

PURPOSE: It is the Work Management Subgroup's belief that use of this guidance document instills a common approach in understanding work control as it applies across the complex. This document is meant to be used by companies as an aid in performing self assessments of, or assist visits for review of their work control programs. The lines of inquiry are a starting place they are not all inclusive and may not all apply to a specific facility or complex. If you have questions about this document please contact any of the Work Management Subgroup members. It is recognized that there are efforts associated with the development of Work Management CRADs. When the DOE Oversight Manual is issued the Work Management Subgroup will perform a review and update this document as appropriate to keep it up to date.

FUNCTIONAL AREA GOAL: An effective work management process that promotes and improves nuclear, industrial, and radiological safety performance, increase productivity and reduce costs through the efficient use of resources; provides for a long-range plan; integrate site organizations into the process; provides an appropriate methodology for work prioritization; provides a methodology to address a graded approach to planning and scheduling and incorporates an effective feedback and improvement loop.

REQUIREMENTS:

- DOE Order 414.1A: Quality Assurance
- DOE Order 5480.19: Conduct of Operations
- DOE Order 433.1: Maintenance Management
- DOE Order 440.1A: Worker Safety and Health
- DOE Order 5000.3C: Occurrence Reporting and Processing of Operations Information
- 10 CFR 830.122(b): Quality Assurance

GUIDANCE:

- DOE G 450.4-1B, "Integrated Safety Management System Guide," dated 03-01-01

Performance Objective WP-M-1: Contractor Program Management

The Work Planning and Control Process attributes are documented and described in sufficient detail to ensure successful development and implementation at the activity level.

Criteria:

1. Manuals or procedures exist that contain the requirements for work planning and control for all work.
2. Expectations are established for all organizations and personnel involved with the work, including subcontractors to adhere to the manuals and procedures for the planning and execution of activity-level work.

Lines of Inquiry:

- Does the program identify which requirements are used as the basis for the program?

- Do manuals, procedures, or codes of practice exist that contain the requirements for work planning and control for all work activities (i.e., tasks associated with construction, operations, maintenance, etc.)?
- Are the manuals, procedures, or codes of practice adhered to in the planning and control of activity-level work?
- Is a procedure established for performing and documenting emergency maintenance?
- Are adequate procedural controls established and implemented to assure adequate job planning?
- Are workers made responsible and held accountable for following procedures and performing work within established controls, yet maintaining constant awareness and a questioning attitude with respect to safety?

Performance Objective WP-M-2: Contractor Program Organization

Organizational structure, functional roles, responsibilities, levels of authority, accountability, and interfaces for those managing, planning, performing, and assessing work are clearly defined and documented

Criteria:

1. Roles and responsibilities are defined and understood for work planners, work supervisors, responsible line managers, workers, subcontractors, subject matter experts, and all other personnel involved in activity level work planning and control.

Lines of Inquiry:

- Do work packages clearly identify the line manager responsible and accountable for authorizing the work and ensuring that the work is conducted safely?
- Does the responsible and accountable line manager actively participate in the work planning?
- Are planned maintenance activities accomplished by a dedicated planning staff or by maintenance supervisors at facilities with small staffs? If done by a supervisor, does the workload allow time to supervise work in progress?
- Does the planning process normally include assessment of manpower and skill requirements;
- Are test requirements identified by the appropriate technical authority?
- Is responsibility for determining post-maintenance test requirements assigned to functional groups such as operations, maintenance, and technical support?
- Is worker involvement expectations clearly identified?
- Are Radiological Controls and ES&H organizations and their interfaces described?
- Is engineering interfaces described?

Performance Objective WP-M-3: Contractor Program Qualification and Training

The knowledge, skills, and abilities required for performing assigned work are established, documented, and maintained.

Personnel possess the knowledge, skills, and abilities required for performing assigned work.

Continuing training is provided, which includes lessons learned, to maintain and improve proficiency.

Criteria:

1. Management has established a set of criteria and programs for the establishment of a minimum set of knowledge, skills, and abilities for the work force involved in the planning and execution of the work.
2. Workers (including subcontractors) are trained to understand the hazards associated with their work, the safety significance of the controls provided to protect them from the hazards, and the importance of working within/adhering to the controls
3. Personnel are trained on activity level work planning and control process and understand how their function contributes to and integrates with the processes.
4. Personnel possess the knowledge, skills, and abilities required for performing assigned work.

Lines of Inquiry:

- Are line managers, work planners, safety professionals, work supervisors, hazards analysts, subject matter experts (SMEs), and others involved in work planning and control adequately trained to perform assigned responsibilities?
- Are workers (employees, subcontractors, or others) trained to understand the hazards associated with their work, the controls provided to protect them from the hazards, the safety significance of the controls, and the importance of adherence to the controls?
- Does the planning process normally include assessment of manpower and skill requirements;
- Are workers (employees, subcontractors, or others) trained to understand the hazards associated with their work, the controls provided to protect them from the hazards, the safety significance of the controls, and the importance of adherence to the controls?

Performance Objective WP-M-4: Contractor Program systems and tools

Work management processes/systems are integrated and coordinated.

Criteria:

1. Different work management processes or systems used by different organizations or for different types or categories of work must be designed and implemented such that the combined requirements (e.g., resources, schedules, support, etc.), potential effects, and interdependencies of all work activities are effectively understood, analyzed, and coordinated.

Lines of Inquiry:

- Is a work request (order) system established that clearly identifies the work needed and provides instructions to perform the work?

- Does the work request system provide a method for tracking work in process?
- Does the work request (order) system provide for control of modifications, in-service tests, preventive maintenance (PM), and surveillances?

Performance Objective WP-M-5: Program Expectations

Worker knowledge and experience is used throughout the work process.

A graded approach is defined, which determines the rigor for implementing these work planning and control attributes based on the importance/significance, and associated consequences of the activity.

Criteria:

1. Different work management processes or systems used by different organizations or for different types or categories of work must be designed and implemented such that the work is planned efficiently, effectively, and is performed safely.
2. An appropriate graded approach methodology is used to analyze work hazards and develop controls to ensure the safety of workers.
3. The graded approach considers the safety classification of the equipment impacted by the work (e.g., Safety Class or Safety Significant), and the assumptions concerning equipment availability, operation, and performance documented in applicable facility safety basis documents (e.g., DSA, SER, facility hazards analyses).
4. Work Control Processes include turnover requirements when line management or first line supervisor responsibilities are transferred.

Lines of Inquiry:

- Does the process use a graded approach in determining the rigor associated with planning the work?
- Does the graded approach provide for determination of craft experience and knowledge?
- Is the graded approach defensible in its strategy for determining the planning rigor?
- Does the graded approach consider risk, complexity, and human performance factors?
- Is there a process for turnover of line management or first line manager responsibilities when responsibilities are transferred?

Performance Objective WP-M-6: Assessment and Continued Improvement

Organizations use their assessment and issues management processes to drive work planning and control improvements.

A work environment is established that strives for excellence in work planning and performance and promotes productivity and safety.

Criteria

1. The contractor self-assessment program requires periodic and thorough evaluation of the effectiveness of incorporation of the ISM core functions and guiding principles, and appropriate QA criteria, into activity-level work planning and control. The evaluation process includes line management and independent assessment activities, review and analysis of results, and dissemination of lessons learned and noteworthy practices.
2. A computer-based system is used to:
 - a. Track issues identified from assessments, post-work feedback and lessons learned from workers, planners, and supervisors;
 - b. Identify responsible individuals and corrective actions planned and implemented in response to identified issues; and
 - c. Document final resolution and closeout of issues.
3. Assessment activities include routine and periodic management oversight of work activities on the floor (i.e., direct observation of work and interaction with workers) for the purpose of demonstrating management commitment to and expectations for effective ISM and QA, and identifying opportunities for work process and performance improvements through observations and direct communication with workers.
 - a. Open and effective communications, constructive feedback, and due consideration of diverse opinions are encouraged at all organizational levels.
 - b. A safety conscious culture is established that promotes individual ownership, accountability, teamwork, continuous improvement, and being proactive to prevent or address and correct issues and problems before they become major.
 - c. Workers maintain a positive questioning attitude towards safety and are vigilant towards:
 - 1) Unsafe or potentially unsafe conditions or situations;
 - 2) The possibility of faulty analysis or assumptions, errors, failures, over-simplifications, etc.; and
 - 3) Watching out for facility conditions or equipment performance problems that appear to need correcting and should be reported.

Lines of Inquiry:

- Do craft personnel have a process to report conditions that could lead to equipment or system performance?
- Does the contractor self-assessment program (see DOE P 450.5 and DOE 414.1C) require periodic and thorough evaluation of the effectiveness of incorporation of the ISMS core functions and guiding principles into activity-level work planning and control?
- Are the results from these and other assessments of work processes adequately evaluated and used for process improvement?
- How do you track and trend identified areas of weakness?
- Do employees communicate areas of needed improvement?
- Are employees encouraged to provide feedback for continuous improvement?
- Are there examples of employee identified improvements being acted on?
- Are assessments rigorous enough to identify areas of needed improvement in ISM integration?

- How many internal and external assessments were performed in ISM or Work Planning in the last year?
- Is there a set of corrective actions or a plan for continued improvement in place, based on observations or findings of the assessments?
- What are some examples of improvements in the past year?
- What are the self identified areas of needed improvement?

Performance Objective WP-DS-1: Scope Identification, Prioritization, and Approval

A defined process is used to identify and request work.

A defined process is used to prioritize work; work priority is managed to achieve integration among all necessary interfaces.

Work is formally approved to proceed to the scheduling and planning phase.

Criteria:

1. The activity level work planning and control process has a formal work screening and validation process that determines work need and priority, identifies tentative work schedule and required resources, ensures that work is not duplicative, and initially determines applicable work planning and control process methods based on the nature of the work.
2. Prioritization considers safety and mission impact. Safety impact includes both personnel safety (e.g., OSHA and IH types of considerations) and facility safety (e.g., authorization basis assumptions concerning worker and public safety and environmental impact).

Lines of Inquiry:

- Is the scope of work controlled through change management?
- How does the prioritization method ensure safety of the workers, public, and environment is included with mission scope?
- Are preventive maintenance and surveillance priorities established commensurate with personnel and facility safety, environmental protection, programmatic consideration, and value?
- Are corrective maintenance priorities established based on facility objectives and the relative importance of the equipment?
- Is a maintenance work request considered part of the backlog from the time the work is identified until all actions are complete, including post-maintenance testing and administrative reviews? Is control maintained by identifying and verifying the status of all valid work requests?
- Are corrective maintenance priorities established based on facility objectives and the relative importance of the equipment?
- Does the planning process normally include definition of the problem and identification of the work scope;
- Are the following items considered when assigning priorities: personnel safety; equipment repair urgency/limiting conditions of operations; operability of redundant equipment; critical path equipment; facility conditions required for equipment repair; repair or replacement parts status; and manpower availability?

Performance Objective WP-DS-2: Scheduling

An integrated schedule(s) is developed that balances priorities and resources in a disciplined manner to ensure that work is accomplished safely and efficiently. The scheduling process has provisions for work not requiring a formal schedule. The schedule is managed through a formal change control process.

The schedule(s) is resource loaded and the sequence and timing of activities adjusted to ensure that adequate resources are available and consistent with the applicable requirements.

Criteria:

1. The rigor of scheduling matches the complexity of the work (i.e., complex work requiring multiple resources, coordination, etc. is scheduled in detail, where simple work may not require scheduling beyond understanding resource requirements).
2. Schedule tools such as rolling work week schedules and Plan-of-the-Day (POD) and Plan-of-the-Week (POW) meetings are used to manage and coordinate all work activities that can potentially impact safety and/or operations.
3. Schedules are developed and updated as necessary to effectively coordinate and communicate work activities.
4. The scheduling process:
 - d. Is owned by the facility operations organization;
 - e. Identifies the optimum window(s) of opportunity for performing work based on the time required to plan the work (including identification and analysis of hazards and identification and implementation of controls), the importance of the work to mission and safety, the impact of the work on facility operations, the required or desired sequence of planned work, and the availability and efficient use of resources (parts, equipment, personnel, support); and
 - f. Involves senior management as necessary for problems and critical path issues; and,
 - g. Includes methods for evaluation of effectiveness (e.g., feedback and improvement mechanisms, performance metrics, periodic meetings to critique performance, analyze trends, address emerging issues and concerns, etc.).

Lines of Inquiry:

- Is in-depth work planning utilized to identify the required support and detailed scoping necessary to accurately schedule daily maintenance?
- Is involvement of such required support groups as operations, engineering, radiation protection, security, and quality control coordinated to effectively support the maintenance effort?
- Are weekly and/or daily job-scheduling meetings conducted and the resulting work schedules published?
- Are facility personnel, especially facility managers, apprised of scheduled maintenance activities that affect them, thus ensuring proper activity coordination?
- Is there a formal work authorization process that includes provisions to effectively integrate work activities and coordinates with others who may impact or be impacted by the work (e.g., plan-of-the-day meetings or other mechanisms used to prioritize, coordinate and control ongoing work activities)
- What percentage of the work scheduled gets completed as scheduled?
- What performance metrics are used to track schedule performance?

Performance Objective WP-H-1: Identification and Control of Hazards

Define the work scope by identifying all activities required to complete the work.
Personnel with the appropriate functional area expertise are used to plan the work.
Criteria are established for when team planning is required.

Criteria:

1. Work activities and boundaries are defined in sufficient detail to allow a work planning team to determine the job steps necessary to complete the work so that all hazards can be identified, appropriate controls can be established, and adequate work instructions developed.
 - a. The work needed, objective to be accomplished, condition to be achieved or corrected, problem being addressed, expected outcome, etc, are well documented.
 - b. The specific tasks necessary to accomplish the work are identified. Workers, customers/users, supervisors, planners, and others are involved in task identification as appropriate.
 - c. Equipment, components, locations, etc. described are verified correct and accurate;
 - d. Applicable and affected documents are identified (e.g., procedures, drawings, specifications, vendor manuals, training materials, etc.), and the latest versions/revisions are used in work planning.
 - e. The work activity is clearly and adequately bounded/limited (e.g., physical boundaries such as equipment/components to which work activity is limited, specific area to which work is confined; conditions under which work can be performed; etc.).
2. The work planning process specifies when walkdowns are required to assist in defining work scope and boundaries, and clearly defines roles and responsibilities regarding worker involvement.
 - a. Walkdowns are performed when required.
 - b. Workers that will be performing the tasks participate in the walkdown.
 - c. Work site conditions are documented, including use of photographs if necessary, to ensure appropriate consideration of special or unique planning requirements or circumstances (e.g., lookouts/watches, permits, constraints or interferences to use of normal/routine practices or procedures, resources, support needs such as equipment, labor, engineering or operations, etc.).
3. Associate equipment, parts, and components with systems, processes, or operations to aid in work planning (helps to ensure that the impact of the equipment, part, or component on facility mission and safety is understood; and to schedule multiple tasks affecting systems, processes, or operations at the same time to minimize impact).
4. A team approach used to identify and analyze hazards associated with complex or unique work involving multiple hazards.

5. The team operates (i.e., meets, communicates, reports, etc.) as defined in approved, controlled procedures.
6. The team consists of appropriate types of personnel (e.g., safety analysts, work planners, safety professionals, and SMEs such as health physicists, electrical safety specialists, criticality safety engineers, fire protection engineers, security experts, etc.) for the work being performed given the hazards involved.
7. Workers are involved in work planning to draw upon their knowledge and experience, to understand their concerns, to get their input concerning preferred methods and approaches to work (what works and what doesn't, obstacles frequently encountered and how to avoid them, etc.), and to familiarize them with the work and to buy-in to the selected approach for accomplishing the work.

Lines of Inquiry:

- Are work activities and boundaries clearly defined in sufficient detail (including work performed using generic work documents) to allow a work planning team to determine the job steps necessary to complete the work so that all hazards can be identified, appropriate controls can be established, and adequate work instructions developed?
- Is a team approach used to identify and analyze hazards associated with the work activity?
- Does the team consist of appropriate types of personnel (e.g., safety analysts, work planners, safety professionals, and SMEs such as health physicists, electrical safety specialists, or criticality safety engineers) for the work being performed given the hazards involved?
- Is input from workers sought early in the work planning process concerning how to safely complete assigned tasks, and is their input factored into ensuring that adequate controls are in place?
- Did the walkdown identify the major steps required to perform the activity?
- Was the scope modified once the boundaries, end-points, etc. were better defined?
- Does the planning process normally include identification and review of resources, including other tasks scheduled to occur in the immediate area during the same time period;
- Does the planning process normally include identification of initial facility conditions and prerequisites required for work to be accomplished;
- Was the walkdown rigorous enough to identify the hazards in the major steps?
- Compare the members present in the JHA meeting with the assigned membership of the Planning/JHA Team (it is not a "hard" requirement for the Planning/JHA Team to match one-for-one with the HDIT or meet at the same time, but if there is a difference or only several of the members are present, have the RM justify the difference or lack of attendance).
- Was there active participation by the members of the JHA team during the roundtable discussion?
- Was a job hazard analysis (JHA) walkdown/roundtable(s) performed.
- Are both the work instructions and the work site reviewed, including walk downs where appropriate, to ensure that the hazards analysis results translate to the actual work environment (i.e., reflect actual conditions) and to verify that all hazards that could potentially affect the safety of workers have been identified and that selected controls are appropriate and adequate?

Performance Objective WP-H-2: Use of Feedback and Lessons Learned

Plan work use previous work documents, documented work history, existing knowledge and experience, lessons learned, applicable standards and requirements, and manufacturer's recommendations.

Criteria:

1. Work planning should consider the following types of information as applicable:

- a. Design and design basis information (the design authority/Authority Having Jurisdiction (AHJ) should be involved where appropriate), including:
- b. Component/equipment specifications (e.g., quality, operating environment, physical characteristics and capabilities); and
- c. System requirements and performance criteria.
- d. Safety basis information (e.g., DSA, TSRs, EIS, etc.);
- e. Contract requirements (List A and List B), and/or applicable S/RIDs or WSSs;

Note: The applicable standards and requirements not only include those applicable to the specific work activity (for example NFPA codes for design and installation work on a fire sprinkler system) but also those applicable to work control processes and worker safety in general such as DOE Order 414.1C, *Quality Assurance*, DOE Order 5480.19, *Conduct of Operations*, DOE Order 440.1A, *Worker Safety and Health*, and DOE Order 433.1, *Maintenance Management*.

- f. Lessons learned and feedback information from previous or similar work activities.

Lines of Inquiry:

- Are maintenance history records readily available for use by supervisors, work planners, and maintenance or plant engineers?
- Is vendor information obtained from suppliers controlled and indexed for ready retrieval?
- Are personnel using vendor manuals provided with technically adequate documents that can be relied upon to provide the best available information?
- Are worker concerns regarding unsafe work conditions addressed?
- What sources are used by the planners or workers for lessons learned?
- How does the company help people in sorting through the lessons learned information available?
- What are the expectations for use of lessons learned?

Performance Objective WP-H-3: Hazard Analysis

Identify and analyze the hazards with the work and the work environment; including predictable, potential undesirable events (i.e., “what if” scenarios).

Focus on eliminating or reducing the hazards; for any remaining hazards use a hierarchy of controls (i.e. engineered controls first, administrative controls second, and PPE last).

Criteria:

1. A formal, structured methodology is followed for the systematic identification and analysis of hazards that:
 - a. Ensures thorough and complete analysis of hazards and identification of controls;
 - b. Associated with the work tasks; and
 - c. Associated with the work environment, including hazards from adjacent ongoing activities.

- d. Includes consideration of potential transients or accidents (i.e., “what if” scenarios such as spills, fires, exposures, failures, changing conditions, interference, alarms, unexpected equipment actuations, errors, etc.) and their consequences;
- e. avoids over-reliance on generic work documents, automated job hazard analysis (AJHA) tools and administrative controls such as permits (e.g., radiological, confined space, etc.) in lieu of thorough analysis of specific work tasks/activities;

Note: Over-reliance on generic work documents, permits, automated job hazard analysis (AJHA) tools, administrative controls, or the existence of higher level ES&H programs can result in hazards or hazardous conditions associated with the specific work activity or its environment being missed or not being properly analyzed. The hazards analysis process is intended to thoroughly and systematically identify and analyze hazards by appropriate, qualified individuals who interact and thoughtfully consider potential hazards and consequences to identify controls that need to be implemented to ensure safe, reliable conduct of work. Work planners need to be careful not to become over-reliant on general or higher level controls or AJHA tools to the point where they become a crutch or substitute for engineering judgment and thoughtful analysis that leads, or misleads, the analyst or provides a false sense of security.

- 2. Generic work documents, vendor-supplied work instructions, or previously used work packages/procedures are only used following confirmation of continued applicability and appropriateness to the current work site and activities, and applicable lessons learned and operating experience information has been incorporated.
 - a. Verifies that work activities are consistent with applicable standards and requirements, and do not challenge the facility safety basis or environmental limits; and
 - b. Reviews work tasks from a human performance perspective to identify and either eliminate or develop contingencies for error likely situations.
- 3. Hazards are analyzed collectively to arrive at the optimum set of controls for the work being performed, and to ensure that the selected controls do not conflict with each other or introduce additional hazards. This is an iterative process that must be repeated as tasks are added or changed and as controls are identified or modified.

Note: Examples of where controls might conflict would be where ear protection provided for noise reduction could impair the ability to hear emergency alarms, locking out power for electrical safety reasons could inadvertently disable safety alarms or indications, or where physically restricting access to prevent unwanted interference could impede egress or emergency response actions.

- 4. Potential unwanted/undesirable impacts from the conduct of work activities (e.g., unanticipated alarms, unplanned entry into TSR LCOs, need for additional support, degraded or diminished safety or mission capability) are identified and eliminated.
- 5. A hierarchy of controls methodology is employed that seeks to prevent or mitigate the hazards by first eliminating hazards, second by controlling the hazards (first through engineered controls and next through administrative controls), and as a last resort through the use of personnel protective equipment to protect the worker from the hazard.

Lines of Inquiry:

- Were negative synergistic conditions (i.e., controls for one hazard negatively affecting controls for another hazard) considered?
- Was hazard elimination or reduction considered prior to the final hazard control determination (i.e., were engineering controls considered before the selection of administrative controls or PPE)?
- Were all sources of potential hazards and their associated controls discussed/reviewed (e.g., AJR, RWP, SES, CSE, etc.)? The work package JHA is intended to be the integrated analysis that captures all hazards associated with the work activity.
- Are the major job steps in the JHA of sufficient detail that individual hazards for any particular step can be identified?
- Are all the appropriate hazards associated with each major job step identified?
- Are the controls specific to the job task or are they generic?
- Are the hazard controls appropriate for the hazard level?
- Are hazards analyzed collectively to arrive at the optimum set of controls for the work being performed, and to ensure that the selected controls do not conflict with each other or introduce additional hazards?
- Is a hierarchy of controls methodology employed that seeks to prevent or mitigate the hazards by first eliminating hazards, second by controlling the hazards (first through engineered controls and next through administrative controls), and as a last resort through the use of personnel protective equipment to protect the worker from the hazard?
- Determine if appropriate disciplines were identified based on the scope of work being performed.
- Are the chosen methods of implementation specific to the task or is it a generic application of a control (i.e., follow RWP controls)? Determine the adequacy of a generic reference to AJR, RWP, Hot Work, Energized Work and other work where permits/documents are required and maintained with the WCD.
- Are the assumptions documented in the Job Hazard analysis
- Are controls identified and documented that are useable by the end user without further interpretation?

Performance Objective WP-H-4: Work Instructions

Work plans identify the resources, including support organizations, needed to perform the work.

Develop instructions necessary to complete work activities safely and efficiently, including integration of specific hazard controls. Identify and integrate into the instructions applicable technical and administrative requirements (ES&H, QA, Security, Emergency Management, Safety Basis, etc.)

Establish acceptance/performance criteria to verify completion of the work.

Work documents are written so they can be understood and effectively used by those who perform the work.

Work documents are formally reviewed and approved.

Criteria

1. Work instructions identify impacts on safety systems and equipment and/or facility operations/processes, and applicable TSRs or other administrative controls.
2. Hazards associated with the work and the controls developed to protect the worker are appropriately documented in the work package.

3. Written work instructions include appropriate features (e.g., identification of appropriate controls, warnings and precautions, QA hold points, control room communications, required inspections, approvals to proceed to next steps, and independent verifications, etc.) necessary for confirmation of critical steps, values, equipment positions, etc., and for worker safety, equipment protection, and continuity of operations.
4. Work planning identifies and documents in work instructions/procedures all necessary prerequisite actions to be completed and verified before proceeding with work tasks. These include verification of required facility initial conditions (e.g., correct operating mode or availability of systems or equipment); communications (e.g., notifications/announcements and approvals); confirmation of equipment position and system status; confirmation of proper installation of controls (establishment of lookouts/watches, lock-outs and tag-outs, PPE, compliance with administrative limits, controls, and requirements); availability of support equipment (e.g., lighting and scaffolding); and any other field preparations or actions that must be completed before work is begun.
5. Work planning identifies and documents in work instructions/procedures all necessary precautions and limitations necessary to prevent or reduce personnel exposure to hazards (radiological, electrical, chemical, environmental, etc.) and damage to property and equipment. Precautions and limitations should:
 - a. inform the worker of hazardous conditions that exist or could be encountered during the work;
 - b. identify action(s) required by the worker for protection;

Note: Precaution statements and associated specific action steps should be placed in the work instructions at the location directly proceeding where they are to be performed. General precaution statements pertaining to the overall scope of work or to a particular portion of the work should be placed at the beginning of the work instructions or prior to the portion of the instruction to which they apply.

- c. be considered for situations where improper action or omissions could disrupt facility operations, result in undesirable conditions or consequences, or cause inadvertent actuation of systems/equipment or entry into TSR LCOs (e.g., failure to install or remove a jumper, lead, fuse, bypass, or interlock);
 - d. be preceded by warning and caution statements where warranted by potentially serious consequences; and
 - e. be clear, concise, and specific (generic precaution statements should be avoided).
6. Work instructions require documentation of as-found conditions; incomplete/uncompleted items; discrepancies; unexpected, unusual, abnormal, unplanned, or unexplained conditions; equipment responses and surrounding circumstances; relevant and indications or alarms etc. to ensure preservation of evidence and allow for subsequent analysis.
7. Acceptance/performance criteria should:
 - a. Conclusively determine whether the work was accomplished successfully;
 - b. Verify that the work did not introduce or cause other deficiencies or problems;
 - c. Determine that applicable design, safety, and interface criteria are met.
8. Testing is coordinated with operations where appropriate.
9. Work package procedures ensure proper equipment restoration and return to service so that there is positive assurance/confidence that design and safety functions will be adequately performed.
10. Work packages are clearly written and complete.
11. Work packages are user friendly (e.g., unnecessary information, having to look up required referenced information in other documents, or other actions that result in overly complex or cumbersome work packages are avoided).

12. The sequence of steps in work instructions ensure that work is performed safely, efficiently, and effectively/successfully.
13. All required information is identified (prerequisites, needed tools, test equipment, vendor information, reference materials, services, support equipment or personnel, conditions).
14. Required work package reviews and approvals are appropriate (i.e., only include those that are necessary and provide value).
15. The individuals responsible for work package execution, typically the first line supervisor or person-in-charge (PIC), and closure are clearly identified.

Lines of Inquiry:

- Do written work instructions adequately highlight features related to worker safety (e.g., identification of appropriate controls, warnings and precautions, hold points and independent verifications, etc.)?
- Are work packages user friendly (e.g., is unnecessary information provided or actions required, such as having to look up referenced information in other documents, that result in overly complex or cumbersome work packages)?
- Does preplanning obtain such necessary support items as special tools, other equipment, repair parts, and materials required to accomplish the work when needed?
- Does the planning process normally include identification and review of necessary procedures, drawings, vendor manuals, and maintenance history;
- Does the planning process normally include identification of needed and available data for use in analysis of maintenance problems;
- Does the planning process normally include procurement of necessary repair parts, materials, tools, and equipment;
- Does the planning process normally include identification of quality control and technical inspection requirements;
- Does the planning process normally include establishment of equipment restoration and post-maintenance inspection or testing requirements;
- Does the planning process normally include identification of applicable maintenance and operation procedures?
- Are human factors considerations incorporated into procedures to promote error-free performance?
- Are the hazards associated with the work and the controls developed to protect the worker appropriately documented in the work package?
- Are the hazards associated with the work and the controls developed to protect the worker appropriately documented in the work package?
- Is adequate assurance provided that the controls will remain in effect so long as the hazard is present?
- Determine if appropriate disciplines were identified based on the scope of work being performed.
- Are the chosen methods of implementing the hazard controls appropriate (judgment call since a hazard control identified in the JHA may have several ways to implement the control in the WCD)?
- Are the chosen methods of implementation specific to the task or is it a generic application of a control (i.e., follow RWP controls)? Determine the adequacy of a generic reference to AJR, RWP, Hot Work, Energized Work and other work where permits/documents are required and maintained with the WCD.
- Are all specific hazard controls in the JHA implemented in the WCD?
- Is the location of the hazard controls in the WCD appropriate (i.e., does the control immediately precede the hazard)?
- Is the rigor of the testing performed based on the work done and the importance of the component or equipment to safe and reliable facility operation?

- Is the post-maintenance testing program clearly defined?

Performance Objective WP-R-1: Preparing for performance of Work

Readiness is confirmed prior to scheduled work performance with regard to: system (including software), prerequisite controls, work environment, people, documents, tools and materials.

Field conditions are confirmed to match planning document(s).

Criteria:

1. Work documents are reviewed by workers prior to work performance to ensure workability and familiarity with the work.
2. Workers are confirmed to be trained and qualified.
3. Availability of tools, equipment and support services is confirmed.
4. Includes a final check to determine if circumstances have changed since the work was planned that could affect the safe performance of work activities.
5. Both the work instructions and the work site are reviewed, including walk downs where appropriate, to ensure that the hazards analysis results translate to the actual work environment (i.e., reflect actual conditions) and to verify that all hazards that could potentially affect the safety of workers have been identified and that selected controls are appropriate and adequate.
6. The impact of tools and temporary equipment (e.g., scaffolding, rigging, power supplies, welding equipment, enclosures, insulation, shielding, etc.) on facility systems and equipment is understood and accepted.

Lines of Inquiry:

- Is there a walkdown of the “final draft” of the WCD.
 - Was the walkdown performed (as a minimum) by a supervisor and craft and was it of appropriate rigor to determine the “usability” of the WCD?
 - If concerns were raised, were they addressed to the satisfaction of the craft?
 - If the concerns might require changes to the WCD, was the Planning Team reconvened to address the changes? If so, was the JHA revisited to determine if new hazards were created by the changes and new controls implemented in the WCD?
- Review the Work Control Document to ensure that the work scope is clearly defined and that the supervisor understands the work scope/boundaries.
- Review the initial conditions, precautions, limitations, and prerequisites contained in work control package to determine their applicability to the work steps that the work crew is currently performing

Performance Objective WP-R-2: Authorization of Work

Work is formally authorized to proceed

Criteria:

1. Work packages clearly identify the line manager responsible and accountable for authorizing the work and ensuring that the work is conducted safely.
2. The responsible facility manager understands the scope of work being performed and its relationship to other ongoing facility work activities.
3. There is a formal work authorization process that:

- a. ensures all preparations have been completed (including required notifications, approvals, permits, etc.) and that required controls are implemented before the work is started; and
- b. includes provisions to effectively integrate work activities and coordinates with others who may impact or be impacted by the work (e.g., plan-of-the-day meetings or other mechanisms used to prioritize, coordinate, and control ongoing work activities); the combined effect of all ongoing work activities should be understood.

Lines of Inquiry:

- Is there a formal work authorization process that ensures all preparations have been completed (including required notifications, approvals, permits, etc.) and that required controls are implemented before the work is started;
- Is there a formal work authorization process that includes provisions to effectively integrate work activities and coordinates with others who may impact or be impacted by the work (e.g., plan-of-the-day meetings or other mechanisms used to prioritize, coordinate and control ongoing work activities); and'
- Is there a formal work authorization process that includes a final check to determine if circumstances have changed since the work was planned that could affect the safe performance of work activities?

Performance Objective WP-P-1: Pre-Job Briefings

Personnel with the appropriate functional area expertise are used to perform the work.

Pre-job briefings are conducted

Criteria:

1. Pre-job briefings are held that:
 - a. Ensure that workers understand the hazards in the work area and the controls provided to protect them from the hazards, and that the controls will remain in effect as long as the associated hazards are present;
 - b. Ensures that all workers understand their responsibilities as related to the work activity, including required records, forms, information, or other documentation associated with the work that must be completed;
 - c. Confirms that work hazards and safety provisions are understood and appreciated by all workers involved such that each worker has confidence that their coworkers are knowledgeable and prepared;
 - d. Cover applicable procedures and instructions, critical job steps, warnings and precautions, error-likely situations, expected outcomes, response to unexpected outcomes, including emergency conditions (emergency communications and contingency or compensatory actions), and relevant operating experience; and
 - e. Allows opportunity for workers to ask related questions; worker concerns regarding unsafe work conditions are addressed

Lines of Inquiry:

- Do pre-job briefings ensure that workers understand the hazards in the work area and the controls provided to protect them from the hazards;

- Do pre-job briefings confirm that work hazards and safety provisions are understood and appreciated by all workers involved such that each worker has confidence that their coworkers are knowledgeable and prepared;
- Do pre-job briefings cover applicable procedures and instructions, expected outcomes, and response to unexpected outcomes, including responses to emergency conditions; and,
- Do pre-job briefings allow opportunity for workers task related questions?

Performance Objective WP-P-2: Performance of Work

Work is performed and documented in accordance with the applicable work instruction(s). Documentation includes any problems encountered during execution of the work, and any feedback information considered useful for improving the work process.

Line management oversight is sufficient to ensure work proceeds as planned.

Appropriate actions are taken if unexpected hazards or conditions are encountered.

Criteria:

1. Workers understand that working outside the defined scope of a work package is prohibited. Workers are responsible and held accountable for explicitly following work instructions and procedures, and performing work within established controls, yet maintaining constant awareness and a questioning attitude with respect to safety.
2. Results of the work process are adequately documented (i.e., forms properly filled out; results, observations, and comments recorded; adequate information provided describing issues, problems, deviations, etc., and resultant actions taken). Documentation includes concerns and observations related both to the specific work activities performed and other facility conditions worthy of note that may not be directly related to the work being performed (e.g., leaks, degraded equipment condition, housekeeping issues, fire or other safety hazards, etc.).
3. Workers understand that they have the responsibility and authority to stop work if conditions are deemed unsafe or if there is doubt concerning how to proceed safely.
4. Workers know where to go and what to do should new or different hazards or circumstances other than addressed in work planning be encountered.
5. Safety issues affecting work in progress are resolved in an appropriate and timely manner.
6. Errors discovered during the course of performing work (such as errors in equipment labeling or location, or in drawings, procedures, and other documents) are promptly reported, and the effect on current work activities thoroughly assessed before proceeding.

Lines of Inquiry:

- Do workers understand that they have the responsibility and authority to stop work if conditions are deemed unsafe or if there is doubt concerning how to proceed safely?
- Do workers clearly understand that working outside the defined scope of a work package is prohibited?
- Do workers know where to go and what to do should new or different hazards or circumstances other than addressed in work planning be encountered?
- Are work instructions explicitly followed by workers?
- Are the workers in compliance with the PPE requirements contained in the work package?
- Are safety issues affecting work in progress resolved in an appropriate and timely manner?

- Are errors discovered during the course of performing work (such as errors in equipment labeling or location, or in drawings, procedures, and other documents) promptly reported, and the effect on current work activities thoroughly assessed before proceeding?
- Is post-maintenance testing performed, as appropriate, after corrective and preventive maintenance activities?
- Is the oversight of the work commensurate with the complexity or risk of the work?

Performance Objective WP-P-3: Changes to Work

Field changes in work scope are thoroughly reviewed, analyzed (including adequacy of hazards analysis and controls), documented, and approved before being implemented.

Criteria:

1. Informal, un-reviewed, or un-approved deviations, shortcuts, or workarounds are not tolerated.

Note: A graded approach is used that analyzes and approves field changes based on their importance/significance. Some field changes may be very minor where it can be readily determined that no new hazards are created or introduced, and where the existing controls are adequate, thus requiring minimal review and approval. Other field changes may involve significant changes in the hazards involved, or the adequacy of existing controls may be uncertain and require further analysis, thus requiring more formal review and approval. In all cases, the changes and the basis for the degree of review and approval deemed appropriate should be documented in the work package.

Lines of Inquiry:

- Are changes to work instructions controlled through appropriate review and authorization prior to use and do they ensure user awareness of applicable changes?
- If the concerns might require changes to the WCD, was the Planning Team reconvened to address the changes? If so, was the JHA revisited to determine if new hazards were created by the changes and new controls implemented in the WCD?
- Does Operations review and accept the work?
- Does Operations accept the work prior to use of the system or components affected by the work?

Performance Objective WP-P-4: Work Complete

Work is complete when the outcome is achieved, the documentation is complete, and the work is accepted.

Criteria:

1. Housekeeping is completed in the area of work ensuring that the area is as clean when the job is finished as it was when it started.
2. The documentation supports the work performed and provides adequate traceability to any newly installed or replaced components.
3. Retesting is either completed satisfactorily or is identified as being required prior to turnover back to operations.
4. Operations Review is completed to accept the work performed and readiness of the equipment for use.

Lines of Inquiry:

- Does the planning process normally include review of work instructions of work packages for completion;
- Are the results of the work process adequately documented (i.e., forms properly filled out; results, observations, and comments recorded; adequate information provided describing issues, problems, deviations, etc., and resultant actions taken)?

Performance Objective WP-F-1: Post Review and Feedback

Post-job reviews are conducted to collect feedback, including lessons learned.

Feedback is analyzed to identify improvement opportunities. Improvement opportunities are effectively dispositioned.

Work Documents are evaluated and processed in accordance with approved records management procedures.

Timely updates and improvements are incorporated into affected documents (such as; engineering drawings, training documents, operating procedures, hazard analysis, etc.).

Criteria:

1. Post-job reviews are conducted to obtain feedback, both good and bad, for use in making work process improvements.
2. The post-job review process is a formal, proceduralized process that requires documentation of results and participation by appropriate workers and supervisors.
3. A formal feedback process exists that allows individuals involved with work planning and performing work (including workers, planners, supervisors, support organizations, SMEs, customers/users/stakeholders, etc.) to provide input for improving the work process.
4. The process is user friendly, provides capability to link feedback to specific work procedures, equipment, or types of work, and is being effectively used to make meaningful improvements where practical (i.e., work planning uses lessons learned and feedback from previous work).
5. Work packages are not closed out until all required documents and records are included and are complete.
6. Work packages are closed out in a timely manner, i.e., timely revisions are made to documents affected by the work, such as facility drawings, the Master Equipment List (MEL), training materials, facility procedures, relevant historical information (e.g., equipment maintenance and repair history, calibration data), facility design basis documentation such as System Design descriptions (SDDs), etc.

Lines of Inquiry:

- Are craft personnel involved in identify and solving emergent equipment problems?
- Are work packages closed out in a timely manner (i.e., are timely revisions made to documents affected by the work, such as facility drawings, MELs, training materials, maintenance procedures, etc., or does a backlog exist)?
- Are closed out work packages complete (i.e., do they contain all required documents and records)?
- Are post-maintenance test results documented and reviewed to ensure proper system/equipment performance prior to returning the system to service?
- Is maintenance rework identified and documented?

- Does a formal feedback process exist that allows individuals involved with work planning and performing work to provide input for improving the work process?
- Are post-job reviews conducted to obtain feedback, both good and bad, for use in making work process improvements?
- Is the post-job review process a formal, proceduralized process that requires documentation of results and participation by appropriate workers and supervisors?
- Is the status of equipment that has undergone maintenance tracked to ensure that all testing is completed prior to work closeout?