

# Advanced Photon Source

User Policies and Procedure

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## APS Experiment Safety Reviews

### Changes made in this revision:

- Revised step 6 in Section 2 Procedure

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## APS Experiment Safety Reviews

### 1 INTRODUCTION

#### 1.1 Summary

Using the Advanced Photon Source (APS) web-based system, researchers are required to define the scope of their experimental activities at the APS and to prepare an Experiment Safety Assessment Form (ESAF) and an Experiment Hazard Control Plan (EHCP). The ESAF will identify the materials, equipment, processes and hazards associated with the experiment and the EHCP will identify all controls required to mitigate hazards to an acceptable risk level.

For the purposes of this Policy and Procedure, the organization responsible for the day-to-day operations of the facility where the experiment will be performed will be referred to as the *experimental facility management*. Facility managers include Collaborative Access Teams (CATs), Collaborative Development Teams (CDTs), and APS Groups.

The experiment assessment and approval process described in this policy and procedure is to be followed by APS Staff and non-APS researchers, for experiments performed on beamlines and in other APS experimental facilities.

The experimental facility management and the APS will be working together as partners in the review process to ensure that a safe working environment is maintained at the APS.

An experiment cannot be started without:

- 1) the ESAF/EHCP having been completed by the experimenters,
- 2) review and approval by both APS Safety (Experiment Safety Review Board for beamline experiments or a Divisional ESH Coordinator for nonbeamline experiments) and the experimental facility management, and
- 3) the Experiment Authorization Form (EA), including endorsements, has been completed and posted.

The EA and EHCP are generated automatically from the ESAF system. The approval of the experiment and the EHCP is valid until the listed end date given in the ESAF. Resubmission of the ESAF is required if the experiment is to be conducted after this time limit has elapsed. If the experiment is conducted on a beamline then the EA form must be posted at the beamline end cabinet and an EHCP must be posted at the experiment station. If the experiment is not conducted on a beamline then the EA and the EHCP forms must be posted near the work area (e.g., at the lab entrance).

## 1.2 Responsibilities

**Researchers** wishing to conduct experiments at the APS are responsible for:

- Preparing an EHCP by completing an electronic ESAF on the APS web pages that:
  - Defines the scope of the experiment, disclosing all materials (samples, reagents, equipment, etc.), facilities, and processes that will be used at the APS
  - Identifies hazards associated with their activities
  - Defines the safeguards consistent with ANL and APS standards
  - Lists the experimenters that will be working at the APS
  - Lists the start and end date of the experiment
- Submitting the ESAF and the EHCP to the APS far enough in advance of the experiment so that the APS can verify that the proposed controls are adequate and consistent with applicable requirements
- Identifying at least one member of the experiment team as an on-site spokesperson (OS) who will sign the Experiment Authorization form upon confirming the accuracy and completeness of the EHCP and that all safeguards are in place
- Completing all required training prior to the beginning of the experiment work
- Working within the scope of and in conformance with the EHCP
- Sharing opportunities for improvement on the experiment safety process with the APS and beamline personnel

**Experimental facility management** is responsible for:

- Assisting experimenters in identification of safeguards consistent with the safe operation of beamline facilities
- Reviewing EHCPs in a timely manner
- Identifying to the APS plans that are beyond the experimental facility management's expertise to evaluate and for which APS and/or ANL support is sought
- Approving EHCPs only after determining that they appear to:
  - Identify all significant risks to personnel and the environment
  - Define a hazard control strategy capable of reducing risks to acceptable levels
  - Include adequate hazard control verification requirements
- Designating individuals who can approve EHCPs
- Verifying safeguards and all required training are in place and endorsing the EA

**APS/PSC Experimental Facility Operation Group (EFOG)** is responsible for:

- Administrating the APS beamline experiment safety review program; the APS/PSC Deputy ALD for Operations has line responsibility for the program
- Maintaining web-based systems for entering ESAFs, experiment safety reviews and for the preparation of EHCPs
- Reviewing the ESAF hazard categories and control sets at least every three years to ensure consistency with the Argonne Work Planning and Control process and to incorporate applicable lessons learned.
- Assisting experimenters in identification of safeguards and training required by ANL or APS policy

- Appointing an APS Beamline Experiment Safety Review Board (ESRB) whose members, or designees, review and approve EHCPs
- Approving EHCPs only after determining that they appear to:
  - Adequately describe the experiment
  - Identify all significant risks to personnel and the environment
  - Define a hazard control strategy satisfying ANL requirements and capable of reducing risks to acceptable levels
- Reviewing EHCPs in a timely manner including adequate hazard control verification requirements
- Verifying and documenting the implementation of hazard controls where required
- Posting authorization forms and EHCPs

### 1.3 Applicability

The use of this procedure is applicable to APS users, Experimental Facility Management, APS Floor Coordinators, and other APS safety personnel.

### 1.4 References

[LMS-PROC-200](#) “Local Work Planning and Control Implementing Procedures”

### 1.5 Type of Procedure

Guidance procedure governing experiment safety review at the APS

## 2 PROCEDURE

Step	Person taking the action	Action
1	Spokesperson for the research group	<p>Using the APS web-based Experiment Safety review system, submit information to the experimental facility management and the APS characterizing the experiment by completing an ESAF.</p> <p>Submission of this information must meet the lead-time requirements defined on the APS Experiment Safety web page. Experiments that present minimal hazards common to all beamlines should be submitted at least 7 days prior to the scheduled start of the experiment. Additional time is required for higher levels of risk and for safety protocols new to the APS. If circumstances do not allow for the full 7 days for review, the APS will consider the request for expedited review on a case-by-case basis.</p> <p>[Steps 2 and 3 can take place in any order, but both steps must be completed before an experiment is authorized.]</p>

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2	Experimental facility management (for the beamline or laboratory where the experiment is to be performed)	Review the submitted EHCP for consistency with anticipated hazards associated with the experiment and consistency with beamline facilities safeguards. If acceptable, the designated representative of the experimental facility management approves the plan using the APS web-based experiment safety review system. Typically the experimental facility management will screen the plan before the APS review.
3	APS Experiment Safety Review Board  Or  the experimental facilities management ESH Coordinator	For beamline experiments, the APS Experiment Safety Review Board reviews the EHCP for consistency with expectations and ANL/APS standards. If acceptable, a member of the Board, or designee, approves the plan using the APS web-based experiment safety review system.  or  For non-beamline experiments the experimental facilities management ESH Coordinator reviews the EHCP for consistency with expectations and ANL/APS standards. If acceptable, a member of the Board, or designee, approves the plan using the APS web-based experiment safety review system.
4	APS	Advise the submitter of one of the following conditions: <ul style="list-style-type: none"> <li>• That the EHCP has been approved by both the Experimental facility management and the APS, and that the experiment may run after required training is completed and specified hazard controls have been verified to be in place, or</li> <li>• What safety concerns need to be addressed and that the plan needs to be revised and resubmitted, or</li> <li>• If the proposed experiment falls outside the scope of activity the APS can safely accommodate.</li> </ul> <p>[Note: the approval is valid until the end date of the experiment as listed in the ESAF. An experiment that is to be conducted after the listed end date must be resubmitted for review and approval.]</p>

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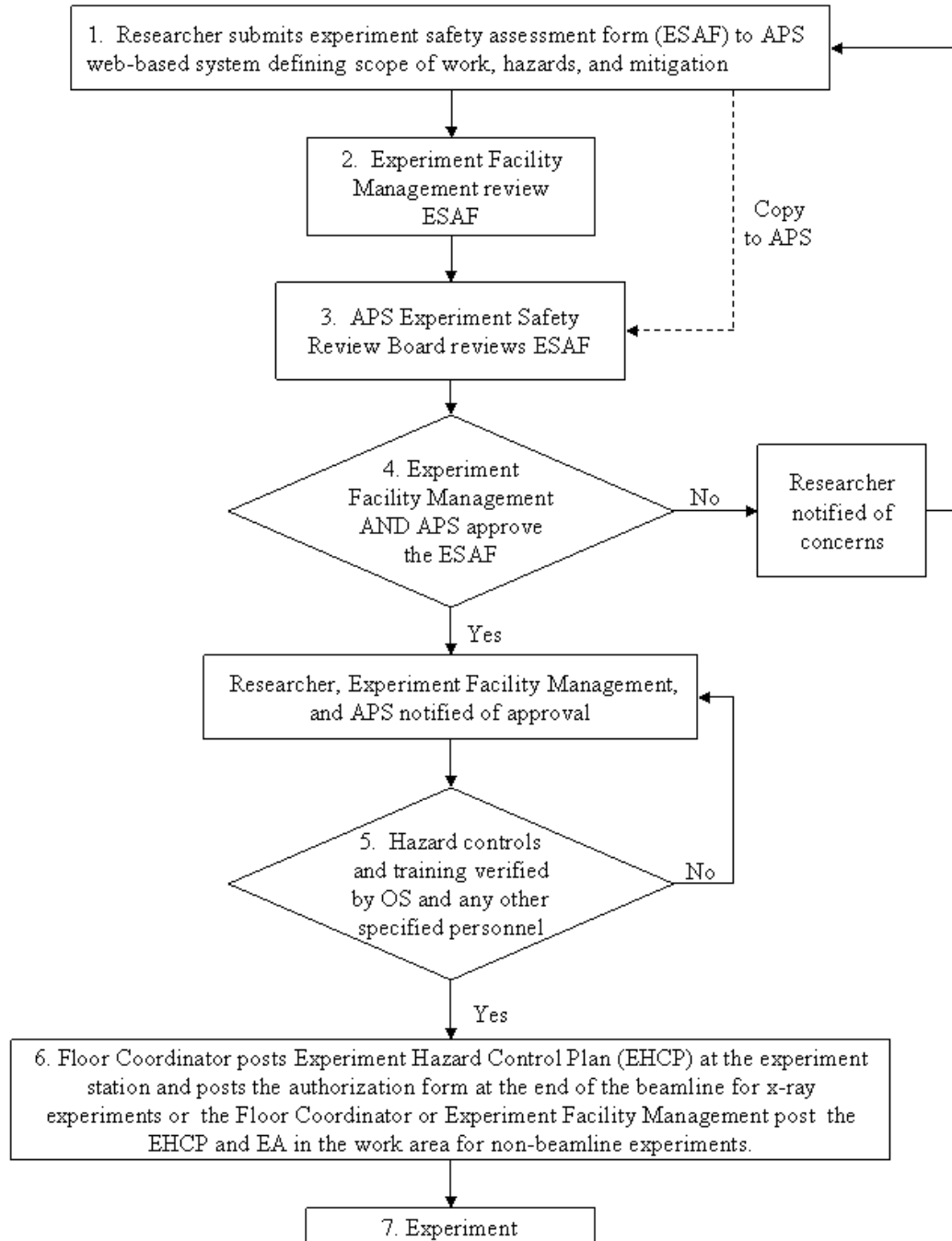
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5	Experiment On-site Spokesperson and other personnel designated in the EHCP	<p>Experiment On-site Spokesperson and other personnel designated in the EHCP:</p> <ul style="list-style-type: none"> <li>• Verify that the EHCP accurately identifies materials, equipment, activities and users that are part of the experiment and</li> <li>• Endorses the EA form</li> </ul> <p>Personnel designated in the EHCP must:</p> <ul style="list-style-type: none"> <li>• Verify that the EHCP has been reviewed and approved,</li> <li>• Verify that the specified controls, training, and safeguards are in place, and</li> <li>• Endorses the EA form</li> </ul> <p>The verification and endorsement are required before the activity that triggered the requirement can begin. If a non-hazardous sample that is consistent with the originally defined scope of the ESAF is added to the experiment, no additional approval by the APS is needed. Addition of hazardous materials or equipment beyond the original scope of the ESAF will require approval by the APS before the experiment may begin.</p>
6	An APS Floor Coordinator  Or  ESH Coordinator	<p>Authorize the beamline experiments to proceed: An APS Floor Coordinator posts the endorsed experiment authorization form in the display cabinet on the main aisle at the end of the beamline and a copy of the EHCP at the experiment station or in the laboratory (for non-x-ray experiments). The ESAF is posted via an entry in the APS Floor Coordinator shift log and automatic copying of the final ESAF to the Experiments database. A copy of the signed EA form is delivered to the User Safety Officer for records retention. Records are stored per requirements in LMS-PROC-79 in the designated APS digital system (ICMS).</p> <p>or</p> <p>Authorize the non-beamline experiments to proceed: An ESH Coordinator posts the endorsed experiment authorization form and a copy of the EHCP near the work area or at the entrance to the laboratory. A copy of the signed EA form is delivered to the User Safety Officer for records retention. Records are stored per requirements in LMS-PROC-79 in the designated APS digital system (ICMS).</p>
7	Experimenters	Conduct the experiment and upon completion submit an APS End of Experiment Form

## APS User Experiment Safety Review Process





### 3 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
ESAF	APS User Safety Officer	Electronic record in Oracle Database	Destroy 75 years after end of experiment
EA Form	APS User Safety Officer	Electronic record in APS ICMS or paper copy in APS User Safety Officer office	Destroy 75 years after end of experiment

### 4 TRAINING AND ADDITIONAL REQUIREMENTS

Minimum APS core training to be completed by all users:

- ESH100U, Argonne National Laboratory User Facility Orientation (required)
- APS101, APS User Orientation (required)
- ESH738, General Employee Radiation Training (GERT) (required)
- ESH223 or ESH223U, Cybersecurity Training (required)
- ESH377, Electrical Safety Awareness (required for resident users and Argonne employees)
- Sector-specific Orientation (required for work at beamlines)

### 5 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>