

Response to the Review Panel's Report

We are extremely grateful to the Panel for carrying out the review and for providing this insightful report. There are no statements in the report that we would take major issue with, so the following is largely an acknowledgement and commentary about how we plan to move forward on the recommendations. The numbering below is that of the Panel's report.

1) Inclusivity: The Panel is correct in saying that we need to make the plans for commissioning the ACA more explicit. We expect that a person with in-depth knowledge of the ACA correlator will join the team in the early part of next year. This will help us with both the early testing of that correlator and in preparing a detailed plan for ACA commissioning by the end of 2010 – well before the first 7-meter antennas are in place at the high site.

2) Organization: We are well aware of the hazards of having a single team of scientists covering the whole range of activities, which includes AIV testing, Commissioning and Science Verification and the preparations for Early Science. The point that resource conflicts become more acute when we are doing commissioning and AIV tests simultaneously is well taken. We will continue to watch closely as to whether the structure we have is working satisfactorily. In answer to the point about the scientists lacking direct contact with the equipment, we will try to exploit the opportunities that do exist in some areas and in the other areas we will work to improve the amount of contact and communications between the scientists and the engineers (both hardware and software).

3) Schedule: We are very much aware that the schedule for CSV is challenging, and that it is getting more so as a result of delays in deliveries. We agree that having priorities and contingency plans set in advance is an important aspect of addressing this. On the specific recommendations:

1. Prioritization. In the case of the “Start of Early Science” we already have a list of minimum requirements that is separate from the desired goals. Priorities on the commissioning tasks have also been set implicitly when we agreed the sequence of delivery of software capabilities with Computing. We will however make these more explicit in our planning. Having monthly sessions to track progress and adjust plans is a good suggestion. We will keep the review panel informed of these in case they wish to keep in touch.
2. An analysis of the effort required on a task-by-task basis was made in drawing up the original commissioning plan and the resulting figures were consistent with the staffing plan that we have. We will repeat this exercise in a little more detail in the coming months, making use of the experience gained in the past year, although it is always going to be difficult to make accurate predictions of the effort required for the test activities of the type that we are dealing with here.
3. Performing an analysis of the major risks is clearly appropriate and we aim to have this done by the end of this year. We will also try to develop mitigation strategies where needed.

4) Staffing: We are working hard to find additional staff. Some offers have been made in the last few weeks and a new advertisement has just been released.

5) and 6) require no comment.

On the other issues raised by the Panel:

Points 1) and 2) about the data links between the OSF and the AOS and from the OSF to Santiago are of concern to us too. The Project is well aware of the importance of the communication issues and appropriate steps are being taken on both issues, including being

prepared to put in a temporary fiber connection to the high site if the microwave link proves inadequate and setting up a new contract for the link to the Santiago.

On point 3) it is less clear that there is a serious difficulty so long as the data rates used for the current planning (6 MB/s mean, 60 MB/s peak) can really be reached. This was analyzed in some detail in ALMA memo 501 and it appears that only rather extreme cases will not be catered for. We will, however, have another look at this taking account of observing plans that are being discussed in the community. An aspect that should be considered is the extent to which the limited data rates and storage capacity will limit serendipitous discoveries with ALMA.

On item 4), the planning does now incorporate running the OSF interferometer until at least the start of Early Science. We are also committed to adding the polarization calibration source mentioned in 5) to our plans, although it is true that we have not yet identified a source of funds for that. The point 6) about the failure rate is well taken, and this is in fact our (the authors) number one concern at the moment. It is however not a simple problem to solve. Item 7), which relates to the location of the most northern antenna station, is by contrast easily fixed. We have now concluded the necessary studies and have definitely decided to move it to the more protected location. We also agree with point 8) about the importance of the commissioning scientists remaining scientifically active and we are trying to make sure that this happens. It is true that the ALMA “science verification” process will provide some opportunities for this, but we think that it is essential to keep other avenues open as well, e.g. using existing facilities.

We very much appreciate the Panel’s help and advice (which included many verbal comments as well as the written report) and we hope that we will be able to call on them again in the future.

Richard Hills and Alison Peck

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