

Neutron Sciences

Research Accelerator

The Research Accelerator Division's mission is to safely and reliably operate the SNS Accelerator and Target and to execute impactful Accelerator R&D focused on SNS improvements and strategic opportunities, all in support of delivering neutrons for impactful scientific discovery.

Operations, Integration and Maintenance

Central hub for the SNS operations, including shift operations, maintenance planning, integration and asset management.

1. *Integration and Planning* — Integration of SNS field work and installation, planning of outages and maintenance, operations schedule, operation data analysis
2. *Accelerator Operations* — Shift operations in the SNS CCR (Central Control Room)
3. *Mechanical Support* — Mechanical research mechanics, executing and supporting mechanical systems field work
4. *Electrical Support* — Electrical research mechanics, executing and supporting electrical systems field work for the target, accelerator and instrument systems

Accelerator Science and Technology

Advance accelerator physics and accelerator and engineering R&D at the SNS and provide support for diagnostics and high-level application software.

1. *Accelerator Physics* — Accelerator R&D in areas of beam dynamics and high intensity hadron beams; Operations and R&D at the Beam Test Facility; Operations support in machine set-up, high-level application software, foil production and conditioning
2. *Beam Instrumentation* — R&D in beam instrumentation and lasers; Operation support, maintenance and upgrades for SNS beam instrumentation and diagnostics
3. *Mechanical Engineering* — Engineering design for accelerator systems components and development of new accelerator systems and components

Accelerator Systems

Support of all linac systems, Front End, SRF, RF, high power, DC and pulsed power systems; integrates cryogenics systems at the SNS, and executes focused R&D in SRF and advances lasers.

1. *Cryogenics* — Operations, maintenance and improvement of SNS cryogenic systems (2K and 4K linac cryogenic systems, cryogenic modulator system helium and nitrogen cryogenic systems).
2. *Front End Systems* — Operation support, maintenance and upgrades for the SNS Front End Systems; R&D in advanced ion sources
3. *Superconducting RF* — Maintenance, support, improvement and upgrade of the superconducting linac RF systems; R&D in superconducting RF, plasma processing, terahertz laser systems
4. *RF Systems* — Maintenance, support, improvement and upgrade of all SNS linac high-power and low-level RF systems and RF test facilities
5. *Electrical Power Conversion Group* — Maintenance, support, improvement and upgrade of all SNS high voltage modulators, DC and pulsed power systems

Target and Mechanical Systems

The Target and Mechanical Systems section provides operations and support for target and mechanical systems at the SNS.

1. *Cooling Systems* — Operations, maintenance and support of all accelerator and utilities cooling systems
2. *Vacuum Systems* — Operations, maintenance and support of all accelerator and instrument vacuum systems
3. *Target Systems* — Support and maintenance of target systems, target utilities and remote handling
4. *Target Operations* — Shift operations for target systems (target, mercury loop, cryogenic moderator system)

Control Systems

The Controls systems section integrates SNS control systems and personnel protection systems.

1. *Controls Integration* — Operations, maintenance, support and upgrades of the control systems hardware and software
2. *Protections Systems* — Support, maintenance, upgrade and improvement of the personnel protection systems

3. *Cryogenics and Target* — Support, maintenance, upgrade and improvement of process controls for the cryogenics and target systems
4. *Conventional Facilities and Vacuum* — Support, maintenance, upgrade and improvement of process controls for the conventional facilities and vacuum systems

Research Reactors

The Research Reactors Division's mission is to safely and reliably operate the High Flux Isotope Reactor, providing one of the highest steady-state neutron fluxes of any reactor in the world for neutron scattering experiments focused on impactful scientific discovery, as well as materials irradiation studies and production of medical, industrial, and research isotopes.

Maintenance

Sustain material condition and ensure safe, reliable operation for HFIR and Melton Valley Complex Facilities.

1. *Maintenance Engineering* — Implement and continuously improve the HFIR Maintenance Program for respective areas of expertise. Create detailed work plans for maintenance and upgrade field work and provide Task Leading support.
2. *Maintenance Implementation* — Skilled craft performing hands-on work

Operations

Authorize, direct, and monitor plant operations, consistent with all requirements, and respond to off-normal conditions.

1. *Reactor Shift Operations* — Responsible for operating the reactor, responding to off-normal events, and supporting outage activities.
2. *Cold Source Shift Operations* — Responsible for operating the HFIR Cold Source, responding to off-normal events, and supporting outage activities.
3. *Operations Engineering and Support* — Provide technical assistance to the Operations Manager for managing Material Balance Areas, Nuclear Criticality, Fuel Shipments, etc.; provide day shift operator support for these types of activities; and serve as operating shift relief staffing, as required.

Engineering

Design Authority for HFIR, responsible for maintaining the design basis and processes for design modifications, as well as implementation of design changes.

1. *Electrical and I&C* — Responsible for design and installation for maintenance, modernization, and development of new capabilities falling within electrical, instrumentation & controls, and industrial controls software engineering expertise.

2. *Mechanical / Cold Source* — Responsible for design and installation for maintenance, modernization, and development of new capabilities falling within mechanical, cryogenics, vacuum, and related engineering expertise.
3. *Experiments & Fabrication* — Responsible for fuel fabrication quality and continuity of supply, as well as completing complex fabrications, such as control plates, beryllium reflectors, and other components. Serve as liaison to in-core and other non-scattering experiments, helping align research goals with HFIR requirements for successful implementation, and managing the process for approval, irradiation, shipment, and other logistics. Includes design, analysis, and fabrication of experiments, or providing needed support for these processes when performed by researchers in other divisions/directorates seeking to utilize HFIR.
4. *Design Basis* — Develop CAD models, produce engineering drawings in accordance with standards, and implement drawing management processes to ensure configuration control.

Neutron Scattering

The Neutron Scattering Division's mission is to provide scientific and technical expertise to support and develop world-class neutron scattering user facilities. NSD works with scientists from around the world and across a wide range of research fields to solve critical research problems and foster break through scientific discoveries.

Diffraction

Lead the development of neutron diffraction methods and their use in scientific studies.

1. *Powder Diffraction* — Develop powder diffraction methods; perform scientific studies using powder diffraction, participate as integral partner in user research
2. *Single Crystal Diffraction* — Develop single-crystal diffraction methods; perform scientific studies using single-crystal diffraction, participate as integral partner in user research

Large Scale Structures

Lead the development of neutron methods that span multiple length scales, and lead their use in scientific studies.

1. *SANS and Spin Echo* — Develop Small Angle Neutron Scattering (SANS) and Neutron Spin Echo (NSE) methods; perform scientific studies using SANS and NSE, participate as integral partner in user research
2. *Reflectometry* — Develop neutron reflectometry methods; perform scientific studies using neutron reflectometry, participate as integral partner in user research
3. *Materials Engineering* — Develop neutron scattering, diffraction and imaging methods used for the study of materials under mechanical loading and under extremes of pressure or temperature; perform scientific studies using specialized neutron instruments and sample environments, participate as integral partner in user research

4. *Bio-Facilities* — Provide and develop techniques for structural biology studies on neutron beamlines , perform scientific studies using neutron instruments, participate as integral partner in user research

Spectroscopy

Lead the development of neutron spectroscopy methods and their use in scientific studies.

1. *Chemical Spectroscopy* — Develop neutron spectroscopy methods best suited to study chemical phenomena; perform scientific studies using these spectroscopy techniques, participate as integral partner in user research
2. *Direct Geometry* — Develop direct geometry (time-of-flight) neutron spectroscopy methods; perform scientific studies using these spectroscopy techniques, participate as integral partner in user research
3. *Triple-Axis* — Develop triple-axis neutron spectroscopy methods; perform scientific studies using these spectroscopy techniques, participate as integral partner in user research

HFIR Beamline Operations

Support scattering experiments and instruments at HFIR; manage the transition of the HFIR instruments during the Be-reflector replacement outage.

1. *HFIR Science Support* — Provide direct technical support as integral part of the instrument teams for each of the HFIR beamlines
2. *HFIR Instrument Support* — Provide technical support for the operation of the HFIR beamlines, interface with RRD personnel for regulatory compliance; interface with crafts for maintenance, repairs, and improvements

SNS Beamline Operations

SNS Beamline Support: Support scattering experiments and instruments at SNS, including instrument improvements and installations; monitor and support safe operations at all beamlines.

1. *SNS Science Support 1* — Provide direct technical support as integral part of the instrument teams for half of the SNS beamlines
2. *SNS Science Support 2* — Provide direct technical support as integral part of the instrument teams for half of the SNS beamlines
3. *SNS Instrument Support and Neutron Choppers* — Provide technical support for the operation of the SNS beamlines; interface with crafts for maintenance, repairs, improvements including neutron choppers

4. *Instrument Hall Coordinators* — Provide 24/7 technical and logistical support for the neutron scattering instruments at SNS and HFIR

Sample Environment and Labs

Develop and deploy leading sample environment capabilities and laboratory support for the user program.

1. *High Pressure* — Develop and deploy leading sample environments for high pressure studies at both SNS and HFIR beamlines
2. *High Temperature* — Develop and deploy leading sample environments for high temperature studies at both SNS and HFIR beamlines
3. *Low Temperature and Magnets* — Develop and deploy leading sample environments for cryogenic and high-magnetic-field studies at both SNS and HFIR beamlines
4. *Labs and Soft Matter* — Responsible for user sample management and supervision of activities in user labs across SNS and HFIR. Develop and deploy leading sample environments for soft matter studies at both SNS and HFIR beamlines

Neutron Technologies

The Neutron Technologies Division's mission is to develop and deploy critical technologies for instruments and target systems. Support operations in those areas and execute projects in support of neutron sciences

Neutron Instrument Technologies (RP)

Develop, deploy and support state-of-the-art technologies for SNS and HFIR instruments.

1. *Instrument Development & Neutronics* — Develop new concepts for HFIR and SNS instruments, including automated and seamless integration across data streams. Develop new source concepts and technologies, and provide radiation transport calculations
2. *Neutron Optics & Polarization* — Develop new devices that employ neutron polarization, and support instruments in the user program with polarized beam operation
3. *Detectors* — Develop and deploy new detector technologies and support instruments in the user program
4. *DAQ Development* — Develop, deploy and support software and electronics hardware for acquiring data, and the high-level user interfaces for conducting experiments
5. *DAQ Integration* — Implement and support hardware and software solutions for controlling and monitoring instrument equipment. Provide and maintain corresponding computing, networking and data storage resources

Neutron Technologies Engineering

Develop, deploy and support neutron instrument and target systems with innovative engineering and technology

1. *Instrument Engineering* — Develop and deploy world-leading, reliable and safe neutron instruments to enable a world-class neutron science program
2. *Design Services* — Support neutron instruments and target systems with world-class mechanical design expertise and software product management
3. *Survey, Alignment & Metrology* — Deploy advanced surveying, alignment and measuring expertise to support instrument, target and accelerator engineering and operations
4. *Monolith Engineering & Manufacturing* — Develop, design and support monolith components to deliver a reliable and high-performance neutron source. Support procurement and fabrication for complex target systems components
5. *Target Engineering* — Develop, design and support mercury process system components that deliver a reliable and high-performance neutron source

Site Services

Provide management of facilities, projects, engineering and construction for conventional facilities across the Chestnut Ridge site

1. *Facilities Management & Engineering* — Design, construct and manage the facility infrastructure across Chestnut Ridge, while providing technical support for the safe and compliant operation of conventional facilities
2. *Electrical Engineering* — Provide electrical design, construction oversight and maintenance of the facility infrastructure and associated science groups, while managing the operation and maintenance of the Power Distribution System across the Chestnut Ridge campus