ARRA Infrastructure Improvements
at the
National Optical Astronomy Observatory

Quarterly Scientific Report (4)

for

1 May 2012 – 31 July 2012

Prepared for:
National Science Foundation
Scientific Program Order No. 16 (AST-0947035) is Awarded
Pursuant to Cooperative Agreement No. AST-0132798, Article VII
ACTIVITIES AND FINDINGS

Activity related to infrastructure improvements through the fourth quarter (May through July) of Year 3 of the award is described for each project below.

A one-year extension of SPO-16 AST-0947035 to 31 July 2013 was granted to enable completion of the work on projects such as the Kitt Peak instrument handling facility, the repair and renovations to the CTIO mountain dormitories, and several involving the La Serena infrastructure.

TUCSON INFRASTRUCTURE

Renovate computer room electrical, cooling and fire detection/suppression systems:
During this quarter, the contractor completed the high-voltage electrical connections for the centralized uninterruptible power supply (UPS) unit (Figure 1). NOAO staff are finishing the heat removal system for the unit. Installation of the batteries and system startup by the UPS vendor is scheduled for early August 2012. During that month, the UPS system should be online, which will enable final testing of both the generator and automatic transfer switch. This will complete the final phase of the multi-year project to renovate the NOAO main computer room.

Replace and renovate electrical supply/distribution equipment:
Minor equipment adjustments have been finished up and the final phase of the multi-year renovation to the high-voltage distribution system has been completed.

Replace 15-year-old building energy management and control system:
With replacement of the system completed, the contractor is working with NOAO staff to provide training on the system. The contractor will be delivering a final set of as-built drawings as well as operation and maintenance manuals to complete the project. Facilities staff are working to learn the new system and its capabilities.

KPNO MOUNTAIN INFRASTRUCTURE

KPNO water system renovation:
The contractor worked with KPNO staff during this quarter to provide training on operation of the renovated plant. Ongoing discussions with Environmental Protection Agency personnel identified new testing requirements for the plant, and additional water testing instruments were obtained. With stored water at critical levels, the monsoon season finally began in late June providing significant rainfall for processing to establish full testing and operation of the new plant. Minor adjustments to the water processing system...
were made in June, and the system was placed into service. The contractor delivered the final set of as-built drawings and operation and maintenance manuals to complete this project. Additional water system efforts will be deferred while the instrument handling facility project is ongoing.

**Kitt Peak instrument handling facility:**
Following a competitive bid procedure during the past quarter, a local architectural and engineering (A/E) firm was selected to prepare the renovation documents for the new facility. The A/E firm reviewed the Kitt Peak facility location and similar NOAO-Tucson test spaces and is developing the project documents. The documents should be available to pursue contractor bids by the end of this summer with renovation efforts commencing shortly thereafter. With this project ongoing, NOAO obtained a one-year extension of award SPO-16 AST-0947035 to enable completion of the work.

**CTIO MOUNTAIN INFRASTRUCTURE**

**Pachón water system renovation:**
All sections of piping that were determined to be in poor condition from the well to the tank on Cerro Tololo have been replaced (see Figure 2). A more recently installed section of the existing pipeline is being inspected to ensure that it is in adequate shape to remain in long-term service. Final protection and support of the newly installed piping is in progress as well as repairs to the pumping stations. Depending on the availability of remaining award funds, replacement of a section of piping from the Cerro Pachón service yard to the hotel/dining area is being considered. Completion of this project is anticipated by the end of September 2012.

**Dormitories repair & renovations:**
A contract for renovation of all three dormitory buildings was executed and work is in progress. The initial phase includes concentrating on refurbishment of the 10-unit dormitory (see Figure 3) and one wing of the dining/dormitory building. Interior work was begun on the technician’s dormitory as part of that first phase. The contract for upgrade of the heating systems at all three dormitories is being finalized, and the upgrade will be scheduled in coordination with the ongoing renovation work. Completion of the project is anticipated by the end of December 2012.

Figure 2: The last stretch of piping being installed for the Tololo/Pachón water line. (Image credit: Jeff Barr, NOAO/AURA/NSF.)
Pachón kitchen & dining facility:
The ARRA-funded portion of this project was completed. Non-ARRA funds were utilized to complete the interior build-out of the project. The new Pachón kitchen and dining facility was put into service on 4 June 2012.

Blanco 4-m mirror coating chamber:
The hardware was purchased, but the coating chamber work is being delayed until the next mirror recoating cycle.

Cerro Tololo UPS upgrade:
Completed during this award year. The new UPS was installed and is now in operation.

Mountain meeting rooms renovation:
Completed during this award year. The improved meeting room is now in use.

LA SERENA INFRASTRUCTURE

Machine shop modification & refurbishment:
This project is being rescoped. Its original scope was not within the budgeted allocation. Requirements are being developed for safety and functional improvements to the anodizing facility, which is considered to be the most critical modification to the La Serena machine shop facility. Final definition of the project is anticipated by the end of FY 2012 with completion of the work by September 2013.

La Serena compound water system renovation:
Bids for replacement of the fire-suppression water system are being evaluated. Other related repairs to potable and fire-suppression water infrastructure are under consideration. Final completion is anticipated by March 2013.
La Serena meeting rooms renovation:
Remodeling of an underused area of the CTIO La Serena library is underway to provide a staff interaction space and a multipurpose meeting/dining area. Completion of the project is anticipated by the end of December 2012.

Repair and renewal of security fencing for La Serena compound gate:
The most effective use of the remaining allocated funds to improve the security of the compound is being considered. Completion is anticipated by September 2013.

SUMMARY OF FOURTH QUARTER EXPENDITURES

The table below provides a summary of the award accounts, showing cumulative expenditures to date (31 July 2012) and the total funds remaining.

<table>
<thead>
<tr>
<th>Award</th>
<th>Amount</th>
<th>Prior Expenses</th>
<th>Expenses This Quarter</th>
<th>Total Expenses</th>
<th>Funds Available</th>
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