

BWXT Y-12, L.L.C.
Management Requirements

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BWXT Y-12
Procedure

Subject: Integrated Work Control Manual (IWCM)

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Concurrence:

This document has completed the management requirements process.

S. G. Brown /s/ 01/04/07
Requirements Management

This document has been reviewed by an Authorized Derivative Classifier and UCNI Reviewing Official and has been determined to be UNCLASSIFIED and contains no UCNI. This review does not constitute clearance for public release.

J. A. Nations /s/ 12/18/06
Signature & Date

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REVISION LOG
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Revision Date	Description of Change	Section/Pages Affected
11/30/06	DMR 06-WC-07(Intent Change) Complete Revision to comply with APAT Format, updated procedure references, modified/clarified criteria for prioritization, modified/clarified criteria for minor work, added numerous steps to all chapters, modify PWT & RTS requirements, completely rewrote Chapter 5 Schedule Work, placed Dispatched Work List in a separate document Y/IA-422, removed UCN forms from the manual, etc.	All
06/20/06	DMR 06-WC-03 (Non-Intent) Provided clarification for Chapter 6, Dispatched Work	Chapter 6 / Page 5
05/31/06	On Record.	
11/14/05	On Record.	
10/04/05	On Record.	
08/11/05	On Record.	
07/25/05	On Record.	
05/18/05	On Record.	
04/15/05	On Record.	
03/01/05	On Record.	

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PURPOSE

To communicate the requirements and expectations covered by this manual for:

- identifying, prioritizing, and authorizing work,
- planning work,
- developing post-work test and return to service requirements,
- scheduling work,
- performing work, and
- post-job review and closeout.

APPLIES TO

- The maintenance and service work and support activities covered by this manual.
- The roles and responsibilities summarized in the Responsibilities Section of this Chapter for the Authorizing Manager, Building/Operations/Production Manager, Division Manager, Integrated Scheduler, Job Supervisor, Planning Supervisor, Procurement Personnel, Responsible Manager, Responsible Planner, Security Area Owner, Subject Matter Experts, System Engineer, Work Coordinator, Work Management Center Manager, Work Window Manager, and Worker.
- All performers and responsibilities identified in this manual.

Work approved before the effective date of this manual may continue until closeout. Work performed on a periodic basis (i.e., repetitive/recurring work), including preventive maintenance (PM)/predictive maintenance (PdM), planning of onsite/field calibrations, test inspections, surveillances et al., must be upgraded to meet the requirements of this manual, in accordance with the normal schedule specified in Y-12 document control procedures, for review and update.

OTHER DOCUMENTS NEEDED

- UCN-21286, *Job Package Revision*
- UCN-21575, *Pre-Job Briefing Checklist*
- UCN-21576, *Post-Job Review Checklist*
- UCN-21579, *Hazard Identification Worksheet (HIW)-Maintenance Activities*
- UCN-21678, *Post-Work Test (PWT)*
- UCN-21696, *Schedule Control Form*
- UCN-21697, *Justification for Critical Work Order List*

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OTHER DOCUMENTS NEEDED (cont.)

- Y12-047, *Integrated Safety Management/Integrated Safeguards and Security Management (ISM/ISSM)*
- Y14-001, *Conduct of Operations Manual*
- Y14-176, *System Equipment and Component Labeling*
- Y15-013, *Change Control Process for Non-Safety Basis Structures, Systems, and Components*
- Y15-101, *Manual for the Management of Records and Controlled Documents*
- Y15-187, *Integrated Safety and Change Control Process*
- Y15-636, *Integrated Safety Management Program*
- Y17-011, *Startup Testing Program Manual*
- Y17-015, *Welding Program Manual*
- Y18-005, *Application of Federal Labor Standards*
- Y18-021, *Physical Asset Management Solution (PAMS)*
- Y71-917, *Y-12 Complex Air Permitting and Compliance Documentation Program*
- Y73-001, *BWXT Y-12 Industrial Safety Program*
- Y73-045, *Job Hazard Analysis Manual*
- Y73-107, *Lockout/Tagout for Personnel Protection*
- Y73-116, *Personal Protective Equipment Program*
- Y73-528, *Electrical Safety Instruction*
- Y74-803, *Change Evaluation/Major Change Determination*
- Y74-809, *Unreviewed Safety Question Determinations*
- Y/IA-417, *Maintenance Planning Guide.*
- Y/IA-422, *List of Pre-Approved Dispatched Work*

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RESPONSIBILITIES

NOTE Managers may designate other position titles to carry out the responsibilities listed for the functional position titles shown in this Manual.

POSITION	RESPONSIBILITIES
Authorizing Manager (AM) (e.g., Operations Mgr., Production Mgr., Building Mgr.)	<ul style="list-style-type: none"> ▪ The person assigned the responsibility and authority for authorizing work. Within this manual, there are two primary authorization points; 1) initial work request authorization, and 2) work package review/approval for scheduling.
Building/Operations/ Production Manager	<ul style="list-style-type: none"> ▪ May serve as an AM. ▪ Prioritize work, using the integrated Prioritization Matrix. ▪ Approve the day-by-day plan-of-week (POW) schedule. ▪ Periodically, reviews open work orders to determine priorities, funding, deletions, or cancellations, etc., to manage the backlog of work.
Division Manager	<ul style="list-style-type: none"> ▪ Institute process that ensures that line managers and supervisors provide oversight of day-to-day work activities by observing work execution, work planning and reviewing work packages. ▪ Ensure that line managers are trained to use this manual and that those line managers use this manual for work control. ▪ Ensure that appropriate worker involvement, feedback, and continuous improvement are part of the work control process. ▪ Conduct oversight activities to ensure this manual is safely, securely and effectively implemented.
Integrated Scheduler	<ul style="list-style-type: none"> ▪ Develop and issue resource-loaded task-level schedules and reports for work activities. ▪ Update and maintain the schedule by participation in standing meetings to update schedule information. ▪ Develop planning schedule for use by planners to prioritize their planning assignments. ▪ Review and analyze schedule task dependencies, task duration, and resources to determine schedule feasibility, and propose resolutions to schedule conflicts and other issues. ▪ Analyze and report on schedule performance metric data in support of process improvement and trending.

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POSITION	RESPONSIBILITIES
<p>Job Supervisor (JS)</p>	<p>The person assigned responsibility and authority by the RM for overall validation, coordination, execution and close-out of a work activity.</p> <ul style="list-style-type: none"> ▪ Validate that workers meet worker qualifications. ▪ Ensure that work start approval is obtained from the Building or Shift Manager in accordance with the Y14-001, Chapter 8. ▪ Conduct workability walk downs for complex work prior to commencing work. ▪ Ensure materials, tools, equipment and PPE for the job is obtained and staged at work location prior to job execution. ▪ Ensure that workers assigned to jobs are appropriately trained, fit for duty, and medically fit. ▪ Ensure that workers understand job and work area hazards and required controls. ▪ Conduct pre-job briefings and post-job reviews. ▪ Ensure safe, secure and compliant performance of the work. ▪ Properly implement changes to WOs. ▪ Resolve issues with the assistance of the Work Window Manager. ▪ Ensure Building or Shift Manager approves Return to Service after completion of PWT in accordance with Y14-001, Chapter 8. ▪ Ensure work is properly completed, including documentation of work history. ▪ Ensure that appropriate worker involvement, feedback, and continuous improvement are part of the work control process. ▪ Ensure minor work activities do not exceed written criteria. ▪ Provide status updates for POD/POW. ▪ Return completed work packages/procedures to WMC. ▪ Provide status updates to the Work Window Manager (WWM) and call WWM if job stops or problems arise. ▪ Review and comply with the locked-in work window schedule. ▪ Route Work Packages requiring welding to the Field Welding Engineer assigned to maintenance, after welding is completed for review and approval in accordance with Y17-015, <i>Welding Program Manual</i>.

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POSITION	RESPONSIBILITIES
Planning Supervisor	<ul style="list-style-type: none"> ▪ Monitor the quality of Work Package Instructions for Minor and Complex Work to ensure that the work packages meet the requirements of this manual. ▪ Ensure planners are trained and qualified commensurate with their assigned responsibilities. ▪ Maintain a current roster for assigned areas of all qualified Planners authorized to plan work packages. ▪ Ensure that appropriate worker involvement, feedback, and continuous improvement are part of the work control process. ▪ Ensure quality work packages are developed to support work priorities.
Procurement Personnel	<ul style="list-style-type: none"> ▪ Place orders for required parts and materials; and track and provide status of orders against promised delivery dates. ▪ Serve as primary interface with the procurement and subcontracting personnel. ▪ Remain proficient in procurement requirements to ensure compliance with these requirements in transactions with outside vendors. ▪ Expedite delivery of parts and materials when necessary to meet the POW schedule. ▪ Coordinate parts delivery with Job Supervisor/WMC to ensure availability for scheduled execution.
Responsible Manager (RM)	<p>The RM is the line manager who has the ultimate responsibility, authority, and accountability for the work activity including security and adherence to commitments of the Y-12 Environment, Safety and Health Policy.</p> <ul style="list-style-type: none"> ▪ Provide oversight and approval of work activities based upon confidence that the work will be conducted safely and securely in accordance with the requirements of this manual; ▪ Assign JSs to work activities identifying their boundaries, roles, responsibilities, and authorities; and, ▪ Approve the quality of complex work packages for new work and model work that are used to perform PM/PdM.

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POSITION	RESPONSIBILITIES
Responsible Planner	<ul style="list-style-type: none"> ▪ Involve the workers who are assigned or potentially could be assigned to the activity, and as necessary, the SMEs throughout the planning process. ▪ Lead the effort to fully define the work. ▪ Using a team of appropriate workers and SMEs, develop the job hazard analysis. ▪ Prepare the work package/procedure to effectively communicate the work scope, while implementing the hazard controls into the associated work steps. ▪ Enter post-work testing instructions into the work package/procedure as identified by the System Engineer. ▪ Use Lessons Learned and work history captured in SAP Master Equipment List to create Job Instructions for Complex New Work. ▪ Use work standards and other source documents to develop Job Instructions for Complex New Work. ▪ List/purchase parts and material needed for Minor and Complex Work as specified by the System Engineer. ▪ Ensure availability of required PPE, unless normally provided by Operations or ES&H. ▪ Route Work Packages requiring welding to the Field Welding Engineer assigned to maintenance, prior to work in accordance with Y17-015, <i>Welding Program Manual</i>.
Security Area Owner (SAO)	<ul style="list-style-type: none"> ▪ Responsible for requesting the establishment, approval, re-approval, and disestablishment of a security area. ▪ Responsible for implementing all security requirements of the security plan for his/her security area of assigned responsibility. ▪ Responsible for requesting and obtaining from Physical Security the required compensatory measures that need to be implemented for maintenance and service work that affects the security requirements outlined in the security plan.
Shift Manager	<ul style="list-style-type: none"> ▪ Serve as an AM to authorize the start of work in accordance with Y14-001. ▪ Approve the Return to Service of SSCs after completion of PWT in accordance with Y14-001, Chapter 8. ▪ Conduct the plan-of-day (POD) meetings. ▪ Overcome barriers to ensure the accomplishment of the POD scheduled work.

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POSITION	RESPONSIBILITIES
<p>SMEs [IH, Environmental, FPE, Shift Technical Advisor (STA), et al.]</p>	<ul style="list-style-type: none"> ▪ Serve on JHA Teams when requested. ▪ Determine hazard controls for JHA identified hazards specific to their area of responsibility. ▪ Identify hold points and steps for those relatively high risk or complex activities that require direct, on-site oversight to ensure protection of workers, facilities, and the environment.
<p>System Engineer</p>	<ul style="list-style-type: none"> ▪ Ensure that work activities for your assigned structures, systems, and components (SSCs) comply with configuration management requirements in accordance with Y15-187, <i>Integrated Safety and Change Control Process</i>. ▪ Provide Job Instructions input for work on assigned SSCs, including: <ul style="list-style-type: none"> ◦ Identify spare parts. ◦ Develop Post-Work Testing (PWT) requirements. ◦ Assist in work package instruction development. ◦ Provide make or buy recommendations. ◦ Authorize vendor data for use. ◦ Permanent or temporary modifications in accordance with Y15-187. ◦ Develop Return to Service requirements. ▪ Define the structures, systems, and components (SSCs) included in the Master Equipment List in accordance with Y18-021, <i>Physical Asset Management Solution (PAMS)</i>. ▪ Maintain the Master Equipment List data up-to-date for assigned SSCs in accordance with Y18-021. ▪ Assist with prioritization of work to maintain SSC reliability and availability.

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POSITION	RESPONSIBILITIES
<p>Work Coordinator (WC) (The work performed by the WC may also be performed by the WWM, as directed by the WMC Manager.)</p>	<ul style="list-style-type: none"> ▪ Use SAP to screen for duplicate requests for work. ▪ Open work orders in SAP. ▪ Confirm the scope of work in a SAP notification by conducting field walk downs, as needed, to ensure work scope is accurately defined. ▪ Serve as single point of contact for work order status within area of assigned responsibility. ▪ Obtain authorization for expending funds on identified work. ▪ Screen the work to determine the appropriate planning method, depending on the complexity and degree of potential work hazards. ▪ Screen work orders against Dispatched Work criteria defined in Chapter 3. ▪ Obtain confirmation from Operations for the plant conditions needed to achieve the work completion, including operational system conditions. ▪ Coordinate resources and obtain required permits, including, but not limited to radiological work permits, lockout/tagout permits, hot work permits, security compensatory measures or plans, etc. ▪ Confirm parts and material availability prior to scheduling work package. ▪ Assist the Work Window Manager in the development of schedules for assigned work windows and the confirmation of "Ready to Work" prior to execution week. ▪ Prepare updates and input through weekly meetings into the schedule, based on customer needs and status of work. ▪ Issue, and close WOs in SAP, as required by SAP. ▪ Ensure that work history recorded in work packages is entered in the SAP Work History section for the SSCs.

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POSITION	RESPONSIBILITIES
Work Management Center Manager	<ul style="list-style-type: none">▪ Serve as focal point for integrating operations and maintenance activities.▪ Coordinate the scheduling of all work activities in assigned facilities including production, maintenance, inspections and modifications/upgrades while integrating these activities with required facilities surveillances, calibrations, and utility outages where work will be performed.▪ Develop schedules that reflect work commitments and associated activities to be accomplished.▪ Manage the schedule change control process to ensure maximum utilization of resources.▪ Monitor maintenance and facility backlog and make adjustments in schedule to reduce backlog and optimize resource utilization.▪ Collect schedule performance metric data.▪ Manage critical work order list, as required.

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POSITION	RESPONSIBILITIES
<p>Work Window Manager (WWM) (The work performed by the WWM may also be performed by the WC, as directed by the WMC Manager.)</p>	<ul style="list-style-type: none"> ▪ Serve as the single point of contact for resolving issues from initiation to completion of work during the work window. ▪ Ensure that feedback and continuous improvement are part of the work control process. ▪ Ensure management priorities for the work window are understood and interpret these priorities for affected organizations so that field work reflects priorities accurately and consistently. ▪ Ensure schedules reflect realistic resource loading and all required craft/support disciplines that will be needed. ▪ Conduct pre-planning meetings. ▪ Coordinate with the implementing organizations to identify work activities as far in the future as possible for effective planning. ▪ Document justification to change the locked-in work window schedule, and approve any such changes. ▪ Ensure operational impacts are identified and that activities are planned around production schedules in the field. ▪ Ensure planned work packages are ready to work (task ready) prior to the execution week. ▪ Ensure that resources are available to support all scheduled work. ▪ Confirm the availability of parts, tools, materials, equipment, and permits prior to Plan-of-Week meeting. ▪ Resolve obstacles to schedule execution. ▪ Resolve field problems between organizations, including frequent interface with organization management as required to solve emerging issues. ▪ Stay up-to-date on the status of the facility and ensure all affected organizations are informed of changing facility conditions. ▪ Prepare and conduct the work window review meetings. ▪ Identify and submit WOs and supporting documentation for records retention.

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POSITION	RESPONSIBILITIES
Worker	<ul style="list-style-type: none"> ▪ Participate in work planning and perform walkdowns/walkthroughs as scheduled. ▪ Review and understand the work and the specific work steps. ▪ Be involved in the work control process and provide feedback to support continuous improvement. ▪ Perform assigned work activities in a safe, secure and efficient manner. ▪ Notify supervisor of inability to perform work or of conflicts in the performance of work. ▪ Follow the procedures and work control documentation as written. If the directions need clarification, stop/suspend work in accordance with Y73-001, <i>BWXT Y-12 Industrial Safety Program</i>, stabilize the situation, contact the supervisor, and resolve the issue before resuming work. ▪ Suspend affected work when any unidentified hazards or security vulnerabilities are encountered or when the job instructions cannot be followed in accordance with Y73-001. ▪ Resume work only when the condition resulting in a Suspend Work has been resolved by the JS in accordance with Y73-001. ▪ Be aware of potential environmental impacts associated with the activity and the controls to eliminate or mitigate the potential impacts.

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WHAT TO DO

A. Understand Integrated Work Control – Overview.

Integrated Work Control is a deliberate process of managing the resources necessary to identify, select, plan, schedule, perform, close and assess the defined scope of work. The vision for the integrated work control process is to optimize structure, system and component (SSC) availability for production activities, while ensuring that the integrity of the work management process is maintained; that the workers, the public, and the environment are safe; and that the work control process is continuously improved.

The integrated work control process provides:

- A method to manage workload and coordinate site resources to perform work.
- A long-range plan that includes maintenance and service work, seamlessly integrated with mission work, to maintain an optimum level of material condition necessary to support mission accomplishment.
- Safe and secure work practices commensurate with the level of risk, using the graded approach.
- A safety and security-conscious culture that understands continuous improvement through the use of worker feedback, corrective actions, and performance indicators.
- The conduct of safe, secure and effective facility and system outages.
- Individual ownership for all aspects of the process.

Excellence in integrated work control requires an environment in which workers, supervisors and managers routinely demonstrate the following behaviors:

- Recognize that work management is a multi-organizational process.
- Take responsibility for the preparation, execution, and results of work activities.
- Provide assistance and mutual support to all users of the IWC process.
- Establishment of high standards and expectations.
- Conduct routine self-assessments.
- Incorporate lessons learned into the process.
- Understand the aggregate effect of ongoing work.
- Demonstrate pride in the work control process.

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A. Understand Integrated Work Control – Overview. (cont.)

This IWCM is designed to enhance Integrated Safety Management System (ISMS) implementation at the activity level. At Y-12 ISMS encompasses safeguards and security topical areas in accordance with Y12-047, *Integrated Safety Management/Integrated Safeguards and Security Management (ISM/ISSM)*. Additionally, in the ISMS the term “safety” encompasses environment, safety and health, pollution prevention, waste minimization, and resource conservation.

Work flow process that directly aligns with the ISMS five core functions. **Figure 1-1** shows the relationship of the ISMS core functions with the process outlined in this manual, along with the correlation to the corresponding chapters.

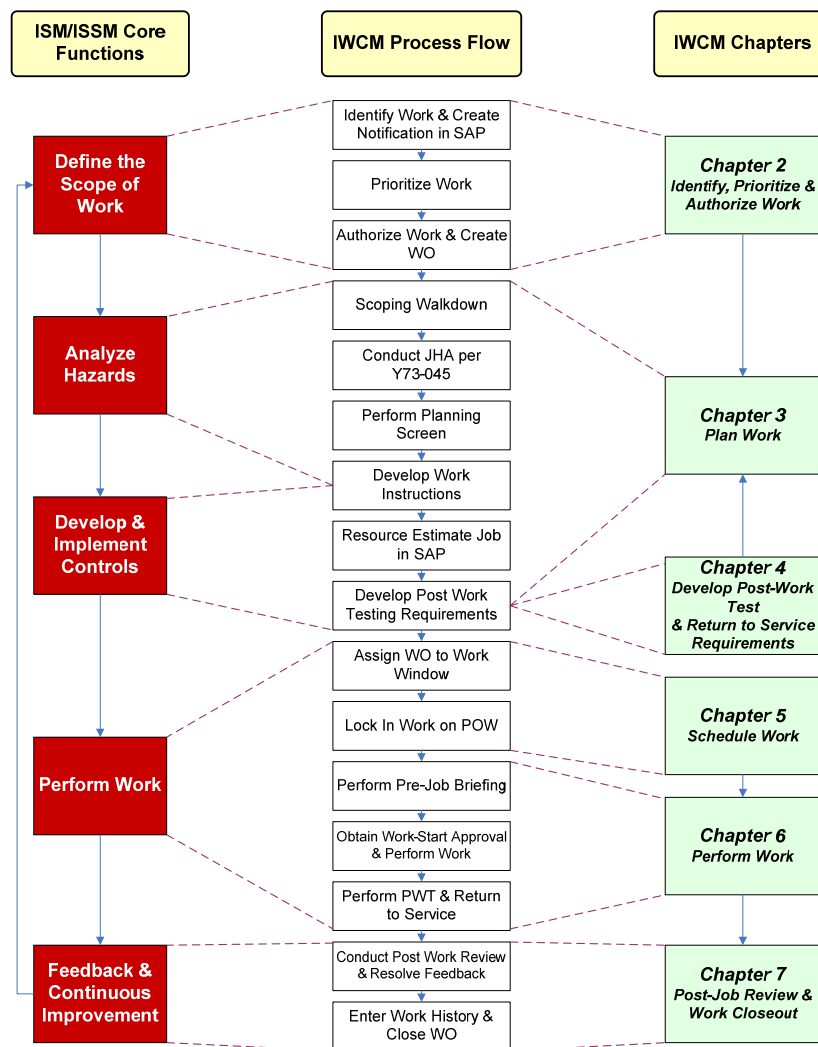


Figure 1-1. Integrated Work Control Manual – Implementation of ISMS Core Functions

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A. Understand Integrated Work Control – Overview. (cont.)

Clear definition of roles and responsibilities. The Responsibilities Section of this chapter describes the roles and responsibilities for personnel affected by this manual. The essence of line management responsible for safety and security is achieved through the following principles:

Authorizing Manager (AM). The authorizing individual at Y-12 for work control activities is generally either the Building/Operations/Production Manager. The work control process outlines two distinctive authorization points: 1) the AM approves the work request early in the process to get the planning process started, and 2) reviews/approves the work package for scheduling.

Responsible Manager (RM). The RM is the line manager responsible for the safety of the worker in the field performing the activity and for the security of any security interests in the area during the activity.

Job Supervisor (JS). Each activity will require the assignment of a JS to oversee and supervise the activity through completion. The JS, generally the first line supervisor, is the individual who is assigned the responsibility and authority for overall work validation, coordination, execution and close-out of the work package/procedure.

Responsible Planner (RP). The RP is the individual assigned the responsibility to establish and document the hazard mitigating controls and work package instructions for a defined work activity prior to work execution.

Subject Matter Experts (SMEs). SMEs are individuals with a combination of academic credentials, recognized work experience, and/or specialized expertise needed to assist in defining the work, identifying and analyzing the hazards or security vulnerabilities, and selecting controls to mitigate the risks.

Reduction of extraneous field paperwork. Work packages/procedures will be focused on providing the craft/worker the right amount of job instructions, based on hazard and complexity, to perform the work safely and securely. Paperwork required only for planning, such as reference material, will not be included in the field work package/procedure, and will be retained in the history file. This allows the craft/worker to focus only on what is actually required, thus reducing the probability of error.

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A. Understand Integrated Work Control – Overview. (cont.)

Figure 1-2 below illustrates the process flow through the IWCM chapters from a decision making perspective. A brief summary of each chapter is also provided.

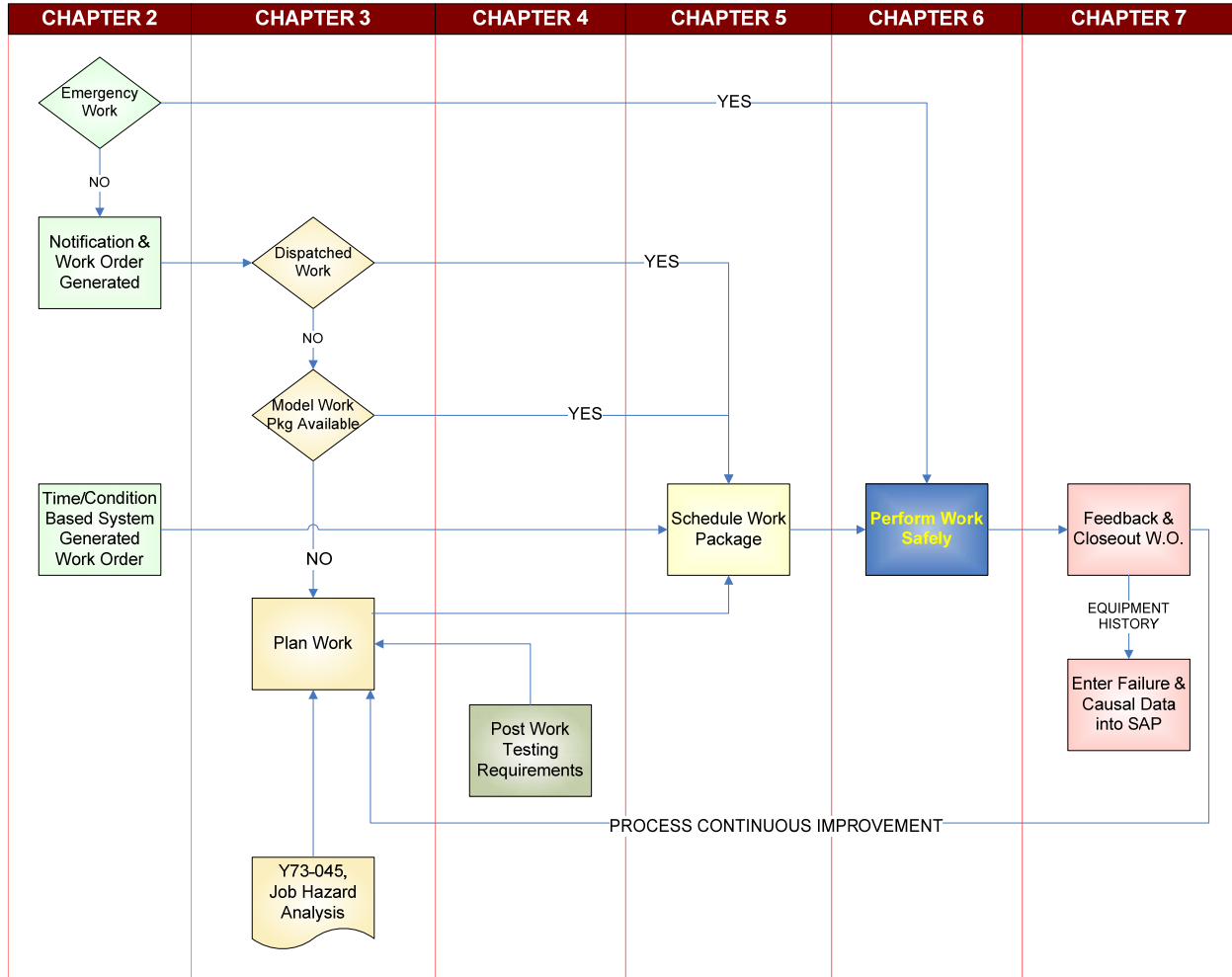


Figure 1-2. IWCM Process Flow

B. Identify, Prioritize and Authorize Work (Chapter 2)

The IWCM implements, and is consistent with the Integrated Work Management System (IWMS) business practices for integrating Maintenance, Operations, Engineering, Planning, Integration and Control (PI&C), and other division programs that support the ultimate goal of maximizing SSC availability in a safe and secure manner.

Chapter 2 defines the process for identification of work through the use of a SAP notification. All maintenance and service work requires a SAP notification to be submitted, screened and authorized prior to any work commencing.

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C. Plan Work (Chapter 3)

Chapter 3 describes the process to ensure the hazards associated with performing work are properly analyzed, and the work is planned to control these hazards such that the workers, the public, and the environment are not harmed. The requirements for Subject Matter Expert (SME) support are included in this chapter.

Y-12 work is planned, using the graded approach, to recognize the hazards and complexity of the work. Within this defined graded approach are three planning methods: **Dispatched Work**, **Minor Work** and **Complex Work**.

D. Develop Post-Work Test (PWT) & Return-to-Service (RTS) Requirements (Chapter 4)

Post-Work Test development and documentation requirements are described in Chapter 4 of this manual. PWT verifies that the SSC can perform its intended function; that the work corrected the original deficiency; and that new or related problems were not created by the work activity. PWT instructions contain acceptance criteria and baseline data that aid in measuring the performance of SSCs, and allow documentation and evaluation of the test data.

Return-to-Service requirements are determined in accordance with Y14-001, *Conduct of Operations Manual*. The Shift Manager/Building Manager uses these to ensure that the required work and testing is completed successfully, and the SSCs have been returned to an acceptable operating condition.

E. Schedule Work (Chapter 5)

Chapter 5 describes the process for scheduling work through the Work Management Centers (WMCs). The WMCs will integrate the schedules which implement the priorities established from the prioritization matrix for facility activities, including production, operations, maintenance, modifications, and upgrades. In addition, required facility surveillances, calibrations, and utility outages are also integrated, as appropriate. The process to develop the Planning Schedules (weeks T-6 to T-2) include weekly meetings to identify planner resource needs and to review up-to-date information on the status of work orders. Work is rescheduled, as needed, based on schedule delays identified by the Responsible Planner, i.e. parts shipment date, engineering equivalency, permits, etc.

The process for developing Execution Schedules during weeks T-2 to T-0 includes Plan-Of-Week (POW) meetings that are held to discuss management commitment for release of equipment, maintenance commitment for execution, completion of load boards, and the completion of package evaluations. The previous week's performance is reviewed for its impact on established metrics and on decisions whether to carryover the work or to reschedule. Scheduling changes are made, as needed.

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F. Perform Work (Chapter 6)

Chapter 6 describes the process by which work is performed, consistent with the requirements of Conduct of Operations. Specifically, it describes the following:

- Assignment of a JS to oversee and manage the work in the field.
- Verification of readiness prior to work start, including ensuring work package/procedure workability, proper training and qualification of workers assigned and pre-job briefing the activity.
- Work authorization and release by the AM (i.e., Shift Manager or Building Manager).
- Procedural compliance to job instructions and working within the scope of the job.
- Appropriate Post-Work Test and Return-to-Service customer acceptance.

G. Perform Post-Job Review and Work Closeout (Chapter 7)

Chapter 7 describes the processes and tools associated with performing a critical analysis of work to ensure that issues, improvements or lessons learned are identified, and incorporated into subsequent work.

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RECORDS

- All records generated as a result of this procedure are maintained in accordance with Y15-101, *Manual for the Management of Records and Controlled Documents*, and established retention and disposition schedules in the Approved Comprehensive Records Schedule at <https://home1.y12.doe.gov/scripts/eicms/prod/SMARTMain.cfm>.

Work Management Center Manager/Designee

- Completed Minor Maintenance Work Packages, including any history files.
- Completed Complex Work Packages, including any history files.
- Completed Post-Work Test Forms contained in Complex Work Package history files.
- Completed and approved UCN-21696, *Scheduling Control Form*
- Completed and approved UCN-21697, *Justification for Critical Work Order List*
- Completed and approved UCN-21286, *Job Package Revision*
- Completed and approved UCN-21575, *Pre-Job Briefing Checklist*

The following is the record retention schedule for records generated in accordance with this procedure.

RECORD TYPE	SSC Grades 1-3 & Federal/State Code SSCs	Grade 4 & Balance of Plant SSCs
Minor Work Package	Intrusive Work: Quality Assurance Lifetime Records	Non-intrusive work on Grades 1-3 and all work on other SSCs: Retain for 1 year after the work package is closed. Then destroy in accordance with Y15-101.
Complex Work Package history files	Quality Assurance Lifetime Records	Retain onsite for 1 year after the work package is closed. Then disposition in accordance with Y15-101.
Post-Work Test Form contained in Complex Work Package history files	Quality Assurance Lifetime Records	Retain onsite for 1 year after the work package is closed. Then disposition in accordance with Y15-101.

SOURCE DOCUMENTS

BWXT Y-12 Standards/Requirements Identification Document (S/RID), Requirement Units: RUID 11467, 11468, 11469, 11470, 11471, 11472, 11474, 11478, 11479, 11480, 11481, 11482, 11483, 11484, 11486, 11487, 11489, 11492, 9935, 9936, 9942, 10560, 10887.

APPENDIXES

Appendix 1-A, *Acronyms and Definitions*

Subject: Integrated Work Control Manual (IWCM)
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APPENDIX 1-A
Acronyms and Definitions
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ACRONYMS

AHJ	-	Authority having jurisdiction
ALARA	-	As Low as Reasonably Achievable
AM	-	Authorizing Manager
CM	-	Corrective Maintenance
DOE	-	Department of Energy
EIS	-	Equipment Inspection Scheduler
EM	-	Emergency Maintenance
FLS	-	Federal Labor Standards
HIW	-	Hazard Identification Worksheet
ISM	-	Integrated Safety Management
ISSM	-	Integrated Safeguards and Security Management
IWC	-	Integrated Work Control
IWCM	-	Integrated Work Control Manual
JHA	-	Job Hazard Analysis
JS	-	Job Supervisor
MM	-	Maintenance Manager
MMPD	-	Maintenance Management Program Description
MSDS	-	Material Safety Data Sheet
MW	-	Minor Work
M&TE	-	Measuring and Test Equipment
NNSA	-	National Nuclear Security Administration
PdM	-	Predictive Maintenance
PM	-	Preventive Maintenance
POD	-	Plan-of-Day
POW	-	Plan-of-Week
PWT	-	Post-work Test
PPE	-	Personal Protective Equipment
PSS	-	Plant Shift Superintendent
RM	-	Responsible Manager
RP	-	Responsible Planner
RUID	-	Requirement Unit Identification
SAP	-	Enterprise Asset Management System Software
SME	-	Subject Matter Expert
SOC	-	Skill-of-Craft
S/RID	-	Standards and Requirements Identification Document
SSC	-	Structures, Systems, and Components
USQD	-	Unreviewed Safety Question Determination
WC	-	Work Center
WMC	-	Work Management Center
WWM	-	Work Window Manager
WO	-	Work Order
YSO	-	NNSA Y-12 Site Office

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DEFINITIONS

ALARA (As Low as Reasonably Achievable): The Y-12 policy that requires operations to be conducted in such a manner that internal or external personnel exposure to biological, chemical, physical, or radiological hazards or discharges to the environment are ALARA.

Backlog: A measurement of available time in crew-weeks for maintenance work (i.e., corrective, preventive and predictive) that is planned and estimated in SAP.

Categorical Exclusion: A category of excluded actions covered by pre-approved DOE documents, for which the NEPA Coordinator can make a determination without further review by DOE.

Close Work: Completion of documentation for finished work.

Complex/High Risk Tasks: Tasks that require one or more of the following:

- Resolution of conflicting PPE for hazard controls;
- Detailed, sequential job instructions;
- Complex coordination between crews and/or craft types;
- Involve the work of more than one crew at the same time on unrelated tasks; or
- Require a high hazard grade in accordance with Y73-045, *Automated Job Hazard Analysis*.

Complex Work: Work that does not meet the criteria for *Dispatched Work* or *Minor Work*, thereby, requiring the development of a WO with written job instructions, checklists, and/or other documentation.

Configuration Management: Configuration Management is an integrated management process that establishes (1) the requirements, (2) the design/operations documentation, and (3) the physical/functional configuration of a structure, system, or component (SSC) and maintains the consistency among these items as changes are made.

Corrective Maintenance (CM): Those actions executed to restore to service failed or malfunctioning SSCs, which are no longer capable of performing their design function, or to correct a deficiency.

Cost Object: A charging entity, which may be a cost center or work breakdown structure.

Credited Safety Feature: A feature of an SSC that is credited with preventing or mitigating the effects of a safety basis accident. Examples of credited safety features include pipe geometry in fissile solution systems, drain holes in some cabinets in large geometry exclusion areas, and closure time of certain isolation valves.

Credited Safety Function: A function performed by an SSC that is credited in the facility safety basis with preventing or mitigating the effects of a safety basis accident. Examples of safety functions are pressure relief for a vessel capable of exploding, fire suppression (sprinklers) in some facilities, and moderation control in some fissile processing areas.

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Deferred Maintenance: Maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period and reported annually.

Deficiency: A deficiency is any condition that deviates from the design of an SSC and results in a degraded ability of the SSC to perform its design function.

Dispatched Work. Work that involves a work scope that is predefined in Chapter 3 and in Y/IA-422, *List of Pre-Approved Dispatched Work*, such that workers can perform the work using existing skills or qualification with no specific work instructions.

Emergency Work: Emergency Work is defined as work that requires immediate action to prevent a fatality or serious injury, irreparable harm to the environment, serious loss of property, or breach of security.

Emergency Response (ER): A specific set of actions executed immediately to mitigate and stabilize specific events, such as radiological and environmental releases, fires, explosions, injuries or illnesses, using emergency response procedures or training, rather than the work control process.

Estimated Work: Work for which the estimate of the labor hours is based on historical data and/or engineering standards.

Fire Barrier: A listed component or assembly, tested and approved by an independent, nationally recognized testing laboratory as having a designated fire resistance rating in hours that is designed to prevent the spread of fire, or identified in the facility-specific Fire Protection Engineering Assessment.

Functional/Operational Check: Post-work Test that uses standard practices, as well as craft skills and knowledge, and requires no formal documentation to demonstrate that SSCs operate in a manner which enables them to perform their design function.

Hazardous System Boundary: The containment boundary of systems such as those:

- containing hazardous chemical solutions at any pressure;
- containing flammable liquids or gas;
- containing steam or cryogenic liquid;
- with temperatures equal to or greater than 125 degrees Fahrenheit;
- under hydraulic pressure;
- containing nuclear or radiological materials;
- with high intensity light rays such as those produced within some fiber-optic cabling;
- containing any gases that have the potential of creating a hazardous atmosphere, based on the working conditions;
- containing water under pressure that creates hazards to employees performing the specific task;
- with mechanical motion that may be caused by residual or stored energy;
- total flooding gaseous fire suppression; or
- exposed, energized electric circuits over 50 volts in accordance with Y73-528, *Electrical Safety Instruction*.

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Hold Point: A point identified within an inspection plan, procedure, or instruction, beyond which work must not proceed until the requirement for the hold point has been satisfied.

Intrusive Work: Work that breaks containment of an SSC; has the potential to make the system or equipment inoperative; and/or impairs the proper functioning of a system or equipment, such that post-work testing is required in order to determine that it has been returned to an operative status.

Job Hazard Analysis (JHA): A process for conducting hazard identification and analysis for work to include identification of appropriate hazard controls.

Job Task Briefing: A process in which the Job Supervisor personally interfaces with the workers as they are assigned work activities that are categorized as Minor Work. The purpose of the job task briefing is to have the Job Supervisor discuss with the workers/crafts the hazards, controls, correct tools/equipment and techniques to be used, and stop work authority. The job task briefing does not require formal documentation.

Kitting: The staging of parts and materials prior to work start; such that, parts and materials needed for a specific WO are delivered to a location adjacent to the work area packaged as a kit, and not co-mingled with other materials.

Labor Standards (LS): A general term, used to describe the Y-12 application of the Davis-Bacon Act and McNamara-O'Hara Service Contract Act required by the Y-12 contract with DOE.

Laydown Area: An area on or close to the work site that is designated and approved by the Shift Manager/Building Manager to be used by personnel to store the material and equipment to be used on the work for the duration of the work.

Lockout/Tagout: The process of hazardous energy isolation and control of equipment and systems for the protection of personnel.

Maintenance Department Manager: A department manager responsible for personnel who perform maintenance work.

Minor Work: Work that involves a work scope that is bounded by written criteria, such that workers can perform the work using existing skills or qualification with minimal work instructions. Like DW, workers are responsible for implementing safe and compliant work practices based on their training, qualification, or certification.

Model Work: Model Work is a mechanism to input efficiency into the Complex Work process for repetitive type activities. Activities that have duplicate or very similar work scopes with equivalent hazard controls should be made into Model Work packages to prevent the need for re-planning the next time the activity is performed. Model Work packages are pre-approved and verified to be adequate for the requested work scope prior to issuance.

Modification: A planned and controlled alteration to permanent SSCs, including improvements, upgrades, and temporary modifications.

Non-Intrusive SME Support Activities: Activities such as scoping walk downs, surveys, inspections, sampling, et al. performed by SMEs that do not involve breaking containment of an SSC, potentially making the SSC inoperable, and/or impairing the proper function of the SSC.

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Obtaining Plant Conditions: A verification process to ensure that the SSCs, support services, and permits required for the performance of the work are now or will be available, such that scheduled work may be started and completed safely and securely and without interruption.

Part Number: A unique number that establishes the identification of parts and material.

Physical Assets: All DOE-owned or DOE-used and controlled land, land improvements, structures, utilities, motor vehicles, equipment, and components.

Planning Method: The graded approach used for planning *Minor Work* and *Complex Work*, tailored to the degree of safety, security, health, or environmental risk.

Plan-of-Day (POD): The document issued daily by the operations manager that contains all scheduled and planned activities in the operations area. The POD assists in the control of surveillances, maintenance, testing and all other activities affecting systems operations within the operations area.

Plan-of-Week (POW): POW meetings that are held to discuss management commitment for release of equipment, maintenance commitment for execution, completion of load boards, and the completion of package evaluations. The previous week's performance is reviewed for its impact on established metrics and on decisions whether to carryover the work or to reschedule. POW meetings may be conducted each week or as often as necessary.

Post-work Test: A test performed upon completion of work to demonstrate that:

- The original deficiency has been corrected.
- Operability of the SSC has been restored.
- No new deficiencies have been created.

Practical Estimate: An estimate of man-hours and materials required to complete a scope of work, based on practical experience.

Pre-Job Briefing: A documented meeting, attended by designated performers of specific work, to discuss appropriate personal protective equipment requirements, health and safety precautions, security requirements, individual roles and responsibilities, and other pertinent work information prior to starting work.

Predictive Maintenance (PdM): Those actions necessary to monitor SSC performance, analyze parameters, and determine trends for the purpose of predicting when an SSC is approaching a condition in which it may no longer be capable of performing its design function.

Prioritization Matrix: A matrix that scores SSC Condition or Need Driver versus the SSC Classification to determine the integrated priority for performing the work.

Priority: The number 1 through 5 assigned to work, based on the score from the Prioritization Matrix.

Quality Assurance (QA) Requirements: Actions specified in procedures that provide confidence that quality will be achieved.

Repair: A repair is an activity that restores an SSC to a condition such that it can perform its design function.

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Return to Service: An SSC status change, in accordance with the Conduct of Operations Manual, Chapter 8; whereby, the Building/Shift Manager confirms that the SSC deficiencies have been resolved; that lockouts/tag outs that would affect equipment or system operability have been cleared; that alignment sheets have been completed; that tests required by the approved work document have been satisfactorily completed; and proper housekeeping has been performed.

Routine Maintenance: Maintenance activities such calibration, refurbishment, corrective and preventive maintenance requiring at the most replacement with like-for-like or equivalent components, and housekeeping. New installations or modification work are not considered routine maintenance.

Safety Basis Accident: Safety basis accidents are accidents identified in a Safety Analysis Report that have the potential to injure workers and/or the public. They are usually accidents like fires, explosions, nuclear criticality, etc. Standard industrial hazards, such as falls, electrical hazards, and exposure to common chemicals like nitric acid are generally not considered to be safety basis accidents.

Safety Class SSCs: – In accordance with Y15-001, Safety Class SSCs include portions of process systems, whose preventive and mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined by safety analysis. These SSCs are generally graded an SSC Grade 1.

Safety Significant SSCs: – In accordance with Y15-001, Safety Significant SSCs are not designed as safety class, but their preventive function is a major contributor to defense in depth and/or worker safety, as determined from safety analysis.” These SSCs are generally graded an SSC Grade 2.

Skill-of-the-Craft (SOC): The level of knowledge and skill attained by employees that allows them to perform work safely and effectively based on their training, qualifications, experience, and judgment.

Standards/Requirements Identification Document (SRID): BWXT Y-12 developed list of environmental, safety, and health (ES&H) high level safety work control requirements with which to guide work activities in the Y-12 National Security Complex.

Step-by-Step Compliance: Process of performing work in a specific sequence without deviation from the order of steps prescribed in the work package instructions.

Structure, System, and Component (SSC): A term used to refer collectively to:

- *Structures* – elements that provide support or enclosure such as buildings, freestanding tanks, basins, dikes, and stacks;
- *Systems* – collections of components assembled to perform a function such as piping, heating, ventilation, fire protection, and air conditioning; and
- *Components* – elements of a system such as pumps, valves, relays, and motors.

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Subject Matter Expert (SME): An SME is an individual with technical expertise and knowledge in a specific work area, i.e., System Engineer, Building Manager, Shift Technical Advisor, Craftperson, etc.

Task: A single activity performed without interruption in its sequence of actions.

Temporary Modification: Temporary alterations made to SSCs that are included in the Y-12 Configuration Management Program or at the discretion of the Ops Mgr/System Owner, that do not conform with approved drawings or other design documents, in accordance with Y15-187, *Integrated Safety and Change Control Process*.

Troubleshooting: The process of locating and identifying SSC malfunctions through deductive and inductive reasoning in order to determine an effective means to restore SSCs to a condition whereby they can perform their design functions.

Vital Safety System: Safety-class systems, safety-significant systems, and systems that actively perform an important defense in depth safety function.

Walkdown: An event where participants physically visit the area where the job will be performed to clarify the scope of the work and/or analyze the hazards associated with the work.

Walkthrough: A round table discussion of the hazards of a job provided that all persons participating are knowledgeable of the area and the hazards associated with the work. This must be agreed upon by all participants.

Waste Generator: Any person, whose act or process, produces waste or causes a material to become a waste.

Work Center (WC): A focused area of responsibility that is administered by a supervisor and a certain number of workers who are dedicated and aligned to serve a specific need.

Work Management Center (WMC): The organization responsible for implementing the integrated work control process for specific customers.

Work Package: A Work Order and associated documentation, which is required for performance of work activities in accordance with this Manual.

Work Package Instructions: Written information, including precautions, prerequisites, list of tools, parts, and materials, permit provisions, hazard controls, and action steps, needed to perform work.

Work Package Review: A review to ensure that the job instructions include the permit provisions, controls for identified hazards, the instructions for performance of the work, and the post-work test and return to service requirements and security plan requirements.

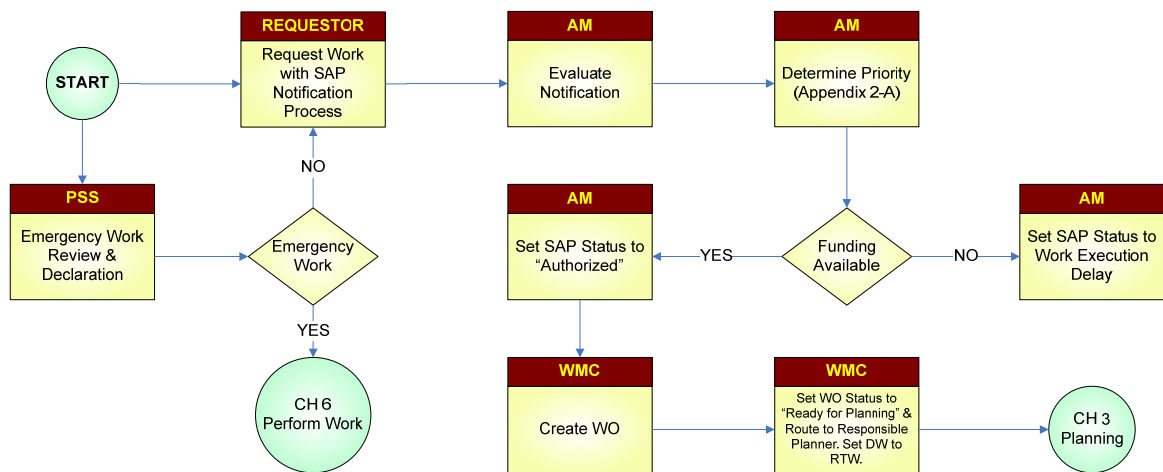
Work Scope: The written definition of the work to be performed that defines the customer authorized requirements and boundaries, includes the symptoms, and/or solutions, and is sufficient to determine potential safety, security, health, and environmental issues.

Work Start Approval: The authority defined in Conduct of Operations for the Building or Shift Manager to release SSCs to personnel to start authorized work, after verifying that current work site conditions have not changed from those defined in the approved work package.

WHAT TO DO

The Work Management Centers are staffed to ensure that:

- The graded approach is used to screen the work in order to determine the appropriate planning method, depending on the complexity and degree of potential work hazards
- The scope of the work is well defined in a SAP notification.
- The work is prioritized, using an integrated Prioritization Matrix.
- The work is selected and authorized for expending funds or is postponed.
- Work Orders (WOs) are created using the SAP for authorized notifications.



A. Identify Emergency Work.

The first step in the planning process is to determine if a true emergency does or does not exist. True emergencies such as spills, fires, explosions, vehicle accidents, injuries and illnesses, etc. require emergency response, rather than a methodical evaluation of scope and hazards. Emergency responses are performed by trained professionals such as Emergency Medical Technicians and follow emergency response procedures rather than this manual.

Once a determination has been made that an emergency response is not required or has been completed, an activity is evaluated to see if it involves emergency work. Emergency work requires immediate action to prevent serious personal injury, harm to the environment, or serious loss of property or breach of security. Before emergency work can commence, the Plant Shift Superintendent (PSS) must assess the situation and make a formal declaration of Emergency Work. Emergency Work normally falls into Priority 1 work per Appendix 2-A, Prioritization Matrix, but can be Priority 2 work as determined by the PSS.

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A. Identify Emergency Work. (cont.)

Plant Shift Superintendent (PSS)

1. IF required, THEN formally declare activity as emergency work.
2. Ensure that the emergency work continues uninterrupted until the emergency condition is stabilized.

NOTE Chapter 6 provides further guidance for the performance of Emergency Work.

3. Implement the following compensatory measures to control the performance of emergency work:
 - Designate job supervisor to provide direct field supervision of the emergency work activity.
 - Identify Subject Matter Expert (SME) support that will provide on-site direction and oversight during the performance of emergency work.
 - Ensure the job supervisor remains available at the affected site of the work to immediately resolve issues or problems as they occur until the emergency work is stabilized.

B. Identify Work and Create Notification.

Y-12 Personnel/Projects Requesting Maintenance or Services

NOTE 1 Time/condition-based SAP generated work orders do NOT require generation of notifications, unless new equipment is involved.

NOTE 2 A notification for service work can be entered using unclassified SAP WEB interface for the following maintenance support or areas of service:

- Maintenance
- Utilities Maintenance
- Plant Services
- Computer Services
- Calibrations and Inspections
- Garage Services
- Engineering Services
- Equipment requests for new items
- Sign Shop
- Develop Model Job Packages

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B. Identify Work and Create Notification. (cont.)

Equipment Owner/System Engineer/Designee

NOTE 3 Designated users of Classified SAP may bypass the WEB interface and directly enter notifications.

1. Create a notification in unclassified or classified SAP and record information that defines requested work, as appropriate:
 - Consequences of NOT fixing the problem
 - Cost object
 - Date of failure
 - Detailed description of requested work
 - Location of needed work
 - Master Equipment List (MEL) unique identification number for SSCs involved in the work
 - "Need" date for completion
 - Requestor's badge, building, and phone number
 - Suggested solution or repair
 - Known hazards, required permits, access restrictions, etc.
 - Component identification to lowest tier

Authorizing Manager

NOTE Notifications must be authorized before resources can be expended. In some cases, Building/Operations/Production Managers may want to delegate authorization authority to the WMC for some types of work.

2. Establish the appropriate authorization process for notifications, in accordance with pre-approved WMC/Building/Operations/Production Manager authorization agreements.

Building/Operations/Production Manager/Designee

3. IF the required criteria on UCN-21697, *Justification for Critical Work Order List*, is met, THEN fill out the form.
4. Route the UCN-21697 form to the Work Coordinator.

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C. Evaluate Notification and Prioritize Work.

Work Coordinator

1. IF UCN-21697, *Justification for Critical Work Order List*, is received, THEN route the form for appropriate evaluations and signatures.
2. Evaluate SAP notifications for:
 - **Validity** – Determine whether an existing work order covers the scope of the requested work. IF requested work is NOT valid because it is redundant to existing work, or for other reasons, THEN reject the notification.
 - **Completeness** – Ensure all required fields are completed
 - **Work Scope** – Work scope is understandable and boundaries are well defined

Authorizing Manager

3. Evaluate SAP notifications for:
 - **Cost Object** – Verify that the cost object is correct and open to resolve the task
 - **Security Needs** - Determine the work necessary to assure compliance with security requirements as determined by Safeguards and Security
 - **Correct Unique Equipment Identification Number** – from the SAP Master Equipment List.
 - **Safety Basis** – Impact of deficiency on the ability of the SSC to perform safety basis functions, such as Vital Safety Systems.
4. Evaluate each notification using the Appendix 2-A, *Prioritization Matrix*, to establish the Priority (1 through 5) for the work.
5. Notify the Work Coordinator concerning which Work Orders are to be worked, delayed or rejected.

D. Defer or Authorize the Notification.

Authorizing Manager/Designee

1. IF the Work Order is to be delayed, THEN set SAP status to “Postponed” for future periodic review.
2. IF the Work Order is rejected, THEN set the status in SAP to “Rejected.”
3. IF the Work Order is to be worked, THEN authorize the notification AND set SAP status to “Authorized.”

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E. Create Work Order (WO).

Work Coordinator

1. Create Work Orders from authorized notifications using SAP.
2. Assign each WO to the appropriate Work Center and Planner for planning, as described in Chapter 3 of this manual.
3. Discuss the priority of the WO with the Building/Operations/Production Manager, as needed, AND assign the appropriate Priority (1 through 5) using the Appendix 2-A, *Prioritization Matrix*.
4. Input the appropriate Priority number in SAP.
5. Input into SAP the appropriate Revision Week in accordance with Chapter 5 of this manual to establish when the planning should be complete.
6. Assign the appropriate Maintenance Activity Type, i.e., PM, corrective, service, modification, etc., AND input it into SAP.
7. Change the SAP status of WOs to be planned to “Ready for Planning” AND GO TO Chapter 3 in this manual.

APPENDIX

Appendix 2-A, “Prioritization Matrix”

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**APPENDIX 2-A
 Prioritization Matrix
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SSC CLASSIFICATION		SYSTEM/EQUIPMENT CONDITION OR NEED DRIVER					
		Emergency: Immediate threat to life, health, security, or the environment	System or equipment has failed such that it is incapable of performing its designed function and compensatory measures are NOT available to maintain operations.	<ul style="list-style-type: none"> System or equipment has failed such that it is incapable of performing its designed function and compensatory measures are available to maintain operations. Calibration or PMs necessary for the operation of the equipment within its required specifications is overdue and preventing the use of the equipment. 	<ul style="list-style-type: none"> System or equipment can still perform its designed function but failure is imminent (unit is not expected to be able to operate without failure until a regularly scheduled outage period) <u>OR</u> Work on existing operational systems or equipment designed to modify or enhance capabilities 	Pre-planned Re-occurring Work: (PMs, PdMs, Calibrations, Tests, Inspections) that require scheduled equipment or system outages for work to be performed	<ul style="list-style-type: none"> “Scheduled” Safety Work “Scheduled” Security Work Minor Deficiencies that do not prevent the System/Equipment from performing its designed function, <u>OR</u> Pre-planned Re-occurring work: (PMs, Calibrations, Tests, Inspections) that do NOT require scheduled equipment or system outages for work to be performed
		100	10	8	6	4	2
Vital Safety System	10	1000	100	80	60	40	24
Passive SSC-1 or SSC-2	9	900	90	72	54	36	22
Mission Essential Active Current Requirement	8	800	80	64	48	32	16
Mission Essential No Current Requirement	7	700	70	56	42	28	14
Minor Security System/Component	6	600	60	48	36	24	12
Balance of Plant Systems	5	500	50	40	30	20	10
Building & Structures & Support Systems	4	400	40	32	24	16	8
Mission Essential – Inactive-Warm Standby	3	300	30	24	18	12	6
Grounds / Tools / All Other	2	200	20	16	12	8	4
Mission Essential – Inactive-Cold Standby	1	100	10	8	6	4	2

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Normal Scheduling Guidance**

Priority:

1	Red (1000 – 90) Begin immediately and work around the clock
2	Yellow (80 – 42) Schedule at earliest opportunity
3	Orange (40 – 24) Schedule at next opportunity in accordance with Chapter 5 of this Manual
4	White (20 – 4) Schedule as resources allow at next opportunity in accordance with Chapter 5 of this Manual
5	Green (2) Work only when time allows (fill in activity)

**Exceptions to normal guidance will be controlled and approved by WMC Manager.

WHAT TO DO

A. Understand How Work Is Planned – Overview.

Work Coordinator and Responsible Planner

1. Apply the graded approach to planning Y-12 maintenance and service work based on hazard and complexity.

There are three basic planning methods: Dispatched Work, Minor Work and Complex Work. Dispatched Work is predetermined work that falls within the skill of the craft/worker that requires no formal planning. Minor Work is work that also falls within the skill of the craft/worker, but requires some level of minimal work instructions. Complex Work is work with increased complexity requiring more detailed work instructions. **Figure 3.1** illustrates this graded approach based on hazard and complexity as it applies to work planning.

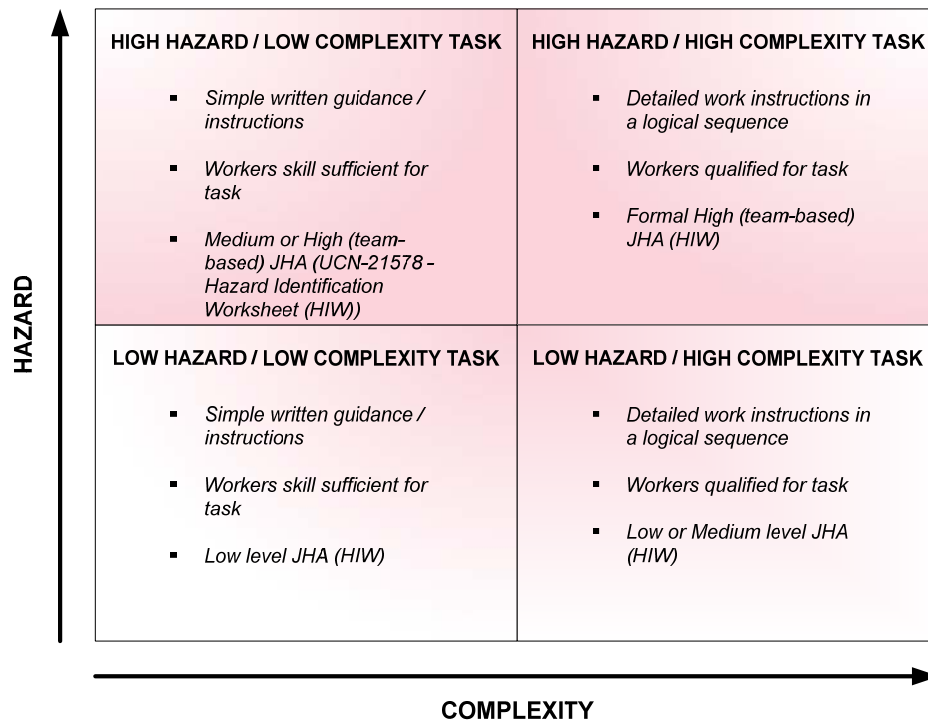


Figure 3.1. Graded Approach to Planning

Dispatched Work (DW) - DW involves a work scope that is predefined in Y/IA-422, *List of Pre-Approved Dispatched Work*, such that workers can perform the work using existing skills or qualification with no specific work instructions. Workers are responsible for implementing safe and compliant work practices based on their training, qualification, or certification. The scope statement of the job provides enough detail for the performance of the work. Formatted instruction steps are not used for DW.

A. Understand How Work Is Planned – Overview. (cont.)

Work Coordinator and Responsible Planner

Minor Work - Minor Work involves a work scope that is bounded by written criteria, such that workers can perform the work using existing skills or qualification with minimal work instructions. Like DW, workers are responsible for implementing safe and compliant work practices based on their training, qualification, or certification. The scope statement of the Minor Work package generally provides enough detail for the performance of the work, but written work steps may be used to provide further clarification.

Complex Work – Complex Work by definition requires more coordination than Minor Work. Therefore, all Complex Work requires more detail in the development of work instructions and will be categorized into one of the following:

- **Model Work** – Model Work is a mechanism to input efficiency into the Complex Work process for repetitive type activities. Activities that have duplicate or very similar work scopes with equivalent hazard controls should be made into Model Work packages to prevent the need for re-planning the next time the activity is performed. Model Work packages are pre-approved and verified to be adequate for the requested work scope prior to issuance.
- **New Work**– Complex Work without a pre-approved Model Work package, by definition is categorized as New Work. New Work must be planned by accessing the SSC on the SAP Master Equipment List, and creating a new work package. Manufacturer recommendations; applicable codes, standards and requirements; SME and system engineering input; worker knowledge; and standard technical procedures, are used as a basis for formulating the work package, such that the quality of the work package is assured.

Troubleshoot and Repair (TS&R)– TS&R work may be either Minor or Complex Work. Y/IA-417, *Maintenance Planning Guide*, provides detailed guidance for preparing the TS&R work package instructions.

TS&R work packages are used when:

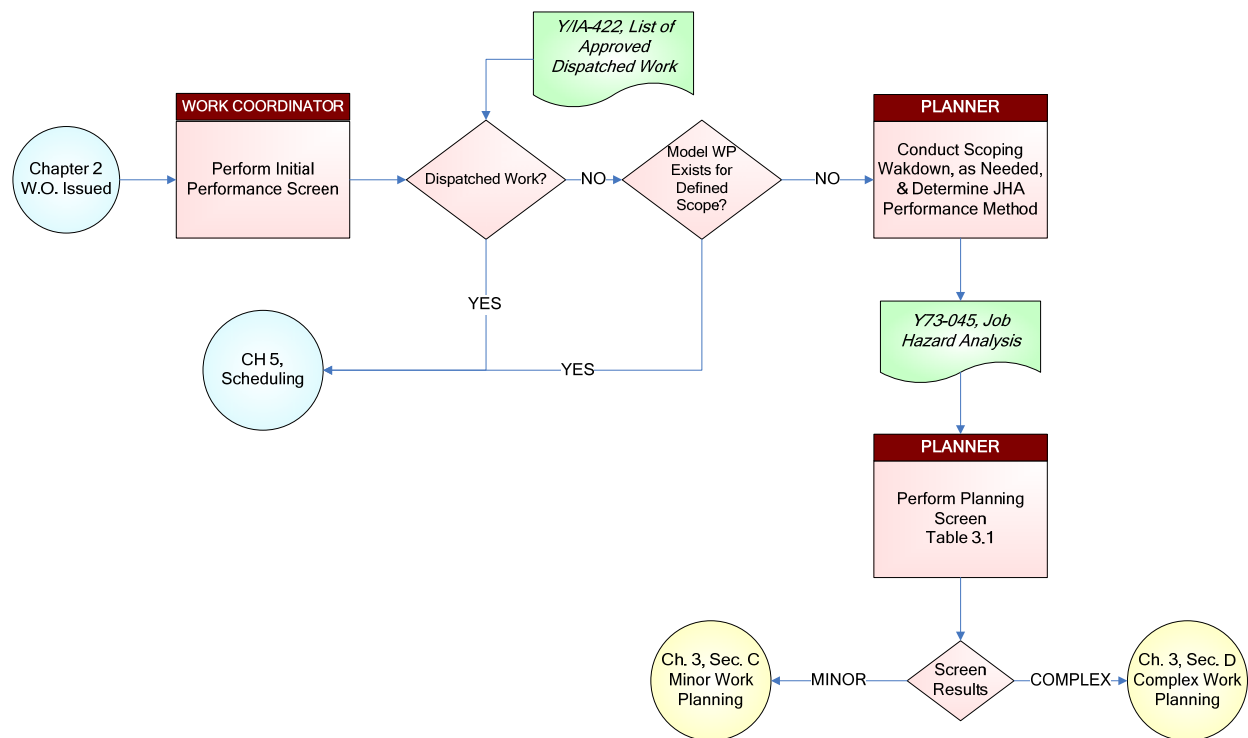
- The problem is unknown.
- The proper repair method is unclear, or
- When trying to correct the root problem and not just the symptom of the problem.

TS&R work package instructions are written with defined boundaries to troubleshoot the problem:

- To define and document the cause of failure.
- To clearly define the boundaries of the work needed to correct the failure.
- To define the steps to repair the failure.
- To document the corrective action taken to prevent recurrence.
- To define the required Post-Work Test.

2. Ensure that the content and format of all minor and complex maintenance work packages are developed in accordance with this manual and Y/IA-417, *Maintenance Planning Guide*.

B. Determine Planning Method.



Work Coordinator

1. Review the work order (WO) against the Dispatched Work list provided in Y/IA-422, *List of Pre-Approved Dispatched Work*.
2. IF the work is categorized as Dispatched Work (DW), THEN GO TO Chapter 6 for work execution.

NOTE Consultation with the Responsible Planner and/or Job Supervisor may be necessary to determine applicability of Model Work Packages.

3. IF the work is NOT DW, THEN determine whether the work is covered by an approved Model Work Package.
4. IF the maintenance work is covered by an approved Model Work Package, THEN use the approved Model Work Package for performing the requested work.
 - a. Perform a walkdown/walkthrough, as needed, to determine whether the existing scope, hazard analysis and controls, and work package instructions are adequate to perform the requested work safely and securely.

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B. Determine Planning Method. (cont.)

Work Coordinator

- b. Verify that the hazards and site conditions have not changed, and that the work steps adequately address the necessary controls to mitigate all known hazards.
 - c. Verify that permits required to perform the work remain valid, or obtain new permits.
 - d. Ensure that the provisions of the permits required for the work are appropriately addressed in the work package instructions.
 - e. Schedule the work in accordance with Chapter 5.
5. IF an approved Model Work Package does NOT cover the work, THEN notify the Responsible Planner.

Responsible Planner

NOTE The appropriate workers, SME and/or System Engineer should be involved in the walkdown/walkthrough exercise, as needed.

6. IF a scoping walkdown/walkthrough exercise of the area is needed to further define the work scope, THEN perform the scoping walkdown.
 - a. Ensure that you possess an understanding of the facility and walkdown/walkthrough hazards and are current on the training requirements for entry into the affected areas, including any specific training required to perform the walkdown/walkthrough.
 - b. IF the work is inside limited areas, vaults, vault type rooms and cages, modular storage vaults, or material access areas, THEN contact the Security Area Owner (SAO) to determine whether the scope of work impacts the security plan and to determine any applicable compensatory actions.
 - c. Inform the Shift Manager/Building Manager prior to conducting a scoping walkdown.
 - d. Identify the following during the walkdown/walkthrough exercise:
 - Basic work steps for accomplishing the assigned scope, i.e., “what to do.”
 - Mechanisms/approaches for completing assigned scope, i.e., “how to do it.”
 - Established boundaries for completing the assigned scope, i.e., “where to do it.”
 - Whether the work is inside limited areas, vaults, vault type rooms and cages, modular storage vaults, or material access areas.

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B. Determine Planning Method. (cont.)

Responsible Planner

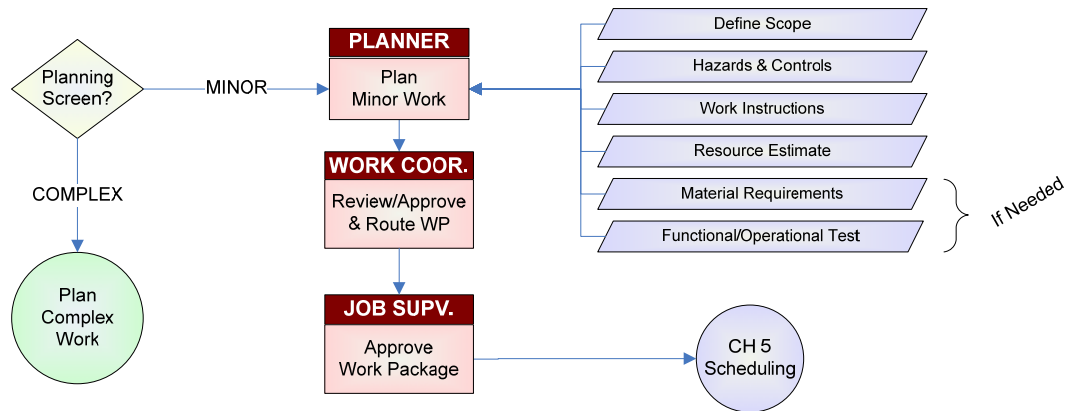
NOTE The result of the JHA process will be the hazards and controls identified by the HIW or AJHA and these will be incorporated into the Work Package.

7. Perform a JHA in accordance with Y73-045, *Job Hazard Analysis*.
8. Determine the appropriate planning method by using the defined scope, approved JHA and the criteria in Table 3.1, *Planning Process Screen*.

Table 3.1. Planning Process Screen	
a.	The work scope is defined in sufficient detail such that detailed work instructions are NOT required. <i>In answering this question, the Planner should consider whether detailed work instructions would add value or help ensure work is performed safely. Does the worker possess the requisite knowledge to perform the work safely without detailed work instructions?</i>
b.	The work involves routine tasks that have been performed previously within the last 18 months, and workers are qualified to complete the assigned task(s).
c.	The work can generally be completed in one work-week or less. Work scopes that have multiple tasks requiring extensive time to complete should be planned as Complex Work.
d.	The organization performing the work will NOT require the coordination of more than 3 separate outside supporting organizations (e.g., RadCon, Engineering, Fire Department, et al).
e.	The work will NOT result in a modification on a configuration controlled SSC Grade 1 or 2.
f.	Material substitutions will NOT be involved. Like-for-like replacements or engineering equivalencies are allowed as Minor Work.
g.	The work will NOT result in a High-level JHA as defined in Y73-045.
h.	The work will NOT require a post-work testing (PWT) beyond a functional/operational check.
i.	The work will NOT be troubleshooting and repair of SSC Grades 1 or 2.
j.	The work will NOT degrade the operability of Fire Suppression, Alarm, or Detection Systems, Equipment or Components.
k.	The welding work is "incidental welding." It does NOT require a weld map, sketch, or drawing and a welding package to be generated, i.e., weld inspection report, welding procedure specifications, etc., in accordance with Y17-015, <i>Welding Program Manual</i> .

9. IF ALL criteria in Table 3.1 are satisfied, THEN plan the job as Minor Work in accordance with Section C of this Chapter.
10. If ANY criteria in Table 3.1 are NOT satisfied, THEN plan the job as Complex Work in accordance with Section D.

C. Plan Minor Work.



Responsible Planner

1. Determine if the application of Y74-809, *Unreviewed Safety Question Determinations*, or Y74-803, *Change Evaluation/Major Change Determination*, is required.
 - a. Answer NO, if the work requested is:
 - Exempted by Y74-809/Y74-803 or considered to be routine maintenance (see Y74-809, Appendix A for definition), OR
 - Greater than 200 feet from a facility having safety basis (SB) documents AND will not affect such facility.
 - b. Answer YES, if the work requested does NOT meet the criteria listed in either bullet above, and the application of Y74-809 or Y74-803 is required, THEN contact Shift Manager (SM) for further guidance.
2. Perform an initial rough order estimate of resources and cost and enter data into SAP.
3. Screen work orders to determine the applicability of Federal Labor Standards (FLS), in accordance with Y18-005, Appendix A, *Guidelines for Davis-Bacon Non-Covered Work*.
 - a. IF applicability of FLS is NOT clear OR IF the work scope appears to be potentially covered under FLS, THEN provide scope and cost information to the Site Labor Standards Committee (SLSC) for review and disposition.
 - b. IF the work is covered by Davis-Bacon, THEN forward the request for work to Projects for processing.
 - c. IF the work is NOT covered by Davis-Bacon, THEN continue processing the work order as Complex Work.

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C. Plan Minor Work. (cont.)

Responsible Planner

4. IF the work is NOT covered under the NEPA categorical exclusion for maintenance activities (CX-GEN-011) and under the Cultural Resource Exclusion (NHPA) per Y71-917, THEN submit a NEPA checklist to the NEPA program office for review.
5. Plan the Minor Work package as follow:
 - a. IF the Hazard Identification Worksheet (HIW) identifies only Low hazards, THEN attach it to the Work Package.
 - b. IF the Minor Work Package has an AJHA or HIW with Medium hazards, THEN ensure that the hazard controls identified are incorporated into the work package instructions.
 - c. Provide work instructions in sufficient detail for the worker to understand the scope of the work and perform the work safely applicable to their skills and knowledge.
 - d. Attach only those drawings or other documents necessary for field personnel to take to the work location to perform the defined scope.
 - e. Determine the number and disciplines of workers necessary to perform the work, the work duration and enter the information into SAP.
 - f. If parts and/or materials are not readily available in shop areas for kitting or staging, THEN purchase or reserve the parts and materials required to complete the work.
 - g. Perform an estimate of resources and cost and enter the data into SAP.
- NOTE** Minor Work never requires a PWT beyond a functional/operational test.
- h. Prepare a functional/operational PWT in accordance with Chapter 4 of this Manual.
6. WHEN the planning of a Minor Work Package is complete, THEN change the SAP status to "planning complete."

Work Coordinator

7. Perform a work package workability review and approval AND route to the Job Supervisor.

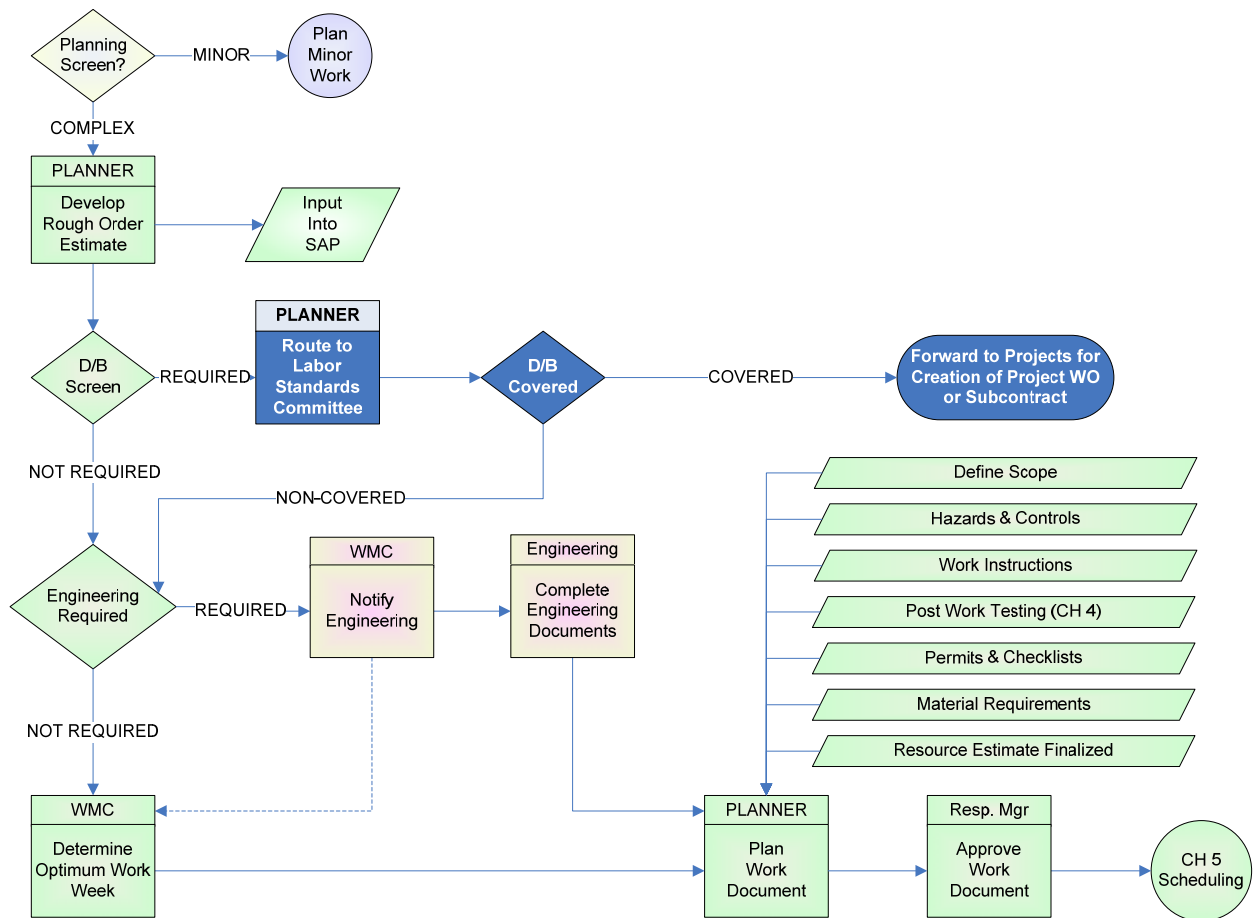
Job Supervisor

- NOTE** The Job Supervisor's approval of the Work Package confirms that the hazard controls, permit requirements, and information from supporting organizations have been appropriately incorporated into the work package instructions to enable the work to be performed safely.
8. Approve the work package and route to Work Management Center.

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D. Plan Complex Work



Responsible Planner

1. Perform an initial rough order estimate of resources and cost and enter data into SAP.
2. Determine if the application of Y74-809, *Unreviewed Safety Question Determinations*, or Y74-803, *Change Evaluation/Major Change Determination*, is required?
 - a. Answer NO: if the work requested is:
 - Exempted by Y74-809/Y74-803 or considered to be routine maintenance (see Y74-809, Appendix A for definition), OR
 - Greater than 200 feet from a facility having safety basis (SB) documents AND will not affect such facility.
 - b. Answer YES: if the work requested does NOT meet the criteria listed in either bullet above and the application of Y74-809 or Y74-803 is required, THEN contact Shift Manager (SM) for further guidance.

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D. Plan Complex Work. (cont.)

Responsible Planner

3. Screen work orders to determine the applicability of Federal Labor Standards (FLS), in accordance with Y18-005, Appendix A, *Guidelines for Davis-Bacon Non-Covered Work*.
 - a. IF applicability of FLS is NOT clear OR IF the work scope appears to be potentially covered under FLS, THEN provide scope and cost information to the Site Labor Standards Committee (SLSC) for review and disposition.
 - b. IF the work is covered by Davis-Bacon, THEN forward the request for work to Projects for processing.
 - c. IF the work is NOT covered by Davis-Bacon, THEN continue processing the work order as Complex Work.
4. IF the work is NOT covered under the NEPA categorical exclusion for maintenance activities (CX-GEN-011) and under the Cultural Resource Exclusion (NHPA) per Y71-917, THEN submit a NEPA checklist to the NEPA program office for review.
5. Consult with the System Engineer to determine whether Engineering Services are required based on the following criteria:
 - Work requires formal post-work test specifications in order to demonstrate that the SSC can perform its safety functions after work is completed.
 - Work involves other than like-for-like replacement for SSC Grades 1, 2, 3 or 4.
 - Work involves a temporary modification, in accordance with Y15-187, *Integrated Safety and Change Control Process*, Section H.
 - Work potentially impacts the Criticality Safety envelope, in accordance with Y70-150, *Nuclear Criticality Safety Program*.
 - Work involves welding, fire barriers, code requirements, or procurement of safety related materials or parts.
 - Work modifies the configuration of SSC design in accordance with Y15-187 and/or Y15-013, *Change Control Process for Non-Safety Basis Structures, Systems and Components*.
 - Work requires drawings or engineering sketches.
 - Work requires a USQD in accordance with Y74-809, *Unreviewed Safety Question Determinations*.
 - Work requires security compensatory measures or a security plan.
 - Work requires an excavation or penetration permit.
 - Work has potential to degrade Fire Suppression, Detection, or Alarm Systems Equipment or Components.
6. IF Engineering services are required, THEN create an operation or sub-order for Engineering support.

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D. Plan Complex Work (cont.)

Work Coordinator

7. Determine the optimum work window in accordance with the requirements in Chapter 5 of this manual based on initial scope, estimate and engineering completion commitment.

Responsible Planner

8. Review the SAP work history data for the SSCs involved in the work package and feedback on similar work for SSCs in accordance with Y15-331, *Lessons Learned Program*.
9. Review manufacturer recommendations; applicable codes, standards and requirements; SME and worker knowledge; and standard technical procedures.
10. Create a New Work package, as follows:
 - a. Ensure that the hazard controls identified in the JHA are incorporated into the work package instructions, such that the JHA can be retained in the WMC, and will not be required by the workers at the work site.
 - b. Add prerequisites, precautions and instructions to the initial draft work package instructions for New Work, sufficient to incorporate:
 - The hazards and controls identified by the JHA, including the resolution of any conflicts between controls, permits and SME input.
 - The permits, engineering data, and support organizations input provided by the Work Coordinator.
 - Notifying the Shift Manager/Building Manager of any large quantities of hazardous materials being staged past the work shift.

NOTE Although Complex Work does NOT require the use of step-by-step instructions for all work, step-by-step instructions should be used whenever appropriate to prevent the worker from inadvertently bypassing a hold point.

- c. Determine whether steps require signature spaces or initial blocks.
- d. Use initial blanks instead of signatures for all work steps that **do NOT** require hold points, such as witnesses, inspections, verification points, or data collection.

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D. Plan Complex Work (cont.)

Responsible Planner

- e. IF a welding job is required, THEN perform the following in accordance with Y17-015, *Welding Program Manual*.
 - 1) Provide the Field Welding Engineer a weld map, sketch, or drawing and a copy of the work order to enable a welding package to be generated, i.e., weld inspection report, welding procedure specifications, etc.
 - 2) Ensure that the work instructions require the original welding work package to be returned to the Field Welding Engineer after the welding is completed for review and approval.
 - 3) Ensure that Field Welding Engineer approval of the welding job is required for the SSC to be returned-to-service.
- f. Insert into the work package instructions the requirements for the proper disposition and disposal of all waste generated by the defined scope of work.
- g. IF the work package contains a configuration change package or modification to a process system, THEN ensure that the SE reviews and approves the instructions before issuing.
 - 1) Request that the SE:
 - send an e-mail of concurrence OR
 - initial and date the work package OR
 - provide concurrence via documented telecom.
 - 2) Ensure the e-mail is filed in the work package history file.
- h. Order parts, including safety related parts, and materials required to complete work scope, AND identify them on the material list within the work package.
- i. IF the job is waiting on parts, THEN mark the appropriate order status [SAP: Planning Awaiting Materials (PAM)] in SAP.
- j. Copy those portions of technical procedures, drawings, schematics, or vendor manuals that workers need to use at the work site while performing the work AND insert them into the work package.
- k. Insert LO/TO instructions into the work package instructions.
- l. IF the work impacts the ability of the SSC to perform its design function, THEN add the PWT steps, data required, acceptance criteria for New Work and Return to Service requirements provided by the System Engineer into the work package instructions, as appropriate, in accordance with Chapter 4 of this Manual.
- m. IF the System Engineer requests review and approval of the work instructions, THEN ensure that SE review and approval with signature, badge and date is included in the work instructions.
- n. Estimate the labor hours for each worker discipline that shall be sufficient to complete the work, based on work history and previous experience, AND record in SAP.

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D. Plan Complex Work. (cont.)

Responsible Planner

11. WHEN the planning of a Complex Work Package is complete, THEN change the SAP status to “planning complete.”

Work Coordinator

12. Check SAP for Complex Work Packages with a status of “planning complete” AND provide a list of these to the Responsible Manager, including copies of the Work Packages, etc., as needed.

Responsible Manager

13. Determine whether a formal Operational Safety Board (OSB) or Management Review Board (MRB) review is required in accordance with Y15-636, *Integrated Safety Management Program*, Appendix C.
14. IF a formal review of the work package is required by Y15-636, Appendix C, THEN obtain the Operational Safety Board (OSB) or Management Review Board (MRB) review in accordance with Y15-636.

NOTE The Responsible Manager approval of the work package confirms that the hazard controls, permit requirements, and information from supporting organizations have been appropriately incorporated into the work package instructions in order to perform the work safely.

15. WHEN the hazard controls, permit requirements and information from supporting organizations have been appropriately incorporated into the work package instructions to perform the work safely, THEN approve the work package AND notify the Work Coordinator to change the status to “ready for scheduling.”

Work Coordinator

16. WHEN notification is received from the Responsible Manager that the Work Packages are “ready for scheduling,” THEN change the SAP status to “ready for scheduling” AND prepare the Work Packages for scheduling.
17. Divide the work package into two parts:
 - **Part 1: Work Package Instructions** – including the parts and material list, applicable health and safety permits, and appropriate attachments, such as drawings, sketches, or vendor instructions that the workers may need to use while performing the work at the work site.
 - **Part 2: Reference Material** – including the JHA, work package forms NOT needed at the work site, and other engineering information that the workers do not need to use while performing the work, and will be retained in the history file at the WMC. Some permits must be at the work site, e.g., Confined Space, Hot Work, etc. Verify that **Part 1: Work package instructions** are sufficient for the workers to perform the work.

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D. Plan Complex Work. (cont.)

Work Coordinator

18. Retain the **Part 2: Reference Material** portion of the work package in the WMC, including the JHA, and other engineering information that the workers do NOT need to use while performing the work.
19. Maintain all maintenance records generated as a result of this Manual in accordance with the Records Section of Chapter 1.

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Chapter 4: Post-Work Test (PWT) & Return-to-Service (RTS) Requirements

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WHAT TO DO

A Post-Work Test (PWT) is performed following work that may have affected normal functioning of the SSC to demonstrate that the original deficiency has been corrected, the operability of the SSC has been restored, and that no new deficiencies have been created. The PWT and its level of documentation are commensurate with the work performed and the importance of the equipment to facility safety and reliability.

Return-to-Service (RTS) requirements are determined by the System Engineer in accordance with Y14-001. The Shift Manager/Building Manager uses these to ensure that the required work and testing is completed successfully, and that the SSCs have been returned to an acceptable operating condition.

A. Determine the Type of PWT and RTS Requirements.

System Engineer/Subject Matter Expert

1. Determine the need for a Formal PWT based on whether the work:
 - Impacts a credited feature of the SSC, or
 - Affects the ability of the SSC to perform a credited safety function, or
 - Has a high complexity or failure consequences.
- a. IF a Formal PWT is required, THEN develop the Formal PWT, considering the following additional key elements to make the determination:
 - The need for acceptance criteria and baseline data that aid in measuring the performance of repaired equipment and that facilitate quantitative documentation of test results.
 - Verification that credited features/functions of the SSC(s) are preserved,
 - Verification that the work corrected the original deficiency.
 - Ensure that new or related problems are NOT created by the work activity.
 - The need for specific written instructions or formal procedures, as appropriate.
 - Insertion of Hold Points to accommodate data-taking, to obtain special approvals to proceed, to avoid conflicts with other processes, or when needed for other reasons.
 - The use of applicable engineering technical specifications.
- b. Ensure that the Formal PWT is incorporated into the work instructions in accordance with Section C of this Chapter.

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Chapter 4: Post-Work Test (PWT) & Return-to-Service (RTS) Requirements

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A. Determine the Type of PWT and RTS Requirements (cont.)

Responsible Planner

2. Review vendor recommendations and other available documentation to determine the proper degree of post-work testing requirements based on the work scope, requesting assistance from the System Engineer/Subject Matter Expert, as needed.
 - a. IF the information reviewed identifies:
 - The need for specific written instructions or formal procedures, and/or,
 - Insertion of Hold Points to accommodate data-taking, to obtain special approvals to proceed, to avoid conflicts with other processes, or when needed for other reasons.

THEN develop a Formal PWT.
 - b. Incorporate the Formal PWT into the work instructions in accordance with Section C of this Chapter.
3. IF the work does NOT meet the criteria in steps A.1 or A.2, THEN develop a Post-Work Functional/Operational Check and incorporate it into the work instructions in accordance with Section B of this chapter.

B. Develop Post-Work Functional/Operational Check

Responsible Planner

- NOTE** Appendix 4-A contains an example of Post-Work Functional/Operational Check. The *Functional/Operational Check* uses standard practices, as well as craft skills and knowledge, and requires no formal documentation to demonstrate that SSCs operate in a manner which enables them to perform their design function.
1. Develop a Post-Work Functional/Operational Check for all Minor Work Packages that require SSCs to operate in a manner which enables them to perform their design function in accordance with Appendix 4-A.
 2. Use standard craft practices, skills and knowledge to create Post-Work Functional/Operational Checks.
 3. Request assistance, as needed, from the System Engineer/Subject Matter Expert to determine appropriate Post-Work Functional/Operational Checks.

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Chapter 4: Post-Work Test (PWT) & Return-to-Service (RTS) Requirements

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C. Develop Formal PWT and RTS Requirements for Complex Work Orders.

System Engineer/Subject Matter Expert

NOTE UCN-21678 can be used as an aid for documenting and communicating the PWT and Return-to-Service requirements.

1. Document the PWT and RTS requirements using UCN-21678, *Post-Work Test (PWT)*, as needed, utilizing assistance from the Responsible Planner.
2. Determine Return-to-Service Requirements that will ensure:
 - Lockouts/Tagouts that would affect equipment or system operability have been cleared.
 - Post-Work Tests required by the approved work document have been satisfactorily completed.
 - All deficiencies associated with the defined scope of work have been resolved.
 - Equipment is returned to its required configuration.

NOTE 1 Y17-011, *Startup Testing Program Manual*, describes one method that is available for developing a Post Work Test. Y17-011 provides several different forms, as well as directions, for writing test instructions and performing tests of differing complexities. This approach will provide formatting and test documentation consistency. Test Engineers, as requested, will be made available to assist the System Engineer to make the determination of testing scope, acceptance criteria, and establishing testing requirements.

NOTE 2 Appendices 4-A-E contain examples of Post-Work Test Requirements and Return-to-Service Requirements.

3. Provide the Post-Work Test and Return-to-Service Requirements to the Responsible Planner for Complex Work Orders.

Responsible Planner

NOTE Appendix 4-B contains an example of a Formal Post-Work Test and Appendix 4-D contains an example of Return-to-Service Requirements.

4. Develop/incorporate Post-Work Test Requirements and Return-to-Service Requirements into the work package job instructions.
5. IF troubleshoot and repair activities are performed, THEN develop Post-Work Test and Return-to-Service Requirements with assistance from the System Engineer/SME, as needed, in accordance with Appendix 4-C AND record them in the blanks provided in the work instructions during the execution phases of the job.

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C. Develop Formal PWT and RTS Requirements for Complex Work Orders (cont.)

Responsible Planner

6. WHEN requested by the System Engineer, THEN provide a signature line in work package for System Engineer approval of PWT/RTS instructions.

7. WHEN a Shift Manager authorization of the PWT is specified by the System Engineer, THEN ensure that a hold point is added to the job instructions for the Shift Manager/Building Manager to authorize post-work testing by qualified personnel using approved procedures or instructions.

APPENDIX

- 4-A. Post-Work Functional/Operational Check (Example)
- 4-B. Formal Post-Work Test (Example)
- 4-C. Post-Work Test and Return-to-Service Requirements for Troubleshoot and Repair (Example)
- 4-D. Return-to-Service Requirements (Example)
- 4-E. Post-Work Test Recommended Test Options

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APPENDIX 4-A
Post-Work Functional/Operational Check (Example)
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Post-Work Functional/Operational Check only

The level of detail of a PWT will depend on the complexity of the activity. The following example shows a PWT Operational Check.

Scope of Work: 9709 - Replace steam valve/tag # ST24 on the north side of building with a 1" brass gate valve.

1. **IA/Pipefitter** to clear the Lockout/Tagout on valve/tag ST24.
2. **Pipefitter** to "OPEN" Valve/Tag ST24.
3. **Pipefitter to** verify proper installation/operation of valve by moving the handle from open to the closed position to verify handle moves freely without binding and leave the valve in open position to visually check for leakage at connecting pipe joints at operating pressure.

SAT: _____

UNSAT: _____

4. The PWT has been completed on equipment # _____ and the test results meet the specified acceptance criteria.

PWT's Performers Signature

_____/_____/_____
Date:

EXAMPLES:

- Visual Inspections
- Normal operations at normal pressure/temperature
- Leak detection at normal operations, including soap bubble test, etc.

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APPENDIX 4-B
Formal Post-Work Test (Example)
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PWT Instructions approved by:

_____ /_____/_____
 (System Engineer/Subject Matter Expert Signature) Badge Date

If specified by the System Engineer/Subject Matter Expert, the following **HOLD POINT** should only be entered into the work instructions. Operations authorization may be required, as determined by operations, to begin the performance of a PWT following work activities. If so, a signature and date space will be provided in the section for operations personnel to indicate authorization to perform PWT. **The following is an example of an operations' authorization of a PWT.**

HOLD POINT:

Authorization is given for the performance of PWT on equipment # _____
 _____ /_____/_____
 (Authorizing Manager's Signature) Badge Date

NOTE: The PWT performer(s) will check each step as either, "SAT"/"UNSAT" and record data. Comments will be recorded on any "UNSAT" conditions.

Scope of Work: Replacement of unloader valves on air compressor in boiler room.

Post Work Test Instructions Example

4.xx. **IA/Pipefitter/Electrician** to clear Lockout/Tagout, close the air compressor disconnect switch.

Initial: _____

4.xx. **Pipefitter** to verify that the air compressor comes on at 120 PSI +/- 2 PSI:

Record actual start pressure: _____ PSI

4.xx. **Pipefitter** to verify that the air compressor and turns off at 140 PSI +/- 2 PSI:

Record actual stop pressure: _____ PSI

4.xx. **Pipefitter** to verify no air leaks on the unloader valves via soap test and record if any air leaks found in the comments section.

SAT: _____ UNSAT: _____ Comments: _____

4.xx. **Operations/Pipefitter** to verify that the air compressor can be started from the remote air compressor start station.

SAT: _____ UNSAT: _____ Comments: _____

PWT Failure Example

4.xx If air compressor settings do not meet the listed parameters, then **Pipefitter** to make the pressure switch adjustments until settings are in the correct range by re-working steps 4.xx thru 4.xx and record results below in 4.xxa – 4.xxb. If the air compressor settings do meet the listed parameters, N/A this section.

4.xx a. Record actual start pressure: _____ PSI SAT: _____ UNSAT: _____

4.xx b. Record actual stop pressure: _____ PSI SAT: _____ UNSAT: _____

4.xx **Pipefitter** to notify **Job Supervisor** if PWT requirements are still UNSAT: Initial: _____

Completion of PWT Example

4.xx The PWT has been completed on equipment # _____, and test results meet the specified acceptance criteria.

_____ /_____/_____
 (PWT Performer's Signature) Badge Date:

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APPENDIX 4-C
Post-Work Test and Return-to-Service Requirements
For Troubleshoot and Repair
(Page 1 of 2)

Perform Troubleshoot & Repair Activities on _____ in Bldg. _____

Work Order # _____

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Post Work Test:

4.xx **System Engineer** to document the Post Work Testing and Return-to-Service Requirements below:

- PWT Requirements:

- RTS Requirements:

 System Engineer Signature Badge# Date /_____/_____

HOLD POINT:

4.xx Authorization is given for the performance of the PWT on _____ .
 (N/A if Authorization is not required by Operations or Systems Owner).

 Authorizing Manager's Signature Badge# Date /_____/_____

4.xx **(Craft) (s)** to perform the PWT as specified in Step 4.xx on _____

Document Test Results below:

	SAT _____	UNSAT _____
	SAT _____	UNSAT _____
	SAT _____	UNSAT _____

The PWT has been completed on equipment number _____ and the test results meet the specified acceptance criteria.

 PWT Performer Signature Badge# Date /_____/_____

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**APPENDIX 4-C
(Page 2 of 2)**

Perform Troubleshoot & Repair Activities on _____ in Bldg. _____ Work Order # _____ Rev-0	Page 8 of 15
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Post Work Test (cont.):

4.xx **Job Supervisor / Issuing Authority, and Craft (s)** to clear the permitted LO/TO / Single Source on _____ as required.

_____	_____	____/____/____
Job Supervisor's / IA's Signature	Badge#	Date

Return-to-Service:

4.xx Shift/Bldg. Manger to document that the criteria in Step 4.xx are satisfied.

_____	_____	____/____/____
Shift/Bldg. Manager's Signature	Badge#	Date

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Chapter 4: Post-Work Test (PWT) & Return-to-Service (RTS) Requirements

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APPENDIX 4-D
Return-to-Service Requirements
(Page 1 of 1)

The Responsible Planner only includes the applicable Return-to-Service Requirements in the Work Package instructions. The Shift Manager/Building Manager's signature is required, in accordance with Y18-012, to confirm that the applicable requirements have been met:

- Proper housekeeping has been performed.
- SSC tags and deficiencies have been resolved.
- Lockout/Tagout(s) that would affect equipment or system operability have been cleared.
- Alignment sheets have been completed in accordance with ConOps, if required.
- Tests required by the approved work document have been satisfactorily completed, as required.
- The necessary valve line-up/component alignment sheet has been completed.
- The ventilation system has been returned to the appropriate configuration.
- Electrical disconnects are closed.
- Potable water testing is complete.
- System venting is complete.

Example of Return-to-Service Requirements:

I confirm that:

1. The SSC deficiency has been corrected.
2. Post work testing has been completed, and the results meet the specified acceptance criteria.
3. Lockout/Tagout(s) associated with this work have been cleared.
4. Housekeeping is complete
5. Smoke alarms are back in service
6. SSC labeling is complete

SSC# _____ may be returned to service.

 (Authorizing Manager's Signature)

 Badge

____/____/____
 Date:

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Chapter 4: Post-Work Test (PWT) & Return-to-Service (RTS) Requirements

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APPENDIX 4-E
Post-Work Test Recommended Test Options
(Page 1 of 6)

The System Engineer uses vendor recommendations and engineering judgment, to determine the proper post-work testing requirements. The testing selected by the System Engineer shall depend on the scope of completed work and the requirements established by the Conduct of Operations Manual, Chapter 8.0. Examples of work activities and possible post-work testing options are shown in **Table 1**. This list of activities and tests is a guide only and is not meant to be all-inclusive.

Table 1: Recommended Post-Work Test Options

Work Activity	Recommended Test Options
Repair electric motor	<ol style="list-style-type: none"> 8. Perform the following checks: insulation resistance, winding resistance, polarization index, and high potential. 9. Verify proper direction of rotation and proper phase relationships. 10. Operate the equipment and verify absence of abnormal noises. 11. Obtain baseline vibration-analysis data. 12. Measure the bearing temperatures. 13. Measure the starting and the running current for each phase. 14. Check oil levels. 15. Check air-filter cleanliness.
Repair circuit breaker	<ol style="list-style-type: none"> 1. Verify adjustment of circuit breaker trips. 2. Perform trip-shaft torque measurements, if applicable. 3. Measure phase-to-phase and phase-to-ground insulation resistances. 4. Measure microhms across each main contact. 5. Perform automatic-function test on the breaker (opens and closes on required signals). 6. Measure breaker-response time. 7. Verify operation of auxiliary trip devices and relays. 8. Perform manual operational checks on the breaker. 9. Check breaker parameters (e.g., breaker operating voltage, current, control power, status lights).
Adjust packing of or repack air-operated or motor-operated valve (MOV)	<ol style="list-style-type: none"> 1. Using air or motor operator, verify full stroke of valve to ensure freedom of movement. (NOTE: Valve stroke required may be different from operative capability.) 2. Perform strike-timing test. 3. Check running current on motor. (If running current has increased by more than 8 percent of the baseline value, evaluate the need to perform diagnostic testing of the valve.) 4. Check for leakage at normal operating pressure. 5. Perform leak rate test, if required.

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Work Activity	Recommended Test Options
Repair internals of air-operated or motor-operated valve	<ol style="list-style-type: none"> 1. Leak-test valve if required by technical safety specifications or surveillance procedures. 2. Perform retesting required for adjusting packing. 3. Verify position indications (remote and local). 4. Grease/lubricate MOV.
Repack manual valve or adjust packing	<ol style="list-style-type: none"> 1. Verify that valve stem moves freely without binding. 2. Check for leakage at operating pressure.
Repair (or replace) MOV	<ol style="list-style-type: none"> 1. Perform full-stroke exercising checks (two motor-operator strokes) done at normal system flow, pressure, and temperature. 2. Test seat leakage. 3. Perform strike-timing test. 4. Measure the running and the starting current of motor. 5. Verify torque and limit-switch settings. 6. Test automatic functions. 7. Check position verification. 8. Check packing leakage, at operating pressure. 9. Grease/lubricate MOV. 10. Perform appropriate diagnostic tests to establish a new baseline.
Repair (or replace) air-operated valve	<ol style="list-style-type: none"> 1. Perform full-stroke exercise checks at normal system parameters. 2. Test seat leakage. 3. Perform stroke-timing test. 4. Test automatic functions. 5. Check position verification. 6. Verify control-valve loop alignment. 7. Check packing leakage at operating pressure. 8. Check positioner and E/P or S/P converter calibration.
Repair solenoid valve	<ol style="list-style-type: none"> 1. Perform full-stroke exercise checks. 2. Test seat leakage. 3. Test automatic functions. 4. Check position-indication verification.
Repair (or replace) isolation valve	<ol style="list-style-type: none"> 1. Perform any code-required strength or seat-tightness testing. 2. Perform technical-specification-required leak-rate and operability testing. 3. Verify position indication.
Repair pressure-regulating valve	<ol style="list-style-type: none"> 1. Check set-point calibration. 2. Test valve-seat leakage.

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Work Activity	Recommended Test Options
Repair safety valve/relief valve	<ol style="list-style-type: none"> 1. Test relief setpoint (bench test or in-place test). 2. Test valve-seat leakage. 3. Check proper position indications. 4. Check for chatter and packing leakage.
Repair (or replace) safety-related pumps or non safety-related pumps	<ol style="list-style-type: none"> 1. Test in accordance with ASME code, as required. 2. Perform appropriate surveillance test. 3. Check direction of rotation if motor leads were disconnected. 4. Inspect suction filters, oil level, cooling flows, suction and discharge pressures, bearing temperatures, packing or seal leakage. 5. Run baseline vibration analysis. 6. Measure applicable pump and motor performance data. 7. Perform automatic function tests. 8. Inspect base plate/foundation.
Perform work on ventilation system fan/filter unit	<ol style="list-style-type: none"> 1. Perform function tests and manual start. 2. Check dynamic balance. 3. Check bearing temperatures, vibration levels, abnormal noise, airflows. 4. Measure running current. 5. Perform filter inspections and tests.
Repair (or replace) manual, motor- and air-operated dampers	<ol style="list-style-type: none"> 1. Check full stroke. 2. Check damper leakage. 3. Check automatic function and interlocks. 4. Check stroke timing. 5. Check position indication.
Rebuild (or repair) air compressor	<ol style="list-style-type: none"> 1. Check for leakage at operating pressures. 2. Measure bearing temperatures. 3. Measure baseline-vibration levels. 4. Check for unusual noise. 5. Check parameters (discharge pressure, cooling flow, oil level, air temperatures).
Perform turbine work	<ol style="list-style-type: none"> 1. Test automatic start functions. 2. Check turbine (pump) performance (flow, speed, bearing temperature, and vibration amplitude). 3. Test turbine protective features. 4. Test manual start. 5. Check oil levels. 6. Check for fluid leakage at normal system parameters. 7. Measure baseline vibration data. 8. Check for rotor grounds. 9. Grease sliding plates at foundation and pedestal. 10. Check auxiliaries for heating and cooling.

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Work Activity	Recommended Test Options
Perform work of emergency diesel generator (EDG) and related components	<ol style="list-style-type: none"> 1. Test automatic-start function. 2. Check EDG fluid parameters (e.g., lube-oil level, cooling-water temperature and flow, governor-control oil system, fuel-oil sampling). 3. Test EDG automatic protective features (over speed, generator differential, low lube-oil pressure, high crankcase pressure, etc.). 4. Test EDG synchronization and load. 5. Test EDG manual start. 6. Check diagnostic baseline parameters (e.g., vibration, cylinder compression). 7. Check voltage regulation and frequency.
Perform heat-exchanger work	<ol style="list-style-type: none"> 1. Check heat-exchanger parameters (temperature, flow, external leakage, etc.). 2. Test heat-exchanger performance (heat balance). 3. Check hydrostatic or operational test for tube and tube-sheet leakage.
Perform piping-system work	<ol style="list-style-type: none"> 1. Flush system. 2. Check ASME code requirements. 3. Perform pressure/hydrostatic test. 4. Check integrity of mechanical joints. 5. Check cleanliness and verify system filled and vented. 6. Verify correct fluid-chemical parameters. 7. Verify that piping supports, heat tracing, and insulation are restored. 8. Review for unusual pipe displacement. 9. Ensure that instrumentation lines are attached to pipe and properly refilled.
Make new (or repair) weld	<ol style="list-style-type: none"> 1. Inspect weld as specified by approved welding procedure. 2. Test weld in accordance with the ASME code (this is required for systems covered by the code). Facility guidelines are specific for applicable categories.

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Work Activity	Recommended Test Options
Replace component in instrument loop	<ol style="list-style-type: none"> 1. Calibrate replaced component. 2. Ensure that component is installed properly. 3. Inspect mechanical joints under normal operating or hydrostatic test pressure to verify no leakage. 4. Verify proper operation of instrument loop by comparing with: <ul style="list-style-type: none"> • Other readings of the same parameter on different instrument channels • Readings between channels that monitor the <u>same</u> variables and bear a known relationship to each other • Readings between channels that monitor <u>different</u> variables and bear a known relationship to one another. 5. Measure loop-response time if a time constant is associated with instrument response. 6. Perform operational checks on process.
Replace switch devices (pressure, flow, temperature, level)	<ol style="list-style-type: none"> 1. Calibrate pressure switch and verify actuation and reset points. 2. Inspect mechanical joints under normal operating or hydrostatic test pressure to verify no leakage. 3. Verify, in accordance with technical manual and technical safety specifications, that environmental qualification requirements have not been degraded by installation or work. 4. Ensure that switch is valved in after work and that indication is as expected.
Perform instrumentation transmitter channel work	<ol style="list-style-type: none"> 1. Perform channel checks. 2. Calibrate all channel components except sensor. 3. Calibrate sensor channel (complete channel). 4. Test operation of trip activation device. <p>NOTE: During channel calibration, verify that all automatic actuation interlock set points and resets function properly.</p> <ol style="list-style-type: none"> 5. Calibrate in-core detector channel (normalization).
Perform work on radiation monitors	<ol style="list-style-type: none"> 1. Perform channel checks. 2. Perform source checks. 3. Test automatic functions. 4. Calibrate channel.
Perform transformer work	<ol style="list-style-type: none"> 1. Check transformer parameters (oil temperature, oil level, oil pressure, tap settings, cooling-fan status). 2. Test transformer operability (primary/secondary voltage and current). 3. Check insulation resistance high-potential, polarization index.

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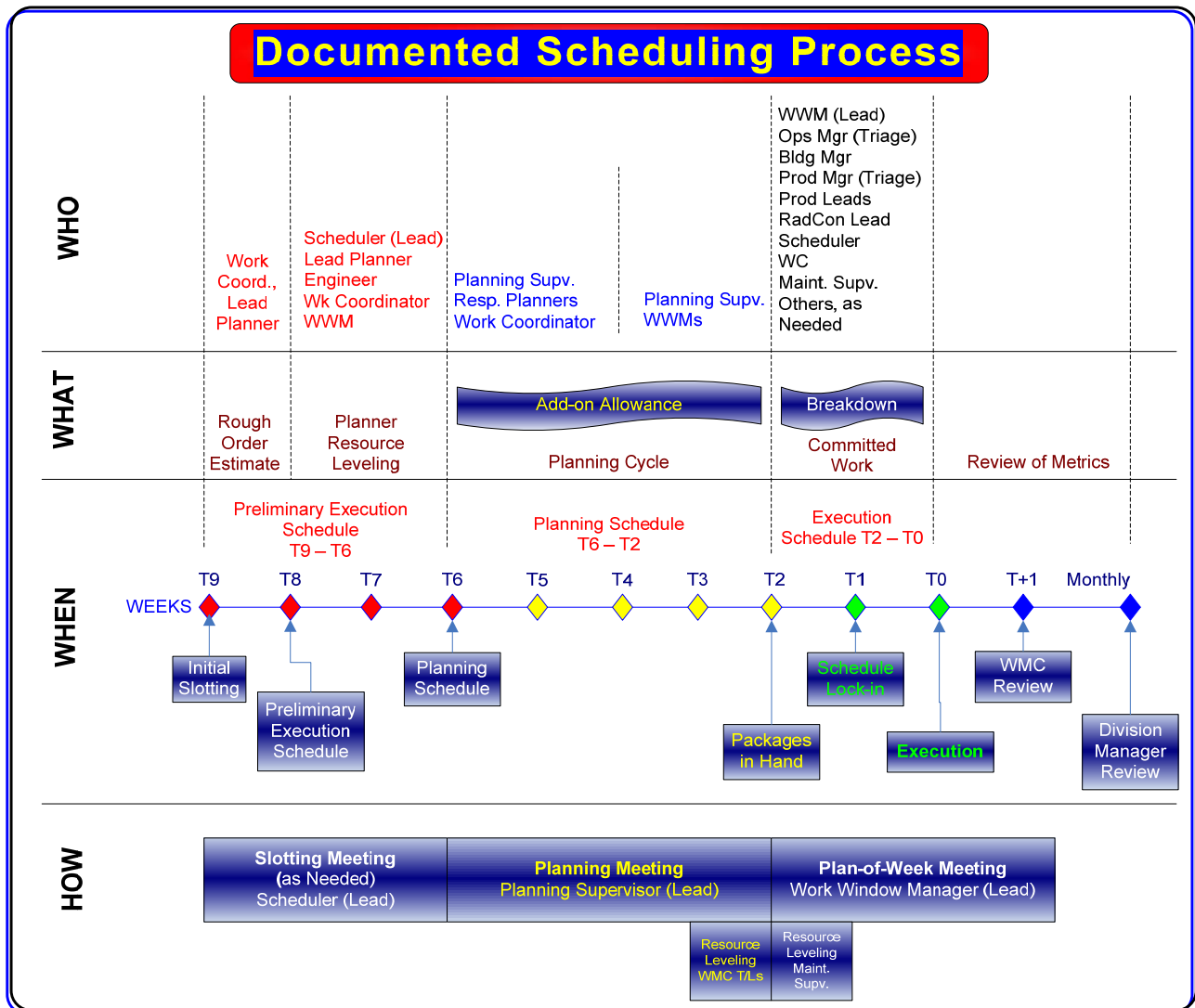
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Work Activity	Recommended Test Options
Repair (or replace) static inverters	<ol style="list-style-type: none"> 1. Verify voltage and currents. 2. Check inverter load. 3. Perform transfer test, if applicable.
Perform electrical work on load center and distribution panel.	<ol style="list-style-type: none"> 1. Verify voltage and load current. 2. Visually check for fastener tightness, cleanliness.
Repair cranes and hoists	<ol style="list-style-type: none"> 1. Perform load test. 2. Check limit-switch operability. 3. Check brake/clutch operability.
Perform battery work	<ol style="list-style-type: none"> 1. Check battery parameters (specific gravity, electrolyte level, cell voltage, electrolyte temperature, battery-terminal voltage). 2. Verify that battery cells, cell plates, terminals, and connectors are free of corrosion. 3. Perform battery service discharge test. 4. Perform battery performance discharge test.
Repair (or replace) tank/pressure vessels	<ol style="list-style-type: none"> 1. Check tank/vessel integrity for leakage. 2. Check tank parameters (proper level, pressure, temperature indications). 3. Check tank-content parameters (e.g., boron concentration, radiation level, viscosity, particulate contamination, other). 4. Check tank cleanliness. 5. Check ASME code requirements, as appropriate. 6. Check condition of internal coatings.

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WHAT TO DO

Overview of the Documented Scheduling Process



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Chapter 5: Schedule Work

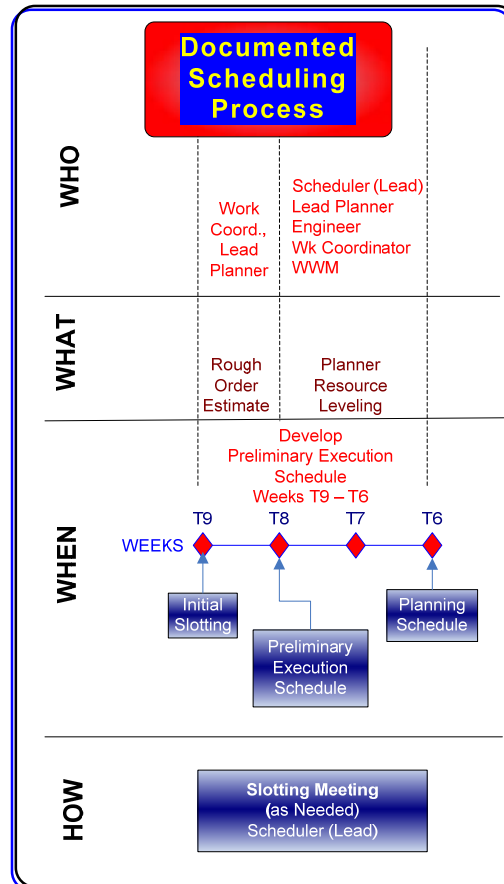
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Overview of the Documented Scheduling Process (cont.)

Scheduled equipment, process and facility outages are used to minimize the impact of maintenance work on production capabilities and maximize the effective use of personnel and equipment resources. The integrated schedule is used to develop facility specific "Plans of the Week" (POWs) which detail specific locked-in work activities to be accomplished during a given week. POWs are used to assist the Building Manager, Operations Manager and/or the Production Manager in developing the facility Plan of the Day (POD). The scheduling effort produces a resource-loaded and resource-leveled schedule indicating the sequence of execution necessary to meet site production, project and program goals while addressing craft utilization and efficiency. Resource-loaded means that personnel are scheduled 8 hours per day to optimize productivity and efficiency. Resource-leveled indicates that all of a particular resource is scheduled and being utilized.

The Documented Scheduling Process covers the 9 weeks from the initial slotting through the actual execution of work. Preliminary Execution Schedules (PES) incorporates rough order of magnitude estimates and the associated resources. The process to develop the Planning Schedules (weeks T-6 to T-2) include weekly meetings to identify planner resource needs and to review up-to-date information on the status of work orders. Work is rescheduled by the Work Window Manager, as needed, based on schedule delays identified by the Responsible Planner, i.e. parts shipment date, engineering equivalency, permits, etc. Changes affecting execution dates are communicated to the Scheduler. The process for developing Execution Schedules during weeks T-2 to T-0 includes Plan-Of-the-Week (POW) meetings that are held to discuss commitment for management release of equipment, commitment for maintenance execution, commitment for calibration and inspection work, completion of load boards, and the completion of package evaluations. The previous week's performance is reviewed for its impact on established metrics and on decisions whether to carryover the work or to reschedule. Scheduling changes are made, as needed. Changes in execution dates are communicated to the Scheduler. At week T-2, the Job Supervisor performs an accuracy review of the scheduled work packages. At week T-1, final Execution Schedules are provided to Operations for inclusion in the Plan-Of-the-Day (POD).

A. Develop Preliminary Execution Schedule During Weeks T-9 to T-6.



Scheduler

1. Provide Preliminary Execution Schedule to the Planning Supervisor based on the Rough Order of Magnitude (ROM) estimates developed by the Responsible Planner and the Initial Slotting week provided by the Work Coordinator.

Responsible Planner

2. Ensure that a Rough Order of Magnitude estimate has been developed in SAP for all work assigned in the Preliminary Execution Schedule.

The ROM estimate is intended to be used for preliminary resource leveling purposes and to establish a realistic expectation for planning's work load. A detailed estimate will be developed as the Responsible Planner develops the work package and creates operation level detail in SAP during weeks T-6 to T-2. ROM estimates for each individual work order may not be available, therefore, the collection of craft hours for resource loading is on a "best effort" basis.

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A. Develop Preliminary Execution Schedule During Weeks T-9 to T-6. (cont.)

Responsible Planner

3. Identify any activity prior to week T-6, that will run longer than four weeks and request a new slotting week to minimize rescheduling once the Preliminary Execution Schedule is established.

Scheduler

4. Provide Preliminary Execution Schedules to the responsible Work Management Center and the Planning Supervisor.

NOTE The Work Window Manager (WWM) and the Work Coordinator (WC) roles and responsibilities may be performed by either WWM or WC depending on the assignments of the Work Center Manager.

Work Window Manager

5. Evaluate the Preliminary Execution Schedules for weeks T-9 to T-6 to ensure the following:
 - Each week is adequately loaded for existing craft resources.
 - Load boards are used to enhance this activity.
 - Known absences, training, etc. are considered as part of evaluation.
 - Slotted work week is appropriately based on plant priorities and resource loading.
 - Management commitment has been obtained from the equipment owner to release associated equipment for maintenance on the scheduled date, as needed.
 - Funding commitment has been obtained by the appropriate cost center manager in accordance with Chapter 2 of this Manual.
6. Reschedule work, as needed, based on preliminary schedule evaluation.

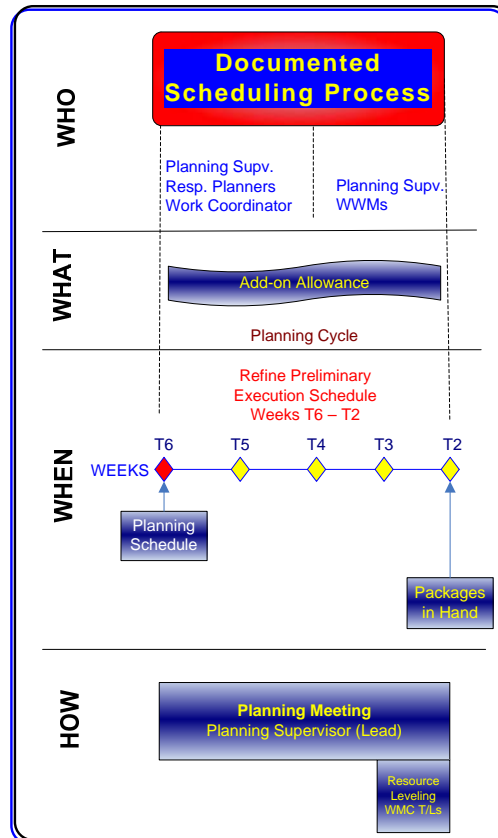
Work Management Center Manager

- NOTE** A weekly review will take place with representation from all three WMCs to review the resource loading for week T-6 and to address potential manpower shifts between centers.
7. Utilize the Preliminary Execution Schedule to review resource loading for the schedule and to address potential manpower shifts between the Work Management Centers.

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B. Refine the Preliminary Execution Schedule During Weeks T-6 to T-2.



Planning Supervisor

1. Conduct weekly meetings with the Responsible Planners to review the status of work orders on the planning schedule and to identify planner resource needs.
2. Provide up-to-date information on the status of the work orders to the Work Management Center Manager AND planner resource needs to the Planning Section Manager.

Work Management Center Manager

3. Reschedule work, as needed, based on schedule delays identified by the Planning Supervisor and the Responsible Planners, i.e. parts shipment date, engineering equivalency, permits, etc., AND ensure execution date changes are communicated to the Scheduler.

Scheduler

4. Input the changes into the scheduling software as communicated at the weekly status meeting, as needed.

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B. Refine the Preliminary Execution Schedule During Weeks T-6 to T-2. (cont.)

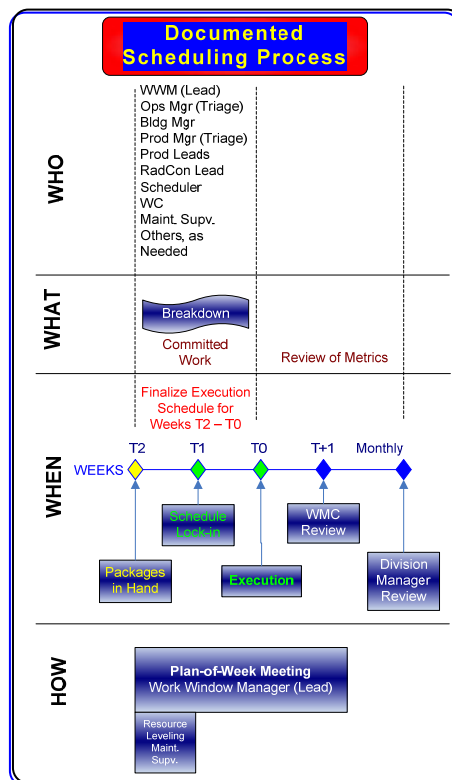
Work Window Manager

- Update SAP with the changes communicated at the weekly status meeting, as needed, e.g., main work center, revision code, slotting week, etc.

Planning Supervisor

- Track adherence to the planning schedule, periodically, to provide input to established metrics AND route the results to the Work Management Center Manager and the Planning Section Manager.

C. Finalize the Execution Schedule During Weeks T-2 to T-0.



NOTE 1 Although Work Management Center Manager/Designee may schedule Plan-of-the-Week (POW) meetings at other frequencies depending on facility maintenance activities, POW meetings are usually weekly and include appropriate personnel, such as WWM, Building/Operations/Production Manager(s), RadCon, Integrated Scheduler, Maintenance Supervisor, etc., as identified by the WMC Manager/Designee.

NOTE 2 A guide agenda is used, as needed, during the POW meeting.

WMC Manager/Designee

- Conduct POW meetings to discuss maintenance execution schedules and performance, including the following agenda items, as needed.

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C. Finalize the Execution Schedule During Weeks T-2 to T-0. (cont.)

WMC Manager/Designee

- a. Obtain management commitment for release of equipment.
- b. Obtain commitment for maintenance execution, and calibration and inspection work.
2. Evaluate the priority of new work orders to determine whether planning schedule priority changes are required.
3. Document the approval for planning schedule changes on UCN-21696, *Schedule Control Form*.
4. Ensure scheduling changes are made, as appropriate, AND communicated to the Scheduler.
5. Provide a copy of the completed *Schedule Control Form* with planning priority changes to the affected Planning supervisor(s) and Responsible Planner(s).
6. Obtain approval for the POW schedule from the Building/Operations/Production Manager(s) AND provide final Execution Schedule for week T-1 to Operations designee for inclusion in the Plan-of-the-Day, as needed.
7. Ensure that completed package evaluations have been completed.
8. Review the previous week's performance for impact on established metrics and on decisions whether to carryover the work or to reschedule.

Work Coordinator

9. Ensure conditions to support the proposed work orders on the execution schedule are adequate, i.e., parts availability, site accessibility, forklift availability, etc.
10. Ensure the work is scheduled on affected facility's POD, as required.
11. Provide the Job Supervisor with scheduled work packages at T-2 to perform an accuracy review.
12. Provide the Job Supervisor with all scheduled work packages for execution at T-1.

Job Supervisor

13. Ensure the scheduled work packages are complete and accurate AND can be executed as planned.
14. Execute work per schedule.
15. Report schedule issues to the Work Window Manager.

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D. Evaluate Emergent Work.

A large portion of work is emergent (also referred to as "Add On") and is handled outside the Documented Scheduling Process. An example of emergent or add on work would be an unexpected breakdown of a critical production machine that has no backups. This job would need to be planned and worked as soon as possible to avoid production delays. This means that some jobs on fully loaded planning and execution schedules would need to be rescheduled in order to plan and execute the new high priority job in a timely manner.

Work Management Center Manager/Designee

1. IF there are Critical Work Orders, THEN update the information on the Critical Work Order Status Report daily.

The Critical Work Order Status Report is the list of critical breakdown jobs developed from the completed and approved UCN-21697, *Justification for Critical Work Order List*, forms. It tracks the status of these jobs from initiation to completion.

- a. Conduct Status Meeting daily for Critical Work Orders.
The daily Status Meeting is usually attended by: Production Managers, Operations Manager, Work Control Management, Work Coordinators, Planning Supervisors, Procurement Representative, Engineering Representative, ES&H and Quality Representatives, and Maintenance Managers. Priorities, engineering issues, planning statuses, maintenance statuses and resource issues, procurement delivery dates, issues for rapid resolution, AJHA's and permits are discussed and addressed.
 - b. Update the Critical Work Order Status Report daily from the information reported at the Daily Status Meeting and from more current information provided by the Work Coordinator during the work day.
 - c. Track the jobs on the Critical Work Order Status Report until the PWT is completed and the equipment has been returned-to-service.
3. Evaluate priority of new work orders to determine whether planning schedule priority changes are required.
 4. Document the approval for planning schedule changes on UCN-21696, *Schedule Control Form*.
 5. Provide a copy of the completed *Schedule Control Form* with planning priority changes to the affected Planning supervisor(s) and Responsible Planner(s).

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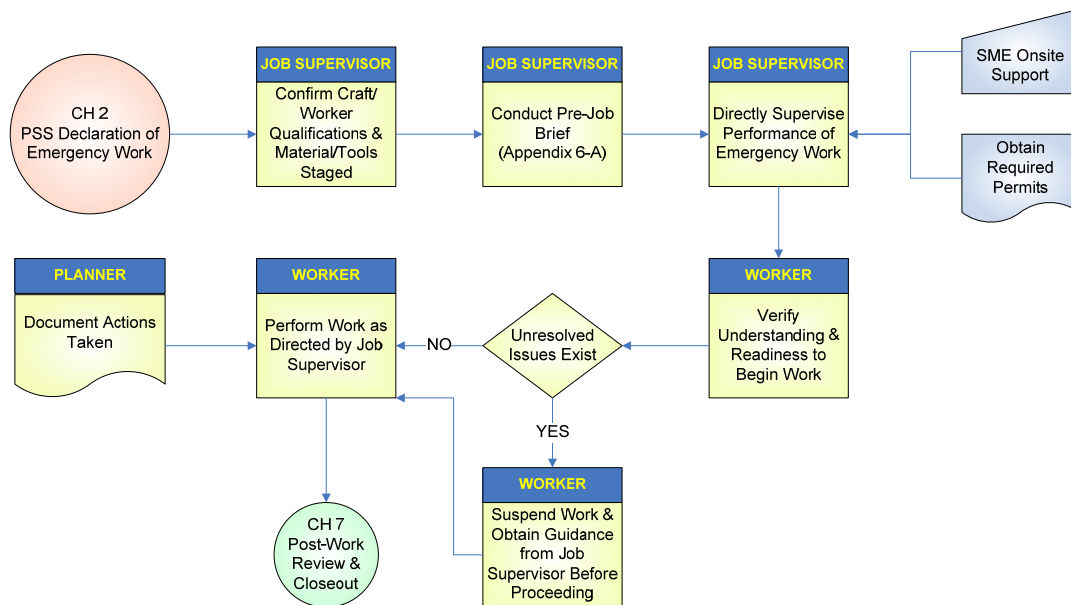
WHAT TO DO

This chapter is focused on the job supervisor, who directly oversees the work, and the workers that are engaged in the performance of the work. The job supervisor, who is responsible for performing the work, confirms that the individuals are qualified to perform the assigned tasks.

The Job Supervisor conducts a pre-job brief to ensure the performers understand the scope of the work and work-specific hazards and their controls. The Job Supervisor oversees the performance and completion of the designated work to mitigate the emergency condition, as well as post-work review and closeout steps to ensure actions are documented. Follow-up work order(s) may be needed to return the SSCs to service.

Before returning equipment to service, the Shift Manager/Building Manager confirms that the return to service requirements specified in the work package instructions are satisfied in accordance with Y14-001.

A. Perform Emergency Work.



NOTE 1 The PSS gives Work Start Approval when they notify the Job Supervisor that there is emergency work that needs to be performed.

NOTE 2 The Job Supervisor must remain onsite to directly oversee and supervise the emergency work activity.

Job Supervisor

1. Confirm that the individuals are qualified to perform the assigned tasks.
2. Verify that all known materials, tools and PPE are available and properly staged to perform the defined scope.
3. Designate a Planner or other onsite individual to document all actions taken during performance of the Emergency Work.

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A. Perform Emergency Work. (cont.)

Job Supervisor

4. Obtain all required permits to safely execute the emergency work per guidance from onsite SMEs and PSS.
5. Conduct a pre-job brief using UCN-21575, *Pre-Job Briefing Checklist*. Discuss the following to ensure the performers understand:
 - Applicable Material Safety Data Sheets.
 - Applicable precautions and limitations.

NOTE The following information can be obtained from the Shift Manager.

- Criticality Safety, Operational Safety requirements (OSR) and Technical Safety Requirements (TSR) concerns and controls.
 - Permit requirements.
 - Potential abnormal events and contingency plans.
 - Required Personal Protective Equipment (PPE).
 - Responsibilities of all personnel involved, including the Workers, onsite SMEs, and Planner.
 - The scope of the work.
 - Work-specific hazards and their controls.
6. Document the content and attendees of the pre-job brief on UCN-21575, *Pre-Job Briefing Checklist*.

Worker

7. Perform the work as directed by the Job Supervisor.
8. Suspend work if unsafe or unsecure conditions arise AND obtain guidance from the Job Supervisor.
9. Do NOT resume work until identified issues are resolved.
10. Resolve unidentified safety or security issues that caused any work to be suspended prior to work resumption.

Job Supervisor / System Engineer

11. Determine post-work testing requirements.

Worker

12. Perform the post-work testing specified by the Job Supervisor and/or System Engineer.
13. Ensure the work area has been returned to an acceptable condition that does NOT leave hazards for others.

Job Supervisor

14. Perform Post Job Review in accordance with Chapter 7.
15. Collect work documentation from Planner/onsite individual and assemble for filing.
16. Deliver completed work package documentation to WMC.

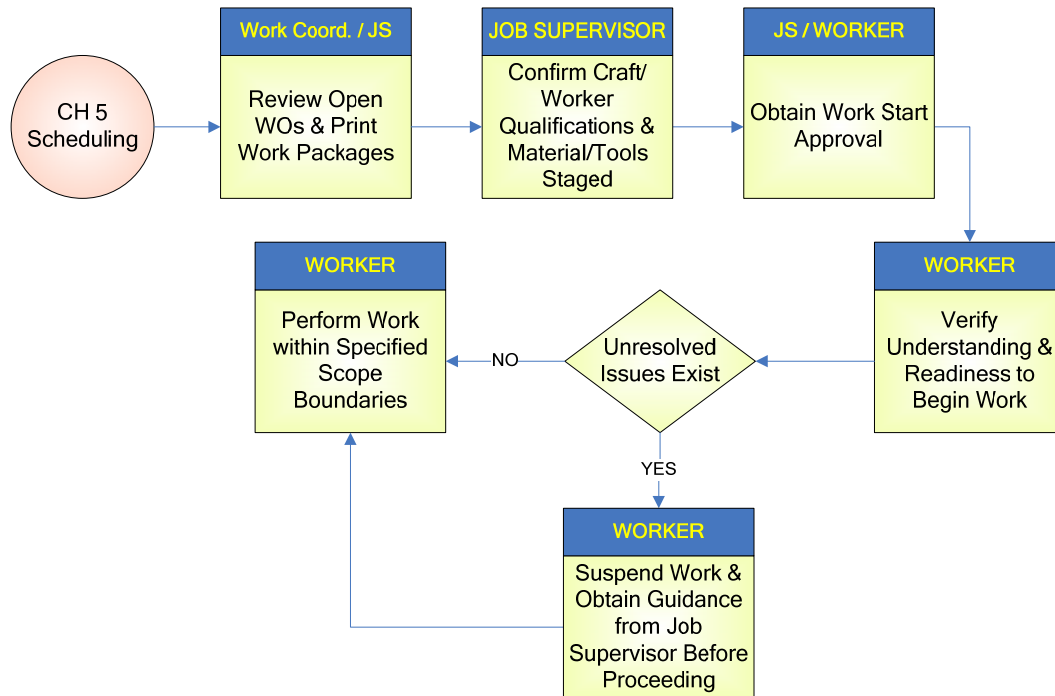
Work Coordinator

17. Record and document in SAP the emergency work performed.

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B. Perform Dispatched Work



NOTE Depending upon the location and crew, either the Work Coordinator or the Job Supervisor reviews SAP and prints the Dispatched Work Packages.

Work Coordinator/Job Supervisor

1. Review open jobs in SAP for Dispatched Work and print the Work Packages.
2. IF the Work Coordinator printed the packages, THEN route them to the Job Supervisor.

Job Supervisor

3. Confirm that the individuals are qualified to perform the assigned tasks.
4. Verify that all required PPE in accordance with Y73-116, *Personal Protective Equipment Program*, and materials/tools are available and properly staged to perform the defined scope.
5. Provide the Dispatched Work Packages to the Craft Workers for execution.

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B. Perform Dispatched Work. (cont.)

Worker

6. IF any work is to be performed outside of one or more nuclear facility (within an approximate 200 foot radius), THEN, **prior to commencing the work**, contact the nuclear facility Shift Manager in each facility to ensure the affected safety basis documents are NOT violated by the work activity.

NOTE It is important to check in with the Building/Shift Manager at the beginning of each shift and check out at the end of each shift to ensure the status of SSCs are communicated and understood, including when multiple shifts are required to complete the job.

7. Obtain the Building/Shift Manager's authorization to start Dispatched Work.
8. Verify your understanding of the work scope and site hazards prior to work start by answering the following questions.

******* ATTENTION *******

All questions must be answered NO for work to proceed as Dispatched Work.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Will I be exposed to hazards in the area that are not normally encountered while performing this type of work?
<input type="checkbox"/>	<input type="checkbox"/>	Will I use chemicals, equipment, or materials for which I do not understand the hazards?
<input type="checkbox"/>	<input type="checkbox"/>	Does the job require Personal Protective Equipment (PPE) for which I am not trained to wear?
<input type="checkbox"/>	<input type="checkbox"/>	Will bystanders be exposed to job hazards?
<input type="checkbox"/>	<input type="checkbox"/>	Does the work involve entry into beryllium areas, confined space entry or asbestos abatement?

9. Perform the work specified in the scope statement of the dispatched work package.
10. Suspend work if unsafe or unsecure conditions arise, or the work package CANNOT be accomplished as defined, AND notify the Job Supervisor.
11. Do NOT resume work until identified issues are resolved.

Job Supervisor

12. Resolve issues that caused work to be suspended, prior to work resumption.

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B. Perform Dispatched Work. (cont.)

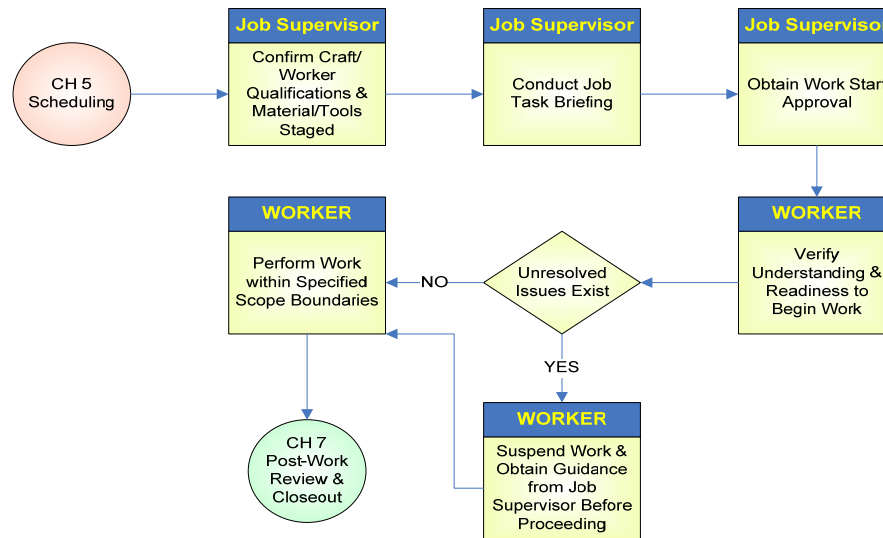
Worker

13. Perform the functional test to confirm that the work has been successfully completed.
14. Ensure the system/equipment has been returned to an acceptable operating condition.
15. Inform the Building/Shift Manager that the work has been completed upon the completion of the job.
16. Return the work area to acceptable condition, i.e., tools picked up, ladders removed, trash properly disposed of, good housekeeping, etc.
17. Sign the completed dispatched work package and return it to the Job Supervisor before the end of the work day.

Job Supervisor

18. Return completed dispatched work package to WMC by close of business on the next day.

C. Perform Minor Work



Work Coordinator

1. Verify that any applicable change request packages, change evaluations or USQDs associated with the Work Package are valid prior to providing the work package to the Job Supervisor for execution.

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C. Perform Minor Work. (cont.)

Job Supervisor

2. Confirm that the individuals are qualified to perform the assigned tasks.
3. Verify that all required materials, tools and PPE are available and properly staged to perform the defined scope.
4. Conduct a job task briefing for the personnel who are performing the minor work.

A job task briefing is a process in which the Job Supervisor personally interfaces with the crafts/workers as they are assigned work activities that are categorized as Minor Work. The purpose of the job task briefing is to have the Job Supervisor discuss with the workers/crafts the hazards, controls, correct tools/equipment and techniques to be used, along with stop/suspend work authority. The job task briefing for Minor Work is NOT formally documented. However, the Job Supervisor must be satisfied that the hazards are recognized, that proper controls will be applied by the individual workers, and that the work will be conducted safely and securely before releasing the work. The Job Supervisor confirm this understanding by asking questions.

5. IF any work is to be performed outside of one or more nuclear facility (within an approximate 200 foot radius), THEN, **prior to commencing the work**, contact the nuclear facility Shift Manager in each facility to ensure the affected safety basis documents are NOT violated by the work activity.

Job Supervisor/Worker

NOTE It is important to check in with the Building/Shift Manager at the beginning of each shift and check out at the end of each shift to ensure the status of SSCs are communicated and understood, including when multiple shifts are required to complete the job.

6. Obtain the Building/Shift Manager's authorization to start minor work.
7. IF the charged hours are anticipated to exceed 125% of the craft estimate before completion for Minor Work Packages with resource estimates of ≥ 8 total man-hours, THEN contact the Responsible Planner and WMC for revision.

Worker

8. Determine if any new hazards exist that are NOT identified in the minor work package, prior to work start.
9. IF any new hazards are identified, THEN suspend work and return the minor work package to the Job Supervisor/Responsible Planner for resolution.

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C. Perform Minor Work (cont.)

Worker

10. Perform the work specified in the scope statement of the minor work package in accordance with work package instructions.
11. Document in the work package the relevant as-found conditions and the work performed, including SSCs' replaced, for a complete and accurate work history.
12. Suspend work if unsafe or unsecure conditions arise, or the work package instructions cannot be accomplished as written, AND notify the Job Supervisor.
13. Do NOT resume work until identified issues are resolved.

Job Supervisor

14. IF work is suspended, THEN resolve issues that caused work to be suspended prior to work resumption.

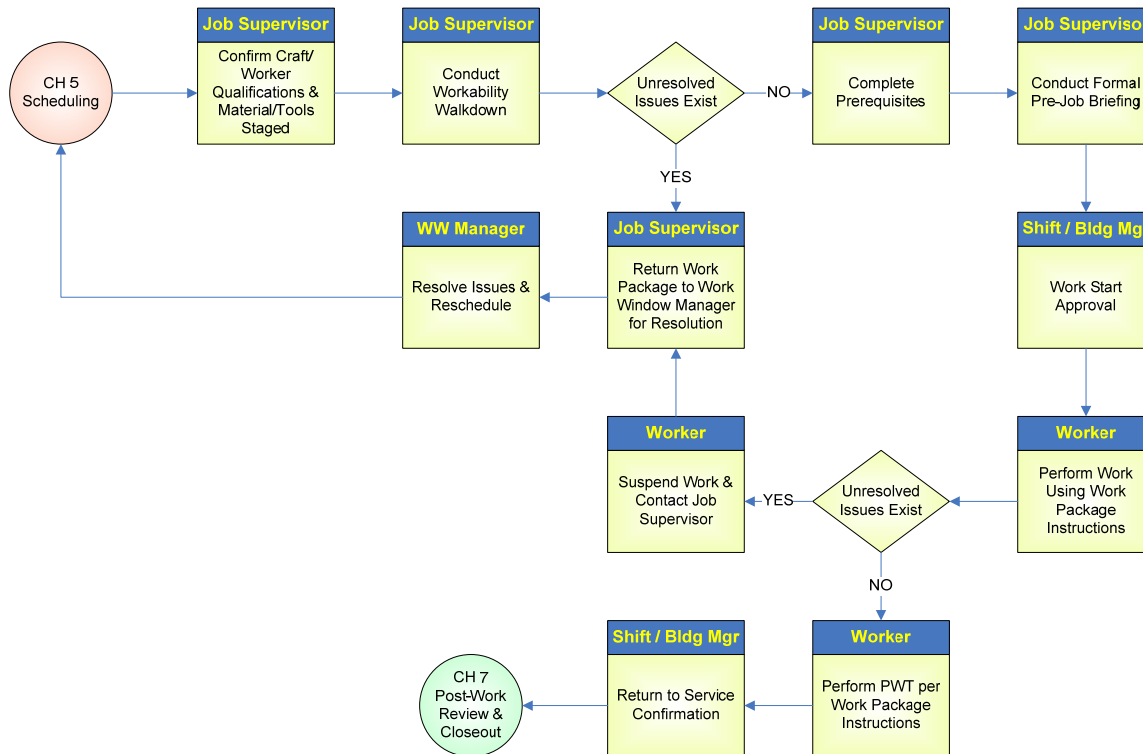
Worker

15. IF a PWT functional/operational test is specified in the work instructions of the minor work package to confirm that the work has been successfully completed and the SSC has been returned to service, THEN perform the PWT.
16. Return the work area to acceptable condition, i.e., tools picked up, ladders removed, trash properly disposed of, good housekeeping, etc.
17. Inform the Building/Shift Manager that the work has been completed upon the completion of the job.
18. Sign the completed minor work package and return it to the Job Supervisor before the end of the work day.

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D. Perform Complex Work



Work Coordinator

1. Verify that any applicable change request packages, change evaluations or USQDs associated with the Work Package are valid prior to providing the work package to the Job Supervisor for execution.

Job Supervisor

2. Confirm that the individuals are qualified to perform the assigned tasks.
3. Verify that all required materials/tools are available and properly staged to perform the defined scope.

NOTE If the work is defined as repetitive/recurring, and a workability walkdown was previously performed, a verification of facility conditions and hazards is sufficient and an additional workability walkdown is NOT required.

4. IF workability walkdowns are to be conducted, THEN ensure that personnel entering potentially hazardous areas possess an understanding of facility and walkdown/walkthrough hazards, and that they are current on the training requirements for entry into affected areas, including any specific training required to perform the walkdown/walkthrough.

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D. Perform Complex Work (cont.)

Job Supervisor

5. Inform the Building/Shift Manager prior to entry for workability walkdown.
6. Perform a workability walkdown with the individuals assigned to perform the work to determine whether any new hazards exist, and to ensure the work package instructions and provisions of the permits and hazard controls in the work package instructions are understood.
7. IF the walkdown identifies any unresolved issues, THEN return the work package to the Work Window Manager for resolution.
8. Complete the work instruction prerequisites to ensure readiness to work, such as:
 - Assemble required test equipment.
 - Assemble scaffolding and shielding materials.
 - Assemble tools and material at work location.
 - Build contamination control devices (catch basins, tents, water storage/recovery systems).
 - Complete rigging preparations.
 - Contact work support personnel as required.
 - Finish prefabrication work.
 - Provide necessary temporary air, power, and water requirements.
 - Set up welding equipment, as required.
9. Conduct a pre-job brief using UCN-21575, *Pre-Job Briefing Checklist*, utilizing the graded approach commensurate with the complexity and risks associated with the work and discussing any of the following that applies to the work to ensure the performers understand:
 - Applicable Material Safety Data Sheets.
 - Applicable precautions and limitations.
 - Criticality Safety, Operational Safety requirements (OSR) and Technical Safety Requirements (TSR) concerns and controls.
 - Security Plan
 - Hold points for workers responsible for the completion of the hold point and workers performing work immediately before or after the hold point.
 - "Lessons learned" from recent events.
 - Permit provisions listed in the work package instructions.

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D. Perform Complex Work (cont.)

Job Supervisor

- Potential abnormal events and contingency plans.
 - Required Personal Protective Equipment (PPE).
 - Responsibilities of performers.
 - Task specific training, qualification or certification requirements.
 - The prerequisites listed in the work package instructions.
 - The scope of the work.
 - Work-specific hazards and their controls.
10. Document the content and attendees of the pre-job brief on UCN-21575, *Pre-job Briefing Checklist*.
 11. IF any work is to be performed outside of one or more nuclear facility (within an approximate 200 foot radius), THEN, **prior to commencing the work**, contact the nuclear facility Shift Manager in each facility to ensure the affected safety basis documents are NOT violated by the work activity.

NOTE It is important to check in with the Building/Shift Manager at the beginning of each shift and check out at the end of each shift to ensure the status of SSCs are communicated and understood, including when multiple shifts are required to complete the job.

12. Obtain the Building/Shift Manager's authorization to start work.
13. IF the charged hours are anticipated to exceed 125% of the craft estimate before completion for Complex Work Packages with resource estimates of ≥ 8 total man-hours, THEN contact the Responsible Planner and WMC for revision.
14. Oversee and direct the work activities in accordance with the approved work package instructions and resource estimates.

Worker

15. Perform work within the requirements specified in the work package instructions.
16. Document in the work package the relevant as-found conditions and the work performed for a complete and accurate work history.
17. Return the work area to acceptable condition, i.e., tools picked up, ladders removed, trash properly disposed of, good housekeeping, etc.

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D. Perform Complex Work (cont.)

Worker

18. IF, during performance of the work activity, an unexpected condition occurs that:

- prevents work from being performed as planned;
- changes the scope of work;
- may jeopardize employee safety or health; or physical security;
- creates an environmental impact;
- has an adverse impact on the quality of operations, processes, or facilities; or
- may cause a violation of federal or state laws or DOE orders.

THEN stop/suspend work and perform the appropriate steps in accordance with Y73-001, *Industrial Safety Program*.

- a. Notify the Job Supervisor of the situation and document the progress that has been made in the work package so that the next crew that works on the job will know where to begin.

Job Supervisor

- b. IF the work is suspended because of any significant change in work activity, such as rescheduling, prioritization, etc., THEN re-obtain work start approval from Building/Shift Manager prior to resuming the work.
 - c. Obtain resolution from the Work Window Manager for any issues that require work to suspend.
19. Document worker comments in the UCN-21576, *Post-Job Review Checklist*, in accordance with Chapter 7 of this manual.
20. IF a welding job has been completed, THEN ensure that the original welding work package is returned to the Field Welding Engineer for approval in accordance with Y17-015, *Welding Program Manual*, before PWT or RTS.
21. Oversee the completion of the specified PWT in order to verify the ability of the SSC to perform its intended function, that the work corrected the original deficiency, and to ensure that new or related problems are not created by the work activity
22. Ensure the work area has been returned to acceptable operating condition, i.e., tools picked up, ladders removed, trash properly disposed of, good housekeeping, etc.
23. Obtain the Building/Shift Manager's written confirmation that the Return to Service requirements specified in the work package instructions are satisfied, in accordance with Y14-001.

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E. Revise Work Packages.

Job Supervisor

NOTE A reduction in the scope of work may potentially generate different hazards which would require a re-evaluation and a revision. For instance, different methods of accomplishment contained within the change may lead to exposure(s) to different types of hazards.

1. Determine whether a work package revision is required based on requested changes that affect any of the following:
 - The scope or intent of the job.
 - A hazard control measure identified in the work package.
 - Hold points, inspections, or verifications.
2. IF the change requires a revision, THEN complete UCN-21286, *Job Package Revision* and return the work package to the Work Management Center to process the change.
3. Route the work package revision to the Responsible Planner.

NOTE Pen and ink field changes are allowed for correcting minor errors in text (e.g., typographical errors, misspellings). This process is not to be used to compensate for or justify poor quality work packages. The quality of the work package should be sufficient to avoid pen and ink field changes. Additional minor changes may be allowed with the concurrence by the Responsible Planner.

4. IF the change does NOT require a revision, THEN make a pen and ink field change.
5. Ensure that the affected organization in the comment section of the work package reviews and concurs with pen and ink field changes.

Job Supervisor

6. Make pen and ink field changes, as follows:
 - a. Draw a single line through the entry to be changed.
 - b. Make the desired entry into the work package.
 - c. Draw a vertical line in the right-hand margin next to the change.
 - d. Initial and date the change.
 - e. Record reason for change in work package comments section

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E. Revise Work Packages. (cont.)

Responsible Planner

7. Verify understanding of revision request AND ensure it is valid.
8. IF the change affects a hazard control, THEN revise the original JHA in accordance with Y73-045, *Job Hazard Analysis*.
9. Revise the work package to include changes to scope, hazard controls, work steps, etc., as required.
10. Follow the requirements of Chapter 3 of this manual for work package development.
11. Indicate the revisions on every affected page.
 - a. Drawing a vertical line in the right hand margin next to the change.
 - b. Entering the revision number.
 - c. Initial and date the change.
12. Retain all pages replaced in the work package as a result of a revision in the work package history file and marked as Superseded.
13. Record reason for change in work package comments section
14. Route the work package back to the Work Management Center for re-scheduling.

Job Supervisor / Responsible Manager

15. Review and approve the revised work package.

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Chapter 7: Post-Job Review and Work Closeout

Effective Date: 01/16/07

WHAT TO DO

Overview of the Feedback and Closeout Process

Oversight processes provide excellent feedback input because they give a more accurate feel for work difficulty and potential coordination issues. Management oversight tools to monitor work execution include the Plan-of-the-Day, which monitors the day-to-day progress of work execution, and the self-assessment processes that require management to observe work in the field.

When feedback is captured, the focus needs to be on two primary objectives: (1) feedback to ensure continuous improvement of the work control process; and (2) feedback to ensure structure, system and component (SSC) reliability based on causal and failure data. Workers and supervisors perform an analysis of work to ensure that issues, improvements or lessons learned are identified and incorporated into subsequent work. Work reviews take on many forms, ranging from individual post-job reviews to analyzing all of the work performed by a group or a facility within a specified time period (e.g., the previous work window review).

The post-job review is the key part of the feedback loop for achieving continuous improvement in the integrated work control process. Job supervisors solicit worker feedback concerning the work, and Job Supervisors and Responsible Planners provide feedback to workers regarding the resolution of their post-job review comments.

The WMC ensures that work history, including data such as equipment failure cause and damage, is entered in SAP for the SSCs on which work was completed. Responsible Planners use the work history when planning subsequent work on the same or similar SSCs. System Engineers and Reliability Centered Maintenance Facilitators use the work history entries to trend SSC performance for improved reliability and to improve the PM/PdM program in accordance with Y18-021. The WMC uses the work window review process to compare numerous metrics to improve the overall scheduling and work flow process.

A. Perform Post-Job Review.

Job Supervisor

1. IF feedback would improve the planning process, OR
IF the work is Complex, except for non-intrusive SME support activities, OR
IF anyone has requested it,
THEN perform a Post-Job Review AND complete a UCN-21576, *Post-Job Review Checklist*, to solicit worker feedback concerning work control process improvements based on the planning, i.e., work instructions, materials, etc., and scheduling, i.e., coordination, permits, communication, etc.

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A. Perform Post-Job Review. (cont)

Job Supervisor

2. Ensure the work package documentation has been fill out properly and the equipment failure cause and damage associated with the appropriate equipment has been identified.
3. Initiate return of unused parts to storage and identify parts and materials consumed during the work so restocking may occur.
4. Retain any as-built drawings/sketches in the work package.
5. Return completed dispatched work packages to WMC by close of business on the next day AND completed Minor and Complex Work Packages to WMC within 5 working days.
6. Initiate action to resolve worker comments recorded on post-job review checklists.

Work Coordinator

7. Use Worker and Job Supervisor feedback as input for the Work Window Review.
8. IF requested, route a copy of as-built drawings/sketches to the System Engineer.
9. Route a copy of the completed Post-Job Review Checklists to the Responsible Planner for review to improve planning, order replacement stock, etc.

B. Perform Work Closeout

System Engineer

1. Initiate update of as-built drawings, as appropriate.

Work Coordinator

2. Ensure equipment history recorded in work packages is entered into SAP Work History section for the SSCs
3. Closeout work package within 3 working days of receipt of the completed work package, and forward for document retention in accordance with the Records Section of Chapter 1.

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C. Perform Work Window Review

Work Window Manager

1. Schedule a Work Window Review Meeting the week following execution of the work window, as applicable.
2. Target the audience to include personnel involved in the planning, scheduling and performance of the work and include appropriate facility/operations personnel.
3. Review what was completed, what is still required, and, as appropriate, why the work wasn't completed.
4. Monitor actual man-hours clocked versus estimated to improve the estimating process and to understand the number of hours charged compared to the estimate.
5. Utilize delay codes to identify problem areas.
6. Record improvement action items and assign actions to the appropriate personnel.
7. Prepare a Work Window Review Report, if applicable, to include:
 - A breakdown of the types of work scheduled & accomplished for the week, including emergent work.
 - Action Items, responsible persons, and schedule for resolution.
 - Standardized Metrics (for like comparison with other work windows) which track and trend the work window elements, should be completed.
 - What was initially intended to be accomplished, but was not.
 - The issues that prevented the work from being accomplished.