

SNS HFIR User Group (SHUG) Executive Committee Minutes
Archived at <http://neutrons.ornl.gov/users/shug>

Teleconference held December 4, 2012, 1:00pm EST.

Present

- Executive Committee: Greg Beaucage (chair), Dave Belanger, Fred Heberle, Peter Khalifah, Cora Lind, Antonella Longo, Hanno zur Loye
- Guests: Kelly Beierschmitt, Tom Proffen, Paul Langan, Steve Nagler, Laura Edwards, Al Ekkebus

Absent

- Executive Committee: Yan Gao, Malcolm Guthrie, Tyrel McQueen, Michael Mackay

Minutes submitted for review January 1, 2013 by F.A. Heberle and approved January 8, 2013 by the Executive Committee.

ACTION ITEMS:

- Paul: Send Cora information about new beamlines for USNC/Cr meeting.
- Al: Send copy of US/Europe neutron capacity comparison to Greg and Tyrel for NUFO meeting. (carry over to next meeintg)
- Al, Steve, others: Look into previously proposed instruments that weren't funded, send to Executive Committee.
- Fred: Send reminder of Executive Committee term expiration dates.
- Al: Gather information about what other facilities have done in terms of recognizing outstanding theses, papers (carryover from Dec. meeting).

ATTACHMENTS and WEBSITES of interest from the teleconference:

- [SHUG letter to user community regarding early target failures at SNS](#)

AGENDA

1. Roll call
2. Approval of minutes from November meeting (*approved*).
3. Approval of current agenda
 - a. Cora added discussion item: USNC/Cr meeting
4. Action items from November meeting
 - a. Share daily reports of target status with SHUG Executive Committee (Al). *Item completed.*
 - b. Letter from SHUG to users regarding SNS target issues (Greg). *Item completed.*
 - i. Kelly noted that internal scientists were very appreciative of the letter.

- c. Gather information about what other facilities have done in terms of recognizing outstanding theses, papers (AI). *Carry over to next meeting.*
- d. Share job postings for group leaders with the SHUG Executive Committee (AI). *Item completed.*
- e. Email election for next SHUG chair (all). *Item completed.*
 - i. Tyrel won the election and will be the new chair, effective June 2013.

5. Updates

- a. Kelly's updates/comments
 - i. NUFO web event (Greg will attend). US neutron capacity is limited. NIST's second guide hall and our new instruments will help, but Europe's capacity is nearly three times that of the US, and as a result their user community is much larger. NUFO needs to address this capacity limitation in the US.
 - ii. Search for Deputy Associate Lab Director for Neutron Sciences. A draft job description has been prepared, and is being routed through Thom Mason and others, with input from the NAB. The job entails working across scientific divisions, helping to set the neutron strategy decades out (new target station at SNS, second guide hall at HFIR, instrument upgrades). Candidates should have extraordinary scientific experience and credentials, and exhibit talent managing and working with people leading scientific endeavors. Official advertisement and international search will begin Jan. 2nd or 3rd. We hope to make an offer by late spring or early summer. SHUG executive committee will see a copy of the job description, and assistance from SHUG (advising or nominating candidates) is appreciated.
 - iii. Update on DOE meetings in Washington, DC (Dec. 10th and 11th) to update Harriet Kung and Jim Murphy on our 5 year plan:
 1. *Maintaining neutron production.* HFIR fuel inventory is low, and additional fuel elements are needed. SNS needs a supplemental, one-time investment to build an inventory of qualified spare targets.
 2. *Sample environment.* We're submitting a budget for building out sample environment.
 3. *Data collection, reduction, modeling, and simulation.* We have made investments in these areas and no supplemental requests are needed.
 4. *Instruments.* Four instruments are in commissioning and will be added this year. We have a strategy for building out

and renovating current instruments (e.g., BL4B this year), and a multiyear strategy to add detectors and improve optics and shielding. A supplemental request will be made to improve science capability.

5. *SING3*. Beams are available at both HFIR and SNS, and we are requesting authorization to begin planning the next set of instruments, and some funding to start organizing the community.
 6. *Discussion of long-term future of neutron sciences*. Second target station and guide hall: 12-14 years required from start to finish, and 2025 is the earliest neutron production if we were to begin now. HFIR lifetime extends beyond 2040 without upgrades or rebuilds. The pressure vessel is the limiting lifetime component, but it is seeing very little radiation damage since the Be reflector takes most of the damage.
 7. *User access to high-performance computing*. Tom Proffen will give a presentation.
- b. SNS/HFIR facility/instrument updates (Kelly, Division directors)
- i. Kelly's facility update
 1. SNS operating at 850 kW. We're not completely satisfied with the current spare target, and will hold at 850 until a second spare arrives (April). Will restore to 1 MW as soon as the new spare is ready to install. A power disruption on SNS's first day affected the entire lab (2 of 3 TVA feeders to ORNL were lost). This is a rare event and we don't know why it happened (the problem was not onsite). Computers and accelerator went offline, and half a day of neutron production was lost. The operating hours will be given back during the next scheduled maintenance day (Dec. 4th).
 2. HFIR operating at 100% power. Reactor was impacted by power disruption but emergency backup systems prevented a power loss. Current plan is for 6 cycles during this fiscal year, but additional funding for a 7th cycle will be requested during DOE meetings this week.
 - ii. Steve Nagler (Quantum Condensed Matter). Instruments are working well. We are short-handed at HFIR and hope to be hiring additional instrument scientists soon: two for the triple axis

instruments (each of the four currently has one IS), and one at HYSPEC (currently has one IS).

- iii. Paul Langan (Biology and Soft Matter). The two SANS instruments (BioSANS, EQ-SANS) are working well. IMAGINE is halfway through commissioning, and data from representative samples will be collected during the next cycle. IMAGINE will be included in the next proposal call with limited access. MANDI begins commissioning today, and we're currently interviewing for a second beamline scientist. BL4B (liquids reflectometer) begins tests on robotic sample changer today, with first users next week. It has been upgraded and should now be a much easier instrument to use.
- c. User office updates (Laura)
 - i. HFIR ends current cycle on Dec. 14 and will be back Jan. 8. SNS is now scheduled through the end of January, with plans to continue through the end of May. The next proposal call closes March 6, and the next SRC will convene toward the end of April (SHUG help is requested).
- 6. SHUG Chair election results (Greg)
 - a. Tyrel won the election and will begin his term in June.
- 7. U.S. National Committee for Crystallography (USNC/Cr) meeting (Cora)
 - a. Cora requests input for discussion. Paul Langan suggests mentioning the three new crystallographic beamlines, IMAGINE, MANDI, and TOPAZ (action item).
- 8. Discussion of instrument upgrades
 - a. Greg requested input from SHUG executive committee about instruments or capabilities we'd like to see. Kelly mentioned that when the facility was built, instrument development teams proposed several instruments that weren't funded. We should look at this list before continuing the discussion (action item for Al, Steve).
- 9. Upcoming events (Al)
 - a. Neutron Spin Echo and BASIS workshop in February.

Next telecon date: Tuesday January 8, 2013, at 1:00pm EST

Letter to the user community for SNS/HFIR from the SNS/HFIR User Group (SHUG)

November 20, 2012

SHUG would like to bring to your attention the intrepid effort by the staff at SNS, supported by others at Oak Ridge, in rapidly recovering from an early target failure. Most users have little knowledge of what goes on behind the wall at SNS or of the level of complex and dangerous engineering and science that goes into maintenance of the target so that your science can proceed. I can only give my summary based on limited expertise, but the story of the recent SNS startup will go down as a technical milestone in SNS and Oak Ridge history.

The target at SNS is a highly radioactive matryoshka doll construction shaped like a torpedo with the accelerator beam hitting the nose of the structure to distribute the heat. The target has a mercury vessel, a water coolant layer and a helium shroud layer. The radioactive fluids flow through this complex device. In early October, the staff at SNS were faced with a unique problem: the target, which normally has a 6-month lifetime at 1 MW of beam power, had failed after only 100 hours. This was the second such failure in a month, so the technical staff was in crisis mode. Each target costs approximately one million dollars so there was little room for trial and error. It was believed that the failure was due to a design flaw and the SNS team was given the task of finding the failure mode using robotic arms in a radiation/toxic material shielded area. The task was similar to open heart surgery in the dark.

After first identifying many potential failure modes, Kevin Jones's Accelerator and Target Operations team investigated all of them. The "smoking gun" appears to be a defective weld, which has been identified in the same general location (the same weld joint) on each failed target. This knowledge is now being applied to targets under construction. The five-week shutdown was treated as a maintenance outage, with additional work being done on the accelerator and target hall. Because of this extra effort, about half the lost time will come back to the users by shortening the length of future maintenance outages.

One spare target now remains, which has a weld joint that may be problematic. SNS is currently exploring ways to repair or strengthen the weld joint without doing other damage to the target. The team is also expediting procurement of a target currently under fabrication with a new vendor (this will be the first target they've delivered). The mercury vessel of this target is in good condition, and they are now looking at the water shroud and leak sensors (the sensors were problematic but repairs have been made). Effort is now being devoted to getting another spare target in-house, so that SNS will be confident they have sufficient backup.

The decision was made last week to go ahead with installation of the best spare target (as mentioned previously, this target has been thoroughly examined, with one minor repair). Installation is now complete. The [revised run schedule](#) has been published. The instrument will be turned on Monday Nov. 26th, with user operation starting Wednesday

Nov. 28th. There will be a short break for the Christmas holiday, but otherwise [SNS will be running continuously until May 2013](#). The total user time lost for the fiscal year is approximately 500 MWh. Overall a ~ 10% reduction in user time compared to 2012A is expected, which amounts to about 10 days. All users that had approved proposals for 2012B will be able to schedule their experiments before September 30, 2013.

The team at SNS has done an extraordinary job in a remarkably short timeframe, and what they've learned from diagnostics, tooling, and operating procedures will serve the facility well going forward. They have learned things that will fundamentally change the way targets are built, and the organization has leaped ahead many years in experience during this single outage.

Prof. Greg Beaucage, University of Cincinnati
Head of the SNS/HFIR User Group (SHUG)
On behalf of SHUG and the user community.