

Advanced Photon Source

PROCEDURE	Page 1 of 12
Procedure #:	3.1.124
Revision #:	0
Effective Date:	1 May 2013
Review Period:	2 years
Supersedes:	3.1.118
Last Reviewed:	25 Feb 2013

Work Planning and Control at the APS

(Effective 1 May 2013)

Changes made in this revision:

This is a new procedure that replaces 3.1.118 "Implementing Non-Experimental Work Planning and Control at the APS" (APS_1305115)

Prepared by:

G. Goepfner, AES/MOM
B. Glagola, AES UES

Reviewed by:

AES/ADD-MIS
AES/ESH Coordinator
ASD/ESH Coordinator
XSD/ESH Coordinator
PSC/ESH/QA Coordinator

Approved by:

AES Division Director
ASD Division Director
XSD Deputy Division Director
PSC Associate Laboratory Director/APS Director

APS_1432773

The current version of this procedure is accessible from <http://centraldocs.aps.anl.gov/>. Print or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the online version.

PROCEDURE	Page 2 of 12
Procedure #:	3.1.124
Revision #:	0

Table of Contents

1	INTRODUCTION	3
1.1	Purpose	3
1.2	Scope	3
1.3	References	4
2	BACKGROUND	4
2.1	Facility and Experimental WP&C	4
2.2	Lines of Authority and Responsibility	5
2.3	Mission-Critical Procedures	5
3	PREPARATION OR PRE-REQUISITE ACTION	5
3.1	Hazard Analysis	6
3.2	Types of Non-Experimental Work	6
3.2.1	Type 1 Work – Skill-of-the-Worker	6
3.2.2	Type 2 Work – Work Done by Written Procedure	7
3.2.3	Type 3 Work – Task-Specific Work	7
3.3	Stop Work Authority	7
3.4	Beamline Hazard Classes	8
3.5	Accelerator Shutdown Planning	8
4	PROCEDURE	8
5	CLOSEOUT OR POST-PERFORMANCE ACTIVITY	11
6	REVISIONS TO A PROCEDURE	11
7	DOCUMENTS/RECORDS CREATED BY THIS PROCEDURE	12
8	TRAINING REQUIRED	12
9	FEEDBACK AND IMPROVEMENT	12

Work Planning and Control at the APS

1 INTRODUCTION

With the various types of activities required for the operation of the APS, the APS has developed differentiated methods for managing work planning and control (WP&C). Argonne's expectations for WP&C are described in Local Work Planning and Control Implementing Procedures, [LMS-PROC-200](#)¹.

This document defines the overarching APS approach to WP&C. There is a second tier of APS procedures that define the specific mechanisms for implementing WP&C for most types of activities at the APS (e.g., experiments, work on accelerator facilities, etc.). These procedures are tailored to the type of work, establish approval/authorization requirements, and include:

- [Introduction and Use of the APS Work Request System](#)²
- [APS Experiment Safety Reviews](#)³
- [Beamline ESH Programs](#)⁴

Further, following these procedures and the general procedures defined in this document, hazard analysis-based, task-specific work plans are developed (e.g., experiment hazard control plan, accelerator facility maintenance procedures, etc.).

1.1 Purpose

Implementation of this WP&C plan ensures that work at the APS is executed in a manner that enables efficient operations, protects the environment, provides a safe working environment, and protects the health of APS workers.

1.2 Scope

This WP&C plan covers:

- All parts of the APS organization;
- Experimental and non-experimental technical work (i.e., not administrative/office tasks);
- APS personnel working at the APS;
- APS personnel working at non-APS locations on the Argonne site;
- APS personnel working off the Argonne site; and
- Activities of APS users in APS facilities, including both users that come from other Argonne organizations and users who are not Argonne employees.

This WP&C plan does not cover:

- Service work provided to the APS by Argonne Operations personnel (e.g., FMS and ESQ);
- Administrative/office work performed in office areas^{*}; or

- Work performed by Argonne subcontractors**.

* if the requirements of [LMS-PROC-200](#)¹, Exhibit E.1, Note 1 are met

** if the requirements of [LMS-PROC-200](#)¹, Exhibit E.1, Note 2 are met

1.3 References

¹Local Work Planning & Control Implementing Procedures, [LMS-PROC-200](#)

²Introduction and Use of the APS Work Request System, [APS 1302758](#)

³APS Experiment Safety Reviews, APS Procedure #3.1.25, [APS 1187022](#)

⁴Beamline ESH Programs, APS Procedure #3.1.07, [APS 1410274](#)

⁵Managing APS Facility Procedures, APS Procedure #3.1.05, [APS 1001409](#)

⁶ANL-804 Skill-of-the-Worker Classification, [APS 1427696](#)

2 BACKGROUND

2.1 Facility and Experimental WP&C

The APS has WP&C processes tailored to the operational needs of the facility including WP&C policies and procedures for the following areas:

1. Non-Experimental APS Facility WP&C

Facility maintenance procedures are developed according to [Managing APS Facility Procedures](#)⁵ and based on hazard screening and mitigating controls from Argonne safety tools (Argonne [WPC web-application](#)). Skilled workers are required for executing these procedures. Some WP&C processes are unique to particular APS activities (e.g., shutdown planning driven by the APS maintenance schedule and work requested through the APS Work Request system) and tailored to the activities.

2. Non-Experimental Beamline WP&C

Each APS beamline maintains an ESH plan according to [Beamline ESH Programs](#)⁴. Most types of non-experimental activities on beamlines are common from beamline to beamline. To ensure WP&C consistency across beamlines, a set of common non-experimental activities will be analyzed using the hazard screening and mitigating controls identification from Argonne safety tools (Argonne [WPC web-application](#)). Activities outside this standard hazard envelope require a hazard analysis and, if the activity is applicable to multiple sectors, the hazard and control set may be added to the standard envelope.

3. Experimental WP&C

Experiment hazard control plans are developed according to [APS Experiment Safety Reviews](#)³. An on-line tool based on the Experiment Safety Assessment form (ESAF) is

used for all experimental work at the APS. The ESAF system is used to screen hazards and develop control sets consistent with Argonne standards for all experimental activities at the APS.

To minimize any ambiguity of applicability and consistency across the APS, the ESAF system is used for all experimental work at the APS. ESAF is employed by users for beamline-related experimental activities, user non-beamline experimental activities (e.g., experimental activities in the Lab Office Module Labs), and for APS non-beamline experimental activities.

2.2 Lines of Authority and Responsibility

ESH is a line management responsibility at the APS. The processes described in this document apply across the APS Divisions and have been approved by the Division Directors. CATs are managed by non-APS groups and, for the purposes of the plan described here and indeed for all ESH aspects of their activities at the APS, report through a CAT Director to the AES DD.

Work at the APS is approved/authorized at the Group Leader/Sector Manager level. APS procedures or Laboratory requirements may require other approvers/authorizers (e.g., ESH Coordinator, Accelerator Operations (Main Control Room), Division Director, Associate Division Director, SME, User Safety Officer, etc.).

The APS relies on its highly skilled personnel, and it is the Group Leader's/Sector Manager's responsibility to ensure that personnel have the proficiency, skill, training, and experience to safely perform their assigned tasks.

2.3 Mission-Critical Procedures

It is APS policy that mission/safety-critical procedures, namely those that are required to ensure a safe work environment and reliable, efficient operations at the APS, be documented/implemented per [Managing APS Facility Procedures](#)⁵. Division management approval is required for procedures created according to this process. More rigor (see for example [LMS-PROC-200](#)¹, Table E-1) is required for mission-critical procedures than for procedures that have limited safety or operational impact on APS operations or on experimental activities. [Managing APS Facility Procedures](#)⁵ need not be followed for work that relies on knowledgeable trained worker (see Skill-of-the-Worker section below) or for some non-repetitive task (see Task-Specific Work section below), provided that the unavailability of the worker will not impact safe, reliable, efficient operations at the APS. A graded approach is required in implementation.

3 PREPARATION OR PRE-REQUISITE ACTION

The categorization of types of work listed below may be used to provide guidance for determination of the type of work control and the formality required for a task. WP&C

will be accomplished using a graded approach, commensurate with the hazards, complexities, and coordination of work to be performed. Mitigated risk resulting from the selection of a control is factored into the hazard identification and control selection process (see [LMS-PROC-200](#)¹, Section E.3). SME reviews related to hazard identification and control selection is integrated into the implementing tools.

3.1 Hazard Analysis

Procedures covered by this plan use the following to screen/analyze for hazards and determine controls:

1. The [WPC web-application](#); or
2. The APS experiment hazard identification and control web application ([ESAF](#)) system.

Controls (permits, approvals, authorizations, etc.) identified through the hazard analysis process are incorporated into APS procedures and are subject to review and approval according to [Managing APS Facility Procedures](#)⁵.

3.2 Types of Non-Experimental Work

Employees assigned to perform any of the following types of work must have the “skill of the worker” (see below) for the task and have any additional training that is needed to safely complete the work.

For non-experimental APS facility work, determine how the work is to be done according to the following:

3.2.1 Type 1 Work – Skill-of-the-Worker

This is work that can safely be performed by a worker possessing the needed proficiency, skill, training, and experience to perform a given task without the need for enhanced work planning, a formal procedure, or direct supervision. Workers have the appropriate level of proficiency (training, education, experience, and competency) to identify hazards and develop an appropriate control strategy to mitigate risks associated with the hazards ([LMS-PROC-65](#)). Such work is usually a routine low-hazard activity performed in a stable environment, and of a non-complex nature that supports a group’s day-to-day function (e.g., a *low* or *medium* level of rigor, per [LMS-PROC-200](#)¹, Tables E-1 and E-2).

Group Leaders/Sector Manager/ESH Coordinators must review employee/APS resident user JHQs on an annual basis, and ensure that employees/users in the group are current in their training courses and can perform assigned work tasks safely.

For work performed on APS accelerator facilities by APS personnel, the worker’s group leader must document the required skill levels that are necessary for technicians to meet these requirements (use the [ANL-804](#)⁶ form), and complete a hazard analysis to determine that hazards and their appropriate controls are identified and are within the identified skill set. Section 3 of form ANL-804 is not applicable if the Group Leader/Supervisor approval of worker proficiency is considered to be adequate.

PROCEDURE	Page 7 of 12
Procedure #:	3.1.124
Revision #:	0

3.2.2 Type 2 Work – Work Done by Written Procedure

This type of work requires written procedures at the group level. Typically this work will have medium-to-high hazards (e.g., a *medium* or *high* level of rigor, per [LMS-PROC-200](#)¹, Tables E-1 and E-2). Mitigating controls are incorporated into the procedure so that they can be integrated into the work. Technical groups are responsible for writing the procedures for work done in their groups. The procedures follow a standard format used at the APS and reside in the APS ICMS electronic document management system. A procedure can be reviewed and/or approved by people in the group as well as people outside the group and an SME, if required. Approvers may include the ESH Coordinator, ADD, and DD. See [Managing APS Facility Procedures](#)⁵ for approved procedure format.

A single hazard analysis may be applied once to a family of procedures if the work defined by those procedures is similar. It may also be applied only once to several task-specific jobs if they are similar in work scope.

Accelerator facility procedures may require the staff and technicians to read and sign off the procedure. If this is a requirement, it will be included in the procedure.

Beamline-specific procedures may become part of the beamline’s ESH plan subject to review and approval by the Beamline ESH Plan Review Committee.

3.2.3 Type 3 Work – Task-Specific Work

These are work tasks that occur infrequently, possibly only once, may not warrant an APS procedure developed per [Managing APS Facility Procedures](#)⁶, and cannot be done under Skill-of-the-Worker criteria only. Type 3 work is approved by the Group Leader/Sector Manager and a step-by-step checklist may be required for Type 3 work. A hazard analysis must be completed and documented, including a description of the work and hazard controls. A Subject Matter Expert (SME) review may be required.

3.3 Stop Work Authority

Through training and/or orientation, prior to working at the APS, all APS personnel and users will be instructed as follows:

- If they find themselves or others engaged in an unsafe activity, or observe unsafe working conditions, they are obligated to stop that work activity and immediately inform their supervisor, sector manager, or the responsible engineer (i.e., “stop work authority,” Argonne policy [LMS-POL-1](#));
- If a worker has been assigned a task and if they believe they do not have the skills to safely execute, they are obligated to stop that work activity and immediately inform their supervisor, sector manager, or the responsible engineer; and
- If the scope of a task changes such that it exceeds the existing hazard analysis or controls, they are obligated to stop that work activity and immediately inform their supervisor, sector manager, or the responsible engineer.

3.4 Beamline Hazard Classes

The APS User Safety Officer maintains the hazard screening and controls identification for standard classes of experimental activities for ESAF and ensures that the screening/controls are current with Argonne WPC standards.

The XSD ESH Coordinator maintains the hazard screening and controls identification typical of non-experimental beamline activities and ensures that the screening/controls are current with Argonne WPC standards.

3.5 Accelerator Shutdown Planning

Shutdown Planning Meetings with representatives of the technical groups doing work shall be held starting several weeks before a scheduled shutdown maintenance period. Separate meetings between the responsible engineer and technicians assigned to his work tasks shall also be held, depending on the complexity and hazards associated with the work. Appropriate procedures or step-by-step work checklists shall be reviewed by the technicians at that time. Responsible engineers walk through the work area with technicians before starting work to determine that the work environment and work start conditions are consistent with the hazard analysis. Supervisors and responsible engineers will make frequent visits to the work area to review work in progress, to engage the technicians doing work about any safety or work plan related issues, and to document these visits.

4 PROCEDURE

Step	Responsible Person	Action
Determine Type of Work		
1.0	Task Manager	If experimental work, exit this procedure and implement WP&C through the on-line ESAF system (APS Experiment Safety Reviews ³).
1.1	Task Manager	If work is to be performed by an APS employee but not in an APS facility: 1) the work plans must be developed that jointly meet the hazard analysis/safety requirements of both facilities, 2) plans must clearly identify who is responsible for the authorization and oversight of work, and 3) plans will be developed according to the WP&C for APS facility work – go to 2.0.
1.2	Task Manager	If APS facility work, go to 2.0.
1.3	Task Manager	If beamline work, go to 3.0.

Advanced Photon Source

PROCEDURE

Page 9 of 12

Procedure #:

3.1.124

Revision #:

0

APS FACILITY WORK		
2.0	Task Manager	Define scope of work: 1. Identify work tasks to a level of detail consistent with the risk, complexity, and hazard of work. 2. Clearly define boundaries of work scope. (Scope may be identified as part of an APS or a Group's work request system.)
2.1	Task Manager	Determine how the work will be performed according to the Types of work described in section 3. (Table E-1 in LMS-PROC-200 ¹ may be used to provide guidance for determination of the type of work control required.)
2.2	Task Manager	Inform Group Leader of scope of work.
2.3	Group Leader	In consultation with the task manager identify if workers qualified under Skill-of-the-Worker.
Hazard Analysis and Identification of Controls		
2.4	Group Leader	1) If a new Skill-of-the-Worker Classification is required, complete ANL-804 ⁶ and enter in ICMS. Qualification for Skill-of-the-Worker requires an ANL WPC hazard analysis. 2) If worker(s) need to be qualified, qualify them.
2.5	Group Leader	For Type 2 and Type 3 work: If a procedure is already in place and no new hazards are present, then go to next step; OR If a new procedure is needed, create a new ANL WPC hazard analysis using the "SOP-supporting Hazard Analyses" option in the WPC web-application . The APS procedure number(s), title(s), and ICMS Content ID must be on the hazard analysis, if applicable. (Controls, approvals, and authorizations are developed and approved for procedures according to the APS procedure on procedures.)
2.6	Group Leader	Identify any additional requirements that must be satisfied for work authorization. For work being performed on accelerator systems, add requirements to the ticket in APS Work Request System, and approve work control document. (APS 1302758)
2.7	Work Authorizers (identified through a work request system)	Authorization: worker's Group Leader: <ul style="list-style-type: none"> • Authorize work at the group and section level; • Ensure conditions and requirements for safe work have been satisfied; • Ensure permits, procedures, and the results of the hazards analysis do not introduce any controls that are in conflict; and • If work involves more than one group, ensure the work is coordinated (clear scope of work defined, and hazards and controls discuss among participants). (Work being performed on accelerator systems are scheduled and authorized through the APS Work Request System (APS 1302758 .)

APS_1432773

The current version of this procedure is accessible from <http://centraldocs.aps.anl.gov/>. Print or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the online version.

Advanced Photon Source

PROCEDURE

Page 10 of 12

Procedure #:

3.1.124

Revision #:

0

2.8	Task Manager	Manage task within controls for Skill-of-the-Worker, procedure work, and task-specific work.
2.9	Worker(s)	If Type 3, review work and acknowledge understanding by signing the work control document. Verbal acknowledgement of work for Type 1 (Skill-of-the-Worker) and Type 2 (Procedure) is acceptable. Perform work within controls.
2.10	Group Leader	Request employee feedback for work (see section 5 of this procedure). Revise procedures or work control documents, and associated hazard analysis, as needed.
NON-EXPERIMENTAL BEAMLINE WORK		
3.0	Beamline Task Manger	Define scope of work: 1. Identify work tasks to a level of detail consistent with the risk, complexity, and hazard of work. 2. Clearly define boundaries of work scope.
3.1	Beamline Task Manager	Determine how the work will be performed according to the types of work described in section 3 . (Table E-1 in LMS-PROC-200 ¹ may be used to provide guidance for determination of the type of work control required.)
3.2	Sector Manager or Group Leader	Inform the Group Leader/Sector Manager of scope of work.
3.3	Beamline Task Manager	In consultation with the Group Leader/Sector Manager identify if task is covered by the Beamline ESH Program. <ul style="list-style-type: none"> - If the task is covered by the Beamline ESH Program, exit this procedure and execute the task according the Program controls/requirements. - If a new task, not covered by the Program, continue to the next step. - If in doubt, go to next step.
Hazard Analysis and Identification of Controls		
3.4	Beamline Task Manager	In consultation with 1) an APS Division ESH Coordinator or User Safety Officer and 2) the Sector Manger/Group Leader: evaluate the hazards and identify requirements for updating the Beamline ESH Program (i.e., new Skill-of-the-Worker qualification process and/or new procedures and/or task-specific plan).
3.5	Beamline Task Manager	If no changes are required of the Beamline ESH Program, exit this procedure and execute the task according the Program controls/requirements.
3.6	Sector Manager or Group Leader	Complete hazard analysis; identify any additional requirements that must be satisfied for work authorization. If the Beamline ESH Program is not to be revised, go to next step OR Update the Beamline ESH Program per Beamline ESH Programs ⁴ .

APS_1432773

The current version of this procedure is accessible from <http://centraldocs.aps.anl.gov/>. Print or electronically downloaded copies may be obsolete. Before using such a copy for work direction, employees must verify that it is current by comparing its revision number to that shown in the online version.

3.7	Sector Manager or Group Leader	Authorize work to be done; ensure permits, procedures, and the results of the hazards analysis do not introduce any controls that are in conflict;
3.8	Beamline Task Manager	Manage task within controls for Skill-of-the-Worker, procedure work, and task-specific work.
3.9	Sector Manager or Group Leader	Request employee feedback for work (see section 5 of this procedure). Revise procedures or work control documents, and associated hazard analysis, as needed.

Note: New hazard analyses are based on the Argonne [WPC web-application](#). Existing procedures will require the new hazard analysis form at the time of the procedure review date, and should include a hyperlink to the web-based hazard analysis.

5 CLOSEOUT OR POST-PERFORMANCE ACTIVITY

Feedback is an essential element throughout the execution and completion of work activities. Feedback may be verbal for work performed as Skill-of-the-Worker, and may be documented for procedure or task-specific type work. Some procedures may require documented feedback and this documentation should also include lessons learned as a means to improve the work process.

For experimental work the APS End of Experiment Form has been implemented for feedback on experimental activities.

Upon completion of accelerator shutdown work, the work shall be reviewed at the section or group level to determine if there were changes to the work scope, work steps, equipment or PPE requirements, or hazards. If the work followed an APS procedure and an opportunity for improving the procedure is identified, the group/section leader or worker should submit an on-line [APS Policies and Procedures Comment Form](#) (see [section 9](#)) and, as appropriate to help ensure safety and efficiency, other lessons learned should be shared at post-shutdown meetings, future shutdown planning meetings, or with the APS Lessons Learned Coordinator.

6 REVISIONS TO A PROCEDURE

A procedure or task-specific work control document must be revised when there are changes to the work scope, work steps, or equipment that take the document beyond the scope of its associated hazard analysis. Procedures should also be evaluated for revision: for changes even when they are still covered by the existing hazard analysis; when feedback is received from procedure users; or based on recommendations from lessons learned evaluations. Changes to APS facility procedures are reviewed and approved according to [Managing APS Facility Procedures](#)⁵. For task-specific work control

documents, editorial changes are permitted if they do not go beyond the original safety envelope that was approved. If a new hazard and/or control is identified, changes should be made through the WPC web-application and will require re-approval and re-authorization.

APS facility procedures and their associated hazard analyses must be reviewed every one or two years as determined by the group leader and the procedure author.

7 DOCUMENTS/RECORDS CREATED BY THIS PROCEDURE

The documents/records listed below will be created in the execution of this procedure and must be retained as indicated.

Description of Document/Record (include ID number, if applicable)	Custodian	Storage Location and Medium	Retention Requirement
Group-level technical procedures	APS Procedure Administrators	ICMS	5 years
ANL-804, Skill of the Worker	Author	ICMS	5 years
Completed work control documents	APS Procedure Administrators	ICMS	5 years

8 TRAINING REQUIRED

Persons with actions in the procedure are to read this WP&C implementation plan.

9 FEEDBACK AND IMPROVEMENT

If you are using this procedure and have comments or suggested improvements for it, 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: Field Modification of APS Policy/Procedure ([APS 1408152](#)).

* http://centraldocs.aps.anl.gov/comment_form.php