

NScD Upgrade Projects Status Report

February 2016



New 11T magnet (Mag "G") for CG2 undergoing vendor testing

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1. Instrument Upgrades Summary Status Table

		New FY16													FY15 Pilot Projects		
Beamline(s)/Area		CG2/4A	CG2	CG4B	HB2C	1B	1B	4A	6	11A	15	17	SE	12	18	CG2	CG3
Title		5T mag for pol. Ref/SANS	GPSANS collimator replacement	Larmor Dev. Beamline	WAND Phase II upgrade	NOMAD background reduction	NOMAD sample changer	Mag. Ref. Improvement Project	EQ-SANS detector vesse/sample area modifications	POWGEN Upgrade	NSE Magnetism Capability	SEQUOIA vacuum upgrade	14T SNS magnet	TOPAZ Background Reduction	ARCS vacuum upgrade	MagG (11T)	BioSANS detector
Project Lead		Fitzsimmons	Crow	Robertson	Frontzek	Robertson	Carruth	Fitzsimmons	Heller	Huq	Ehlers	Jones	Stone	Huq	Jones	Armitage	Urban
Conceptual Design Review	Project organization (team)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Top-down cost estimate (labor and materials)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	High level milestone list	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Risk assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Long lead procurement requests (if applicable)																
Final Design Review	Project Plan	✓						✓		✓				✓	✓		
	Design Criteria Document (if applicable)							✓	✓	✓			✓			✓	
	Update cost estimate based on final design	✓						✓		✓			✓	✓	✓	✓	
	Detailed schedule/milestone list	✓						✓		✓			✓	✓	✓	✓	
	Specified completion criteria	✓						✓		✓			✓	✓	✓	✓	
Project Execution	Submit request/documents for procurement funds	✓						✓		✓			✓	✓	✓	✓	
	% of major procurement (>\$25K) contracts awarded (\$ awarded/\$ estimated)									40					100	100	100
	Equipment installation complete														✓		
	Equipment ready for integrated testing														✓		
	Commissioning complete														✓		
	Completion Report														✓		

2. Project: 5T mag for pol. Ref/SANS for CG2/4A

2.1 Project Lead: M. Fitzsimmons

2.2 Progress

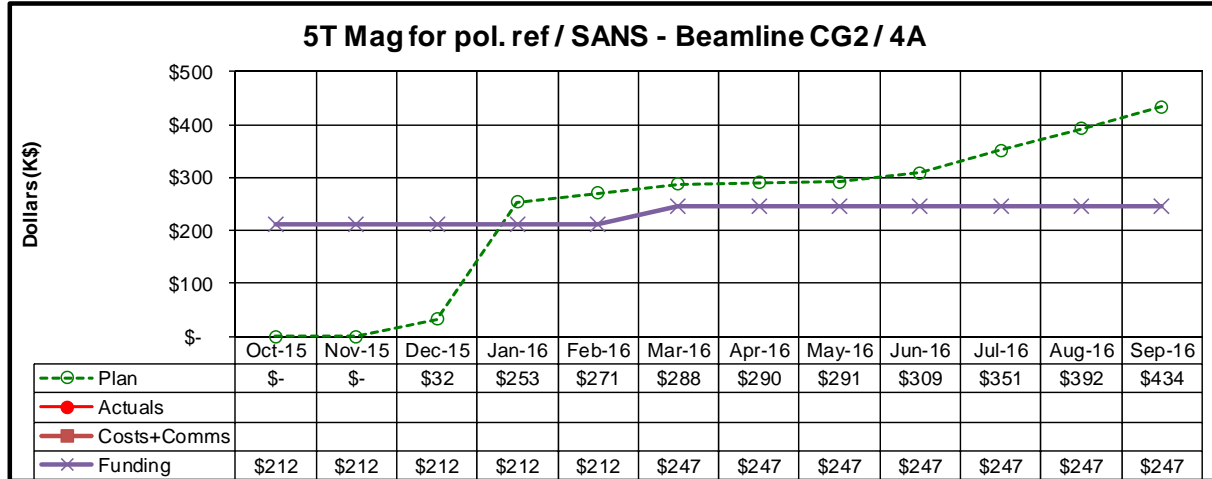
- The 5T magnet specifications have been completed and submitted to purchasing.

2.3 Issues/Concerns

- None

2.4 Milestones

CG2/4A: 5T mag for pol. Ref/SANS	Current planned date	Actual completion date
Define requirements	Feb-16	Feb-16
Issue RFP	Feb-16	
Select vendor and award contract	Mar-16	
Acceptance testing at vendor	Sep-16	
Receive magnet and complete acceptance testing on site	Nov-16	
Perform first experiments at HFIR	Nov-16	
Perform first experience at BL4A	Nov-17	



3. Project: NOMAD background reduction

3.1 Project Lead: M. Tucker

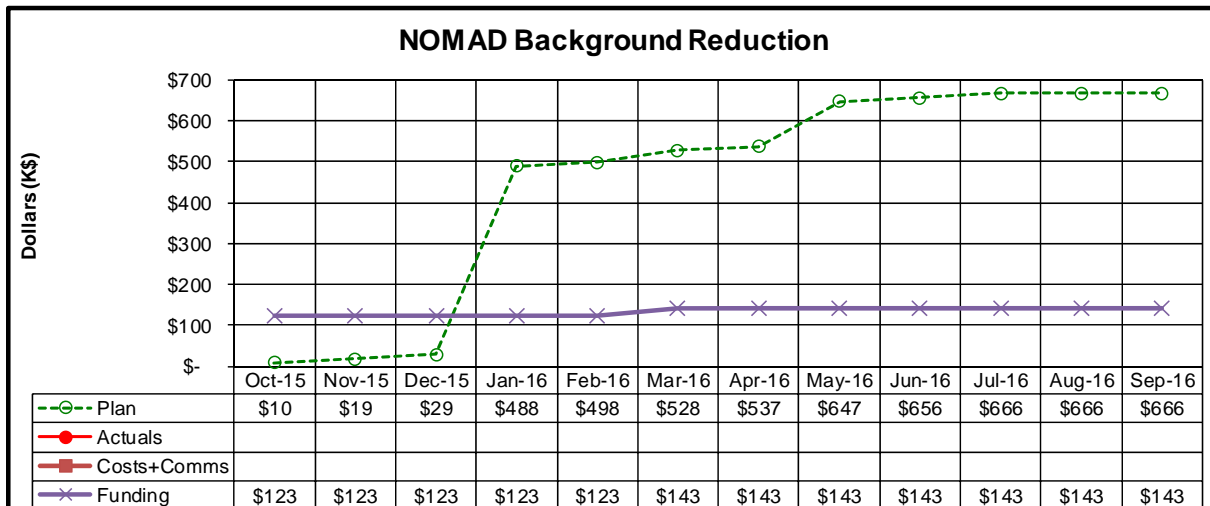
3.2 Progress

- No input this month

3.3 Issues/Concerns

3.4 Milestones

1B: NOMAD background reduction	Current planned date	Actual completion date
<i>Phase 1</i>		
Diagnostic measurements complete	Jul-16	
Vessel re-alignment complete	Aug-16	
<i>Phase 2</i>		
Award procurement of prototype radial collimators	Oct-16	
Install and test prototypes	Aug-16	
Award procurement of final design radial collimators	Jan-16	
Install/test final radial collimators	Sep-16	
Project complete	Oct-16	



4. Project: Larmor Dev. Beamline at CG4B

4.1 Project Lead: L. Robertson

4.2 Progress

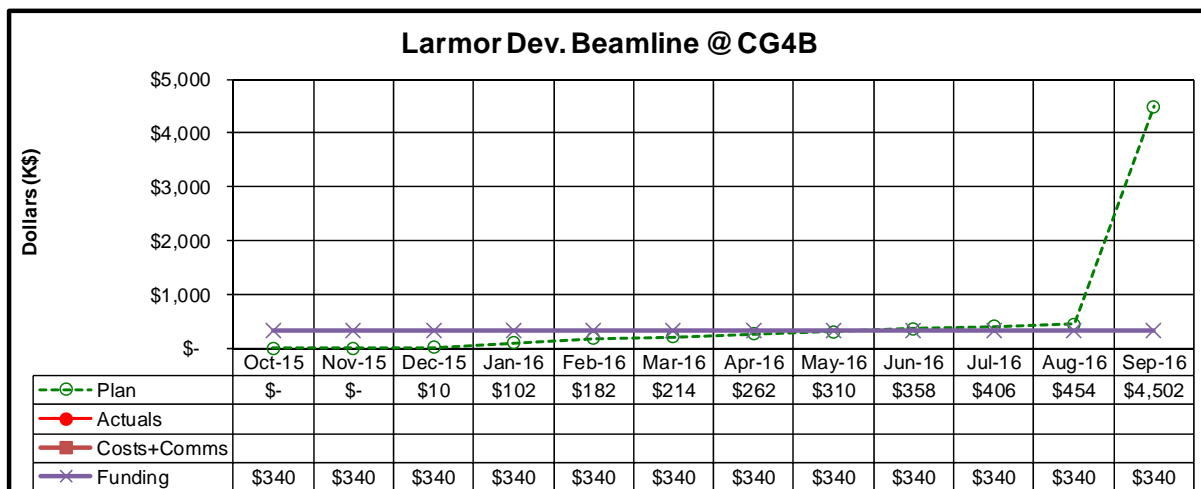
- No input this month

4.3 Issues/Concerns

- No input this month

4.4 Milestones

CG4B: Larmor Dev. Beamline	Current planned date	Actual completion date
Award contract for monochromator	Mar-16	
Install monochromator	May-16	
Award contract for shield wall	Mar-17	
Install shield wall	May-17	
Award contract for shutter	Mar-17	
Install shutter	May-17	
Award contract for beamstop	Mar-17	
Install beamstop	May-17	
Award contract for support rail	Mar-17	
Install support rail	May-17	



5. Project: NOMAD Sample changer

5.1 Project Lead: J. Carruth

5.2 Progress

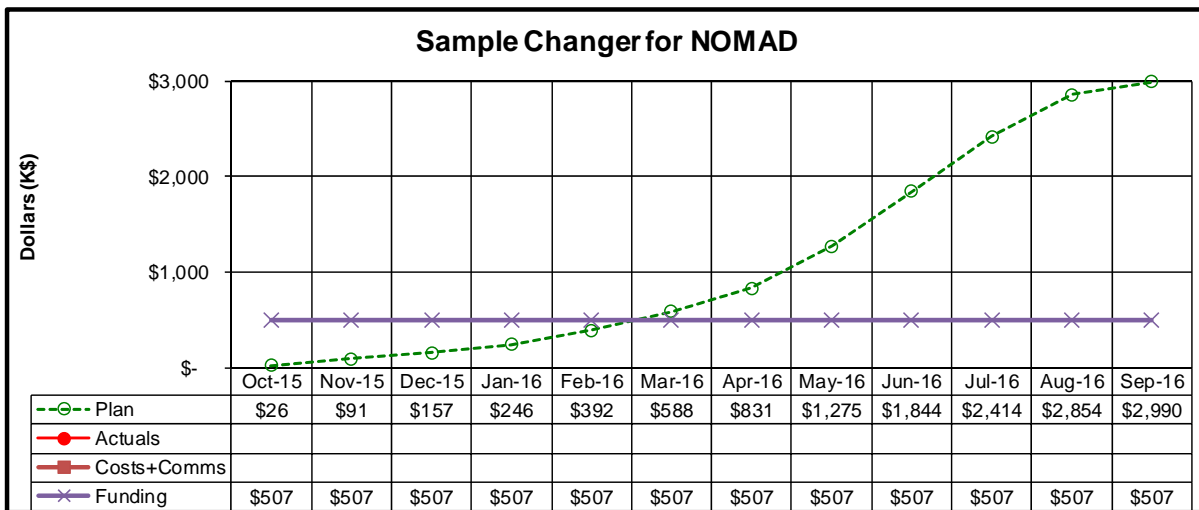
- Meetings to determine resource requirements and labor scheduling were held in January and the project team confirmed basic design and resources required.
- Final design is pending.
- Acquisition of parts pending design review by project designer (J. Wenzel).

5.3 Issues/Concerns

- None

5.4 Milestones

1B: NOMAD sample changer	Current planned date	Actual completion date
Finalize design of changer and re-entrant well	Apr-16	
Contracts for all required components awarded	May-16	
All components on site	Jul-16	
Complete assembly of sample changer in lab	Sep-16	
Controls completed and tested	Oct-16	
Changer installed and initial commissioning complete	Dec-16	
Deployed to user program	Mar-17	



6. Project: EQ-SANS detector vessel/sample area modifications

6.1 Project Lead: W. Heller

6.2 Progress

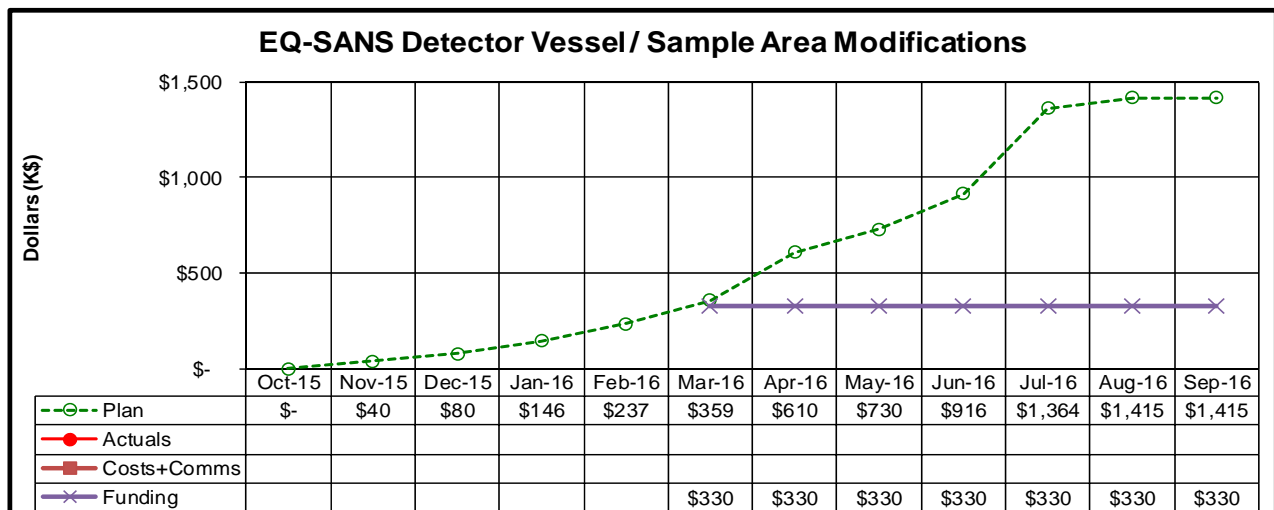
- The radiological calculations have been completed and a draft report has been prepared.
- Discussions with the RSO will occur in April.
-

6.3 Issues/Concerns

- None

6.4 Milestones

6: EQ-SANS detector vessel/sample area modifications	Current planned date	Actual completion date
Complete design of cone replacement	Mar-16	
Verify radiological safety/operating constraints	Mar-16	
Award contract for cone fabrication	Apr-16	
Award contract for sample table and sample environment mounting apparatus	Mar-16	
Award contract for shield plug and flange adapters	Mar-16	
Award contract for telescoping beam extender	Mar-16	
All equipment on site and ready for installation	Jul-16	
All equipment installed and ready for operation with neutrons	Feb-17	
Complete radiological survey	Mar-17	



7. Project: 14T SNS magnet

7.1 Project Lead: M. Stone

7.2 Progress:

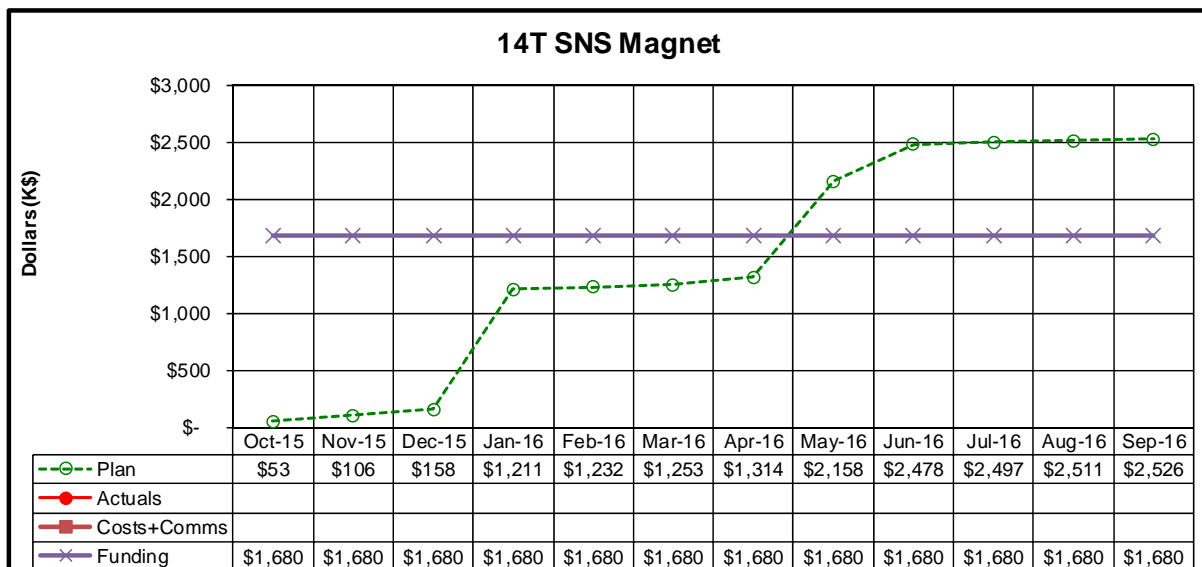
- The 14 T magnet procurement documents will be sent to procurement once funds are allocated to the project.

7.3 Issues/Concerns

- All progress is on hold until a charge code is assigned.

7.4 Milestones

SE: 14T SNS magnet	Current planned date	Actual completion date
Define requirements	Feb-16	Feb-16
Issue RFP	Mar-16	
Select vendor and award contract	May-16	
Preliminary design review (at Seller’s site or by teleconference at the buyer’s discretion)	Aug-16	
50% design review and document package (at the Seller’s site, or by teleconference, at the buyer’s discretion.)	Sep-16	
Factory acceptance testing at the Seller’s site	Sep-17	
Magnet received	Jun-17	
Commissioning at SNS complete	Nov-17	



8. Project: SEQUOIA vacuum upgrade

8.1 Project Lead: L. Jones

8.2 Progress

- The core team has been working on resolving scope questions and the design is ongoing. Randy Summers is meeting with vacuum designer, Steve Beard, and starting to pull up all the old drawings for confirmation of actual conditions. The expectation is to be ready for design changes as they come in, instead of fixing/updating old drawings before changes are made.
- The project was partitioned into two phases

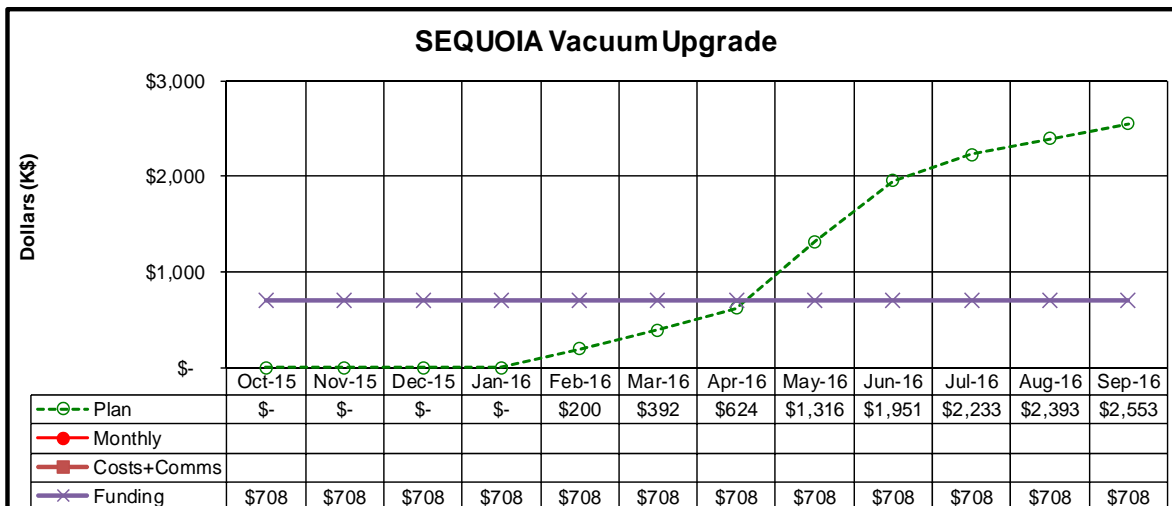
- During Phase I (summer 2016), installation of the controls, electrical cabling, sensible chill water and compressed air infrastructure on the installed turbo pumps on the sample chamber will be completed. This will allow high vacuum pumping redundancy for the sample chamber and should result in quicker pump down times in between sample changes for more efficient operations.
- The remainder of the scope will be completed in Phase II (summer 2017). This will involve adding a vacuum line from sample chamber to the installed detector-roughing pump and disconnecting and removing the current roughing pump and the pump's SCE exhaust line. The new vacuum line will utilize the cave wall penetration currently being used by the existing exhaust line. Phase II also includes the rewriting and standardization of the PLC controls. The existing controls and rack will be replaced by newly built controls and electrical cabinets. All the current electrical cabling and replacing the controls cabling will be reused for the new racks. Also, two new turbo pumps will be added to the detector chamber, the valves/gauges will be standardized and existing mechanical vent valve and lighted vacuum indicator sign on the sample chamber will be added to the controls.

8.3 Issues/Concerns

- None

8.4 Milestones

17: SEQUOIA vacuum upgrade – Phase I	Current planned date	Actual completion date
Install and integrate turbo pump	Jun-16	
Procurements awarded	Oct-16	
Installation complete	Jul-16	
Commissioning with neutrons complete	Aug-16	
Project complete	Sep-16	



9. Project: ARCS vacuum upgrade

9.1 Project Lead: L. Jones

9.2 Progress

- The BL18 ARCS vacuum upgrade was completed February 15th, during the transition period after beam ramp up. There was no impact to the user program.
- The project completion report (which includes a few follow-on items planned for the summer 2016 outage) has been finalized.
- The upgrade is performing even better than expected. Low vacuum can now be maintained with only one turbo pump (doubling the planned redundancy). In addition, the new facility-built controls are easy to use and multiple people will be able to make changes to the new PLC ladder logic as opposed to only one expert.
- The project scope included
 - New vacuum equipment
 - New electrical power and controls
 - New and upgraded sensible chill water supply
 - New compressed air system
 - Changes to configuration control shielding and exhaust changes that required extra calculations and approvals from the radiation group, the Radiation Safety Officer (RSO), and the Radiation Safety Coordinator (RSC), an ORNL structural engineer, and the fire protection group
 - New controls that are easier to use and manage

9.3 Issues/Concerns

- None

9.4 Milestones

18: ARCS vacuum upgrade	Current planned date	Actual completion date
Install and test upgrade	Feb-16	Feb-16

10. Project: GPSANS collimator replacement

10.1 Project Lead: L. Crow

10.2 Progress

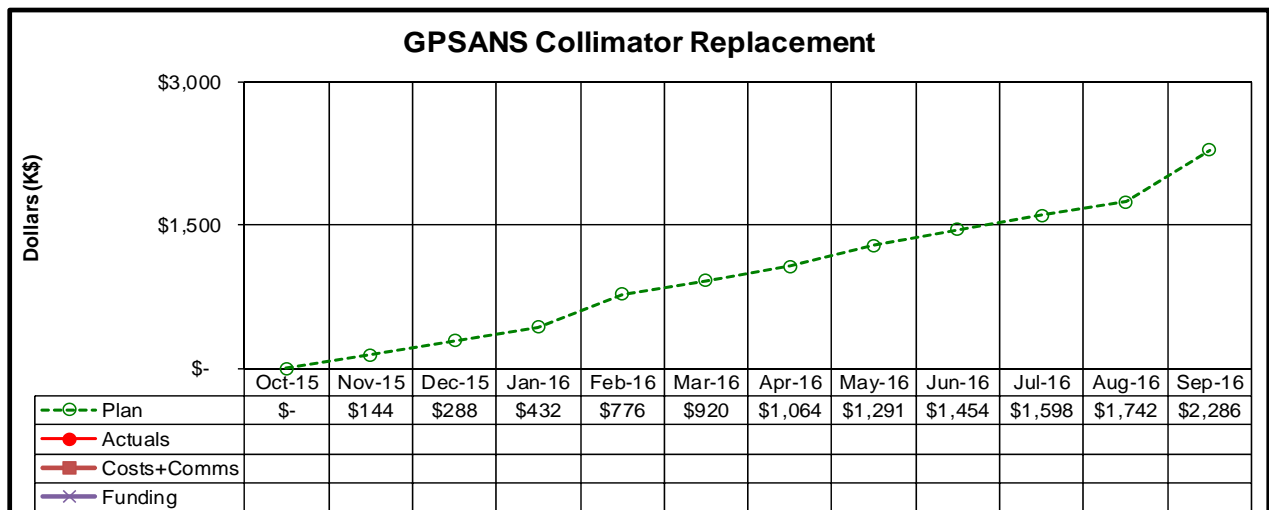
- No input this month

10.3 Issues/Concerns

- None

10.4 Milestones

CG2: GPSANS collimator replacement	Current planned date	Actual completion date
Award contract for prototype collimator	Apr-16	
Award contract for new guide	Mar-16	
Award contract for new collimator sections	Jun-16	
All equipment on site	Dec-16	
Complete offline assembly and alignment	Mar-17	
New collimator guide assemblies installed at the beamline	May-17	



11. Project: NSE Magnetism Capability

11.1 Project Lead: G. Ehlers

11.2 Progress

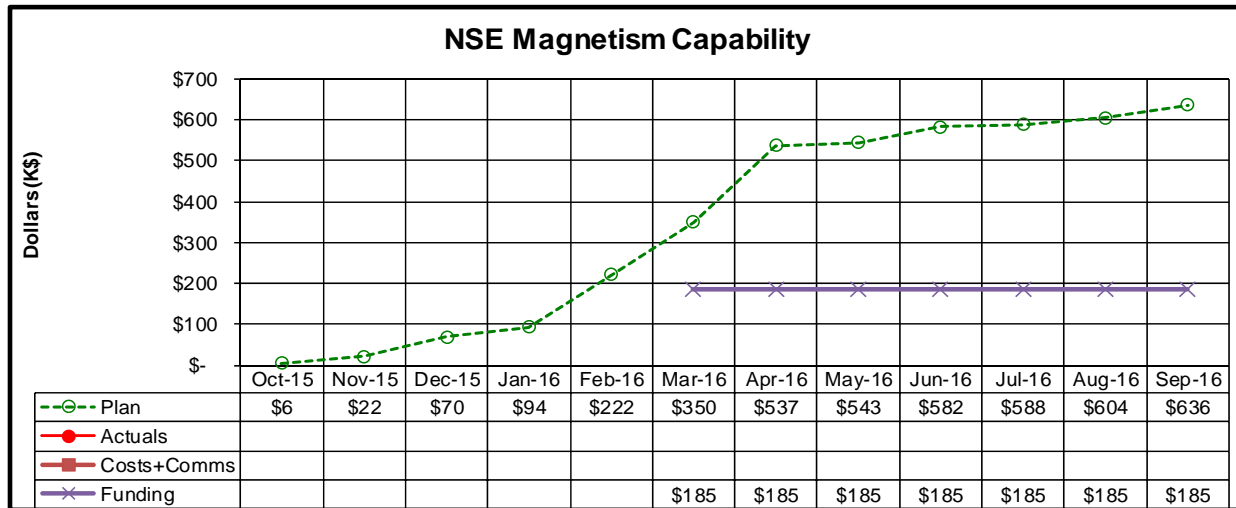
- The performance requirements for the closed cycle refrigerator (CCR) have been finalized
- Development of the specification documents for a 3He CCR is underway

11.3 Issues/Concerns

- None

11.4 Milestones

15: NSE Magnetism Capability	Current planned date	Actual completion date
Complete first experiment with existing CCR	Dec-15	Dec-15
Award contract for compact bottom loading CCR	Mar-16	
CCR on site and ready for installation	Aug-16	
Complete first experiment at ³ He temperature	Dec-16	



12. Project: WAND Phase II upgrade

12.1 Project Lead: M. Frontzek

12.2 Progress

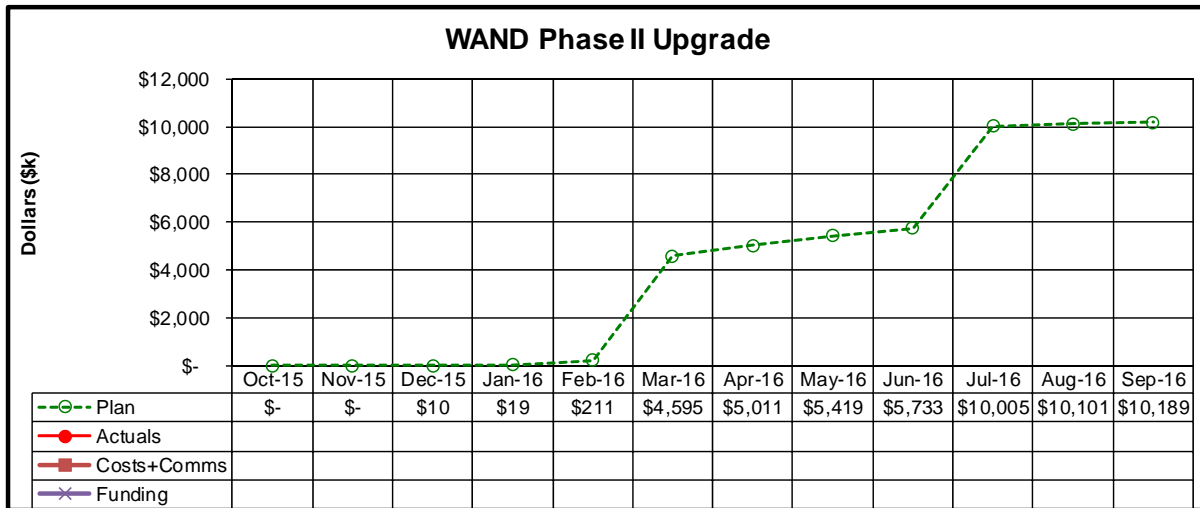
- A new instrument scientist, Matthias Frontzek, has been assigned as project lead for the WAND phase II upgrade
- Initial discussions will be held with the detector, software and engineering groups in April to discuss project details
- The project team will be heading out to Los Alamos in April to plan and discuss the shipment of the detector to ORNL

12.3 Issues/Concerns

- None

12.4 Milestones

HB2C: WAND Phase II upgrade	Current planned date	Actual completion date
Receive detector from Los Alamos (with BNL Support)	Sep-16	



13. Project: BioSANS detector expansion

13.1 Project Lead: V. Urban

13.2 Progress

- Many hardware components are on site and ready for installation
 - New interlock
 - Galil motion control panel
 - Motor bulkheads
 - Motor/encoder for calibration arm
 - Encoder for west wing array, cooling manifold and cooling lines for west wing array
 - Frame for west wing carriage
 - Laser encoder for main array
 - LV distribution panel
- Contracts for the maintenance cart and fabrication of the dual control cooling air control cabinet have been awarded

13.3 Issues/Concerns

- None

13.4 Milestones

CG3: BioSANS detector	Current planned date	Actual completion date
Complete installation of west wing detector upgrade	Jun-16	
Complete commissioning of new detectors	Jul-16	

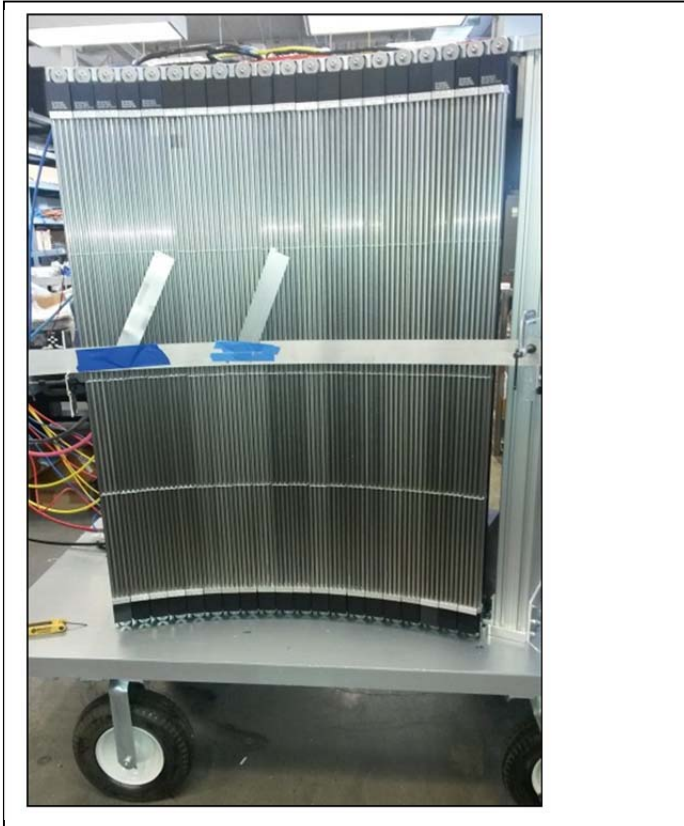


Figure 2 Front view of assembled west wing array in lab with Boron AI testing masks



Figure 1 PLC hardware for interlock



Figure 3 Front face of Galil motion control panel

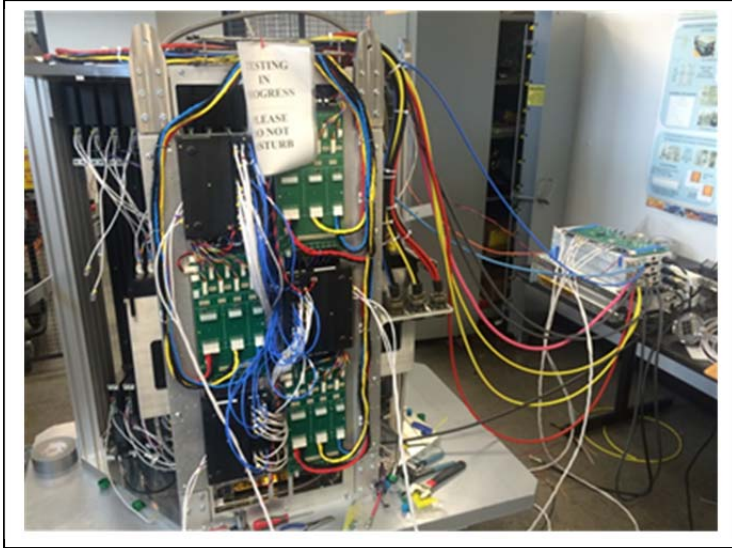


Figure 5 Rear view of assembled west wing array connected to test power supplies and pre-processor



Figure 4 Galil motion control panel

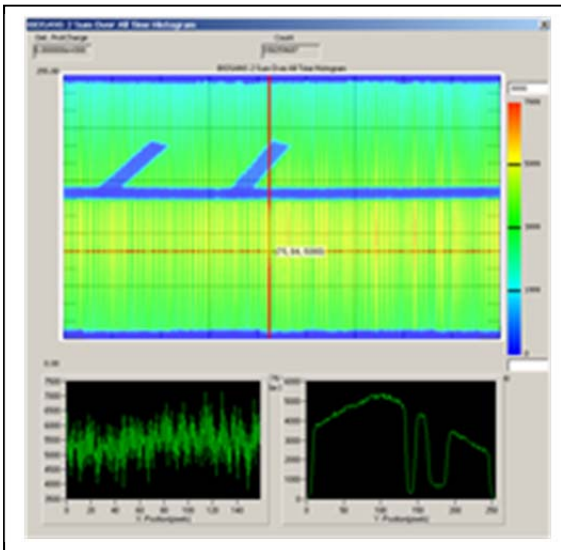
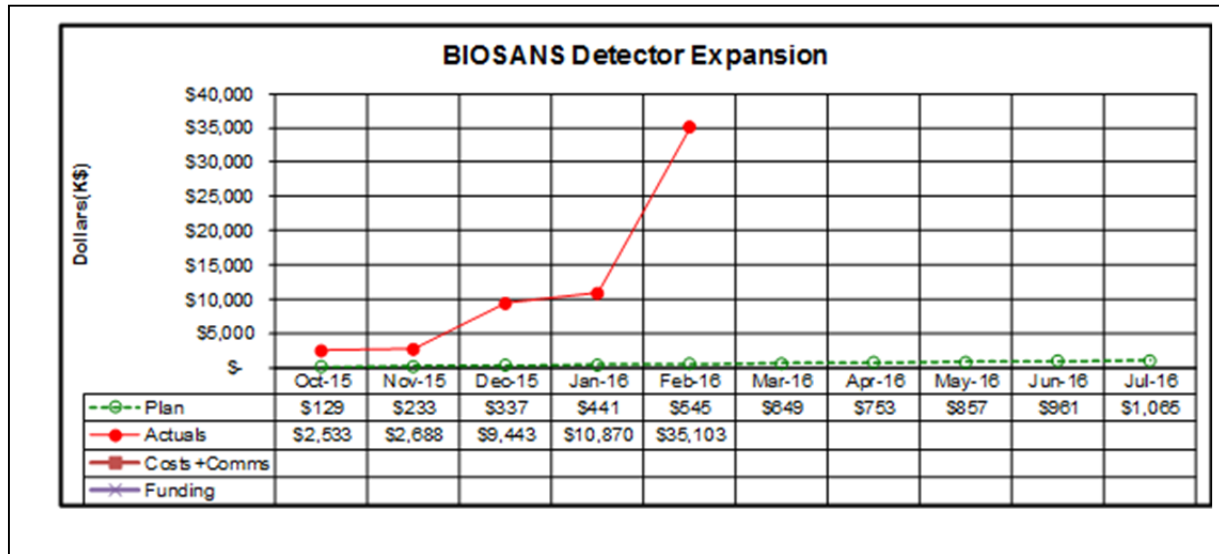


Figure 6 Histogram of west wing array offline testing



14. Project: Mag. Ref. Improvement Project

14.1 Project Lead: M. Fitzsimmons

14.2 Progress

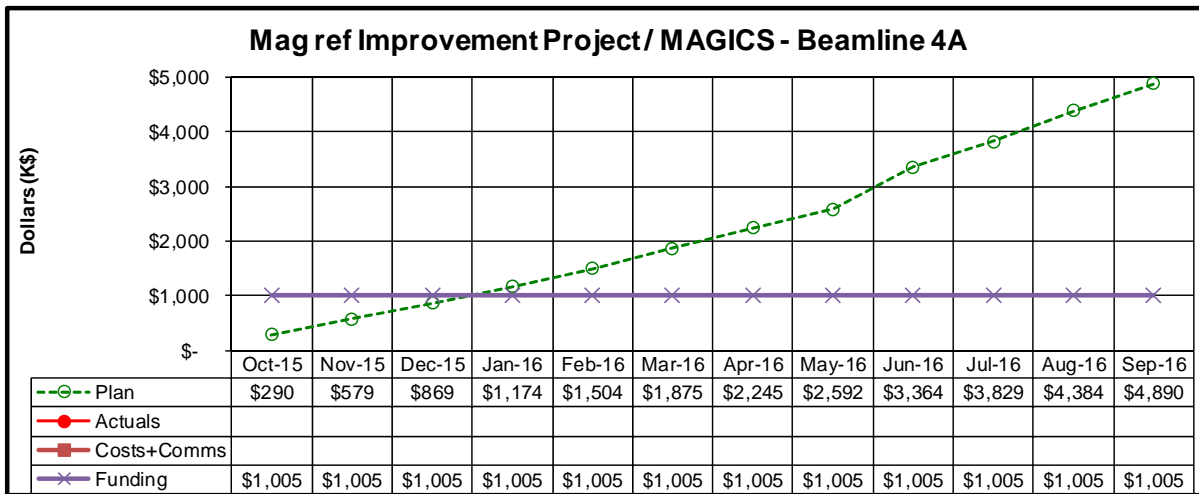
- Final design work is underway
- Final drawings for the lower table frame are being developed
-

14.3 Issues/Concerns

- None

14.4 Milestones

4A: Mag. Ref. Improvement Project	Current planned date	Actual completion date
Complete conceptual design review	Jan-16	Jan-16
Award contract for hexapod cryostat mount	Mar-16	
Complete final design review	May-16	
Award contract for remaining components	Jul-16	
Assemble detector table and complete offline testing (location TBD)	Oct-16	
All equipment installed at the beamline	Dec-16	
Systems testing at the beamline	Feb-17	
Commissioning with neutrons complete	Apr-17	



15. Project: POWGEN Upgrade Project

15.1 Project Lead: A. Huq

15.2 Progress

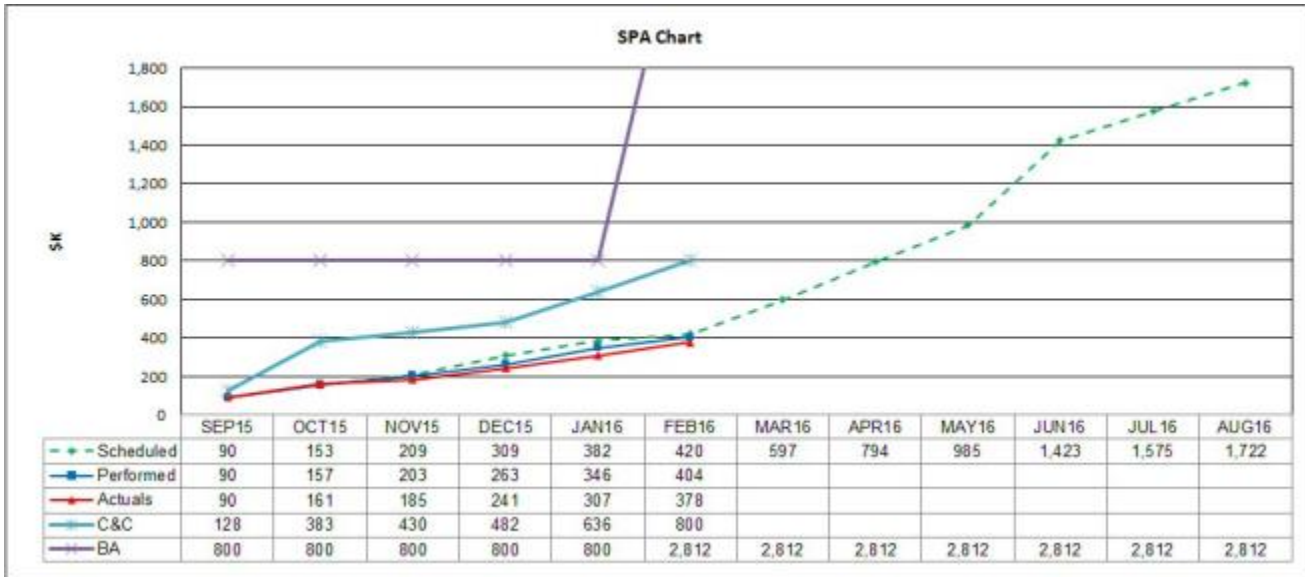
- Completed test application of B4C coating for the coarse radial collimator
- Sample vessel pressure cylinder rolled and welded
- Awarded contracts for
 - Model 80 vacuum slit
 - Boron carbide stock shield plates
 - 10B enriched Boron Carbide powder for internal vessel shield coating
- Design of upstream optics assembly completed
- Prototype power distribution board completed and ready for module testing
-

15.3 Issues/Concerns

- None

15.4 Milestones

11A: POWGEN Upgrade	Current planned date	Actual completion date
Sample vessel ready For installation (assembled-tested-fiducialized)	Sep-16	
Optics ready For installation (assembled-tested-fiducialized)	Sep-16	
10 New modules assembled & tested	Oct-16	
Begin removal of existing detector modules	Dec-16	
Complete modification of existing modules	Feb-17	
Begin reinstallation of modified detectors and new detectors	Apr-17	
Complete IRR for modified instrument	Apr-17	
Project complete	Jun-17	



16. Project: MagG (11T) for CG2

16.1 Project Lead: D. Armitage

16.2 Progress

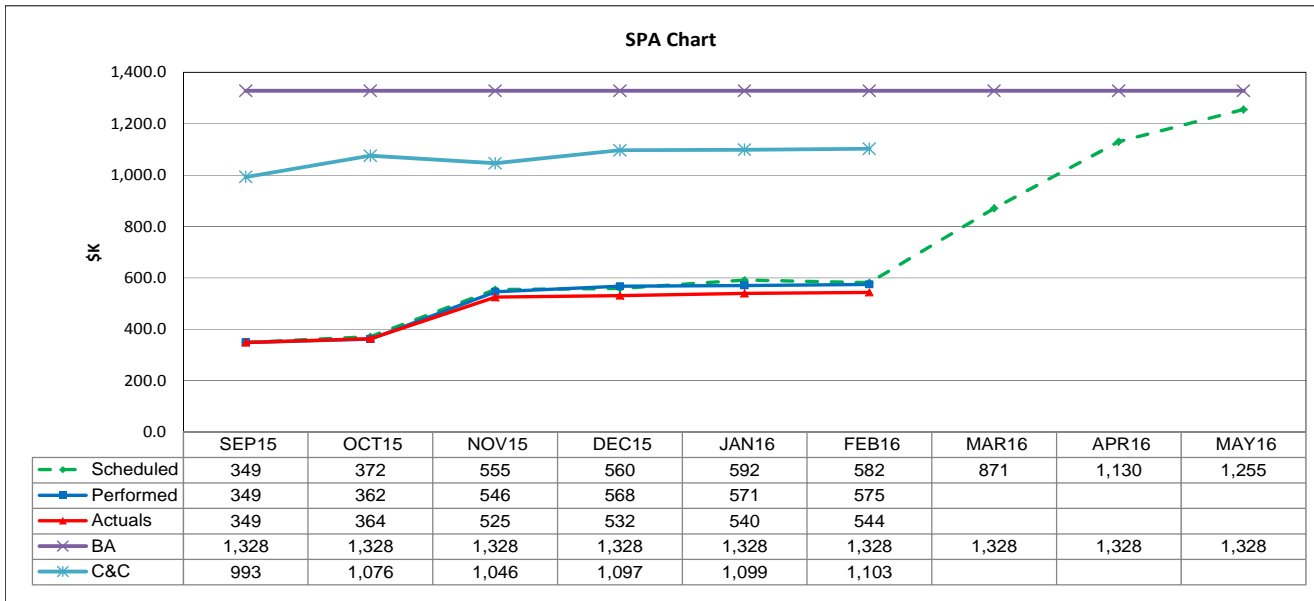
- Magnet assembly is complete and acceptance testing at the vendor has started.

16.3 Issues/Concerns

- During magnet cool down testing, the vendor discovered a helium leak. This leak has been found and repaired and cool down testing is scheduled to re-start on March 17. The impact on the scheduled April 12 delivery will not be known until the vendor provides an updated timeline.

16.4 Milestones

CG2: MagG (11T)	Current planned date	Actual completion date
Complete acceptance testing at the vendor	Mar-16	Mar-16
Receive magnet	Apr-16	
Receive goniometer	May-16	
Complete DAS modifications for new goniometer	Apr-16	
Award contract for lifting fixture	Mar-16	
Receive lifting fixture	Mar-16	
Install goniometer and magnet at beamline	May-16	



17. Project: TOPAZ Background Reduction

17.1 Project Lead: A. Huq

17.2 Progress

- None this month

17.3 Issues/Concerns

17.4 Milestones

TOPAZ goniometer	Current planned date	Actual completion date
Award contract for cryo-goniometer	Mar-16	
Presentation of design by vendor to SNS staff	Apr-16	
Approve detailed design and start fabrication of goniostat	May-16	
Complete factory acceptance test of goniostat in vacuum chamber	Sep-16	
Approve vendor design of cryostat	Sep-16	
Cryo-goniometer on site	Jan-17	
Off-line acceptance testing complete	Mar-17	
Commissioned and ready for use by TOPAZ users	May-17	