

Date: May 27, 2011
Updated 29-Jun-11

To: file

From: F. Willeke

Topic: Control Room Operations Planning

Memo

1. Purpose of this MEMO

The way the PS directorate's accelerators are operated will evolve and requirements will change over the next 3-4 years when NSLS-II accelerators come on line one-by-one and NSLS accelerators will eventually be shut down. Some of the milestones on this route have been well described and planned while others are still under discussion. The purpose of this MEMO is to define a global strategy of how to transition from the present NSLS operations to final NSLS-II operations. Detailed plans will be worked out according to this strategy as soon as all input parameters for a firm plan have stabilized. Meanwhile, the decisions to be made along the path towards NSLS-II operations will use the global strategy as a guideline.

2. Time Line

- **Nov 2011:** Start NSLS-II LINAC commissioning.
Comment: This is the aggressive vendor's plan. The NSLS-II project plan is compatible with a 3 months later start.
- **Jan 2012:** Start NSLS-II LINAC Operation.
Comment: This is the aggressive vendor's plan. The NSLS-II project plan is compatible with a 3 months later start.
- **Sept 2012:** Start Booster Commissioning, September 2012.
Comment: This is the aggressive vendor's plan. The NSLS-II project plan is compatible with a 3 months later start.
- **Dec 2012:** Start Booster Operations, December 2012.
Comment: This is the aggressive vendor's plan. The NSLS-II project plan is compatible with a 3 months later start.
- **Jun 2013:** Start NSLS-II Storage Ring Commissioning
- **Apr 2014:** Start Storage Ring Operation

- **Sept 2014:** NSLS Operations will end.

Comment: This date has not yet been fixed. The Sep'14 date is used at present for immediate planning. The shut down date will be determined later which does not affect any planning and decision to be made at this time.

Operation Phases	Start	End	Dur	FY12	FY13	FY14	FY15	FY16
				1-Oct-11	30-Sep-12	30-Sep-13	1-Oct-14	1-Oct-15
NSLS-Operations	1-Oct-11	1-Nov-11	31	■				
NSLS-II LINAC Commission & NSLS Operations	1-Nov-11	30-Jan-12	90	■				
NSLS-II LINAC Operations & NSLS Operations	30-Jan-12	1-Sep-12	215		■			
NSLS-II Booster Commission & NSLS, NSLS-II LINAC Operations	1-Sep-12	1-Feb-13	153		■			
NSLS-II Injector, NSLS Operations	1-Feb-13	15-Jun-13	134		■			
NSLS-II Injector, NSLS Operations & Storage Ring Commissioning	15-Jun-13	15-Mar-14	273		■			
NSLS-II & NSLS Operations	15-Mar-14	30-Sep-14	199			■		
Early NSLS-II Operation	30-Sep-14	30-Sep-15	365				■	
NSLS-II Operation	30-Sep-15	30-Sep-16	366					■

Table 1: Photon Science Accelerator Operation Phases

3. NSLS-II LINAC Commission and NSLS Operations

Nov 2011 - Jan 2012

NSLS-II LINAC commissioning and NSLS operation will be in parallel. LINAC commissioning will be carried out from the local control room in the injector building. The demonstration of the LINAC performance parameters is part of the LINAC vendor deliverables. Commissioning activities will be carried out by trained NSLS-II staff in collaboration with the LINAC manufacturer's commissioning team in accordance with BNL and DOE safety regulations. The plan is to carry out LINAC commissioning during daytime.

NSLS operations will be carried out from the NSLS control room in Bld. 725 in two 12 hour shifts per day (which is the present practice) which are manned with on machine operator assisted by 2 floor coordinators.

The participation and training of an NSLS operator in the LINAC commissioning is requested. The goal of LINAC commissioning as far as operator support is concerned is to have several of the NSLS operators trained on how to operate the NSLS-II LINAC. NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training. Present estimate is 1 shift per day training effort.

4. NSLS-II LINAC Operations and NSLS Operations

January 2012 - Sept 2012

NSLS-II LINAC and NSLS operation will be in parallel and will be carried out from the present NSLS-control room in Bld. 725 in two 12 hour shifts per day (which is the present practice) which are manned with on machine operator assisted by 2 floor coordinators.

The additional workload of operating the LINAC will be accommodated by the present NSLS-operating crew. A NSLS-II LINAC on-call expert service will be organized to assure that abnormal operation conditions and technical issues can be handled and resolved without impact on the downstream

accelerators. However, NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training (1 shift per day).

5. NSLS-II Booster Commission and NSLS and NSLS-II LINAC Operations

Sept 2012 - Dec 2012

NSLS-II Booster commissioning and NSLS operation will be in parallel. Booster commissioning will be carried out from the local control room in the injector building. The demonstration of the Booster performance parameters is part of the Booster vendor deliverables. Commissioning activities will be carried out by trained NSLS-II staff according to directions by the Booster vendor commissioning team in accordance with BNL and DOE safety regulations. The plan is to carry out Booster commissioning in three 8 hour shifts per day and 7 days a week.

NSLS operations will be carried out from the NSLS control room in Bld. 725 in two 12 hour shifts per day which are manned with on machine operator assisted by 2 floor coordinators (which is the present practice).

The participation and training of an NSLS operator in the Booster commissioning is requested. The goal of Booster commissioning as far as operator support is concerned is to have several of the NSLS operators trained on how to operate the NSLS-II Booster. NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training (1shift per day).

6. NSLS-II Injector Operations and NSLS Operations

Dec 2012 - April 2013

NSLS-II LINAC Booster and NSLS operation will be in parallel and will be carried out from the present NSLS-control room in Bld. 725 in two 12 hour shifts per day (which is the present practice). The additional workload of operating the NSLS-II injectors will be accommodated by the present NSLS-operating crew. A NSLS-II injector on-call expert operator service will be organized to assure that abnormal operation conditions and technical issues can be handled without impact on the downstream accelerators. NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training (1shift per day).

7. NSLS-II Injector and NSLS Operations and Storage Ring Commissioning

Apr 2013 - Mar 2014

During NSLS-II storage ring commissioning, NSLS operation will be in parallel and will be carried out from the present NSLS-control room in Bld. 725 in three 8 hour shifts per day with one machine operator for each shift. Thus the NSLS operations mode will be synchronized to the required mode of initial NSLS-II commissioning and operation.

NSLS-II LINAC Injector operation will be carried out in parallel from the present NSLS-control room in Bld. 725. The additional workload of operating the Booster will be accommodated by the present NSLS-operating crew. A NSLS-II Injector on-call expert operator service will be organized to assure that abnormal operation conditions and technical issues can be handled without impact on the downstream accelerators.

Storage Ring commissioning will be carried out from the local control room in Bld. 740 (RF electronics room). Commissioning will be carried out by accelerator scientists and engineers on three 8 hour shifts per day, 7 days a week. Present plans are to have 3 persons on shift which includes one operator for training purpose. The goal of storage ring commissioning, as far as operator support is concerned, is to have the NSLS operators trained on how to operate the NSLS-II accelerator complex. NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training.

Special commissioning tasks such as storage ring injection set-up and optimization, high intensity studies in the storage ring and similar requires that injector operations and storage ring commissioning is carried out from the same location. To be able to switch the operation of NSLS-II injectors from the control room in 725 to the local control room in bld. 740, a token system is developed which will allow operation of the systems from only one location at a time. The control system will provide information where the token resides and there will be a clear hand-over procedure developed to assure that this change of command will be transparent, efficient and safe. Such a token system is also required for special operation modes such as RF studies from the RF control room or similar and will be therefore integral part of the NSLS-II control system.

8. NSLS-II and NSLS Operations

Mar 2014 - Sep 2014

This configuration is likely not to happen, but there is the possibility that for a short while NSLS and NSLS-II operations may overlap. NSLS then continues to be operated from the NSLS control room in bld. 725.

In the first six month of NSLS-II, operations will consist mostly of ID, frontend and beamline commissioning. This will be performed by expert operators assisted by the operations group staff. These activities will be carried out from the local control room in Bld. 740. NSLS will possibly continue to be operated from its own control room until the end of fiscal year 2014. The operation mode is three 8 hr shifts per day and 7 days a week. NSLS operators are requested to participate in NSLS-II operations for training purpose. NSLS operations crew staffing plans need to take into account increased workload of NSLS-II Training.

9. NSLS-II Operations

Oct 2014 –

Starting from FY15, NSLS-II will proceed in a step-by-step fashion into normal operations mode. Depending on the rate by which new beamlines will become available, this process is going to take between 1 and 2 years. During this time, the NSLS-II operations center will move to its final location which has not yet been determined.

The NSLS control room in 725 will be abandoned and the equipment will be disassembled and decommissioned.

10. Control Room Staff

The previous considerations lead to the staffing plan which is summarized in table 1. Note that the operation coordinators for NSLS have to be added to the plan. They are not included here because floor coordination need to be organized differently in NSLS-II. Thus this plan is only for machine operators.

OPERATION SCENARIO	Period		Operating Hours	Number of Operators per NLS-II shift	Number of Operators per NLS shift	Number of Experts per shift	Integrated FTE	Number Operator Staff required	Total Staff involved in acc ops
NLS-Operations	1-Oct-11	1-Nov-11	672	1	0	0	0.38	5	5
NLS-II LINAC Commission & NLS Operations	1-Nov-11	30-Jan-12	2088	1	0.33	1	1.58	6.7	11.7
NLS-II LINAC Operations & NLS Operations	30-Jan-12	1-Sep-12	5088	1	0.33	0.33	3.84	6.7	8.3
NLS-II Booster Commission & NLS, NLS-II LINAC Operations	1-Sep-12	1-Feb-13	3600	1	0.33	1	2.72	6.7	11.7
NLS-II Injector, NLS Operations	1-Feb-13	15-Jun-13	3144	1	0.33	0.33	2.38	6.7	8.3
NLS-II Injector, NLS Operations & Storage Ring Commissioning	15-Jun-13	15-Mar-14	6480	1	1	2	7.36	10	20
NLS-II, NLS Operations	15-Mar-14	30-Sep-14	4704	1	1	1	5.35	10	15
Early NLS-II Operation	30-Sep-14	30-Sep-15	8688	0	2	0.33	9.87	10	11.7
NLS-II Operation	30-Sep-15	30-Sep-16	8712	0	2	0	9.90	10	10

Table 1 Operation Group Staffing Overview FY11-FY15

11. Guideline for Operations Crew Staffing

According to the considerations of the previous sections, the machine operator group will have to take on more responsibilities in the near future and has to develop into the group which will run the NLS-II accelerator complex. For this reason, the operations staff should be kept constant for now and additional staff will be required in FY12 and later. Any reduction of staff due to retirement or fluctuations should be counteracted by new hires.