Atacama Large Millimeter / submillimeter Array

ALMA Science Operations
Phase II Process and Change Request Procedures (Cycle 0)

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Change Record

Version	Date	Draft #	Reason/Initiation/Remarks
0.3	2011-07-26		"Phase_II_Procedures-Cycle_0_v0.3.doc", from M. Rawlings & L.-A. Nyman
A	2011-08-13	0	Copied by JEH into AEMD format; brought in implementations from Phase2 policy document (v0.71), and updated based on SciOpsIPT f2f meeting Aug 1-5, 2011. Sent to SciOpsIPT & P2G for comment.
A	2011-08-20	1	JEH: updated some details based on conversation w/LN 8/14/2011. Still needs to be revised based on Cycle 0 PRP results. Included comments from PA. Added Appendix II-III. Need working draft by P2G bootcamp (Aug 24-26). Assigned open issues to the following: GM=Gautier Mathys; MR=Mark Rawlings; LN=Lars Nyman. Unassigned (green font) can be resolved after bootcamp.
A	2011-08-26	2a	JEH: Incorporated comments from MR/LN on 8/22. Added text on helpdesk workflow for CRSC to Sec 3.2 and Appendix I. Turned over to P2G for final revision after bootcamp. 2a: changed 1 sentence in Append I to reflect proper helpdesk workflow.
A	2011-09-12	2b	JEH: replaced grades with revised Cycle 0 rating system in Sec. 4; updated timeline in Sec. 5.1 & 6 with revised timeline for ph2 prep sent by LN on 9/8/2011; updated JIRA workflow in Append II to reflect discussion w/M.Rawlings on 9/9/2011. Added words to Sec. 5.1 reflecting the fact that Ph2 materials are only to be generated for "highest priority" projects, and not "Filler". Updated Secs. 5.3 & 9 to reflect that only P2G can generate SBs. Updated Appendix I to reflect how change requests that are requested before a contact scientist is assigned are handled & updated Fig A-1. (Version used for Cycle 0 Batch 1)
A	2011-09-24	3	MR & LN: revisions to Sec5.2 & 5.4; JEH: added Table 1 to Sec. 5.1; moved Sec10 into Appendix I; moved Sec6 to Appendix II; modified Appendix III to reflect changes to CRSC helpdesk response; updated Appendix III with material from P2G wiki; added placeholder Appendix VI for material ArcCS should review with PI; Added placeholder Appendix VII for DSO to explain process for selecting Filler projects. (Version used for Cycle 0 Batch 2)
A	2011-10-07	3b	JEH: clarified transfer of responsibility from JAO to local P2G members in Sec. 5. Additional review elements added to Appendix VI. Still needed: workflow for Sec. 6; Review of Append VI; Define process in Append. VII.

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1 Motivation

The Atacama Large (sub)Millimeter Array (ALMA) is a large international observatory sponsored by agencies spread over three continents and potentially open to users worldwide. Users submit proposals to the observatory using the ALMA Observing Tool (hereafter "OT") to describe the "science goals" of their proposed observations – the targets, observing frequencies, sensitivity limits, desired resolution, etc. Entering this information is considered "Phase I" mode of the OT. At the end of the Phase I process, the "Primary Investigator" (PI) of the proposal submits it to the ALMA archive for consideration by the ALMA Proposal Review committees. The Proposal Review Process (PRP) is described in other documents [RD2, RD3].

After the proposals are reviewed, some are awarded grades that qualify them to be scheduled for observations during the following ALMA observing season. In order to be observed, the Science Goals must be converted into "Scheduling Blocks" (SBs), the atomic observing units that are submitted to the ALMA scheduling queue for eventual execution. The process of converting project science goals into SBs is also done in the OT, in what is considered the OT's "Phase II" mode of operation. This document describes the procedures for this process that will be used for ALMA Cycle 0.

While converting a projects Phase I inputs into Phase II products, it is possible to change the instrument specifications originally entered into the OT. This document also describes the process for requesting, documenting, and making such changes. The policies under which such changes are considered, requested, allowed and disallowed are given in the *"Phase II Proposal Change Policies"* document [RD4].

2 Supporting Material

2.1 Acronyms

ACA	ALMA Compact Array
ALMA	Atacama Large (sub)Millimeter Array
APRC	ALMA Proposal Review Committee
AOP	ALMA Operations Plan
ARC	ALMA Regional Center
ARP	ALMA Review Panel
ASA	ALMA Science Archive
CSV	Commissioning and Science Verification
CRSC	Change Request Standing Committee
DC	Directors Council
DSO	Department of Science Operations
EA	East Asia
ESO	European Organization for Astronomical Research in the Southern Hemisphere
EU	Europe
JAO	Joint ALMA Observatory

JIRA	From Wikipedia: "Rather than an acronym, JIRA is a truncation of Gojira (the Japanese name for Godzilla)"
NA	North America
OT	Observing Tool
PI	Principle Investigator
PRP	Proposal Review Process
P1M	Phase 1 Manager
P2G	Phase II Group
TA	Technical Assessor

2.2 Related Documents

No.	Title	Authors	Version & Date	AEDM ID or document name
RD1	ALMA Operations Plan (AOP)	R. Smeback & Operations Working Group	Version D, 29 October 2007	ALMA-00.00.00.00-002-D-PLA.A
RD2	Principles of the ALMA Proposal Review Process	ALMA TAC Subcommittee	Rev 3, 26 January 2011	AEDM 2010-078
RD3	ALMA Proposal Review Process Implementation Plan	Lars-Ake Nyman & Gautier Mathys	v1.4, 06 March 2011	ALMA-90.25.03.00-001-A-PLA
RD4	ALMA Science Operations Phase II Proposal Change Policies	M. Rawlings et al. (Ph2 Policy Working Group)	A0, 11 August 2011	
RD5	ALMA Helpdesk Staff Guide	A. Remijan	A2.4, 28 July 2011	

3 Overview

This document describes the process of converting OT Phase I materials (in terms of PI-specified Science Goals) into OT Phase II materials (Schedule Blocks). This process involves the following steps:

- Documenting changes resulting from the Proposal Review Process
- Incorporation of PRP changes and Generation of first version of SBs
- Review (and possible modification) of SBs with PIs
- Validation of SBs and submission to the ALMA scheduler

An overview of each of these steps is given in the relevant subsections below. This document describes the overall process for SB generation, including required workflow, documentation, notifications and protocols. It does not included details on using the OT to create and modify SBs. Those are given in the in-line OT documentation (OT User Manual and Reference Manual).

3.1 Types of Changes

At various times of the Phase II process, there are a number of possible scenarios in which a reviewed ALMA proposal/project might be required to undergo change. These scenarios are defined more fully in the Proposal Change Policy document [RD4], and are briefly summarized here.

I. **Changes mandated by the ALMA Proposal Review Process.** These include changes identified by the proposal review panels and assessment process, and would be part of the review panel output.

II. **Changes identified by ALMA staff, based on technical considerations.** These changes may be identified during the Phase II process or during SB execution.

III. **PI-instigated requests for changes.** These might conceivably originate during the review period, the Phase II preparation period or the actual observing period.

In accordance with the *Phase II Proposal Change Policy* document [RD4], each and every change to a PI submitted project that was necessary to take the PI-specified Phase I products (in terms of Science Goals) and turn them into the finally validated Phase II products (Scheduling Blocks) must be fully documented so that they can be repeated if necessary. Any changes that affect the scientific goals of the project must be communicated back to the PI and their approval documented. The principles for accepting or denying changes are described in [RD4]; the current document describes how the change requests, decisions regarding the change requests, and changes are documented for the Cycle 0 observing period.

3.2 The Change Request Standing Committee

The ALMA Directors Office shall appoint a "Change Request Standing Committee" (CRSC) charged reviewing any requested changes to the scientific scope of an approved project on a case-by-case basis (see 8.4Appendix I This committee shall balance the default policy that no unnecessary changes should be made during the actual observing period [RD4], with the desire to maximize the execution efficiency and scientific yield of observing projects.

The Standing Committee will be responsible for ruling on any "Major" project change requests (as defined in Section 8.4 below) that are submitted after the completion of the Proposal Review Process and before the end of the associated observing period. The approval and implementation of any such changes that are submitted after the start of the observing season should only occur rarely during future routine science operations, but it is conceivable that Early Science circumstances may be different.

Change requests will be directed to the CRSC via the "Change Request" sub-category under the "General" department of the ALMA helpdesk (see 8.4Appendix III

Before approving any changes involving new targets or positions or additional frequency coverage, a search of the ALMA Science Archive (ASA) for duplication of both position within a certain specified target radius and frequency band with other projects shall be performed. The potential impact of all proposed changes on the ALMA observing queue and the potential for project overlaps arising shall be assessed and summarized.

The results of the change request assessment shall be communicated back to the PI or ALMA staff via notes added to the originally submitted helpdesk ticket, indicating whether the change request has been approved or rejected (see 8.4Appendix III for the procedure to be followed). If a change request is filed during the Phase II preparation period prior to each observing season, then a response shall be returned to the PI within four days. All approved changes to a project shall be implemented in accordance with the general procedure described in Section 5.3.

The Standing Committee may need to meet on relatively short notice and quite frequently during September 2011, and with decreasing frequency thereafter. Ideally a decision should be taken whenever a change request is received, but even if this is not always possible, the aim should be to deal with them as soon as possible. Given the timelines involved, the Standing Committee will be composed only of JAO staff (see Section 0). At least 50% of the standing committee members must approve of a proposed change for it to be approved. The approval is related back to the originator through the helpdesk system following the procedure outlined in 8.4Appendix III

4 Changes resulting from the Proposal Review process

The Cycle 0 Proposal Review Process has four steps: parallel scientific and technical assessment (which may include instructions or recommendations for project modification); face-to-face meetings of the Science Assessors arranged into a number of science-themed ALMA Review Panels (ARPs) which make recommendations on proposal acceptance and ranking of the proposals assigned to their panel; overall assessment of all proposals recommended by the

individual ARPs by the ALMA Proposal Review Committee (APRC) producing a final science ranked listing of proposals, grades, and a consensus report to be sent back to the PI; and finally approval of the ranked list by the Directors Council (DC). This process is described in documents [RD2, RD3].

There are several types of project changes that may result from the proposal review process. These include the descoping of a project (e.g. due to duplication of targets) and changes to the requested observational parameters based on technical or scientific considerations (e.g. to reach the stated science goal). Either technical or scientific assessors may suggest such changes in the written evaluations that are entered into Phase I Manager (Ph1M) tool and visible to the ARPs[1]. The Phase II policy document [RD4] suggests that such changes should be the exception rather than the rule.

Accepted proposals (i.e. those which received a "Highest Priority" or "Filler" rating at the conclusion of the PRP) must include explicit instructions from the review panels as to whether or not any recommended changes from the scientific or technical assessment are to be incorporated into the project. This is done at the ARP level using the "ARP Comments to the APRC" field of the Ph1M, which is visible to the APRC, and should be included in the consensus report to the PI. If any such change recommendations are not adopted by the APRC, then the consensus report should be edited accordingly. The reason for this decision shall be recorded in the "Comments to DC" field of the APRC tool.

All PRP-mandated changes, as documented in the consensus report, must be implemented in the project unless there is a compelling technical reason not to do so. In this case, the reason must be documented during the Phase II generation process (see next section), and related to the "Change Request Standing Committee" (see Section 3.2). PRP-mandated changes shall be implemented by the ALMA staff preparing the Phase II materials, and will be presented to the PI during the Phase II review process, as described below (Section 5.3).

5 Phase II Project Generation, Review & Validation Process

At least for the first few ALMA observing cycles, SB generation and any changes shall only be made to a project by authorized ALMA science staff, and reviewed by the PI of the project in question. Any and all changes to the Phase I setup or default generated SBs shall be fully documented by the appropriate ALMA staff as described in this section. A project shall only be admitted to the observing queue when the required changes have been implemented and approved.

A detailed timeline for this process for Cycle 0 is given in Section 8.4Appendix II , including training and project prioritization. This section describes the tasks to be performed every time SBs are to be generated, reviewed and validated.

[1] The Technical Assessors may additionally provide comments about possible changes to the technical setup in a field of the Ph1M that is not visible to the Science Assessors and therefore not considered during the scientific review. These comments are meant for the ALMA staff preparing the Phase II products or scheduling or executing the project, and are not thought to affect the scientific goals of the project. These changes are not approved by the PRP process and will be discussed in the next section.

5.1 Project Assignment to Support Staff

The JAO will appoint a "Phase II Project Generation Group" (hereafter P2G; see Section 0), which is responsible for generating the first drafts of SBs for approved cycle 0 projects. The P2G will take into consideration the PI-stated science goals, PRP-mandated changes, scheduling consideration, and current array capabilities. It will be comprised of members from CSV, DSO, and each ARC (at least two per ARC, to avoid single-point failures). The ARC P2G members are expected to transfer their knowledge about SB creation to relevant staff members at their home institute.

Following the DC approval of a ranked list of projects to be observed, the DSO produces a spreadsheet of all projects which received a "Highest Priority" or "Filler" rating, balanced by Executive. These projects will be assigned to a Phase II generation period based on the requested configuration(s) and the anticipated configuration schedule. There will be (at least) three Cycle 0 Phase II generation periods: ~September 2011 (first compact configuration "Highest Priority" projects), October 2011 (remaining compact configuration "Highest Priority" projects), and ~November-January 2012 (extended configuration "Highest Priority" projects). At least initially, Phase II materials will only be generated for projects that receive a "Highest Priority" rating. Phase II materials for projects that receive a "Filler" rating will not be generated unless and until it appears likely that all scheduled "Highest Priority" projects will be observed before the end of the Cycle 0 period. *The DSO will define the policy for selecting proposals off of the "Filler" list of projects in a future version of this document* (see 8.4Appendix VII These timelines are summarized in Table 1. A more detailed timeline is given in 8.4Appendix II

Batches	Project Rating	Total # of Projects	P2G SB Generation Period	PI Interaction Period	P2G Validation	Array Config.
Batch#1	Highest Priority	21	August 26 - September 11	September 12-28	September 29-30	Compact
Batch#2	Highest Priority	40	October 1 - 15	October 16-29	October 30-November 1	Compact
Batch#3	Highest Priority	51	November 1 - December 1	December 2 - January 10	January 11-15	Extended
TBD	Filler	51	(if at all)	TBD	TBD	

Table 1: ALMA Cycle 0 Phase II preparation periods

The DSO then assigns each project to a P2G member and to an ARC, based on PI affiliation or preferred ARC, and enters this information into an access-restricted DSO/ARC wiki page [LN: PLEASE ADD URL]. The list is made available to the ARCs, who assign a contact scientist to each project and enter this information into the shared wiki. *[Version 3: This is currently being done via an excel worksheet]*

5.2 Generation of first version of SBs

At the start of Phase II, each P2G member creates a DSO JIRA ticket for the project (a subtask of a parent "Cycle 0 Projects" ticket – see Section 7) with the subject line containing the project code and PI name. In the body of the ticket they list the title of the proposal, their own name and email, the supporting ARC, and the name of the ARC contact scientist. Additional information to be included is detailed in 8.4Appendix IV The creation of a unique JIRA ticket for each project is the key to tracking the details of the development/refinement of each project during Phase II. By default, authorized JAO staff and the ARC contact scientist should receive the initial notification e-mail regarding the creation of the JIRA ticket.

The P2G member then uses the Ph1M to review the proposal consensus report (which will include any PRP-mandated changes) and any comments made by the Technical Assessors (TA) that are meant for ALMA Phase II or scheduling staff. The P2G member will retrieve the relevant project .aot file from the ALMA Science Archive (ASA), and attached a copy of it to the JIRA ticket, to ensure that an original, pristine copy of the first version of the project is always easily accessible. They then modify the SGs to meet the directives of the PRP, documenting these changes in the JIRA ticket. They review TA suggested changes in the Ph1M and decide whether or not to accommodate those that are "minor" changes (see Section 8.2). Major changes (see Section 8.4) may not be made without the documented approval of the Change Request Standing Committee (see Section 3.2).

The P2G member may make any technical changes they deem appropriate, based on the currently known "best practices" (see Section 8.2). These include changes required to execute the project properly, efficiently and with a high likelihood of scheduling, without affecting the PI-defined scientific goals. All such changes must be documented & explained in the appropriate JIRA ticket (see 8.4Appendix IV

When these changes are finished, the P2G member (re) generates the Phase II materials (SBs Observing Script Simulator output when possible, etc.) for the project. Again, they make any technical changes to the default generated OT phase II SB parameters as they deem appropriate, based on the currently known "best practices", documenting these in the JIRA ticket. When finished, they use the OT to validate the SBs and store the project back to the ASA, which puts it into the "Phase 2 submitted" state of the project the life cycle. Any additional supporting material, such as any available Observing Script Simulator output, should also be attached to the JIRA ticket. They note in the ticket that the materials are now ready for review by the ARC contact scientists and PI. This triggers an email notification to the ARC contact scientist.

At this stage, the responsibility of projects with a JAO P2G originator will be transferred to a P2G member at the supporting ARC. This will facilitate rapid turn-around of iterations between ARC contact scientists and/or PIs (see below). The originating JAO P2G member remains on the JIRA ticket and should follow all subsequent changes to the project.

5.3 ARC Review of SBs & Interaction with PIs

5.3.1 ARC staff

The ARCs assign a support staff member to be the primary support contact for each project, who will work with the PI on making sure that the project does what the PI requested (modulo any PRP-mandated changes and technical realities). Note that the report in the JIRA ticket outlining the creation process of the ticket becomes vital at this point: it will inform the supporting ARC staff member of the specifics of the project, and allow them to explain the structure and characteristics to the PI. The supporting ARC staff member will be in contact with the P2G through the JIRA system. The project remains in the "Phase 2 submitted" state in the life cycle throughout this process.

The ARC staff retrieves the project from the ASA using the OT and reviews the phase II materials and all notes in the corresponding JIRA ticket. They contact their local P2G members first for any questions, or the originating P2G member if there are errors in the phase II materials. If they have any suggested changes that fall into the “best practices” or “minor” categories (See Sections 8.2 & 8.3), they discuss these with the local P2G member. If agreed upon, the changes are documented in the JIRA ticket, and the local P2G member regenerates the phase II materials, attaches them to the JIRA ticket, and the project is re-saved to the ASA. Major changes (see Section 8.4) may not be made without the documented approval of the CRSC (see Section 3.2).

When the ARC staff member understands the SBs, they arrange a time to contact the PI to review the Phase II products. This may be done via the helpdesk, using screen-sharing technologies (e.g. Skype, Netmeeting, etc.), e-mail, phone call, etc. The ARC contact scientist should explicitly explain to the PI any changes to the project mandated by the PRP, and any changes to the construction of the Science Goals enacted to make the project more technically sound. The contact scientist should get explicit approval of these changes from the PI[2]. If the PI expresses a desire to make any minor changes, the ARC scientist makes sure the request meets the criteria outlined in Section 8.3. If so, the ARC scientist notes the desired changes in the JIRA ticket and contacts the local P2G member to regenerate the phase II materials. If the PI wants to request a major change (Section 8.4), they must submit a formal Change Request to the project via the helpdesk following the procedure outlined in Section 8.1.

As soon as PI approval has been received (and an verdict on any major change requests to the CRSC received and enacted, if applicable), then the ARC scientists notes the approval in the JIRA ticket and notes that the project is ready for P2G validation. If the PI does not initially approve the implemented change, then the ARCs will work with the PI to resolve the issue.

5.3.2 ARC node staff

ARC node staff will follow the same procedures as described in the previous section, except that if the project was originated by a JAO P2G member, the P2G contact for technical questions will be the responsible P2G member of the supporting ARC.

[2] The approval should only concern the setup of the Project (positions, frequencies, calibrators etc.). The PI can provide comments on the scheduling and the execution of the Project, but these should only to be regarded as comments.

5.4 Phase II Validation Process

After the JIRA system notifies the originating (or other designated) P2G member that PI approval has been received for a project they initially generated, they review the JIRA ticket and new .aot if appropriate. If there are any questions or problems with the Phase 2 materials, they use the JIRA ticket to resolve these with the ARC scientists.

A summary of the final changes to the project must be transferred to the appropriate text fields of the .aot file, along with the name of the ALMA staff member that implemented the change. A standard-format summary of the project is maintained in the associated project creation JIRA ticket, which can be appended/modified to document any and all changes made to the project. A standard subset of this summary is also maintained within the project structure itself (i.e. in addition to the information in the JIRA ticket) to allow any party with appropriate ASA access permissions that needs to examine the project (ARC support staff, PHT members, etc.), to see the details and history of the changes made. In Cycle 0, the "Project Note (Staff Only)" field is to be used for this purpose.

Changes may apply to the entire project (e.g. descoping targets due to duplication with another proposal), or to individual science goals (e.g. adding additional spectral windows to increase the continuum bandwidth and therefore decrease the necessary execution time). For project-level changes, the appropriate information shall be prepended to a project-level free-form text description field in the OT. For Cycle 0, this is the "Project Note (Staff Only)" field. A description of any change to be made at the Science Goal (or SB) level shall be appended to the free-form text "Description" field of the Science Goal (or SB) via the OT.

When the originating P2G member is satisfied that the Phase II products are finalized, they make sure the project "validates" in the OT, then attach a copy of the final .aot file to the JIRA ticket and put the project into the "Ready" state using the Project Tracker.

6 Project Changes occurring after original SB validation

All approved changes that occur after the Phase II process (depending on when the request was actually submitted), are implemented by the responsible P2G member in coordination with ARC contact scientist and the project PI. This may happen, e.g., after a SB is found to be "broken" by the Astronomer on Duty. [DO WE NEED TO DESCRIBE HOW PMG NOTIFIES ARC? ISN'T THIS THROUGH PT? WILL THAT WORK IN CYCLE 0?] The PI shall be required to review the project using the OT and formally approve the implemented changes before the modified project is admitted into the observing queue. This whole process shall be tracked using unique change request identification codes.

All changes made to projects after the initial Phase II process shall be logged, described in the "Description" field of the appropriate Phase II Science Goal(s) in the OT, along with the name of the ALMA staff member that implemented the change. The descriptive material in the "Project Notes" field of the project shall also be updated using the OT as needed. These fields shall only be writable by authorized ALMA science staff, but shall be viewable by the project PI.

7 Documenting Project Workflow in JIRA

The ALMA DSO/ARC JIRA system (jira.alma.cl; project=Science Operations (SCOPS) or directly at http://jira.alma.cl/browse/SCOPS) is used to document and track all changes and any internal JAO-ARC communication on a per-project basis. Phase II project preparation and modifications are tracked on a per-project basis via a standard-format set of subtasks created under a parent ticket (the SCOPS-1 ticket for all Cycle 0 projects). Actual observation execution information shall be included under the "Work Log" section of the ticket. Each project shall also have a corresponding, linked JIRA ticket for data reduction. These shall be created as subtasks of a separate parent ticket (SCOPS-24 for Cycle 0 projects).

A main benefit of using a JIRA ticket for the lifetime of each project is that any new JAO and ARC staff will be able to be assigned to support projects more or less immediately, for their first observing Cycle, and will be able to inherit the expert knowledge necessary to effectively support a given project not only from their peers at the ARCs, but via the established JIRA ticket threads for previous projects as well. To ensure this, the tickets are required to include specific information, as detailed in 8.4Appendix IV

The JIRA system will work fully in tandem with the Project Tracker tool, and will generally contain complementary information. For example, the Project Tracker will clearly be more immediately useful to the AoD during actual observations. Note also that some parts of the Project Tracker content will be accessible by project PIs, whereas this will not be the case with the JIRA system.

Any changes that need to be applied to the project during the observing period, any important additional input from the PI via the ARC support staff, etc. may also be documented as additional postings to the project's JIRA ticket. Once a project has been observed, and is undergoing QA2 (Quality Assurance, Stage 2) checking, any significant issues identified should also be noted as comments to the relevant JIRA data reduction ticket. Once data delivery of the completed (or as completed as possible) has been confirmed (via a check against the project status in the Project Tracker), the supporting ARC scientist should close the JIRA ticket. Any subsequent QA3 issues that arise following data delivery to the PI may be grounds for temporarily re-opening the ticket.

8 Project Change Request

8.1 Procedure for PI-requested Changes

The procedure for PI initiated changes depends on if they occur during the review of the Phase II products with the ARC contact scientist, or at some other time.

All "Major" PI-initiated project change requests (see Section 8.4) or any requests that occur outside of the Phase II review process with the ARCs shall be submitted by the PI via the "Change Request" form in the Helpdesk (see 8.4Appendix III Each change request is required to include a justification for each and every requested change. A request lacking an accompanying justification shall be automatically rejected. A decision on the requested change shall be communicated back to the PI (with a cc to the ARC contact scientist) via the helpdesk system as described in Section 3.2.

The PI may also request changes during the review of the Phase II products with the ARC contact scientists. Those deemed minor by ALMA science support staff may be approved by the contact Scientist. These changes shall be logged in the project JIRA ticket, and are required to receive final P2G approval before admission to the observing queue. If the assigned ARC staff is unable to decide if a requested change should be categorized as minor or major, then he/she should ask the PI to submit a Change Request ticket to the CRSC through the helpdesk.

8.2 "Best Practice" Changes

These are changes to the SGs or the default generated OT SBs or SB parameters in order to properly execute the project, given the capabilities of the array and currently understood "best practices". They may include the following:

- Additional continuum frequency spectral windows to a continuum observation, if it decreases the expected execution time
- Additional spectral windows if needed to cover the requested spectral lines (e.g. in the case that the OT validated with a single spectral window covering both lines, but the SBs cannot actually be constructed that way)
- Changes to the structure of the Science Goal that lead to a more efficient project execution without adversely affecting the science goals (i.e., the same sources are observed, the same area is covered, the same sensitivity or better is achieved, etc.)
- Changes to make the project easier or more likely to scheduled without adversely affecting the science goals (i.e. observing with multiple configurations)
- Changing the default calibrations if deemed necessary to reach the stated science goals

It is worth noting that this category of changes may actually increase the expected execution time of the project. This should only be done if absolutely necessary to achieve the project science goals. Any changes should be kept to the minimum necessary. More extreme changes may be considered for the highest science ranked projects, particularly if this increases their likelihood of completion.

For ALMA Cycle 0, these changes may only be made by ALMA P2G members, and may be made at their discretion, as long as (1) they are documented in the appropriate JIRA ticket as described in Section 7, (2) they do not change the science objectives of the proposal, and (3) they are eventually approved by the PI.

8.3 Minor Changes

The following scenarios are currently regarded as minor changes to a project (ones with no implied changes to the science scope and do not increase the total execution time), and can be considered for changes between the submitted Phase I and Phase II materials:

- A change in the target position that is no more than the beamsize/2;
- A change in the target frequency for spectral line observations that is no more than 20% of the width of the original spectral window specified, and only as long as no additional major spectral lines would be measured as a result of the change;
- Trivial changes, such as changing the velocity reference frame from LSR to Heliocentric.

ALMA staff may make minor changes at their discretion, as long as (1) they are documented in the appropriate JIRA ticket as described in Section 7, (2) they do not change the science goals of the proposal, and (3) they are approved by the PI.

PI's may request minor changes while working with the ARC contact during the phase II preparation stage, or by submitting a helpdesk ticket to the "Proposal Change Request" subcategory of the "General Queries" helpdesk department. Each and every change must be fully justified in the ticket. Approval is related back to the PI by the ARC contact in the first case (who documents it in the appropriate JIRA ticket), via a reply to the helpdesk ticket. The revised Phase II materials are generated by the responsible P2G member.

8.4 Major Changes

The following scenarios are currently regarded as major changes to a projects' scientific scope, and shall not normally be allowed, unless mandated as part of the PRP process or required to correctly or efficiently create the Phase II products:

- General
  - A non-minor change in the target, or the addition of targets
  - Additions to types of requested polarimetry data not related to calibration
  - A specific change in the number and/or composition of (sub)arrays
- Spectroscopic observations
  - A non-minor change of frequency for a line observation (e.g. in order to observe a different line transition of the same chemical species)
  - A change in bandwidth and/or spectral resolution
  - Additional continuum frequency coverage
  - Addition of extra spectral window configurations/frequency ranges
- Mapping observations
  - Changes/increases to mapping areas
  - Additions/changes to map resolutions
  - Changes in arrays (e.g. inclusion of TP, ACA)
- Calibration (in cases that increase the total estimated execution time)
  - A change from "system-defined" to "user-defined" calibrators, and vice versa;
  - Addition of extra calibrators

ALMA staff may not request major changes for PI projects, except as mandated by the PRP or as allowed under the "Best Practices" procedures (see Section 8.2).

PIs request major changes by submitting a helpdesk ticket to the "Proposal Change Request" subcategory of the "General Queries" helpdesk department. Each and every change must be fully justified in the ticket. Approval is related back to the PI through the helpdesk (see Appendix III The revised phase II materials are generated by the responsible P2G member.

Appendix I Memberships of ALMA Cycle 0 P2G and CRSC Committees

Initial Cycle 0 P2G Membership (patterned after the CSV "ObsMode" group)

JAO: Alison Peck, Stuartt Corder, Diego Garcia, Mark Rawlings
EA: Aya Higuchi, Yasutaka Kurono
EU: Andy Biggs, Liz Humphreys
NA: Kartik Sheth, Harvey Liszt

Change Request Standing Committee (CRSC; crsc@alma.cl)

Lars-Ake Nyman (Chair), Gautier Mathys (Deputy Chair), Baltasar Vila Vilaro, Andreas Lundgren, Mark Rawlings, Diego Garcia, Stuartt Corder

Appendix II Phase II Timelines for Cycle 0

This section gives the relevant dates and descriptions of significant Cycle 0 phase II events. It supplements Table 1.

Aug 1-Sept 5: Training and Preparations for SB generations:

- ☐ **August 1:** A team of OT "experts" will be identified and assigned to the "Phase II Project Generation Group" (P2G), responsible for generating the first drafts of SBs for approved cycle 0 projects, taking into consideration the PI-stated science goals, PRP-mandated changes, scheduling consideration, and current array capabilities (COMPLETED: See Section 0).
- ☐ **August 19:** The end of the APRC meeting. A list of science-ranked projects will be produced for submission to the DC meeting. The highest ranked projects will be identified by the PHT for use in a Phase II "Boot Camp". It is considered unlikely the DC will make substantial changes to the highest ranked projects. From the list, DSO will identify 3-5 "first light" projects to be assigned to P2G members from the ARCs. These projects must have SBs finalized (including PI approval) by an internal September 21 deadline for Cycle 0.
- ☐ **August 24-26:** A "boot camp" event will take place involving the P2G members. The aim is to give the participants a sufficiently deep understanding of the observing modes to be able to understand the structure of all phase 2 projects created. During the boot camp, the participants will work on the production of the SBs for a small but representative sample of projects, including the 3-5 "first light" projects.
- ☐ **August 27-Sept 5:** The P2G produces a Powerpoint presentation on Phase II project preparation for ARC training purposes.
- ☐ **August 29:** The DC meeting takes place, resulting in the final ranked list of Cycle 0 projects.
- ☐ **August 30-Sept 5:** The DSO produces a prioritized list of projects for Phase II based on project ratings and dividing the projects into three "phase II preparation" periods: those to be scheduled during the first two months (Oct-Nov, ~20 projects; compact configuration), those to be scheduled during the remaining months of the compact configuration[3] (Nov-Feb, ~30 projects), and those to be scheduled during the extended configuration (Mar-Jul, ~60 projects). The DSO assigns each project to a P2G member and to an ARC, based on PI affiliation or preferred ARC.

Sept 5-Sept 30: Production of first set of SBs (for projects to be scheduled ~Oct 1 – Dec 31 2011):

- ☐ **September 5-7**: The ARCs assign a contact scientist (hereafter ArcCS) to each project and sends this information back to the P2G.
- ☐ **September 5-14:** This is a good time for the local ARC P2G members to conduct a Phase II training session in their ARCs.

[3] Scheduling periods for compact/extended configuration are subject to change

- **September 7-11:** The P2G creates JIRA subtasks for each project and completes SB generation for first 21 projects (~2 per P2G member), following the process described in Section 5.2. ArcCS are added to the appropriate JIRA tickets and receive notification of when the SBs are ready.
- **September 12-20:** P2G members assigned the "first light" projects work with PIs to get these validated by the September 21 deadline.
- **September 12-28**: The ARC contact scientists review their assigned SBs, following the process described in Section 5.3. If they have any questions, they first discuss them with local P2G members. If questions persist, they may contact originating (or assigned) P2G member. Any desired changes are discussed with P2G, and if agreed upon are made by ArcCS, who also update the JIRA ticket. When comfortable with the SBs for a project, the ArcCS contacts the PI and arranges a timeframe for reviewing the SBs for PI for approval. This review is documented in the appropriate JIRA ticket.
- **September 28:** This is the deadline for conducting reviews with PIs. The ArcCSs indicate when PIs have approved Phase II products by annotating the appropriate JIRA tickets, which notifies the originating (or assigned) P2G member that these materials are available for validation.
- **September 29-30:** P2G members review any changes made to the SBs, raise and resolve any questions with the associated ArcCS. The projects must be validated before September 30th.

Oct 15 – Dec 1: Production of second set of SBs (for the remaining compact configuration projects to be scheduled ~Nov 1 2011 – Jan 31 2012):

- **October 1-15:** The P2G prepares the SBs & JIRA tickets for the remaining 35 compact configuration cycle 0 projects (~4 per P2G).
- **October 16-29:** The ARC astronomers meet with the PIs of these projects.
- **October 26-28:** Another Phase II boot camp takes place in Santiago.
- **October 30-November 1:** The P2G validates the second batch of SBs.

Dec 1 2011 – Jan 15 2012: Production of remaining extended configuration SBs (for projects to be scheduled ~Mar 1 – July 31 2012):

- **November 1- December 1:** The P2G prepares the SBs and JIRA tickets for the remaining 56 "highest priority" Cycle 0 projects (~6 per P2G).
- **December 2, 2011 – January 10, 2012:** The ARC astronomers meet with the PIs of these projects.
- **January 11 – January 15:** The P2G validates these SBs.

Appendix III Proposal Change Request Form in ALMA Helpdesk

Change requests are submitted through a special form on the ALMA helpdesk at http://help.almascience.org. The form is accessed by selecting the "General" category of the helpdesk and then selecting the "Proposal Change Request" sub-category. This provides access to the form that is displayed in Figure A- 1. Each and every change must be justified in the body of the ticket.

The procedure for responding to Change Request tickets is documented in the "ALMA Helpdesk Staff Guide" [RD5], and summarized below.

Submitted tickets will be directed to the ARC associated with the submitter. This will trigger a notification to the triage staff at the relevant ARC, who will transfer the ticket to their local "Change Request" department. The triage personnel at the ARC will be provided with a list of contact scientists associated with project codes. If the ticket is received after a contact scientist has been assigned to the project, then the triage staff assigns the ticket to them. If not, the triage staff assigns the ticket to themselves, until such a time as a contact scientist is assigned. If a contact scientist is never assigned (e.g. for "Filler" projects), the triage staff will maintain ownership of the ticket.

When the triage staff member transfers the ticket to their local "Change Request" department, a notification is sent to the e-mail list assigned to the Change Request Standing Committee (crsc@alma.cl). The CRSC conducts its deliberations outside of the helpdesk, and conveys the final decision by adding a "note" to the helpdesk ticket. Note: the CRSC does NOT "respond" to the ticket – that is the obligation of the ARC staff assigned to the ticket (preferably the contact scientist). After the ruling, the assigned ARC staff member responds to the PI with verdict. If this occurs for projects for which Phase II materials are being generated, the contact scientist annotates the associated JIRA ticket accordingly (see Section 5.3).

Note that according to this workflow, the ticket is not "assigned" to the Change Request Standing Committee; instead it is assigned to staff at the supporting ARC. This prevents the ticket from being "lost from view" of the supporting ARC. This issue is discussed in more detail in [RD5].

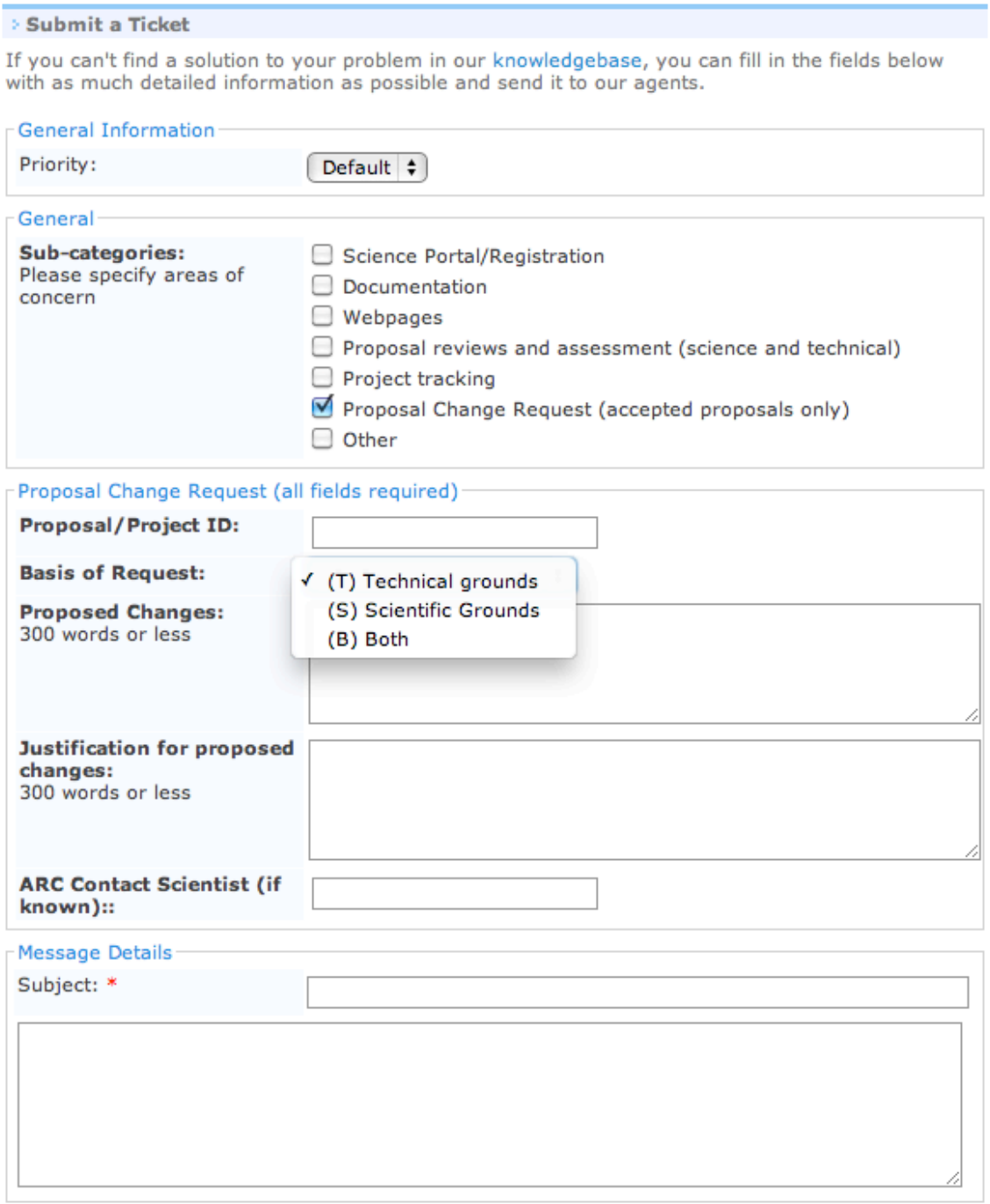


Figure A- 1: Screenshot of Change Request Form from the ALMA Helpdesk "General" category.

Appendix IV Elements of JIRA Ticket and Project Notes

This information is maintained at http://wikis.alma.cl/bin/view/AIV/ResourcesForEarlyScienceCycle0Observing. The information on that wiki takes precedence over the information below.

The JIRA tickets should be created in the "Science Operations (SCOPS)" project, as subtasks of SCOPS-1. Please try to create the tickets with following the generic title format: Cycle 0 Science Project Preparation: 2011.0.00XXX.S where XXX is replaced by the appropriate project code number.

Items to be included in the Project JIRA Tickets:

[By P2G originator]: These are entered in the JIRA ticket "Description" field An online Google form is available for anyone who wishes to (and is permitted to) use it. The link is available at the P2G wiki. On completion of the form requesting the above information, the form will e-mail the input back in a suitably formatted format.

Project code: 2011.0.00XXX.S
PI name: Joe Bloggs
Project title: Some Whizzy Science Project
Name of P2G Phase II originator: Mark Rawlings
Supporting ARC: EU
ARC contact scientist(s): Andy Biggs
List of SB name(s): SB1 SB2 SB3
Configuration(s) requested: Extended only
Summary of Field Source positions [RA, Dec]: [0 to 3hr; -30 to -50 deg]
Phase Calibrator(s) used: 3C273
Provisional Amplitude Calibrator(s) used: Neptune
Brief summary of receiver band(s) used &/or tuning(s): B3, B7, CO(1-0), (etc.)
Brief summary of correlator set-up(s): FDM, TDM (plus any other relevant information, e.g. # channels, etc.)
Any particular weather requirements: Any weather
Modifications mandated by the Proposal Review Process (if any): No mandated changes
Other additional important preparation notes: (scheduling considerations, etc)
JIRA data reduction tracking ticket (if known): Not yet known

Attach a copy of the completed .aot file and observing script simulator output to the jira ticket. This is to ensure that a pristine copy of the original version is safely preserved outside the Science Archive.

[By ARC Contact Scientist]: These are entered as "comments" to the JIRA Ticket.

Optional: ARC suggested Minor Modifications

……

P2G approval

Met with PI on [DATE] via [Method (helpdesk, email, skype, f2f, etc)]

Optional: PI requested Minor Modifications

…..

Optional: PI submitted Change Request [Ticket No.]

[Summary of requested changes]

Project review on hold pending response

Response Received on [DATE]

[Summary of response]

Optional: Scheduling Considerations (request that P2G add these to "Description" field)

PI approved on [DATE] via [Method]

Ready for P2G review

[By P2G Originator]: Responses entered as "comments" to the JIRA ticket, but Description field is updated to reflect the sum total of changes needed to produce the final phase II materials.

Reviewed on [DATE]

Optional: Any required changes

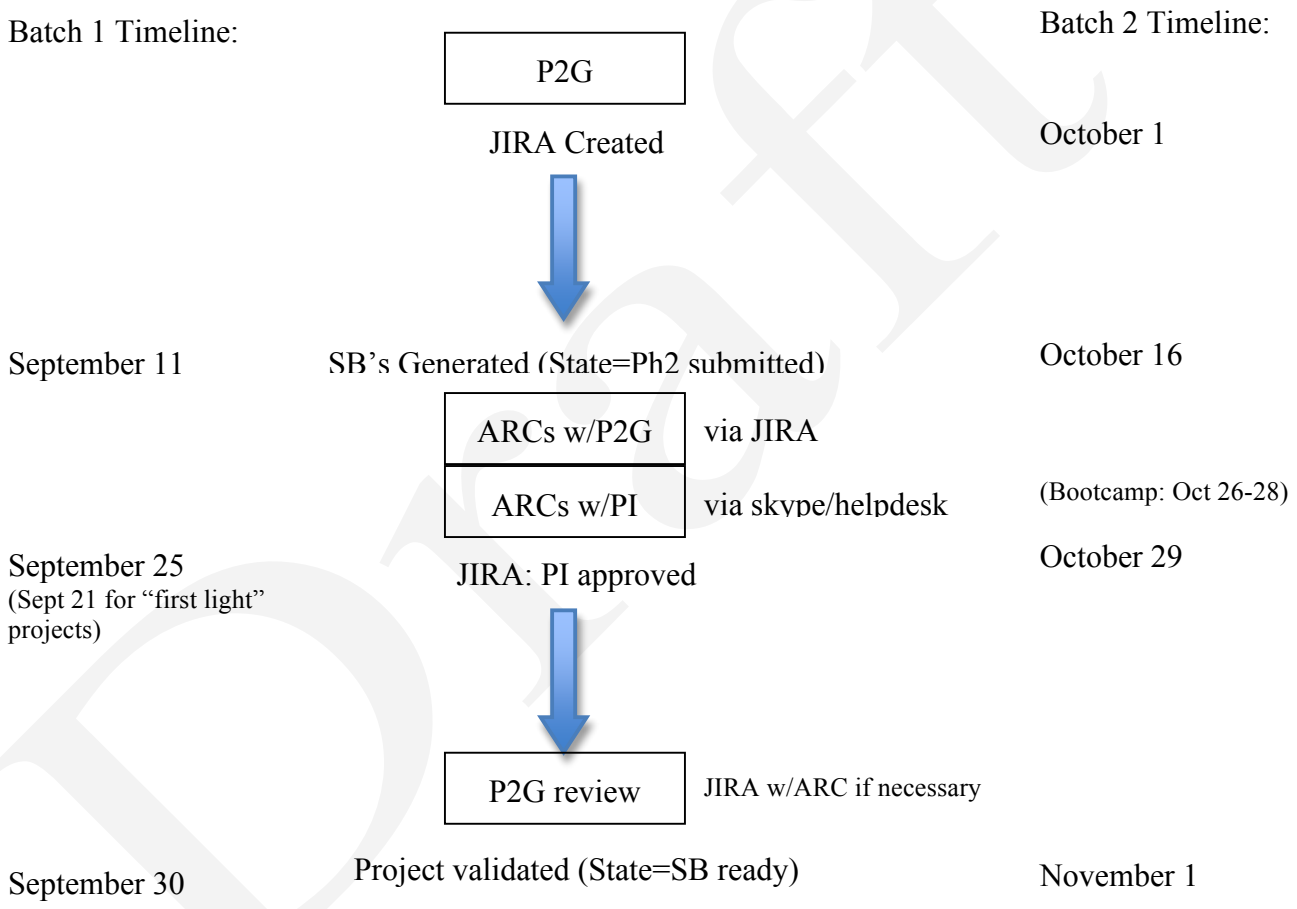
(may need to iterate w/ARC, and ARC may need to iterate w/PI)

Project Validated on Date: [DATE]

[By P2G Originator]: ***Items to be pre-pended to the "Project Notes" OT field contents during Phase II Project Preparation:***

Name of P2G Phase II originator: Mark Rawlings
Supporting ARC: EU
ARC contact scientist(s): Andy Biggs
List of SB name(s): SB1 SB2 SB3
Configuration(s) requested: Extended only
Summary of Field Source positions [RA, Dec]: [0 to 3hr; -30 to -50 deg]
Phase Calibrator(s) used: 3C273
Provisional Amplitude Calibrator(s) used: Neptune
Brief summary of receiver band(s) used &/or tuning(s): B3, B7, CO(1-0), (etc.)
Brief summary of correlator set-up(s): FDM, TDM (plus any other relevant information, e.g. # channels, etc.)
Any particular weather requirements: Any weather
Modifications mandated by the Proposal Review Process (if any): No mandated changes
Other additional important preparation notes: Lorem ipsum dolor sit amet, consectetur adipisicing elit.

Appendix V Phase II Preparation Flow Diagram



Appendix VI Items to Review with PI

(Placeholder – improve based on experience)

Before meeting with a PI, the ARC contact scientist must review the JIRA ticket created by the P2G member as well as the output from the Observing Script Simulator. If the ARC scientist has any questions on why the project was setup in a particular manner, has any suggestions on the observing strategy, or needs clarification on any of the observational parameters, they should communicate directly with the responsible P2G member. Only when they fully understand the project setup should they meet with the PI.

There are some standard questions that the ARC Contact Scientists should be prepared to answer before meeting with a PI. Some of these are:

For each source (or SB in the case of sources that share calibrators):

- Flux Calibrator:
  - What is the primary flux calibrator? How bright is it? How often is it observed? What S/N will be obtained?
  - S/N is per antenna, per scan time, per spw total bandwidth
- Bandpass Calibrator:
  - What is the bandpass calibrator? How bright is it? How often will it be observed? What S/N will be obtained?
  - S/N is per antenna, per scan time, per channel
- Gain Calibrator (sometimes called Phase Calibrator)
  - What is the gain calibrator? How bright is it? How far away from the source is it? How often will it be observed? What S/N will be obtained?
  - S/N is per antenna, per integration time, per spw total bandwidth
- Source
  - How often will my source(s) be observed, for how long?
  - For projects where imaging performance is important: What range of hour angle will be observed (affects image fidelity)

Science Goals (number of targets; mapping area; spectral setups):

- Were the science goals modified in any way by the Proposal Review panels?
- Were the science goals modified to accommodate “best practices” (e.g. were any changes made to spectral windows, etc)

Appendix VII Procedure for Selection of Filler Projects

The DSO will define the policy for selecting proposals off of the "Filler" list of projects in a future version of this document.

When it appears [possible; likely] that [all? Any Executives?] Cycle 0 "Highest Priority" projects will not be [scheduled? Observed?] before the [end of a particular configuration? End of the Cycle 0 period?], the DSO will select [HOW MANY?] projects from the list of projects assigned a "Filler" rating. Projects will be [Divided by Executive &/or Divided by configuration &/or LST range?], and from the corresponding list, the projects with the highest APRC rank will be selected and sent email notifications by [the ARC? the PHT?] that Phase II materials will be generated for their proposals. Each will be assigned a P2G member and ARC contact scientist, who will follow the procedures described elsewhere in this document for generating and approving the Phase II products. [TIMELINES???]