

Work Planning and Control: SSRL Implementation for User Experiments



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This document is scheduled for review in three years, 2012.

Overview

All work at SLAC is planned, authorized and released. All workers are expected to perform work, including experiments, within established and documented controls. Stop work authority is understood by all workers. WPC authorization has two elements: affirmation that the worker is fully trained, qualified and licensed, if needed; and that the worker understands the hazards and controls of the work activity they will be carrying out.

SSRL executes the elements of WPC for experiments performed by Users as described below. Due to the often extended timeline between when a User's proposal is accepted and their arrival on site to perform experiments, SSRL has separated these two authorization elements and ensure they occur as follows.

- SSRL User Authorization includes:
 - ESH & access training compliance,
 - Hazard identification and analysis, development of mitigation and control strategy, as documented in the Safety Review Summary (as applicable) and on the SSRL Beam Line Safety Checklist, and
 - Documented procedure verification.

- SSRL User Release includes:
 - Verification of authorization,
 - Pre-job briefing (face-to-face discussion) to ensure the User understands the hazards and controls of the experiment they have been authorized to perform,
 - Completed SSRL Beam Line Safety Checklist, and
 - Coordination of the experiment within the physical boundaries of SSRL control.

SSRL User Authorization is granted by a SLAC knowledgeable employee (i.e. SSRL Safety Staff), who verifies the authorization elements listed above. SSRL User Release is a two-step process. A pre-job briefing is conducted by a SLAC knowledgeable employee (i.e. Staff Beam Line Scientist, Beam Line Engineer, SSRL Safety Staff or Beam Line Duty Operator), and the final release is granted by the Beam Line Duty Operator who verifies the release elements listed above.

Process: How are Users authorized and released to conduct experiments at SSRL?

At SLAC all work, which includes performing experiments, requires planning, analysis and review prior to authorization and release. Users are required to identify and disclose potential safety issues in their proposal and beam time request/user support forms before they arrive. A knowledgeable SLAC employee, such as the SSRL Safety Staff, Beam Line Scientist or Engineer or Duty Operator will review the proposed experiment and engage with the user to ensure that hazards are understood, appropriate controls identified, that required procedures follow best known methods/practices and that the user can adequately explain; the steps, hazards and controls of their process.

Experiments are evaluated through the appropriate process prior to starting. Completion of the evaluation, required ES&H training, site and facility access agreements (i.e. Use Access Guidelines & Agreement), safety talks and the experimental Safety Checklist constitute line management authorization for work to proceed within the limits imposed by the facility. Furthermore, release is then granted to users by the Duty Operator after verification of completion of the Safety Checklist, including the pre-job briefing.

When in operation, SSRL provides 24/7 assistance to users. Whenever possible, the pre-job briefing will be conducted by the Beam Line Staff. SSRL Safety Staff may serve as back up. Outside normal hours, Duty Operators are authorized to perform the pre-job briefing. When this is the case, they will inform SSRL Safety Staff (via email or phone message) that they have done so.

As with any work activity at SLAC, should the experimental conditions change, new hazards be introduced or other conditions occur that have not been evaluated, then re-authorization is required to ensure that potential hazards that may have been introduced are understood and controlled. At this point re-release may also be required. For confirmation or if any questions or problems arise during the course of a visit, contact the Duty Operator who is on duty 24/7 whenever experiments are scheduled.

Documentation

Work Authorization is documented by the following:

- Approved proposal/initial safety review
- Approved beam time request/final safety review
- All users sign Access Guidelines (signature on file for 1 year)
- Individual user initials part 1 of Safety Checklist*
- Safety Staff signs and dates part 2 of Safety Checklist in “initial safety review” box

*User initials indicate the following: "I am conducting the experiments as previously described and approved. I am not introducing any element that was not previously disclosed."

User Pre-job Briefing and Release are documented by the following:

- Beam Line Engineer, Beam Line Scientist, Staff Scientist, SSRL Safety Staff or Duty Operator (see Appendix for list of POC and backup) carry out meaningful pre-job briefing with users to confirm that all potential hazards have been disclosed, evaluated and mitigated. Any newly identified hazard is brought to the attention of SSRL Safety Staff and addressed before part 2 is signed.
- Person conducting the pre-job briefing then signs and dates part 2 of Safety Checklist in “user safety checkout”
- Duty Operator checks each box of part 3, including verifying that that elements identified in part 2 and SRS (when applicable) are implemented and the training has been logged
- Duty Operator signs and dates part 3.

Training requirements

The SSRL User Research Administration (URA) Office ensures, in conjunction with the SSRL Safety Staff, that all the training defined as part of the proposal and experimental review process, has been completed before issuing badges. Once completed, core training records (EOESH/GERT) are uploaded to the ES&H system, confirmed by URA staff prior to issuing ID badge. The SSRL Safety Staff or Beam Line Staff may identify additional training requirements in the course of the review. Requirements are communicated to users. These are documented in the Safety Review Summary (SRS). These additional training requirements must be met before work can be authorized.

Summary of Procedures

WPC Elements	SSRL Process	Responsible Parties	Comments
Define work scope	Proposal submission	User spokesperson; SSRL User Administration	http://www-ssrl.slac.stanford.edu/userresources/proposals.html
	Proposal review for science rating	SSRL User Administration; Review Panels	
Identify and analyze hazards	Proposal review for hazards	Initial review by SSRL Safety Staff	User administrator verifies training has been completed before issuing badge
Identify controls		SSRL Safety Staff communicate with Spokesperson	Result of initial safety review integrated in proposal
	Beam time request	Final safety review by SSRL Safety Staff	Changes from original proposal are analyzed for new hazards and new controls are put in place
Prepare ATA, JSA, SOPs or equivalent	Access Guidelines	All users sign Access Guidelines	This is done once a year
	User orientation (Safety talk; Hutch authorization)	SSRL Safety Staff, Floor staff with the user team	User orientation is refreshed according to the GERT training cycle. Training is logged and log kept at user station. Specialized activities carry specific training requirements and tracking
	Safety Review Summary (SRS)	SSRL Safety Staff issue a review summary as needed	As needed: hazard identified by SSRL Safety Staff, controls, additional training are documented on the Safety Review Summary
SSRL User Authorization		Safety Review Summary signed by Spokesperson	Documents agreement by Spokesperson to be implemented for specific experiment
	Safety Checklist (SCL)	SSRL Safety Staff issue Safety Checklist	Safety Checklist required for each scheduled experiment. Refers to the SRS when hazards are present
		Individual user initials part 1	User confirms "no new element"
		SSRL Safety Staff sign part 2 of Safety Checklist in "initial safety review" box	Documents authorization based on safety review
Pre-job briefing and Release	Safety Checklist (SCL)	Users and SSRL Safety Staff/BLE/ Beam Line Scientist/Staff Scientist/DO	Meaningful discussion to make sure all elements of experiments have been evaluated and mitigated through the safety review. See discussion guidance and poster
		SSRL Safety Staff/BLE/ Beam Line Scientist/Staff Scientist/DO sign part 2	Documents that the that the User understands any boundary conditions of their experiment or of the SLAC equipment, and that they are aware of any specific requirements listed in the SCL and SRS
		Duty Operator signs part 3	Documents all BL safety items checked

Execute work		Users	
Change in work plan or Unexpected event?	Communicate to DO and SSRL Safety Staff	User, or BL Staff, SSRL Safety Staff, DO (walk through) initiates the communication	
	If minor change (i.e., within scope of procedures already reviewed and evaluated)	SSRL Safety Staff reviews safety checklist	
		Signature of amended Safety Checklist for authorization and release (see above)	
	If major change (i.e., involves new procedures)	SSRL Safety Staff reviews newly proposed procedure and prepares new SRS	
		Spokesperson or designee signs SRS	
		New Safety Checklist issued and signed off as above for authorization and release	New cycle of authorization and release
Post-job review	End of run summary	Spokesperson	Issues brought to the attention of X-ray Research and Facilities Division management
Revise approach as needed	Issues review Identify necessary steps to remedy issues; Closure and communication	Involvement of interested parties: URA staff, SSRL Safety Staff, others as appropriate, XRFD Management; URA communicate with users and staff	Future improvement: tracking system

Appendices

- 1) Sample Safety Checklist
- 2) Sample Pre-job briefing poster
- 3) Pre-job briefing discussion guide – sample questions
- 4) POC - Beam Line staff (To be updated periodically)
- 5) Links for internal reference

SSRL BEAM LINE SAFETY CHECKLIST Non VUV Beam Line

1. EXPERIMENTER INFORMATION

BRANCH LINE:	<input type="text"/>	PROPOSAL:	<input type="text"/>	SPOKESPERSON:	
DATE ON:	<input type="text"/>	DATE OFF:	<input type="text"/>	EXT TO:	<input type="text"/>
				EXT TO:	<input type="text"/>
				EXT TO:	<input type="text"/>
				APPROVED:	<input type="text"/>
				APPROVED:	<input type="text"/>
				APPROVED:	<input type="text"/>

EXPERIMENTERS COMING TO SSRL

User initials indicate the following: "I am conducting the experiments as previously described and approved. I am not introducing any element that was not previously disclosed."

<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

2. BEAM LINE SAFETY INSTRUCTIONS (see Safety Review Summary for additional information)

Initial Safety Review:	<input type="text"/>	Date:	<input type="text"/>
User Safety Checkout by:	<input type="text"/>	Date:	<input type="text"/>

Users shall not be put online until all line items in this section are signed off.

3. BEAM LINE SAFETY ITEMS

(BDO checks each Beam Line Safety Item to verify compliance)

<input type="text"/>	BLA is valid	<input type="text"/>	Hutch inspection-
<input type="text"/>	Compliance with all Beam Line Safety Instructions have been met.		*No new openings
<input type="text"/>	Equipment is earthquake braced		*Lead glass windows installed
<input type="text"/>	No electrical hazards have been identified		*Feedthroughs are secured in place
<input type="text"/>	User emergency contact numbers posted on white board		*Beam stops are in place (as applicable)
<input type="text"/>	All relevant user training has been completed		*Rat shields in place (as applicable)
			*Functional test of Search Reset System

BEAM LINE DUTY OPERATOR:	<input type="text"/>	DATE:	<input type="text"/>
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(BDO signs after all Beam Line Safety Instructions and Items are met.)

4. SAFETY REVIEW SUMMARY

HAZARD TYPE(S):

HAZARDS:

REQUIRED PROCEDURES, INSTRUCTIONS, REFERENCES

The above safety information describes all known potential hazards associated with this experimental run and all procedures necessary to maintain a safe and healthy environment while at SSRL

STOP!

Has anything changed compared to the Safety Checklist?

SAMPLES

- Appropriate containment?
- Pressure hazards?
- Potential for toxic exposure ?
- Nanoscale materials?
- Biohazards?
- Radioactive materials?

EQUIPMENT

- Electrical equipment subject to the Electrical Equipment Inspection Program?
- Lasers?
- Radioactive source?
- Vacuum/Cryostats?
- Seismic concerns?

CRYOGENS

- Use of LN2? Other cryogenes?
- Other cryogenic substances?
- Samples immersed in LN2?
- Familiar with PPE?
- Familiar with O2 deficiency safety?

HAZARDOUS MATERIALS

- MSDS needed?
- Compressed gases?
- Flammables?
- Appropriate storage?
- Appropriate containment?

10/20/2009

Questions? Concerns? Call Duty Operator at xt 4040 or contact the Safety Officer

Pre-job briefing discussion guide for personnel signing part 2

The following list of questions is meant to guide the conversation towards a meaningful assessment of potential hazards. It is not an exhaustive list.

GENERAL

- 1) What are the critical steps or phases of this experiment?
- 2) How can a mistake be made at that point?
- 3) What is the worst thing that can go wrong?
- 4) What controls are needed to prevent #2 and #3?

YES NO

SAMPLES

- Is the user bringing anything not listed on the beam time request [] []
- What is the sample containment? – [] []
- If samples are sealed, are there any pressure hazards? [] []
- If samples are open, is there potential for exposure? [] []
- Would it be toxic? [] []
- Ask why they aren't sealed.
- What the size (scale) of the samples in use [] []
- May the samples be considered Nanoscale? [] []
- DOE notification range is less than 100nanometers (0.1 micrometers). Verify that training has been taken or notify SSRL Safety Staff
- Do the samples contain any biohazards ? [] []
- Human tissues? [] []
- Animal tissues? [] []
- Other? (e.g., infectious agents, airborne pathogens) [] []
- Radioactive materials? [] []

CRYOGENS

- Is the user using LN2 or other cryogenes? [] []
- Is the user familiar with PPE? [] []
- Is the user familiar with O2 deficiency safety? [] []
- Are samples immersed in cryogenes? [] []

EQUIPMENT

- Are lasers being used [] []
- Are you using other hazardous equipment (e.g., equipment with radioactive source, not tested by a nationally recognized testing laboratory) [] []
- Any concerns regarding vacuum/cryostats? [] []
- Any concerns regarding seismic bracing? [] []

HAZARDOUS MATERIALS

- Are MSDS needed [] []
- Is the user using compressed gases? [] []
- Is the user using flammables? [] []
- Are chemicals appropriately contained and stored? [] []

Other

- Does the user need on the job training? [] []
- Are there any other EH&S related concerns? [] []

Help with Pre-job Briefings

- Be specific in your questions, generalities will get vague answers
- Discuss error traps (incremental changes, procedures that are not correct, work methods that are different from beam line to beam line for similar equipment), possible consequences, and needed defenses for each critical steps
- Discuss the specifics of the experiment; tailor error-prevention techniques or other defenses to the task
- Be engaging, don't conduct briefing as a monologue
- Plan, be prepared and allow time for conducting of the pre-job briefing
- Principal participants must be present for briefing
- Help user understand the scope of the task and that due consideration must be given to scope changes and scope creep
- Checklists do not engage conversation, they just check what's there/not there, not what might have changed. Ask follow up questions.
- Do not conduct in a distracting location

Answer suggesting a hazard not previously disclosed and mitigated, is a trigger for you to contact the SSRL Safety Staffs, Behzad Bozorg-Chami or Matt Padilla. They will then make any necessary adjustments - if possible - or inform the user that they are unable to go online.

Beam Line Staff Documenting User Pre-job Briefing
(Updated list maintained at <http://www-ssrl.slac.stanford.edu/safety/index.html>)

BL	Primary Staff	Backup Staff
1-4	John Pople	Bart Johnson
1-5	Christine Trame	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Mike Soltis
2-1	Charles Troxel	Bart Johnson
2-2	Charles Troxel	Bart Johnson
2-3	Charles Troxel	Bart Johnson
4-1	Joe Rogers	Bart Johnson/Staff
4-2	Thomas Weiss	HiroTsuruta
4-3	Matthew Latimer	Eric Nelson
5-4	Curtis Troxel	Donghui Lu
6-2	Bart Johnson	Valerie Borzenets
7-1	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Mike Soltis
7-2	Valery Borzenets	Bart Johnson
7-3	Matthew Latimer	Eric Nelson
8-1	Dan Brehmer	Curtis Troxel
8-2	Dan Brehmer	Curtis Troxel
9-1	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Mike Soltis
9-2	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Mike Soltis, Christine Trame
9-3	Matthew Latimer	Eric Nelson
10-1	Dan Brehmer	Curtis Troxel
10-2	Ron Marks	Bart Johnson
11-1	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Ana Gonzalez
11-2	Joe Rogers	Bart Johnson/Staff
11-3	Joe Rogers	Bart Johnson
12-2	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Mike Soltis
13-1	Dan Brehmer	Curtis Troxel
13-2	Dan Brehmer	Curtis Troxel
13-3	Dan Brehmer	Curtis Troxel
14-1	Graeme Card, Aina Cohen, Tzanko Doukov, Pete Dunten, Ana Gonzalez, Irimpan Mathews, Clyde Smith, Christine Trame	Mike Soltis

Links [for internal reference]

Overview of SLAC WPC process is given at

<https://www-internal.slac.stanford.edu/wpc/overview/>

https://www-internal.slac.stanford.edu/wpc/overview/work_authorization.asp

All employees who authorize or release work are required to complete WPC Training (ESH course 120).

Reference: Department: ESH Division Office

Program: Work Planning and Control

Authority: ES&H Manual, Chapter 2, Work Planning and Control

<http://www-group.slac.stanford.edu/esh/general/wpc/policies.htm>

Date Effective: 31 August 2009