ALMA MONTHLY REPORT

July 2010

Table of Contents

1. INTRODUCTION

The most notable and unfortunate event in the month of July was the fatal accident on the road between the OSF and AOS near km 16.4 involving the Shell truck that provides fuel to our site. On its way down from the AOS the driver lost control. The truck ended up at the bottom of the ravine and was totally destroyed. The driver was ejected from the cabin and died instantly at the crash scene.

The tenth complete Front End was received at the OSF on July 5th and the sixth antenna was integrated into the array at the AOS on July 27th.

2. PROJECT MANAGEMENT

2.1 Management IPT and IPT Meetings

With a number of MIPT members on travel following the SPIE conference on astronomical telescopes and instrumentation, the only regular teleconference meeting of the MIPT was held on July 15th. Weekly IPT teleconference meetings and JAO key personnel meetings continued through the month.

2.2 Schedule and Cost Control

The PMCS team produced a full schedule status update on August 2nd. With deliveries at the beginning of August, the situation with FE monitor and control kits will be improved, but still on the critical path for deliveries of FE assemblies to AIV. Delivery of two amplitude calibration devices at the end of July was just in time to enable completion of AIV for the 8th and 9th antennas.

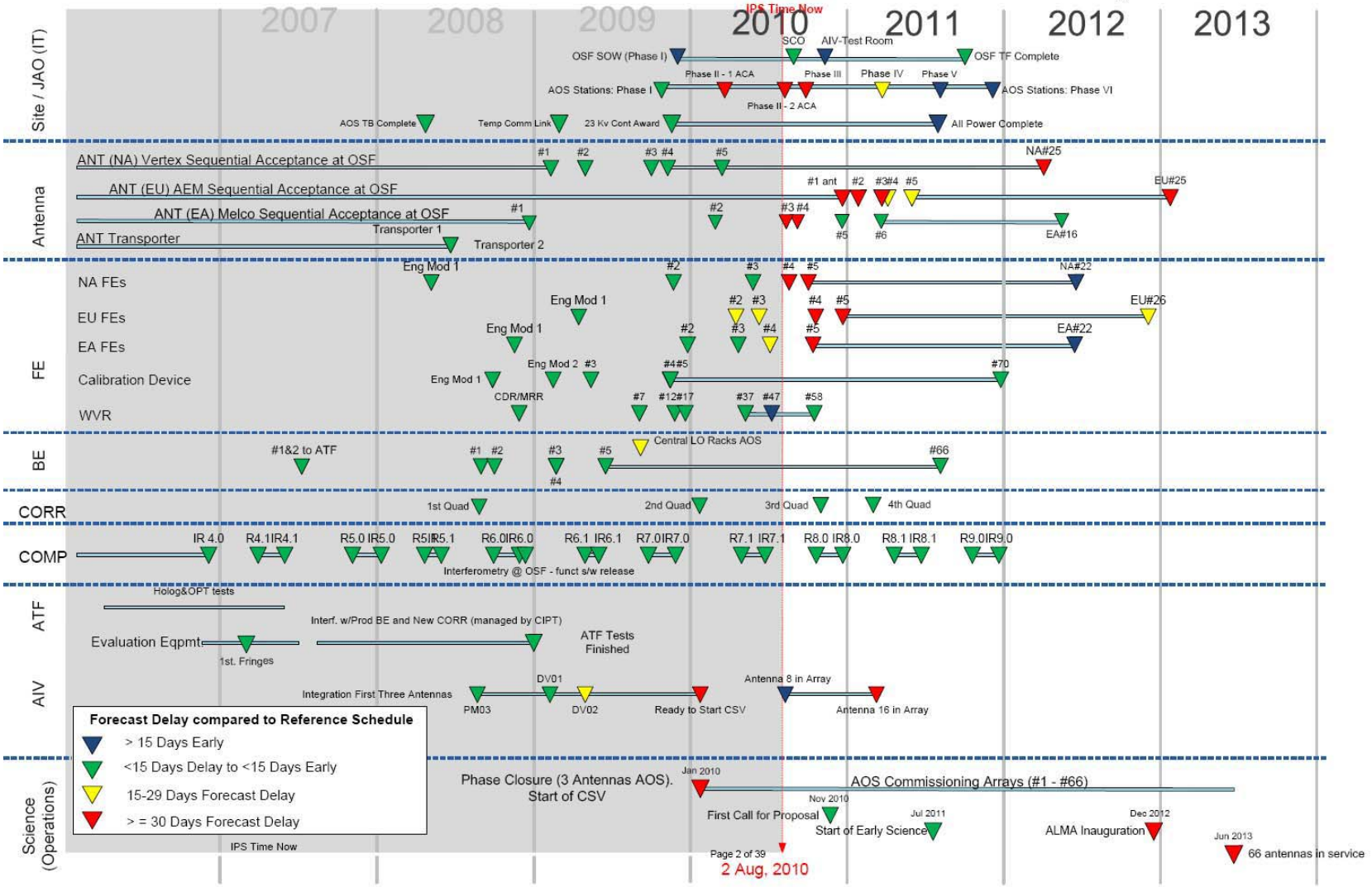
No change requests for major outstanding items were approved in July. Consequently, no significant changes in the cost-to-completion budget occurred.

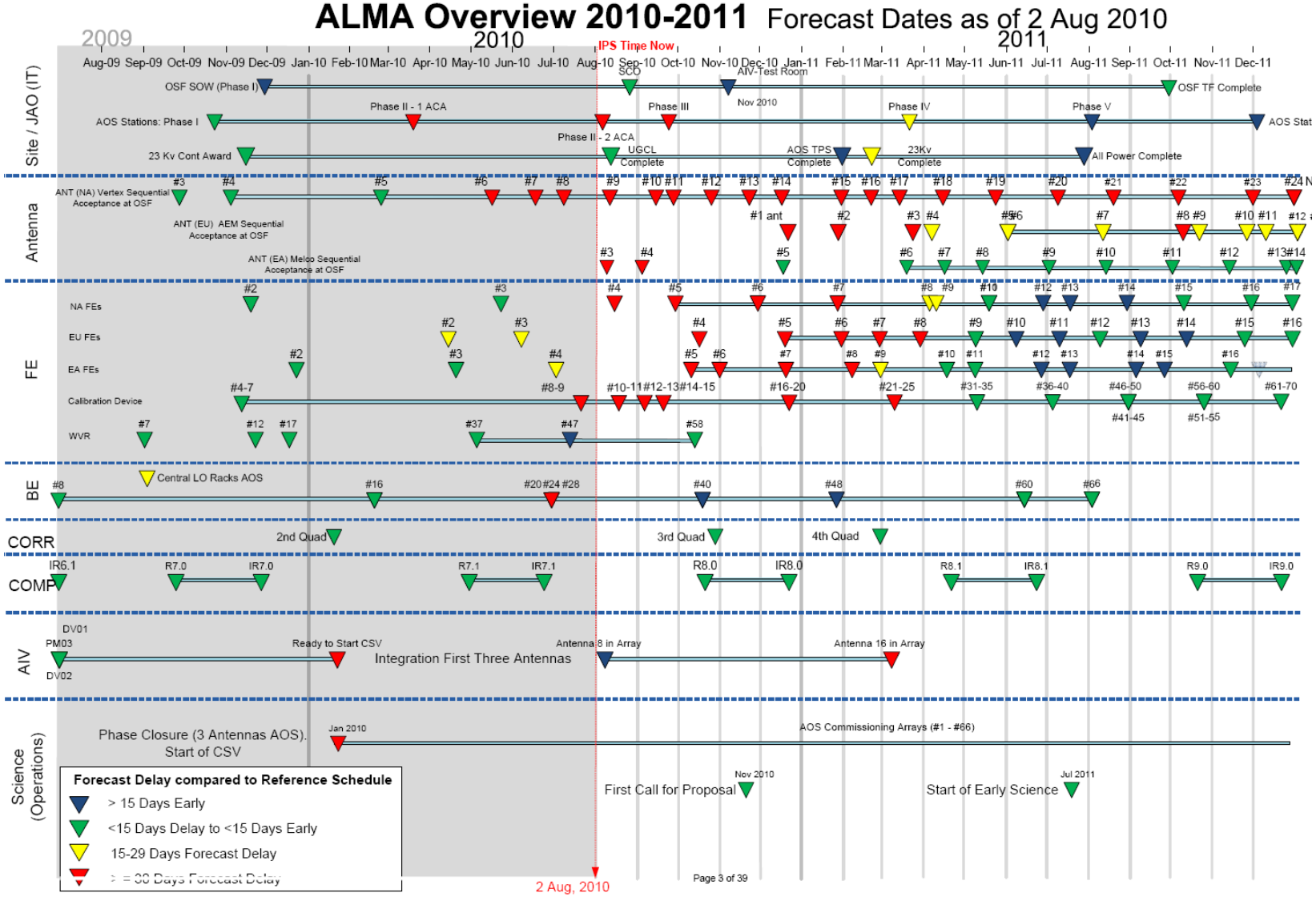
2.3. Overview Schedules

The General Overview and Overview 2010-2011 of the ALMA Forecast Schedule show event dates with color-coding to indicate deviations with respect to the Reference Schedule. The changes in the August 2nd Forecast Schedule displayed below with respect to the July 2nd Forecast Schedule are:

- Site: termination of the contract for construction of the AOS power and signal distribution networks will result in delays in the completion of the Phase III through VI antenna stations. The new forecast dates are one to two months later. The delay in Phase III stations will adversely impact the near-term schedule of CSV activities. At present, the impact on the Early Science and following major milestones is not clear.
- Antennas: delays of roughly one month in the near-term acceptances of NA antennas have resulted in a three-week delay in the Antenna 8 in Array milestone for AIV. The forecast delivery of the 25th NA antenna has consequently also changed from Dec 2011 → Feb 2012.
- Front End: delays in the delivery of calibration devices #10 – 11 are forecast to impact completion of AIV and handover to CSV for the corresponding antennas.
- Major Milestones: no significant changes in forecast dates of these milestones.

ALMA General Overview – Forecast Dates as of 02 Aug 2010




ALMA Overview 2010-2011 Forecast Dates as of 2 Aug 2010
2009
2010
2011
IPS Time Now
Aug-09 Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10 Sep-10 Oct-10 Nov-10 Dec-10 Jan-11 Feb-11 Mar-11 Apr-11 May-11 Jun-11 Jul-11 Aug-11 Sep-11 Oct-11 Nov-11 Dec-11
Site / JAO (IT)
OSF SOW (Phase I)
SCO
AIV-Test Room
OSF TF Complete
AOS Stations: Phase I
Phase II - 1 ACA
Phase III
Nov 2010
Phase IV
Phase V
AOS Stat
Phase II - 2 ACA
23 Kv Cont Award
UGCL Complete
AOS TPS Complete
23Kv Complete
All Power Complete
Antenna
ANT (NA) Vertex Sequential Acceptance at OSF
ANT (EU) AEM Sequential Acceptance at OSF
ANT (EA) Melco Sequential Acceptance at OSF
#1 ant
FE
NA FEs
EU FEs
EA FEs
Calibration Device
#4-7
#8-9
#10-11
#12-13
#14-15
#16-20
#21-25
#31-35
#36-40
#46-50
#41-45
#56-60
#51-55
#61-70
WVR
#7
#12
#17
#37
#47
#58
BE
Central LO Racks AOS
#8
#16
#20
#24
#28
#40
#48
#60
#66
CORR
2nd Quad
3rd Quad
4th Quad
COMP
IR6.1
R7.0
IR7.0
R7.1
IR7.1
R8.0
IR8.0
R8.1
IR8.1
R9.0
IR9.0
AIV
DV01
PM03
DV02
Ready to Start CSV
Integration First Three Antennas
Antenna 8 in Array
Antenna 16 in Array
Science (Operations)
Phase Closure (3 Antennas AOS). Start of CSV
Jan 2010
AOS Commissioning Arrays (#1 - #66)
First Call for Proposal
Nov 2010
Start of Early Science
Jul 2011
Forecast Delay compared to Reference Schedule
> 15 Days Early
<15 Days Delay to <15 Days Early
15-29 Days Forecast Delay
2 Aug, 2010
Page 3 of 39

2.4 Front End Integration

Our 10th Front End (FE) on site, i.e., the 4th FE (SN-11) from the East Asian FE Integration Center (FEIC), arrived at OSF on July 5th. This fulfilled (with a five-day slip) the first 2010 mission of the FE integration subproject – to deliver 10 FEs to serve for the eight antennas at AOS and the two antennas for the OSF interferometer before the end of June. The provisional acceptance on-site (PAS) meeting for the 9th and 10th FEs was held on July 16th, and the FEs were recommended for acceptance upon closure of the remaining action items.

With the delivery of the 10 FEs on site, the project turns more attention to the completion of the FE design verification, which has been given second priority so far in the interest of keeping the schedule. JAO conveyed the following message to FE IPT and FEICs and asked them to provide a schedule for completion of the design verification and restart of the delivery/acceptance of the FEs. The schedule is currently under discussion among FE IPT, FEICs and the FE integration subproject manager.

(Message from JAO)

> The JAO appreciates the efforts of FE IPT and FEICs to timely deliver the first ten Front Ends that allowed the AIV/CSV to proceed toward the important project milestone of eight antennas at the AOS.
>
> With the delivery of the 10th FE, and as agreed last year and reiterated on various occasions, we believe the focus should now turn to design verification. Therefore, the JAO requests the FE IPT, and specifically the North American and European FEICs, to concentrate effort on completing the outstanding design verification tasks as soon as possible and to the agreed schedule.
>
> Furthermore, we consider it essential that the European FEIC complete its Operational Readiness Review (ORR) 2 before the acceptance of further front-ends from that integration centre.
>
> With regard to the East Asian FEIC, which does not have any design verification tasks, we are prepared to provisionally accept one more front-end while the design verification is completed in NA and EU.
>
> This is a difficult decision with consequences for the project schedule in the near term but we believe it is essential to ensure we have full confidence in the integrity of the front-end design. To continue on the present course with dual goals of delivery of front-ends and completion of design and integration centre verification presents an un-acceptable risk and leaves scope for confusion about priorities.

The component supply to the FEICs has been greatly improved in general, although we have seen some cases where a missing component (a cable or a card) stopped assembly work of FEs. We are still on a learning curve.

The North American FEIC continued the preliminary acceptance in-house (PAI) testing of its fourth FE (our 11th FE; SN-05). It also started the PAI testing of its fifth FE (SN-13) using the second test line according to the test plan agreed at the Test Readiness Review (TRR) held on July 2nd.

The East Asian FEIC continued the preparation of the second test line. The commissioning test for the second test line started, and it will be ready for an ORR in October. Start of the PAI testing of its fifth FE (SN-12) was delayed by a missing component and trouble with the first beam scanner.

The European FEIC continued commissioning of the beam scanning/phase measurement system and preparations for the ORR Part 2 (ORR2). The ORR2 dates were reset to September 30th and October 1st to accommodate a delay of the air conditioning installation in the test room. Assembly of its fourth FE (SN-14) completed and its functional tests were made.

3. EA EXECUTIVE

3.1 Management

The ALMA-J Office was moved to a new building called ALMA Building within the Mitaka Campus of NAOJ on July 6th. The unpacking and office arrangements continued for a while.

3.2 ACA Antennas

3.2.1. ACA 12m antennas:

Antenna PM03:

PM03 has been undergoing maintenance by MELCO at the NAOJ SEF since June 24th. Maintenance includes a major corrective action for the receiver cabin and its HVAC duct system as well as other actions for nonconformance items found during operations at AOS.

Antenna PM02:

MELCO completed maintenance of PM02 at the Technical Facility including corrective actions for the rainwater leakage through the HVAC dust and for reliable operation of the stow pins. The tilt direction of the Vertex membrane was changed to reduce radio reflections at Band 3. After corrective maintenance, PM02 was moved to the AOS on July 8th.

The receiver cabin temperature was found to be lower than 16ºC at the AOS. NAOJ installed an additional heater as a quick corrective measure, and is measuring the HVAC response.

Antenna PM01:

MELCO has repaired the AZ-DD motor. Ten magnets and three coils were replaced with new ones, and the magnet-coil gap was carefully readjusted to prevent collision. From results of a drive performance test, we confirmed that the repair and readjustment were correctly performed on July 26th.

Antenna PM04:

A full-scale pointing verification test of PM04 was completed. The performance is good, and the result is shown in the test report to the acceptance review. A holography campaign was conducted, and the surface panels were adjusted to reach the best map of 9.2 um. However, a thermal deformation was found larger than specified.

3.2.2 ACA 7-m antennas:

Antenna CM01:

NAOJ completed a holography campaign with the NAOJ-developed holography receiver. Good surface maps have been collected at nighttime, and the 7-meter surface seems to be good and stable (the best map shows accuracy of less than 6 um rms), but still some actions are needed to obtain reliable daytime maps. The pointing measurements were also done successfully.

Antenna CM02 to CM05:

Four 7-meter antennas, from CM02 through CM05, are completed and under preparation for shipment to Chile. They are scheduled to leave Japan on August 3rd and expected to arrive in Chile around September 6th.

3.3 EA Front End

EA FE #4 (FEND S/N11) was safely shipped to the OSF, and PAS tests for EA FE #4 were successfully conducted at the OSF by the AIV team. The PAS meeting was held on July 16th, and there were no major technical issues. The panel recommended the acceptance of EA FE #4 after the completion of action items. The TRR meeting of EA FE #5 was held on July 7th. The main issue discussed at the TRR meeting was how to proceed with action items raised in the ORR meeting for the first test line. Since the EA FEIC is going to perform a full verification test on EA FE #5, it was decided that the ORR action items with direct impact on the full verification measurement have to be closed before the full verification test is carried out. We expect to finish the full verification tests as well as other tests necessary to close the ORR action items by September 22nd. The preparation for the second test line is ongoing.

To improve the noise temperature degradation caused by the doubler which does not properly double the frequency of the signals, prototyped loop waveguides were installed into the Band 4 Cold Cartridge Assembly (CCA4)(S/N02) and are being tested. The measurement results of the drain voltage of the power amplifier was reported to the FE LO group to calculate the LO power, which turned out still low. This means the path loss was slightly small, especially on the Polarizatoin-1 side. Redesigning of the waveguide to increase the loss of the waveguide is in progress.

The PAI review meeting for Band 8 Cold Cartridge Assembly (CCA8) (S/N04) was held on June 22nd. The cartridge passed the review successfully. The review discussed optimization of IF variation/ripple by increasing the current of the magnet for the mixer and stability of IF cross talk. In this regard, we performed a re-test of IF variation/ripple with optimization and stability check of cross talk with tilting angles of 0 degree and 90 degrees, as part of PAI action items. From this testing result, the shipping destination of CCA8 (S/N04) was determined to be EA FEIC. The FE IPT decided that the PAI review of CCA8 (S/N05) would be postponed due to the large cross polarization at the band edges. The request for waiver of cross polarization was submitted to the FE IPT. The shake/vibration test was performed on CCA8 (S/N02). At the random vibration test, the horn was removed from the soldering part. A redesign to improve the cartridge performance is progressing.

A prototype cartridge to be used for the preproduction cartridge (S/N01) has been assembled and tested. The receiver beam at cryogenic temperature showed the aperture efficiency of more than 84% for both polarizations from 790 to 940 GHz. The beam squint was also evaluated, almost meeting the specification that requires the co-alignment of both polarizations to be less than 10% of the Full Width at Half Maximum (FWHM) of the primary beam. We received the final production drawings of the Band 10 blank cartridge body including our requests from RAL for the signature process.

The FE IPT face-to-face meeting for Band 4, 8 and 10 was held at NAOJ from July 12th to July 14th (Band 4 on 12th, Band 8 on 13th, and Band 10 on 14th).

3.4 ACA Correlator

The planned on-site tests of quadrants #1 and #3 were successfully finished. The on-site test reports of quadrants #1 and #3 were submitted to ALMA EDM. The on-site testing of quadrants #0 and #2 is being conducted. We successfully received optical signals from the antennas on the ACA pads through the AOS patch panel. This test was a joint effort with the AIV team, and its details were reported to the JIRA system.

4. EU EXECUTIVE

4.1 Management

The yearly ESO budget preparations continued.

The ALMA Board telecon, MIPT tele- and video-conferences as well as other regular ALMA telecons were attended.

Extensive discussions among the involved parties (ESO Administration, JAO Administration, and ESO ALMA Division) took place to define several aspects related with the move to the new headquarters in Santiago in order to allow a seamless and timely transition.

4.2 EU Antennas and Transporter

OSF status and progress

At the OSF there are currently five antennas installed on assembly pads, while the 6th steel structure has arrived in Antofagasta and is on its way to the OSF. The general status is as follows:

Antenna #1: Fully integrated including reflector and panels. The antenna has been powered since mid-May and in the month of June the first commissioning phase was completed. In July further commissioning was done with the HVAC and other systems.

During the month advancements on remaining open works and on the refurbishment/completion of the receiver cabin, for which various design details were missing at the time of shipment to Chile, took place.

The next campaign of servo tuning and installation of wind metrology is planned for August. Start of acceptance testing is scheduled for August 23rd with the first batch of acceptance tests related to electrical safety and EMC. ESO has installed most of the equipment needed for testing: Optical Pointing Telescope (OPT), OPT Control System (Minirack STE), etc.

Antenna #2: Mechanically integrated, including reflector and panels. Various systems commissioned and start of servo tuning planned for August.

Antenna #3: Steel structure integration is finished. Cabinet to cabinet cabling is ongoing. The installation of panels was completed. The BUS was moved outside the building and lifted onto the receiver cabin on July 21st.

Antenna #4: Steel structure integration continues. The receiver cabin has still to be repositioned by inserting a shim. Rack to rack cabling is ongoing. Thermal insulation is largely installed. The installation of panels has been completed and the BUS was moved outside the building and is ready for installation.

Antenna #05: Some mechanical installation progress, especially on the thermal insulation. The azimuth axis was measured and is ready for cabin installation. Blank mounting of the two halves of BUS performed and gluing planned for beginning of August.

Shipment and logistics: BUS #8 arrived on site. Steel structure #6 is on the way to the OSF from the harbor.

Europe progress

The inspection of Antenna #7 after installation of complete insulation is planned for the first week of September, together with factory acceptance test (FAT) of steel structure #8.

ESO has taken part in FAT of BUS #9 and 10 in France to verify that the as-built inputs from the OSF site are correctly flowing into the manufacturing. A similar check on the receiver cabin is foreseen, date to be defined.

Programmatic

Considerable progress can be reported on the preparation of the procedures for commissioning and testing. The consortium has received comments from ESO on the first draft and is currently working on updates. The deadline for the update is September 2nd. The verification plan has been formally issued and transmitted to ALMA. The draft Acceptance Plan (ALMA) has been prepared. The consortium is preparing the integration and commissioning reports needed for the AIPC (Assembly & Inspection Point Chile), starting the acceptance phase.

The AIPT lead visited the site to get a first hand idea of the remaining open works for planning the start of acceptance testing. It has been noted that while more needs to be done, most of the corrective actions proposed by AEM are showing effects.

Still under discussion is the preparation by AEM of some additional antenna pad(s) that would allow a higher production rate providing additional parking space.

Figure 1: AEM antennas

Transporter

Final acceptance certificate provided to Scheuerle at the end of the warranty. Awaiting for delivery of last batch of spares.

Ridges and I/F plates

Some progress is reported on the completion of the remaining batch of ridges to be delivered by Asturfeito. The date of inspection of the final batch has now been proposed by the company for mid-October 2010.

4.3. EU Front End

The production of most EU FE deliverables is at the required steady rate, with Band 7 and Band 9 ahead of schedule and other items like FE DC power supplies, water vapor radiometers and cryostats reaching the nominal production rate and starting to accumulate some stock.

The Amplitude Calibration Device (ACD) remains a source of concern, although the situation is improving due to the actions that have been taken. While the manufacture of the robotic arms is progressing seamlessly, other components have been delayed by technical problems as well as by a mission to the OSF of two key staff members (see below for details).

The technical problems are being resolved while the manpower shortage has been partly mitigated with the addition of ESO internal resources mainly for the calibration wheel whose manufacture turned out to be more resource intensive than expected.

The delivery of Band 3 warm mirrors is still behind schedule and the production rate is not increasing as expected due to low production yield. Close contact is maintained with the contractor to monitor progress. It is emphasized that despite these delivery issues a sufficient buffer of Band 3 warm mirrors is available to continue FE assembly integration.

Areas of Concern:

- Availability of components and sub-assemblies needed for FE AIV and design verification at the EU FEIC.
- Completion of provisional acceptance of FE assemblies and other products by the JAO.
- Slow processing of NCRs, RfWs, and CREs by the ALMA Change Control Board (CCB).

4.4 EU Back End

EU Back End activities proceeded within schedule.

Digitizer assembly:

The PAI of Digitizer Assembly Batch #8 took place and the batch is being shipped to the Back End integration center in Socorro. Production of Batch #9 is progressing on schedule.

Three units of digitizer test equipment have been assembled and successfully passed PAI. The documentation is being finalized.

The amendment to the production digitizer contract with University of Bordeaux to incorporate the fabrication of the new digitizer test equipment and to purchase the last left over of ALMA chips has been granted.

Photo mixer:

Production of photo mixers is progressing on schedule.

Batch 4 and most of Batch 5 with the exception of few units to be fully outfitted have been manufactured and tested.

The metal blocks for Photomixer Batch #6 are being manufactured.

Delivery of Faraday rotating mirror (FRM) by NRAO could become a bottleneck for the production of Band 9 photomixers. BE in Charlottesville is currently investigating the production of FRMs with ISOWAVE.

A visit to the photomixer manufacturer, RAL, took place to discuss how to implement the contract amendment to cover Band 10 needs. In the same occasion bracket installation,

Faraday mirror installation and their tests were discussed. It is expected that the amendment will require ESO Finance Committee approval.

4.5 EU System Engineering and Integration

SE: The following reviews were attended and/or prepared: Antenna acceptance DV09, PAI Front End #11. Support was given to the Antenna and Front End IPT regarding sub-system acceptances. Configuration control of the antenna documentation was set-up. Documents were reviewed and commented on ALMA EDM. Co-ordination meetings with JAO SE were attended to synchronize the activities. Support was given to the Front End IPT to assemble the amplitude calibration device.

CMMS: Response was provided to the ALMA CMMS acceptance plan. A proposal was prepared about the format that should be used by the IPTs to deliver the part and equipment information to CMMS and was populated with parts data.

Enclosures: Kick-off meeting for the production of 40 compressor enclosures was successfully carried out. The schedule and drawing set (valid for execution) were updated. The first production enclosure is planned to be ready by beginning of November. The production of six additional interim enclosure housings from the manufacturer of the pre-production batch is ongoing. Two sets are expected by beginning of August. Components for ten enclosure electronic controls were procured and two assembled units were delivered. Work on the action items from the auxiliary review is progressing.

OSF activities: He lines were installed on Vertex antenna 7. Maintenance and trouble-shooting activities were performed to keep the cryogenic system cold. Work on the cryogenic OSF TF infrastructure progressed.

PA: Front End and Antenna IPT were supported. Inspections were done and acceptance events attended. Interviews with an additional PA person were done and an offer was made. PA meetings were attended.

5. NA EXECUTIVE

5.1 Management

Requests for quotation to complete the installation of the electrical and fiber optic infrastructure at the AOS were distributed on July 6th. Bids are scheduled to be received by August 27th.

5.2 NA Antennas

DV04 was successfully moved to the AOS on July 26th, bringing the total number of antennas at the high site to six.

The conditional acceptance agreements for DV06 and DV08 were generated by the PA staff and signed by the NA project manager. The acceptance of these two antennas will bring the total number of accepted Vertex antennas to eight.

The pointing tests for DV09 were completed, and its acceptance review is now scheduled for August 12th.

DV10 will be moved from inside to outside the SEF in early August so that its servo acceptance tests can begin.

Initial photogrammetric measurements of the DV11 surface were made during the week of July 19th.

A face-to-face meeting between Vertex and the NA AIPT is scheduled for late August at the OSF to investigate the surface stability of the Vertex antennas. The meeting is scheduled to coincide with tower holography measurements of DV01 when it is moved from the AOS to the OSF.

Three of the BUS segments for DV14 that arrived last month were damaged. Vertex has contacted the segment manufacturer, Airborne, to make a damage claim and to request an assessment of how the damage occurred. The damaged segments will not affect the delivery of DV14 and future antennas because Airborne has already produced and delivered a number of additional segments that are stored in Germany.

The tilt meters in the antenna metrology system show a drift in measured tilt with temperature. The temperature-dependent tilt may originate in the tilt meter mounting structure, as opposed to the tilt meter itself. A finite element analysis of the mounting structure is underway. Vertex is working with the tilt meter manufacturer, Applied Geomechanics, to resolve the problem. Additionally, Vertex has implemented a compensation feature in its ACU software to compensate for the temperature-dependent tilt. The revised software is being tested. The use of the tilt meters has been temporarily discontinued in science verification experiments.

Eric Hansen, a mechanical/optical engineer with the National Solar Observatory, met with the manufacturer of the OPT to make an independent assessment of the origin of its temperature-dependent image drift. He developed a model of the OPT, and his analysis indicated that the image drift is caused by gravity and/or trapped pockets of air contracting and expanding with temperature. Methods for improving the lens mounting within the OPT mechanical housing should address the problem. The temperature correction algorithm implemented in software appears to be working well. The second production OPT is scheduled to arrive in Chile in early August.

The systems integration of the nutator will take place in early August. The final tuning of the nutator servo will occur later in the month.

5.3 NA Front End

Three Band 3 cartridges were shipped to the EA FEIC in late July. Three more will ship to the NA FEIC in August.

Cross-polarization patterns of the Band 3 feed horn and orthomode transducer were measured at room temperature. The measurements will be repeated at cryogenic temperatures. The results of the measurements will be documented in August.

A total of 27 Band 6 cartridges have been shipped from the NA FEIC. Three additional cartridges are in PAI.

We are on track to deliver 160 warm cartridge assemblies (WCAs) for Bands 3, 6, 7, and 9 by the end of September 2010. Thirty-four WCAs for Band 7 have been built, and an additional three are in the process of being built.

The lack of availability of a component for the cryogenics monitor and control board jeopardized the delivery of the board, but the board manufacturer now has all components to complete it. The FE IPT is scheduled to receive all boards by early August. A problem with the gate valve driver board was resolved.

A pre-PAI meeting for NA FE #4 was held on July 21st. During the meeting, issues identified with the completion of reliability testing and design verification for the entire FE IPT suspended the delivery of this front end. The JAO has requested the FE IPT to concentrate on design verification.

A new policy for managing the potential of electrostatic discharge in the NA FEIC was developed and is under final review.

A change request (CRE-244) to alter the cross-polarization isolation specification for Band 6 was approved by the change control board on July 7th. The excessive cross-polarization was attributed to the manufacturing tolerance of the Front End's feed horn. However, the cost and schedule impacts for implementing an alternate feed horn design were determined to be too severe. The approval of the change request allows Band 6 production to proceed, in keeping with the guidance of ALMA Board to build to cost. We will explore alternative economical methods for improving the Band 6 cross-polarization performance.

The production of the mixer bias boxes has been suspended to determine the origin of the premature corrosion on it.

5.4 NA Back End

A new monitor and control board is being developed for the analog and digital rack power supplies, which do not provide sufficient current for its +5 VDC supply voltage.

Six fiber optic wraps were shipped to the OSF on July 19th.

5.5 NA Correlator

The PAS of correlator quadrant 3 at the AOS is nearly complete. A failed correlator data processor (CDP) computer delayed the quadrant PAS tests. A replacement was shipped to the AOS to expedite the tests.

Seven of the 192 48V/5V DC-to-DC convertors in the correlator system at the AOS have failed, giving a failure rate much higher than expected. The converters run at a small fraction of their rated power and run cool to the touch. Replacement units for the failed ones in correlator quadrant 1 were ordered and received. Their performance will be checked by correlator IPT staff prior to shipping them to Chile.

Software and field programmable gate array personalities for the full, four-quadrant, and correlator configuration are being developed.

5.6 NA Computing

Software release 7.1.1 is being made into the operational software version for all OSF standard test environments.

Good progress has been made in the parallelization of CASA imaging to eight computer nodes.

Scientists gave CASA tutorials in Santiago and at the OSF.

6. SITE

6.1 OSF

Work continued at the OSF TF on HVAC installations along with the next phase of electrical modifications. Further definition of scope and estimated costs that is needed for the modifications to the transporter shelter, administrative offices, as well as the FE, BE, and correlator laboratory areas, continued, but was not completed in July. Formal acceptance of the completed CH 23-OSF-AOS road is underway. JAO review of the Statement of Work and Technical Specification for the architectural design and engineering of the OSF Residence, including review by AUI and NAOJ, will be completed in the first week of August. ESO expects to issue the call for tenders in September.

6.2 AOS

The request for proposals to complete the installation of the power and fiber optic networks at the AOS was issued in early July. Proposals are due on August 27th. If the new contract can be awarded in September, connection of the Phase IV (central cluster) antenna stations should be possible by March 2011. This is one of the prerequisites to be ready to start Early Science later in 2011. In parallel, three small contracts for the work needed to complete power and signal connections to the Phase I and III antenna stations, plus the infrastructure for the weather station located in the central area of the array, were awarded at the end of July. Availability of the Phase III stations for CSV will be delayed until at least mid-September. This will have TBD impact on readiness to start Early Science.

6.3 Power

Meetings with various European contractors for the 23 kV power system and the multi-fuel power generation system (MFPGS) were held in late July. Production of the 23-kV equipment is on schedule. Successful factory testing of the flywheel load-leveling equipment to be located at the AOS was witnessed. The MFPGS prime contractor reported that manufacturing of the critical multi-fuel turbines by Turbomach has started. At the OSF trenching and installation of the power and fiber optic transmission line between the AOS and OSF is on schedule and more than 50% complete.

6.4 Santiago Central Offices (SCO)

ESO acceptance of the building from the contractor was completed. Permission to occupy by the Vitacura municipality and approval by the electricity supplier are now expected in mid-August. In the meantime, outfitting of the building (furniture, IT installations, etc.) has proceeded on schedule. The move from the Alsacia and El Golf offices to the new SCO is scheduled for August 19th to 23rd.

7. SYSTEM ENGINEERING

Continuing efforts are devoted to investigate the power quality in the AOS Technical Building. All deficiencies are being tracked and corrective actions are being discussed with the users. A revision of the relevant interface control documents is being conducted before implementing the corrective actions. Hiring a consultant field engineer to help on this urgent task is being explored. Furthermore, a follow up session of the Infrastructure Review with focus on power has been held resulting in the closing of a third of the open actions.

Preparations for the front end service vehicle CDR have been hampered by the prime contractor not delivering the required documentation. The amount of information provided at engineering meetings makes the panel confident that the technical content for the CDR is available and that the problem is in getting the documentation delivered. The meeting will go ahead with the documentation available and measures will be taken at the CDR to ensure the prompt delivery of the remaining documentation.

The System Performance Analysis Tool has been compiled, distributed in the group and to AIV and CSV staff. A training session has been planned in early August. The tool comprises both general system requirement calculators and advanced more specialized calculators.

This tool is key to System Verification activities and evaluation of test results.

A face-to-face working meeting was held with CIPT and BE at NRAO Socorro from which significant progress was made in the definition of monitoring and control requirements and interfaces. Further working meetings are planned with FE IPT and later with Site to oversee the alarms definition and implementation concept for power.

As already reported System Verification is dependent on CSV activities and observations to accomplish the verification of system requirements. In this context, a test report template and related test procedures are being prepared and the SE/SV group is actively participating in key CSV activities that have a direct connection to system verification activities.

The CCB met on July 6th and approved 29 documents related to FE and Antenna IPTs.

Concerning staffing, Maurizio Miccolis has accepted the position of JAO System Engineer (ISM) and will start on October 11th. Furthermore, Eduardo Pizarro has accepted the position of Lead Document Specialist (LS) in the JAO System Engineering team and will start on August 16th.

8. PRODUCT ASSURANCE

8.1 Management

The PA structure is undergoing changes to better reflect the changes that occurred in the project with the departure of the Project Engineer.

There is still a lack of personnel. In conjunction with the Project Manager, a strategy for recruiting less experienced personnel and provide them with on the job training is being designed.

The PA group has lost some personnel as well.

8.2 PA Activities at the OSF

PA staff members are attending PAS testing and verifying compliance with testing procedures. As part of PA tasks we continue performing workmanship inspection to every deliverable that is received in the warehouse. PA has inspected antennas, FEs, power supply units, etc.

PA is present at the AOS witnessing antenna movements and performing inspections of the trenching.

PA personnel are coordinated with AIV personnel in all activities at the site, both at the AOS and OSF.

8.3 Other PA Activities

PA participated in the SPIE symposium in July. PA personnel also participated in specific training, such as crane operation. The team has started a master index of standardized work processes together with AIV.

9. SCIENCE IPT

Commission and Science Verification

The most important improvement to note is that there were no unplanned power outages at the AOS during the month (and only two planned ones). Clearly the efforts to get the Temporary Power System into a reasonably reliable condition have paid off. Unfortunately the other problems that have been slowing progress remained with us: in particular the wind was unusually high – actually above the 20 m/s operational limit for much of the period 13th to 22nd July. Winds as high as 45 m/s (100 mph) were recorded at one point. The AOS was evacuated during the periods of very high winds and fortunately there was no significant

damage to the antennas or the buildings. The incidence of faults on the antennas remained high with problems continuing with drives, shutters, stow pins and HVAC systems as well as the difficulty that the calibration devices get stuck when they are too cold. A worrying new fault was that one of the hexapods used to adjust the position of the secondary mirror became erratic in its movements – a similar problem was seen several months ago but this was tracked down and all of the hexapods have been replaced. We have also found that the "inclinometers", a critical part of the metrology system, on two of the Vertex antennas, have become erratic, producing large pointing errors, and that the inclinometers on all of them are much more affected by temperature changes than expected. The net result of all this was that, although we had five antennas at the high site for most of the month and six at the end of it, there were only 8 nights where we actually had more than three antennas available in a fully operational state.

This was also a difficult period on the software side. Version 7.1.1 was brought into operation at the AOS early in the month. This includes several important new features, including in particular a rewrite of the Data Capture task, but these brought many new problems with them. This meant that most of the commissioning time was spent identifying these problems and testing the patches that were installed to fix them. In retrospect it is clear that these upgrades were brought into use too early, although it is also true that only rather limited testing can be done on this part of the software without having the full system operational. A further serious problem is that since the introduction of version 7.1 we have been seeing a fault on the Vertex antennas where the communications process in the antenna control unit gets hung up. So far no explanation for this has been found. Overall the system is back to a quite unstable state, requiring numerous restarts and generating many JIRA tickets every night.

Finally a series of new problems emerged with other parts of the system – the correlator reports timing errors, two of the water vapour radiometers were not able to synchronise properly, the process of locking the local oscillators is unreliable on some receivers and the new calibration devices appear to give incorrect results.

In spite of all this we have continued to make headway on numerous technical issues – for example measuring and understanding the pointing and focusing offsets resulting from changing the receiver band, investigating how the tracking errors increase as a function of wind-speed and conducting initial surveys of sources suitable for amplitude and phase calibration. We are also working hard on getting the Observing Tool to generate viable Scheduling Blocks and feeding back the problems we find to the developers.

Not surprisingly, however, progress towards the higher-level CSV goals has been very limited: in particular we did not achieve the milestone of making the first images with six antennas. It is clear that the system is not really in a state to pursue such objectives and instead we have to dig in and solve the problems one by one. In support of the systems engineering initiative to identify the top ten issues, we drew up a list of the major current problems and are focussing our efforts on these. We have reorganized the effort of the commissioning team into five "technical" groups – antennas, calibration, correlator, imaging and systems – plus two others on observing modes and documentation. Each group has an identified lead, deputy and membership and we are prioritizing the tasks to be tackled in each area. We are confident that this will improve our effectiveness and focus in the face of the current difficulties.

Outreach

There have been an unusually large number of visitors, partly as a side-effect of the total eclipse being visible from Easter Island, and we were busy taking them round the site and arranging meetings in Santiago during that period. We also hosted the ESO Visiting Committee and the review panel for the AUI operations budget proposal.

Staffing

Melanie Krips has joined us for a stay of about three months under the collaborative arrangement that has been set up with IRAM. She brings a great deal of experience of interferometry from the Plateau de Bure Interferometer and from her previous work at the Submillimeter Array. Al Wootten was with us for the second week of July and Anaelle Maury and Anita Richards visited from the EU ARC.

10. COMPUTING IPT

In July a patch release (R7.1.1) was deployed to AIV and CSV. The goal was to reduce the delay between sub-scans from 10s to 2s. However, speeding up this part of the software revealed some timing problems elsewhere in the system and the time was in fact only decreased to 5s. These issues will be resolved in the next release (R8.0). Perhaps more importantly, to enable these changes the "data capture" component of the control software required extensive refactoring, and during the deployment mission all the consequences of this were not discovered, which caused lost time to AIV and CSV. CIPT will schedule a follow-up meeting in August to resolve the remaining major issues. The major lesson learned is that the project globally needs to more systematically test all operationally important scripts – including the resulting data analysis – before and after software installation missions, even of patches, to prevent repeats of this experience.

In the development towards the next major ALMA software release (R8.0), a pre-release of the next version of ACS (v9.0) was made available for initial subsystem testing. As part of this process CASA/ACS coordinated their Python version, which makes deployment significantly easier.

The ALMA Science Archive queries "tiger team" got fully underway and had written 5 optimized queries by the end of July. The NGAS mirroring optimization was completed and was able to nearly fully utilize the available bandwidth (96%). The OSF Storage Area Network (for performance improvements) and first batch of Santiago Archive computers were ordered.

Major improvements in linear polarization in CASA were checked in. They will be in the next major CASA release (scheduled for October 2010).

The Dynamic Scheduling Algorithm was significantly optimized. Simulation with 7000 SBs (~1 year) now takes 15 minutes.

In general considerable efforts in many subsystems were undertaken in preparation for the next "Integrated Test", which will be conducted by DSO starting in late August.

11. SCIENCE OPERATIONS

11.1 The August-September integrated test of science operations software

The next integrated test will take place in August-September and the results will serve as input to the Science Operations Readiness Review. The test will cover proposal preparation and submission, the proposal review process, the phase 2 process and the helpdesk.

The improved server-archive system at the SCO is being set up for submission of proposals.

11.1.1 Science Operations Readiness Review

The preparations for the Science Operations readiness review have started. The panel members are George Helou (chair), Jessica Chapman, Michitoshi Yoshida and Mark

Phillips. The charter for the panel and a preliminary agenda have been defined.

11.2 DSO activities

Hiring

Job offers were sent to the four Operations Astronomer candidates.

Baltasar Vila Vilaro accepted the Data Manager job offer and started on August 1st.

The first two DSO Archive Operators, Alejandro Barrientos and Fernando Morales started to work at the OSF on August 2nd. During the first months they will be trained by staff from the Department of Computing.

Jorge García, presently working as Data Analyst at Gemini, accepted the Database Content Manager position.

Four applications for the Lead astronomer position for the Proposal Handling Team were received. Two of the candidates look very promising. Interviews will take place in August.

Candidates for the DSO administrative position were interviewed. The position is based at the OSF and will support both DSO and the Department of Computing.

Support to AIV and CSV

The support to the AIV/CSV activities by the Array Operations Group and the DSO astronomers continued.

Software

The various teams working on requirements and testing of the software tools continued their work including the ObsTool, Phase 1 Manager, Project Tracker, Archive, AQUA and Pipeline. The results from the integrated test were evaluated and the requirements updated as necessary.

The second CIPT delivery progress telecon was held in order to monitor the status of CIPT deliveries.

The Operations Software Coordination Group continued their biweekly telecons.

Other

DSO staff participated in various outreach activities, conferences and workshops.

11.3 ARC activities

11.3.1 NA ARC

Hiring activities

NRAO astronomer Ed Fomalont transferred into NAASC effective August 1st. A third offer for a NAASC scientist was made. Administrative Assistant Holly Foster joined the team on July 1st.

JAO support

The NRAO postdoc Manuel Aravena is serving a tour for CSV support from July 9th to August 18th.

Software Development & testing

Work continued on integrating the ALMA helpdesk with Single Sign-on, in preparation for the

second integrated test, including a successful test of the High Availability service that will be used to support the helpdesk.

The website for CASA was redesigned (see http://casa.nrao.edu). Crystal Brogan gave a CASA tutorial for JAO staff on July 19th. Progress was made on CASA tools for image analysis (imcollapse & specfit). NAASC staff created a "Data Range Query" for the ASA development team.

Conferences and workshops

Pre-registration opened and planning continues for the NAASC/NRC workshop to be held (see http://www.almatelescope.ca/Spectroscopy2011/) January 15th-17th 2011 in Victoria, BC. Planning continues for NAASC participation in the January AAS in Seattle WA, including an ALMA Special Session: "Observing with ALMA" on January 12th.

Other

NAASC staff participated in a retreat on July 7th, generating a Mission Statement and Charter and new organizational structure with three main groups: User Support Services (group head: Crystal Brogan), Data Services (group head: Mark Lacy), and JAO Support (group head: John Hibbard). The NSF review of the proposal for "NA ALMA Operations and the NAASC" took place at the OSF and Santiago from July 13th-18th, with participation from key members of the JAO. The review was considered an unqualified success.

NRAO CIO David Halstead met with NOAO/LSST/Reuna/RedClara/FIU/ALMA representatives to finalize plans for a Gigabit network from Santiago to the US. The NAASC archive group successfully loaded Oracle data from Chile (May 2010 data) into the NAASC NGAS system.

11.3.2 EU ARC

Hiring activities

Suzanna Randall accepted the second offer as ARC scientist. She starts on August 1st. Her main tasks are helpdesk, web site and user documentations. She will help Liz Humphreys and Andy Biggs during the next integrated test.

JAO support

Andy Biggs provides support to CSV in Chile as ESO ARC staff, and A. Richards as UK ARC node.

Tim van Kempen (ARC node ALLEGRO, NL) will start October 1st for two years in Chile.

Melanie Krips has started her three months participation in CSV.

Software Development & testing

ESO ARC and ARC nodes staff participated in the fifth CASA sit-together to test CASA with eVLA data.

Conferences and workshops

A CASA tutorial (M. Zwaan) was held on July 19th-20th at the Oxford University, UK.

Other

The archive installation continued with a purchase of archive HW and installation of the Archive Science Interface.

CASA development: TICRA primary beam simulation data, import into CASA. Various

tickets, among others hanning smoothing in cvel, exportfits problem, field and spw id matching.

11.3.3 EA ARC

Hiring activities

Koh-ichiro Morita has now become the JAO System Verification scientist, and Masao Saito will be the new Project Scientist from August 1st.

A CASA software engineer has been advertised with an application deadline of August 31st.

CSV support

Aya Higuchi worked in Chile from June 4th to July 23rd. Kengo Tachihara provides support from July 28th to August 30th.

Software development and testing

We discussed the helpdesk configuration, and reported that the proven configuration of Helpdesk for the first ES was a single server (less risk) as a first step.

We prepared two drafts of the end-user documentation, "OT-ph1 quick start" and "Recipe matrix spreadsheet".

EA-ARC manager attended the ALMA CASA Coordination Group meeting to facilitate coordination between AIV/CSV and CASA interferometry and single-dish development.

Conferences and workshops

We provided an OT demo and mini-tutorial in the NRO users meeting (July 21st-22nd). Sachiko and Kengo also made presentations about Early Science of ALMA in the meeting.

Other

The EA-ARC staff moved to a new ALMA building in Mitaka campus during July 5th– 9th.

12. ALMA DEPARTMENT OF ENGINEERING

12.1 Management

Dean Chalmers and Cristián Lastra spent the first week of July in Socorro visiting the NRAO office and EVLA. It was a very constructive time in terms of understanding how the EVLA is operated and meeting counterparts in North America personally. D. Chalmers also took the opportunity to meet with M. McKinnon and discuss coordination between NA and DTS in the future.

Work proceeded on plans for the merger of DTS and AIV under the Department of Engineering. Ximena Acuña worked extensively with AIV administrative assistants to formulate a merger plan for the two administration systems.

12.2 AIV

12.3 Antenna Group

During July, AG technicians continued to provide support to AIV activities such as troubleshooting and repair of various minor problems and investigations of larger issues.

The transporter team took over the building formerly used for hazardous materials to store tools, equipment, and set up two workbenches.

Recruitment continues to be a major activity with the following occurring in July:

- Electrical Technician; Mr. Rodrigo Guarda started on August 2nd and will be on the same shift as Pedro Campana for a period of one or two months at the most.
- Mechanical Technician; two candidates have been selected and offers will be made in August.
- Helper; an offer has been made and we are waiting for a response.
- Electrical Technicians; there will be a second call to be posted on August 22nd.
- Control System Specialists; there will be a second call with minor changes to the job description; to be posted on August 22nd.

Between June 26th and July 9th, the antenna group manager along with the Department Head attended the SPIE conference in San Diego. After the conference they visited EVLA observatory to get knowledge of the maintenance and operations processes, hosted by Gene Cole. They attended daily operations coordination meetings, a presentation of the EVLA M&C and failure reporting systems. They visited the ALMA backend laboratories and met with key people on the development, construction and verification processes. The highlight was of course the visit to the EVLA site, including control room, correlator room, warehouse, machine, electronics, and overhaul shops.

12.4 Instrument Group

The DTS Electronics Group has been renamed Instrument Group within the Department of Engineering. The mission of the group is unchanged. The manager position for the group has been advertised.

The chair of the Front End Service Vehicle Critical Design Review has approved the CDR plan and appointed members of the review panel to attend the CDR in Taichung, Taiwan, August 17th-19th.

Two of the infrastructure documents reported on in the last several months, which list equipment requirements for the Instrument Group Technical Facility laboratory, await final approval by the ALMA Program Manager. The third document, listing requirements for Front End, continues to be updated based on further review. Once the documents are signed by the approving authorities, procurement can begin for the equipment listed. The AIV group plans to order separately equipment needed for the next three years to support its mission.

Other activities: IG has assisted in preparing a table for the Maintenance Plan showing staffing and spares requirements and available documentation by configuration item. IG continues to work with ALMA System Engineering to identify monitor data and alarm requirements for optimum maintenance reporting during Operations.

12.5 Maintenance Group

The ADE MG Manager met with the ALMA Deputy safety manager to review the radio requirements for the emergency brigade. A meeting with a radio provider was held and the emergency brigade radio requirements were explained. In August, a radio provider will demonstrate with a live test they can provide radios in a configuration that meets ALMA's requirements and is compatible with the forthcoming new radio system.

The MG Manager and Deputy Manager met with the local support agent for the AOS UPS. Discussions were held with respect to service of the UPS and its operational mode. Clarification of the scope of work and subsequent service is expected in August.

The MG Deputy Manager started collation of the MG equipment information for entry into CMMS. Additionally he commenced the review of the OSF TF fire pumps and is in the process of creating a comprehensive maintenance plan and overhaul schedule. The

revision of the fire pumps systems is part of an ongoing plan to review all ALMA systems. E.g. fire protection, fire pumps, building management, oxygen.

Recruitment for the maintenance planner, power engineer, medium voltage electrical technicians, HVAC technicians/helpers and a radio technician continued with new hires expected within the quarter.

CMMS implementation continued with the collation of equipment and equipment structures for ALMA groups. The AG has provided Vertex antenna and transporter data including structure, list of equipment, list of spares and job guidelines and basic corrective maintenance procedures.

The IG has provided data for BEND AAs, FEND, FEND-CRYO including structure, list of equipment, partial list of spares. AIV has provided a list of tools and instruments. Computing and IT have provided equipment lists for personal laptops, desktops and servers. The warehouse is already testing and using the stock module and giving feedback to improve functionality. Some of the data has already been loaded in the system and the other is being prepared in Clic-Clac. The AOG received a demonstration of fault reporting.

The radio system upgrade project continued with the completion of a radio survey. J. Penroz and S. Watson continued preparing the specifications of the radio infrastructure and repeater towers. Following meetings with vendors a complete list of equipment has been finalized. Application to SUBTEL for radio frequency allocation will commence in August. Additionally J. Penroz commenced the application process for approval of the radio towers with the Chilean aeronautical authority.

In August, a soil mechanics survey and electro-conductivity survey will be carried out as required for the design of the repeater tower foundations and lightning/earth grids.

MG technicians attended a two-week training course of training on Oxy-acetylene welding and cutting and electric arc welding.

MG staff continued fitting out workshops, purchasing equipment, and performing minor maintenance to OSF systems. Revision of the fire pump systems commenced and a comprehensive maintenance will be undertaken in the coming months. Dust storms at the OSF increased corrective maintenance to such systems as fire protection and HVAC.

12.6 Technical Group

The second stage of the AOS security upgrades constructed and is complete according to the supplier. DTS inspection will be carried out this week.

The Electronic Access System will start its installation on July 26th and is expected to be finished by early September.

The AOS Work Permit & Access Control System is already running (trial run), but some modifications are being made to allow usage at all ALMA installations (OSF and SCO). Additionally, the regular WP for each area is being defined and will be uploaded this month.

Finally, the reactivation of the Office Infrastructure Project has been formally required by AIV and will probably start this month.

13. ALMA DEPARTMENT OF COMPUTING

13.1 Management

Interviews for the senior administrative assistant vacancy for Science Operations and Computing were held at the end of this month. Two candidates have been invited to visit the

OSF at the beginning of August and an offer should be made to one of them before the end of the month.

Interviews for the software engineer vacancies also took place at the end of July. Four candidates were found to be suitable and will be invited to the OSF for further screening.

A policy related to twiki content security has been prepared and distributed for comments. A draft process formalizing the assignment of computing equipment and resources to new hires has been prepared.

Continuing with the implementation of the approved training plan, one person attended an Oracle workshop in the US, and three posters were presented at the SPIE in San Diego. Additionally, active support was provided for the organization of a people management training to be held in September.

The head of the department participated in a meeting at Reuna to explore the possibility of a high bandwidth link for science data transfer. Following up on this meeting, the EVALSO project manager has also been contacted.

As agreed by the MIPT, one software engineer will be temporary transferred for nine to twelve months starting in August to the NRAO in Socorro to work in the implementation of the antenna nutator control software.

The performance evaluation process started and most staff in the department has participated in the workshops organized by human resources.

13.2 Network

13. 3 Information Technology Group

Most activities of the IT group are currently focused on the outfitting of the new ALMA building in Vitacura.

Fiber optic links were installed to connect the new premises with the current network core located in El Golf. Plans have been prepared and tested with critical providers to switch all services in Alsacia/El Golf to Vitacura during the third weekend of August.

Network cabling to support a high-speed network is being installed in the new building. Cisco equipments to support this network were received at the end of the month from Siemens Germany and will be installed during the first week of August. Several meeting rooms are currently being prepared to host videoconference equipments that will arrive from C-Line Germany during the second week of August.

In parallel with these activities in Santiago, the IT group is working with the software group to test the microwave link bandwidth, in order to establish the number of antennas that can be supported by the current backup link.

Modifications to the Access Control software are being developed to support the new system that will be deployed at the AOS.

13.4 Software Group

During this month, the Software Group and Computing IPT concentrated on the installation, deployment and testing of the R7.1.1 software release. Some problems, mostly in the data capture area, remained after the R7.1.1 patch deployment mission. They are currently being worked out with the collaboration of both groups. Currently, R7.1.1 is the official software release installed and supported in all AOS and OSF standard tests environments.

A meeting to discuss the path forward to finalize the deployment of the Telescope Monitoring and Control Data Base was carried out. Although this has been included in the R7.1 software release, some missing functionality needed in operation was identified. A

prioritized list of pending items has been agreed and will be implemented to proceed with the deployment.

Testing of the new total power implementation continues in coordination with the Computing-IPT. This new implementation removes the limitation on the sub-scan duration and the number of points for the total power-observing mode.

The implementation of the specific monitor and control points in the mount software for the European antennas has been started. The basic functionality should be ready to use mid-August as agreed with the EU Antenna IPT. Computing IPT will take care of the graphical user interface adaptation to be used by the new antenna.

An upgrade to the NA Antenna IPT standard test environment has been agreed to support the commissioning of the production OPT. The software will be upgraded in August to R7.1.0.

Two antennas, PM02 and DV04, have been integrated to the AOS standard test environment. Six antennas now compose the array.

An initial prototype for web-based trend analysis tools has been developed. The purpose of this system is to display the monitoring data collected in the archive system in a way that can be used by the engineering teams for further analysis. A demonstration has been provided to the System Engineering Group, in the context of the monitoring and alarm effort they are leading.

14. ADMINISTRATION

14.1 Operations Overview

Construction of the ALMA camp dorm expansion continued this month with the successful completion date of August 2nd for the first 16 rooms, eight more rooms are scheduled for August 15th and the remaining 16 rooms by mid September. These additional forty rooms should be sufficient to house all the ALMA staff and most visitors through the construction period.

Planning and procurement activities continue on the ALMA Santiago Central Office (SCO), which is still on schedule for completion and move-in the weekend of August 20th. Installation has begun for internet cabling, video conferencing equipment, furniture, and blinds. Chairs and other furnishings are being received. Purchase orders for the moving company, plants, signs, and more furnishings have been placed. Change orders to existing ESO maintenance contracts are in process to cover the new building. Processes for sharing services and metering utilities are being agreed with ESO. Emergency and evacuation programs are being prepared. Weekly meetings with ESO Administration and Contracts & Procurement, and the JAO SCO outfitting project team are ongoing to ensure everything will be ready for the office move.

The Facilities Group, working with the ESO and AUI Site IPTs completed the project to double the available temporary power to the AOS. This increase in power is sufficient for the AOS facility and up to 16 antennas. The purchase request for the permanent shelter to improve the reliability for the temporary power supply (TPS) has been placed. Reliable power at the AOS continues to be a primary concern for the Observatory.

A call for tenders for an exploratory well has been delayed until September. Requirements for water will increase significantly once Operations assumes Road Maintenance activities beginning in the fourth quarter of 2010. Conservation efforts will be increased at the site in the coming months. Calls for tenders for the ongoing services of fuel supply and catering & cleaning are being prepared. Both of these contracts expire in early 2011.

14.2 Finance / Budget

The 2009 financial report was accepted by the ALMA Board. The 2010 first and second quarter reports will be submitted to the ABC in August. Work continues with JAO management and the Executives on the 2011 budget and Version E of the ALMA Operations Plan (AOP). The final 2011 draft budget and AOP are scheduled to be submitted to the ABC by September 30th.

15. HUMAN RESOURCES

15.1 Recruitment

Local staff:

Three new employees joined the team during July, two in AIV and one in operations. We are now into the last round of AIV hires completing their staffing.

International Staff:

Lewis Ball accepted NRAO's contract offer to become Deputy Director, starting in September. Baltasar Vila Vilaro, System Astronomer, accepted the position of head of JAO data management group, effective August 1st.

Four interviews were conducted for the position of Head of ALMA Department of Engineering (ADE) and three of the candidates will have further interviews in August. The position of Human Resources Manager for International Staff and Head of Internal Communications was re-advertised with a deadline of September 15th.

15.2 Activities of the Month

Collective Bargaining Process: The whole month was dedicated to the collective bargaining process. The first 15 days of the month were dedicated to the calculation of different negotiating scenarios and drawing up the final version of the first answer from the employer, delivered to the union on July 16th. The second half of the month was dedicated to negotiations, which carried on into the first week of August.

Performance Evaluation for Local Staff: The PEP was kicked-off in July and various trainings were conducted to educate staff about the logic of each step of the process.

Training & Development: Details about ALMA's new approach to English language training, effective August, were communicated to all local staff. Emphasis will now be placed on conversation sessions at the OSF and personal use of the Rosetta Stone online software. Classroom lessons will be used to a lesser extent.

Two Communications Workshops were coordinated to take place at the OSF in August and invitations were sent to participants.

Ten staff members were invited to participate in a trial Microsoft Office online training (Lynda.com) that took place during July. The intention was to test the software in order to decide whether or not to purchase it; a final decision is expected during August.

16. EDUCATION AND PUBLIC OUTREACH

16.1 Infrastructure

Website

Intensive work is currently underway with the target of implementing version 2.0 of the ALMA website in September. Activities include: programming new modules for the Content Management System; designing of new templates for articles, press releases and events web pages; and definition of systematic protocols for eventual uploading of information.

16.2 Reporting

Internal Newsletter – April/May/June Edition

The eighth edition of the JAO Newsletter was released featuring the arrival of a fifth antenna to Chajnantor, the restoration process of the site museum and apachetas at the site and the story of the Andean constellations as told by community elders.

Science Newsletter

Work on the sixth issue of the science newsletter is underway. The release date, initially expected in the second half of July, was postponed until August due to late deliveries of articles by some of the contributors.

16.3 Description

ALMA Outreach Building Blocks

A more detailed version of the script for the 3D animation which explains how ALMA works was created. Based on this script, a call for tenders will be opened aiming to select a Chilean company to perform the production work.

New outreach material is being created including:

- Release of a 44-page booklet intended for the media, science communicators and visitors to the ALMA site. Two versions were made, both in Spanish and English. This booklet describes the different “extreme characteristics” that make ALMA such an exceptional project; it was very well received by general ALMA staff and astronomers.
- Release of a flyer intended for a general public, which explains the differences between wavelengths and how ALMA will "observe" the universe. The flyer was printed in Spanish and English versions.

Internal Outreach Material

EPO helped with the communications strategy to keep staff informed about the move to the new offices. Among other things, EPO prepared a Frequently Asked Questions for internal release.

Visit of IRAM labs in Grenoble, France

The EPO Officer visited the laboratory of IRAM in Grenoble, France, where several deliverables are being produced, including Band 7. This visit gave the EPO Officer the opportunity to interact with the teams working on these elements, to get to know the design and fabrication process, and photograph stages of the process, as part of the documentation of ALMA’s construction.

16.4 General Activities

Visits on site

In collaboration with colleagues from NAOJ, the EPO Office coordinated the visit of an important Japanese media delegation.

EPO also hosted the visit of a Chilean company which is preparing a 3D video about astronomy intended for children and the general public. The project is an interesting combination of real facts and fiction, in order to make the movie accessible to a young audience. Chilean astronomers such as José Maza and Luis Barrera acted as consultants to ensure the scientific accuracy of the information. This video will have great visibility among thousands of (young) people. The official opening in September should attract a lot of attention since it will be the first Chilean 3D movie. The Minister of Education already showed interest in attending the event. After that, the movie will be broadcasted at the Planetarium of Santiago and throughout Chile. Being one of the sponsors of the movie, ALMA will be highlighted in different ways as part of the promotion, including a 3D version of the ALMA logo which will be featured in the movie.

The EPO Office coordinated visits of amateur astronomers traveling to Chile and its main observatories as part of a trip to see the solar eclipse in Easter Island.

Recruitment

The EPO Assistant left on July 22nd. The recruitment process for the hiring of a successor is underway.

16.5 Education

Educational Improvement plan in Toconao

EPO organized a master class at the Toconao school. Therein, students had the opportunity to show to the community the work they have performed during the first semester of the year.

17. SAFETY

Fatal Accident

On July 13th the Shell truck that provides fuel to our site went up to the AOS to fill up the power generator tanks. On its way down, the driver lost control of the truck and flew over a dry ravine, landed, flipped over, and ended up at the bottom of the ravine. The truck was totally destroyed and scattered into pieces. The driver was ejected from the cabin and died instantly at the crash scene. Three thousand liters of diesel fuel were spilled. The accident investigation is being carried out by Shell as well as the clean up procedure. The cause of the accident is still unknown; an independent technical evaluation is underway.

High voltage trainings at ALMA

The National Fire Protection Association high voltage safety certification took place on July 26th-27th as scheduled.

Emergency plan

The emergency working group has made progress in several areas: emergency chain of command; inventory of emergency situations; safety and damage control; environmental assessment in emergency situation; and emergency communication systems.

The workplace risk assessments are also underway; if everything goes according to plan the assessments should be finished by mid-August.

Miscellaneous

Some emergency measures were taken during the wind and sand storms. Approximately five storms happened during the third week of July.

A man-lift training and certification course was carried out as scheduled on July 12th-13th and July 19th-20th.

Emergency brigade and fire protection

The emergency radio communication system did not work. Several meetings were held with the vendor to try to fulfill the emergency brigade needs, including a site visit to re-program the radios, but to no avail. The radios had to be sent back to the vendor.

The next emergency brigade trainings will happen during the first two weekends of August, two-days training per shift.

Health and well-being

The safety week was a success. Sixty people attended each conference on average. Talks addressed topics such as the effects of sun radiation and altitude, as well as ergonomics and environmental care.

18. LIST OF COMMONLY USED ACRONYMS

AAER: ALMA Annual External Review
AAS: American Astronomical Society
ABC: ALMA Budget Committee
ACA: Atacama Compact Array
ACD: Amplitude Calibration Device
ACS: ALMA Common Software
ACU: Antenna Control Unit
ADM: Administration Department
AEM: Consortium building the European antennas.
Thales Alenia Space (formerly Alcatel), European Industrial Engineering, MT-Mechatronics
AG: Antenna Group (DTS)
AIPT: Antenna IPT
AIV: Assembly, Integration and Verification
AOS: Array Operations Site
ARC: ALMA Regional Center
ASAC: ALMA Science Advisory Committee
AZ: Azimuth
BCR: Budget Change Request
BE: Back End
BEIPT: Back End IPT
BUS: Back-Up Structure
CASA: Common Astronomical Software Application
CCA: Cold Cartridge Assembly
CCB: Change Control Board
CDR: Critical Design Review
CIDL: Configuration Item Data List
CIPT: Computing IPT
CLOA: Central Local Oscillator Article
CMMS: Computerized Maintenance Management System
CRE: Change Request
CSV: Commissioning and Science Verification
DSO: Department of Science Operations
DTS: Department of Technical Services
EG: Electronics Group (DTS)
EMC: Electro-Magnetic Compatibility
EPO: Education and Public Outreach
EVALSO: Enabling Virtual Access to Latin-America Southern Observatories
EVLA: Extended Very Large Array
FAT: Factory Acceptance Test
FBG: Fiber Bragg Gratings
FC: Finance Committee
FE: Front End
FEIPT: Front End IPT
FESS: Front End Support Structure
FESV: Front End Service Vehicle
FETMS: Front End Test Measurement System
FRM: Faraday Rotating Mirror
GARD: Group for Advanced Receiver Development
HVAC: Heating, Ventilating and Air Conditioning
ICD: Interface Control Document
IF: Intermediate Frequency
IPT: Integrated Product Team

IRAM: Institut de Radioastronomie Millimétrique
IRR: Image Rejection Ratio
ISM: International Staff Member
JAO: Joint ALMA Office / Joint ALMA Observatory
LLC: Line Length Corrector
LO: Local Oscillator
LPR: Local Oscillator Photonic Receiver
LRU: Line Replaceable Unit
LSM: Local Staff Member
LSST: Large Synoptic Survey Telescope
MELCO: Mitsubishi Electric Company
MFPGS: Multi-Fuel Power Generation System
MG: Maintenance Group (DTS)
MIPT: Management Integrated Product Team
MRR: Manufacturing Readiness Review
MVA: Mega Volt Amperes
M&C: Monitor and Control
NAASC: North American ALMA Science Center
NCR: Non Conformance Report
NGAS: New Generation Archive System
NOAO: National Optical Astronomy Observatory
NRC: National Research Council (Canada)
OPT: Optical Pointing Telescope
OSF: Operations Support Facility
OT: Observing Tool
PA/QA: Product Assurance/Quality Assurance
PAI: Preliminary Acceptance In-house
PAS: Preliminary Acceptance on Site
Ph1M: Phase 1 Manager
PMCS: Project Management Control System
PRP: Proposal Review Process
PSU: Power Supply Unit
PT: Project Tracker
RAL: Rutherford Appleton Laboratory
RF: Radio Frequency
RID: Review Item Discrepancy
RFW: Request for Waiver
SB: Scheduling Block
SCB: Schedule Control Board
SCO: Santiago Central Office
SE: System Engineering
SEF: Site Erection Facility
SG: Software Group
SN: Serial Number
SOW: Statement of Work
TB: Technical Building
TF: Technical Facility
TPS: Temporary Power System
TRR: Test Readiness Review
UP: User Portal
UPS: Uninterruptible Power Supply
WCA: Warm Cartridge Assembly
WVR: Water Vapor Radiometer