

# The ALMA Observing Tool & The ALMA Archive

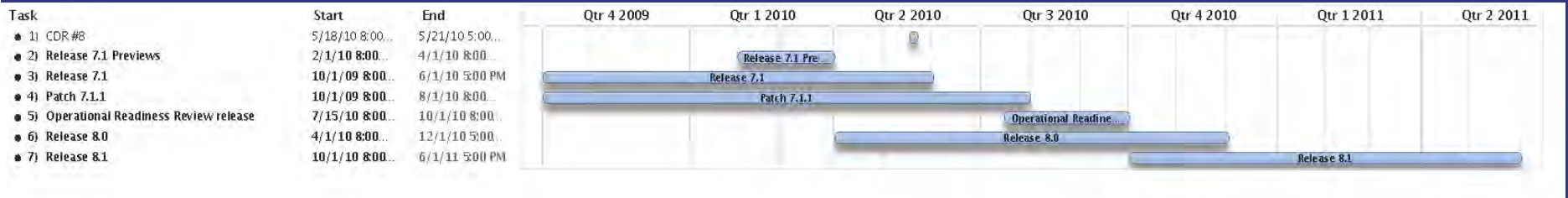
B. Glendenning (NRAO).

A. Biggs (ESO), A. Bridger (UKATC),  
J. Schwarz (ESO), A. Wicenec (ESO)

# Highlights of Previous Release (R7.0)

- In use at OSF since Dec 09
- Front-end Archive, ASA portal are operational
- New observing modes added (e.g., astro holography)
- Observing Tool enhancements
  - Overview, Phase I support, splatalogue, sensitivity calculator, ...
- Acquisition & processing of WVR data, stored in ASDM
  - Filled to CASA
- Enhanced monitor point archiving and retrieval (TMCDB)
- Project & SB lifecycle tracking
- Parallel system startup & shutdown
- CASA 2.3
- Major upgrade of operating system (RHEL 5.3)

# 2010-2011 Planning



- Planning discussed with AIV/CSV/DSO in January meeting
- Early Science date will be met if
  - CIPT delivers according to agreed schedule
  - Project provides timely input in areas requiring elaboration

# Observing Tool - Recent News

- R7.0 deployed at OSF as part of CIPT Software Release ALMA-7\_0\_0 (December 2009)
- OT – and SBs – now in frequent use at the OSF (lots of feedback)
- Alan Bridger and Andy Biggs visited SCO and OSF in January
- User Test 7.0 run in Jan/Feb 2010 – summarised later

# Recent Features

- Connection to Splatalog now enabled (internal copy and online option)
  - Splatalog itself is in “beta”
- Improved “guidance” panel
- Sensitivity Calculator improved and error in calculation fixed
  - Note that some inputs remain equal to the spec (Tsys)
- More realistic “Template Library” – based on DRSP
- Proposal summary pages added
- User is now authenticated when connecting to archive
  - All projects remain visible for the time being
- CSV have requested a number of Phase II (SB) enhancements

# User Test 7.0 Goals

1. Test archive submission/retrieval to Chile
  - Though an initial installation this was essentially the “real thing”
2. Test the user database connection and searching
  - LDAP server used, but a test-only database for security reasons
3. Test user authentication
4. Test the new spectral line search tool
5. Review changes made to the ALMA Sensitivity Calculator
6. Assess Improved Overview “guidance” Panel
7. Summary page for Technical Assessment
8. New 'File' menu structure including distinction between 'Save' and 'Submit'
9. New Template Library (based on DRSPs) and the way of interacting with this
10. Get specific feedback on the documentation
11. Anything else

# User Test 7.0 Results I

- 24+ testers, ARCs + SCO + ASAC
- 52% MacOS, 37% Linux, 11% Windows (all varieties)
- General Impression positive: tool has improved since last test
- The archive and server-side setup in Santiago was very successful
- Installation issues with “OpenJDK” Java variants (non-Sun): mostly because they are based on early patch levels
- Usability
  - Improved since last test
  - Significant number of first time users
  - Several users tried just writing proposal, creating science goals and submitting as quickly as possible, successfully
- Overview Guidance Panel
  - Much improved, some good constructive suggestions

# User Test 7.0 Results II

- Spectral Line selection tool: general approval
  - Again some good constructive suggestions
  - Some (important) missing lines (*problem now understood, and is essentially a consequence of the beta status of Splatalog – a fix is in place*)
  - Some features of tool not always realised (sorting of columns)
- Template Library: mixed feedback
  - Some liked it, some were not so keen on the content, some were confused as to purpose/use
  - Content was subset of DRSP projects of some fame – suggestions for better content welcome
  - Better presentation (names/notes) may help
- Summary of Proposal: mixed feedback
  - Confused terms in Tool and Documents
  - What is it for? (*Key aim is printable version of proposal for users and Technical Assessors*)
  - But positive reaction to idea of including it
- Documentation: generally good response
  - Specific areas need improvement – recognised it is difficult to keep pace with developments
  - Needs to be searchable



# Future Plans

(Key points of interest)

- **R7.1 April (Reaches OSF in June following integration with rest of system)**
  - Initial version of division of Science Goals into SBs supporting Early Science observing modes
  - Capture of query parameters for calibrators (queries to be passed to SB and then onto the Control system to execute them at runtime)
  - Basic support for ephemeris objects (no updating after submission)
  - Basic temporal support (no periodic/monitoring)
  - Printable version of the proposal and Technical Assessment (TA) pages, more details completed
- **R8.0 October**
  - Extension of Science Goals to allow multiple spectral setups.
  - Options for user-selectable calibrators – to be passed to Control to select from
  - Allow update of ephemeris tables after submission
  - Add support for periodic observing (monitoring)
  - Complete details for printable summary and TA
  - Addition of overheads to time estimates
- **Summer 2010: Training of ARC staff**

# Future Tests and Key dates

- Now: Internal load testing
- April 2010 – Beta test of Phase I
  - May conduct limited tests of Phase II
  - Based on R7.1 code
- July 2010 – Public Preview Release
  - Not a test, but feedback encouraged
- October 2010 – Version for Early Science Proposals
  - Internal readiness test
  - Based on R8.0 code
- December 2010 – Early Science Release for Call for Proposals
- Early 2011 - Phase II tests, need to schedule so as to not confuse real Phase I use
- May 2011 - Phase II Early Science Release of OT to users

# Current Issues

- Obtaining information to be used in generating SBs from Science Goals
  - This is improving, but much of the detail must ultimately come as output of the CSV process. Thus what we are able to put in at release 8, or even 8.1 may still be preliminary. (E.g. overheads, best calibration strategies, etc.)
- Interface to scheduling (especially dynamic scheduler).
  - The hiatus in scheduling development means work on this is behind
- Phase II testing
  - Use at the OSF is helping a lot here, but ALMA users, and ARC staff, may approach Phase II and SB creation differently.
  - So user tests needed, but care should be taken in timing, so as to avoid confusion with Phase I, and the genuine Call for Proposals.

# New Investigator Panel

Investigators

Title	Full name	Email	Affiliation	ALMA ID	Associated ARC
PI	Alan Bridger	ab@roe.ac.uk	UK ATC	alan	EU
Col	Andy Biggs	abiggs@eso.org	European Southern ...	andy	EU
Col	Hiroshi Yatagai	yatagai.hiroshi@nao...	NAOJ	hiroshi	EA
Col	Harvey Liszt	hliszt@nrao.edu	NRAO	hliszt	NA
Col	Mark Rawlings	mrawling@alma.cl	Joint ALMA Office	mrawlings	CHILE

Investigator search constraints

Name contains john

Find Investigators

Full name	Email	Affiliation	ALMA ID
John Lennon	john@thebeatles.c...	The Beatles	john
John Hibbard	jhibbard@nrao.edu	NRAO	jhibbard

Select Investigator Cancel

Set PI Add Col Remove Col

Attach Detach View

Attach Detach View

Suggestion

# New Calibrator Interface

ALMA Calibrator Selection Tool <2>

Calibrator Catalogue Location

Catalogue Location  Local File  VO Catalogue  Web Catalogue

Query Parameters

Target RA  Dec

Search radius

Frequency Min  GHz  Max  GHz

Flux Min  Jy  Max  Jy

Calibrator type

Observed after  before

Calibrator List

Best	Source Na...	RA	Dec	Separation...	Frequency...	Flux (Jy)	Last Obser...
Amp,Bps,Fo	0102+584	01:02:45...	58:24:11...	17.42358...	149.8962...	1.32	2009-10...
	0205+322	02:05:04...	32:12:30...	18.75300...	149.8962...	0.78	2009-10...
	0251+432	02:51:34...	43:15:15...	23.77208...	149.8962...	0.26	2009-10...
	0313+413	03:13:01...	41:20:01...	28.00185...	149.8962...	1.02	2009-10...

Feedback

**WARNING: The 'best' buttons are an interim implementation**

# New Summary Pages (PDFs)

## Science Goals

## Proposal

TA's ID : TA-id-001 ProposalID : id-2016A-001

### ALMA SEMESTER 2016A

SG : 1 of 12 ScienceGoal(NAME\_OF\_SCIENCE\_GOAL) has 11 Targets

**ALMA Band 03 General Properties : 64 - 116 GHz (25B)**

IF GHz	Trx	50% Tsys	50% zen. opacity	1MHz	1mJy@1"	HPBW 12m	HPBW 7m	resolution 50x12m	resolution 12x7m
4.0-6.0	37-37K	0.0K	0.00-0.00	3.0 km/s	0.100-0.191K	44-61"	76-105"	0.000-0.00"	0.00"

**Science Goal Control Parameters**

Resolution	Largest Structure	Rms mJy	Dynamic Range	Polarization
2.0"	76"	3.0 mJy	100	10%

**<Not Yet Available> Use of 12m Array 50 antennas**

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Per target	Data Rate
Synthesis								
OTF-TP								

**<Not Yet Available> Use of ACA 7m Array 12 antennas**

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Per target	Data Rate
Synthesis								
OTF-TP								

**<Not Yet Available> Use of ACA TP Array 4 antennas**

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol	Per target	Data Rate
Synthesis								
OTF-TP								

**Target list for Science Goal 05**

Target	Ra, Dec(J2000)	Or other	Id	Motion	V, def, frame -DR-z	Linewidth v or freq	Source Flux	Po'm
1-Sgr A-ish	17:42:30.000, -29:00:00.000	0.000, 0.000		Sidereal	50km/s, hel, OPTICAL	0 km/s	0.000 Jy	0%
2-Sgr B	17:47:01.920, -28:25:22.800	0.000, 0.000		Sidereal	50km/s, hel, OPTICAL	0 km/s	0.000 Jy	0%

**Frequency/correlator/spectral Intc**

Frequency GHz	Line ID	# Stokes(1,2,4)	# Chans per Stokes	Bandwidth	Chan Spacing	Polarized %
110.000000 GHz	cyano-bs	1	2048	62.5 MHz, 170.3 km/s	30.52 kHz, 0.083 km/s	99%
100.000000 GHz	dimethyl-bs	4	2048	62.5 MHz, 187.4 km/s	30.52 kHz, 0.091 km/s	99%

**Set 0 - setup**

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA7m OTF-TP	ACA7m OTF-TP
110.000000 GHz	0.0K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K
100.000000 GHz	0.0K	0.0 mJy, 3.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K

**Set 0 - rms**

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA7m OTF-TP	ACA7m OTF-TP
110.000000 GHz	0.0K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K
100.000000 GHz	0.0K	0.0 mJy, 3.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K

**Set 1 - setup**

Frequency GHz	Line ID	# Stokes(1,2,4)	# Chans per Stokes	Bandwidth	Chan Spacing	Polarized %
99.000000 GHz	continuum	2	2048	2000.0 MHz, 6056.4 km/s	876.56 kHz, 2.957 km/s	99%

**Set 1 - rms**

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA7m OTF-TP	ACA7m OTF-TP
99.000000 GHz	0.0K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K

**Set 2 - setup**

Frequency GHz	Line ID	# Stokes(1,2,4)	# Chans per Stokes	Bandwidth	Chan Spacing	Polarized %
99.000000 GHz	continuum	2	2048	2000.0 MHz, 6056.4 km/s	876.56 kHz, 2.957 km/s	99%

**Set 2 - rms**

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA7m OTF-TP	ACA7m OTF-TP
99.000000 GHz	0.0K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K

**Set 3 - setup**

Frequency GHz	Line ID	# Stokes(1,2,4)	# Chans per Stokes	Bandwidth	Chan Spacing	Polarized %
99.000000 GHz	continuum	2	2048	2000.0 MHz, 6056.4 km/s	876.56 kHz, 2.957 km/s	99%

**Set 3 - rms**

Frequency GHz	50% Tsys	12m Array Synthesis	12m Array OTF-TP	ACA7m Synthesis	ACA7m OTF-TP	ACA7m OTF-TP	ACA7m OTF-TP
99.000000 GHz	0.0K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K	0.0 mJy, 0.0 K

Panel# : -1 ProposalID :

### Early Science 2010

Title :

Astronomical Category : ISM, Astrochemistry, Star formation/protoplanetary disks, exoplanets - 30

Date Submitted : 19-2-2010

PI Name : Jean-Luc Picard ARC : E/ Institution : Enterprise Contact : +81-422-34-3321, JLP@nao.ac.jp

LargeOrLongterm  Normal  TargetOfOpportunity  Calibration  DirectorsDiscretionaryTime  Simulation  Engineering  Maintenance

Continuation  Resubmission  Related Proposals :  Student/PhD

Stringency : PEL : Atmos.Quality Needed :  A  B  C  No grade  SB's Done

Space... the Final Frontier. These are the voyages of the starship Enterprise. Its continuing mission: to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no one has gone before.

Abstract

ISASURVEY?  Deep field  Large field  Scattered  Source  Line #Science Goals : 3

Total Time : 14.8 h

Band 1 ...  Band 2 ...  Band 3 ... 2.1h  Band 4 ...  Band 5 ...

Band 6 ... 12.7h  Band 7 ...  Band 8 ...  Band 9 ...  Band 10 ...

**<Not Available Yet>**

**12m Array** Max Data Rate : Data Volume :

Joint  Synthesis  +Mosaic  OTF-SD  SubArray

Line  +polarization  Continuum  +polarization

**<Not Available Yet>**

**ACA 7m Array** Max Data Rate : Data Volume :

Joint  Synthesis  +Mosaic  OTF-SD

Line  +polarization  Continuum  +polarization

**<Not Available Yet>**

**ACA Total Power** Max Data Rate : Data Volume :

Joint  OTF-SD

Line  +polarization  Continuum  +polarization

# Archive - Recent News

- OSF Archive installation in October 2009 (14 machines).
- ASA Portal installation at OSF.
- R7.0 deployed at OSF as part of CIPT Software Release ALMA-7\_0\_0 (December 2009).
- ACS/Archive releases 8.0 and 8.1.
- All data from the various STEs going into one archive.
- Andreas Wicenec, Holger Meuss and Alessio Checcucci visited Santiago and OSF in several missions between Oct. 2009 and Feb. 2010.
- Support for OT user test: Archive, web machine and ACS virtual machine installation at SCO.
- Installation of small ARC archives in Japan and at ESO (Oct. 2009, Jan. 2010).

# Future Plans

## (Key points of interest)

- ACS 8.2 (April 2010):
  - Full support for project code generation and project tree inside user repository with public interfaces for OT and ObObs.
  - NGAS mirroring and caching service tuning.
  - Testing of mirroring and database replication between ESO test archive and ESO ARC archive.
- Before July 2010:
  - Re-structuring of XMLStore tables and support for versioning.
  - Update of OSF database storage hardware to fibre channel SAN.
  - Implementation of ALMA specific code for request handler and basic integration into ASA portal.
  - Scalability tests for monitoring system.
  - Implementation of interface to ingest simulation data into archive.
- Plone training for JAO and ARC staff (Mar. 22-25) (ASA portal technology).
- Support for OSF operations.
- Planning and support for main SCO archive installation.



# Future Milestones

- Bulk data replication tests:
  - Garching development to ESO ARC installation (on-going).
  - Santiago to Garching development (April).
  - Santiago to NAOJ (June).
  - Note: OSF Santiago testing not useful as long as the network upgrade is not available.
- Database replication tests:
  - Garching development to ESO ARC installation (April)
  - Santiago to Garching development (March)
- Portal integration with project tracker (July)
- SCO archive migration/installation after availability of building.
- Development of archive operational procedures (1st document, August, working group in place).
- Integration of request handling system in portal (September)

# Current Issues

- Key staff loss: A. Wicenec leaving for SKA position
  - Application period for replacement has just ended
- Archive issues at the OSF:
  - Caused by excessive load from various sources. Not reproducible in simulation (hardware failures, excessive software logging after exception).
  - Good news: After the intervention the archive worked smoothly.
  - Bad news: The intervention is just a temporary solution, which leaves us with less redundancy.
  - Final solutions: Submission of tickets to reduce the excessive load and replacement of the database storage hardware in order to be able to cope with such a load.
- Scalability of monitoring to 66 antennas (~ 165,000 monitor points) has to be verified.

# ASA Portal Source Query

The screenshot shows the ALMA Science Archive website. At the top left is the ALMA Science Archive logo. The top right features a navigation bar with links for 'site map', 'accessibility', and 'contact us'. Below this is a search bar with the text 'Search Site' and a 'search' button. The user's name 'Andreas Wicenc' and a 'log out' link are also visible. A vertical sidebar on the left contains a list of navigation options: Home, Science Archive, Science data query, Source browser (highlighted), ASDM browser, Recent ASDMs, Project Overview, Sourcecatalogue, Spectral Lines, USNO-A2 Catalog, UCAC2 Catalog, DSS query, DRSP query form, Project Tracker, XML Store, Bulk Store, Monitor/Logging Store, News, Events, Users, Services, and Archive admin. The main content area is titled 'Source table browser' and includes the instruction 'Browse ASDM tables'. A paragraph explains that the search form is case insensitive and performs a full substring search, with examples like 'Jupiter', 'Jup', 'jupiter', and 'piter'. Below the text is a search form with a text input field containing 'Jupiter', a 'submit' button, and a placeholder text: 'Enter source name (this is a case insensitive substring search)'. At the bottom left, there is a copyright notice: 'All content copyright © ALMA observatory.' At the bottom right, the date and time are shown: 'Feb 26, 2010 03:09 PM'.

# ASA Portal Project Overview

The screenshot shows the ALMA Science Archive website. The header includes the ALMA logo, the text 'ALMA SCIENCE ARCHIVE', and navigation links for 'site map', 'accessibility', and 'contact us'. A search bar is present with the text 'Search Site' and a 'search' button. The user's name 'Andreas Wicenec' and a 'log out' link are also visible.

The left navigation menu contains the following items: Home, Science Archive, Science data query, Project Overview (highlighted), Sourcecatalogue, Spectral Lines, USNO-A2 Catalog, UCAC2 Catalog, DSS query, DRSP query form, Project Tracker, XML Store, Bulk Store, Monitor/Logging Store, News, Events, Users, Services, and Archive admin.

The main content area is titled 'Project Overview' and contains the following text:

**Project Overview**  
Project overview form

The project overview form allows retrieval of a table of project related information based on a few simple query parameters. All parameters are case in-sensitive and treated substring searches. That means that if you enter a string like 'Bill' in the PI Name field the query will actually search for '%BILL%' in the database. The same holds also for the creation date field. Entering '2009-12' will show all projects created during December 2009. Leaving all fields empty will show a summary table of all projects.

The search form includes the following fields:

- PI Name**: Enter the PI name or a substring.
- Date-time of Creation**: Format: YYYY-MM-DDTH24:MI:SS. Substrings are allowed.
- Project Name**: Enter the project name or a substring.
- Manual Mode**: Select constraint (Both).

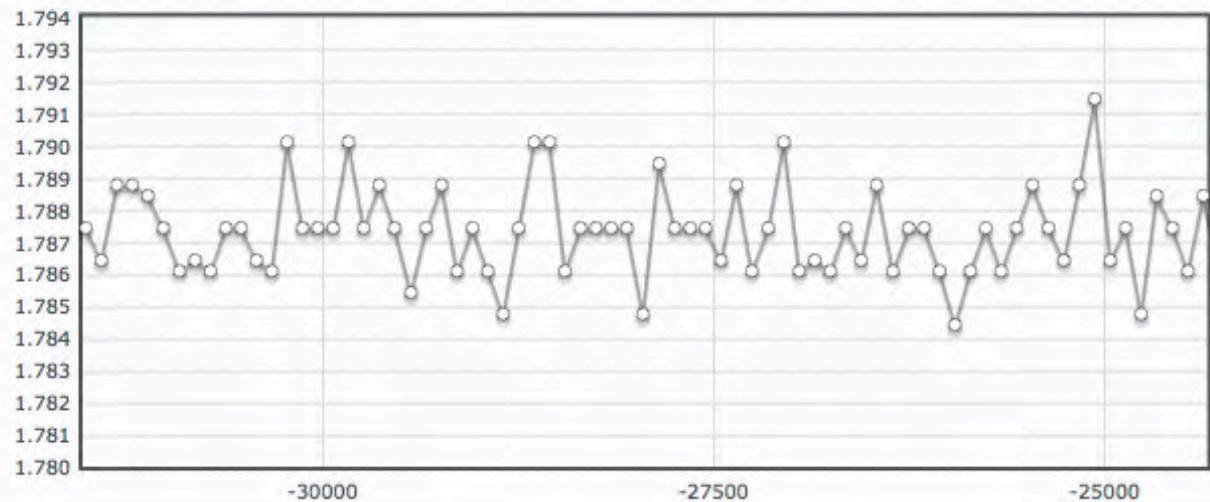
A 'submit' button is located at the bottom of the form.

At the bottom of the page, there is a copyright notice: 'All content copyright © ALMA observatory.' and a timestamp: 'Feb 26, 2010 01:24 PM'.

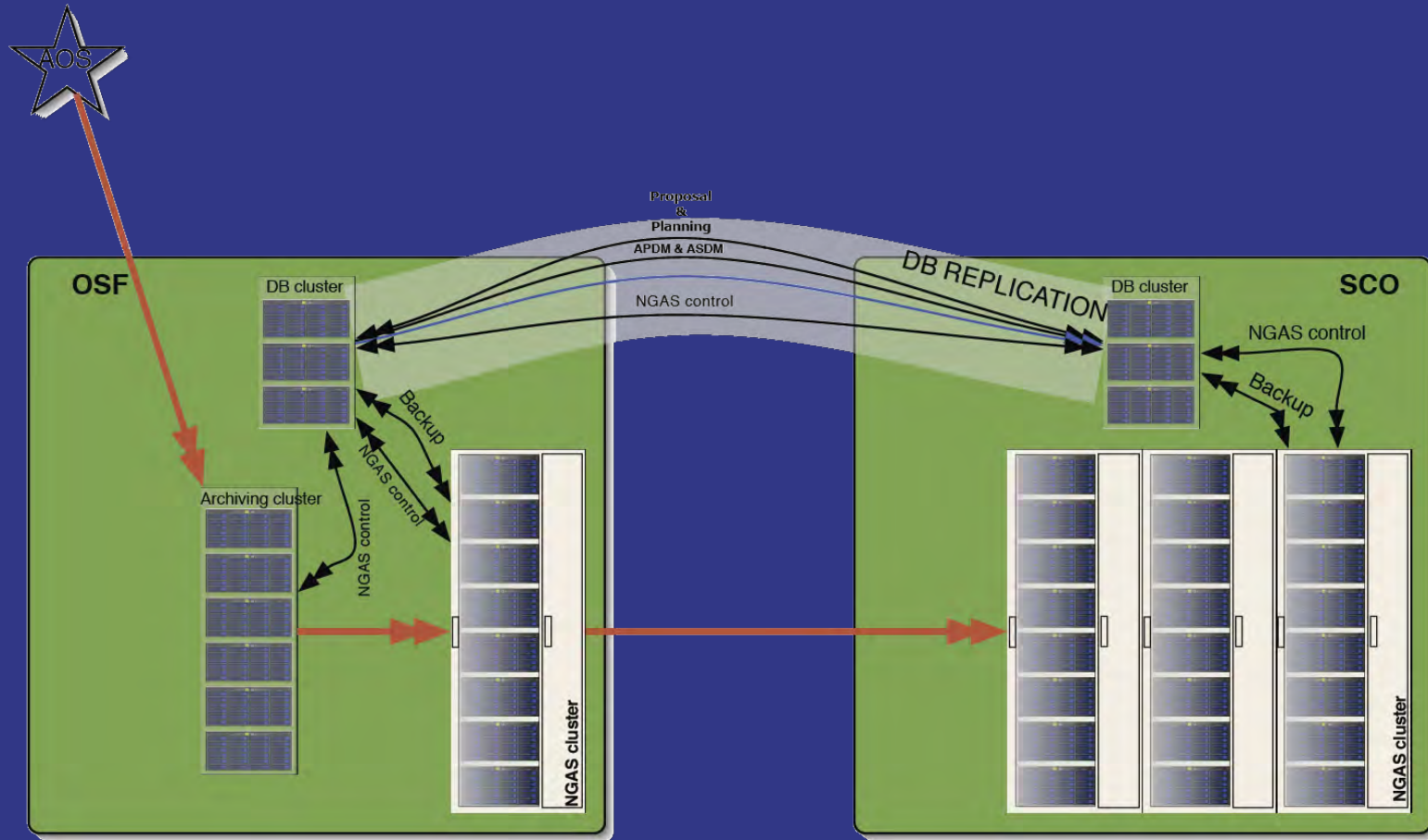
# ASA Portal Monitor Plotter

Plot of Monitorpoint: 68734

CONTROL/DV02/FrontEnd/ColdCart9/TEMPERATURE\_SENSOR1



# Archive Deployment









# Selected Other Required Deliveries

- Proposal Handling tool (Preview March 31)
- Project Tracker (March 31)
- Program Review Panel Simulation (April 1)
- Observing Tool – Early Science Release (Oct 1)
- ALMA Data QA Tool (Oct 1)
- Preliminary Dynamic Scheduling Algorithm (Oct 1)