



SANFORD UNDERGROUND RESEARCH FACILITY

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

Experiment Integration & Support

Table of Contents

1.0 Purpose 4

2.0 Scope 4

3.0 Definitions 4

4.0 Responsibilities..... 4

5.0 Instructions..... 5

6.0 Documented Information/Related Documents 9

Revision History

Rev	Date	Section	Paragraph	Summary of Change	Authorized by
01	9/6/2022	NA	NA	Initial Release	CCR 603
02	11/8/2022	2, 4, 5 & 6	2.0, 4.2.3, 4.4.1, 4.4.2, 4.4.3, 4.7.2, 4.7.3, 5.1.1, 5.1.2, 5.2.1, 5.2.2, 5.2.3 & 6.1-6.10	Clarifying Scope; Consolidate and modify Laboratory Coordinator responsibilities; Expand Director of Engineering responsibilities; Clarify General Support; Adding Machining Services; Adding reference to SURF Portal, site-specific training, ESH Manual webpage, First Report and Incident Investigation form and Emergency Management Standard; Clarify Experiment Point of Contact role; Include reference to User Association and Customer Satisfaction; Additional Related Documents, change order of listing;	CCR 642
03	12/19/2023	5 & 6	5.2.1, 5.2.2, 5.2.4 & 6.1- 6.16	Consolidate Attachment A and B; Reference IMS documents where applicable; Clarifications on Facility Access, SARF, Guide Training, Emergency Access; Clarification on Shipping, Work Planning and Shift reporting: Updating IT section	CCR 878
04	5/29/2024	NA	NA	Update Logo	CCR 946
05	6/25/2024	5 & 6	5.2.2 & 6.8	Update First Report and Incident Management information	CCR 962
06	1/5/2026	4, 5 & 6	4.2.1, 4.3.1, 5.1.1, 5.2, 5.2.1-5.2.4 & 6.1-6.10	Updated document due to change to the document numbering of controlled documents due to the change from DocuShare system to SharePoint system and changes for OFI from internal audit	CCR 1207

1.0 Purpose

In partnership with research groups, the South Dakota Science and Technology Authority (SDSTA) aims to maintain a robust organization with resources to promote safe and successful experiment operations at the Sanford Underground Research Facility (SURF).

2.0 Scope

This document describes integration and support elements that apply to all experiments at SURF. It further summarizes SDSTA responsibilities regarding facilities and infrastructure necessary to conduct science at SURF.

3.0 Definitions

NA – Define the term this is specific for this document.

4.0 Responsibilities

4.1. SURF Laboratory Director

- 4.1.1. Allocates SDSTA resources from all departments to support experiments and associated facilities.

4.2. Director of Science

- 4.2.1. Manages the Experiment Implementation Program in accordance with SCI-1000-S-001 Experiment Implementation Program including overall responsibility for support of experiments.
- 4.2.2. Assigns an individual to act as the Experiment Point of Contact (EPOC) for each experiment.
- 4.2.3. Assigns individuals to act as Laboratory Coordinator (LC).

4.3. Experiment Point of Contact (EPOC)

- 4.3.1. Member of the Science Department who assists with navigation of the Experiment Implementation Program in accordance with SCI-1000-S-001 Experiment Implementation Program, reviews project implementation documentation (Experiment Planning Statement, Hazard Assessments, inventories, etc.), reviews and approves procedures, and reviews documentation supporting authorization requests.
- 4.3.2. The EPOC acts in a coordination role for other SDSTA resources (e.g., marshalling necessary support from other departments as needed).

4.4. Laboratory Coordinator (LC)

- 4.4.1. SDSTA personnel designated by the Director of Science to act in a coordination role to communicate key information, facilitate access to facility resources, perform safety oversight for experiment personnel and activities and ensures site-specific orientation training as appropriate. LC observations are documented and may involve compiling some notes from others.
- 4.4.2. LCs are certified as a Facility Guide and are familiar with SDSTA emergency procedures, including emergency communication equipment and operation of underground refuge chambers. LCs may assume the role of Lead Guide and act in a leadership role in the event of an emergency or evacuation.

- 4.4.3.** The LC may perform other duties associated to their SDSTA position, but activities that require significant attention for sustained periods may require that the LC role be re-assigned.
- 4.5.** Director of Environment, Safety & Health (ESH)
 - 4.5.1.** Ensures ESH resources for supporting experiments, nominally through the Radiation/Experiment Health & Safety Manager position.
 - 4.5.2.** Ensures technical and maintenance support for safety systems in facilities used by experiments.
- 4.6.** Radiation/Experiment Health & Safety Manager
 - 4.6.1.** Main ESH resource supporting experiments, reviews experiment implementation documentation (Experiment Planning Statement, Hazard Assessments, etc.), reviews and approves procedures.
- 4.7.** Director of Engineering
 - 4.7.1.** Ensures engineering support for the operation of laboratory facilities.
 - 4.7.2.** Ensures engineering support for technical assessments.
 - 4.7.3.** Ensures nominal level of engineering assistance to experiments for installation planning, and support for integration with the facility.
- 4.8.** Director of Information Technology
 - 4.8.1.** Manages the deployment, monitoring, maintenance, purchasing and support of all IT systems at SURF.
- 4.9.** Director of Surface Operations & Utilities
 - 4.9.1.** Ensures technical and maintenance support for facilities used by experiments, including the following systems: alarm systems, building management systems, fire suppression systems. Manages Facilities Technician(s) support of laboratory facilities and specific experiment activities.
- 4.10.** Director of Underground Operations
 - 4.10.1.** Ensures technical support for underground infrastructure maintenance and transportation of experiment personnel and equipment. Evaluates proposed locations for experiments. Manages Infrastructure Technician(s) support in areas approved for experiment access.
- 4.11.** Director of Hoists & Shafts
 - 4.11.1.** Ensures safe access to underground areas and coordinates access schedules, maintenance activities and construction efforts related to SURF hoists and shafts.
 - 4.11.2.** Approves and coordinates advance non-standard access requests (e.g., access on maintenance days/weekends, special cage times).
- 4.12.** Duty Officer
 - 4.12.1.** Approves and coordinates emergency access requests.

5.0 Instructions

- 5.1.** Experiment Support
 - 5.1.1.** General Support
 - Under the DOE Cooperative Agreement, SDSTA manages and operates SURF and provides basic support to all users of the facility, based on DOE Office of Science User

Facility Definition - <https://sc.osti.gov/User-Facilities/Policies-and-Processes/Definition>:

- Provision of useable underground space that includes ventilation, power, water pumping.
- Volume of underground space should be appropriate to scientific need.
- Access to the underground for the installation, operation, decommissioning of experiments.
- Communication and networking services.
- Scientific and engineering liaison with users needed to help them meet the unique environment of SURF.
- Provision of usable above ground laboratory and setup space to prepare experiments.
- Needs beyond basic support are billed to experiments on a cost-recovery basis (via contract or General Services Agreement).
- A detailed list of general services is available in SCI-1000-A-001 Experiment Integration & Support Attachment.
- Full cost recovery is required for proprietary experiments (those that do not publish results in open-access scientific journals). A fee structure based on the annual SDSTA budget (surface / UG) relative to non-proprietary researcher access and space footprints is updated annually and communicated via a contract or General Services Agreement:
 - Project access (per experiment person, per hour, based on location)
 - SDSTA personnel acting on behalf of a project (per SDSTA person, per hour)
 - Space occupancy and operations (monthly, based on annual budget and location)
- Some experiments will operate equipment in an unattended mode without having personnel onsite, and in those cases, cost recovery will be based on space occupancy and specific support by SDSTA personnel. Other experiments will not install equipment, in which case cost recovery will be based on access and specific support by SDSTA personnel.
- Each experiment will nominally receive support from Science, ESH, Engineering and Operations for the installation, operation and decommissioning of experiments. Specific personnel assignments for various science facilities (including surface and underground locations) and science experiments are managed within individual departments.

5.1.2. Machining Services

- The SURF Machine Shop is located at the Rounds Operation Center and provides personnel and tools for basic fabrication jobs on site. These include drill press, band and cold cut saws, punching tools and basic plasma cutting and MIG welding. A detailed list of equipment and capabilities is available, and inquiries can be made to the Director of Surface Operations & Utilities or Deputy.

5.2. Experiment Integration

Several resources are involved in integrating an experiment and its associated personnel into SDSTA operations and for maintaining and sustaining a strong relationship throughout the lifetime of the experiment. The Science Department maintains an internal website collecting information and links relevant for researchers regarding safety, communications, logistics and templates required for experiment integration at SURF, according to DOE Office of Science User Facility Definition.

5.2.1. Facility Access

- General
 - Facility Access requirements are defined by ESH-1000-S-002 Facility Access Standard.

- Internal Forms are available to gather basic personal information, sign-up for scheduled training classes and to receive Information Technology (IT) accounts (e.g., SURF Access Request Form (SARF), accessible via SURF Project Wide Applications (SURF Portal: <https://portal.sanfordlab.net>)). All SURF Users require training in accordance with ESH-12000-S-002 ESH Training Standard, which determines the level of access approved. E.g., once experiment personnel complete the “General Safety – Basic” training class, they are eligible to be issued a personal facility access badge with appropriate access permissions. Additional job-task or site-specific training and annual refresher training is required.
- Underground Access
 - SDSTA nominally offers access to the underground for Users via the Yates Shaft or the Ross Shaft and can accommodate 24-hour access as requested and availabilities allow. Cage schedules are maintained indicating specific times when experiment personnel can go down or up. Personnel and materials are transported via the Yates Shaft with limited availability via the Ross Shaft. Restrictions or changes to underground access or material transports, due to maintenance activities and construction efforts may occur. These changes will be communicated to and coordinated with affected experiment personnel.
- Facility Guides
 - Enhanced emergency response training is available to enable experiment personnel to be authorized as a Facility Guide, as outlined in the ESH-12000-S-002 Guide and Guide Training Standard. This training allows groups additional scheduling flexibility, especially for facility holidays or non-standard shifts
- Emergency (Non-Standard) Access
 - SDSTA recognizes that conditions may arise requiring non-standard access to experiment equipment, and processes have been developed to accommodate experiment personnel. See ESH-1000-S-002 Facility Access Standard, Section 6.4, for details.

5.2.2. Planning and Communication

- Shipping and Transport
 - SDSTA receives materials for many groups from many vendors. Guidelines for shipping materials to SURF are available (see Shipping Instructions according to DOE Office of Science User Facility Definition) and an online tool is available for scheduling transport underground (see Yates Manifest via SURF Portal). For experiments with a significant amount of equipment (several pallets or more), a manifest is required with detailed information on equipment arriving at the SURF including a description of items, manufacturer/ supplier information, quantities, masses and dimensions of items and transport containers (pallet, crate, etc.); a manifest template is available (according to DOE Office of Science User Facility Definition). A dedicated form has been developed for high-value items to ensure expectations for both experiment and facility personnel are identified (according to DOE Office of Science User Facility Definition). Manuals for equipment used onsite are expected to be available.
- Work Planning
 - Details of experiment activities need to be communicated to SDSTA, including the proposed location(s), cage times, personnel names, work procedures, materials and any facility support that is required to accomplish the work. A daily work plan is required (according to DOE Office of Science User Facility Definition), and used by SDSTA personnel to approve a trip and to enter the relevant details in the online Trip Action Plan database (TAP) available via the SURF Portal. Specific representatives from some experiment groups may interact directly with the TAP database. Changes to experiment activities will be updated in the TAP database as they are known.

Experiment representatives will regularly review the status of personnel training and institutional insurance that are required to perform work on SURF property and regularly ensure the various inventories are up to date on an ongoing basis.

Experiment personnel will conduct and document pre-job briefings for work involving approved procedures in accordance with ESH-2000-S-001 Work Planning and Control Standard. An experiment representative (e.g., Lead Researcher) releases the work to a specific crew on a specific day (i.e., the experiment representative gives specific permission to perform authorized work).

- Shift Reports
 - Each experiment group will document their activities after completion of a shift according to the shift report template (according to DOE Office of Science User Facility Definition). In particular, the shift report includes a summary of the experiment activities, any comments, recommendations, irregularities, near-misses, or incidents. Recording acts of safety is strongly encouraged. The personnel hours recorded in the experiment shift reports are compiled by the SDSTA and serve several purposes, including safety statistics.
- Incident Reports
 - Injuries or significant operational upsets qualify as an incident and must be reported to the SDSTA using ESH-3000-F-001 First Report form. All incidents, including injuries or unusual occurrences such as significant equipment failures, must be reported verbally to SDSTA personnel. Injuries must be evaluated before a worker can return to work. Failure to report an injury in a timely manner may jeopardize the processing of any associated Workers' Compensation claims. SDSTA personnel will assist with investigations as necessary. Summary details from relevant facility or other experiment incidents will be shared with experiment personnel.
- Evacuation Drills
 - SDSTA is committed to conducting regular evacuation drills that involve facility staff and experiment personnel. SDSTA recognizes that it is important to minimize the impact these drills have on experiment activities and in particular the Laboratory does not want to compromise valuable progress and/or equipment. Guidelines for conducting evacuation drills are outlined in the ESH-6000-S-003 Emergency Management Standard.

5.2.3. Science Integration

- Project Mailing List
 - A project mailing list called "Project Team" is intended as a way of communicating information on various general topics to all SURF stakeholders. Experiment personnel who regularly visit the SURF site are encouraged to register; instructions are listed according to DOE Office of Science User Facility Definition.
- Science Integration Meeting
 - Regular meetings are held between facility representatives (including representatives from Science, Operations, ESH and management) and representatives from the main experiment groups to discuss both facility and experiment logistics items. Key elements from recent shift reports are shared with the group; the experiment representatives are expected to communicate important items with their respective collaborations.
- Laboratory Coordinator
 - Laboratory Coordinators (LCs) are present on a regular basis at facilities where the activities of one group may impact another group such as at the main underground campuses. To that end, the LC facilitates a daily coordination meeting to discuss activities and logistics for the day, including identifying requests for specific resources (e.g., common space, staff such as Facilities Technicians, etc.).

- LC perform workspace walkthrough inspections and post shift reports including observations and suggestions, as well as notes from the custodians and facility technicians.
- Update personnel accounting tools (TAP, whiteboards, etc.) as appropriate.
- Coordinate and conduct informal table-top evacuation exercises as appropriate.
- Experiment Point of Contact
 - The Experiment Point of Contact assists with navigation of the Experiment Implementation Program, in accordance with SCI-1000-S-001 Experiment Implementation Program, and can help identify points of contact within other SDSTA departments as needed (ESH, Operations, etc.). The nominal ESH point of contact for experiment groups is the Radiation/Experiment Health & Safety Manager; however other ESH resources may be required.
- Management Meetings
 - Regular meetings are held between facility management (including the SDSTA Director of Science, the SURF Laboratory Director and SDSTA Executive Director) and experiment management/PIs for the main experiment groups to identify and resolve any critical issues that arise.
- User Association
 - An organization intended to serve SURF researchers and the wider underground science community. The User Association provides an avenue for two-way communication on topics important to researchers, promotes a sense of community, and articulates and promotes the scientific case for underground science in accordance with IT-4000-S-002 Information Technology Science Services and Support Plan.
- User Surveys
 - A survey will be conducted on a regular basis (nominally annually) in which experiment personnel participating in activities at SURF are polled on their perceptions of experiment support, among other topics in accordance with IMS-P-912 Customer Satisfaction.
 - The User Association may also conduct user surveys.

5.2.4. Information Technology

- Science Services and Support
 - The SDSTA IT department has developed a plan for IT services and support in accordance with IT-4000-S-002 Information Technology Science Services and Support Plan including an overview of the SDSTA's IT network and a process for troubleshooting issues.

6.0 Documented Information/Related Documents

- 6.1.** IMS-P-912 Customer Satisfaction
- 6.2.** SCI-1000-S-001 Experiment Implementation Program
- 6.3.** SCI-1000-A-001 Experiment Integration & Support Attachment
- 6.4.** ESH-1000-S-002 Facility Access Standard
- 6.5.** ESH-2000-S-001 Work Planning and Control Standard
- 6.6.** ESH-3000-F-001 First Report
- 6.7.** ESH-6000-S-003 Emergency Management Standard
- 6.8.** ESH-12000-S-002 ESH Training Standard
- 6.9.** ESH-12000-S-002 Guide and Guide Training Standard
- 6.10.** IT-4000-S-002 Information Technology Science Services and Support Plan