



**Atacama
Large
Millimeter
Array**

ALMA HIL Simulation Environment Preliminary Design Review Plan


ALMA-05.13.00.00-0001-A-PLA

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Change Record

Version	Date	Affected Section(s)	Change made by	Reason/Initiation/Remarks
A.0	2017-10-18	All	B. Lopez	First issue
A.1	2017-10-23	Chapter 6	R. Price, B. Lopez	First draft of the required documentation package
A.2	2017-10-31	All	B. Lopez	Several modifications after first feedback
A.3	2017-11-09	Chapter 4	B. Lopez	PDR participants updated
A.4	2017-11-14	All	B. Lopez	Panel updated, some TBDs eliminated
A.5	2017-11-14	Section 1.3	B. Lopez	Meeting date modified
A.6	2017-11-22	Section 5	B. Lopez	Comments on the timeline from Tzu Shen incorporated
A.7	2017-11-22	Section 4.1	B. Lopez	Correction on NA-ICT participants from Laura Jensen incorporated
A	2017-11-24	Section 4 and 7	B. Lopez	Decision making authority definition corrected; minor edit in Section 7 (agenda).

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1. Introduction

1.1. Purpose


This document describes the plan for the Preliminary Design Review (PDR) of the ALMA HIL Simulation Environment. This plan is based on the guidelines described in [AD01].

1.2. Scope

The review is limited to the ALMA HIL Simulation Environment, including all related hard- and software. It is noted that **no** 64 Antenna Correlator related modification/upgrades are part of the scope of this review. Budgetary matters will only be considered to the extent of reviewing/validating the presented cost- and effort estimations.

1.3. Date and place

The PDR will be held on February 15th, 2018, at the ALMA Santiago Office, with video connections to remote locations, as required.

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2. Related Documents, Abbreviations and Acronyms

2.1. Applicable Documents

No	Document Title	Reference
AD01	ALMA Design Reviews – Definitions, Guidelines and Procedure	ALMA-80.09.00.00-001-D-PLA

2.2. Reference Documents List


No	Document Title	Reference
RD01	ALMA Product Tree	ALMA-80.03.00.00-001-R-LIS

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2.3. Abbreviations and Acronyms

The acronyms used in this document are listed below.

AD	Applicable Document
ALMA	Atacama Large Millimeter/Submillimeter Array
ALMA-NA	ALMA North America
HIL	Hardware-in-the-loop
ICD	Interface Control Document
IET	Integrated Engineering Team
JAO	Joint ALMA Office
NRAO	National Radio Astronomy Observatory
PDR	Preliminary Design Review
RID	Review Item Discrepancy
SOW	Statement of Work

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3. Preliminary Design Review Objectives

This PDR seeks to accomplish the following, specific objectives:

- Evaluate the progress, technical adequacy, and risk resolution of the selected design approach;
- Determine the preliminary design's compatibility with the corresponding requirements;
- Evaluate the degree of definition and assess the technical risk associated with the selected development/production methods and processes;
- Establish the existence and compatibility of the physical and functional interfaces;
- Review if the HIL Simulation Environment Project Plan, including Work Breakdown Structure (WBS), resource allocation, cost estimations and schedule, is realistic.


The PDR concludes the phase of the development where:

- *Multiple* solutions or concepts which meet the specified requirements (for an ALMA simulation environment) are *identified and explored*.
- *Critical technologies* are identified and their feasibility analyzed.
- *Selected* solutions and concepts are *refined and validated* through extensive tradeoff studies and analyses. This may include simulations, calculations and/or prototype hardware development, test and evaluation. It shall be demonstrated, via one of the aforementioned techniques, that the selected design shall meet the requirements in terms of *functional and technical specifications* as well as in terms of *estimated schedule*. A compliance matrix is required.
- The *top-level performance requirements* for the subsystem are analyzed to ensure they are complete, documented and well understood.

In particular, the PDR is held to confirm that the selected technical solutions and concepts are defined in such a detail that:

- The subsystem *functional architecture*, external *interfaces*, the subsystem *specification* and the subsystem *description* are available.
- All technically *critical areas* are *highlighted* and potential solutions are presented.
- *Project schedule risks* can be evaluated with a high degree of confidence.
- The *development and production* plans, test and resources (work force, budget, facilities, spare-parts) are clearly identifiable.

The expected outcome is to conclude the preliminary design and development phase and initiate the detailed design and development phase.

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4. PDR Organization

The PDR shall be conducted in accordance with **ALMA Reviews Definitions, Guidelines and Procedure**, AD01. Approved Chair is **Bernhard Lopez**. Members of the panel are proposed by the Chair in cooperation with the ALMA-NA Management. The administration, organization, and function of the panel shall follow the project requirements described in AD01.

Any attendees other than those who have been appointed are regarded as observers. Members of other IxTs and Management who are not named are encouraged to attend. The comments of the observers will be included in the panel minutes.


The meeting report shall be delivered to the ALMA-NA Executive, and the ALMA Management Team. The decision-making authority for this review is the ALMA-NA Operations Manager, **Phil Jewell, who is acting on behalf of the AMT**.

4.1. PDR participants

The following groups of review participants have been identified:

- 1) Presenters,
- 2) Review Panel, and
- 3) Observers.

As Presenters, 1), the following people have been identified: Tzu Shen, Rodrigo Amestica, Alejandro Saez (TBC).

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The Review Panel, 2), is composed by the following members:

Review Chair:

(JAO) Bernhard Lopez; Bernhard.Lopez@alma.cl

Systems Engineer:

(JAO) Nick Whyborn; Nick.Whyborn@alma.cl

Science:

(JAO) Baltasar Vila-Vilaro; bvilavil@alma.cl

Executive Representatives:

(EA) Manabu Watanabe, watanabe.manabu@nao.ac.jp

(NA) Chris Langley, clangley@nrao.edu

(EU) Alessandro Caproni, acaproni@eso.org

Domain experts:

(NA) Bill Shillue, bshillue@nrao.edu

(EA) Takashi Nakamoto, takashi.nakamoto@nao.ac.jp

Remote reviewers will participate in this PDR by using the call-in number or video connection, which will be provided in the final PDR agenda.

As Observers, 3) have been considered:

ICT: Brian Glendenning, Erich Schmid, George Kosugi, Jorge Ibsen

IET: Silvio Rossi, Shin'ichiro Asayama, Kamaljeet Saini, Norikazu Mizuno

IST: Al Wootten, Leonardo Testi, Daisuke Iono, John Carpenter

AMT: Satoru Iguchi, Phil Jewell, Leonardo Testi, Stuartt Corder


Massimiliano Marchesi, AMG Manager

Rachel Rosen, ICT Control SW Lead

Roberto Price, ESG Systems Engineer

4.2. Review Process

Members of the Review Panel are requested to review the HIL Simulation Environment data package and provide their written comments and questions in advance of the review meeting. These comments should be recorded as "Review Item Discrepancies" (RIDs), System/Sub-system "HIL Simulation Environment" and delivery "PDR", using the JIRA review ticket system (see link below). RIDs should only be issued where there is an issue of substance that falls within the scope of this PDR. Observers are also encouraged to file RIDs, if/as deemed appropriate.

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The PDR Chairperson shall review, consolidate and assign the RIDs to the HIL Simulation Environment Team, which shall then respond to each RID through the JIRA review tickets. The schedule for this process is given in Section 5 of this document.

The review meeting discussion shall be focused on those RIDs where agreements or discussions are pending. For this it is expected that the HIL Simulation Environment Team incorporate the according RID references at their presentations.

RIDs may be closed if the Review Panel accepts that the answer provided by the HIL Simulation Environment Team is considered adequate or if the HIL Simulation Environment Team agrees on an Action Item (with associated completion date) to address the concern expressed in the RID. An Action Item may itself be closed subsequently if the HIL Simulation Environment Team response meets the requirements of both the Review Panel Chairperson and the originator of the RID.

The ALMA "RID" JIRA ticket implementation can be found at the following link:

<http://jira.alma.cl/projects/RID>

(If you do not have JIRA access please contact Bernhard.Lopez@alma.cl.)

4.3. Roles and Responsibilities

The Decision-Making Authority shall:


- Define the objectives of the review;
- Approve the review plan;
- Appoint the review chairperson;
- Approve the Review Panel membership in consultation with review chairperson;
- Examine the Review Panel report presented by the review chairperson;
- Consider the recommendations and required actions resulting from the review;
- Generate the relevant decision as required.

The HIL Simulation Environment Team shall:

- Deliver the complete Data Package by the agreed dates;
- Provide responses to all RIDs submitted for review by the agreed date;
- Support the review meeting and provide the necessary facilities;
- Respond to agreed Actions within the agreed due dates;
- Provide a regular status report to the review chair about the progress on the agreed Actions after the review.

The Review Chair shall:

- Organize and execute the PDR, with support by the HIL Simulation Environment Team Leader;

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- Consolidate all RIDs received from the Panel Members and submit the RIDs to the PDR coordinator for review/response;
- Coordinate and provide to the HIL Simulation Environment Team, a list of all Actions that may result from the review meeting;
- Prepare and issue the Panel Report, together with a list of the agreed Actions;
- Receive administrative support.

The Panel Members shall

- Review the Data Package;
- Raise RIDs as appropriate and provide their findings to the Review Chair;
- Review the responses by the HIL Simulation Environment Team to the RIDs;
- During the PDR meeting support the Review Chair in the disposition of the RID responses, negotiating Actions and corresponding due dates;
- Support the Chair in the preparation of the Panel Report;
- Act as the representative for RIDs issued by reviewers who might not be able to attend the review meeting.


The Observers are invited to

- Review the Data Package and the design;
- Raise RIDs as appropriate;
- Review responses to the RIDs;
- Arrange, if not attending the review meeting, for a panel member representing the RIDs raised.

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5. Review Schedule


1. 14-Nov-17 Presentation of the preliminary PDR Plan
2. 17-Nov-17 Panel members are defined and approved by the Chairperson, JAO and NRAO
3. 29-Nov-17 Approval of the final PDR Review Plan; PDR process kick-off
4. 15-Jan-18 Delivery of the PDR Documentation Package to the Panel Members
5. 01-Feb-18 Delivery of the RID statements from the review panel members to Chair
6. 05-Feb-18 Forward of the RID statements from Chair to the HIL Simulation Environment Team
7. 12-Feb-18 Return of RID statements with responses to the review panel members
8. 13-Feb-18 Delivery of the PDR agenda to the review panel members
9. 15-Feb-18 **PDR Meeting**
10. 10-Mar-18 Delivery of the Final Panel Report

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6. Review Documentation

The PDR Documentation Package consists of the following documents (in accordance with section 3.2.2 of [AD01]):

- **SPECIFICATIONS AND REQUIREMENTS**
 - HIL SIMULATION ENVIRONMENT (HSENV) SPECIFICATION
 - INTERFACE CONTROL DOCUMENTS
 - HSENV TO SITE (OSF)
 - HSENV TO CONTROL SW
 - HSENV TO CENTRAL TIMING
 - HSENV TO PATCH PANEL (AOS)
- **PRELIMINARY DESIGN REPORT**
 - DESIGN DESCRIPTION
 - DESIGN JUSTIFICATION AND TRADEOFFS BETWEEN DIFFERENT DESIGN ALTERNATIVES
 - SUBSYSTEM/SW ARCHITECTURE DESCRIPTION
 - FUNCTIONAL DIAGRAM/DESCRIPTION
- **COMPLIANCE MATRIX**
- **CONFIGURED ITEMS DATA/PARTS LIST (W/R TO THE PRODUCT TREE)**
- **STATEMENT OF WORKS (DRAFTS)**
- **PROJECT MANAGEMENT PLAN**
 - HSENV JUSTIFICATION
 - WBS INCL. DEVELOPMENT PLAN/WORK PACKAGE DESCRIPTIONS
 - ORGANIZATION
 - RISK MANAGEMENT
 - PA PLAN
 - SAFETY PLAN
 - PRELIMINARY INTEGRATION, VERIFICATION AND COMMISSIONING PLAN, INCL. PRELIMINARY PROCEDURES, IMPACT ASSESSMENT AND RISKS
 - COST ESTIMATIONS

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7. Preliminary Tentative Agenda

The detailed agenda will be provided ahead of the meeting by the Review Chair.

8. Logistics

8.1. Location

The review will be held at:

ALMA Santiago Office, meeting room will be confirmed on shorter notice.

8.2. Call-in Number

Tele- and video- connections will be arranged for remote participants.

Access information will be provided later.

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