constitute a major portion of operators' shift responsibilities?
   - Is control panel operator administrative workload minimized? Do other operators continue monitoring when one operator has necessary administrative work?

5. The operator has established and implemented the authorization to operate control area equipment.
   - Is operation of control area equipment performed only by persons specifically authorized in writing?
   - Do trainees operating control area equipment do so only under the direct supervision of the normally assigned operator?

OBJECTIVE 2.d. - Communications

The operator has established and implemented operations practices that ensure accurate, unambiguous communications among operations personnel.

CRITERIA

1. The operator has established and implemented the provision of communications systems for emergency and normal operations.
   - Are all facility personnel promptly alerted to facility emergencies?
   - Are communications systems in place to support normal operations?
   - Are alternate methods provided for areas where public address or emergency signals cannot be heard?
   - Are communications systems periodically tested?
   - Can control areas override other communications system users for emergencies?

2. The operator has established and implemented the administrative control of communications equipment, including authorization to use the public address system and allowable locations and purposes for radio use.
   - Is public address system use controlled to maintain its effectiveness and prevent it becoming commonplace?
   - Are point-to-point communications the preferred method wherever practical?
   - Is radio usage controlled to prevent electronic interference with facility equipment? Are radio-prohibited areas defined and marked?
   - Are radio frequency or channel assignments controlled and readily available to users?
   - Where appropriate, are dedicated radio or pager channels assigned to specific functions such as emergency communications or security?

3. The operator has established and implemented the methods for control areas to contact operators and supervisors.
   - Do policies define how to notify operators or supervisors to contact the control area?
   - Are emergency and normal notification methods distinctive?

4. The operator has established and implemented the use of abbreviations and acronyms.
   - Are acronyms and abbreviations developed and promulgated for oral and written communications?
   - Are only approved abbreviations and acronyms allowed/required to be used?

5 The operator has established and implemented the use of oral instructions and communications, including use of repeat-backs and sender/receiver identifications.
   - Do policies require clear and concise oral communications?
   - Do policies define when repeat-backs are appropriate and how they are implemented?
   - Do policies define protocols for transmitting information and identifying senders and receivers?

OBJECTIVE 2.e. - On-Shift Training

The operator has established and implemented operations practices that control on-shift training of facility operators, prevent inadvertent or incorrect trainee manipulation of equipment.

CRITERIA

1. The operator has established and implemented the on-shift training program.
   - Has the Operations Manager approved the operator qualification program and coordinated changes with the Training Department?
   - Do candidates receive one-on-one instruction on station for positions requiring operator certification?
   - Is on-shift training conducted by persons both qualified to operate equipment and authorized to train others?

2. The operator has established and implemented the authorization and documentation of training activities.
   - Are training activities during operations specifically identified in the training program, including knowledge requirements and trainee actions such as perform, simulate, etc.?
   - Is qualification program completion formally documented, with on-shift and classroom training activities documented as they occur?

3. The operator has established and implemented the supervision and control of personnel under instruction by qualified personnel.
   - Do qualified operator-instructors supervise trainees to prevent misoperation of equipment?
   - Do early-stage trainees discuss operations, procedures, and actions before performing actual operations?
   - Do more proficient trainees point and describe actions before taking them?
   - Do operator-instructors always monitor trainees and remain capable of intervention?
   - Do operator-instructors verify trainee entries on official round sheets and logs, and discuss any out of specification readings or unfavorable trends?

4. The operator has established and implemented the facility conditions and controls for conducting training during operational activities, including suspension of training during unanticipated or abnormal events.
   - Are training activities conducted only when facility conditions permit, and as authorized by facility management?
   - Are training activities and trainee operation of equipment suspended immediately during emergency or unanticipated abnormal conditions, or when deemed appropriate for safety or operational conditions?
   - Has management established the maximum number of trainees allowed during operations and the maximum number of trainees per operator-instructor?

OBJECTIVE 2.f. - Investigation of Abnormal Events, Conditions, and Trends

Operators integrate related requirements in DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information, dated 8-19-03, and DOE O 225.1A, Accident Investigations, dated 11-26-97. (DOE Order 422.1)

The operator has established and implemented operations practices for investigating events to determine their impact and prevent recurrence.

CRITERIA

1. The operator has established and implemented the specific events requiring investigation, and criteria for identifying other events or conditions to be investigated.
   - Are violations of a safety documentation design limit investigated?
   - Is abnormal or unexpected system performance that adversely affects operations or safety (e.g. improper instrument readings, automatic control failure, chemical analysis, etc.) investigated?
   - Are abnormal or unexpected safety conditions (e.g. stray voltage, safety feature or interlock malfunction, etc.) investigated?
   - Is discovery of mispositioned valves, switches, or components investigated?
   - Are events reportable to DOE or other agencies (e.g. EPA, DOT, State regulators, etc.) investigated?
   - Are unplanned shutdowns or significant losses of operation investigated?
   - Are procedural violations or personnel errors with actual or potential personnel injury, facility damage, or facility safety degradation investigated?
   - Are equipment failures that could affect safety or mission investigated?
   - Are radiological or toxic material release limits being exceeded or material being lost investigated?
   - Are recorded data being out-of-specification or showing unexpected trends, with actual or potential adverse impact on operations or safety, investigated?
   - Is actual or suspected sabotage investigated?
   - Is loss of special nuclear material investigated?
   - Are repetitive problems investigated?
   - Is measuring and test equipment being found to be out of calibration, with actual or potential impact on operations or safety, investigated?
   - Are investigations directed by appropriate authority, particularly for near-miss situations, performed?

2. The operator has established and implemented the designation of investigators and their training and qualification.
   - Is a senior manager responsible for investigations? When they delegate investigations or portions of investigations to others, do they retain overall responsibility for rigor and consistency of investigations?
   - Are investigators experienced and technically qualified?
   - Are investigators unbiased and have no vested interest in the results of the investigation?
   - Are investigators trained in facility systems, operations, and investigation techniques?

3. The operator has established and implemented the investigation process and techniques.
   - Does timely data collection by a designated person include: initial conditions, operator statements, pertinent computer/instrument printouts or charts, pertinent documentation and records, and other appropriate information?
   - Are records and data annotated to prevent misinterpretation?
   - Is investigation data permanently recorded for future reference?
   - Does data collection not interfere with facility operation unless vital to understanding the event?
   - Are the facts of the event reconstructed chronologically from the data?
   - Is the event analyzed to determine equipment and personnel response, procedure and equipment adequacy, human performance factors, and safety impact?
   - Does management determine the appropriate restart process (if applicable)?
4. The operator has established and implemented the causal analysis and corrective action determination.
   - Are the causes determined?
   - Are appropriate corrective actions to prevent recurrence of the event determined?
   - Are corrective actions approved by the responsible manager and tracked to completion?

5. The operator has established and implemented the event investigation, reporting, training, and trending.
   - Are investigation reports timely?
   - Do investigation reports contain a description of the event, its impact, root cause, lessons learned, and corrective actions?
   - Do investigation reports note any positive aspects of the event?
   - Are investigation reports approved by the responsible manager and reviewed by appropriate managers and safety personnel?
   - Are investigation report lessons shared with appropriate operators, support staff, other facility organizations, and other facilities?
   - Are events evaluated for inclusion in training programs?
   - Do processes include a method to train operators on serious events upon their return to work?
   - Are procedure problems, operator errors, and other appropriate events part of the facility trend analysis program? Are periodic summaries of event analysis and trends are provided to managers? Do training programs include appropriate material from event reports and trend analysis?

6. The operator has established and implemented the response to known or suspected sabotage.
   - Is known or suspected sabotage immediately investigated?
   - Is the condition of potentially affected systems determined, and is safety system operability confirmed?
   - Does management determine whether continued operation is justified and do they determine if safe shutdown is appropriate?
   - Does management take action to minimize the impact of sabotage and deter future acts?

OBJECTIVE 2.g. - Notifications

Operators should integrate related requirements found in DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information, dated 8-19-03; DOE O 151.1C, Comprehensive Emergency Management System, dated 11-2-05; DOE M 205.1-8, Cyber Security Incident Management Manual, dated 1-8-09 and DOE M 470.4-1, Safeguards and Security Program Planning, dated 8-26-05, Section N Table 1, and applicable regulatory notification requirements. (DOE Order 422.1)

The operator has established and implemented operations practices to ensure appropriate event notification for timely response.

CRITERIA

1. The operator has established and implemented the procedures for internal, DOE, and external notifications, including events, persons to be notified, persons responsible to make notifications, contact information, and recordkeeping.
   - Are responsibilities for making notifications specifically assigned to positions or persons?
   - Are events requiring notification identified and documented?
   - Are notification timeliness standards established?
   - Are primary and alternate personnel to be notified for each event identified and documented?
   - Is contact information for the personnel to be notified kept current and available to notifying personnel?
   - Are all notifications documented in formal records that include date, time, reason, person notified, and person making notification?

2. The operator has established and implemented the communications equipment for notifications.
   - Is adequate equipment for making notifications available at the main control area and/or other appropriate location?

OBJECTIVE 2.h. - Control of Equipment and System Status

The operator has established and implemented operations practices for initial equipment lineups and subsequent changes to ensure facilities operate with known, proper configuration as designed.

CRITERIA

1. The operator has established and implemented the authorization for, and awareness of, equipment and system status changes.
   - Is the operations supervisor responsible for maintaining proper configuration and authorizing status changes for major equipment?
   - May the operations supervisor delegate status change authorizations for support or less-important systems and equipment?
   - Are status changes communicated to affected operators and organizations?
   - Are status changes resulting from operations or work reported to cognizant supervisors?

2. The operator has established and implemented the initial system alignment, maintaining control of equipment and system status through startup, operation, and shutdown, and documentation of status.
   - Are components and systems aligned prior to first operation?

- Are checklists used to guide initial alignments and rechecks, and do they include equipment identification matching installed labels, required component position, data entry space for actual position and any deviations, and documentation of alignment or recheck?
- Do supervisors review and approve completed alignment checklists?
- Does management determine the need for alignments and rechecks? Examples of situations that may need alignments or rechecks are startup from complete shutdown, outage recovery, or mode changes.
- Does restoration of safety-related systems following maintenance includes functional testing of their capability?
- Are records of equipment and system alignments retained for operators' reference?
- Are deviations from the reference alignment, including lockouts and tagouts, tracked and controlled by a status board or other effective system?

3. The operator has established and implemented the use and approval of lockouts and tagouts for administrative control of equipment.
   - Do supervisors approve lockouts and tagouts in their facility and remain aware of status changes that result?
   - Are personnel trained in their responsibilities concerning changing system or equipment status and operation of locked or tagged components?

4. The operator has established and implemented the Operational Limits compliance and documentation.
   - Are compliance with operational limits, including safety basis Limiting Conditions for Operations, established through administrative controls?
   - Are compliance and actions taken to restore operating within limits documented in facility records?
   - Are supervisors aware of, and direct completion of, actions to comply with operational limits?
   - Are operational limit entry conditions and actions documented in appropriate operating records?
   - Are operating personnel kept informed of any limiting conditions and their required actions?
   - Do operating personnel periodically review Limiting Conditions for Operation and Action Statements in effect for proper implementation?
5. The operator has established and implemented the management of equipment deficiencies, maintenance activities, post-maintenance testing, and return to service.
   - Do operators note equipment deficiencies, document them in work control systems for correction, and identify them to other operators by tags, logs, status boards, or other effective method?
   - Do designated managers authorize in writing the work control documents for all activities, including maintenance on equipment important to safety, on equipment that affects operations, or that changes control indications or alarms?
   - Is the status of work in progress documented and available for review by operators?
   - Do work control documents specify retest requirements to ensure, prior to restoration to service, proper functioning, effectiveness of the maintenance, and that no new problems were introduced?
   - Do supervisors assure themselves of proper equipment operation before authorizing its return to service after maintenance, testing, or emergency/abnormal event?

6. The operator has established and implemented the awareness and documentation of control panel and local alarm issues.
   - Are operators and supervisors aware of inoperable alarms, alarms with temporary set points, multiple-input alarms that do not provide indication of a subsequent condition, or other limitations?

- Are deficient alarms documented for information to all affected personnel and entered into work control systems for correction?
- Do operators take appropriate actions to monitor conditions when alarms are unreliable?
- Are operators and supervisors aware of alarms expected during normal operations?

7. The operator has established and implemented the control of temporary equipment modifications and temporary systems.
   - Do administrative systems control temporary modifications? Examples include electrical jumpers or lifted leads, pulled circuit cards, disabled alarms, piping jumpers or blocks, disabled relief valves, strainers or filters temporarily installed or removed, temporary shielding, blocked drains, and others.
   - Do administrative systems control temporary systems?
   - Do administrative controls include appropriate engineering review and approval of the design and safety of the modification before installation?
   - Do administrative controls include written authorization for installation?
   - Do administrative controls include independent verification of installation and removal?
   - Do administrative controls include documentation of the modifications?
   - Do administrative controls include completion of any training, procedure changes, or labeling required?
   - Do administrative controls include periodic audits of installed temporary modifications?

8. The operator has established and implemented the configuration control and distribution of engineering documents.
   - Do administrative systems provide for configuration control of engineering documents per applicable DOE directives?
   - Do processes provide for designating safety structures, systems, and components and their quality assurance requirements to support system engineer and maintenance needs?
   - Do processes control safety software per applicable DOE directives?
   - Do operations personnel and all other affected organizations have access to current, approved engineering documents?

OBJECTIVE 2.i.1 - Lockout and Tagouts

The operator has established and implemented operations practices for the installation and removal of lockout/tagouts for the protection of personnel.

CRITERIA

1. The operator has established and implemented the procedures, roles and responsibilities associated with the development, documentation, review, installation, and removal of a lockout/tagout.
   - Do procedures and/or Lockout/Tagout Program implement OSHA Rules and are they designed to control hazardous energy and materials during servicing or maintenance or whenever unexpected operation or energization could cause injury?
   - Do procedures include provisions that only authorized, qualified personnel perform lockout/tagouts?
   - Are personnel trained on their responsibilities regarding tags and locks?
   - Do procedures include provisions for documenting lockout/tagouts, including:
     - an indexing/numbering system,
     - identification of the reason for the lockout/tagout,
     - applicable work packages or other documents,

- equipment covered,
- all components and their position,
- authorization for installing the lockout/tagout,
- placement and verification of locks/tags,
- authorization for removing the entire lockout/tagout or individual locks/tags,
- documenting the removal of locks/tags,
- designating the component position after clearing locks/tags, and
- documenting the repositioning of components after clearing locks/tags?

- Do procedures designate the manager responsible for lockout/tagout records?
- Do procedures include provisions for periodic management reviews of lockout/tagout records?
- Do procedures include provisions for checking component positions of equipment outside the lockout/tagout necessary to support restoring locked/tagged equipment to service?
- Do procedures include periodic audits of active lockout/tagouts to ensure locks and tags are properly attached, components are in the correct position, all required signatures have been obtained, and other lockout/tagout requirements have been met?
- Do procedures include techniques for verifying the position of locked components, with preference for the use of a hands-on check or position indicator?
- Do procedures include provisions for authorizing and documenting the repositioning of locked components for a lockout/tagout?
- Do procedures include provisions for returning removed tags to the authorizing manager and documenting the manager's final check that all locks and tags are removed?
- Do procedures include provisions that permit, but discourage, temporary clearance of locks/tags per OSHA Rules?

2. The operator has established and implemented compliance with Occupational Safety and Health Administration Rules, 29 CFR Part 1910 and/or 29 CFR Part 1926, requirements for the protection of workers using lockout/tagout.
   - Does the lockout/tagout program address compliance with OSHA Rules, 29 CFR 1910 and/or 29 CFR 1926?

3. The operator has established and implemented compliance with National Fire Protection Association Standard 70E electrical safety requirements using lockout/tagout.
   - Does the lockout/tagout program address compliance with NFPA 70E?

4. The operator has established and implemented the description and control of the tags, locks, lockboxes, chains, and other components utilized for the lockout/tagout program.
   - Do procedures contain provisions that when key operated locks are used, access to the keys is restricted to authorized personnel?
   - Do procedures contain provisions that when key operated locks are used, keys are readily available to appropriate personnel?

5. The operator has established and implemented the training and qualification in lockout/tagout and special considerations for DOE facilities, e.g. operational limitations, or seismic issues from the mass of locks or chains.
   - Do training programs comply with applicable OSHA Rules and support qualification of personnel to perform lockout/tagouts?
   - Does training include material on how lockouts can hinder facility operations, particularly when local component operations are necessary while remote controls are locked out?
   - Does training include material on how the mass of locks or chains may impair seismic design features of components?

OBJECTIVE 2.i.2 – Caution Tags

The operator has established and implemented operations practices for the installation and removal of caution tags for equipment protection or operational contro.

CRITERIA

1. The operator has established and implemented the roles and responsibilities associated with the development, documentation, review, installation, and removal of caution tags to convey operational information or equipment alignments for protection of equipment.
   - Are personnel formally designated to prepare, approve, and install tags?
   - Are personnel trained on their responsibilities regarding tags?
   - Do procedures include provisions for documenting caution tags, including:
     - an indexing/numbering system,
     - effective date and time,
     - the precaution or information applicable to the situation or equipment,
     - location of tags by component name,
     - number or other identification,
     - authorization for installing the tags,
     - documentation of placement and verification of the tags,
     - authorization for removing tags, and
     - documentation of removal?
   - Do procedures designate the manager responsible for caution tag approval and location of records for review by appropriate personnel?
   - Do procedures contain provisions for management determination that instructions on caution tags comply with facility procedures, technical safety requirements, or other specifications?
   - Are situations requiring caution tags brought to the attention of responsible managers, who approve them if necessary?
   - Do procedures contain provisions for a documented periodic review of all active caution tags to determine their continued need, that the records are correct, and that appropriate action is taken to remedy conditions requiring tags for long periods (over three months)?

2. The operator has established and implemented the description and control of the tags.
   - Do procedures contain provisions for caution tags to be uniquely identifiable and easily distinguished from other tags?
   - Do procedures contain provisions for caution tag placement so as to not obscure indications or controls, while remaining readily apparent to operators?

3. The operator has established and implemented measures to prevent relying on caution tags for personnel protection.
   - Do procedures contain provisions restricting the use of caution tags to situations where a component or system is functional, but some precaution or item(s) of information is necessary prior to operation?
   - Do procedures contain provisions for management determination that caution tags are appropriate and that they are not used instead of more appropriate administrative controls or a lockout/tagout?

OBJECTIVE 2.j. Independent Verification

The operator has established and implemented operations practices to verify that critical equipment configuration is in accordance with controlling documents.

CRITERIA

1. The operator has established and implemented the structures, systems, components, operations, and programs requiring independent verification.
   - Do procedures or other authoritative documents explicitly identify components whose positions must be independently verified?
   - Does management use accepted safety analysis methods (for example, fault tree or probability risk analysis) and/or expert opinion to develop the list of equipment/components requiring independent verification?
   - Does facility management considers all safety-related system components for independent verification?
   - Do procedures allow exemption from independent verification for components whose mispositioning does not affect system performance, whose mispositioning is immediately known to operators, or where significant radiation exposure would be required for verification? Are alternate means of determining position considered, and are any such exemptions approved by senior operations management?
   - Does management consider independent verification for components whose mispositioning could challenge safety-related equipment, cause shutdowns or other undesirable results, or lead to unintended toxic or radioactive material release?
   - Does management specify safety management programs and other functions such as training and procedure development that will be independently appraised to verify their continued conformance with regulations and directives?

2. The operator has established and implemented the situations requiring independent verification.
   - Do procedures require independent verification when equipment must be available and it is reasonably possible that components were mispositioned?
   - Do procedures require independent verification of lineups to take equipment out of service or return it to service, e.g. isolation boundaries, equipment under maintenance or repair, instrumentation lineups for testing and their restoration, work on backup components and their restoration, etc.?
   - Do procedures include appropriate independent verification for system lineups?
   - Do procedures include appropriate routine periodic verification of critical components during operation, which would not normally need a second check?
   - Do procedures include provisions for dealing with mispositioned components found during routine periodic checks or lineups, including appropriate management approval for repositioning and subsequent independent verification?

3. The operator has established and implemented the methods for performing and documenting independent verification.
   - Does management develop and approve verification techniques appropriate to facility-specific equipment, using manufacturer's recommendations and expert operators?
   - Are operators trained in techniques appropriate to the facility's equipment?
   - Do procedures provide reference documentation explaining how to perform verification of the facility's components, e.g. manual, solenoid-, motor- and air-operated valves, circuit breakers,

blank flanges, removable links and fuses, control power availability, and any other specific component position or condition required?

- Do procedures specify how to achieve independence, including having each check include identification of the component and determining both its required and actual position, and minimizing interactions between operators positioning components and those verifying position, except in special situations for throttled valves or to reduce radiation or toxic exposure (concurrent dual verification)?
- Do procedures favor direct local position checks over remote indications, absent exposure considerations or other overriding factors?
- Do procedures favor direct local position checks over process indications such as flow, pressure, or voltage, absent exposure considerations or other overriding factors? Is the use of any such indirect methods specifically authorized in procedures?
- Do procedures specify how to check throttled valves? Are local mechanical position indicators, scribe marks, or other authorized methods preferred over shutting and then opening a prescribed number of turns? If shutting/opening is necessary, do facility procedures consider concurrent dual verification?
- Do procedures favor direct local position checks over surveillance testing to show component positions? If surveillance tests are used, do they conclusively prove component position and are they specifically approved by operations management?
- Do procedures specify that components danger tagged per the lockout/tagout program will not be manipulated for independent verification?
- Do procedures specify that verifiers not change component position or status to correct an inconsistency?
- Do procedures specify how to document independent verification, including component identification; normal or expected position, desired position, final position, identification and signature or initials of positioners and verifiers for each item, and supervisory review?

4. The operator has established and implemented situations, if any, allowing concurrent dual verification.
   - Do procedures specify situations where concurrent dual verification is used? Examples are throttled valves that must be repositioned to determine position, or sequential operations such as a bolt torqueing pattern.
5. The operator has established and implemented the methods for performing concurrent dual verification, if used.
   - Do procedures specify how concurrent dual verification is done, if at all?
   - Do procedures for concurrent dual verification (if used) include provisions for maintaining independence to the maximum extent possible, and do facility policies include provisions preventing the use of concurrent dual verification unless specifically authorized?

OBJECTIVE 2.k. - Logkeeping

The operator has established and implemented operations practices to ensure thorough, accurate, and timely recording of equipment information for performance analysis and trend detection.

CRITERIA

1. The operator has established and implemented narrative logs at all key positions, as defined by management, for the recording of pertinent information.
   - Do procedures include provisions for narrative logs maintained by the operations supervisor or control area operator (or equivalent) at a minimum?

- Do procedures include provisions for narrative logs at stations staffed part-time to provide continuity and information pass-down?
- Do procedures include provisions for narrative sections on round sheets when a separate narrative log is not maintained?

2 The operator has established and implemented the prompt and accurate recording of information.
- Is prompt and accurate recording of information required and recorded?

3. The operator has established and implemented the type, scope, and format for log entries.
- Does management provide written direction on information to be recorded in each log, including the following elements to be recorded in at least one log, but not necessarily all in the same log:
  - Facility mode changes
  - Criticalities and criticality information (for reactors or critical experiments)
  - Abnormal facility configurations
  - Status changes of safety-related or other major equipment
  - Occurrence of reportable events
  - Starting and completing surveillance tests
  - Entering and exiting Limiting Conditions for Operations
  - Security incidents
  - Out-of-specification chemistry or process analysis results or measurements
  - Shift reliefs
  - Significant information concerning emergencies, abnormal, or unexpected events, but not to interfere with taking appropriate response actions?
- Does management provide written direction on the format for log entries, including legible, permanent, smear-proof, and entries capable of machine copying?
- Does management provide written direction on electronic log entries, if used?

4. The operator has established and implemented methods for recording late entries and correcting erroneous entries without obscuring the original entry.
- Does management provide written direction on how to make late entries, including noting the actual time late entries are made and prohibiting rewriting logs to make entries appear timely?
- Does management provide written direction on how to make log corrections? A widely-accepted industry standard is to make a single lineout through the incorrect entry without obscuring it and writing the correct entry in a nearby space, with the date and initials of the person making the correction.

5. The operator has established and implemented periodic supervisory reviews for accuracy, adequacy, and trends.
- Does management provide written direction for periodic supervisory review of logs for accuracy, completeness, timeliness, trends, and conformance with management direction?
- Do log review practices include periodic operations supervisor review of control area logs, and periodic review of operating station logs outside the control area by the control area supervisor or other appropriate manager?

6. The operator has established and implemented document retention requirements.
- Does management provide written direction on keeping logs available for operator review after return from periods of absence?
- Does management provide written direction on log storage and preservation for the expected life of the facility or as directed by DOE and National Archives and Records Administration regulation?
- Does management provide written direction on how to retrieve stored logs?

OBJECTIVE 2.I. - Turnover and Assumption of Responsibilities

The operator has established and implemented operations practices for thorough, accurate transfer of information and responsibilities at shift or operator relief to ensure continued safe operation.

CRITERIA

1. The operator has established and implemented the definitions for all key positions requiring a formal turnover process.
   - Do procedures contain provisions for using a turnover process for at least the supervisory positions?
   - Do procedures contain provisions for using a turnover process for key positions, including appropriate stations staffed part-time?

2. The operator has established and implemented turnover of equipment/facility status, duties, and responsibilities that results in the safe and effective transfer of equipment status and in-progress or planned activities from one shift or workgroup to the next.
   - Do turnover procedures contain provisions for documenting a review of checklists or other documents that record key information appropriate for the position, either operational or supervisory, such as:
     - Facility operating mode and status
     - Key process parameters
     - Key tank or vessel levels
     - Status of safety equipment
     - Operational limits in effect
     - Limiting Conditions for Operations in effect, either normal or abnormal
     - Any procedures, either standard or temporary, in progress
     - Changes in radiological or hazardous material conditions
     - Waste management status
     - Required samples or analyses
     - Upcoming or in-progress maintenance, testing, or evolutions?
   - Do turnover procedures contain provisions for operators and supervisors to complete document reviews before assuming responsibility for their position, reviewing in enough detail to understand status, important history, and plans?. Such reviews normally extend back the shorter of 24 hours or their last shift.
   - Do turnover procedures contain provisions for operators and supervisors to walk down appropriate control panels and computer displays to determine facility status, alarms, lineups, and equipment configuration? For control areas, do the oncoming and offgoing personnel jointly walkdown the control panels and displays? Do supervisors and operators walkdown panels early in the shift and preferably before turnover?
   - Do turnover procedures contain provisions for offgoing and oncoming operators and supervisors to discuss, during stable facility conditions whenever possible, turnover documentation and clarify any questions?
   - Do turnover procedures contain provisions that when all turnover items are complete and the oncoming person understands the status, they formally state that they assume responsibility and make a narrative log entry to that effect?
   - Do turnover procedures contain provisions for operations supervisors to conduct briefings as needed for their oncoming shift operators and appropriate support personnel (vendors, maintenance, crafts) to review status, problems, upcoming work, or other appropriate topics?

3. The operator has established and implemented the process for reliefs during a shift.
   - Do turnover procedures contain provisions for conducting operator and supervisor reliefs during shifts? These turnovers may include a less exhaustive process than the regular shift change as long as the oncoming person is at least as knowledgeable as they would be from a regular turnover.

OBJECTIVE 2.m. - Control of Interrelated Processes

The operator has established and implemented operations practices to ensure that interrelated processes do not adversely affect facility safety or operations.

CRITERIA

1. The operator has established and implemented the defined responsibilities with respect to the control of interrelated processes.
   - Are all the interrelated processes identified? (Processes or activities that can affect operations, but are under the control of persons other than the affected operators, such as shared support systems or special testing.)
   - Does a memorandum of understanding or other formal agreement exist which defines roles and responsibilities for all parties for each of the interrelated processes identified?

2. The operator has established and implemented operator training and qualification to understand interrelated processes, to interpret instrument readings, and provide timely corrective action for process-related problems.
   - Is formal training on interrelated processes documented?
   - Do procedures provide for timely corrective action of process-related problems?
   - Is training of the operators of the interrelated process required in a memorandum of understanding or other similar formal agreement of roles and responsibilities?
3. The operator has established and implemented establishing lines of communication between operating personnel, process support personnel, and other interrelated process operators for coordination of activities.
   - Are the methods of communication specified in a formal agreement of roles and responsibilities?
   - Are the points of contact for each organization specified in a formal agreement of roles and responsibilities?
   - Are the events requiring communication specified for each party in a formal agreement of roles and responsibilities?

OBJECTIVE 2.n. - Required Reading

The operator has established and implemented operations practices for an effective required reading program to keep operators updated on equipment or document changes, lessons learned, or other important information.

CRITERIA

1. The operator has established and implemented in the identification of material to be distributed via required reading.
   - Do directives contain provisions for a required reading program, including, as appropriate, procedure changes, equipment design changes, operating experience information, and other facility-specific items?

- Do directives for the required reading program include provisions for listing designated items, screening them for appropriate content, and procuring copies of the documents?

2. The operator has established and implemented in the identification of which personnel are required to read specific required reading items.
   - Do directives for the required reading program include provisions for designating specific items for specific operators or groups of operators?
   - Do directives for required reading program include provisions for ready access to required reading materials?

3. The operator has established and implemented the distribution of required reading to appropriate personnel and documentation of their timely completion.
   - Do directives for the required reading program include provisions for assigning due dates for items, including, where appropriate, completion before operators go on shift again?
   - Do directives for the required reading program include provisions for documenting and tracking completion of designated specific items for specific operators or groups of operators?
   - Do directives for required reading program include provisions for retaining documentation of completion and for periodic management review for timely assignment completion?
   - Do directives for the required reading program include provisions for removing completed items from distribution?

OBJECTIVE 2.o. - Timely Instructions/Orders

The operator has established and implemented operations practices for timely written direction and guidance from management to operators.

CRITERIA

1. The operator has established and implemented the appropriate circumstances for the use of timely instructions/orders.
   - Do directives for timely instructions/orders specify appropriate information items such as special operations, administrative directions, special data collection campaigns, or notification of expected visitors?
   - Do directives for timely instructions/orders specify appropriate orders such as direction to perform special evolutions or tests, limitations on performing certain operations, direction to perform maintenance actions, or other direction?
   - Do directives for timely instructions/orders include provisions to prevent the use of timely instructions/orders as a substitute for administrative or operational procedure revisions?

2. The operator has established and implemented the designated levels of review and approval prior to issuance.
   - Do directives for timely instructions/orders include designation of review and approval authorities?

3. The operator has established and implemented the configuration control of timely instructions/orders.
   - Do directives for timely instructions/orders include segregation of timely instructions/orders into daily and long term categories?
   - Do directives for timely instructions/orders include provisions for removing or canceling superseded or outdated items?

- Do directives for timely instructions/orders include provisions for periodic management reviews that only appropriate and current items are distributed, and that appropriate personnel review them within time limits?

4. The operator has established and implemented the distribution of timely instructions/orders to appropriate personnel and documentation of their receipt and understanding.
   - Do directives for timely instructions/orders include provisions for distribution of timely instructions/orders to appropriate operators?
   - Do directives for timely instructions/orders include provisions for appropriate operators to review items before or early in shift?
   - Do directives for timely instructions/orders include provisions for documenting operator reviews every shift for daily items, including those that are delayed or remain in force longer than a day, and periodic and as-changed reviews of long term items?

OBJECTIVE 2.p. - Technical Procedures

The operator has established and implemented operations practices for developing and maintaining accurate, understandable written technical procedures that ensure safe and effective facility and equipment operation.

CRITERIA

1. The operator has established and implemented the expectations for the use of procedures to perform operations.
   - Do management policies establish the expectation that operators will use written procedures for operations, will perform them as written, and will stop work and notify management when procedures cannot be executed as written?

2. The operator has established and implemented the process for procedure development.
   - Do directives include a written process for procedure development, including format, clear language standards, and configuration control?
   - Do management policies designate procedures to be developed for all anticipated operations, evolutions, tests, and abnormal or emergency situations?
   - Do management policies direct alarm/annunciator response procedures to be developed for all alarm panels?
   - Do directives designate a senior manager responsibility for procedure development, and include provisions for the capabilities and experience of procedure writers?
   - Do directives include a process for completing and documenting procedure review and approval of both hard-copy and electronic procedures?
   - Do directives specify that procedures will provide administrative and technical direction to effectively conduct the operation, using detail appropriate to the complexity of the task, the experience and training of the operators, the frequency of performance, and the significance of the consequences of error?
   - Do procedure preparation records contain documentation of the reason for key steps so they are not inadvertently deleted or changed in revisions and changes?

3. The operator has established and implemented the procedure content, including consistent format and use of terms (e.g. prerequisites, warnings, cautions, notes, hold points, etc.), detail sufficient for accomplishing the operation, technically accurate procedures capable of performance as written, and procedure conformance with the facility design and manufacturer documentation.

- Is procedure scope and applicability readily apparent?
- Are procedures for multiple equipment trains clearly distinguishable from each other?
- Are emergency procedures clearly distinguishable from normal operating procedures?
- Do procedures incorporate appropriate information from applicable source documents, including design, safety basis, and vendor technical documents?
- Are prerequisites and initial conditions clearly specified?
- Are tools, equipment, and materials specified and do procedures provide measures to document their calibration or condition before use?
- Are hold points requiring independent verification or approval clearly indicated?
- Is procedure language clear, definitions are explained, and detail is appropriate for the operators' skill, experience, and training?
- Are procedure format standards defined?
  - One action per step;
  - Warnings, Notes, and Cautions are clear, do not contain actions, and precede the applicable step; and
  - Warnings, Notes, Cautions, and headings appear on the same page as the applicable step.
- Are procedures technically and administratively accurate?
  - Are instructions and information correct?
  - Are referenced documents correctly identified?
  - Are instructions for transferring between procedures clear?
- Do critical steps include signature/initial/checkoff blocks, with only one action per block?
- Are instrument readings and tolerances specified and conform to instrument scales or readability?
- Do procedures contain explicit parameters and not require mental arithmetic to determine acceptability? Are any calculations clearly explained and do procedures provide space to record them?
- Does the procedure step sequence conform to the normal operational sequence?
- Do procedures reflect human factors considerations such as procedure callouts exactly matching equipment labels, units in procedures match instrument markings, charts and graphs easily read, and important steps or information highlighted?
- Do emergency procedures provide guidance for both single and multiple casualties?
- When procedures use or refer to other procedures or steps, are they are clearly identified with the exact identification to prevent confusion in transferring to or from them?
- Do procedures specify the restoration or shutdown steps for equipment following tests or other operations?

4. The operator has established and implemented the process for procedure changes (pen and ink or page changes) and revisions (complete reissues).
   - Do directives include a documented process for review and approval of revisions and changes? Directives may also use only a revision process or may use an electronic publishing process. In all cases, configuration control must be maintained. Does the selected process maintain configuration control?
   - Are procedure changes intended for more than one-time use documented in a location readily available for operator reference and noted in timely orders/instructions and/or turnover documents?
   - Do directives contain provisions for initiation of changes or revisions if procedure problems are found, including provisions for emergent changes or revisions necessary to proceed with operations when a procedure is faulty?

- Do directives contain provisions for initiating a procedure revision when changes remain in effect for extended periods (e.g. more than 6 months) or when several changes have accumulated (e.g. more than 5)?
- Do directives contain provisions for including all outstanding changes in any procedure's revision?
- Do directives include provisions for implementing revisions for permanent equipment modifications or replacements, and implementing changes for temporary equipment modifications?
- Do directives include provisions to review procedure development records of the reason for key steps to prevent inadvertent deletion or change?
- Do directives include provisions to use walkthroughs (procedure execution with actual or simulated operation of components by subject matter expert(s)) to validate procedure changes and revisions?

5. The operator has established and implemented the process for training personnel on new, revised, or changed procedures.
   - Do directives include provisions for communicating important procedure changes and revisions to operating personnel through required reading or other appropriate method?
   - Do directives include provisions for communication of procedure changes and revisions to the training department to update training courses?
   - Do directives include provisions for communication of procedure changes and revisions to the organizations responsible for personnel qualification to update qualification requirements?

6. The operator has established and implemented the process for approval of new, revised, or changed procedures.
   - Do directives include provisions for operations supervisor or manager approval of new or revised procedures prior to use, with reviews of revisions to at least the depth as the initial version?
   - Do directives include provisions for safety committee or safety manager or equivalent, and, if applicable, emergency manager, review of procedures that affect safety-related equipment or emergency response?
   - Do directives include provisions defining appropriate circumstances for expeditious approval of minor procedure changes and the process, with a minimum of at least one designated senior qualified operator and one senior operations manager approval, followed up by standard review and approval within a short period, up to 2 weeks?
   - Do directives include provisions for using the standard review and approval process for changes that do not meet the facility's criteria for minor changes?

7. The operator has established and implemented the initial-issue and periodic review and testing of procedures.
   - Do directives include provisions for review of new and revised procedures prior to use and periodically for technical accuracy and human factors considerations?
   - Do directives specify the frequency of periodic procedure reviews, considering the complexity of the operation, maturity of operations, and facility life cycle?
   - Do directives include provisions for reviewing procedures after a significant occurrence, either human error or equipment upset?
   - Do procedure reviews include comparison to source documents to verify accuracy?
   - Do procedure reviews include validation walkthroughs?

8. The operator has established and implemented the availability and use of the latest revisions of procedures.
   - Do directives include provisions for maintenance of a controlled copy of all operating procedures at the control area for operator reference, and selected procedure controlled copies at appropriate locations outside the control area?
   - Do directives include provisions for verifying working copies of procedures against controlled copies for use during evolutions, and controlling working copies to prevent using outdated procedures?
   - Do directives include provisions for maintenance of controlled copies of alarm and annunciator response procedures readily accessible to operators for alarm response?
   - Do directives detail how operators obtain current copies of electronic or hard-copy procedures for performing evolutions, and also detail how to determine procedure approval and revision status?

9. The operator has established and implemented the specified and defined procedure use requirements, i.e. reader-worker method, reference use only, use-each-time, and emergency response.
   - Are operators trained in procedure use requirements and does management oversight reinforces the expectations?
   - Do directives and management policy contain provisions for operators to report deficient procedures and initiate changes or revisions to correct them instead of continuing on? During emergency conditions, may operators take necessary action to place the facility in a safe condition, and to protect equipment, personnel, and public safety without first initiating a procedure change?
   - Do directives define applicable procedure use methods and specify when to use them? Options include reader-worker, reference, fill out steps as a checklist, and others.
   - Do directives include provisions for use of procedures for emergency response? Normally, immediate actions are committed to memory and may be executed without reference to the procedure. When conditions permit, operators use the procedure to check completion of the immediate actions and continue with follow-up actions.

OBJECTIVE 2.q. - Operator Aids

The operator has established and implemented operations practices to provide accurate, current, and approved operator aids.

CRITERIA

1. The operator has established and implemented the technical evaluation and management approval of operator aids.
   - Do directives contain a process for developing, approving, and controlling operator aids?
   - Are operators, maintenance staff, and other facility staff trained on the operator aids process?
   - Are operator aids approved by operations management prior to posting. Do approving authorities determine the accuracy and necessity of operator aids?
   - Do directives and management practice not allow operator aids to alter procedures, but instead initiate procedure revisions or changes if necessary?

2. The operator has established and implemented that operator aids serve as conveniences, not operational requirements.
   - Do directives and training provide that operator aids serve as a convenient reminder or quick reference source for information, not a substitute for procedures?

3. The operator has established and implemented the operator aids do not obscure equipment.
   - Do directives call for posting operator aids close to the point of use in a manner that does not obscure indications or controls?
   - Do directives call for operator aids to be sturdy, and securely mounted or stowed, and waterproof where necessary?

4. The operator has established and implemented the administrative control of installed operator aids.
   - Do directives controlling operator aids include provisions for maintaining a master list and copy of all approved operator aids in the control area or other appropriate area? Does the listing include:
     - Unique identification numbers for each operator aid,
     - Listing of source documents for operator aid content, including revision status, and
     - Date of approval, revision, and posting location for operator aids?
   - Do directives controlling operator aids include provisions to update operator aids when their source material is updated?

5. The operator has established and implemented the periodic review for adequacy and correctness.
   - Does the review verify the accuracy, necessity, and condition of posted operator aids?
   - Does the review verify only approved operator aids are posted?
   - Does the review verify agreement between the master list and actual postings; remove or replace operator aids and update the master list as needed?
   - Does the review verify operator aids reflect the latest revisions of source material?

OBJECTIVE 2.r. - Component Labeling

The operator has established and implemented operations practices for clear, accurate equipment labeling.

CRITERIA

1. The operator has established and implemented the components that require a label.
   - Do directives contain provisions for component labeling, including identification of components and standardized label format and colors? Labeled components include:
     - Valves
     - Major equipment
     - Switches
     - Circuit breakers
     - Fuse panels or locations
     - Instruments and gauges
     - Busses and motor control centers
     - Cabinets, including, where appropriate, listing major components inside
     - Room doors
     - Emergency equipment
     - Fire protection systems
     - Piping
     - Any named SSC, item, or operator control.

2. The operator has established and implemented the label information that uniquely identifies components and is consistent with regulations, standards, and facility documents.

- Do directives for component labeling contain provisions for label information to match facility documentation, including design and safety basis documents, procedures, lineup sheets, and other documents that refer to components?
- Are label nomenclature, abbreviations, and identification codes standardized and included in operator training?
- Do labeled components have unique identification numbers?
- Are color codes consistent and unambiguous?
- Do piping labels indicate the fluid and normal flow direction?
- Is piping color coded per OSHA/ANSI standards and is piping for hazardous and explosive materials uniquely identified?

3. The operator has established and implemented durable and securely attached labels that do not interfere with controls or equipment.
   - Are labels, adhesives, and fasteners made of durable materials compatible with the material to which they are attached?
   - Are labels securely attached?
   - Are labels oriented for easy reading and located as close as practical to the labeled item?
   - Do labels not interfere with equipment operations or indicators?

4. The operator has established and implemented the administrative control of labels, including a process for promptly identifying and replacing lost or damaged labels, preventing unauthorized or incorrect labels, and control of temporary labels.
   - Do directives prohibit informal labels and provide a process for replacing labels?
   - Do directives provide for deliberate inspections for missing or damaged labels, such as post-maintenance checks, operator tours, lineup sheets, or other appropriate means?
   - Do directives include a process to document lost, damaged, or incorrect labels and procure replacements?
   - Do directives include provisions for temporary replacement labels, including: documentation of senior operations supervisor approval, verification of proper placement, and documenting temporary labels in the facility?
   - Do temporary labels have the same information content as permanent labels?

4.2 APPROACH

Record Review:

- Site Contractor assessment records associated with the Conduct of Operations program, the operator training and qualification program, operational responses to off-normal events, and procedure compliance
- Site Contractor Conduct of Operations Matrix and associated implementing procedures
- Documented Safety Analysis
- Technical Safety Requirements
- Routine assessments and oversight of Conduct of Operations program implementation in support of facility operations
- Site Organization Charts
- Procedure for the development, preparation, revision, and use of procedures
- List of P&ID drawings for SC, SS, and defense-in-depth system(s) and supporting subsystems that are deemed SC, SS, or important to safety (defense in depth)
- List of SR test procedures for safety systems

- List of completed SR test packages for safety systems for the previous 18 months or previous three performances, if there have been less than three tests in the previous 18 months
- List of SS and defense-in-depth system modifications for the past 3 years
- Temporary modification control procedure and list of current temporary modifications, and any related impairment or out of service procedures or records
- Operator, Maintenance, and Cognizant System Engineer (CSE) staff training programs and procedures
- Operator and CSE training procedures, courses and lessons plans, and operator and CSE qualifications requirements
- Operator and CSE qualification cards
- List of operating procedures
- List of operator round sheets, TSR surveillance recording documents, and normal, abnormal, alarm response, and emergency procedures
- System operability determination process/procedure and a list of completed operability determinations conducted within the last two years

Interviews:
- Facility Manager
- Training Department Manager
- Procedure Development Lead
- Work Control Lead for the facility
- Work planners who support the facility
- Cognizant System Engineer(s) who support the facility
- Selected facility operational and support personnel

Observations:
- Facility operational demonstrations
- Facility and building walkdowns and reviews
- Facility operational rounds
- Table top demonstrations of selected operations procedures