RESPONSE TO ASAC MAY 2004 MEETING REPORT

Date: 21 July 2004
From: ALMA Board
To: ALMA Scientific Advisory Committee
Subject: Board response to ASAC report of ASAC May 2004 meeting

PREFACE: The Board thanks the ALMA Scientific Advisory Committee (ASAC) for the thoughtful report it produced in response the Board's charge for the May 2004 meeting. The Board also thanks the ASAC's Chair, Dr. Lee Mundy, for attending the Board's recent meeting in Munich, where he clearly presented and elaborated upon the recommendations expressed in the written report.

Herein we provide the Board's response to ASAC's issues of concern. Where ASAC observations or recommendations touch upon complex technical matters, the Board refers them to the Joint ALMA Office for consideration and advice back to the Board.

Charge 1: Total Power and Phase Stability

The Board acknowledges ASAC's support for the changes recommended by the Systems IPT's to the currently proposed technical requirements for delay errors and deviation from the 10-sec average, and requests the JAO to proceed with its implementation unless JAO foresees technical, budget or schedule issues that require further discussion and/or Board approval.

Similarly, the Board endorses ASAC's requests that the project:

a) assesses via simulations how the planned level of phase stability affects ALMA's high-resolution imaging capability, and associated implications for the ALMA Calibration and Software efforts; and

b) investigates whether there are useful tradeoffs between gain stability and sensitivity that could be made for the four total-power antennas.

We further encourage the project to provide ASAC the revised technical requirements and simulations on polarization as soon as they are available.

Charge 2: ALMA Calibration

The Board acknowledges ASAC's concerns regarding the current understanding of calibration issues, as described in section 4 of your report. The Board supports ASAC's recommendation (section 4.1) that the Science IPT identifies and studies the impact of calibration on a handful of the most challenging major science goals, as a means to evaluate fully the impact on the science arising from a loss in the accuracies of the relative and absolute amplitude calibration.

We further endorse the value of continued testing of calibration mechanisms, as well as of more dedicated effort towards absolute calibration needs. However, we wonder if

ASAC members themselves could work closely with ALMA to make maximal use of parallel efforts at other facilities in support of phase calibrator surveys, thereby creating an international team or network of knowledgeable astronomers preparing now for ALMA phase calibration.

The Board thanks ASAC for clarifying during the oral presentation that, among its various recommendations and observations, ALMA should accord top priority for expenditure of ALMA's capped resources on

a) testing and improving the stability of four antenna systems to optimize for total power mapping; and on

b) concentrating more resources on development and testing of amplitude calibration strategies.

Future charges to ASAC will request similar prioritization in order for the JAO and the Board to assess the potential impact of implementing ASAC's recommendations.

Charge 3: ALMA Early Operations in Context

ASAC's clarity on the strategic value of concentrating during early operations on the types of observations in which ALMA will excel is good advice. We anticipate that the project and communities will strive to incorporate the concept in early science operations planning.

The Board endorses your recommendation regarding "…the development of "science demonstration projects" to exemplify ALMA scientific capability and public appeal."

Your further suggestion that some early science programs include observations coordinated with other facilities also has merit, although clearly priority has to be on demonstrating ALMA capabilities without unduly impacting upon construction or early operations development as a result of additional complex constraints that coordinated observations may impose.

We concur that organizing the early science program is an appropriate activity for the ALMA Project Scientist, with input from the ASAC and the scientific community.

Charge 4: ALMA Operations Plan and Operations for Early Science

The Board notes ASAC's agreement with the overall principles outlined in Section 7.1 of draft G3 of the ALMA Operations Plan. The Board may exercise its option to return to ASAC for advice on several important policy issues associated with the time allocation process.

The Board feels ASAC is wise to recommend that "…the project seek ways to involve experts from the community in the commissioning, science verification and early science operation activities," for the reasons ASAC provided. Additionally, the Board encourages efforts by ALMA to ensure that "non black-belt radio astronomers"

participate with the experts in the definition and interpretation of early science, as a means for bringing ALMA's potential into broader community scientific activities.

Charge 5: Science and Software Requirement Prioritization

The Board understands that the ASAC's efforts to comment upon software development were constrained by the recent PDR input to the Computing IPT, and the need to complete the next draft of the Operations Plan. Many Board members have personal experience with the difficulties of on-time, on-budget delivery of software, and thus acknowledge the validity of ASAC's general concerns. The Board anticipates requesting ASAC to revisit these issues in the near future, particularly as they affect readiness for early science operations.

Finally, the Board welcomes ASAC's observations (Summary, item 12) regarding the need to manage carefully community expectations for scientific productivity in the early years of science operations. The Board is asking the project to heed to the best of its ability ASAC's advice regarding time allocations and array scheduling that maximize science while minimizing negative impact upon construction. We anticipate that the project will return to ASAC and the Board for more discussion as early science operations plans mature.