# Work Planning and Control

## Changes made in this revision:

- Revisions to align with Argonne's new Work Planning and Control Manual, and address work intended for the APS Upgrade.

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# Table of Contents

# Work Planning and Control

## 1 Introduction

This document describes APS work planning and control (WPC) processes to:

1. Ensure a safe working environment, protecting workers and the public.
2. Ensure hazards associated with the work are mitigated or eliminated.
3. Identify clear roles and responsibilities of those involved in the planning and execution of the work.
4. Identify the impact of the work on the facility and the work force.
5. Support highly reliable facility operations.
6. Optimize the use of effort and other resources to support the mission of the APS.
7. Provide a consistent framework to develop new or improve existing work practices.

Consistent with DOE and Argonne requirements for Integrated Safety Management (see Appendix A for additional information), each WPC process will contain the following elements:

1. Definition of the scope of work.
2. Identification and analysis of hazards associated with the work.
3. Plans that will mitigate or eliminate hazards. Plans will include the assignment of workers that have the knowledge, skills, and experience to safely complete the work and a briefing to workers, as appropriate to the task(s), on the scope of work and controls.
4. Approval and authorization requirements.
5. Requirements for closeout, feedback, and lessons learned.

## 2 Scope

This policy describes the overall requirements for WPC at the APS—implementation details are established in APS policies and procedures identified below.

This policy applies to:

- All technical and experimental work (i.e., other than office or other administrative work) done by APS employees and APS users. For the purposes of this policy, Argonne Associates, paid for by the APS, are considered APS employees.
- Contracted work (including construction) done at the APS, unless otherwise described by contract.
- Work done by Argonne employees in support of the APS-Upgrade.
- Work done by APS employees not working at the APS. In general, the employee must meet the joint requirements of this APS policy and the host facility requirements.

This policy does not address resource allocation, scheduling, or other administrative project management activities.

# 3 Process

Work planning and control, as described here, is the method by which the APS implements Integrated Safety Management (ISM), meeting the worker safety and health requirements for hands-on work.

Every worker is responsible for helping to ensure that Argonne and the APS maintain a safe work environment.

Managers are responsible for overseeing the work of their reports and responsible for the protection of workers, the public, and the environment.

### Stop Work

In every element of hands-on work (Argonne policy LMS-POL-1), all personnel **have both the authority and the responsibility to stop work** if there appears to be an imminent safety hazard or danger to the environment.

An individual who exercises stop-work authority, must: (1) ensure other workers are notified; (2) report their action to the Person in Charge (PIC), and (3) report their action to their APS Division Director or APS-U Project Director or more senior line manager. Once a stop-work is called, workers may only secure the work environment; otherwise all personnel involved in the work **must comply with the stop-work and halt all work**.

Workers may resume stopped work only when the responsible APS Division Director and/or APS-U Project Director for work involving APS-U, has verified that the appropriate hazard controls are in place and the individual who stopped the work has had the opportunity to concur with the corrective action(s).

### Suspend Work (sometimes also referred to as Pause Work)

Workers have the authority and responsibility to suspend or pause work:

- If a deficiency or unsafe condition is found, provided that it does not pose an immediate danger to personnel or the environment.
- If any ambiguity exists in work authorization or work procedure.
- If a change is made to the approved scope of work.
- If an inconsistency is found between the approved design, the physical installation, or other work documents

Workers may resume suspended or paused work when the deficiency has been corrected or the ambiguity has been clarified and the individual who paused or suspended the work has had the opportunity to concur with any corrective action(s).

## Unreviewed Safety Issues

The APS Safety Assessment Document (SAD) identifies anticipated hazards in APS activities. An Unreviewed Safety Issue (USI) exists when a previously unevaluated hazard discovered in an ongoing operation has the potential to cause one of the following conditions: (1) significantly increased probability of occurrence or consequence of an accident or malfunction of equipment important to safety, relative to that previously addressed in the safety analysis, or (2) an accident or malfunction is introduced that is of a different type than any evaluated previously by the safety analysis and that could result in significant consequences.

APS policy Unreviewed Safety Issue Determination (USID) and the Argonne procedure LMS-PROC-188 outline the process used to determine if a USI exists. Work is suspended or stopped for a USID and may only proceed after the USI question has been resolved by one of three outcomes: a USI Determination is not required; a USI is not present; or, a USI is present and is addressed per the Argonne procedure. If you think there is a possible USI or have a question about USIs, contact an ESH Coordinator for guidance.

## Radiation Safety System Change Control

Any work on radiation safety systems (RSS) must comply with the Change Control for Radiation Safety Shielding policy and procedure. In particular, a Configuration Control Work Permit (CCWP) is required for any RSS work.

## APS Experimental Work

The APS has established a specialized WPC process tailored to experimental work (see the APS Experiment Safety Reviews procedure). Reviews and control plans are based on information collected using the Experiment Safety Assessment Form (ESAF), available as an online form. To ensure uniform standards for experiment controls, the ESAF is used for both beamline and laboratory-based experimental work anywhere at the APS including on the experiment hall floor, in accelerator facilities, in the lab office modules, and in other APS labs. Set-up and testing are included as part of an experiment's scope.

No experiment will be allowed to run until 1) an ESAF has been approved and 2) an APS Floor Coordinator (FC) reviews/confirms experiment controls are in place with the on-site spokesperson and a FC-generated Experiment Authorization form (EA) has been signed-off by the on-site spokesperson and the form has been posted by a FC.

## Contractor Services

The APS also has established specialized WPC processes tailored to Contractor and Construction Services, see the Contractor and Construction Services policy for details. Contract work must be conducted in accordance with LMS-PROC-123, *Contractor Safety*.

Draft contractor Job Safety Analyses (JSAs) or WCDs that affect either: (a) the continuity of APS operations, or (b) an APS credited control essential to safe operation, require review and concurrence by the cognizant responsible manager. When a design change introduces safety concerns, financial risk, potential impact on continuity of operations or credited controls are potentially affected, a design review is required as a pre-requisite; refer to the procedure and criteria in the APS Design Reviews procedure. In these situations, the cognizant responsible manager ensures the adequacy of system requirements and performance criteria, physical configuration, and documentation prior to providing approval for work to proceed.

### Facility Technical Tasks

All other work not described above is categorized as a Facility Technical Task. Work in this category is planned using the Argonne AWARE software application to generate a WCD.

- For repeated tasks and routine work, groups are encouraged to develop standard work procedures and/or incorporate critical work steps directly into the APS eTraveler documents. A general WCD documenting the associated hazards and controls must be created in the AWARE tool, using either the Task-based or Standard Operating Procedure (SOP)-supporting Hazard Analyses option.
- For work that is a one-time job or for tasks that are not routine (due to new personnel performing or overseeing the tasks, tasks being performed in a new location, complexity of the tasks, etc.), a Task-based Hazard Analyses WCD shall be generated by the group originating the work. Complex work typically is that which requires high mental awareness to perform tasks, extensive coordination with individuals and/or organizations, variable work area conditions, and/or emergency personnel on standby.
- The AWARE tool requires the preparer to identify hazards and select appropriate control sets to mitigate those hazards. An overall hazard level is assigned to the WCD, based on the highest hazard level of those identified.
- After the hazard level is assigned, a risk level of low, moderate, or high must be assigned by the individual performing the authorization. Factors affecting the risk include consideration of the personnel or work teams who will perform the work, the location of the work, available supervision, and other factors. See the WPC Manual Section 5.2 for a list of factors to be considered.
- Approval and authorization are the responsibility of the person(s) listed in the following table:

| WCD hazard level (per AWARE) | WCD approver(s) | WCD authorizer |
|---|---|---|
| Low | Group Leader and, for APS-U work, an APS-U Assoc. Project Manager or designee | Supervisor or Group Leader or, for APS-U work, an APS-U Assoc. Project Manager or designee |
| Moderate | Group Leader and, for APS-U work, an APS-U Assoc. Project Manager or designee | Group Leader or, for APS-U work, an APS-U Assoc. Project Manager or designee |
| High | Division manager (DD, DDD, or ADD) and, for APS-U work, an APS-U Assoc. Project Manager | Division manager (DD, DDD, or ADD) for APS-U work, or an APS-U Assoc. Project Manager |

An overall summary of WPC for the APS is provided in Section 5 of this procedure.

New facility installations (e.g., a new beamline) or engineering/facility changes that have the potential to introduce safety concerns, financial risk, potentially impact the continuity of operations or a credited control must be reviewed before the installation or change per the APS Design Review procedure.

# 4 Roles & Responsibilities

### Worker

- Performs the hands-on work.
- Ensures work is done in conformance with the approved controls.
- Stops or suspends work as needed.
- Notifies the Person In Charge (PIC) if work plans need to be corrected.
- Identifies opportunities for improvement and brings them to the attention of the PIC.

### Person In Charge (PIC)

- Directs or oversees the work of one or more workers.
- Communicates the scope, hazard, and controls for the activity and the precautions needed to use equipment and facilities safely and effectively.
- Conducts the pre-job briefing, verifies that workers attend, and must address all questions and concerns raised.
- Accountable for carrying out the work described in the work control document, and ensuring tasks are completed safely as per approved requests.
- Stops or suspends work as needed.
- Ensures workers have the proper training to perform the tasks.
- Feedback point of contact (e.g., where one would go for a correction to work plan or controls or for improvement suggestions).

### Approver(s)

- Person(s) designated to formally approve work plan and controls.
- Approval does not imply that the work can be started; only that the plan is sound.
- Sufficiently knowledgeable of the work to validate that the appropriate hazards have been identified and controls selected.

### Authorizer

- Sufficiently knowledgeable of the work to confirm controls are in place and trained personnel have been scheduled to perform the work.
- Person designated to provide formal permission to initiate work.

# 5 Summary of Work Planning & Control

## Experimental Work, see APS Experiment Safety Reviews for additional information

| 1. Define Scope | 2. Identify Hazards | 3. Identify Controls | 4. Approve | 5. Authorize | 6. Perform Work within Controls | 7. Closeout | 8. Feedback |
|---|---|---|---|---|---|---|---|
| The experiment Spokesperson completes the description sections of the experiment on an ESAF | Experiment Spokesperson identifies the hazard classes sections on an ESAF and submits the ESAF | Upon ESAF submittal, Hazard Control Plan (HCP) is automatically generated | Safety:<br>1) Beamline or APS Group designated approver and<br>2) APS Experiment Safety Review Board | Experiment Authorization (EA):<br>1) APS Floor Coordinator (FC) generates an EA form<br>2) FC confirms controls in place with experiment On-site Spokesperson (OSP)<br>3) OSP signs-off EA form<br>4) FC posts EA at work area | Experiment executed by persons identified on ESAF<br><br>Beamline staff, Floor Coordinators, and APS ESH personnel provide oversight | FC removes EA and updates run log | End of Run form |

## Contractor Services, see Contractor and Construction Services for additional information

| 1. Define Scope | 2. Identify Hazards | 3. Identify Controls | 4. Approve | 5. Authorize | 6. Perform Work within Controls | 7. Closeout | 8. Feedback |
|---|---|---|---|---|---|---|---|
| Requestor submits requirements to APS Site Operations Group (ASO).<br><br>ASO completes a Work Project Checklist (WPC) | Contractor prepare a contractor's Job Safety Analysis (JSA), see LMS-PROC-123.<br><br>When work is to be performed by Argonne staff, a WCD is generated for the Argonne workers using the Argonne AWARE software application. | For each hazard identified, the contractor, in coordination with ASO, develops mitigating controls. | Sign-offs required per the Work Project Checklist are obtained.<br><br>Review and concurrence by the cognizant responsible manager is required for work that may affect the continuity of APS operations or a credited control. | AES Division Director (or designee), or, for work involving APS-U, an APS-U Assoc. Project Manager | Per contracts and applicable JSA and/or WCD<br><br>ASO provides oversight | ASO update facility records | Feedback to ASO |

## Technical Tasks not covered above, see Work Request guide and Argonne's AWARE tool for additional information

| 1. Define Scope | 2. Identify Hazards | 3. Identify Controls | 4. Approve | 5. Authorize | 6. Perform Work within Controls | 7. Closeout | 8. Feedback |
|---|---|---|---|---|---|---|---|
| Scope and Scope Limits are captured clearly in the Scope of Work section of a WCD using either the:<br>• Task-based Hazard Analyses<br>or<br>• SOP-supporting Hazard Analyses<br>in the Argonne AWARE software application. | Requestor or cognizant individual identifies hazards and mitigating controls in the Argonne AWARE software application. | A hazard analysis with identification of controls is required for generation of a WCD.<br>This hazard analysis assigns an overall hazard level (Low, Moderate, High), based on the highest level of the hazard and control combinations in the work package.<br>Routine, common and frequently performed work that is categorized as Hazard Level Low or Moderate can be part of a group summary WCD, using either a Task-based or SOP-supporting Hazard Analyses in the Argonne AWARE software application. | **Hazard: Low** Group Leader and, for work involving APS-U, an APS-U Assoc. Project Manager<br>**Hazard: Moderate** Group Leader and, for work involving APS-U, an APS-U Assoc. Project Manager<br>**Hazard: High** Division Manager (DD, ADD, or DDD) and, for work involving APS-U, an APS-U Assoc. Project Manager<br>Note: in the case of APS-U, for dual approvals, the APS-U approvers will need to be added as custom approvers at the Division Approval level. | Authorization must be documented in the Argonne AWARE software application by:<br>**Hazard: Low** Supervisor or, for APS-U, an APS-U Assoc. PM or designee. Authorization not to exceed 1-yr.<br>**Hazard: Moderate** Group Leader or, for APS-U, an APS-U Assoc. PM or designee. Authorization not to exceed 3-mo.<br>**Hazard: High** DD, Associate DD, or, for APS-U, an APS-U Assoc. PM. Authorization not to exceed 1-mo.<br>The Authorizer assigns a Risk Level, considering risk factors in Section 5.2 of the WPC Manual. High risk work must be entered into the Hazardous Work Registry.<br>Work should be authorized only for systems with approved designs. | Overseen by a Person In Charge<br>For low risk work, the APS Pre-Job Brief software application may be used to document work release. The Brief should be completed as often as necessary to address changing scope, personnel, or conditions.<br>For moderate or high risk work, moderate or high hazard work, APS-U work, or work that may affect the continuity of operations or credited controls, a Pre-Job Brief is required. Pre-Job Briefs must be completed as often as necessary to address changing scope, personnel, or conditions, minimally:<br>• Once per month for moderate risk or moderate hazard work; and,<br>• Once per week for high risk work.<br>See Appendix B. | Update facility records (e.g., file as-built drawings, update maintenance logs, and file closed permits – including CCWPs for work on shielding) | Provide feedback to the procedure author, Person In Charge, Supervisor, Group Leader, and/or APS-U Assoc. Project Manager.<br>A post-job review is required for moderate and high risk work. Feedback should be captured via the APS Pre-Job Brief software application.<br>For low risk work, feedback may be documented via the APS Pre-Job Brief software application, Work Request system, Toolbox Review or Plan of the Day/Week meeting.<br>Post-Job Brief guidance is covered in Appendix B. |

# 6 Related Policies

- Work Planning and Control Manual Rev. 0, September 24, 2018
- Introduction and Use of the APS Work Request System, APS_1302758
- APS Experiment Safety Reviews, APS_1187022
- Beamline ESH Programs, APS_1410274
- Managing APS Facility Procedures, APS_1001409
- Advanced Photon Source Conduct of Operations, APS_1180311
- APS Design Reviews, APS 000031

# 7 Documents/Records Created by this Procedure

| Description of Document/Record | Custodian | Storage Location and Medium | Retention Requirement |
|---|---|---|---|
| Group-level technical procedures | APS Procedure Administrators | DMS/ICMS | 5 years |
| Completed WCDs | Author | AWARE software application | 5 years |
| Pre-Job and Post-Job Briefs | Author | AWARE and APS software application | 5 years |
| APS Work Requests | Author | APS Work Request System | 5 years |

# 8 Feedback and Improvement

If you are using this procedure and have comments or suggested improvements for it, please go to the APS Policies and Procedures Comment Form* to submit your input to a Procedure Administrator. If you are reviewing this procedure in workflow, your input must be entered in the comment box when you approve or reject the procedure.

Instructions for execution-time modifications to a policy/procedure can be found in the following document: Field Modification of APS Policy/Procedure (APS_1408152).

* https://www.aps.anl.gov/Document-Central/APS-Policies-and-Procedures-Comment-Form

# Appendix A: Excerpt from the DOE Integrated Safety Management Policy (DOE P 450.4A CHG 1)

**GUIDING PRINCIPLES OF INTEGRATED SAFETY MANAGEMENT**

LINE MANAGEMENT RESPONSIBILITY FOR SAFETY. *Line management is directly responsible for the protection of the workers, the public, and the environment.*

CLEAR ROLES AND RESPONSIBILITIES. *Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department and its contractors.*
COMPETENCE COMMENSURATE WITH RESPONSIBILITIES. *Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.*

BALANCED PRIORITIES. *Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the workers, the public, and the environment is a priority whenever activities are planned and performed.*

IDENTIFICATION OF SAFETY STANDARDS AND REQUIREMENTS. *Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements is established which, if properly implemented, will provide adequate assurance that the workers, the public, and the environment are protected from adverse consequences.*

HAZARD CONTROLS TAILORED TO WORK BEING PERFORMED. *Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards.*

OPERATIONS AUTHORIZATION. *The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.*

**CORE FUNCTIONS FOR INTEGRATED SAFETY MANAGEMENT**

These five core safety management functions provide the necessary structure for any work activity that could potentially affect the workers, the public, and the environment.

The functions are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and the hazards involved.

DEFINE THE SCOPE OF WORK. *Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.*

ANALYZE THE HAZARDS. *Hazards associated with the work are identified, analyzed, and categorized.*

DEVELOP AND IMPLEMENT HAZARD CONTROLS. *Applicable standards and requirements are identified and agreed-upon, controls to prevent/mitigate hazards are identified, the safety envelope is established, and controls are implemented.*

PERFORM WORK WITHIN CONTROLS. *Readiness is confirmed and work is performed safely.*

PROVIDE FEEDBACK AND CONTINUOUS IMPROVEMENT. *Feedback information on the adequacy of controls is gathered; opportunities for improving the definition and planning of work are identified and implemented.*

# Appendix B: Pre-Job Briefing and Post-Job Briefing Guidelines

*Adapted from Hanford Mission Support Contract procedure MSC-PRO-14047, dated Apr 28, 2011.*

Work at the APS, whether conducted per Work Control Documents (WCDs), technical procedure or other form of work instruction, is expected to begin with a Pre-Job Briefing for the purpose of exchanging essential information about the work between the assigned workers and the task Person In Charge.

The pre-job briefing process communicates to the workers the scope of the work, the hazards and requirements, and the controls such that work can be performed safely. Pre-Job Briefings are a key element of successful implementation of ISM principles at the activity level for performing work within controls.

The Post-Job Review process is a fundamental element of the ISM core function of feedback and continuous improvement at the activity level. The positive and negative outcomes experienced during work performance serve as the talking points that lead to continual improvement. Formal and informal feedback shall be used to verify safe work performance, identify needed corrections, and communicate opportunities to improve the planning and safe execution of the work process.

The minimum expectations are established below for formal and informal Pre- and Post-Job Briefings for work at the APS:

Definitions:

*Formal Pre- or Post-Job Brief*: Documented briefing via the APS Pre-Job Brief software application.

*Informal Pre- or Post-Job Brief:* Individual or team discussion covering basic tenets of a Pre-Job Brief, not requiring documentation. **These typically take the form of a Plan of the Day, Plan of the Week, "Toolbox" or Work Status Review meetings**.

Process:

1. Review the approved procedure and/or Work Control Document to determine if a formal Pre-Job Brief is required based on these criteria below. A formal Pre-Job Brief is required when any of the following criteria are met:

   - A Medium or High Risk determination is made by the work authorizer.
   - A Medium Hazard Level is assigned to the WCD, regardless of risk determination.
   - Work involves the APS-U project.
   - Work may impact the continuity of APS operations, or a credited control.
   - Specified in the work instruction or reference procedure(s).
   - Requested by a member of the work team.
   - Required by a project, facility procedure or Work Control Document where the work activity will take place.
   - When the task is an initial attempt at a new task or infrequently performed.

2. Furthermore, conducting a formal pre-job briefing should be considered, whenever:

   - A large work team is involved,
   - The job is complex,
   - Extensive communication will be required during the job,
   - Workers or the designated Person In Charge have limited experience with the job or each other,
   - Timing is critical to success, or

3. When a formal Pre-Job Brief is conducted, the Pre-Job Brief should be conducted and documented via the APS Pre-Job Brief software application.

4. When a formal Pre-Job Brief is conducted, the Post-Job Brief should be conducted and documented via the APS Pre-Job Brief software application.