

## RESPONSIBILITIES OF EXPERIMENTERS AT NSCL

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*This document describes the responsibilities of experimenters at NSCL as well as NSCL procedures and documentation relevant to experimenters during the life cycle of an experiment. This document will be sent by e-mail to the Spokesperson of the experiment two weeks prior to the start of the experiment. It is the Spokesperson's responsibility to make sure that all members of the experimental team who may be in charge of a shift are aware of this document's contents. While the document, including the Appendices, is required reading, the contents of the links are recommended but not required. Additional details are posted at [groups.nscl.msu.edu/userinfo/](http://groups.nscl.msu.edu/userinfo/).*

*We require that:*

- (a) the Spokesperson of the experiment, prior to the start of the beam time, signs a form acknowledging that he/she has read this document and made sure that all members of the experimental team who may be in charge of a shift are aware of the document's contents and that the team will comply with all operating and safety policies of both MSU and NSCL; and*
  - (b) the Spokesperson or designee will return at the end of the experiment a checklist of tasks the experimental group is responsible for performing. The form and the checklist are available from Raman Anantaraman. In-house Spokespersons should sign the form any time prior to the start of the beam time, and outside Spokespersons should sign it upon arrival at the NSCL.*
1. After an experiment has been granted beam time by the NSCL Director, it typically takes 6 months or longer before the experiment can be run. The timeline for the scheduling process is described in [groups.nscl.msu.edu/userinfo/timeline.php](http://groups.nscl.msu.edu/userinfo/timeline.php).
  2. All communications from the NSCL regarding the experiment will be sent to the Spokesperson, for dissemination to the collaborators as he/she sees fit.
  3. Once the itinerary of outside users coming to participate in the experiment is known, the Spokesperson of the experiment should notify Raman Anantaraman of the names and itineraries of the outside users, so that arrangements can be made prior to arrival. Requests for arranging accommodation, if desired, should be made at this time.
  4. We **must** be notified 2 weeks in advance if you intend to transport any radioactive materials to or from the NSCL. Please submit the form "Request to Ship Radioactive Materials To/From the NSCL" posted at [groups.nscl.msu.edu/userinfo/transport/](http://groups.nscl.msu.edu/userinfo/transport/). This will allow our safety group to make the necessary arrangements.
  5. Details of arrival procedures and miscellaneous useful information are posted at [groups.nscl.msu.edu/userinfo/duringexpts/arrival\\_index.html](http://groups.nscl.msu.edu/userinfo/duringexpts/arrival_index.html). To get into the NSCL when you first arrive, please go to the main (west) entrance of the building (closest to Chemistry). If you arrive during normal business hours, the doors will be open. If after hours, please use the phone located between the outer and inner doors to call the Operator at 305; and, if (s)he

is not at that number, page him/her by dialing 143. Or you can use your cell phone to call the Cyclotron Console at (517)333-6305.

6. Members of your group will need NSCL access cards to enter the NSCL and work in radiation-restricted areas of the laboratory. Our guiding principle is that users receive building access soon after they arrive with cards that expire when they leave. Access cards to radiation-restricted areas are granted only to users with valid user training per our training database (see item 9 below). Raman Anantaraman is your contact for getting your access card. If a user who needs training arrives after hours or on the weekend and has a business need to access the NSCL prior to resumption of business hours, (s)he will be issued a temporary restricted access card (programmed for perimeter door access to non-restricted areas) that expires 8 hrs after resumption of business hours; if such a user needs to enter restricted areas prior to obtaining user training, (s)he must be escorted in those areas; after the user has received the required training, the card will be re-programmed for radiation-restricted area access. Your access card will be personalized by having your picture (head shot) affixed on it. If you can send us such a picture (e.g. in .jpg format) prior to arrival, we will use it; otherwise, Kay Barber (NSCL's Personnel Coordinator, Room N107A) will take your picture after you arrive. Your access card can be used for future visits to the NSCL. Please turn it in to Raman Anantaraman at the completion of your visit.

7. When you arrive at the NSCL, you can collect NSCL parking permits, film badges for the members of your group, and computer account information for your experiment from Raman Anantaraman. The computer account procedures are posted at [groups.nsl.msu.edu/userinfo/daq/computer\\_account.html](http://groups.nsl.msu.edu/userinfo/daq/computer_account.html). Note that users may not install their own software on any of the NSCL computers; but they can request the NSCL staff to do so. Note also that the computers may be re-imaged, removing such extra software, without notification in the interval between experiments.

8. To maintain the integrity of the NSCL computing network, desktop and portable computers not managed by the NSCL Computer Department may not connect to any Ethernet wall jack within the NSCL. Users may connect their portable computers to the MSU campus-wide wireless system, which is also available within the NSCL.

9. The NSCL relies on the cooperation of its users to conduct their activities in a manner that conforms to the environment, safety, health, and security requirements of the NSCL and MSU. The NSCL will provide safety training of users to this end. All NSCL users are required to attend a site-specific radiation safety training session, with an annual refresher session, prior to working in the experimental vaults. Raman Anantaraman will schedule a training session for any members of your collaboration who have not yet obtained site-specific training or the refresher. You should allow 1 hour for this, most conveniently during a weekday preceding your experiment.

10. Before the start of the beam time, experimenters must be aware of (a) the role of the Operator in Charge ([groups.nsl.msu.edu/userinfo/roleoperator.php](http://groups.nsl.msu.edu/userinfo/roleoperator.php)), (b) the role of the Experimenter in Charge ([groups.nsl.msu.edu/userinfo/duringexpts/experimenter.php](http://groups.nsl.msu.edu/userinfo/duringexpts/experimenter.php)), and (c) the procedures for handing over control of the beam ([groups.nsl.msu.edu/userinfo/duringexpts/handingoverbeam.php](http://groups.nsl.msu.edu/userinfo/duringexpts/handingoverbeam.php)). These three procedures are appended at the end of this document.

Specifically:

a) It is the experimenters' responsibility to inform the Operator in Charge whether their experiment is running or not running. "Experiment running" indicates time when data are being taken or an activity in support of taking data that was identified in the proposal is being performed. Both "Experiment running" and "Experiment not running" times count towards the allocated time recommended by the Program Advisory Committee and approved by the Laboratory Director. Reporting the times accurately helps us give better guidance to users in future calls for proposals.

b) Monitors in the Control Room and in the Data-U's display the current status of cyclotron operations, and the names of the Operations staff personnel on shift. Along with other information, you will find the name and photograph of the Operator in Charge and the Beam Physicist on Call for the current shift.

c) Please be aware that the Experimenter in Charge may be called upon to make critical decisions that can affect the whole experiment. Thus it is highly desirable for the Spokesperson of the experiment to establish a communications protocol with the Experimenter in Charge.

11. The Spokespersons assume line management responsibility for safety in their groups. Spokespersons will assign one or more members of their group as Safety Representatives. The safety responsibilities of the Spokesperson and of the Safety Representatives are described at [www.nscl.msu.edu/aud/exp/safety/users.html](http://www.nscl.msu.edu/aud/exp/safety/users.html).

12. Experimenters are responsible for their experimental data. Specifically:

a) We strongly recommend that you save your on-line data periodically to off-line media (e.g. tape) during the experiment. Instructions for doing this can be found in the "Writing Tapes" section of [docs.nscl.msu.edu/daq/accountclosing/](http://docs.nscl.msu.edu/daq/accountclosing/).

b) At the end of the experiment, you must take several actions to secure your data and to prepare for closing the account, as described in [docs.nscl.msu.edu/daq/accountclosing/](http://docs.nscl.msu.edu/daq/accountclosing/). A BACKUP of the original event data should be created on a reliable medium such as LTO/DLT tape. For users wishing to transfer the data to other institutions, the recommended procedure is described in the section "Taking your data home" of the above link. If you plan to transfer the data by some means other than LTO/DLT tape or network file transfer, it is recommended that you discuss this at the start of your experiment with your NSCL collaborators or with Raman Anantaraman to ensure that the process goes smoothly.

c) Backup copies of data, configuration information, documents, etc. must be made within one week after the beam time for the experiment is over. After you have made your copy, you must delete all files in the event file space so that the space can be re-used by a succeeding experiment. Once you have done this, please notify Raman Anantaraman that you have done so. Note that, once the files in the event file space have been deleted, they cannot be recovered (not even by the computer group). We recommend that for outside user

experiments, two copies of the data, etc. be made, one of which is left at the NSCL with the NSCL collaborators or with Raman Anantaraman. Please be sure to use supported media (LTO tape is supported at the present time) if you expect to be able to read your backup tapes at the NSCL. LTO tapes may be purchased from the Computer Department, which will also provide the appropriate tape drive.

d) When you are done making backup copies, please log out from the computers you are using so that they are available for other users.

13. Two brief coordination meetings are held every work day at the NSCL, a general meeting at 8 AM in the Seminar Room and a beam coordination meeting at 1:45 PM in the Atrium. Starting two days prior to the experiment and during the experiment, the Spokesperson of the experiment or a designee should participate daily in both meetings. If the Spokesperson is not available, the Spokesperson informs Raman Anantaraman of a designee.

14. Cyclotron Operators are instructed that no one is allowed to perform potentially hazardous work while alone. On rare occasions during repairs to restore running conditions, experimenters may be requested to act as a Safety Watch during off hours. If an experimenter is unwilling or unable to act as a Safety Watch, the work will be postponed until additional staff becomes available. If an experimenter is working alone and needs to perform potentially hazardous work, he/she must first contact the Operator in Charge.

15. After the experiment is complete, please make sure that the experimental vault and the Data-U are left in a tidy state (the presumed pre-experiment condition). Outside users should allow enough time for this activity before they leave; they are also responsible for removing all experimental apparatus and materials they bring in. Outside users have the possibility to store limited amounts of material at the NSCL in storage boxes. An outside user group wishing to do so should, after informing Raman Anantaraman, take the material to our receiving department, have them put it in a storage box, and collect a number for the box. The receiving department has a database of stored boxes. Thus it will be easy to locate and retrieve the box when the item is needed again.

16. Your feedback at the end of the experiment will help us make the NSCL a more supportive place to do research. To this end, within two weeks of the end of your beam time, please fill and submit the feedback form posted at [groups.nsl.msu.edu/userinfo/run\\_summary/](http://groups.nsl.msu.edu/userinfo/run_summary/).

17. We would appreciate your notifying Raman Anantaraman when a paper is submitted for publication or an advanced degree (Ph.D. or Masters) is awarded to a student, in cases where the paper or degree is based in part or whole on experimental work at the NSCL.

*We wish you the best of luck on your experiment.*

## **APPENDIX 1: ROLE OF THE OPERATOR IN CHARGE**

The Operator in Charge has the authority and responsibility to safely and efficiently operate the Coupled Cyclotron Facility. Decisions of the Operator prevail. Users can request review of Operator decisions through the Assistant Director for User Relations.

1. The name and a photograph of the Operator in Charge are displayed on the data-U status monitors. Experimenters can visit or call (x 305) the Operator in the control room or page the Operator (x 143) if needed. The Operator has one of two 2-way radios with him when performing duties outside the control room (the other radio is charging). These radios can be contacted by dialing 9-2-8090, waiting for the tone, then dialing either 750019 or 750020.
2. In the event of facility equipment breakdown the Operator in Charge performs an initial assessment and coordinates the response. The Operator routes requests from experimenters for after-hours laboratory resources to appropriate lab personnel.
3. Experimenters are not allowed to change beam attenuator settings without approval from the Operator in Charge. This approval is given to individual experimenters for the duration of their shift. Changing to the wrong beam attenuator can cause severe damage to the cyclotrons and to experimental equipment.
4. The Operator has the authority to take control of the beam at any time if this is required for the safe and efficient operation of the Coupled Cyclotron Facility.
5. The Operator in Charge needs to know the status of the beam at all times.
  - a. The Operator releases beam to the experiment by stopping the beam on a beam blocker and informing the experimenter that beam of a specified intensity is available for the experiment on a specified beam blocker. The experimenter can then remove the beam blocker or ask the Operator to remove the beam blocker.
  - b. The experimenter relinquishes the beam by inserting the same beam blocker (or requesting the Operator to stop the beam) and informing the Operator that control of the beam has been returned to the Operator.
6. Operators change shifts at 7 am and 7 pm. During these times Operators are busy with shift-change duties. Operators will visit the experiment towards the beginning of their shift as their duties permit.
7. Operators need to take control of the beam every few hours to measure and record machine parameters and to tune up the beam. While this can often be done efficiently if experimenters make the Operator aware of any time periods where the beam is not used for the experiment, the Operator in Charge must take control of the beam and tune up whenever beam losses increase significantly.
8. The Operator in Charge keeps the experimenters aware of the cyclotron status.

## **APPENDIX 2: ROLE OF THE EXPERIMENTER IN CHARGE**

1. An Experimenter in Charge is assigned during the period the experiment number is displayed in the data-U as current experiment. This includes the time needed to tune the beams for the experiment.
2. The Experimenter in Charge can answer questions about the experiment and its status on behalf of the spokesperson.
3. The Experimenter in Charge keeps the operator aware of the experiment status (running or not running), breakdowns of or problems with facility hardware and functions, and vault entries.
4. The Experimenter in Charge receives beam from and hands beam to the Beam Physicist or Operator in Charge via the red User Lockout Beam Blocker button following the procedure described in Appendix 3.
5. The name of the Experimenter in Charge is displayed on the data-U status monitors. Experimenters can change the name of the Experimenter in Charge by asking the operator (x 305) to change it at any time.
6. We suggest that the shift leader for the experiment visit the control room towards the beginning of an experimental shift.
7. Prior to entering the experimental vault the proper beam blocker and wall plugs must be inserted (in this order) for radiation protection or the experimenters request that the operator insert them. After securing the vault, the wall plug gets retracted, then the beam blocker, so that the wall plug never gets exposed to beam. If experimenters anticipate spending more than 5 minutes in the vault, the beam should be relinquished so that the operator can use the time to measure beam parameters.



### **APPENDIX 3: HANDING OVER BEAM BETWEEN OPERATORS, BEAM PHYSICISTS, AND EXPERIMENTERS**

Beam is handed to and from the experiment with the beam blocker in image 3 of the A1900 inserted. Experimenters control this beam blocker with the red User Lockout Beam Blocker insert and the green User Lockout Beam Blocker retract buttons.

#### **a) Handing beam from the operator or beam physicist to the experimenter**

1. Operator in Charge or Beam Physicist verify that the User Lockout Beam Blocker is inserted and put beam on the User Lockout Beam Blocker.
2. Operator in Charge or Beam Physicist inform Experimenter in Charge that beam is available on the User Lockout Beam Blocker with a primary beam attenuation of xxxxx. Operator in Charge or Beam Physicist hands beam key to Experimenter in Charge.
3. Experimenter in Charge inserts beam key into the Beam Blocker key lock and turns beam key to 'enable' position, verifies the attenuation on the display in the Data-U, and retracts User Lockout Beam Blocker when appropriate.

#### **b) Handing beam from the experimenter to the operator or beam physicist**

1. Experimenter inserts User Lockout Beam Blocker.
2. Experimenter inserts wall plug and viewer to protect experimental setup if beam key is handed back to Operator or Beam Physicist.
3. Experimenter in Charge informs Operator in Charge or Beam Physicist that the beam has been relinquished and hands beam key to Operator or Beam Physicist.

Note: The Operator in Charge and the Beam Physicists only relinquish beam to the Experimenter in Charge, whose name appears on the Data-U display. The location of the inserted beam key is shown on the Data-U displays. The time to hand-over the beam key should be kept short.