Title: QSU# 3 FY2014	***Author:*** L. Wingate, ADs	***Date:*** 08/06/2014
NRAO Doc. #: PMD00053		***Version:*** 0.02

National Radio Astronomy Observatory
Quarterly Status Update #3 FY2014
April – June 2014

PREPARED BY	ORGANIZATION	DATE
L. Wingate, ADs	PMD/Director's Office	08/01/2014

Change Record

VERSION	DATE	REASON
0.02	08/06/2014	Milestone 6.6.3 and 6.7.6 updated on milestone spreadsheet
0.01	08/01/2014	Draft QSU#3

NRAO Quarterly Status Update (QSU3 FY2014)
April - June 2014

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POP Section Number	POP Milestone	Task Name	Completion Date	Q1 Performance Assessment			Q2 Performance Assessment			Q3 Performance Assessment		
				Cost	Schedule	Technical	Cost	Schedule	Technical	Cost	Schedule	Technical
		Observatory Science Operations										
3.1												
		Telescope Time Allocation (TTA)										
	1	SSR review of TTA	12/31/2013									
	2	CfP for semester 2014B	3/31/2014									
	4	SRP & tech review process, semester 2014B	3/31/2014									
	6	TAC meeting for semester 2014A	12/31/2013									
	7	TAC meeting for semester 2014B	6/30/2014									
	8	Update SW tools requirements for TAC support 2014A	12/31/2013									
	9	Update SW tools requirements for PST 2014B	3/31/2014									
	10	Update SW tools requirements for TAC support 2014B	6/30/2014									
	12	Update documentation for CfP & tools 2014B	3/31/2014									
		Science User Services (SUS)										
	14	HD 4.5 documentation	12/31/2013									
	15	Update ALMA Cycle 2 proposal preparation documentation	12/31/2013									
	16	Update CASAGUIDES	12/31/2013									
	17	Update CASAGUIDES	6/30/2014									
	18	IAU Symposium 303 – The Galactic Center	12/31/2013									
	19	NRAO/China Science Workshop	6/30/2014									
	21	AAT/ASA science requirements	12/31/2013									
	22	Manual reduction of ALMA science data and QA2	12/31/2013									
	23	Manual reduction of ALMA science data and QA2	3/31/2014									
	24	ALMA pipeline tests complete between manual and pipeline products	6/30/2014									
	25	Requirements for integrated science portal	6/30/2014									
	26	Manual reduction of ALMA science data and QA2	6/30/2014									
		Science & Academic Affairs										
	29	Jansky Fellow selection	12/31/2013									
	30	NRAO summer student selection	3/31/2014									
	31	SOS program selection for ALMA Cycle 2	6/30/2014									
	32	Summer student program begins	6/30/2014									
		Science Support and Research Services										
	34	Renegotiate electronic journals	3/31/2014									
		Observatory TELESCOPE Operations										
4.1		**Atacama Large Millimeter/submillimeter Array (ALMA)**										
		Construction										
	1	ALMA Construction Completion and Operations Readiness Review	3/31/2014									
	2	Acceptance of Optical Pointing Telescopes	12/31/2013									
	3	Complete installation of 400V cables and fuse disconnects at AOS	12/31/2013									
	4	Complete delivery of FE Thermal Interlock Modules	3/31/2014									
	5	Complete delivery of NAOJ Band 4, 8, and 10 multipliers	3/31/2014									
	6	Delivery of first Front End Handling Vehicle (FEHV)	3/31/2014									
	7	Delivery of three remaining FEHVs	9/30/2014									
		Operations										
		NAASC/NA ARC										
	8	ALMA Construction Completion and Operations Readiness Review	3/31/2014									
	9	ALMA C1 User Survey	3/31/2014									
	10	C2 Phase 2 Software Tests	6/30/2014									
	11	Start of C2 observing season	6/30/2014									
		Offsite HW										
	13	Establish long-term maintenance contracts for vendor bulk modules	6/30/2014									

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				Cost	Schedule	Technical	Cost	Schedule	Technical	Cost	Schedule	Technical
4.2		**Very Large Array (VLA)**										
		Scientific Support for Operations										
	1	Support the 2014B semester (2014 Feb 1) Call for Proposals	3/31/2014									
	3	Support reconfiguration to B-config	12/31/2013									
	4	Support reconfiguration to BnA and A-configs	3/31/2014									
	5	Support reconfiguration to D-config	6/30/2014									
	7	Stabilize VLA capabilities: Y27, sub-arrays, & fast dumps	6/30/2014									
		Array Operations										
	8	Re-configurations to B config	12/31/2013									
	9	Re-configurations to BnA and A configs	3/31/2014									
	10	Re-configuration to D config	6/30/2014									
	12	Complete evaluation of whether evening and nighttime array operations can be moved to Socorro	6/30/2014									
		VLA Prototype ACU										
	13	Critical Design Review of ACU prior to 2nd installation	12/31/2013									
	14	Install 2nd ACU	3/31/2014									
	15	Scientific evaluation of ACU performance	6/30/2014									
		VLA 3-Bit Sampler Upgrade										
	20	Install 3-bit sampler PCB in 2 VLA DTS modules	3/31/2014									
	21	Present performance analysis to NRAO staff	6/30/2014									
		VLA API Upgrade										
	22	Install final 2 API dishes	12/31/2013									
	23	Incorporate API output into VLA dynamic scheduler	6/30/2014									
		Capability Enhancements										
	24	Define and demonstrate new SR and general capabilities for 2014B	12/31/2013									
	25	Define and demonstrate new SR and general capabilities for 2015A	6/30/2014									
		Operational Enhancements										
	27	Tipping scans implemented	3/31/2014									
	28	Improved switched power calibration	6/30/2014									
		Infrastructure Maintenance and Renewal										
	30	Overhaul total of 6 antennas	12/31/2013									
	31	Overhaul total of 6 antennas	3/31/2014									
	32	Overhaul total of 6 antennas	6/30/2014									
	38	Replace VLA Activity Center transformer	6/30/2014									
	40	Preventive maintenance on hatch gear	3/31/2014									
4.3		**Very Long Baseline Array (VLBA)**										
		Scientific Support for Operations										
	1	Support the 2014B semester (2014 Feb 1) Call for Proposals	3/31/2014									
	3	Complete verification tests of VLBA dual RDBE system	3/31/2014									
	5	Stabilize VLBA + Y27/GBT operations	3/31/2014									
		Retirement of VLBA VMEs										
	6	Design, build, and install VLBA Control Computer Interface Box in laboratory	12/31/2013									
		Retirement of Legacy Recording System										
	8	Complete transition of projects using legacy system to DDC	6/30/2014									
	9	Re-integrate Mark 5A recorders from sites into correlator	6/30/2014									
		C-Band Receivers										
	10	Complete construction of spare VLBA C-Band receiver	3/31/2014									
		Capability Enhancements										
	12	Define and demonstrate new SR and general capabilities for 2014B	12/31/2013									
	13	Define and demonstrate new SR and general capabilities for 2015A	6/30/2014									
		Infrastructure Maintenance and Renewal										
	14	Tiger Team maintenance visit to North Liberty	6/30/2014									

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				Cost	Schedule	Technical	Cost	Schedule	Technical	Cost	Schedule	Technical
4.4		**Green Bank Telescope (GBT)**										
		GBT Maintenance										
	1	Beginning of summer painting	6/30/2014									
		Antenna Performance										
	4	A new pointing model for the GBT will be developed	12/31/2013									
		GBT Operations										
		Observatory Development Programs										
5.1		**CDL Development**										
		Phased Array Feeds										
	1	Design improved low-noise amplifier with lower noise and improved reliability	3/31/2014									
	4	Demonstrate single L-Band prototype integrated downconverter digital photonic link	3/31/2014									
	6	Demonstrate single-FPGA narrowband beamformer prototype	3/31/2014							Milestone Cancelled		
	9	Complete design study on optimum wideband antenna elements for a PAF	6/30/2014							Milestone Cancelled		
	10	Implement version control and document existing PAF software	12/31/2013									
	11	Demonstrate new release of PAF software with improved user interface and real-time analysis capability	6/30/2014									
		Advanced Receiver Technologies										
	12	Test triangular Digital OMT (DOMT) on the sky	12/31/2013							Milestone Cancelled		
	13	Demonstrate polarization isolation of DOMT using FPGA	3/31/2014									
	14	Measure W-Band phase stability of the LO distribution network	3/31/2014									
	15	Demonstrate printed circuit flexible thermal transition with low loss up to 40 GHz	6/30/2014									
	16	Build multi-channel digital back end for testing of digital photonic links	3/31/2014									
5.2		**ALMA Development**										
		Band 5 Local Oscillator										
	1	Unit production; WCA No. 04 - 05	12/31/2013									
	2	Unit production; WCA No. 06 - 20	3/31/2014									
	3	Unit production; WCA No. 21 - 50	6/30/2014									
5.3		**GBT Developments**										
	1	ARGUS Cryostat Complete	3/31/2014									
	2	ARGUS Module delivery complete	6/30/2014									
	3	ARGUS IF/LO complete	6/30/2014									
	4	ARGUS Warm electronics complete	3/31/2014									
	6	MUSTANG 1.5 Science commissioning begins	12/31/2013									
	7	MUSTANG 1.5 project complete	6/30/2014									
		OBSERVATORY-WIDE SERVICES										
6.1		**Central Development Lab**										
	3	Demonstrate 4-12 GHz balanced IF LNA with low power dissipation	3/31/2014									
	5	Demonstrate Nb/Al-AlN/NbTiN SIS mixer with low noise up to 900 GHz	6/30/2014									
	7	Complete design of reflective Band 2 optics	3/31/2014									
	9	Produce prototype data acquisition upgrade for PAPER	3/31/2014									
	10	Characterize beam pattern of MWA tiles and PAPER antennas using ORBCOMM satellite	3/31/2014									
	11	Deploy upgraded low-frequency antenna on Green Bank solar radio burst monitor	6/30/2014									
	12	Deploy improved data acquisition system on Green Bank solar radio burst monitor	6/30/2014									

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6.2		**Data Management & Software**										
		Software Development										
		Archive Access Tool										
	1	Develop initial design of ALMA Archive Tool	3/31/2014									
		CASA Pipeline										
	3	Develop CASA pipeline for ALMA Cycle 1 Early Science	12/31/2013									
	4	Integrate VLA Scripted Pipeline	12/31/2013									
	5	Develop CASA pipeline for ALMA Cycle 2 Early Science	3/31/2014									
		CASA										
	6	Release CASA version 4.2	12/31/2013									
	7	Release CASA version 4.3	6/30/2014									
	8	Develop CASA version 4.4	12/31/2013									
			3/31/2014									
			6/30/2014									
			9/30/2014									
		Observing Preparation Tool										
	10	Implement OPT updates for Semester 2014A VLA observing	3/31/2014									
		Proposal Handling Tool										
	12	Implement PHT updates for Semester 2014A TAC meeting	12/31/2013									
	13	Implement PHT updates for Semester 2014B TAC meeting	6/30/2014									
		Proposal Submission Tool										
	14	Implement PST updates for Semester 2014B Call for Proposals	12/31/2013									
	15	Implement PST updates for Semester 2015A Call for Proposals	6/30/2014									
		Reprocessing										
		ALMA Systems Software										
		System Software Updates, Bundle 1										
	17	Deploy Dynamic Scheduling software	3/31/2014									
	18	Deploy Quick-look improvements software	12/31/2013									
	19	Incorporate TelCal calibrations in scan sequences	3/31/2014									
		VLA/VLBA System										
	22	Deploy software to support Semester 2013B observing	12/31/2013									
	23	Deploy software to support Semester 2014A commissioning	12/31/2013									
	24	Deploy software to support Semester 2014A observing	6/30/2014									
	25	Deploy software to support Semester 2014B commissioning	6/30/2014									
	28	Demonstrate quasi-real time spacecraft tracking	3/31/2014									
		GBT System										
		WVSys-Archive										
	30	GBT Data in NRAO Archive	3/31/2014									
		WVSys - M&C										
	31	Core infrastructure changes complete	12/31/2013									
	32	M&C system modified to use new infrastructure	6/30/2014									
		GBTPP - Pipeline										
	34	Deliver GBT imaging capability in CASA	12/31/2013									
	35	VEGAS supports highest data rates	3/31/2014									
	36	Complete GBT Pipeline parallelization	6/30/2014									
		Scientific Information Services										
		Archive & Cluster										
	37	Draft computer access policy for external users	12/31/2013									
	38	Enable early access to cluster resources	3/31/2014									
		XSEDE/Cloud										
	39	Install Grid/Cloud Middleware	3/31/2014									
		Network Performance										
	41	Enable improved monitoring of Internet 2 links	3/31/2014									
	42	Release remote link test procedures to users	6/30/2014									

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				Cost	Schedule	Technical	Cost	Schedule	Technical	Cost	Schedule	Technical
		Co-location at UVa										
	44	Install 10 Gigabit/s link to UVa Data Center	12/31/2013									
	45	Install storage at UVa	3/31/2014									
		Green Bank data										
	46	Install 10 Gigabit network hardware	12/31/2013									
	47	GB link go-live	3/31/2014									
	48	Condition access to PSC Data Supercell	6/30/2014									
		DMSD Administration										
	49	Complete Data Management & Services Department formation	12/31/2013									
	50	Organize and hold a Data Management & Services Review	6/30/2014							Milestone Cancelled		
6.3		**Program Management Department**										
	2	Audit complete – proposal development	12/31/2013									
	3	Audit complete – project management	3/31/2014									
	4	Audit complete – Documentation	6/30/2014									
	6	PMD F2F complete	12/31/2013									
6.4		**Education and Public Outreach**										
		News & Public Information										
	1	Specify, Develop, and Review Design NRAO Homepage	12/31/2013									
	2	Program, implement design, test, correct, migrate Homepage to live server	3/31/2014									
	3	Archive and houseclean deprecated web content	6/30/2014									
	4	NRAO lobby display: Define and specify project. Design digital signage display	12/31/2013									
	5	NRAO lobby display: Programming and graphical implementation	12/31/2013									
	6	NRAO lobby display: Procure digital signage software system, program digital signage display, publish to network	12/31/2013									
	7	Milky Way Explorer for public website: Design and specify project. Develop design	3/31/2014									
	8	Milky Way Explorer for public website: Produce scripts, narrations, graphics, videos, program and implement	6/30/2014									
		STEM Education										
	9	Conduct online course for first cohort of Skynet Jr. Scholars educators	12/31/2013									
	10	Skynet science and education workshop II	6/30/2014									
	13	Review existing inventory of assets and annotate in accordance with appropriate STEM-related teaching standards	6/30/2014							Milestone Cancelled		
6.5		**Administration**										
		Business Services										
	1	Succession planning documentation for OAS divisions	12/31/2013									
		CAP										
	2	Create a process to label controlled items as "ITAR Controlled" or "EAR Controlled"	3/31/2014									
	3	Develop on-line Export Compliance training	3/31/2014									
	4	Develop labeling for "ITAR Controlled" and "EAR Controlled" shipments	6/30/2014									
	5	Develop Grants Lifecycle training program	6/30/2014							Milestone Cancelled		
		ES&S										
	6	Develop a comprehensive safety training plan	12/31/2013									
	8	Develop a security policy	6/30/2014									
		MIS										
	9	Implementation of new cost allocation system	12/31/2013									
	10	Upgrade of J.D. Edwards to tools release 9.1.3	3/31/2014									
	11	Investigation and implementation of automated Personnel Evaluation Process	12/31/2013									
		TTO										

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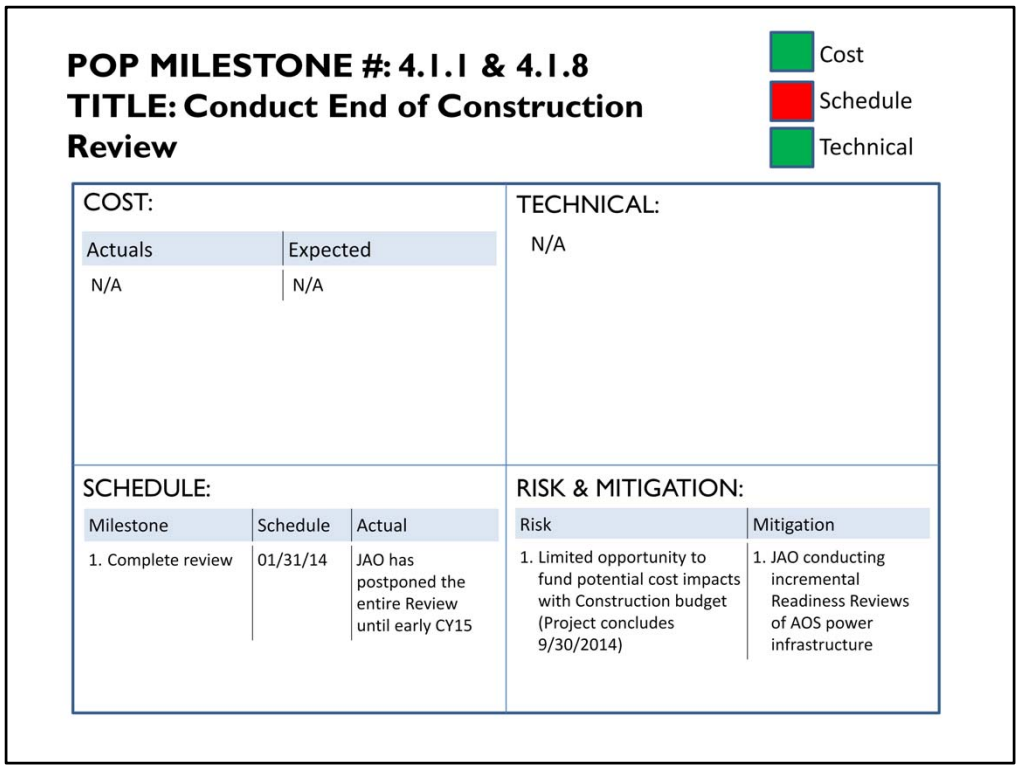
6.6		**Human Resources**										
		Compensation										
	1	Complete the FY 2013 performance review process on time using a new performance software system	6/30/2014									
	2	Provide managers with the information and guidance to complete the FY 2014 Salary Review Process	6/30/2014									
		Policy										
	3	Complete update and consolidation of NRAO HR policies	12/31/2013									
6.7		**Diversity**										
		Communication										
	1	Clarify and communicate the Diversity Mission	12/31/2013									
	5	Continue domestic outreach partnerships to maintain pipeline. Partner with EPO and SSR to maximize existing programs and funding	3/31/2014									
		Employment										
	6	Implement recruitment guide and provide training that focuses on diversity focus	12/31/2013									
6.8		**Computing & Information Services**										
	1	Installation of staff Helpdesk solution	3/31/2014									
	2	Standardization of platform patch solutions	6/30/2014									
	3	Evaluate Open Source NAS	6/30/2014									
	4	Installation of 10Gbps network equipment	3/31/2014									
	5	Retirement of leagacy LDAP	12/31/2013									
	6	Evaluation of interactive Web collaboration tool	12/31/2013									
	8	Evaluation of Bro tool	3/31/2014									
	10	Specification and installation of ER generator	12/31/2013									
	11	Installation of archive servers in UVa Data Center	12/31/2013									
6.9		**Director's Office**										
		Communication										
	2	Complete NRAO exhibit re-design for January 2014 American Astronomical Society meeting	12/31/2013									
	3	Submit science symposium proposal(s) for 2015 American Association for the Advancement of Science Annual Meeting	6/30/2014									

QSU #3 FY2014 Report

April – June 2014



COST: N/A

SCHEDULE: As of May, the Review was planned in two Stages. Stage One was tentatively scheduled for the late July timeframe and would have addressed the Permanent Power Supply and ADE. The balance of the Review was planned for early CY15. Now, The JAO has postponed the entire *"ALMA Construction Completion and Operations Readiness Review (ACCOR)"* until early CY15.

RISK & MITIGATION: No expenses can be charged to the NA ALMA Construction budget after 30 September 2014. If any cost impacts (shared or otherwise) arise from the ACCOR, the expense will have to been paid by NA ALMA Operations. The JAO is conducting incremental Readiness Reviews of AOS power infrastructure (a key North American deliverable).

The NA ALMA Project Office recommends that the ACCOR be completed prior to the close of FY14.

POP MILESTONE #: 4.1.3
TITLE: Complete installation of power cables and fuse disconnects at AOS

Cost
Schedule
Technical

COST:

Actuals (K$)	Expected (K$)
$2,584.7	$2,734.7

TECHNICAL:

N/A

SCHEDULE:

Milestone	Schedule	Actual
1. Complete AOS Utilities contract	01/31/14	05/15/14
2. Complete AOS fuse disconnectors	10/30/13	05/30/14

RISK & MITIGATION:

Risk	Mitigation
1. Contractor (DSM) is a potential single point failure 2. Altiplanic "winter" may impede work	1. Engage 2nd "back stop" contractor (ISM) 2. Press contractor to expedite schedule while weather permits.

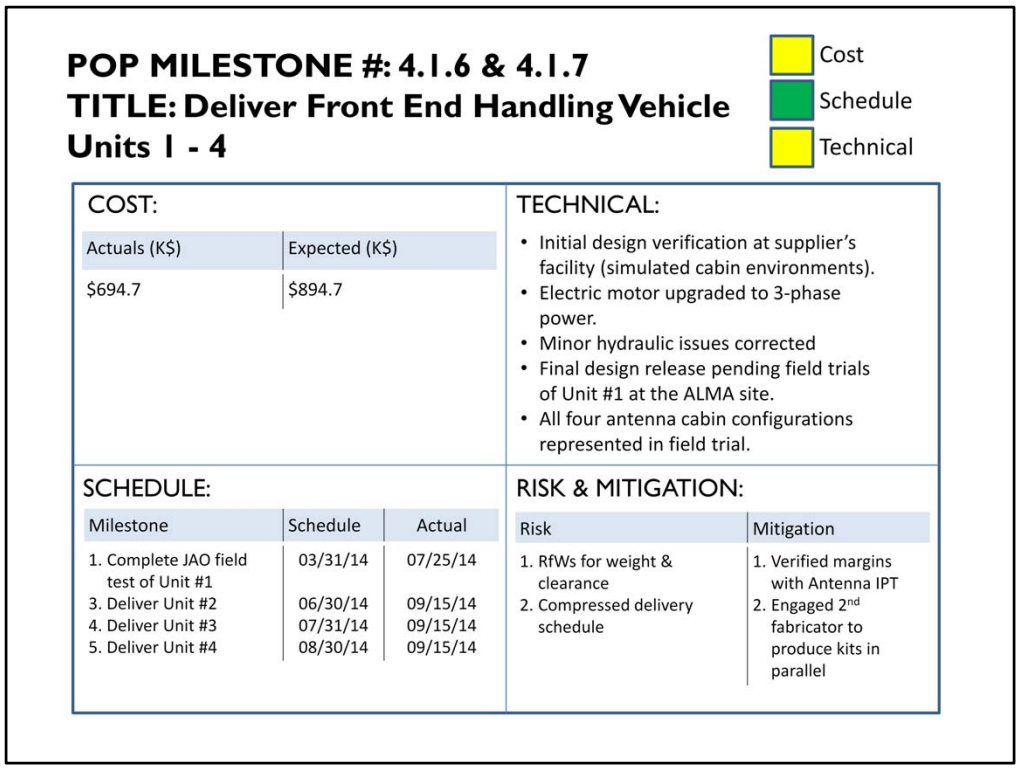
COST: Estimated Cost at Complete is $2,734.72K. Performance penalties may be levied on contractor for work performed after the contracted finish date (31 December 2013).

SCHEDULE: All hardware is installed. The JAO acceptance procedure has been modified to "triage" non-conformances into "*blocking*", "*necessary*", and "*desirable*" issues. All *blocking* issues are being addressed immediately. *Necessary* and *desirable* issues are being addressed on a best-effort basis, with intent to close all of these issues by the end of September.

Final equipment tests will complete in July 2014. Completion of contractor "punch-list" items will occur by mid August 2014. The NA Final Acceptance Tiger Team is managing Workmanship issues and closure of JAO Product Assurance reports. JAO Final Acceptance of all Site utilities and power infrastructure is anticipated in September. Final contract documentation will be prepared in conjunction with the Project Close-out Report during Q4 2014.

RISK & MITIGATION: There have been significant difficulties with the contractor performing fuse disconnector installation and check-out (DSM). This work package is integral to the Project "critical path" schedule. A second contractor (IMA) has been engaged to perform a portion or all of DSM's assignments in the event that DSM falters.

DSM and IMA are being pressured to accelerate schedule while weather is favorable.



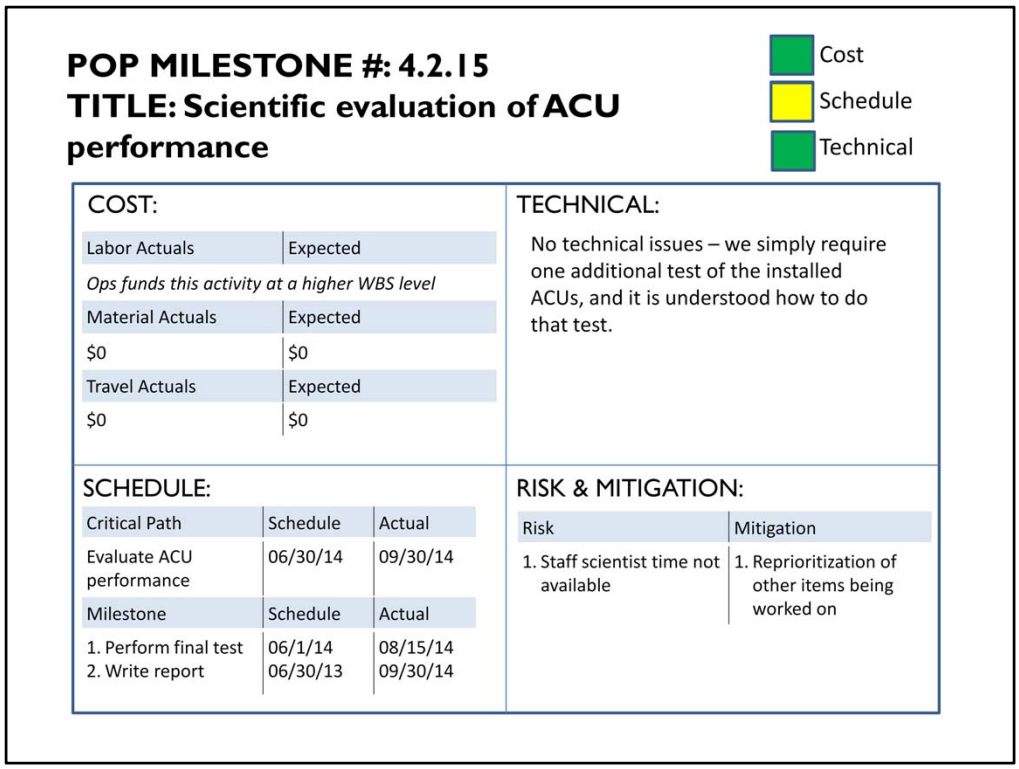
COST: Actuals include Non-Recurring Engineering and procurement of first unit.

SCHEDULE: The FEHV subproject (originally scheduled to complete in Q2 FY13) was running late and then was suspended in Q3 FY13 when the NA ALMA Project *Cost To Complete* forecast indicated a significant cost overrun. The subproject was re-activated late in Q1 FY14. The field tests at the supplier's facilities have identified the need for minor design changes (motor and hydraulic upgrades). Implementation of the design changes has delayed the delivery schedule of Unit #1 by six weeks. The delivery schedule of Units #2-4 is delayed four weeks. All units will be delivered by mid-September.

TECHNICAL: FE Handling Vehicle unit #1 will be field-tested in each of the four antenna configurations at the AOS using the FE Service Vehicle and current Operations handling procedures. Any design changes identified during the field test will be incorporated into it and subsequent units.

RISK & MITIGATION: The current FEHV configuration exceeds the maximum weight specification by 50Kg and exceeds the minimum clearance specification by 9 cm. RfWs have been submitted for each requirement. NA Antenna IPT concurs with the requested RfWs.

A second fabricator is producing "design-stable" components for units 2, 3, and 4 in parallel with the field testing of unit 1. The designer, and fabricator of unit 1, will serve as systems integrator for units 2, 3, and 4. JAO continues to use the same FE handling equipment that it has used from the beginning of the Project. The new FEHVs will increase efficiency and safety margin.

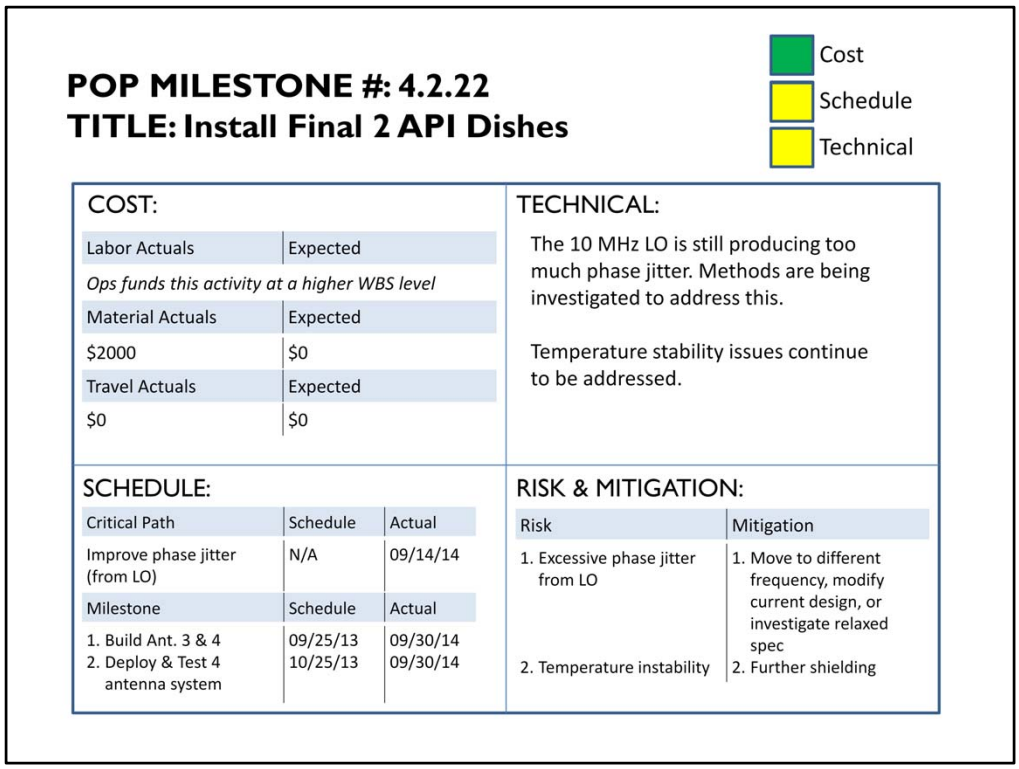


COST: Costs are tracked at a higher WBS level. There are no material or travel costs for this item, only labor.

SCHEDULE: Two tests were deemed sufficient to evaluate the performance of the new ACU units (in two VLA antennas): first, an observation consisting of repeated normal pointing cycles, at three frequencies (L-, C-, and X-bands); second, a super-sidereal test. The first was executed and a report distributed. The second has not been completed.

TECHNICAL: There are no technical issues – we know exactly how to do the super-sidereal test using OTFM.

RISK & MITIGATION: The only risk is continued unavailability of scientific staff effort. We are mitigating this by working the support of this observation into the schedule of the critical personnel.



COST: Costs are tracked at a higher WBS level. The project is funded as part of the VLA LO/IF group, within NM Operations. The majority of the hardware costs for this project were incurred in 2013, but we had a small additional cost in Q2 FY14 for improvements to the LO system, and in Q3 for one final fiber optic transmit/receive system.

SCHEDULE: Technical issues have delayed the system installation. We anticipate the new four antenna API will be operational on the final two antennas by the end of Q4, with two of the antennas in temporary positions. Meanwhile, the old two-element API has been decommissioned, and replaced by the new two-element API (the first two elements of the final four-element system), which is being used in regular operations.

TECHNICAL: The project is to develop a four antenna API, replacing the existing VLA API. Current technical issues with the new API (LO reference instability and poor daytime temperature stability of electronics, both of which cause above-spec phase jitter) are affecting the final installation and delivery of the system. All of the central electronics, and two of the four antennas of the new API are in place and working. A change of LO frequency or redesign of the LO circuit, two new fiber optic transmit/receive systems, and additional temperature shielding, should allow the phase jitter spec to be met, at which point the other two antennas can be put in place, finalizing the system.

RISK & MITIGATION: There are two specific risk items associated with the full delivery of the new API, noted above. The risk of the old API system failing has been mitigated by using the first two elements of the new API as a replacement (with sensitivity as good as the old API). If there are problems meeting the LO phase jitter spec, a relaxed spec will be investigated.

POP MILESTONE #: 4.2.27
TITLE: Tipping scans implemented

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
Ops funds this activity at a higher WBS level	
Material Actuals	Expected
$0	$0
Travel Actuals	Expected
$0	$0

TECHNICAL:

No technical issues – this is all demonstrated to work with the old VLA and simply has to be enabled within the new software system.

SCHEDULE:

Critical Path	Schedule	Actual
Demonstrate TIP analysis	3/31/13	9/30/14
Milestone	Schedule	Actual
1 Re-enable in OPT	2/1/13	8/1/14
2 SDM Pointing table	3/1/13	9/1/14

RISK:

Risk	Mitigation
1. No sky opacity measurements available	1. Continue to use weather data and atmospheric models as proxy

COST: Costs are tracked at a higher WBS level. There are no material or travel costs for this item, only labor.

SCHEDULE: TIP scans were not implemented this quarter due to key operations staff being redirected to higher priority projects. We still aim to implement them by the end of Q4, but other staffing losses (David Harland and Michael Rupen) and delays in hiring their replacements may delay this item into FY15. We did get part of this implemented in the OPT in Q3 – the ability to specify a scan as a TIP scan, with the old default VLA elevations supported. What remains now is only the support in the SDM Pointing table, and a final implementation of the reduction of the TIP scan to derive the opacity (which means implementing the method described in VLA Scientific Memo 170).

TECHNICAL: There are no technical issues – this is all demonstrated to work with the old VLA and simply has to be enabled within the new software system.

RISK & MITIGATION: Tipping scans can in principle provide the best measurement of the sky opacity, needed for high frequency calibration. For the last four years (since turning on WIDAR) we have been using weather data and atmospheric models as a proxy, and will continue to do so until tipping scans are fully commissioned.

POP MILESTONE #: 5.1.1
TITLE: Design improved low-noise amplifier with improved reliability for PAF

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
$281,914.70	$255,824.25 (linear)
Material Actuals	**Expected**
$38.755.99	$32,500
Travel Actuals	**Expected**
$2,383.47	-

TECHNICAL:

The initial design is being modeled and analyzed. Manufacturability of the design has not been assessed.

SCHEDULE:

Milestone	Schedule	Actual
1. Design improved low-noise amplifier with lower noise and improved reliability	03/31/14	09/30/14

RISK:

Risk	Mitigation
1. Risk to schedule as design, procurement, prototype assembly and testing of the LNA are critical to future system testing.	1. Make LNA design a top priority.

COST: This project was funded at a lower level than expected when the ambitious PAF milestones were drafted. $281,914.70 spent to date with an expected cost to date of $255,824.25 . (no indirect costs applied). Cost recovery plans have been in place since start of Q3 and are progressing well. This involves concentrating effort on the highest priority milestones and de-scoping or cancelling other milestones.

SCHEDULE: Q2 Milestone delayed to next quarter to provide time for in depth analysis of the design.

TECHNICAL: None

RISK & MITIGATION: None

POP MILESTONE #: 5.1.4
TITLE: Demonstrate single L-Band prototype integrated downconverter digital photonic link

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
$281,914.70	$255,824.25 (linear)
Material Actuals	Expected
$38.755.99	$32,500
Travel Actuals	Expected
$2,383.47	-

TECHNICAL:

The Downconverter is built and is in testing. The photonic link side of this is being developed by the Integrated Receiver Group.

SCHEDULE:

Milestone	Schedule	Actual
1. Demonstrate single L-Band prototype integrated downconverter digital photonic link.	03/31/14	09/30/14

RISK:

Risk	Mitigation
1. Risk to cost as prototype assembly and testing will continue to expend diminishing funds.	1. Leverage the commonalities of activities and resources for both PAF and IRD to save cost.

COST: This project was funded at a lower level than expected when the ambitious PAF milestones were drafted. $281,914.70 spent to date with an expected cost to date of $255,824.25 (no indirect costs applied). Cost recovery plans have been in place since start of Q3 and are progressing well. This involves concentrating effort on the highest priority milestones and de-scoping or cancelling other milestones.

SCHEDULE: Q2 Milestone delayed to next quarter. The downconverter assembly is built and testing is in progress. Photonic link design is complete and procurement is in process.

TECHNICAL: The downconverter assembly is being tested.

RISK & MITIGATION: Cost. We plan to concentrate on the design and prototyping of the LNAs and test of the digital downconverter with photonic receiver when it is completed. The Integrated Receiver Development group is working on the development of the Photonic Receiver and Link and this project will reap the benefits of this effort.

POP MILESTONE #: 5.1.9
TITLE: Complete a Design Study on Optimum Wideband Antenna Elements for a PAF

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
$281,914.70	$255,824.25 (linear)
Material Actuals	Expected
$38.755.99	$32,500
Travel Actuals	Expected
$2,383.47	-

TECHNICAL:

This has become very low priority where resources and funding are critically scarce. BYU has completed manufacture of several PAF antenna elements which we test and learn from.

SCHEDULE:

Milestone	Schedule	Actual
1. Complete a Design Study on Optimum Wideband Antenna Elements for a PAF.	03/31/14	Exception

RISK:

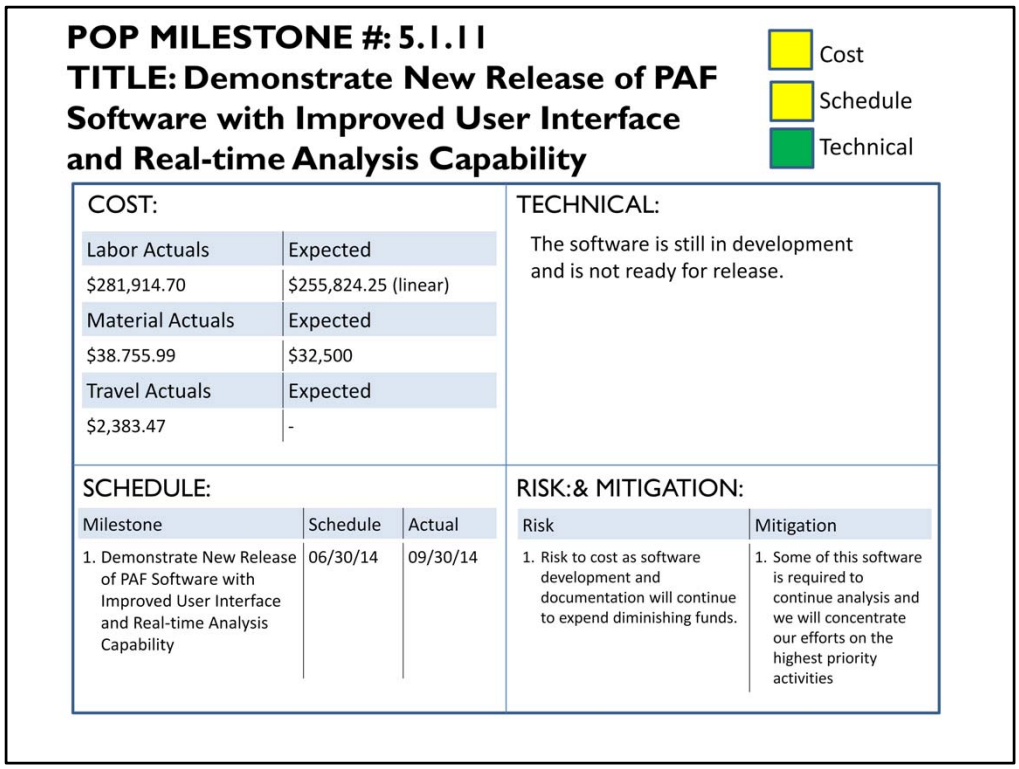
Risk	Mitigation
1. Risk to cost as prototype assembly and testing will continue to expend diminishing funds.	1. Cancel this milestone and concentrate on higher priorities.

COST: This project was funded at a lower level than expected when the ambitious PAF milestones were drafted. $281,914.70 spent to date with an expected cost to date of $255,824.25 (no indirect costs applied). Cost recovery plans have been in place since start of Q3 and are progressing well. This involves concentrating effort on the highest priority milestones and de-scoping or cancelling other milestones.

SCHEDULE: Milestone will not be accomplished and has been cancelled.

TECHNICAL: Cancel Milestone

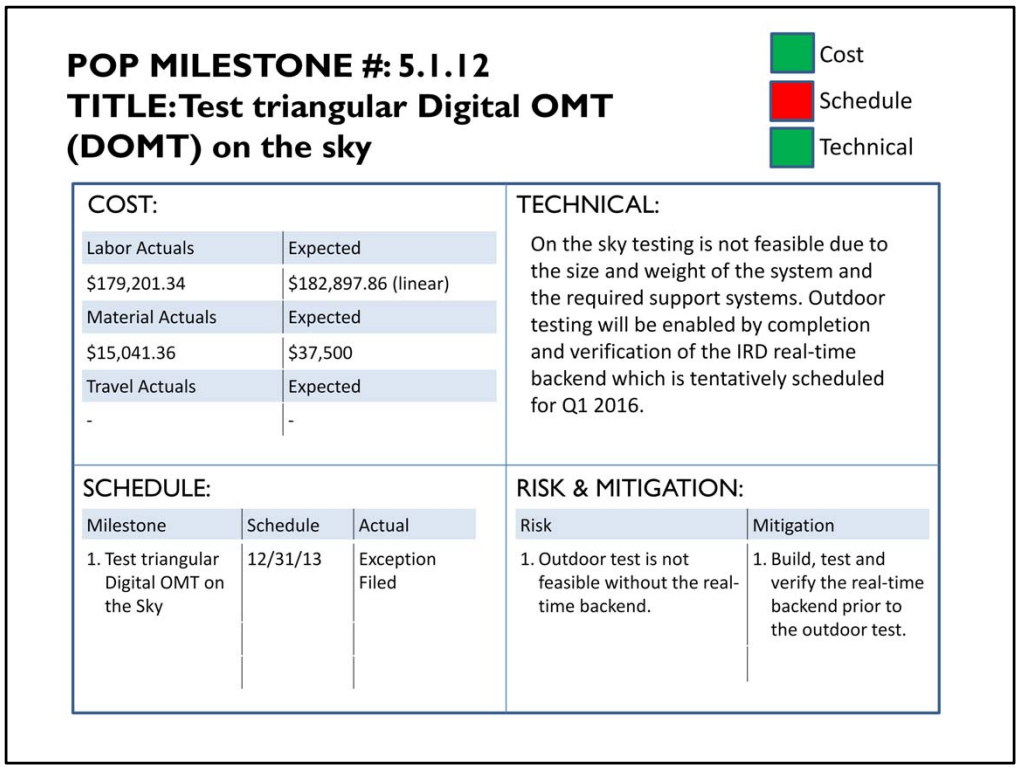
RISK & MITIGATION: None.



COST: $281,914.70 spent to date with an expected cost to date of $255,824.25 . (no indirect costs applied). Cost recovery plans are in place and are progressing well.

SCHEDULE: Milestone will be delayed by one quarter due to lack of qualified resources. Our single qualified resource was working on higher priority tasks. We have added another software engineer to address this milestone in the next quarter.

RISK & MITIGATION: There is a risk to cost however, we will continue to balance the cost with the highest priority analysis software activities.

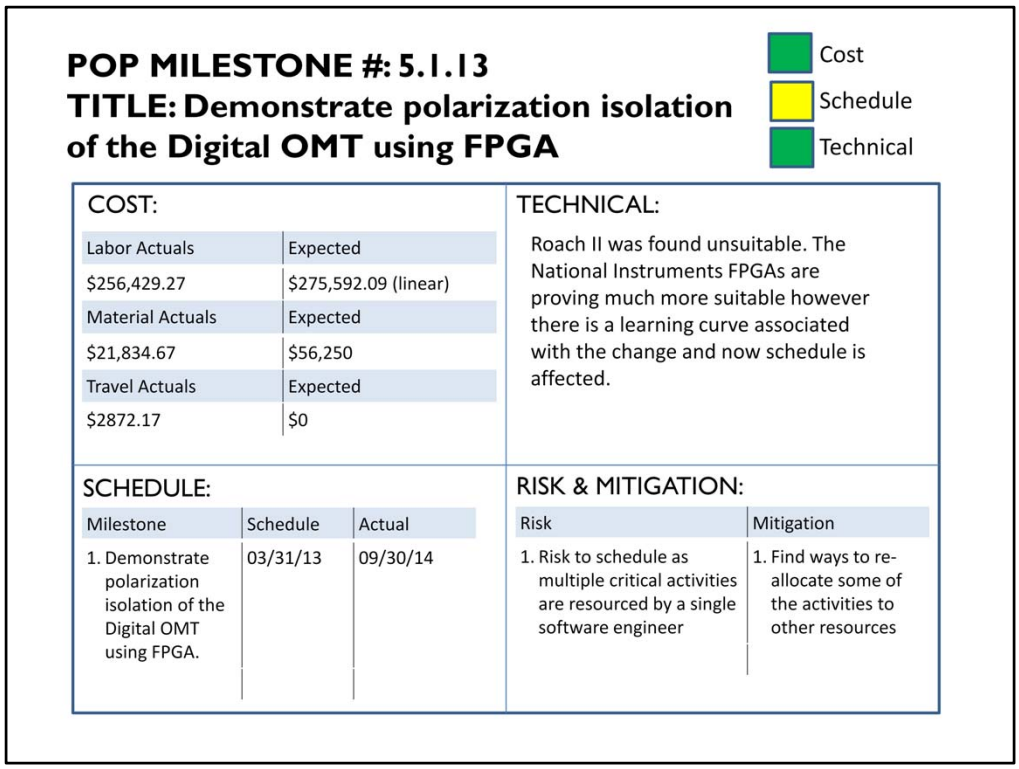


COST: Under Budget. All numbers used are direct expenses and do not have fees and CCR applied. Expected numbers are based on final budget using straight line forecasting.

SCHEDULE: Q1 Milestone of on the sky testing is not as feasible as originally thought due to the size and weight of the system and the required support systems. Indoor testing results showed a great deal of baseline ripple. Outdoor testing will be enabled by completion and verification of the IRD real-time backend which is tentatively scheduled for Q1 2016.

TECHNICAL: Cancelling this milestone for FY14. Reschedule for 2016.

RISK & MITIGATION: Filing an exception report.



COST: Under Budget. All numbers used are direct expenses and do not have fees and CCR applied. Expected numbers are based on final budget using straight line forecasting.

SCHEDULE: Q2 Milestone delayed by six months to provide time for the software engineer to develop code for the National Instruments FPGA.

TECHNICAL: Original plan had the software engineer doing this work programing Roach II however this was found to be unsuitable and he is now using National Instruments technologies. The National Instruments FPGAs are proving much more suitable however there was a learning curve associated with the change and now schedule is affected.

RISK & MITIGATION: The software engineer has multiple critical activities assigned to him. We are working to find methods to alleviate his workload by re-assigning as many tasks as possible to other people.

POP MILESTONE #: 5.3.1, 5.3.2, 5.3.3
TITLE: ARGUS Cryostat, Modules, and IF/LO Complete

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

TECHNICAL:

No identified technical concerns.

SCHEDULE:

Milestone	Schedule	Actual
1. Cryostat delivery	3/31/2014	9/03/14 est.
2. Module delivery	6/30/2014	9/15/14 est.
3. IF/LO delivery	6/30/2014	10/11/14 est.

RISK & MITIGATION:

Risk	Mitigation
1. Possible under expenditure of external funds in FY14	1. Fund amount is small; will be reabsorbed into Ops

COST: Due to differed work the cost is currently lower than budgeted. There are no milestone budgets.

SCHEDULE: The initial POP schedule was for the Cryostat to be complete at the end of FY14 Q2. This required delivery of the cryostat from the University of Miami to Stanford, the modules delivered by Caltech (FY14 Q3), an d the IF/LO to be complete by Stanford (FY14 Q3) for integration with the warm electronics. According to the project schedule, the anticipated delivery of the cryostat is now anticipated in September 2014. NRAO has no ability to managed the delivery or integration at Stanford. Need to monitor the schedule

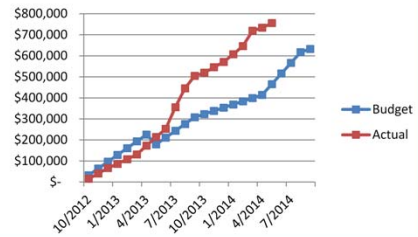
TECHNICAL: None noted.

RISK & MITIGATION: No new risks identified.

POP MILESTONE #: 5.3.6, 5.3.7
TITLE: MUSTANG 1.5 Science commissioning begins/Project complete

Cost
Schedule
Technical

COST:



TECHNICAL:

- There are not currently any known NRAO technical issues.
- Unknown performance of NIST-provided detectors could result in future schedule issues.

SCHEDULE:

Critical Path	Schedule	Actual
NIST detector delivery	12/13	5/30/14 planned
Milestone	**Schedule**	**Actual**
5.3.6 Commissioning Start	12/13	7/1/14 planned

RISK & MITIGATION:

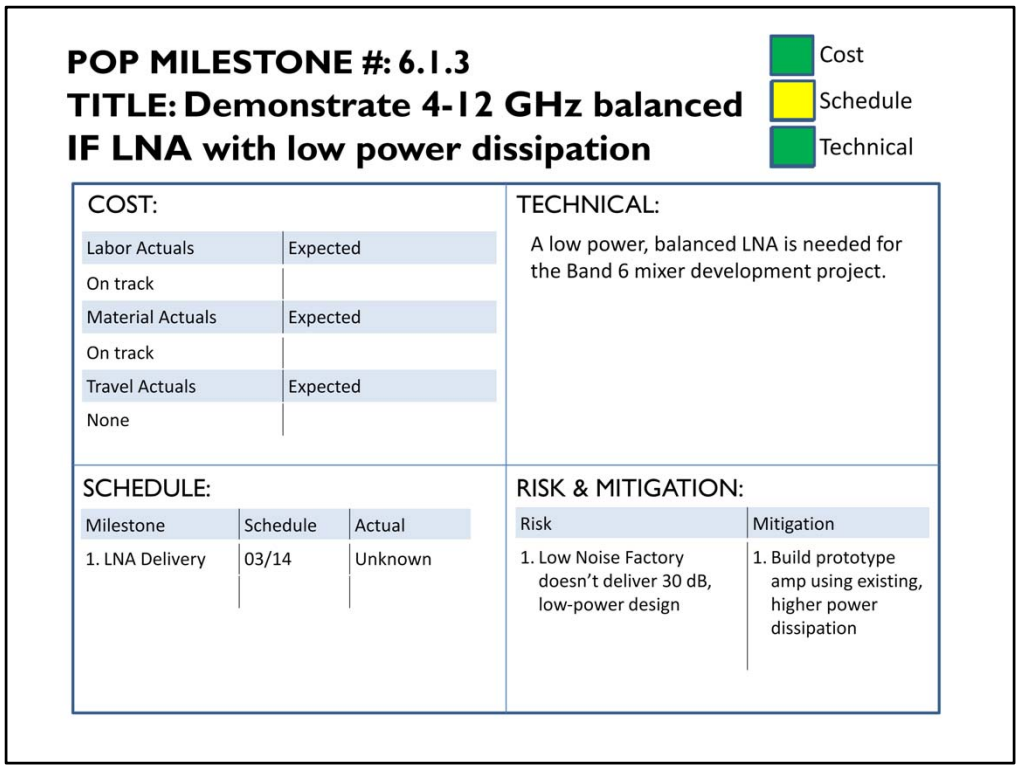
Risk	Mitigation
1. No high frequency observing 2. Delayed release of project team 3. Increase in costs due to deferred work	1. Risk realized. No science from Mustang 1 2. Partial release of s/w team, stop s/w work, reassign resources 3. Lock down budget until deliverables from NIST/UPenn recv'd

COST: Costs for the project are being actively monitored. A change order is anticipated to establish a new baseline. The change order is on hold pending a project review with the NRAO director in early August at which time the plan forward will be approved or amended.

SCHEDULE: The schedule is driven by receipt of the detectors which are being donated by NIST and the leverage available to the PI (UPenn) is therefore limited. As of June 30, 2014 One wafer is complete and ready to assemble and two wafers are ready for the last step of the fabrication. (*NB: Detectors were completed and packaging/wire-bonding started July 14*).

TECHNICAL: There are currently no technical issues out of tolerance for the NRAO portions of the project. Potential UPenn technical issues are related to the performance of the NIST detectors in the cryostat at UPenn.

RISK & MITIGATION: Current MUSTANG 1.0 has been permanently removed from the GBT so high frequency science capability is limited. NRAO has implementing a plan for our project staff based on well defined stopping points until which time the detectors arrive at Upenn.

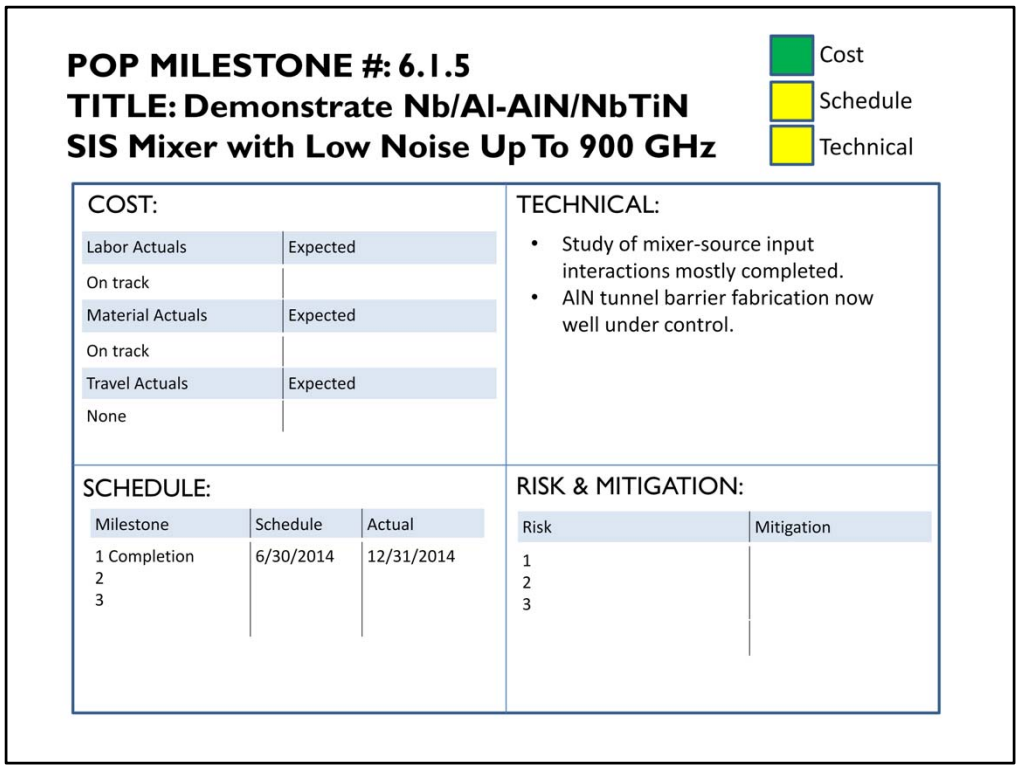


COST: On track.

SCHEDULE: This task is heavily dependent on an outside vendor, Low Noise Factory (Chalmers), who has demonstrated a lower-power 4-12 GHz MMIC-based amplifier and are now developing an amplifier expected to have the acceptably low power dissipation, but that design might not be completed within the timeframe of the ALMA development project. We discussed this with the Low Noise Factory team at a conference in Jun 2014, and they confirmed they are working on the prototype.

TECHNICAL: This is a CDL R&D project that will be used for the ALMA Development Band 6 upgrade.

RISK & MITIGATION: If the low-power dissipation MMIC is not available in time for the ALMA Band 6 development project, we will design a prototype with existing, higher-power dissipating MMICs.

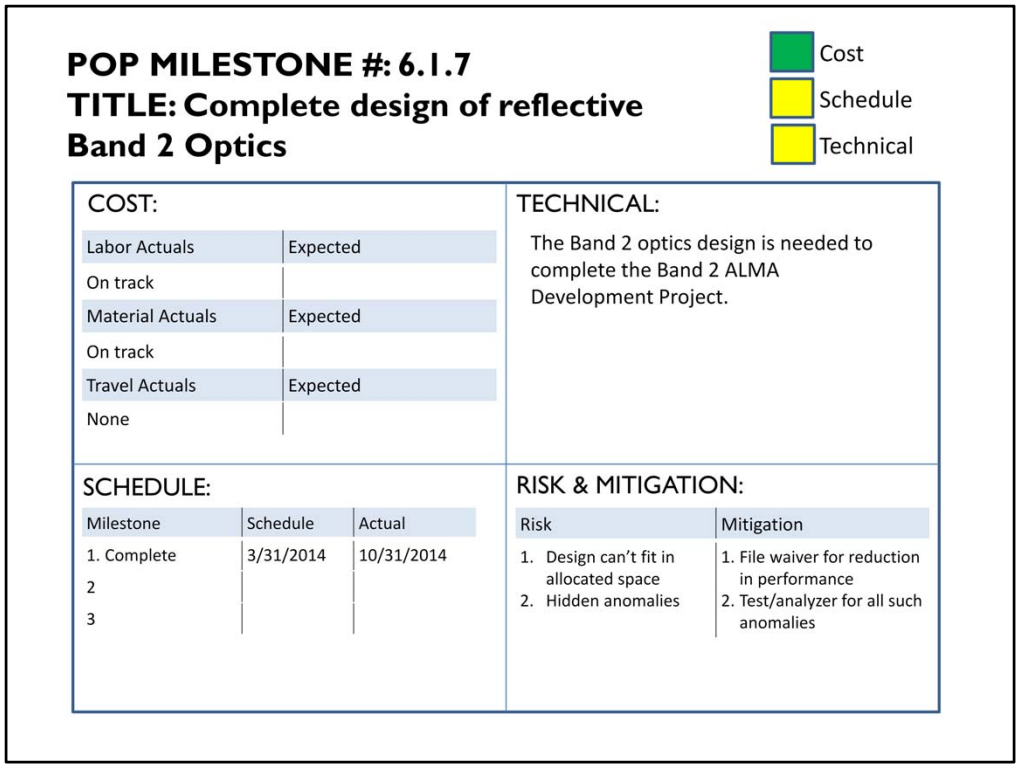


COST: On track, and funding tracked at higher level, in both CDL and ALMA development accounts.

SCHEDULE: Progress is slower than anticipated due to the loss of technicians after completion of ALMA construction that were trained to build and test SIS mixers. Retraining of new techs is nearly complete, but the delay cost the many months.

TECHNICAL: Study of mixer-source input interactions is mostly completed. AlN tunnel barrier fabrication now well under control, but SIS junction fabrication is technically challenging, so this risk has been changed from green to yellow.

RISK & MITIGATION: Unexpended FY14 funds will transfer to FY15 account; thus ensuring Study completion.



COST: On track.

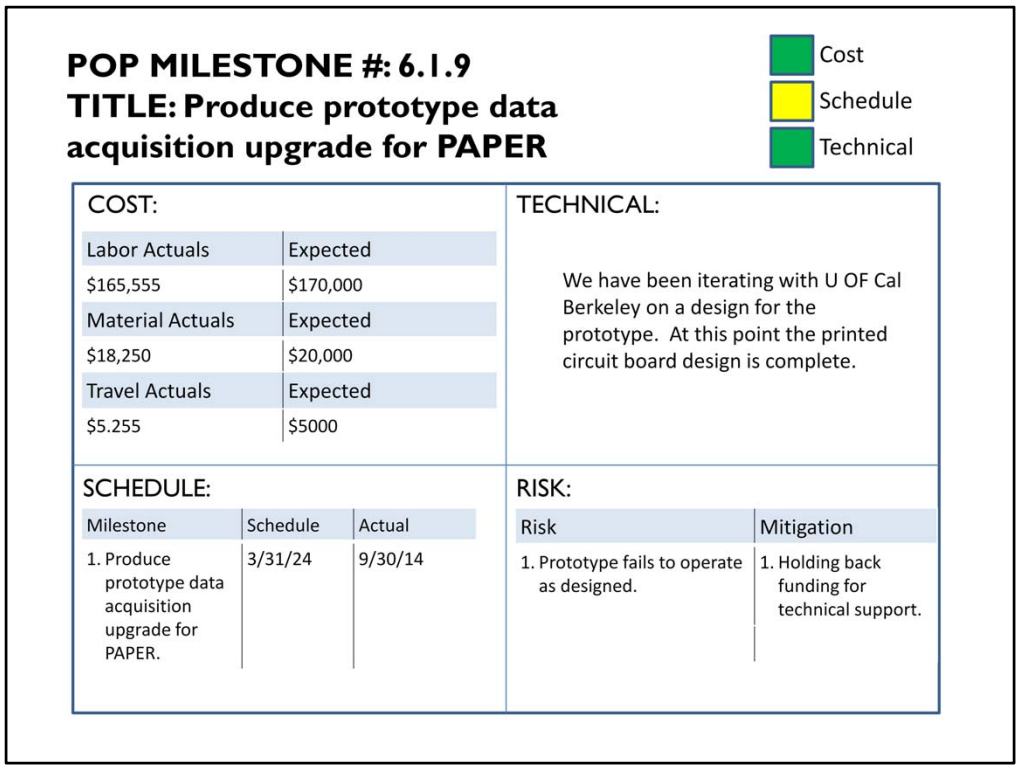
SCHEDULE: Project start was delayed 3 months from Jan 1 to Mar 31, and design work commenced on 11 Jun 2014.

TECHNICAL: An optics design with a meniscus lens at the aperture of the feed horn is being pursued. Analysis of this design is in progress. Technical risk was changed from green to yellow to indicate that existing constraints, such as an unrealistically small infrared filter aperture, further complicate the design.

RISK & MITIGATION:

1) Design can't fit into space allotted – we would need to request waiver for performance degradation

2) Design has hidden anomalies (such as trapped modes) – based on our knowledge of ALMA's optics, we will test/analyze for these anomalies that were found in other ALMA optics designs.



COST: Project is on budget. 93% of budget is expended with very little effort required to finish. $23,165 remains to cover technical support during prototype testing.

SCHEDULE: Block diagram, schematic, and PCB design is produced. The design is locked down and going out for prototype production during the first week of August. Project close-out is scheduled for 31 August and the customer should receive the deliverable by this date.

TECHNICAL: Multiple iterations of the prototype design requested by the project customer has been a large factor in further delaying the project.

RISK & MITIGATION: The design is going out to an outside vendor to produce the prototype which is the deliverable for this project. This prototype will be tested at U of Cal Berkeley. There is a risk that the prototype will not function as designed. NRAO staff will be on hand to provide technical support for this if required. The funding for this effort will also be retained.

POP MILESTONE #6.2.7
TITLE: CASA 4.3 Release

Cost
Schedule
Technical

COST:

Labor Actuals	Expected
DMS funds this activity at a higher WBS level.	
Material Actuals	Expected
$0	$0
Travel Actuals	Expected
$0	$0

TECHNICAL:

In an effort to accommodate all stakeholder needs, the CASA 4.3 development targets were split into two deliverables, the first being the CASA 4.2.2 intermediate release.

SCHEDULE:

Critical Path	Schedule	Expected
Feature Freeze	3/15/14	9/15/14
Milestone	Schedule	Expected
1 RHEL Release	5/15/14	11/03/14
2 OSX Release	5/15/14	11/24/14

RISK & MITIGATION:

Risk	Mitigation
1. Delay Past ALMA Cycle 2 Start	1. CASA 4.2.2 Release
2. Weights & Imaging Testing Conflict	2. CASA 4.2.2 Release
3. Staffing Delays	3. Training & Buffer

COST: DMS funds this activity at a higher WBS level. Costs are not tracked for this milestone.

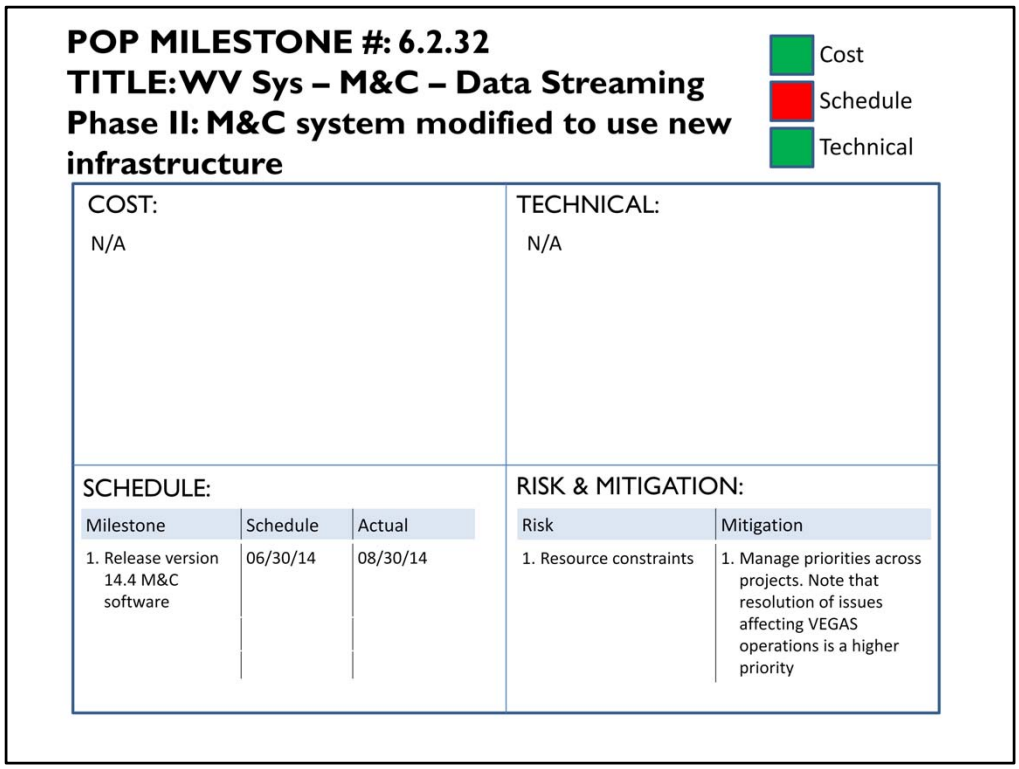
SCHEDULE: The development schedule for CASA 4.3 was changed due to packaging and release problems at the end of the CASA 4.2 cycle. In an effort to accommodate all critical stakeholder needs, the scope of the CASA 4.3 cycle was revised and split into two deliverables. An intermediate release, CASA 4.2.2 would offer the most pressing functionality in time for ALMA Cycle 2 observing at the beginning of Q4. An expanded CASA 4.3 release was rescheduled for FY15 Q1.

TECHNICAL: Technical progress on the CASA 4.2.2 and 4.3 cycles is matching the rebaselined plan developed in Q2. All scheduled work for 4.2.2 has been completed. There are two outstanding issues, identified in testing, that are to be resolved before the release: a stability problem with PlotMS and a configuration change to the filler to accommodate an edge case in the EVLA SDM. Both are expected to be resolved in time for the Q4 release although these issues combined with the departure of a team member in a key position caused a delay past the beginning of ALMA Cycle 2 observing. CASA 4.3 development is progressing to target with no significant technical issues.

RISK & MITIGATION: The highest risk to the project was not releasing CASA 4.3 in time to support ALMA Cycle 2 observing. To attempt to meet this critical milestone, an intermediate release building on the CASA 4.2 codebase is in progress and will include the priority features identified by the CASA Science Steering Committee for ALMA Cycle 2. CASA 4.2.2 will be released in Q4.

An unexpected vacancy within the team has created gaps in skill coverage that could further delay the 4.3 release schedule. This risk is being mitigated by prioritizing work associated with hiring replacements, training existing staff members to fill these skill gaps and provide a level of redundancy, and schedule contingency to allow for anticipated delays in the release process as new staff members learn the CASA environment and tools.

The risk of complicated and ineffective testing given simultaneous major changes to the calibration tasks and imaging tasks was also identified as a concern early in the planning of the 4.3 cycle. This risk was also mitigated with the CASA 4.2.2 release by providing the calibration changes in 4.2.2 and the imaging changes in 4.3. This allows for independent testing of each set of changes.



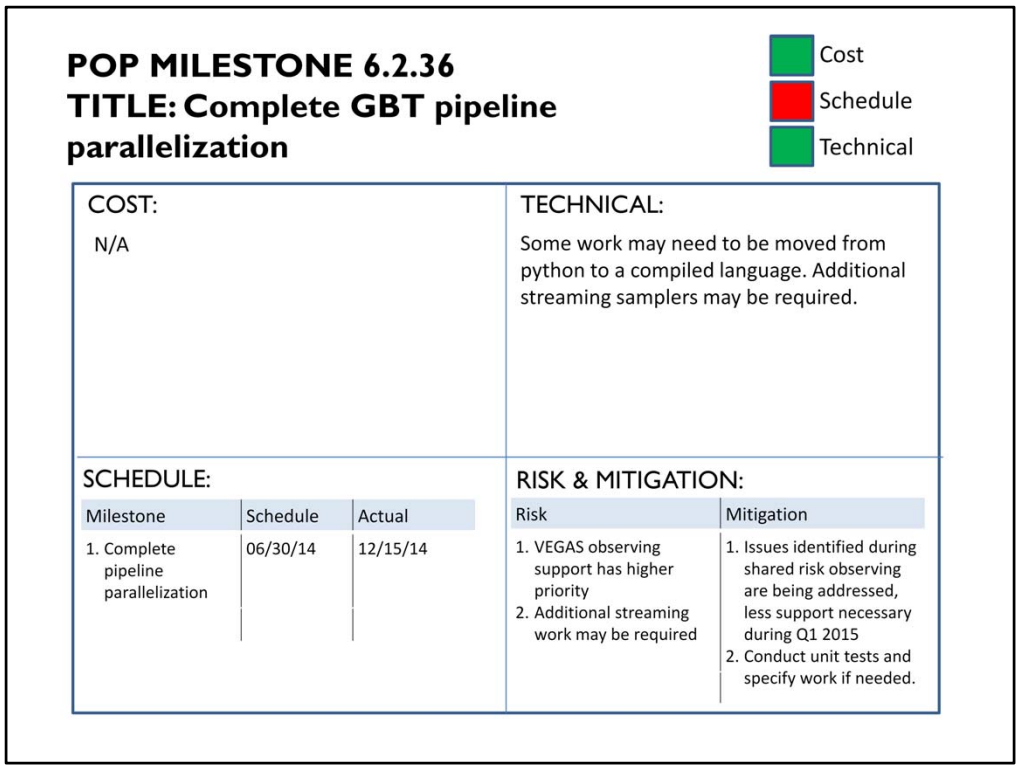
COST: No issues.

SCHEDULE: Delayed due to resource constraints and dependency on VEGAS delivery schedule, which was delayed. Additionally, VEGAS support is the highest priority at Green Bank, so any issues which arise with it could impact the delivery schedule.

TECHNICAL: M&C (Management & Control) Release 14.4 contains the core streaming infrastructure compiled into the device managers to allow streaming capability.

RISK & MITIGATION: Note that resources are severely constrained across projects and service delivery. Service outages and additional high-priority projects could impact resource availability and create additional delays.

Background: Ray Creager is the primary resource for this and due to his involvement with VEGAS/DIBAS the work for phase I was delayed, and subsequently phase II has not yet been completed.

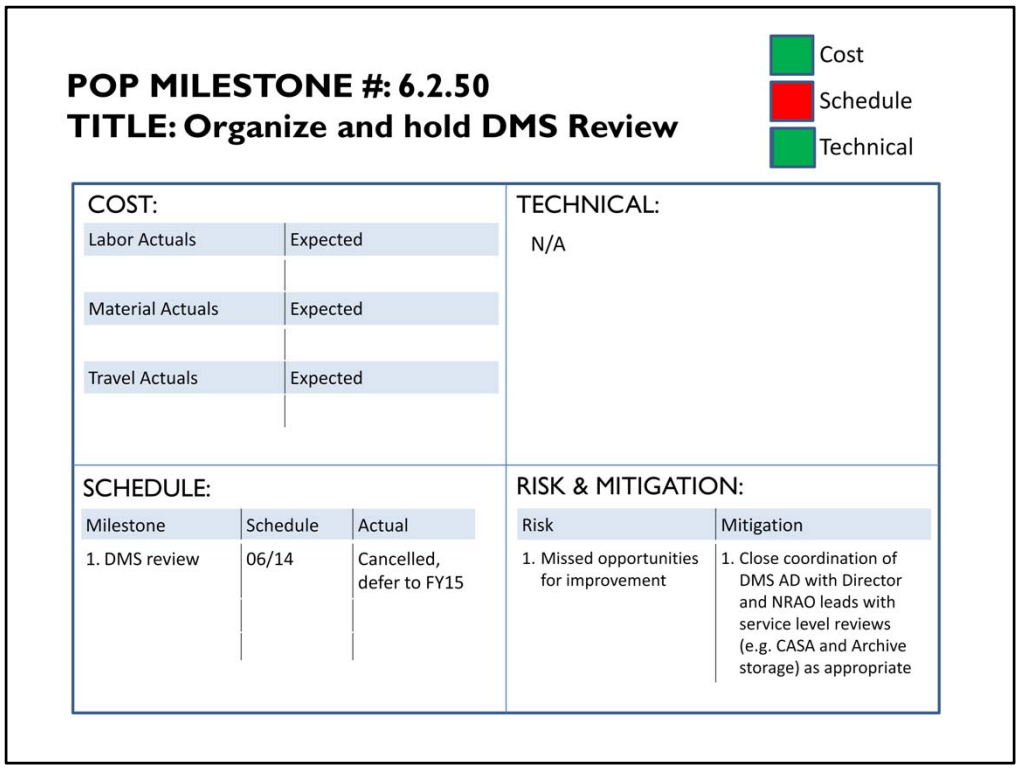


COST: No issues.

SCHEDULE: Delays due to VEGAS commissioning and shared-risk observing support, resource constraints, delay of related streaming Milestone 6.2.35.

TECHNICAL: The initial work is in python, parts of work may need to be done in compiled language as necessary. May require additional streamed samplers not initially provided by Milestone 6.2.31. These are "levers" we can use to improve the performance and parallelization as needed to achieve volume targets estimated from submitted proposals.

RISK & MITIGATION: User support of VEGAS during the transition from shared risk to normal observing has higher priority. This has caused considerable slippage and could cause additional slippage. Most of the known VEGAS support issues identified to date will be addressed by the end of Q4 2014, freeing up resources to work on this milestone.
Existing unit tests will help determine which additional work (streaming, moving to a compiled language) needs to be done, if any.

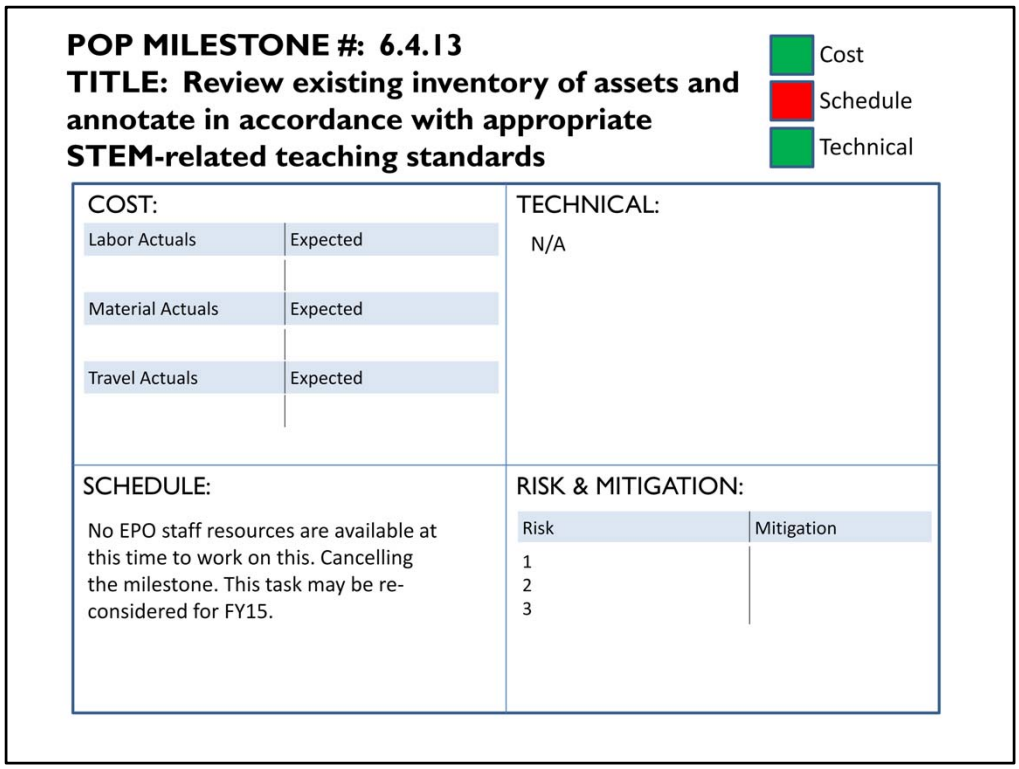


COST: No issues.

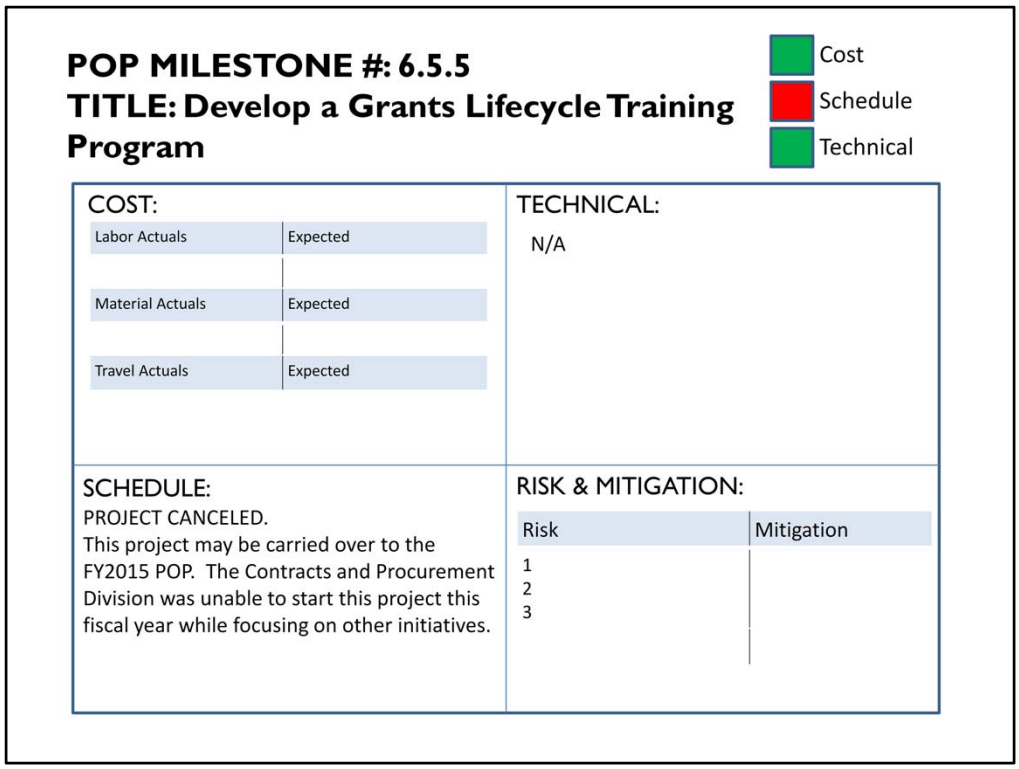
SCHEDULE: Delayed due to resource constraints and priorities. Cancelling this milestone for FY14.

TECHNICAL: No issues

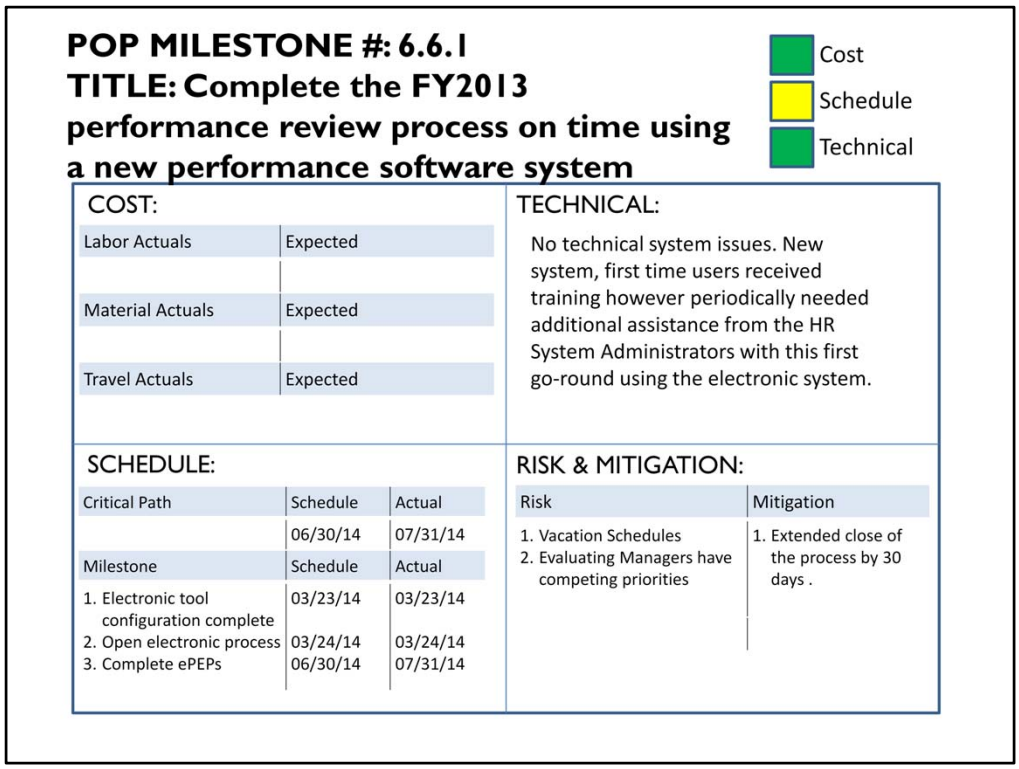
RISK & MITIGATION: DMS performance and priorities would benefit from this high level review, but per discussion with the Director's office it has been deferred until FY15.



SCHEDULE: The staff resource for this task (AUI STEM Education Development Officer) was redirected to other tasks by his employer. No EPO staff resources are available at this time to work on this. Cancelling this milestone for FY14. This task may be re-considered for FY15.



SCHEDULE: The Contracts and Procurement division was not able to start this project and may carry it over to the 2015 POP. Milestone has been cancelled.

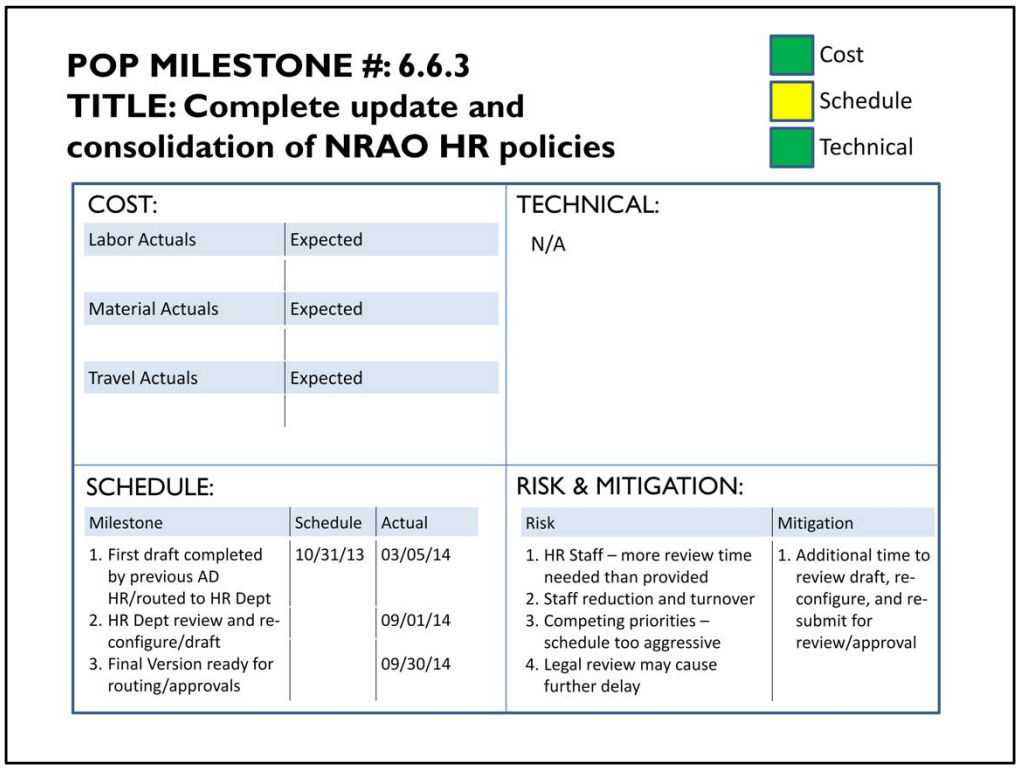


COST: Part of labor cost associated with on-going administration of the PEP process and the planned cost of the new ePEP system

SCHEDULE: Schedule was realistic absent competing priorities, spring/summer vacation and travel schedules and additional first time user assistance needed by users and guidance provided by HR System Administrators

TECHNICAL: No technical issues with the new system that weren't resolved quickly by the HR System Administrators contacting the vendor helpdesk for immediate resolution

RISK & MITIGATION: Extended close of the process by 30 days to allow managers to complete the process with employees.

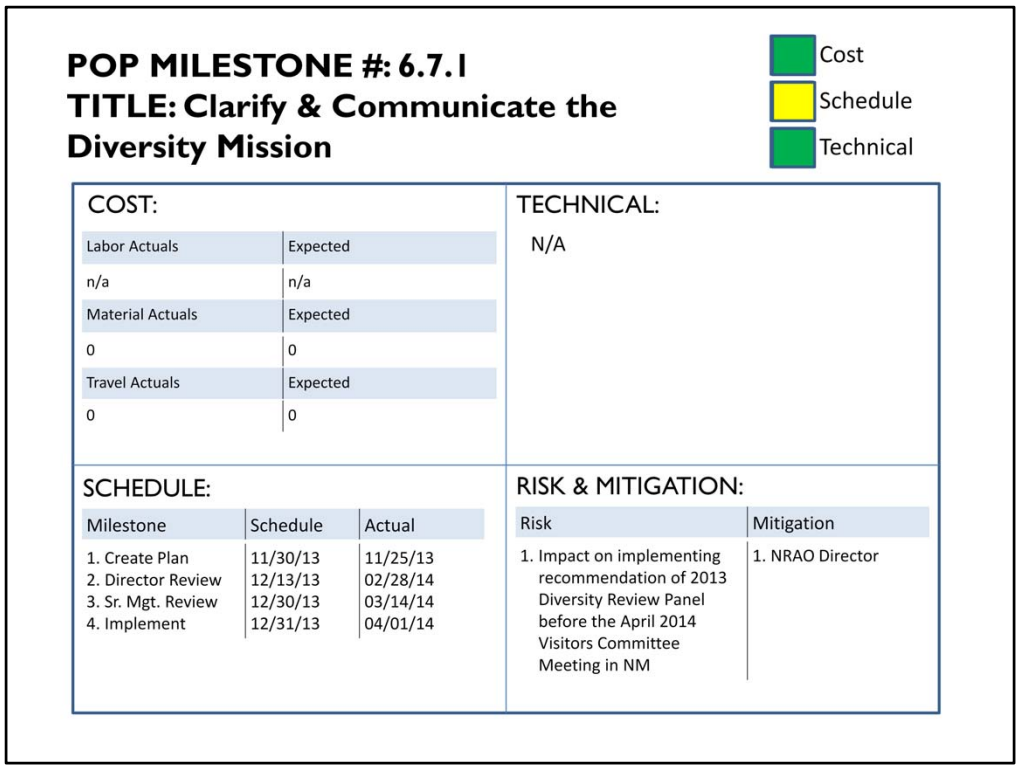


COST: Part of labor cost associated with on-going administration/re-design of policy manual, legal review may cause unanticipated expense.

SCHEDULE: Initial schedule was too aggressive – underestimated time necessary to consolidate the manuals and update into a new version coupled by competing priorities within the HR Department.

TECHNICAL: No technical shortfalls

RISK & MITIGATION: Additional time required to ensure proper consolidation of two manuals and integration of new policies in preparation for final routing/approval. More re-configuration needed than anticipated. Legal review may cause further delay, legal review not built into original timeline. Plan to deliver final update/consolidation by end of FY14 for final reviews/approvals however it is anticipated that final approvals given the potential for revisions along with communications to employees and posting of the new manual will not be accomplished until the end of calendar year 2014 (December 2014).

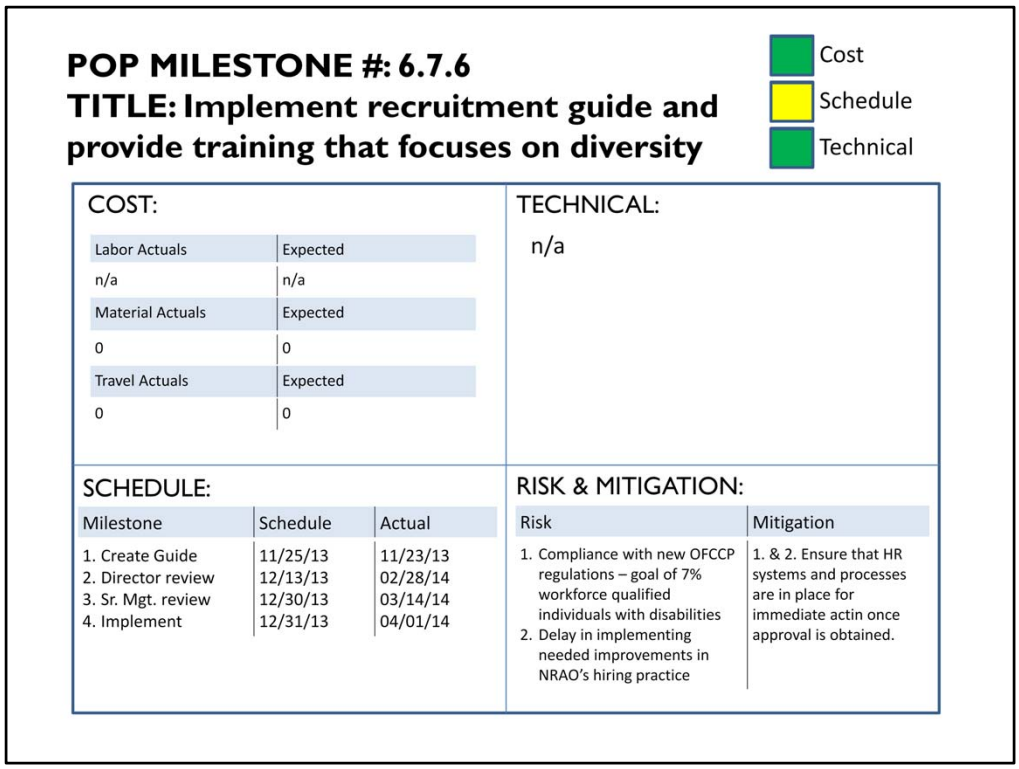


COST: No additional labor cost that has not been previously allocated.

SCHEDULE: Delay – HR reported in Q2 that this milestone was on track; however the Diversity Strategic Plan is still under review by NRAO Director as of this reporting cycle (Quarter 3).

TECHNICAL: No technical components involved in this project.

RISK & MITIGATION: No significant risk. The Diversity Strategic Plan is being reviewed by the Director and will be sent to senior management for comments. The goals established in the POP will not be adversely impacted by a delayed implementation of the plan. Implementing and communicating the diversity strategic plan will assist with clarifying the mission as recommended by the Diversity Review Panelist. The plan serves a roadmap that can be used across the Observatory.



COST: No additional labor cost that has not been previously allocated

SCHEDULE: Delay – HR reported in Quarter 2 that this milestone was on schedule; however, the recruitment guide is still under review by NRAO Director.

TECHNICAL: No technical components involved in this project.

RISK & MITIGATION: All government contractors are subject to the new OFCCP regulations that include an aspirational utilization goal of seven percent for qualified individuals with disabilities. If guide is not implemented in a timely manner, may affect ability to reach % target required. Additional mitigation - due to the limited number of vacancies and the temporary hiring freeze currently in place, the number of vacancies being filled will be less.

QSU# 3 FY 2014 - Financials

Q3 FY14 Summary

- NOTE: All charts reset to reflect Revised POP dated March 2014.
- Overall Issues
  - Benefits – Running at budget for current fiscal year,
  - 2% across the board raises effective in January.
  - Central cost allocation pool established. Recoveries lagging due to non-linear CSA spend.

- NRAO Ops
  - Static WFO & research activity providing CCR revenue assistance and salary support.
  - Accommodating $2.1M swing +/- in NRAO Ops/ALMA Ops.
  - Planning for year end cash needs

FY14 YTD by Major WBS Category
ALMA Ops – Q3

	FY14 POP Budget (March)	FY14 Rev. Budget	FY14 YTD Expenses	YTD % Rev Budget
Telescope Ops	24,014	24,454	17,687	72.3
Development	5,445	6,757	4,531	67.1
Science Ops	5,864	6,281	3,947	62.8
Admin Services	4,556	4,556	2,970	65.2
Director's Office	2,952	3,043	1,910	62.8
FY14 , Total	**42,831**	**45,091**	**31,045**	**68.8**
NSF Allocation Reduction	(2,140)			
Canadian $ Not Shown Above	1,301			
Open Commits	5,033			
C/F For FY14		1,800		
C/F for Future Years	-	134		
All ALMA Resources	**47,025**	**47,025**		

- Shows all ALMA resources.
- Telescope Ops includes $2.8M in reimbursements received in Dec.
- Development reflects open commitments for external awards.
- Total open commitments are ~$7M

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ALMA Development is working as a cumulative pool, including funds as they are awarded and reporting on them as they are expensed – a process which may span multiple fiscal years.

Telescope Ops includes $3.8M in open PO's for JAO activities…catering, cleaning & security are the major drivers. Note that $16.2M in POP budget (operations line) are JAO expenses.

Development includes $2.1M in Open POs for approved awards (Band 5 LO projection $420K; Fiber Optic Link in Chile $620K; UVML $330K; ALMA phasing project w/MIT $160K; UMD Data Mining $240K; U Alberta Next Gen Viewer $220K -paid in July, 62k; NRC mm Camera $60K, NRL Calibration Refinements $120K).

Science Projecting a slight underspend; $650K in open PO's. Most student observing awards and Reber fellowships were not awarded as of 6/30…this process is nearing completion – expect $520K in awards to be released in Q4. Under-utilization of visiting scientist program contributes to underspend ($130K).
Staff still charging to construction, some scientists are charging to telescope ops/JAO rather than NAASC support

Admin services: ICC recovery lags due to other underspends

Director's office low due to IDC correction associated w/accounting change for PPS (equipment vs. normal) and IDC lags due to other spending shortfalls.

FY14YTD by Major WBS Category
NRAO Ops – Q3

	FY14 POP Budget (March)	FY14 Rev. Budget	FY14 YTD Expenses	YTD % Rev Budget
NSF	41,000	43,140		
WFO	1,594	1,594		
Carryforward/Other	1,335	1,335		
Total CSA-1 Revenues	43,929	46,069		
Telescope Ops	18,013	18,013	11,846	65.8
Development	2,248	2,248	2,456	109.3
Science Ops	5,152	5,152	4,006	77.8
Admin Services	15,834	15,834	10,210	64.5
Director's Office	3,308	3,308	2,278	68.9
FY14 , Total	**44,555**	**44,555**	**30,796**	**69.1**
FY14 CSA-1 NET	**(626)**	**1,514**		

- Lag in ALMA spending impacting NRAO Ops;
- Development adjustment in Q4
- Reflects increased pace of development spending on CSA-1 resources.
- Admin services reflects lower ICC expenses due to lag in spending.

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- Telescope ops lagging, major expenditures during summer for maintenance; expect pick-up in Q4.
- Development overspend attributable to cash flow issues for supplemental funding. Funding now in place and projects will be moved in Q4.

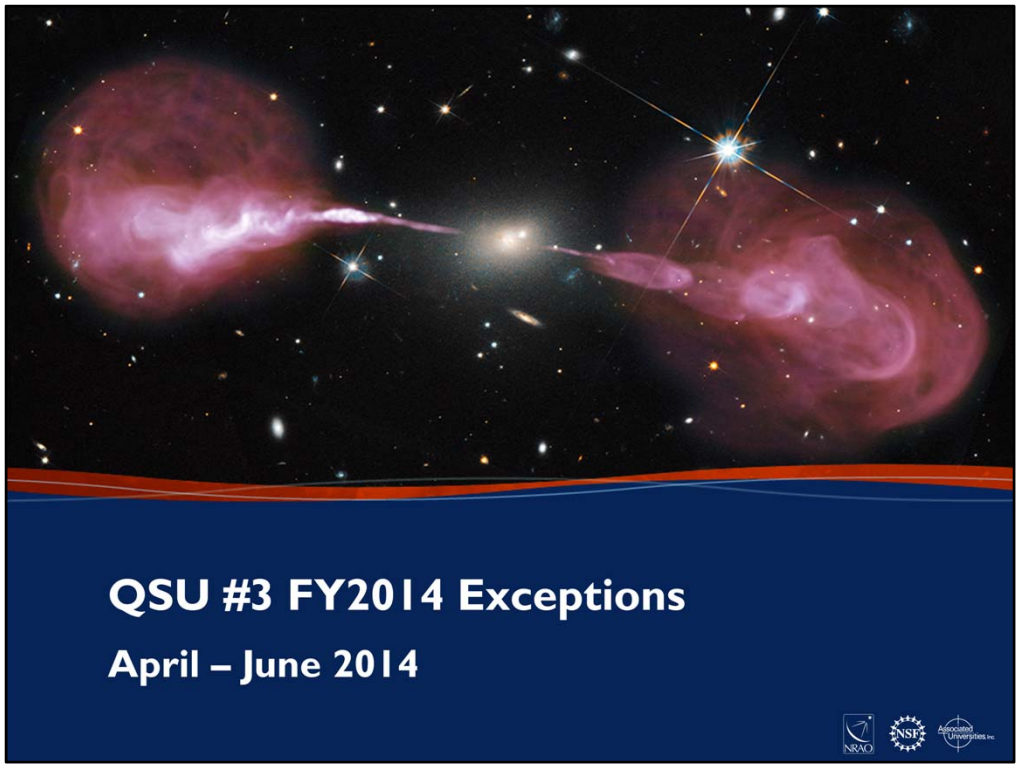
In addition, lagging development spending for ALMA projects increases activity on CSA-1 efforts.

- Admin Services lag primarily attributable to underspend for ICC expenses which follows other underspends.

FY14 YTD by Major WBS Category
Observatory Central Services – Q3

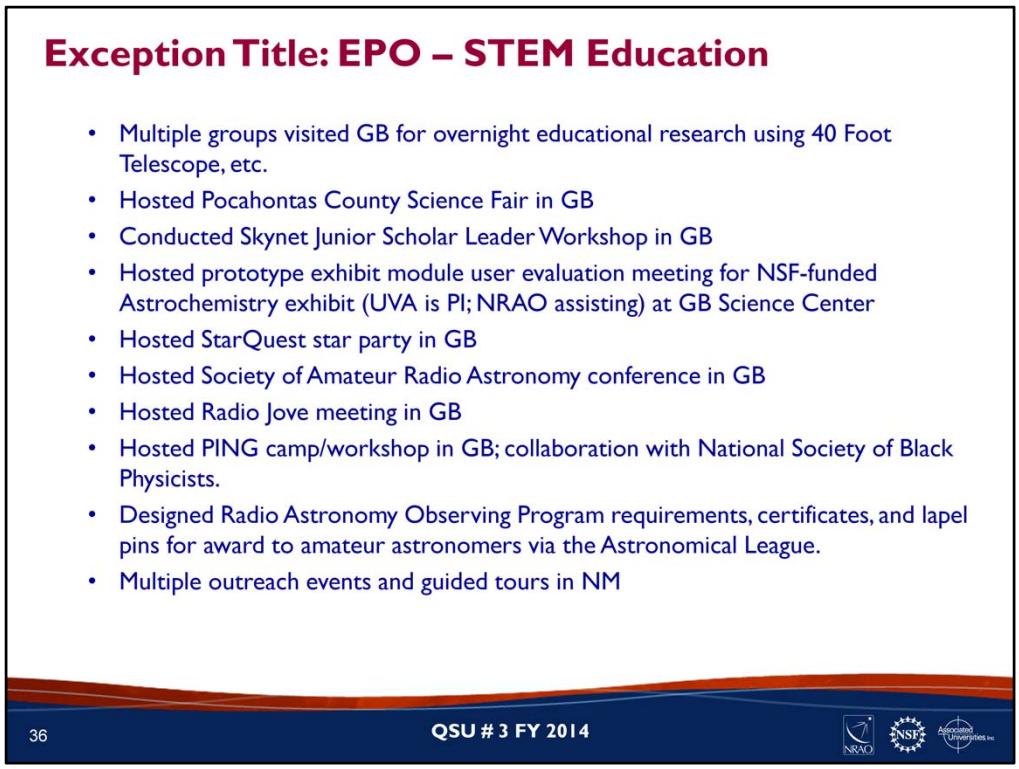
	FY14 POP Budget (March)	FY14 YTD Expenses	YTD % Rev Budget
Telescope Ops	519	240	46.2%
Development	989	579	58.5%
Science Ops	1,943	1,529	78.7%
Admin Services (Gross)	11,744	8,806	75.0%
Director's Office	1,660	1,184	71.3%
FY14 Total, Non CSA Sources	**16,855**	**12,338**	73.2%
Admin Recoveries (CSA's)	(14,209)	(8,857)	62.3%
External Recovery	(2,787)	(2,753)	98.8%
FY14 NET	**(141)**	**728**	

- First year for new Observatory Central Services Pool.
- 30% rate on all allowable expenses.
- External recovery ahead due to construction expenses.
- Internal recovery short due to lag in ALMA expenses in development and other areas.
- Includes open commitments.
- Pending adjustments based on mid-year review of the pool and anticipated Q4 activity will bring closer to balance.



QSU #3 FY2014 Exceptions

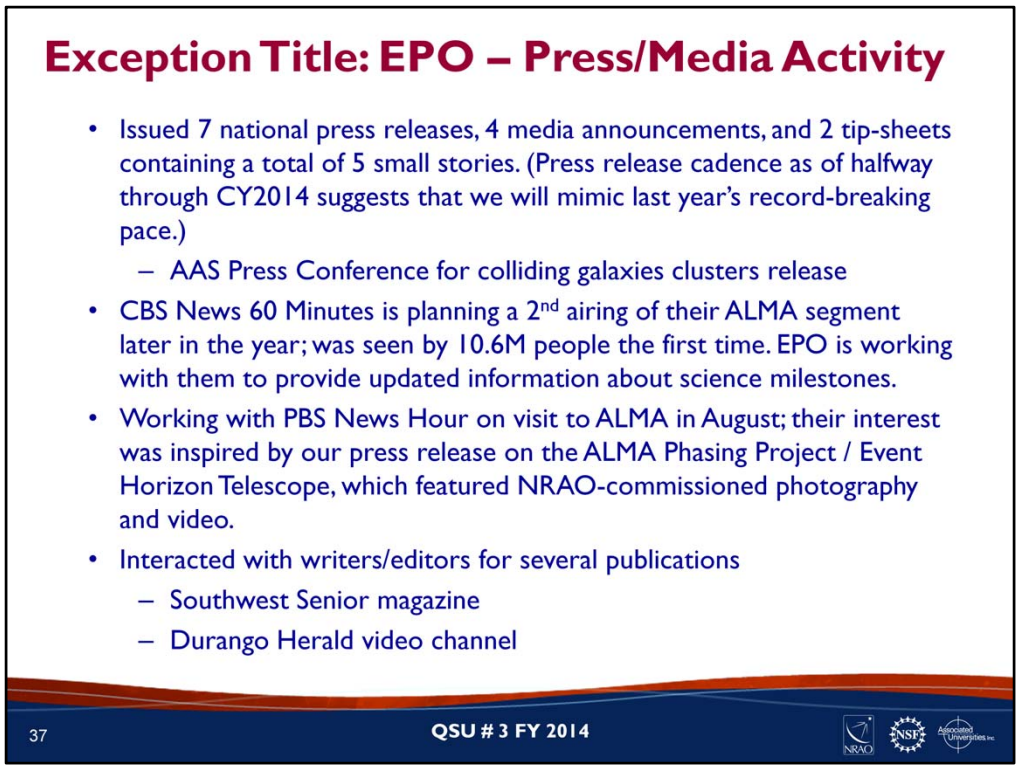
April – June 2014



GB Overnight Groups/40 Foot Telescope, etc. Research: Glenville State college; Fairmont State University; Metz Middle School; Cub Scout Pack 226; Howard Community College; Grosse Point North high School; Rutgers University; Spring Ridge STEM Academy; St. John Neumann Academy; Hardin-Simmons University Mayterm Class; Carolina Friends School; Educational Research in Radio Astronomy; UVA LSAMP summer program; Grosse Pointe Radio Astronomy Team reunion

PING: http://www.nsbping.org/

NM Events: April 2 & 3-Box of Stars training and presentation for Magdalena Schools; April 16-ABQ High School tour 31 students & teachers; April 28-Australian Astronomy club tour (17 amateur astronomers); May 3-CO College tour (31 adult retired professors); May 5-Starlab at Parkview ES; May 6-Starlab at Corrals ES in ABQ; May 8-Starlab in Magdalena; May 13 – 20-VLA Summer School tours and mobile gift shop; June 5-Magdalena school (53 students and teachers); June 7-Presentations at STEM conf. in ABQ; June 24-LA boy scout (15 total); June 25-Tuskegee Airman Summer Camp (32 total plus starlab presentation at Magdalena Gym); June 26-NRAO Summer Student tour training and trip to VLBA Pie Town antenna; June 27-Making a comet at Magdelena Library (12 total attended); June 28-Summer Students tours (56 attended)



Press Releases: Expanded WV Broadband Data Network; GBT Lunar Imaging image release; GBT Failed Galactic Collision; VLA Colliding Galaxy Clusters image release; ALMA Upgrade (ALMA Phasing Project); ALMA Gamma Ray Burst Environment; GBT/VLBA Coldest/Dimmest White Dwarf Ever Detected.

Media Announcements: Online Debut of the Milky Way Explorer; Ken Kellerman to receive ASP Bruce Medal; ALMA Website for Children; Final ALMA Antenna Arrives at High Site

Tipsheet Stories: GBT Images Asteroid; GBT Links to Global Millimeter VLBI Network; VLBA Measures Expansion in Current Universe; VLA Measures Starting Point in Star Formation; STEM: Radio Astronomy "RATS" Celebrate 25th Anniversary at GB.

Exception Title: EPO – Social Media & Web

- Facebook followers grew from 32,047 to 39,420 during Q3
- Twitter followers grew from 4,855 to 5,153 during Q3
- New long-form press release template deployed on NRAO public website; allows for easier reading and text/image composition
- White dwarf press release on 24 June generated such large public interest that the public website was saturated and became unresponsive; EPO is investigating new caching software to improved throughput of popular web content.

Cine Golden Eagle Award for VLA film: See http://www.cine.org/film/beyond-the-visible-the-story-of-the-very-large-array/ and http://en.wikipedia.org/wiki/CINE (for background on the award).

USA Science & Engineering Festival: See http://alma-epo.smugmug.com/Other/USA-Science2014/38895591_bjCsXd#!i=3215748072&k=zwv2Jpx for pictures of the busy NRAO booth.

PASSWORD: STEM2014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