



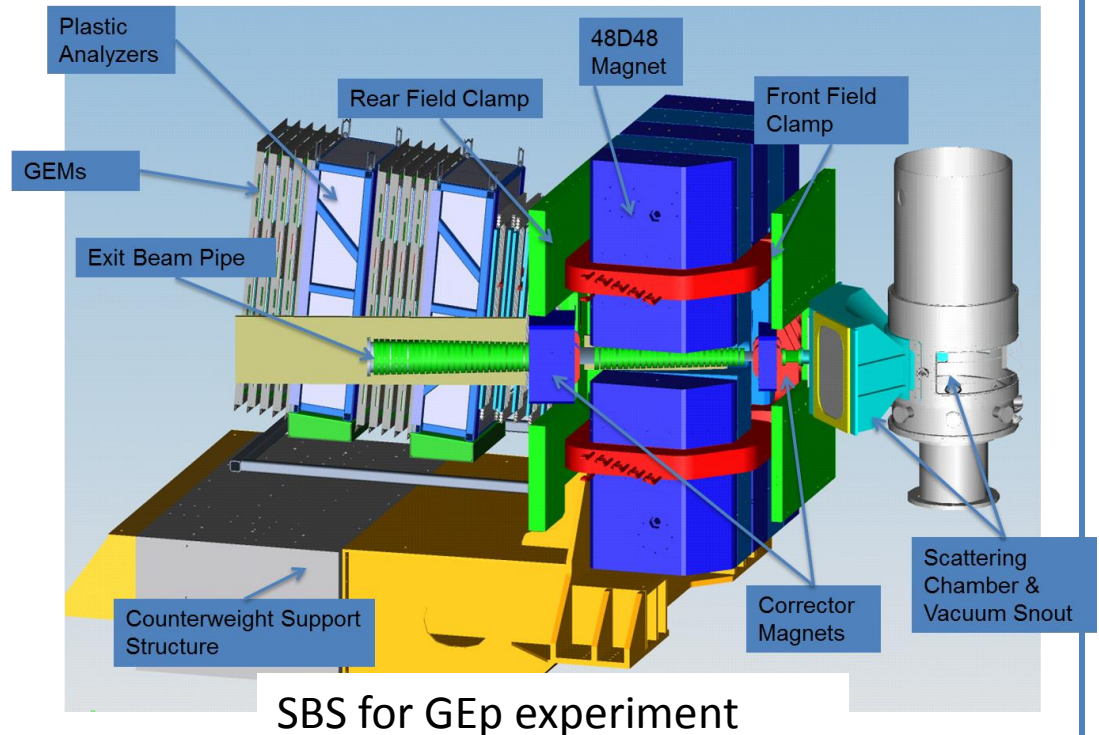
SBS Program: Cost, Schedule, & Management

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Program manager

Outline

- The Program overview
 - Response to DOE 2015 review
 - Management
- WBS status
 - Timelines
 - Deliverables
 - Milestones
 - Costs
 - Outlook



Overview of Program

	Apparatus	Experiment
Projects		
WBS 1 SBSBAS	SBS Magnet with platform and power supply, beamline upgrades. Hall LCW and power upgrades	GEn, GMn , GEp
WBS 2 SBSNFF	Coordinate Detector HCAL trigger Detector frames, Electronics Hut, Lead shielding	GEn, GMn , GEp
WBS 3 SBSPFF	Rear GEM tracker	GEp
SBS dependencies		
	Front Tracker GEMS	GEn, GMn , GEp
	Polarized 3He target	GEn
	Gas Cherenkov (GRINCH) in BigBite	GEn, GMn
	Hadron Calorimeter (HCAL)	GEn, GMn , GEp
	Electron calorimeter (ECAL)	GEp
Existing Hall A equipment		
	BigBite Magnet and Platform , Scintillator Array BigBite PreShower /Shower calorimeter and HRS-Right	GEn, GMn
	LD2 and LH2 cryotarget	GMn , GEp

DOE 2015 SBS review recommendations

Three Recommendations:

- The team should provide to DOE a report on the ECal annealing tests by February 16, 2016. This report should use the beam test data to validate the heat annealing model, and use the model to predict performance under expected operating conditions.
Response: *Report was sent to DOE in March 2016.*
- A document describing trigger and DAQ electronics including a timing diagram for the trigger should be provided one month before the next review.
Response: *Updated DAQ report in pre-brief materials*
- The Laboratory is urged to evaluate the ECal project including the technical feasibility of the annealing solution, and ECal project cost and schedule, by summer 2016.
Response: *Report on three options for ECal was sent to 3 committee member for review in July. The pre-brief materials included: Report on C200 study, report on the conceptual design of ECal and report on the timeline and budget for the construction of the ECal.*

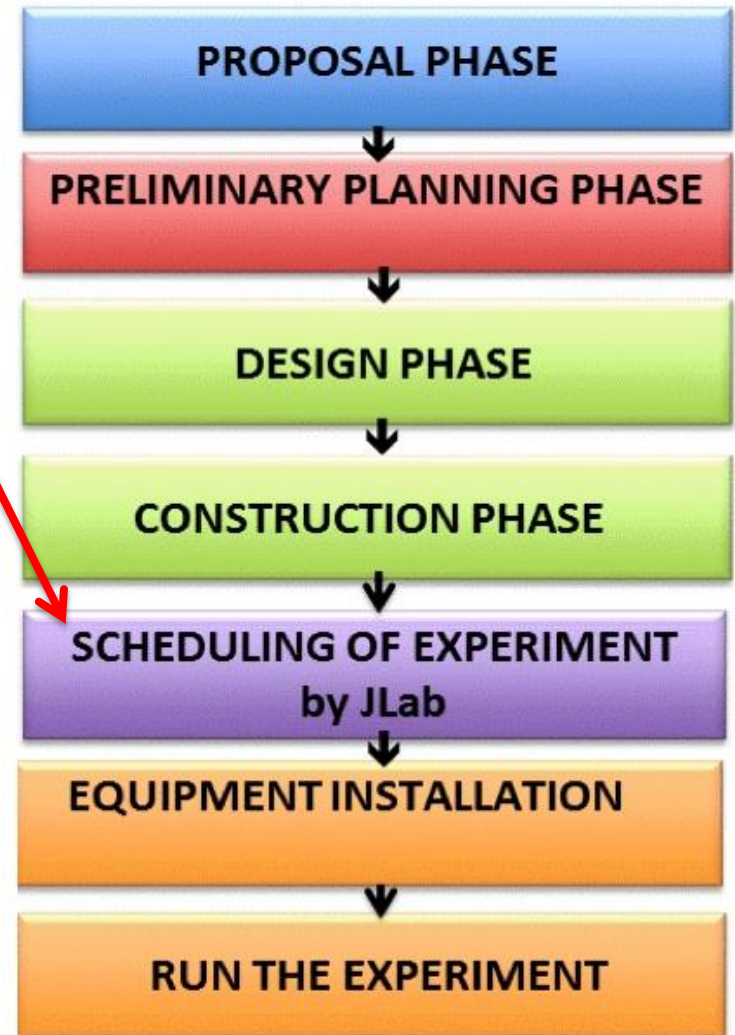
Overview of WBS status

- ❑ WBS1 was completed on Jan 22, 2016
 - ❑ WBS2 will be completed by Jan 31, 2017
 - ❑ WBS3 will be completed by Feb 1, 2017
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- Ready to move into the standard Jlab Review and Schedule Procedure
 - Plan to have Experimental Readiness Review in Spring 2017

Final Review and Scheduling Procedure

Once the construction is near completion and before requesting scheduling:

- ☐ Calculate and document an Experiment Operating Envelope and request a formal Radiation Safety Assessment Document
- ☐ Complete a final safety analysis of the equipment, write an Experiment Safety Assessment Document.
- ☐ A review by the Jefferson Lab Review Committee with additional subject matter experts that includes the experiment installation plan, timeline and any resource requirements



https://www.jlab.org/exp_prog/experiments/scheduling.html

SBS EH&S

- As with any endeavor at JLab, all SBS activities adhere to the protocols as spelled out in the JLab EH&S Manual ([link](#))
- Experiments in the Hall must go through a rigorous readiness review process
 - For details see:
 - http://www.jlab.org/user_resources/PFX/NP-PFX/
 - http://www.jlab.org/user_resources/PFX/NP-PFX/text.html
- When equipment and detectors are delivered to Jlab, one needs HALLA list or a TSOP before equipment can be operated.

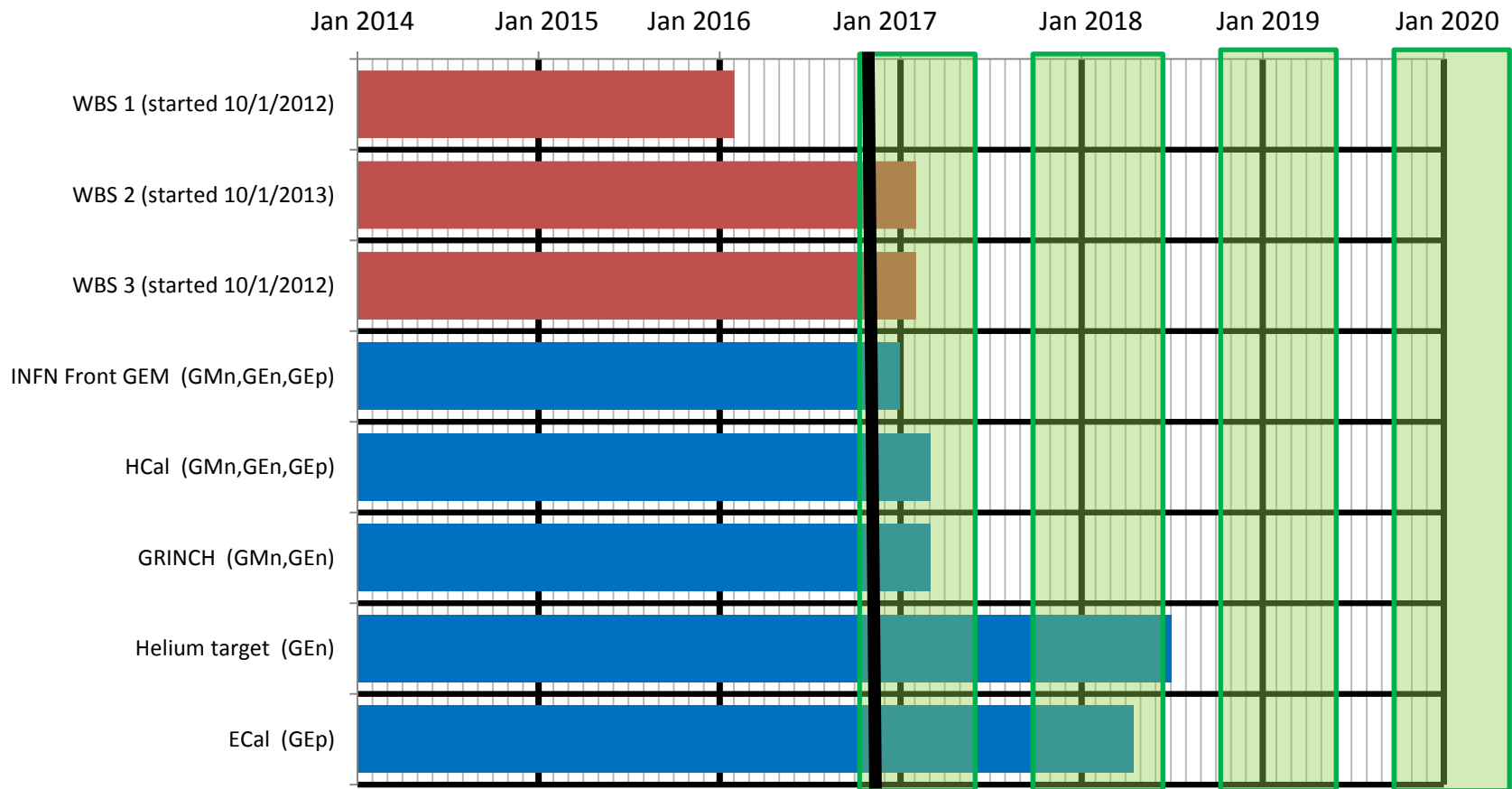
SBS General Operation

- The collaboration has weekly, ~1-hour, tele-conference, topical meetings. Separate meetings on CDET, GRINCH, MC.
- The Collaboration has an annual, 2-day, on-site meeting. Last meeting held on July 21-22, 2016.
- Hall A management (Thia Keppel, Mark Jones, Bogdan Wojtsekhowski, Robin Wines) meets weekly
- Meet with Rolf Ent monthly to review progress and Estimate-to-Complete for all projects.
- Written monthly status reports are submitted to DOE
- Respond by email to DOE inquiries on monthly reports.
- As needed, have a quarterly phone call with DOE

The Individual WBS's

Overview of timelines

- The red (blue) horizontal bars are WBS (Dependencies) timelines
- The green vertical bars are JLab run periods
 - Possible running of SBS GMn and GEn in Oct 2019- May 2020
 - Possible running of SBS GEp in Oct 2020-May 2021



WBS1: Deliverables

- 48D48 Magnet transportation and modifications
- 48D48 Magnet assembly and support platform
- Magnet power supply and its associated infrastructure
- Beam-line vacuum and shielding components
- Beam-line steering magnets and correctors

WBS 1 Milestones

Level	Milestone	Comment
1 (1.1-01M)	Project start	Completed 10/1/2012
2 (2-01M)	Magnet delivered to JLab	Completed 8/21/2013
3	Power supply received	Completed 10/18/2014
3	Magnet yoke modifications	Completed 5/22/2014
2 (1.2-10M)	Platform parts received	Completed 3/24/2015
3	Assemble magnet in Testlab	Completed 9/4/2014
3	Commissioning test of magnet in Testlab	Completed 10/29/2014
3	Beampipe solenoid correctors received	Completed 12/11/2015
3	Detector supports	Completed 3/24/2015
2 (1.2-30M)	Beam-line parts received	Completed 11/30/2015
1 (1.1-10M)	Project completion	Completed 1/22/2016

WBS 1 Highlights

WBS 1 Costs: Overview

Table from PMP

	FY13	FY14	FY15	Total
WBS 1	\$651	\$508	\$166	\$1,326
Contingency (28%)	\$181	\$141	\$46	\$368
Total	\$838	\$643	\$212	\$1,694

WBS 1 Costs: Final Status

Expenditures= Labor+Expenses+Overhead

	Budget	Expenditures	Labor	Expenses	Overhead
FY13	\$838K	\$411K	\$57K	\$258K	\$96K
FY14	\$643K	\$517K	\$91K	\$286K	\$140K
FY15	\$212K	\$663K	\$18K	\$474K	\$171K
FY16		\$147K			
Total	\$1694K	\$1738K			

Expenditures in FY16 *(includes overhead)*

- Beamline vacuum pipe
- Small magnet platform items

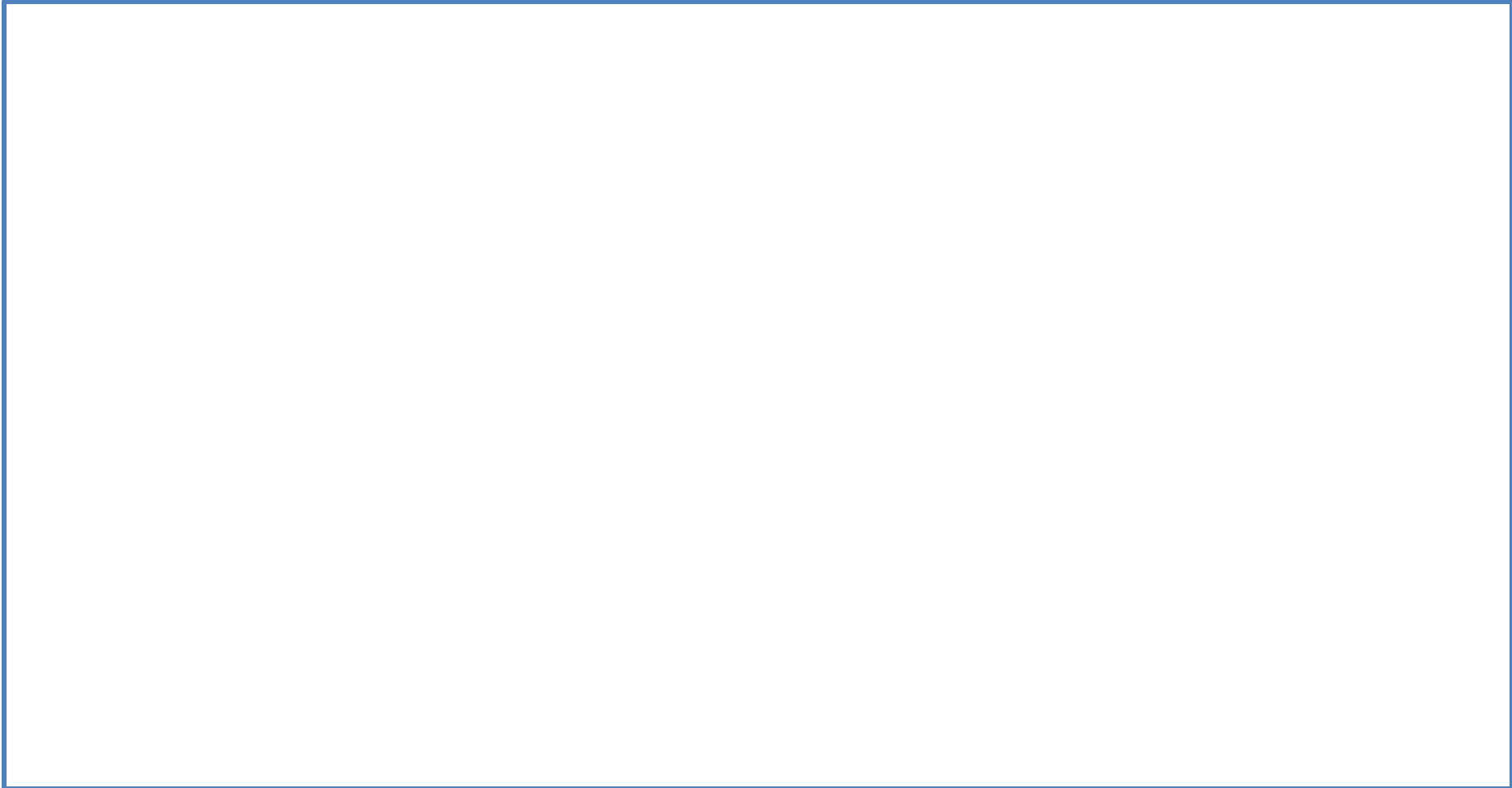
WBS 2 Deliverables

- WBS 2.1 PMT-based Coordinate Detector.
 - Subproject manager: Mahbub Khandaker, Idaho State University
- WBS 2.2 Electronics Hut, Detector Frames, and materials needed to construct beam line shielding
- WBS 2.3 Pole shims and exit field clamp
- WBS 2.4 Hadron Calorimeter trigger

WBS 2 Milestones

Level	Milestone	Comment
1	Project start	Completed 10/1/2013
3	Finish testing of module prototype	Completed 8/30/2014
3	Scintillator ordered	Completed 8/30/2014
2	CDET module design completed	Completed 11/30/2014
3	Wavelength Shifting Fibers ordered	Completed 1/20/2015
3	Scintillator shipped for machining	Completed 4/10/2015
2	JLab receives exit field clamp	Completed 11/6/2015
3	Begin preparation of WLS fibers	Completed 7/6/2015
3	Begin construction of CDET modules	Completed 9/24/2015
3	Assembled one CDET module	Completed 11/15/2015
2	Electronics Hut Parts Recieved	Completed 3/30/2016
2	Trigger completed	Completed 3/15/2016
3	Assembled one CDET plane	Completed 7/15/2016
2	Coordinate Detector assembled	Completed 8/31/2016
1	Project completion	1/29/2017

WBS 2.1 CDET Highlights



WBS 2.2 & 2.3 Highlights

WBS 2.4 Trigger Highlights

WBS 2 Costs: Overview

Table from PMP

	FY14	FY15	FY16	FY17	Total
WBS 2	\$461	\$517	\$59	\$9	\$1,045
Contingency (31%)	\$138	\$168	\$18	\$3	\$327
Total	\$599	\$685	\$77	\$12	\$1,372

Expenditures in FY16 and FY17 are small since only administrative cost remain. Large contract with ISU for CDET (\$517K) has been committed and moved forward CDET frame from FY15 to FY14. Also moved forward the F250ADC order from FY15 to FY14.

WBS 2 Costs: Present Status

(as of the end of FY16)

Expenditures= Labor+Expenses+Overhead

	Budget	Expenditures	Labor	Expenses	Overhead
FY14 + items moved forward from FY15	\$857K	\$667K	\$15K	\$570K	\$107K
FY15	\$441K	\$260K	\$26K	\$130K	\$79K
FY16+FY17	\$63K				
Total	\$1361K				

Expenditures in FY16 *(includes overhead)*

- WBS 2.1
- WBS 2.2 and 2.3
- WBS 2.4 Trigger

WBS 2 Outlook

- WBS 2.1 CDET
 - All modules constructed . Closing contract with ISU.
- WBS 2.2 and 2.3
 - Most items at JLab.
- WBS 2.4 Trigger
 - All items purchased.

WBS 3 Deliverables

- Gas Electron Multiplier (GEM) tracking detectors (40 modules) for rear tracker
- Front-end and Data Acquisition Electronics to accompany these GEM modules

WBS 3 Milestones

Level (ID#)	Milestone	Comment
1 (3.1-01M)	Project start	Completed 10/1/2012
3	Order GEM Parts	Completed 10/18/2013
3	UVa receives GEM parts	Completed 4/23/2014
2 (3.2-01M)	First module assembled and tested	Completed 5/15/2014
2 (3.2-10M)	UVa 5 GEM modules assembled and tested	Completed 12/23/2014
2 (3.2-20M)	UVa 6-16 GEM modules assembled and tested	Completed 7/28/2015
2 (3.2-30M)	UVa 17-29 GEM modules assembled and tested	Completed 3/30/2016
2 (3.2-40M)	UVa 30-40 GEM modules assembled and tested	Expect 11/30/2016
2 (3.2-50M)	1st order of Front End Electronics	Completed 3/5/2015
2 (3.2-60M)	2nd order of Front End Electronics	Completed 3/5/2015
1 (3.1-10M)	Project completion	2/1/2017

WBS 3 Highlights

WBS 3 Costs: Overview

Table from PMP

	FY13	FY14	FY15	FY16	FY17	Total
WBS 3	\$34K	\$598K	\$595K	\$241K	\$26K	\$1,493K
Contingency (19%)	\$10K	\$66K	\$136K	\$68K	\$7K	\$288K
Total	\$44K	\$665K	\$731K	\$309K	\$32K	\$1,781K

WBS 3 Costs: Present Status

(through end of project)

Expenditures= Labor+Expenses+Overhead

	Budget	Expenditures	Labor	Expenses	Overhead
FY14 + items moved forward from FY15	\$1134K	\$975K	\$39K	\$870K	\$66K
FY15 + items moved forward from FY16	\$553K	\$455K	\$16K	\$409K	\$30K
FY16+F17	\$94				
Total	\$1781K				

Expenditures in FY16

WBS 3 Outlook

- WBS 3.1 GEM modules
 - 36 of 40 modules completed . Expected to complete 40 by Nov 30, 2016.
- WBS 3.2 GEM electronics
 - Expect final shipment of electronics from EES to Uva by beginning of November.

SBS Dependencies

Dependency	Institution	Contact	JLab Contact
Polarized 3He target	University of Virginia	Gordon Cates	J. P. Chen
Gas Cherenkov detector (GRINCH)	College of William and Mary	Todd Averett	Bogdan Wojtsekhowski
Front tracker GEMs	INFN-Rome	Evaristo Cisbani	Alexandre Camsonne
Hadron calorimeter HCAL	Carnegie Mellon University and INFN-Catania	Gregg Franklin	Mark Jones
Electron calorimeter ECAL	Jefferson Lab	Bogdan Wojtsekhowski	

Highlights of SBS Dependencies

- All dependencies have tracked milestones (*see next talk*)
- ECal (*see talk in Plenary session*)
- Hcal
- Front Trackers
- GRINCH
- Polarized ^3He target (*see talk in Plenary session*)

Conclusion

WBS 1:

- Completed.

WBS 2:

- CDet completed.

WBS 3:

- 36 of 40 modules completed.