ALMA MONTHLY REPORT

January 2010

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INTRODUCTION

This monthly report covers activities and major developments during January 2010.

The highlight for this period was the start of the Commissioning and Science Verification (CSV) phase. The actual handover from AIV to CSV actually took place on January 22nd. This period was also marked by intense activity to update the ALMA Operations Plan (AOP). A maintenance workshop was held in Charlottesville on January 12th-15th, and a second AOP workshop took place in Santiago, January 18th-21st. Good progress was also made in the project-wide exercise to reinstate a sound level of contingency for construction.

PROJECT MANAGEMENT

1. Management IPT and IPT meetings

MIPT meetings were held on January 14th and January 27th-28th, 2010. The former was a regular teleconference meeting. The latter was an eight-hour videoconference meeting spread over two days in place of a two-day face-to-face meeting as a cost reduction measure. Topics addressed included the proposed 15% cost-to-completion (CtC) budget cuts, partner warranty and spares obligations, expedited Change Control Board (CCB) process, responses to AAER09 panel recommendations, temporary power system status, and status of schedule-critical items. Weekly IPT teleconference meetings continued with an increased emphasis on actions regarding schedule-critical items. Finally, it was decided that the Monday lunch meeting of the JAO key personnel will become more formal.

2. Schedule and Cost Control

EU and NA projects, plus the JAO presented their proposed budget cuts to meet the goal of restoring the construction contingency to a level of ~15% at the January 12th meeting of the Budget Control Board (BCB). The majority of the proposed cuts could be accepted without further discussion. The unresolved items were clarified and decided on with further discussion at a January 19th BCB meeting and at the January 27th MIPT meeting. The total proposed cuts achieve the objective of restoring the remaining contingency to 40m TY$. The outstanding task is to generate, review and approve detailed budget change requests to finalize the revised budget in time for submittal to the Board well in advance of the April meeting.

Schedule control activities continued to focus on actions to deal with schedule-critical items resulting from the November 8th-9th emergency meeting of the Project Managers –especially for FE components not yet into production and FE integration. Unfortunately, these actions have not yet yielded many significant improvements in schedule performance (see section 5, below).

Cesar Ocampo was promoted to JAO Deputy Project Controller, effective January 1st, 2010.

3. System Engineering

Work has started to transition the JAO system engineers to system verification activities. In this respect, the system engineers are overlapping with the two system verification scientists before they head into part-time scientist positions at NRAO. The transfer of knowledge is vital to ensure continuity and support to the system verification tasks. In addition, the JAO system engineers have joined AIV in system diagnostic works and have signed up for participation in some of the CSV tasks.

The FE end-to-end verification review has been completed and the review report has been made available to the FE CDR review panel and management. In brief, the review panel has identified several de-scoping recommendations to the FEIC test sequences, which would result in an optimized verification sequence and therefore higher throughput. The rationale behind the de-scope is that the affected verifications are better covered at another level of integration.

The review process for the FE CDR is providing review item discrepancies covering the different disciplines and interfaces to the rest of the ALMA subsystems. The CDR meeting is planned for February 16th-18th at NRAO Charlottesville.

Preparations for BE photonics local oscillator CDR are moving ahead with the documentation and review plan already in place. The CDR meeting is planned for March 9th-11th at NRAO Charlottesville.

Guidelines describing the implementation of a tiered and timely process for the CCB have been produced and been iterated with the MIPT. In such guidelines, a clear separation of approving roles (CCB or IPT) has been reinforced together with a two-week deadline for processing those requests addressed to the CCB. The implementation of the guidelines is pending implementation of an automatic notification system in the Electronic Document Management (EDM) system.

The hiring situation of the NA System Engineer is still on hold.

4. Front End Integration

The subproject manager established and communicated to the Front End Integration Centers (FEICs) the following two missions of the Front End Integration subproject in 2010:

- We have 10 FEs worth of components in hand, five of which we integrated, tested and delivered by the end of 2009. We should turn the remaining five sets of components to FEs, and test and deliver them before the end of June, 2010.
- Thanks to the efforts of the FE and BE IPTs and the Executives, we are expecting a sudden rise of the delivery rate of the FE components in May. We should make the FEICs ready to absorb this “tsunami of FE components”, and make a successful transition to the steady-state FE delivery rate at FEICs. After that, we should deliver the first “post-tsunami” FEs from the three FEICs in July-August, 2010.

The subproject manager asked the FEICs to update their schedule according to these goals.

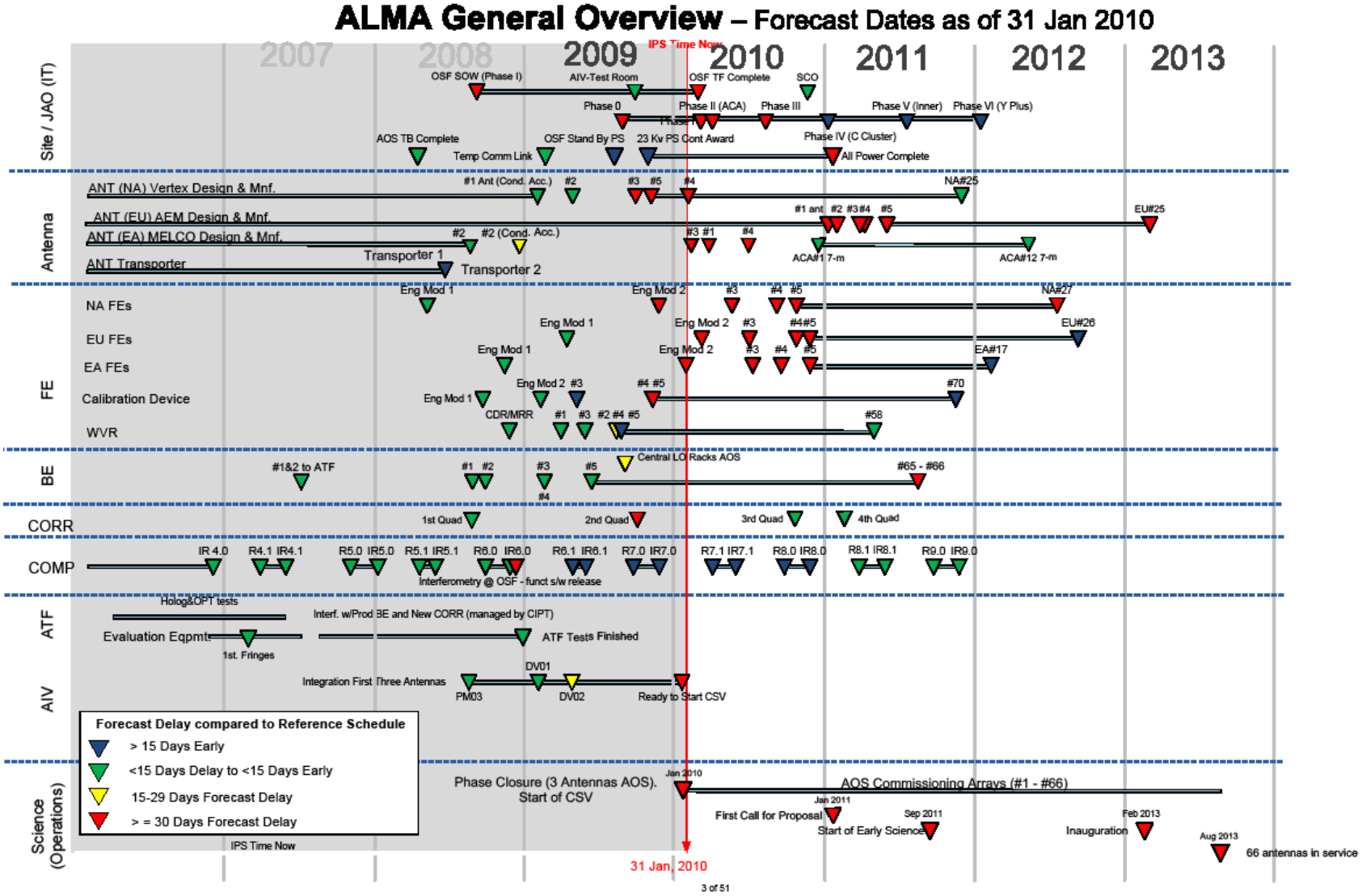
The test readiness review (TRR) for the second FE from the European FEIC (FE-04) was held and again a reduced testing scope was agreed in view of the test and measurement system available at the European FEIC and the schedule for delivering the FE. Its preliminary acceptance in-house (PAI) is expected on February 12th; this will be the sixth FE on site.

The subproject manager joined the FE end-to-end verification review and the ALMA maintenance workshop IV (on FE maintenance).

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 significant changes in the January 31st, 2010 forecast schedule displayed below with respect to the December 31st 2009 forecast schedule are:

- All power (i.e., 23 kV power system) complete: Jun 2011 → Jan 2011. The improved schedule forecast results from discussions with the 23 kV power system contractor now on board.
- EU antenna #25 delivery to AIV: Dec 2012 → Mar 2013. The contractor announced a 3-month slip in acceptance of EU antenna #1. They are working to reduce the propagation of this delay to #25 and will present their revised planning to ESO at a high-level management meeting on February 8th.
- EA FE #3, 4, and 5 delivery to OSF: Jul 2010 → Nov 2010. The change does not reflect shortening of the EA FEIC test time, which is currently being defined. The objective is to limit this slip to Aug 2010.
- Inauguration (50 antennas in service) milestone: Aug 2012 → Feb 2013.
- 66 antennas in service milestone: Apr 2013 → Aug 2013. Both the inauguration and 66 antennas in service milestones are delayed by a combination of the delay in the delivery of the EU antennas (see above) and entry into the forecast schedule of the effect of reduction in the peak AIV staffing, which has been proposed in response to the 15% reduction in the cost-to-completion budget exercise. If the EU antenna contractor can keep the delivery of antenna #25 before the end of 2012, re-optimization of the AIV work flow should allow us to keep the inauguration milestone in 2012 and the 66 antennas in service milestone in Jun 2013.


ALMA General Overview – Forecast Dates as of 31 Jan 2010
2007
2008
2009
IPS Time Now
2010
2011
2012
2013
Site / JAO (IT)
OSF SOW (Phase I)
AIV-Test Room
OSF TF Complete
SCO
Phase 0
Phase II (ACA)
Phase III
Phase V (Inner)
Phase VI (Y Plus)
AOS TB Complete
OSF Stand By PS
23 Kv PS Cont Award
Phase IV (C Cluster)
Temp Comm Link
All Power Complete
Antenna
ANT (NA) Vertex Design & Mnf.
#1 Ant (Cond. Acc.)
#2
#3
#5
#4
NA#25
ANT (EU) AEM Design & Mnf.
#1 ant
#2
#3#4
#5
EU#25
ANT (EA) MELCO Design & Mnf.
#2
#2 (Cond. Acc.)
#3 #1
#4
ACA#17-m
ACA#12 7-m
ANT Transporter
Transporter 1
Transporter 2
FE
NA FEs
Eng Mod 1
Eng Mod 2
#3
#4
#5
NA#27
EU FEs
EU#26
#4#5
EA FEs
EA#17
Calibration Device
#70
WVR
CDR/MRR
#1
#2 #4 #5
#58
BE
#1&2 to ATF
Central LO Racks AOS
#65 - #66
CORR
1st Quad
2nd Quad
3rd Quad
4th Quad
COMP
IR 4.0
R4.1 IR4.1
R5.0 IR5.0
R5.1 IR5.1
R6.0 IR6.0
R6.1 IR6.1
R7.0 IR7.0
R7.1 IR7.1
R8.0 IR8.0
R8.1 IR8.1
R9.0 IR9.0
Interferometry @ OSF - funct s/w release
ATF
Holog&OPT tests
Interf. w/Prod BE and New CORR (managed by CIPT)
Evaluation Eqpmt
ATF Tests Finished
1st. Fringes
AIV
DV01
Integration First Three Antennas
PM03
DV02
Ready to Start CSV
Forecast Delay compared to Reference Schedule
> 15 Days Early
<15 Days Delay to <15 Days Early
15-29 Days Forecast Delay
> = 30 Days Forecast Delay
Science (Operations)
Phase Closure (3 Antennas AOS). Start of CSV
Jan 2010
AOS Commissioning Arrays (#1 - #66)
Jan 2011
First Call for Proposal
Sep 2011
Start of Early Science
Feb 2013
Inauguration
Aug 2013
66 antennas in service
IPS Time Now
31 Jan. 2010
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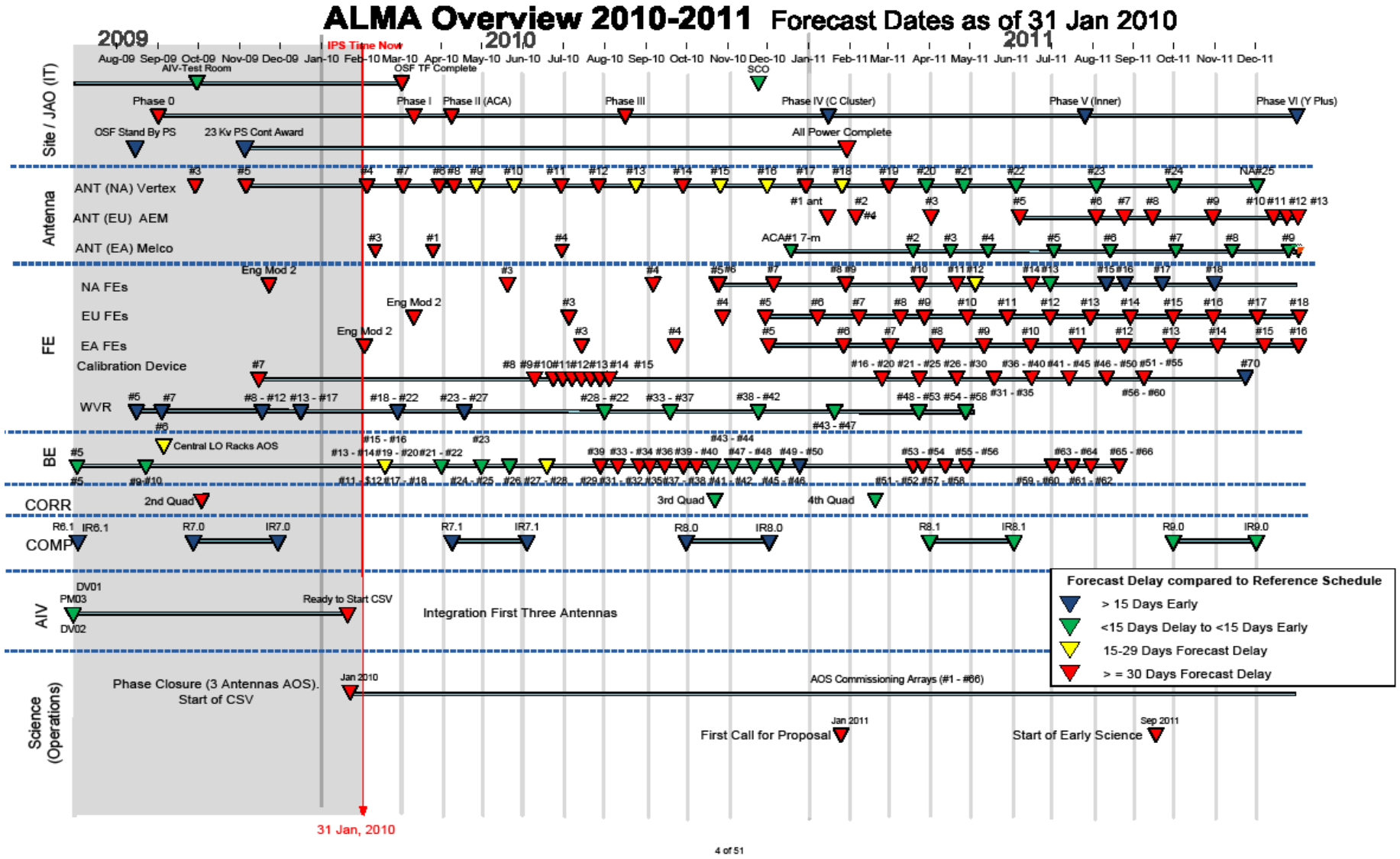
ALMA Overview 2010-2011 Forecast Dates as of 31 Jan 2010
2009
2010
2011
IPS Time Now
Aug-09 Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10 Sep-10 Oct-10 Nov-10 Dec-10 Jan-11 Feb-11 Mar-11 Apr-11 May-11 Jun-11 Jul-11 Aug-11 Sep-11 Oct-11 Nov-11 Dec-11
AIV-Test Room
OSF TF Complete
SCO
Site / JAO (IT)
Phase 0
Phase I
Phase II (ACA)
Phase III
Phase IV (C Cluster)
Phase V (Inner)
Phase VI (Y Plus)
OSF Stand By PS
23 Kv PS Cont Award
All Power Complete
Antenna
ANT (NA) Vertex
ANT (EU) AEM
ANT (EA) Melco
#1 ant
ACA#1 7-m
FE
Eng Mod 2
NA FEs
EU FEs
EA FEs
Calibration Device
WVR
#8 - #12
#13 - #17
#18 - #22
#23 - #27
#28 - #22
#33 - #37
#38 - #42
#43 - #47
#48 - #53
#54 - #58
#31 - #35
#56 - #60
#16 - #20
#21 - #25
#26 - #30
#36 - #40
#41 - #45
#46 - #50
#51 - #55
BE
Central LO Racks AOS
#15 - #16
#43 - #44
#13 - #14
#19 - #20
#21 - #22
#39
#33 - #34
#36
#39 - #40
#47 - #48
#49 - #50
#53 - #54
#55 - #56
#63 - #64
#65 - #66
#9-#10
#11 - #12
#17 - #18
#24 - #25
#26 - #27 - #28
#29
#31 - #32
#35
#37 - #38
#41 - #42
#45 - #46
#51 - #52
#57 - #58
#59 - #60
#61 - #62
CORR
2nd Quad
3rd Quad
4th Quad
COMP
R6.1
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
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31 Jan, 2010
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EA EXECUTIVE

1. Management

The EA PM reviewed the schedule of the EA deliverables with antenna, EA FEIC, ACA Correlator, and Bands 4/8/10 cartridge managers.

We continue to keep the payment procedures for goods & services according to the Collaborative Agreement between ESO and NAOJ, and the Master Agreement between NRAO and NAOJ.

To support the antenna acceptance process and to make the antenna operation and maintenance manuals in English, we hired a new Antenna Document Specialist in EA AIPT, who will start work next April. Also in April, two post-docs will join the East Asian ARC to support users.

2. ACA Antennas

2.1 ACA 12m antennas:

Antenna PM03:

PM03 has been under AIV operation. Regarding the lower temperature of the receiver cabin when the outdoor temperature is lower than -10ºC, an additional heater has been installed in the HVAC air flow system. This is a temporary measure and will be effective to keep the cabin temperature at 16ºC or above. The final corrective measures will be a large scale modification of the thermal insulation structure around the receiver cabin. The measures will be implemented for PM03 when it is returned to OSF in the middle of this year. The AZ stow pin function has been intentionally disabled for fear of an inappropriate movement of the pin. There is no urgent safety concern for antenna PM3 because the AZ mount of the antenna will not be moved by wind lower than 40 m/s. We are still discussing the corrective measures with MELCO. A failure had been found with batteries in UPS. These batteries were replaced with good ones that had been installed on PM04.

Antenna PM01, PM02:

MELCO started taking corrective actions for the HVAC, aiming at increasing the airflow rate in the receiver cabin.

NAOJ OPT was moved from PM02 to PM01. OPT measurements are going on at PM01.

2.2 ACA 7-m antennas:

Antenna CM01:

All operational functions were successfully tested. The drive performance test has started, including the adjustment of the AZ and EL servo system.

Antenna CM02-05:

Among the next four units of the 7m antennas, CM02 and CM03 have been assembled and under a series of tests at the MELCO's plant in Japan. Major subsystems for CM04 and CM05 have been constructed, and the whole antenna is being assembled.

3. EA Front End

After the preliminary acceptance on-site (PAS) of EA FE #2 (FEND S/N06) at the OSF, AIV has provided significant help to fix several technical problems, and most of the major action items are closed by this time.

The EA FEIC has been working on the test equipment system carried to improve its performance. Some of them are action items from the operation readiness review. We have two polarization maintain cables and will install them into the system to see how much the phase stability of the system is improved, particularly when the tilt table is moved.

The calibration of the beam scanner using the standard Band 3 feed horn has been carried out although it has not been completed yet because of technical trouble on one of the signal sources. EA FE #3 (FEND S/N09) was moved into the environmental chamber, and is almost ready for further testing, although we are still missing a couple of components including Band 6 warm cartridge assembly (WCA). Since we would like to perform some testing to improve the performance of the test system itself, a regular PAI test will start in the middle of February.

Preparation for the second test line is also under way. The second IF processor was delivered to the EA FEIC and is undergoing a functional test. It will be installed by early April. The second beam scanner has been ordered and is expected to be delivered to the EA FEIC by mid-year. EA FEIC has decided to develop the local oscillator reference test module using a Mach-Zehnder optical modulator device.

The noise performance retest of Band 4 cold cartridge assembly #2 (S/N CCA4-02) with warm optics is in progress, followed by the Gain compression retest. In parallel, we evaluated the effect of the Au-plating mirrors and ultra-high-precision machined mirrors for the warm optics. The measurement results with these two types of mirror were not much different from that of the conventional warm optics. The results will be reported to the FE IPT. Although the evaluation results of the chamfered horn were not much different from that of the normal horn, we decided to use the chamfered horn for the cartridge production because, in theory, it is expected to reduce the interference noise.

Having been approved by the PAI review chair and the FE IPT, Band 8 cold cartridge assembly #1 (S/N CCA8-01) with WCA (S/N WCA8-3) was shipped from NAOJ to the NA FEIC on January 13th for the January 16th airfreight from Narita. The Band 8 cartridge team is preparing the data of the health diagnostics that will be conducted at room temperature and configuration data for the coming PAS at the FEIC. We are continuing the test of Band 8 CCA #2 (S/N CCA8-04) with replaced multipliers that were newly supplied from NRAO. The noise temperature and image rejection ratio have been measured. The ground contact of the SIS device was bonded by wire instead of Indium. After the iterative experiments of the wire-bonded device, the results showed its characteristics were not much different from that with Indium. As the stable bonding method was established during the experiments, we will adopt the wire bonding, instead of Indium, for the SIS mixer.

4. ACA Correlator

The report of the signal transportation test from the AOS antennas (performed last month) was provided for the AIV team. Also, the scientific functional tests were started, and then more than half of the test items have been completed at present.

EU EXECUTIVE

1. Management

The results of evaluating cost saving options and assessing their impact were presented to the BCB and Management IPT. The goal of the parametric budget cuts, the establishment of a higher construction contingency, has been reached.

Documentation for the extraordinary ESO Finance Committee meeting on February 8th was prepared. One of the major items in this meeting will be the procurement of the multi-fuel turbines.

Various members of ESO ALMA management and IPTs prepared for and participated in the maintenance workshop and the ALMA Operations Plan update meeting.

A high-level management meeting between ESO Council, ESO management, ESO ALMA management and representatives of the AEM consortium was organized for February 8th.

2. EU Antennas and Transporter

Antenna – OSF status

At the OSF, there are at present five antennas in integration.

The main progress concerning antenna #1 includes:

- Insulation: more panels have been mounted with correction of interfaces. The progress is estimated at 70%. There are still many detail areas demanding minor fitting modification. The subcontractor Zarges is on site to complete the work and to produce red-mark drawings.
- Mechanical fitting: this was advanced in parallel with painting touch-ups. Some refurbishment has to be done on the cable wrap and some minor parts. Installation of chiller on platform.
- Cabling: was sensibly advanced in areas like rack to rack cabling, motor cabling. The work is now basically stopped due to missing cable trays preventing to proceed to the cabling from access platforms to steel structure and cabin.
- BUS#1: further investigations were done on the panel mounting which have largely (if not totally) explained the problem. A test mount of 12 panels to verify the impact on the final surface has been done with basically good results (first adjustment 32 micron RMS). For this reason final mounting of panels starts beginning of February and is expected to be completed before the 20th. Work on feed shutter plus finishing the external part of the BUS are needed before lifting the BUS on the cabin.

  A minor accident occurred in the cabin during the removal of the dummy FE assembly. Three lifting lugs, not foreseen for this operation were used and were ripped off the ceiling of the cabin. The material damage is very minor. No injury resulted from the accident. The repair process is known and will involve approximately two days of work for two people.

The main progress concerning antenna #2 includes:

- Insulation: pending on resolution of detail issues of antenna #1 and missing manpower.
- Mechanical assembly: installation of main cable tray. Other work stopped due to missing screws and parts. Minor details on platforms and painting touch up.

Measurement of AZ axis stopped due to missing shim at base causing a misalignment. AEM asked ALMA to lift the antenna with the transporter to insert the shim. Antenna lifting brackets were mounted in order to perform the lift off. The interface is fine.

- Cabling: started rack to rack cabling (approximately 30% complete) and corrected cabling on azimuth and elevation motors.
- BUS#2: completion of checking panel adjusters and completion of lightning protection on BUS. Preparation work for panel mounting.

Antennas #3, #4, #5:

- On antennas #3 and #5 only minor integration work was done due to missing buildings and missing parts. Corrosion protection and some cabling work in the bases were performed.
- No work was performed on antenna #4 due to the clarification of an unloading accident (pending since October 2009). Issue reported solved at progress meeting in Mainz on January 20th.

In general the progress is not as expected and needed. The work is still affected by missing parts, missing personnel, use of outdated documentation and changes performed from the design status, as well as late arrival on site of Zarges personnel.

All these issues will be discussed at a high-level ESO-AEM management meeting on February 8th.

Antenna - Logistics

- Logistics aspects have improved but not as much as expected. Work is still affected by missing parts, sometimes even simple screws.
- Various materials arrived on site, including cabin #5. Cabin #6 was shipped from France.

Antenna – Progress in Europe

- In Europe production of parts is in general going well. ESO inspected cabin #10 and 11, while inspection of BUS 7 and 8 is pending on availability of ESO.
- Inspection of Apex and sub reflector mechanisms 5, 6 and 7 were performed. The problem encountered with the sub reflectors of the Vertex antennas has been discussed with PI and no issue is open on this for the AEM antennas.
- In Spain, antenna #6 has now been moved to a different integration pad in order to perform some additional tests on the azimuth axis. A meeting on the verification procedure to be used in Spain and for acceptance in Chile has been held with positive results. Antenna 7 is almost fully integrated apart from some minor parts. The main assemblies of antenna 8 are integrated. Two access platforms are available. The strategy of integration in Europe is being revisited. The adapted plan is to integrate skirt and insulation in Spain prior to shipment, and to pre-assemble the platforms before shipment, to avoid interface problems as encountered in the past.

Antenna – Programmatic

- Some progress is reported on the preparation of documentation related to commissioning, verification and acceptance. This will be the topic of a detailed meeting in February. Work on the maintenance and operation manual was reviewed by ESO at a dedicated meeting.

- At the progress meeting of January 19th-20th in Toulouse the consortium presented a schedule showing further delay on antenna 1 to 6 and a late end date of the project. ESO has made it clear that this cannot be accepted, and an AEM-ESO management meeting has been called for February 8th in Garching. The need for additional shelter(s) and improved production quality in Spain, as well as reinforcement of the site team has once more been highlighted by the ESO IPT team.
- A modification of the payment plan to further improve the cash flow of AEM has been asked by AEM and is under evaluation by ESO management.

Transporter

Work continues on the fire extinguishing system for the two transporters. The test plan has been received and reviewed by ESO. Installation on LORE has started. The plan is to have the acceptance test of the system in February.

Ridges and I/F plates.

The production of ridges and I/F plates continued at the contractor in Spain. Production of the third batch is ongoing. The base plates for the ACA I/F arrived on site on January 26th.

Inspection of the first base plates produced by Nortemecanica was performed successfully in January. Production of the 210 plates is well advanced. Production has been stopped by ESO in order to check the acceptability of the material specified for the anchoring studs. A decision is expected beginning of February.

Other

Interaction with ALMA on various issues continues. Spare parts and maintenance intervention times data were provided to Operations. Actions generated at the December 2009 workshop are being pursued.

In Garching staff was recruited to work on quality assurance and documentation. Plans are being reviewed to recruit more staff and consultant(s) for the acceptance process.

In Chile interviews with three candidates to support assembly, inspection, and acceptance testing (including nighttime pointing tests) were held. The candidates are provided via a service agency and can start on short notice.

Suitable office space and equipment in view of the increasing number of personnel in the next months and years on site is being procured.

3. EU Front End

In January further progress has been made on cryostats, Band 3 warm mirrors, Band 9 cartridges, EU FE SN04 (EU FE #2), water vapor radiometers (WVRs), amplitude calibration devices (ACDs) and power supplies.

Members of the FE IPT attended the Maintenance Workshop at NRAO in Charlottesville from January 12th-15th.

The FE CDR data package was prepared and made available to the review team on ALMA EDM. Directly following the FE CDR a FE IPT all-hands meeting will be held in Charlottesville on February 18th-19th.

Cryostat #18 passed its PAI review. Cryostats #15, #16, and #17 (initially scheduled for March 2010 delivery) have been shipped to the EA, EU and NA FEICs, respectively.

According to current planning it will take until May 2010 before cryostat #17 can be used for integration due to late availability of other critical components.

Three sets of Band 3 warm mirrors were delivered by the contractor during the second half of January. These units have a minor non-compliance related to the surface roughness due to problems with the Au coating. This results in an increase of the Band 3 receiver noise temperature of about 1-1,5 K. Production of the next batch of mirrors is under way. Delivery of this set is scheduled for early February, and it is expected that these mirrors will be compliant. The Au plating for these units is done by another company.

Band 9 cartridge #33 has been prepared for acceptance and is currently undergoing PAI review.

The TRR for FE assembly SN04 (EU FE #2) to be delivered by the EU FEIC was held on January 18th. The acceptance verification plan for this FE assembly has been reviewed at this occasion. The PAI review meeting is planned for February.

Extensive testing has been performed on the phase stability of the beam scanner test equipment. The beam scanner hardware has been assembled at the contractor's premises and is being prepared for factory acceptance.

Concerning EU FE #3, a number of missing components, scheduled for delivery between September and November 2009, had still not been received in January. This has a negative impact on the FE integration and delivery schedule.

Another 11 WVRs have been assembled bringing the total number of manufactured WVRs to 28. Out of these 11 WVRs, nine have passed RF testing at the contractor's premises in January, and two units are to be tested in February. PAI review of the next batch, consisting of 10 units, is scheduled for February 11th.

ACD: All procurements for components needed for the pre-production loads have been placed. The call-for-tenders package for the calibration loads production has been completed and a preliminary inquiry has been issued by ESO CP. The blocking issue of the ACD robotic arm has been investigated and the cause of the problem has been identified. The problem was caused by a faulty interconnect inside the robotic arm. This was due to a flaw in the mounting process of the interconnect. The contractor has taken steps to avoid this issue for future units and the delivered units will be inspected and repaired if necessary.

FE DC power supply: Production of the FE DC PSUs is proceeding. Due to a problem in the assembly of some of the circuit boards the delivery of the first production batch has slipped by about four weeks into March. The mounting frames are being procured and will be available at the same time as the FE DC PSUs are delivered. Following the maintenance workshop that was recently held in Charlottesville a few more FE DC PSUs are expected to be procured for the OSF Lab. Some test loads, to simplify acceptance and maintenance, will also be procured from the manufacturer.

4. EU Back End

Effective January 1st, Hervé Kurlandczyk took over from Fabio Biancat Marchet as ESO Back End IPT lead. Also effective January 1st, Silvio Rossi moved from the BE IPT to the EU Antenna IPT and relocated to Chile. He will still provide support to the ESO back end deliverables at the OSF for a fraction of his time.

Digitizer assembly: PAI of Lot #4 was successfully carried out in Bordeaux. The units were not sent directly to Socorro as a new firmware release had to be implemented in order to

solve a communication problem between formatter and digitizer observed in the field. The current firmware version 7.3 seems to solve this communication problem. Both Back End in Socorro and the Université de Bordeaux have extensively tested the new firmware and it was decided to proceed with the upgrades. The lot #4 composed of 35 upgraded units will be shipped to Socorro beginning of February.

It is foreseen to send a team of four engineers to the OSF beginning of April in order to upgrade the digitizers already installed in antennas in Chile.

Photo mixer: Batch 1, 2, and 3 are tested and ready to be sent to the FEICs. Batch 4 is in production. A photo mixer failed after shipment to the EA FEIC and was sent back to RAL for failure analysis. The analysis is still ongoing and a replacement was sent to the EA FEIC. The Faraday mirrors to be implemented for Band 9 photo mixers have not yet been sent to RAL due to an NRAO provider delay.

Due to a higher failure rate of photo mixers than expected, the possibility of repairing them is being investigated. The original maintenance plan was to dispose of them if they failed.

Fiber optics: The assignment of antenna pad to fiber connector module in the AOS patch panel was discussed with the Science IPT. The idea is to make the fiber patching as easy as possible when antennas are moved. This depends on the most probable moves of antenna groups during future array operation. The agreed solution will have to be implemented at the AOS patch panel.

Optical data transmission system: The PAS of rack number 5 of the fiber optic amplifier/demultiplexer at the AOS technical building was successfully held.

5. System Engineering and Integration

The documentation for the cryo system auxiliary review was prepared and provided to the review panel for review and comments. Initially scheduled for February 11th, the review has been postponed by decision of the JAO due to unavailability of DTS staff.

The OSF was visited to continue the cryo system testing at the AOS. Visitors from several IPTs and DTS were shown the test activities. At the AEM antenna integration area the length for the Helium lines and electrical cables for the European antenna was established. The drawing update started and antenna IPT was contacted to confirm these. Five more enclosure controls were built and testing started. They will be handed over for the integration into the indoor cryo compressor unit enclosure. The further procurement of the enclosures is an area of concern and more emphasis will be given to this issue.

Several telecons were held with SIVECO to agree the way forward for the CMMS contract close out. The current plan is to do this in February of 2010. SIVECO procured the barcode reader and prepared the SW for the interface to the bar code reader. This was sent to Chile and shall arrive in February. The maintenance meeting was attended, support was given to prepare for the Front End CDR and several other PAI and TRR meetings were attended.

NA EXECUTIVE

1. Management

The cost to complete exercise moved further forward with a summary of the NA parametric cuts being provided and discussed with the MIPT.

The second phase of the FE IPT changes results in the reorganization of the FE IPT leadership as described below.

The NA Project Manager announced that he would be leaving NRAO to take up the post of ESO Director of Programmes on July 1st, 2010. Mark McKinnon (currently the NRAO EVLA Project Manager) will take over as NA ALMA Project Manager in mid-March. Adrian Russell will continue in his role as NA Project Director until he leaves and will support Mark in his new role.

2. NA Antennas

On January 29th the antenna acceptance team met and accepted fully the Vertex antenna surface. This closes out a long standing open item on the Vertex antenna performance.

Work continues on DV04 with a view to bringing it to an acceptance meeting on February 15th.

There has been a breakthrough on the understanding of the offset pointing of the Vertex antennas. After careful detective work, a team led by Jeff Mangum has established that the initial points in an offset pointing run are affected by the residual part of the settling of the metrology system after a large slew. Although the metrology system settles fast enough to meet the all sky pointing requirement of 2 arcsec rms, the residual settling is significant compared to the 0.6 arcsec offset pointing requirements. Since the first sample is used to establish the reference point for offset pointing it was contaminating the data. When this is taken into account then the offset pointing is much better. This will be reviewed at the DV04 acceptance meeting in February.

3. NA Front End

The chassis vibration tests have been completed and the final procurements are in process.

The FE IPT in North America has been reorganized: To reflect the ALMA project's evolution from design and development engineering to recurring manufacturing operations, the organization of the North American (NA) ALMA FE IPT will transition after the Front End Critical Design Review on February 19th. At that time, primary responsibility for the FE IPT will transfer from John Webber to Skip Thacker and Bill Randolph. Skip will be responsible for technical leadership and be the FE IPT Leader; Bill will be responsible for programmatic leadership and be the FE IPT Project Manager.

Kamaljeet Saini will become the Deputy FE IPT Leader, concentrating on intra and inter-IPT systems integration. John will continue in his NRAO roles as Director of the Central Development Laboratory and ALMA NA Correlator IPT Lead, and will become increasingly involved in the NRAO Square Kilometer Array Program.

Eric Bryerton will assume responsibility for the FE Local Oscillator production group formerly headed by Skip. Eric will be responsible for the timely delivery of warm cartridge assemblies and cold multipliers to the three ALMA FEICs.

4. NA Back End

The BE IPT is optimistic that a new version of Digitizer (DG) firmware has solved the intermittent communication hang-up problem between the DG and the Formatter in the DTX LRU. Testing is still ongoing.

BE is scheduled to ship nine antenna article sets to Chile at the end of the month.

5. NA Correlator

The PAS meeting for quadrant two of the correlator was held January 20th. The recommendation of the panel was to accept the second quadrant.

SITE

1. OSF

The OSF Technical Facility completion and modification continued at a slow pace. Review of the modified HVAC system design is still pending. The tender documentation for the architectural and engineering design of the Residence is still under review and revision. It was decided to move ahead with an immediate 40-room expansion of the ALMA camp dormitories in order to alleviate the high cost and inconvenience of accommodating camp overflow at San Pedro hotels.

2. AOS

All of the 192 AOS antenna foundations have been completed. Turnover of the as-built documentation folders for all foundations to the antenna station subproject is underway. Insert installation was completed for eleven antenna stations that are critical to continuation of CSV. The contractor for AOS road networks continued to make good progress, whereas the contractor for power and signal networks, while performing well technically, fell behind in schedule. The contractor has replaced most of their on-site management team and is striving to improve schedule performance.

3. Power

The problem with the contractor installing AOS utilities noted above has caused delays in the implementation of the AOS temporary power system. Installation of the power lines, transformers, and switchgear, which was scheduled to be completed by January 20th, has been delayed until February 10th. The two additional containerized diesel generators completed outfitting and testing at the suppliers in Santiago and were transported to the OSF on January 29th. We currently forecast completion of the first stage of the temporary power system by February 15th, just in time to keep from impacting the commissioning and science verification schedule.

Discussions with the 23 kV power system contractor and their critical sub-suppliers resulted in significant schedule improvements. Completion of the 23 kV power system is now forecast for January 2011. Installation of the permanent fiber optic line between the AOS and OSF is now forecast to be completed by July 2010. This removes the need to consider a temporary AOS-to-OSF fiber optic connection. Approval to award the contract for construction of the multi-fuel power generation system by the ESO Finance Committee is still expected at an extraordinary meeting on February 9th.

4. Santiago Central Offices (SCO)

Good progress continues with construction of the SCO. Installation of HVAC and electrical subsystems, as well as finishing work on interior walls and ceilings continues. Everything is still on track for completion of the SCO construction before mid-2010.

PROJECT ENGINEERING

AIV Progress

a) Three antennas have been transferred to the CSV team, marking the beginning of Science Commissioning. Yahoo! AIV continues to support the antennas as needed during the CSV work.

b) The Front End SN06 has had all level A punch-list items corrected by AIV staff (with the support of the FE-IPT and EA FEIC), and has been installed in antenna DV05. At this time there are two equipped antennas being processed through the AIV stations, and should soon become available to become part of the OSF permanent interferometer. As a result of the FE delivery difficulties, the startup of the interferometer is delayed to February 4th.

Product Assurance Events

c) At the end of January, the antenna acceptance team reviewed NA A-IPT's report on the surface performance of the Vertex antennas. The report, led by Darrel Emerson, showed the decomposition of surface errors that occur as a function of bulk temperature into Zernike polynomials, convincing the panel that this treatment works effectively and is repeatable on two different Vertex antennas, and hence as a general solution. Using this method, and bringing in the other errors (manufacturing errors, solar illumination, gravity deformation, holography measurement errors and holography measurement allocation among others) using the agreed "common antenna testing procedures", the report shows the Vertex antenna meets the 25um surface accuracy requirement over the full temperature range and including a 1 sigma error margin. The panel recommends accepting the surface performance of Vertex antennas, which is, removing this condition from the Vertex conditional acceptance agreements to date.

d) The second quadrant of the 64-antenna correlator successfully passed its acceptance review and will be recommended for acceptance.

e) In February we will review the PM-02 antenna, and also the DV04 antenna, for acceptance. The PM-02 antenna data package includes information on the final surface verification of the PM antenna model.

f) A draft of the ALMA Product Assurance audit Phase 1 report has been exchanged between the JAO and the audit team chair; we fully expect the final Phase 1 report to be received in February. The second phase, an audit of the antenna production quality processes, should also begin in February.

SCIENCE IPT

1. Testing in Chile

During the first two weeks of January we undertook a series of tests to give us an overall picture of the state of the three-element interferometer operating at the AOS. Although these tests and the work undertaken previously have identified a substantial number of "issues" the majority of which are not solved, it was agreed at a review held on January14th that the system was in good enough state for us to make a formal start on Commissioning and Science Verification. The handover from AIV to CSV actually took place on January 22nd.

We are at present working on an initial set of 17 tasks, of which some are tests of particular sub-systems –antennas, receivers, back-end and so forth– at a more intensive level than was undertaken during AIV, and some are tests of the system as a whole, such as the trials of the basic observing modes. A small team is assigned to each task and the responsibilities for writing reports and providing expertise have been assigned.

We were at long last able to move into the proper control room at the OSF. This is definitely a great improvement over the corridor, but unfortunately the air conditioning cannot be used at present because it is too noisy, so it can be rather hot work!

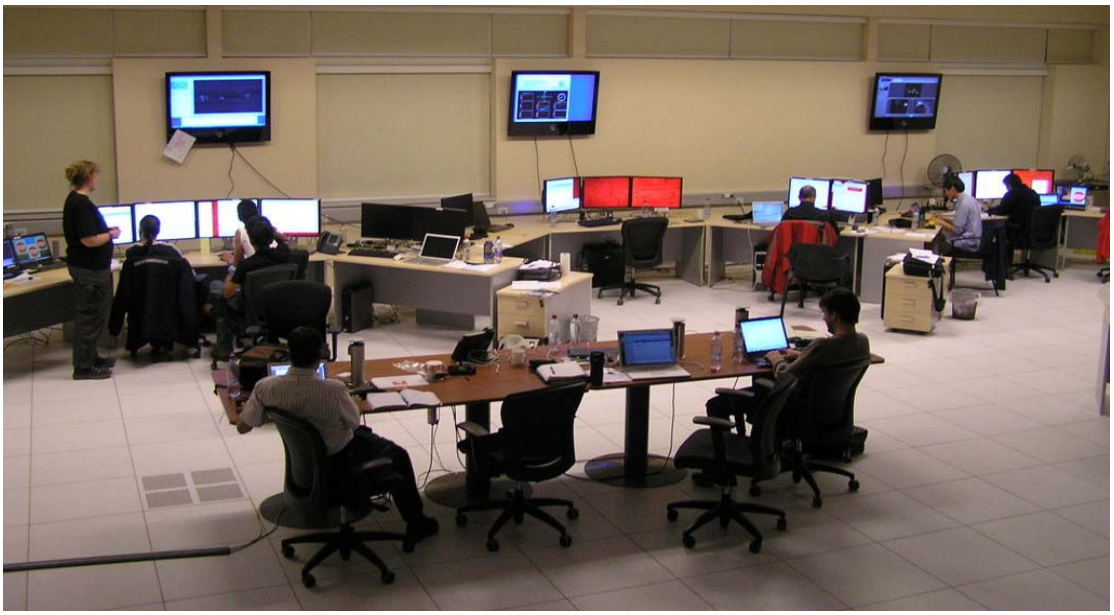
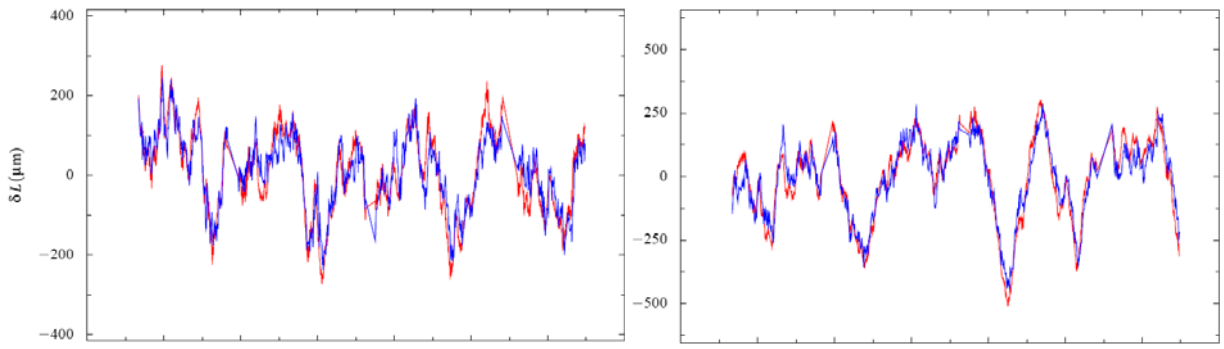


Fig.1-Control room at the OSF

One aspect that is progressing quite well is the initial testing of phase correction using the WVRs. Here is a run on two baselines of about 20 minutes of data –interferometer phase in red, estimated correction from the WVR's in blue. Clearly there is a very tight correlation, which means that the correction will work well under these conditions.



Some of the hardware problems that had been identified earlier are on the way to solution – for example it appears that the cause of the 8-nsec delay changes in the digital transmission system has been found, although it will probably not be possible to make the changes to the firmware needed to solve it until mid-April. A plausible hypothesis to explain the "two-times Azimuth" errors seen in the pointing of DV01 since it moved to the high site has also been found. Most of our time is however taken up by software problems. Many issues were solved as a result of long sessions at the site by members of the Computing IPT. We are nevertheless quite restricted in what we can do at present by a combination of known faults or unexpected behavior in a number of areas. Of particular concern at the moment are the correlator software and the archive and the interactions between them.

Looking ahead, the biggest concern remains the delays in deliveries of equipment and infrastructure. In the short term we need to move the antennas to the ACA stations where we will have the short baselines which are needed for quantitative tests of phase stability and for holographic measurement of the antenna surfaces using astronomical sources. We had expected that the antenna stations would be ready with power and communications by February 1st but this has slipped by several weeks. After that the limiting factor is likely to be the delivery of the next few front-ends and calibration devices. The present forecasts indicate that these will come considerably later than is necessary if we are to meet our next important milestone of obtaining synthesis images with six antennas by June 2010. We are very much hoping that it will be possible to accelerate these deliveries.

ASAC

The draft document on the Proposal Review Process was sent to the ASAC and some preliminary e-mail discussions have already taken place. A report will follow the face-to-face meeting which takes place in Tokyo on March 9th-10th.

Other

Several team members attended the important meeting on software planning and scheduling in Socorro. The lead developer and sub-system scientist for the Observing Tool visited Chile and we are continuing to test this key component and provide feedback to them. A great deal of effort has been going into the investigation of possible ways of reducing the cost of operations.

Staffing

New members joining the commissioning science team in January were Daniel Fullà, Lance Simms and Eric Villard. Al Wootten, who must be the longest-serving member of the ALMA science team by some margin, also joined us here in Chile. He will be here for much of this year. Three strong candidates for the two remaining commissioning posts were interviewed.

Outreach

The presentations at the AAS meeting appeared to go well and the accompanying press release attracted some attention here in Chile. ALMA was also represented at the NA URSI meeting in Boulder. Preparations are underway for various workshops and national and regional meetings featuring ALMA that will be taking place in the coming months.

COMPUTING

In January the CIPT supported the R7 release, including the demonstration of astronomical holography and fringes on ephemeris objects (Jovian moons). While bugs continue to be

found and fixed, the software is ready for CSV. In addition to the work towards CSV, missions in Chile have supported the routine use of the Phase 2 Observing Tool by AIVC staff, as well as a cleanup of the overly voluminous log messages that the system produces.

Work started late in the month towards first fringes with the OSF interferometer. This work is expected to conclude in early February, after which work towards making it a platform for routine testing of CIPT software will commence.

On January 11th-12th a two day meeting was held with CIPT stakeholders (AIV, CSV, DSO, SE) to discuss CIPT planning, focusing on the coming year. While clarifications on need-by dates and information still needed by the CIPT were exchanged, no major surprises were discovered.

The CIPT were also represented in discussions of the update to the Operations Plan, and worked on planning for a reduced funding level (~20%) starting in 2015.

SCIENCE OPERATIONS

1. Operations Plan Update

The work on the update of the AOP and operations budget continued. There was a maintenance workshop in Charlottesville on January 12th-15th, and the second AOP update workshop was held in Santiago January 18th-21st with about 30 participants from the JAO, the ARCs and the Executives. Currently the chapters in the AOP are being updated and several cost saving scenarios are being investigated. The next AOP workshop will take place in Santiago February 10th-12th.

2. Science Operations IPT Meeting and CIPT Planning

Science Operations IPT

The Science Operations IPT had a face-to-face meeting in association with the AOP update workshop. There were discussions on the update of the AOP, the integrated schedule for software deliveries and tests as well as the reviews to be held during 2010, including the Observatory Readiness Review.

CIPT planning meeting in Socorro on January 11th-12th

Several staff members from the DSO and the ARCs attended the CIPT planning meeting in Socorro. The software delivery schedules and the content of each delivery of the various software packages were discussed and agreed upon. The schedule for user tests of the software was also agreed upon.

3. DSO Activities

Hiring: The interviews for the final Array Operator position were held. There were several good candidates and a job offer has been made.

Operations Astronomer positions are advertised with a deadline of March 1st.

Two new DSO astronomers, Tommy Wiklind and Stephane Leon, have arrived in Chile.

Support to AIV and CSV: The Array Operations Group is now providing full 24-hour coverage at the OSF with nine operators, and the DSO astronomers continued their support to AIV/CSV activities.

Software: Alan Bridger (developer of the ObsTool) visited the OSF and Santiago to get input on the creation of scheduling blocks and proposal preparation and submission. DSO staff is currently participating in a user test of proposal preparation and submission for which a proto-archive has been installed in Santiago.

The groups working on various aspects of the operations software tools (especially the ObsTool, Ph1M, dynamic scheduler and Project Tracker) continue their work with regular telecons.

DSO staff are participating in the ongoing tests of the pipeline.

3. ARC Activities

3.1 NA ARC

Hiring:

Candidates were interviewed for NAASC science positions; CASA developer; and NA archive technician positions. Advertisements were posted for NAASC post-doc and administrative assistant.

JAO support:

The CSV liaison K. Sheth continued his tours at OSF.

An ALMA memo was produced describing the most important frequencies in Band 6 for polarization work (SCID-90.00.00.00-019-A-REP) to inform the ongoing tests on Band 6 performance at NTC.

The NA ARC staff attended various meetings, including the CIPT planning meeting in Socorro, the FE M&R workshop meeting in Charlottesville, the AOP workshop in Santiago January 18th-21st and the SciOps IPT face-to-face in Santiago January 22nd.

Software development & testing:

CASA development and testing continued, including support of the CASA helpdesk, meetings on the CASA viewer, tutorials on CASA simulation data at UVa & AAS, and the production of an NRAO eNews article on CASA release 3.0. A project-wide simulation workshop was organized and hosted. The workshop prototyped a use case/user guide to simulation presented on the casaguides wiki: http://casaguides.nrao.edu/index.php?title=Simulation_Recipes.

ARC staff conducted a gap analysis for the Kayako helpdesk system against ALMA requirements and they also participated in ALMA helpdesk requirements & planning meetings with the helpdesk developer.

ARC staff built a SLAP (Simple Line Access Protocol) client in PHP for use in accessing Splatalogue (and other VO compliant spectral line databases) from CASA, and in IDL for more general use.

ARC staff continued to improve the ObsTool exposure time calculation and to update the forms that will be used for technical assessment and began the ObsTool test.

Conferences and workshops:

ARC staff attended the January AAS meeting and presented ALMA and NAASC at the NRAO Town Hall. Posters were presented on ALMA status, ALMA science, CASA and the Splatalogue at an ALMA special session sponsored by NAASC.

The Splatalogue "infomercial" (can be seen by searching for "splatalogue" on YouTube) was produced and debuted as well as the ALMA mouse pad and ALMA Primer (contributed by Canadian partners from HIA).

Other: A draft of the NSF proposal to fund the NA share of ALMA Operations 2012-2015 was refined and sent for review to NRAO and AUI management.

3.2 EU ARC

Hiring: The ARC is re-advertising an ARC astronomer position whose main tasks are to assist the ARC Manager in managing the ARC nodes, participating in the proposal handling process and organizing the technical feasibility. The deadline is March 31st. Two ARC scientist positions will be advertised soon.

CSV Support: ESO ARC astronomers are already taking part in ALMA Commissioning. Each will spend six months in Chile. The first 'CSV liaison' is currently on site (M. Zwaan), second to start in April (A. Biggs).

Software testing:
1. A. Biggs is organizing the current ObsTool testing (due February 16th) and the EU ARC staff will participate.

2. Zwaan and Biggs will also participate in the pipeline testing.

3. EU ARC staff is testing the CASA simulator and specific CASA tasks.

4. D. Petry is contributing to CASA developments related to CASA testing.

Participation in conferences and workshops:
Workshop: Simulator workshop Charlottesville January 11th-12th (E. van Kampen, D. Petry)
Workshop: Astrochemistry at High Resolution organized by Astrophysical Chemistry Group with ALMA input http://www.jb.man.ac.uk/meetings/HiResChem/ January 7th-8th (E. Humphreys)

Other:
P. Andreani participated in the AOP workshop January 18th -22nd.
Activities continue within the Radio Net ALBiUS work package. ESO ARC deliverables are: interoperability and direction-dependent calibration tasks.

3.3 EA ARC

Hiring: Two NAOJ post-docs will start work at EA-ARC in April. Two ARC astronomers/scientists positions have been advertised. The interviews will be held in mid-February with hiring in Q2 2010.

CSV support: The schedule until next March was sent to the Deputy Project Scientist. Kengo Tachihara (NAOJ) will work from February 17th to March 24th 2010. We also discussed his CSV tasks for the next six months with the Deputy Project Scientist.

Software testing:
Kazuya Saigo (NAOJ) and Yu-Nung Su (ASIAA) started the ObsTool (Phase I) user test from the end of January.

Masao Saito (NAOJ) started CASA single-dish (internal) user test according to the request of the ALMA-J computing team.

Kayako has been downloaded at the server in EA-ARC and Horoshi Yatagai (NAOJ) started preparing the installation of the ALMA helpdesk system.

Conferences and workshops:

Kazuya Saigo (NAOJ) attended JVO lecture (January 25th-26th) held in Mitaka.

ALMA-J gave lectures on the status and scientific goals of ALMA to
Japanese journalists in Mitaka, and twenty-six journalists attended the meeting.

Other:
Ryu Ogasawara (Deputy PM) and EA-ARC manager and the member, Masao Saito, joined the AOP Workshop II on January 18th-21st in Santiago and discussed the update of the ALMA Operations Plan and the cost saving scenarios.

EA-ARC manager attended the SciOps IPT face-to-face meeting on January 22nd in Santiago.

TECHNICAL SERVICES

1. Management

The Head of DTS continued to chair/participate in weekly Site Coordination and AIV meetings; monthly Safety Committee and ALMA/JAO Management meetings. Other work this month was dominated by the updates to the ALMA Operations Plan.

DTS recruiting continues to make good progress. During January, we had 14 active recruitment processes running for a total of 20 positions.

2. Antenna Maintenance Group

The development of the ALMA Operations Plan remained the focus of the Antenna Group managers in January. Cristian Lastra was busy assisting the development for all of DTS and attended the Front End Maintenance Workshop in Charlottesville. Cristian and Dean Chalmers participated in Maintenance Plan and Operations Plan workshops in Santiago.

AG recruiting activity continued in January; interviews were held for two Transporter Operator positions, CVs are under review for an Antenna Controls Specialist position, Mechanical and Electrical Technician positions are posted and Lead Machinist and AG Supervisor positions will be posted at the end of the month.

One antenna relocation was carried out; DV05 was moved from a lower OSF pad to an upper OSF pad. Work continued on the transporter fire suppression systems by Westfire Systems with completion planned for mid-February.

In addition the Antenna Group continued to provide support for AIV activities and development of the ALMA shop facilities.

3. Computing Group

ALMA Software Release 7 was officially accepted for CSV operations by Science on January 15th. Supporting the release deployment consumed most of the time during the first half of the month. All the OSF STEs have been upgraded to R7 and interferometry and total power observations have continued in order to verify the correct functionality. STE consoles have been moved from the temporary location in the corridor and installed in the final control room. Ralph Marson and Rafael Hiriart from NRAO and Gianluca Chiozzi from ESO visited the OSF to provide support to the commissioning activities before the acceptance, and to test new functionality such as tracking Jovian moons and astronomical holography. Alessio Checucci arrived from Garching in order to investigate the problems related with the production Archive. He has detected a problem with the cluster and has implemented separate database servers for the monitoring system and scientific observations while the cluster problem is investigated. The STE of Vertex SEF was upgraded to release 6_1_1-B successfully. No major problems have been reported during their operations with this release. Test with the embedded Single Board Computer (new ABM CPU board) have started. It has been tested with the same test suite used with the old CPUs; some synchronization problems have been detected. Tests will continue in cooperation with NRAO colleagues from the control team and a new board is expected to be received in the following weeks. Three summer students arrived at the beginning of January to work with the Computing Group. Two of them will focus on the development and improvement of the ALMA Common Software code generator tool. One student will be dedicated to work in software quality assurance, assessing the maturity level of ALMA software against the standard Control Maturity Model (CMM).

4. Electronics Group

A FE Maintenance Planning Workshop was held in Charlottesville, January 12th–15th. This assisted in planning for the OSF TF in a number of areas, for example identifying cleanliness requirements for FE lab areas and identifying space requirements for cartridge test racks. Modifications proposed for the OSF TF to accommodate lab planning raised many new questions about the electrical, HVAC, Cryogenics and civil works. Many technical requirements were identified. A list of action items was distributed to add to those already developed from Maintenance Workshops I, II, and III.

Armin Silber will transfer to Chile in February for a period of three years to consult and provide leadership for the establishment of the Cryo and Vacuum Team including lab outfitting and training of staff. His proposal for modifications to the OSF Technical Facility was approved during a presentation to the ALMA Director in December.

The vendor for the Front End Service Vehicle (FESV) presented a Preliminary Design Review (PDR) in Taichung, Taiwan, on January 27th. The event was attended in person by a delegation from the JAO. Facilities assisted with a truck doing a shock and vibration test drive up to AOS. The report was presented at the PDR to assist the vendor with further design solutions. First promising design studies for the FESV have been generated.

Information from Maintenance Planning Workshop IV and from documents defining the EG maintenance process were used during the Maintenance Process Workshop in Santiago, January 18th-22nd to prepare a draft project Maintenance Plan. Manpower and budget planning documents have been prepared.

The BE IPT has reviewed a spreadsheet providing a format for input of inventory information to CMMS and is preparing a recommendation for initiating the effort.

5. IT Group

The selection process for a provider for the Backup / Storage project is ongoing; currently there is a short list of two providers (HP and EMC). The design for the infrastructure needed to install the new Microwave dishes on top of the OSF-TB is in process. IT upgraded the IP-Phone system with new licenses and patches; also, a project to integrate IP-Phones plus video in the desktop with some key users finished, we will spread this alternative in ALMA during February/March. A new central syslog is in test and we are also testing possible candidates for user backup. Meetings between ESO-IT and ALMA-IT are in process to work in a common platform of services in Vitacura (access, trenches, generators, etc, will be common to both organizations). Extensive test with NetMRI (for change-control) continues, after the meetings with ESO-IT we will take a decision about the product selected.

6. Maintenance Group

Throughout January the focus of activities was centered on maintenance plan development. The generation of bottom up projections for staffing and maintenance activity costs required substantial consultation with Site IPT and detailed analysis of both existing and future infrastructure. Detailed discussions with respect to the distribution of responsibilities between groups were also held.

The preparation of the Maintenance Plan resulted in delays in other areas like recruitment, radio project, etc.

Recruitment of the Mechanical technician, Maintenance Planner and CMMS Administrator is in progress.

Negotiations to acquire the service of a Siveco consultant for a period of twelve months to assist in CMMS implementation continue with the assistance of Donald Tait to identify the budget and guidance for the approval process.

Veronica Silva worked with the electronics group to document the proposed construction for the EG labs and currently efforts are focused on the design for the installation of the cryogenics systems.

The request to secure the services of a fire system consultant received the approval of the ALMA Director and subsequently a cost center was identified. The review and training on the fire systems is expected to commence the week of March 23rd.

The radio system upgrade project is still in progress but some delay has been experienced; permission to install radio repeaters outside the ALMA concession will be negotiated with CONICYT.

DTS MG staff continued fitting out workshops, purchasing equipment, carrying out minor maintenance to OSF systems and assisting NAOJ with UPS maintenance.

7. Technical Group

In coordination with HR, new LSM positions are being advertised in the web hiring portal and tracked with JIRA: CMMS Administrator, Antenna Control Systems Engineer, Antenna

Mechanical and Electronics Technicians. Candidates for Antenna Transporter Operator and Technical Officer were successfully reviewed.

Weekly meetings are being held with HR to coordinate the recruiting process for future positions (Supervisors, Cryo Team Leader, etc.). For ISM positions, the same coordination strategy is being applied. A new wiki site is being created to gather information about the work progress and user requirements for the Santiago Central Office (SCO). A meeting was held with MIPT to discuss alternatives to assist the outfitting of the SCO: computing room outfitting, networking outfitting and general building outfitting.

During this month, the first stage of the AOS security upgrades was finished (technical yard fencing improvement). Improvements were also made to the AOS access & occupancy procedure.

A considerable fraction of the month was spent providing support to the ALMA Operations and Maintenance Plan development.

ADMINISTRATION

1. Operations Overview

Work continued with the food services and hospitality consultant to review our current operations and advise improvements and cost savings for ALMA. The final report for improvements is expected early February. Planning continues for the expansion of the ALMA camp casino with expected completion by end of Q1.

Planning and procurement for the ALMA camp dorm expansion is under way. The schedule has slipped for a new completion date by mid Q2. The project will increase the ALMA camp capacity with 40 additional rooms.

Studies are being performed on sources of potable water near the community of Toconao, 50km from ALMA. If the samples are suitable, efforts will proceed to contract the purchase of the water. This would considerably reduce the cost of transporting water 150km from Calama.

2. Staffing

Two additional warehouse staff were hired during the month. Skills, health and psychological testing on a shortlist of candidates for the position of Budget & Finance Controller are nearly complete. The position is still forecast to be filled in Q1 2010.

3. Finance / Budget

Several large commitments for activities that will use remaining funds from the 2009 budget were identified. Seven activities were identified and the funds were committed.

HUMAN RESOURCES

1. Recruitment

Local Staff

One new employee joined the ALMA LSM team during January: Warehouse Operator.

Recruitment activities included interviews for Deputy Safety Manager, Array Operator (one position), Transporter Operator (two positions), NAOJ Assistant (one position), OSF Receptionist (one position) and AIV Technician (one position).

International Staff

Two new DSO astronomers, Tommy Wiklind and Stephane Leon arrived in Chile Operations.

The astronomer positions are advertised with a deadline of March 1st. The Chief of Staff was posted on the ESO and NRAO websites with a closing date of April 1st. Both the Senior RF Engineer and HR Manager for ISM & Head of Internal Communications positions were shortlisted during January and interviews are planned in February and March.

2. Activities of the Month

Collective Bargaining: This subject took up great part of the month, with daily meetings, either to bargain or to analyze proposals and work out counter offers. The final proposal was delivered on January 25th and the month closed without an answer from the Union.

AUI LSM Review: The last part of the month included participation in a series of preparation meetings for the upcoming AUI LSM Review programmed for March. These meetings resulted in a document to be presented to the Committee as well as a posting of background documents.

Internal Posting Procedure: Meetings between DTS and HR continue, to complete the internal posting procedure. The procedure was iterated at various levels and finally will be initiated with internal and internal/external postings during February.

Merit Process: Market data for the Merit Process was collected at the beginning of January. However, in order not to interfere with the Collective Bargaining process it was agreed to postpone the process to February, with retroactive effect to January.

ALMA Training and Education Group (ATEG): The process for allocating training budgets among employees and guidelines for conference/seminar attendance were discussed at the JAO Management Team meeting.

EDUCATION AND PUBLIC OUTREACH

1. Infrastructure

Internet
Highlights of the work performed on the ALMA website this month include:

- Publication of a brand new video about the story of ALMA (http://www.almaobservatory.org/en/multimedia/videos/178-on-the-path-towards-becoming-the-most-powerful-radio-observatory-ever)
- Publication of a homemade prospectus "The universe of the coming ALMA revolution" for science communicators and media (http://www.almaobservatory.org/images/stories/publications/the_coming_alma_revolution.pdf)
- Update of the ALMA timeline with new milestones and links to relevant articles (http://www.almaobservatory.org/en/about-alma/essentials/timeline)

2. Reporting

Phase closure announcement

- Press release

As a joint effort between the JAO and the Executives' EPO Departments, a press release about this milestone was released by all the partners on January 4th, 14:20 UTC. It was also disclosed as an official press release coming out of the AAS, "Closing the loop for ALMA". (http://www.almaobservatory.org/en/newsroom/press-releases/177-closing-the-loop-for-alma)

- Announcement at the NRAO Town Hall

The EPO Departments from the JAO and NRAO coordinated the official announcement of the milestone during a special session at the NRAO Town Hall of the AAS meeting on Tuesday January 5th. The announcement was done by the ALMA Director with the presence of more than 350 attendees.

- Video

The EPO Department supervised the creation of a 4-minute video which shows the evolution of the ALMA project, since its meteorology and site testing beginnings, till the actual Phase Closure stage. This video was broadcasted at the NRAO Town Hall during the AAS Meeting.

Science Newsletter

The fourth issue of the science newsletter was released early January right after the AAS meeting; its "focus on" article emphasized the phase closure milestone. (http://www.almaobservatory.org/en/newsroom/newsletter/179-newsletter-4)

Safety Booklet

The EPO Department has coordinated, supervised and reviewed the Safety Booklet both in Spanish and English versions. The booklet is currently being printed and should be distributed during February.

ALMA Building Blocks

The EPO Department started working on the ALMA outreach building blocks that will be used as the "base" material for outreach resources and material to be created. A work plan including timeframe, outcomes and team involved for each of these building blocks is currently under production.

Outreach material

Three new posters were designed with the intention of distributing them to the general public in different outreach activities during the year.

3. General Activities

Closing activities of the International Year of Astronomy 2009 in Chile – January 9th
The EPO Department participated in the closing activities of IYA2009 with an interactive booth which received a lot of attention from families attending the event.

Astroday, La Serena 2010 – January 23rd
Once again ALMA was an important participant in La Serena's Astronomical Fair, Astroday 2010. In this opportunity, the EPO Department set up the complete ALMA booth (educational panels, interactive ALMA model, etc.) and actively participated by interacting with attendees, answering questions related to ALMA, and handing out printed material.

4. Other

ALMA domain names
In collaboration with the EPO Departments from the Executives, the JAO EPO Department coordinated the purchase or renewal of some strategically relevant ALMA-related domain names.

Visits
- National Geographic Traveler's (Slovenian edition) photographic editor.
- Swedish journalist for "Elle" Magazine

Radio Toconao
New interviews, focused mainly on ALMA, are being coordinated for this month's chapters.

SAFETY

1. Miscellaneous

An AOS Emergency Safety Committee has been created together with all contractors working at the AOS. A first meeting already occurred and will be followed by monthly AOS meetings.

Two suitable candidates were identified for Deputy Safety Manager. We are still waiting for the additional Safety Officer who was selected several months ago. This Safety Officer would allow us to start the 12/24 safety shift at the AOS.

Safe and effective food handling requires a systematic approach to control quality factors throughout the food chain supply. Therefore, ALMA has decided to have a "food technician" within the Safety Office. Food quality control and safety are inseparable, highly regulated, and extremely sensitive topics, especially in isolated areas like the ALMA site.

2. Security

We received from security contractor G4S a proposal considering a more attractive contract for the guards to stop the high turn-over rate of guards for ALMA: the guards will receive an annual bonus when they keep working at ALMA. A monthly bonus related to performance might also be paid to all guards. The guards will also receive compensation for transportation costs on a regular basis. These incentives should bring about increased cooperation and higher motivation.

During a recent patrol, the guards at the AOS reacted well when a fire started above a fuel tank of a power generator. Using the fire extinguishers they stopped the fire which would have otherwise caused significant damage.

3. Health

Dr. Pr. Gunga, a member of the European Space Sciences Committee (ESSC) in the European Science Foundation (ESF), visited ALMA on January 28th. He is the Director of the Space Medical Center in Berlin and participated in numerous medical studies for human health in extreme conditions, collaborating also with the University of Chile for human health at very high altitude. During his visit he gave a talk and led a discussion on "Space technology as applied to monitor humans working in extreme environments on Earth" at the OSF-TF. Pr. Gunga would like to use space lab health monitor equipments at high sites in Chile like ALMA.

The paramedics SERVINOR contract is going to expire on February 17th, 2010. It has been decided to issue a new call for tenders.

Pr. Cordaro (University of Chile) proposes to install a Cosmic Rays Observatory on the ALMA high site. A Helium 3 Active Neutron Monitor Observatory would provide the necessary information that, along with the work of high altitude medical specialists in ALMA, to identify proper actions to improve the health of the staff. Working with ALMA technical staff it could also foresee the damage to equipments and metallic structures. This has a cost, so a decision is pending.

LIST OF COMMONLY USED ACRONYMS

AA: Antenna Article
AAER: ALMA Annual External Review
ABC: ALMA Budget Committee
ACA: Atacama Compact Array
ACD: Amplitude Calibration Device
ACHS: Asociación Chilena de Seguridad
ADM: Administration
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
ANASAC: ALMA North American Science Advisory Committee
AOS: Array Operations Site
ARC: ALMA Regional Center
ARL: Aeronautical Research Laboratory
ASAC: ALMA Science Advisory Committee
ASIAA: Academia Sinica Institute of Astronomy and Astrophysics
ATF: ALMA Test Facility
AZ: Azimuth
BACI: Basic Access Control Interface
BE: Back End
BEIPT: Back End IPT
BUS: Back-Up Structure
CCL: Control Command Language
CDMR: Critical Design and Manufacturing Readiness
CDR: Critical Design Review
CIPT: Computing IPT
CLOA: Central Local Oscillator Article
CMMS: Computerized Maintenance Management System
CSV: Commissioning and Science Verification
DTS: Department of Technical Services
EA: East Asia (n)
EDM: Electronic Document Management
EG: Electronics Group (DTS)
EIE: European Industrial Engineering
EPO: Education and Public Outreach
ESD: Electrostatic Discharge
EU: European
FC: Finance Committee
FE: Front End
FEIPT: Front End IPT
FESS: Front End Support Structure
FP6: Framework Program No. 6 (European Commission)
GUI: Graphical User Interface
HR: Human Resources
HVAC: Heating, Ventilating and Air Conditioning
ICCU: Indoor Cryo Compressor Unit
ICD: Interface Control Document
IF: Intermediate Frequency
IPT: Integrated Product Team

IPR: Integrated Project Reference (Schedule)
IRR: Image Rejection Ratio
ISM: International Staff Member
IYA: International Year of Astronomy
JAO: Joint ALMA Office / Joint ALMA Observatory
KVM: Kernel-based Virtual Machine
LO: Local Oscillator
LORR: Local Oscillator Reference Receiver
LORTM: Local Oscillator Reference Test Module
LPR: Local Oscillator Photonic Receiver
LRU: Line Replaceable Unit
LSM: Local Staff Member
MG: Maintenance Group (DTS)
MIPT: Management Integrated Product Team
MRR: Manufacturing Readiness Review
NA: North America (n)
Nb/AlOx/Nb: Niobium/Aluminum Oxide/Niobium
NbTiN: Niobium-Titanium-Nitrogen
NSI: Nearfield Systems Inc.
OPT: Optical Pointing Telescope
OSF: Operations Support Facility
PA/QA: Product Assurance/Quality Assurance
PAI: Preliminary Acceptance In-house
PAS: Preliminary Acceptance on Site
PEP: Performance Evaluation Process
PM: Project Manager
PMCS: Project Management Control System
PPDR: Pre-Production Design Review
PS: Project Scientist
RAL: Rutherford Appleton Laboratories
RID: Review Item Discrepancy
SARR: Site Activities Readiness Review
SCB: Schedule Control Board
SCO: Santiago Central Office
SE: System Engineering
SIS: Semiconductor-Insulator-Semiconductor
SN: Serial Number
SSR: Science Software Requirements
SRR: System Requirements Review
STE: Standard Test Environment
TB: Technical Building
tCLOTS: temporary Central Local Oscillator Test Stand
TF: Technical Facility
TFC: Technical Facility STE C (i.e. the third STE at the TF)
TRR: Test Readiness Review
UPS: Uninterruptible Power Supply
URSI: Union Radio-Scientifique Internationale (International Union of Radio Science)
VO: Virtual Observatory
VVMO: Consorcio Vial y Vives Mena y Ovalle Limitada
WCA: Warm Cartridge Assembly
WP: Work Package
WVR: Water Vapor Radiometer
2SB: Two-Single Side Band