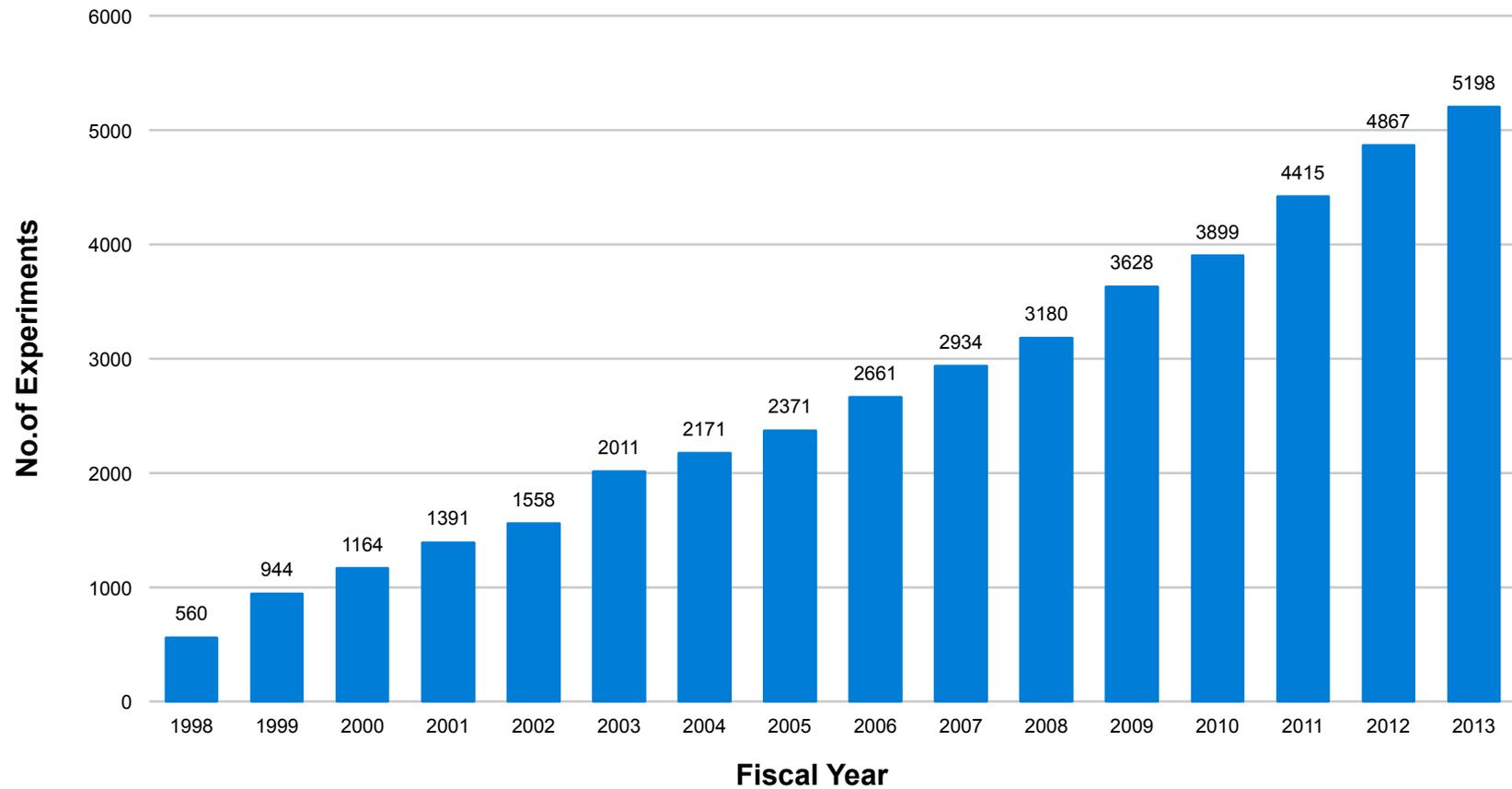


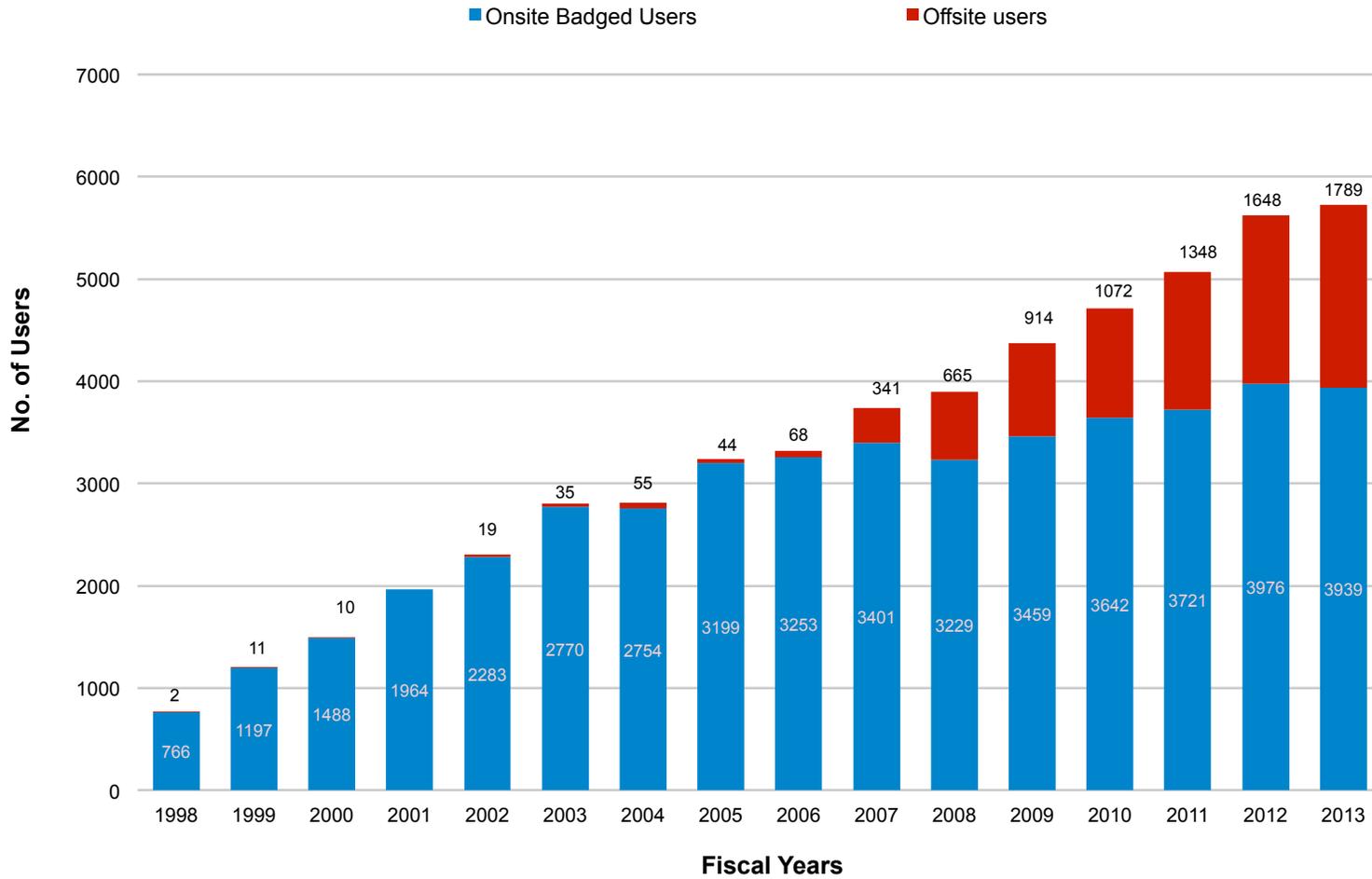
APS Experiment Safety Assessment Form System

Bruce Glagola
APS User Safety Officer
October 28, 2013

Number of APS Experiments (Fiscal Years 1998-2013)



On-Site & Off-Site APS Users (Fiscal Years 1998-2013)



Offsite = remote, mail-in & co-proposers



ESAF System

- Web-based System using Oracle Database
- Used to Collect Experiment Information from Users
 - Pages Displayed Based on Hazards
 - APS Experiment Hazard Classes
 - Administrative Data
 - Experimenters
 - APS Core Training Status
 - Description of Experiment
 - List of Samples / Materials
 - Equipment to be Used
 - Additional Files Attached
 - Identification of Hazard Controls
- Requires Approval by Both Beamline and APS
- Generates Experiment Hazard Control Plan (EHCP)
- Experiment Authorization Form (EA)



User Training

- Resident Users have JHQ
- Non-Resident Users have Mandatory Training to Work at APS
 - GERT
 - ESH100U (General User Facility Training for Users)
 - APS101 (APS Specific Training)
 - ESH223 (Cybersecurity)
 - Sector-Specific Orientation
- ESAF can Autotrigger Additional Training
 - ESH120 (Lasers)
 - ESH700 (Radworker 1)
 - ESH590 (Nanomaterials)

Core APS Training (Due Date)													
Grayed out training is not required for this experiment													
OS	User Type	Badge	First Name	Last Name	Affiliation	GERT	APS 101	ESH100U	Sector	ESH223 (U/A)	ESH377	Delete	
Principal Investigator													
Find	<input checked="" type="checkbox"/>	On-site	22		The University of	Se	10/25/2014	10/25/2014	10/25/2014	11/08/2014	10/21/2014	Not Required	<input type="checkbox"/>
Other experimenters coming to the APS													
Find	<input type="checkbox"/>	Remote	23		The University of	Se	02/28/2015	02/25/2015	02/25/2015	03/24/2015	02/28/2014	Not Required	<input type="checkbox"/>
Find	<input type="checkbox"/>	Remote	22		The University of	Se	10/31/2014	10/31/2014	10/31/2014	11/08/2014	10/21/2014	Not Required	<input type="checkbox"/>
Find	<input type="checkbox"/>	Remote	23		The University of	Se	07/03/2015	07/03/2015	07/03/2015	07/06/2015	07/03/2014	Not Required	<input type="checkbox"/>
Find	<input type="checkbox"/>	Off-site	22		The University of	Se						Not Required	<input type="checkbox"/>
Find	<input type="checkbox"/>	On-site				Se							



APS Remote Training Website

- Remote Training link on APS Safety & Training Webpage:
 - https://beam.aps.anl.gov/pls/apsweb/rt0004.intro_process

Argonne Home >

User Facility Courses for Argonne Employees

Questions? Contact the APS User Office at 630-252-9090 or apsuser@aps.anl.gov.

APS Facility Core Courses:

Note: Sector orientation is given by beamline staff at the APS.

Course	Name
APS 101	Advanced Photon Source User Orientation (2 year retraining)
ESH 100	Argonne National Laboratory User Facility Orientation (one time course)
ESH 223	Cybersecurity Annual Education and Awareness (1 year retraining)
ESH 377	Electrical Safety Awareness Training (3 year retraining)
ESH 738	GERT: General Employee Radiation Training (2 year retraining)

CNM Facility Core Courses:

Course	Name
CNM 101	Center for Nanoscale Materials User Orientation (2 year retraining)
ESH 100	Argonne National Laboratory User Facility Orientation (one time course)
ESH 223	Cybersecurity Annual Education and Awareness (1 year retraining)
ESH 590	Engineered Nanomaterials Orientation (one time course)

Go to "Insert (View) | Header and Footer" to add your organization, sponsor, meeting name here; then, click "Apply to All"



Experiment Types

(Graded Approach - Specific Hazards will enable more tabs to be visible)

- Low Risk

The screenshot shows the 'APS - Experiment Safety Assessment Form' interface. At the top, there is a navigation bar with 'Main Menu', 'Search Criteria', 'Instructions', and 'Logout'. Below this is a row of tabs: 'General' (selected), 'Experimenters', 'Description', 'Materials', 'Equipment', 'Electrical Inspection', 'Requirements', 'Comments Summary', 'Beamline Admin', and 'APS Admin'. The main content area displays 'Status : Pending (Glagola)', 'PEN : 28-IDC-2007-', and 'Role : APS ESRB'.

- Higher Risk

The screenshot shows the 'APS - Experiment Safety Assessment Form' interface for a higher risk experiment. The navigation bar and tabs are similar to the low risk form, but the tabs include 'Lab Use', 'Human Materials', and 'Radioactive Samples' in addition to the others. The main content area displays 'Status : Pending (User)', 'PEN : 28-ID-2007-', and 'Role : APS ESRB'. Below the status information, there is a note: 'NOTE : No experiment will be allowed to run until a properly completed and approved experiment safety assessment form has been posted by an APS Floor Coordinator'.



Experiment Hazard Classes (EHC)

EHCs are Used to Define Controls and Risk Level of Experiment and Define LMS Requirements

- Beamline Operation
- Low Temperatures
- High Temperatures
- Lasers
- High Pressures
- Chemicals
- Biosafety
- Radioactivity
- Magnets
- Non-Ionizing Radiation
- Hydrogen
- Electronics
- Nanomaterials
- USDA Regulated Soil
- Other



Samples / Materials and Equipment

- List all Samples and Materials to be Used
 - Include Materials Used for Prep Work in Lab
- Provides for Identifying Hazards with Each Material
- Identifies Materials to be put in Argonne Waste Stream
- Identifies Need for Laboratory Use

APS - Experiment Safety Assessment Form

Main Menu | Search Criteria | Instructions | Logout

General | Experimenters | Description | **Materials** | Equipment | Electrical Inspection | Lab Use | Requirements | Comments Summary | Beamline Admin | APS Admin

Status: Approved (Gupta) PEN: 16-IDD-2007-022 Role

Material Hazards:

List all samples & chemicals (including macromolecular crystals) that will be brought to and/or used at the APS. Check appropriate boxes regarding known hazards.

Materials Information																
Delete	Name (Policy for Identification)	Quantity	CAS #	Any Hazards	Toxic	Biohazard	Flammable	Radioactive	Carcinogen	Corrosive	Oxidizer	Explosives	Nano	Other	Dispose ANL	Lab Use C
<input type="checkbox"/>	Aluminum Single Crys	~1gm	7429-	N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	Copper Single Crystal	~3.5gr	07440	N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	Epon Resin 815c (bis)	9lb co		Y	Y	N	Y	N	N	N	N	N	N	N	N	Y
<input type="checkbox"/>	Hoppe's No. 9 Powde	1 quar		Y	Y	N	Y	N	N	N	N	N	N	N	Y	Y
<input type="checkbox"/>	Hysol HD3475 epoxy l	2.2lb c		Y	Y	N	Y	N	N	Y	N	N	N	N	N	Y
<input type="checkbox"/>	Index Matching Liquic	a few i		Y	N	N	Y	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	Lithium Fluoride Singl	~3gm	7789-	N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	P47 Phosphor (x-ray p	~300r	10040	N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	Quartz Single Crystal	~10gm	14808	N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	Vitreous Carbon	~1gm		N	N	N	N	N	N	N	N	N	N	N	N	N
<input type="checkbox"/>	acetone	a few i	67-64-	Y	Y	N	Y	N	N	N	N	N	N	N	Y	Y
<input type="checkbox"/>	isopropanol	a few i	67-63-	Y	Y	N	Y	N	N	N	N	N	N	N	Y	Y
<input type="checkbox"/>	methanol	a few i	67-56-	Y	Y	N	Y	N	N	N	N	N	N	N	Y	Y
<input type="checkbox"/>	rifle cartridges empty	<44		Y	Y	N	Y	N	N	N	Y	N	N	Y	N	N
<input type="checkbox"/>	single base smokeles	<160g		Y	Y	N	Y	N	N	N	N	N	N	Y	N	N
				N	N	N	N	N	N	N	N	N	N	N	N	N



Samples / Materials and Equipment

- Identifies Equipment that will be Used

Equipment Information						
Bringing to APS						
<input type="checkbox"/>	<input type="checkbox"/> Cryogenics (system or cryogen not normally a part of the beamline operation)					
<input checked="" type="checkbox"/>	High Temperature	<input type="checkbox"/> Electric Furnace	<input type="checkbox"/> Optical Furnace	<input type="checkbox"/> Heater(for DAC, etc.)	<input checked="" type="checkbox"/> Other High Temp.	
<input type="checkbox"/>	High Pressure	<input type="checkbox"/> Diamond Anvil Cell	<input type="checkbox"/> Large Volume Press	<input type="checkbox"/> High Pressure Vessel	<input type="checkbox"/> Gas Manifold	<input type="checkbox"/> GSECARS Gas Loading System
<input checked="" type="checkbox"/>	Laser	<input checked="" type="checkbox"/> Class 2	<input checked="" type="checkbox"/> Class 3a	<input type="checkbox"/> Class 3b	<input type="checkbox"/> Class 4	<input type="checkbox"/> ANL LSO Approved User Mode Only <input type="checkbox"/> Ruby Fluorescence System
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> High Voltage					
<input type="checkbox"/>	<input type="checkbox"/> Magnetic Field					
<input type="checkbox"/>	Non-Ionizing Radiation	<input type="checkbox"/> RF or Microwave	<input type="checkbox"/> UV Light			
<input type="checkbox"/>	<input type="checkbox"/> X-Ray Generator (does not include the APS Storage Ring)					
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Electrical Equipment (includes any equipment that will be plugged into an electrical outlet)					
<input type="checkbox"/>	<input type="checkbox"/> Other Specify					

<p>Attached Files (the limit length of a file name is 60 characters.)</p> <p>aluminum.pdf Cu MSDS.pdf IMR SR PB Single 20Base 20Smokeless.pdf Index Matching Liquid Carille Labs .pdf MSDS Hoppes No 9 Solvent.pdf 0.5 inchPGSafetyv4.pdf lithium fluoride MSDS.pdf msds quartz.pdf P47 Phosphor MSDS.html Vitreous Carbon.pdf epon resin 815c MSDS.pdf MSDS CCI Primer.pdf Hysol HD3475 Epoxy Hardener.pdf</p>	<p>Please supply a short description of the details of the proposed experiment, including sample and proposed hazard controls (engineered and administrative). You may also attach PDF or Note: the limit length of a file name is 60 characters. Attach PDF or Word Documents</p> <p>We will be performing x-ray diffraction on shock compressed single crystals using diffraction from a single x-ray bunch of approximately 8.8keV energy. A launcher will accelerate a cylindrical aluminum projectile to a velocity nominally below 700m/s which will then impact the target of interest. Operation details of the launcher are provided in an attached SOP document. The targets will consist of a quartz buffer, the sample of interest, and for some of the targets a vitreous carbon x-ray window backing the sample. The samples to be examined are <u>LiF</u>, Al, and Cu single crystals. In order to synchronize the</p>
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Hazards Analysis

- APS Safety Committees in Administrative Roles
- Direct Access to ESAF for Select Hazard Classes
- Can View and Add Comments
- Cannot Approve ESAF
- Radioactive Materials
 - Access by APS Radioactive Sample Safety Review Committee
- Biohazards and Human Materials
 - Argonne Institutional Biosafety Committee Chair

General	Experimenters	Description	Materials	Equipment	Human Materials	Radioactive Samples	Requirements	Comments Summary	Beamline Admin	APS Admin	
Status : Approved (Rice)			PEN : 18-IDD-2007-37				Role : APS ESRI				
Experiment Scope											
<p>APS Verifier The experiment falls within the scope addressed in the Environment Assessment for Enhanced Operations of the APS, June 2003, DOE/EA-1455. If 'N', enter NEPA Review Comments in APS Safety Committee Comments. Y ▾</p> <p>John Vacca / RSO-HP</p> <p>APS Safety Committee Comments (CONFIDENTIAL)</p> <p>51595-07/11/2007 Laurel Vana has received BBP refresher training and BSC training.</p> <p>51595-07/11/2007 This protocol was approved by the IBC as application no. 2006-0009 on 1/10/2007 under BSL2+ containment. Annual updates will maintain protocol validity for a total of three years. Sector staff and user group have obtained bloodborne pathogen training, agent-specific training and informational training regarding the operational components of BSL2+ containment. Eye wash, sink and biosafety cabinet required as adjunct equipment. BSC training required for both user group and sector staff on the APS BSC. Solid waste must be disposed of by Waste Management as regulated medical waste via incineration. Both approved protocol and emergency response information must be kept posted for the duration of the containment period. The APS BSO must inspect the sector prior to the initiation of BSL2+ containment. Biohazardous material must be kept locked up at all times when not in use and properly labelled.</p> <p>51595-07/11/2007 51595-02/28/2007 Attached in the description section is the IBC memo, Sarah Rice's application, Calling tree response/Contact list, and copies of the training recieved by the users and Beamline staff.</p> <p>51595-07/11/2007 Users have recieved BBP training and prion awareness training from the ANL BSO. Beamline staff has recieved Biohazard awareness training and prion awareness training from the ANLBSO. All users have recieved BSC training from the APS BSO</p> <p>51595-07/11/2007 Rad samples are to be mailed to bldg 46 where they will be brought to Bldg 435 by SPM with Health Physics present. ALL users are in the process of obtaining ESH700 training.</p>											
APS Experiment Review Board											
<p>Approver Name : MOONIER, NENA Date : 07/11/2007 Status : Approved ▾ Contact sector coordinator</p>											
<p>Risk Class : High APS Risk Class : High ▾</p>											
Beamline Approver											
<p>Approval Status : Approved Approval Date : 07/12/2007</p>											
APS Comments (Posted at Experiment)											
<p>29872-07/09/2007 Uranium use and containment reviewed and approved by RSO-HP. All required runtime controls and procedures for radioactivity will be implemented by RSO-HP.</p> <p>29872-07/09/2007 Nena Moonier and John Vacca both have to signoff on this experiment at posting time for the APS.</p> <p>51595-07/11/2007 This protocol was approved by the IBC as application no. 2006-0009 on 1/10/2007 under BSL2+ containment. Annual updates will maintain protocol validity for a total of three years. Sector staff and user group have obtained bloodborne pathogen training, agent-specific training and informational training regarding the operational components of BSL2+ containment. Eye wash, sink and biosafety cabinet required as adjunct equipment. BSC training required for both user group and sector staff on the APS BSC. Solid waste must be disposed of by Waste Management as regulated medical waste via incineration. Both approved protocol and emergency response information must be kept posted for the duration of the containment period. The APS BSO must inspect the sector prior to the initiation of BSL2+ containment. Biohazardous material must be kept locked up at all times when not in use and properly labelled.</p> <p>29872-07/12/2007 Per e-mail from user: the samples contain less than 25 micrograms each of uranium.</p>											



Develop / Implement Controls

- ESAB Requirements Tab

- Denotes APS Experiment Hazard Classes for this Experiment

General	Experimenters	Description	Materials	Equipment	Requirements	Comments Summary	Beamline Admin	APS Admin					
<p>The items listed in the boxes below are summaries of the necessary controls, procedures, etc. that are required to be in place before the experiment may begin. To see the full list of APS Experiment Hazard Classes and the detail of the individual classes, please click on one of the links in the header of the hazard class table below.</p>													
Status : Pending (Chrzas)			PEN : 22-BMD-IDD-2008-0610_0800				Role : APS ESRB						
Base	Cryo	High I	Laser	High P	Chem	BSL	Rad	Magnet	RF	EE	High V	Nano	Other
<input checked="" type="checkbox"/> HC 1.0	<input checked="" type="checkbox"/> HC 2.0	<input type="checkbox"/> HC 3.1 <input type="checkbox"/> HC 3.2 <input type="checkbox"/> HC 3.3	<input type="checkbox"/> HC 4.2 <input type="checkbox"/> HC 4.3a <input type="checkbox"/> HC 4.3b <input type="checkbox"/> HC 4.4	<input type="checkbox"/> HC 5.1 <input type="checkbox"/> HC 5.2 <input type="checkbox"/> HC 5.3 <input type="checkbox"/> HC 5.4	<input type="checkbox"/> HC 6.0 <input type="checkbox"/> HC 6.1 <input type="checkbox"/> HC 6.2 <input type="checkbox"/> HC 6.3 <input type="checkbox"/> HC 6.4 <input type="checkbox"/> HC 6.5 <input type="checkbox"/> HC 6.6 <input type="checkbox"/> HC 6.7	<input type="checkbox"/> HC 7.1 <input type="checkbox"/> HC 7.2 <input type="checkbox"/> HC 7.3 <input type="checkbox"/> HC 7.4 <input type="checkbox"/> HC 7.5	<input type="checkbox"/> HC 8.1 <input type="checkbox"/> HC 8.2 <input type="checkbox"/> HC 8.3	<input type="checkbox"/> HC 9.0	<input type="checkbox"/> HC 10.0	<input type="checkbox"/> HC 12.0	<input type="checkbox"/> HC 13.0	<input type="checkbox"/> HC 14.1 <input type="checkbox"/> HC 14.2 <input type="checkbox"/> HC 14.3	<input type="checkbox"/> HC 15.0



Develop / Implement Controls

- ESAS Requirements Tab
 - Short Summary of Requirements for Each Hazard Class

Hazard controls to be implemented before experiment may begin.

Experiment Safety Requirements Summary	
Engineered Controls : (2.0) As determined by <u>Beamline Design Review Process</u> or other review. (1.0) As determined by <u>Beamline Design Review Process</u> .	Procedural Controls : (2.0) As determined by <u>Beamline Design Review Process</u> or other review. (1.0) As determined by <u>Beamline Design Review Process</u> .
Design Reviews and Equipment Inspections : (2.0) Cryogenic Equipment brought to the <u>APS</u> to be reviewed. Pressure safety must be reviewed. (1.0) <u>APS</u> reviews for standard <u>beamline</u> operation already exist.	PPE : (2.0) Proper PPE for handling cryogenic fluids if in use. (1.0) Safety glasses with side shields and appropriate gloves for incidental use of common solvents.
Signs and Labeling (2.0) Containers labeled with common name of liquid <u>cryogen</u> . (1.0) Proper labeling of chemical containers.	Dosimetry and Monitoring (2.0) None Required. (1.0) Only what is required for normal <u>beamline</u> operation.
Safety Training (2.0) ESH145 recommended for cryogenic liquids. (1.0) APS101, ESH100U, GERT, ESH223, ESH377, Sector Orientation	



ESAF Reports

■ ESAF Approved by Beamline and APS

■ ESAF System Generates Two Documents:

- Experiment Hazard Control Plan
 - Posted at Beamline Station
 - Contains Summary of Experiment Hazards and Controls
 - Training Requirements
 - Reference to Attached Documents

APS ESAF - Experiment Hazard Control Plan Report

Printed date: 12/02/2011

PEN: 16-IDD-2007-022

Experiment ID: 47271

ID Start Date: 08-AUG-07

ID End Date:

Title: Single Bunch X-ray Diffraction Measurements on Shock Compressed Single Crystals

On-Site Spokesperson

The information on this hazard control plan is accurate and complete. All materials/samples to be used and hazards have been identified. All users are listed.

Name	Institution	Phone
------	-------------	-------



ESAF Reports

- Experiment Authorization to Perform Work (EA Form)
 - Signed by Experiment OS, Beamline Staff and / or APS Safety

APS ESAF - Experiment Authorization Form

Printed date: 12/02/2011

PEN: 16-IDD-2007-022

Experiment ID: 47271

ID Start Date: 08-AUG-07

ID End Date:

Title: Single Bunch X-ray Diffraction Measurements on Shock Compressed Single Crystals

On-Site Spokesperson

The information on this hazard control plan is accurate and complete. All materials/samples to be used and hazards have been identified. All users are listed.

Name

Institution

Signature

Date



Performance of Experiment

- ESAF is Posted by Floor Coordinator
 - Oversight of ESAF
 - Shiftlog Entry
 - ESAF record copied to Experiments Database
 - Work May Begin
- Users Perform Work
 - Follow Special Procedures Conditions
 - Safely Conduct Work Under Requirements of the EHCP
- Beamline Staff, APS Staff
 - Responsible for Oversight of Work being Performed
- Anyone at ANL
 - Stop Work Authority, If Needed



Feedback and Improvement

- During Review Process
 - Feedback and Questions
 - Content of Experiment
 - Hazards Identification
 - Control Implementation
- After Experiment User Completes End of Experiment Form

1. Was your visit to the APS a success ?
<input type="radio"/> Highly successful (obtained all required data, will have big impact on my program)
<input type="radio"/> Successful (obtained enough data to move program ahead)
<input type="radio"/> Partially successful (obtained some data but not as much as expected)
<input type="radio"/> Totally unsuccessful (no useful data, a waste of time)
Comments <input type="text"/>
APS-Specific Questions 1 2 3 4 5 6 7 Next



Questions?

Go to "Insert (View) | Header and Footer" to add your organization, sponsor, meeting name here; then, click "Apply to All"

