Response to the Report of the 2009 EVLA Advisory Committee

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15 July 2009

The EVLA Advisory Committee reviewed the EVLA project at a meeting in Socorro on March 19-20, 2009. The Committee forwarded 10 specific recommendations on the project in a report to the NRAO Director on April 20. We greatly appreciate the efforts of the Committee members in the review and in making the recommendations. Our responses to the recommendations and other topics mentioned in the report are listed below.

1. ***Further integrate "external" developments (CASA, SSS, OSO) in the EVLA project plan, as has been done for the correlator, including a list of (a) risks, resources, critical interfaces and (b) areas where responsibilities are unclear.***

   While it has been important to identify EVLA construction as a project within the NRAO, with its own project plan, for mainly accounting and project management reasons, the EVLA is not independent of the rest of the NRAO. To consider CASA, Science Support Systems (SSS), and Observatory Science Operations (OSO) as "external" developments is not helpful from the One Observatory's point of view, especially as the EVLA enters early science and full science operation.

   The formation of the OSO organization structure across the NRAO will not have any impact on the EVLA construction project, but the OSO will ensure the Science Operation of the EVLA will fully meet the needs of the user community. We have recently made good progress in integrating CASA with the EVLA project plan (see item 5 below). With the exception of some work on the Proposal Submission Tool, we note that SSS is a work element of the EVLA project, and thus is not "external" to it.

   The Observatory is actively reviewing the current structure and organization in New Mexico Operations, with the view of establishing a well-defined "Science Center for EVLA" to ensure the EVLA users are well supported as the EVLA enters full science operation, similar to NAASC for ALMA. The OSO structure will ensure the science centers for EVLA and ALMA within the NRAO are well coordinated in all relevant aspects for the optimum and cost-effective support of the NRAO users.

2. ***Develop a science driven plan for the distribution and processing of data, taking into account the balance between local processing and centralized (super-)computing.***

   We recognize the importance of this recommendation, and we will develop and implement the plan as we gain experience with the volume and rate of data produced by the WIDAR correlator. As we reported at the meeting, we have purchased a prototype parallel computing cluster with the objectives of parallelizing data analysis code, defining the detailed architecture of the final computing cluster, and delineating the classes of data analysis problems that require the cluster or can be accommodated by commonly-available desktop computers. The plan will include how best to distribute EVLA data (e.g. by tape, disk, and/or high speed internet).

3. ***Given the importance of user acceptance of SSS tools, aim at a vigorous interaction with end-users and continue working towards external deadlines (in particular making new EVLA modes available through the new tools).***

   We are implementing this recommendation. For example, the Observation Preparation Tool (OPT) is the only software tool that provides the capability for the use of the EVLA's new Ka-band receivers. OPT use will be further driven by the addition of other receiver bands (e.g. S) and the WIDAR correlator. Astronomers already use the Proposal Submission Tool for writing (E)VLA, VLBA, and GBT proposals and the Archive Access Tool for retrieving data from the (E)VLA, VLBA, and GBT archives. We continue to include scientists as software testers first from within NRAO, then external to it, whenever we develop one of these tools, as evidenced by the development for all of the Archive Access Tool, Proposal Submission Tool, and Observation Preparation Tool; we firmly believe in that method and will pursue it vigorously.

4. ***Take explicit action on user acceptance of CASA, e.g. integrate in synthesis schools and by facilitating tutorials to interested groups and institutions.***

   To ensure user acceptance of CASA, we will continue to provide CASA tutorials at the Synthesis Imaging Summer Schools held every other year. A CASA tutorial given at the Canadian ALMA workshop in June 2009 was well received. We will explore the possibility of providing CASA tutorials to other interested groups and institutions. In particular, we are considering a CASA tutorial in November that will be aimed explicitly at potential participants in the Early Science Observing (ESO) program, which was formerly known as the Open Shared Risk Observing (OSRO) program. The EVLA staff will be given assignments to ensure that CASA can effectively reduce data for a given observing mode as part of the commissioning process before the release of that mode to

the community. In addition, all participants in the Resident Shared Risk Observing (RSRO) program will be expected to use and provide feedback on CASA. We currently track the number of CASA users, bug fixes, and fix durations, and, as the Committee suggests, we will report these statistics at future meetings, although we are not certain that they are ideal indicators of the degree of user acceptance. We are encouraged by the increasing interest in CASA as indicated by the increasing number of downloads of the software package from the CASA web site since its beta release in October 2007. We will continue to monitor downloads as an indicator of CASA user acceptance.

5. ***Explicitly prioritize specific EVLA requirements and integrate these in the CASA planning, and couple the CASA planning more closely and explicitly with EVLA planning.***

   The software development process for CASA has been adapted to give EVLA needs priority. The EVLA requirements for data analysis and algorithm development have been derived. A detailed, prioritized list of the EVLA requirements needed for the upcoming ESO program was developed by EVLA personnel, and was used extensively in the most recent six month planning effort for CASA. That planning effort included representation by both EVLA scientists and EVLA software management. Periodic meetings are held to review the status of CASA and other EVLA-specific software development. Additional prioritized EVLA requirements will be forwarded as input for future CASA development cycles.

6. ***Secure continuity of CASA key personnel during commissioning and early science.***

   As mentioned in item 5, EVLA needs have been adopted by CASA as a high priority. We do not foresee a significant diversion of CASA staff to other unrelated activities over the EVLA commissioning and early science period. A large fraction of key CASA personnel is located in Socorro, and their active support of EVLA commissioning and early science will arise quite naturally from their proximity to the work. In fact, CASA support of EVLA commissioning is already occurring. The experience gained through CASA support of EVLA will also be of great benefit to the ALMA project. Since ALMA and EVLA are the two highest priorities for the Observatory, we believe that the continuity of CASA personnel will be secure over the time it takes to make the EVLA a fully operational instrument.

7. ***Ensure algorithms developed within the Algorithm R&D are translated into CASA pipelines in a structured way, allowing for proper verification.***

   We will implement this recommendation. We will plan for the effort required to implement algorithms within CASA when we establish priorities for CASA software development cycles (see item 5). The algorithm developer will demonstrate the performance and functionality of the original algorithm, and CASA staff will ensure that the algorithm is properly implemented within CASA. Finally, as in item 4 above, EVLA scientific staff will be assigned to test the implemented algorithm.

8. ***Make supported configurations and caveats explicit in calls for proposal.***

   We will make supported WIDAR configurations, and any caveats associated with their use, explicit in future calls for proposals. We already provide this information in the web-based News for Proposers (see http://www.vla.nrao.edu/astro/guides/news/).

9. ***Establish a science based long-term observing and archiving plan taking into account the potential benefits of later scientific use.***

   This is an excellent suggestion that will maximize the scientific return of individual EVLA observations. We will develop and implement a long term observing and archiving plan. The plan will establish standard observing modes and procedures to ensure that calibrated data are suitable for reasonable scientific use beyond the original intended purpose.

10. ***NRAO needs to maintain and grow a vibrant scientific community at Socorro for the EVLA, for the project to be successful and productive.***

    As the Committee rightly noted, the current scientific staff is heavily engaged in the commissioning and early science activities of the EVLA. Over the past few years, NRAO has hired two assistant scientists and a postdoctoral fellow whose functional duties are devoted solely to EVLA commissioning and early science. A number of Socorro-external astronomers responded with great interest to our recent call for letters of interest in the RSRO program. The participation of these scientists in EVLA early science will provide additional scientific vitality in Socorro over the next few years. On the longer term, with the completion of the EVLA, we are quite confident we will attract postdoctoral fellows and scientists to Socorro with the objective of maximizing the EVLA's scientific impact and productivity.

In addition to the 10 recommendations specifically listed in the Committee's report and discussed above, the Committee mentioned three other topics regarding EVLA early science and operations:

1. ***The Committee strongly encouraged the NRAO to carry out high-impact Observatory-based demonstration science to advertise EVLA capabilities and further engage the community.***

   Members of the NRAO scientific staff, with the possible input from and involvement by the astronomy community, will recommend EVLA demonstration science projects to the NRAO Director, who will select the projects to be observed. The results from the demonstration projects will be reported with NRAO electronic newsletters, on the NRAO web page and will be available on the archive.

2. ***The Committee urged the NRAO to report a more detailed vision of the reach, goals, and implications of the OSO at future Committee meetings.***

   While the OSO Working Group has been charged with delivering an implementation plan by April 2010, intensive discussions and planning have been taking place in all the relevant areas across the Observatory. Some of the tasks relevant to science operations that require immediate attention and action are being implemented without waiting for the final OSO implementation plan. We will be able to make a clear presentation on the status of OSO in future meetings.

3. ***The Committee suggested that the project respond to a recent report of the Science Advisory Group for the EVLA (SAGE). The response should address the SAGE's concern regarding post-processing software.***

   The response was written and forwarded to the SAGE chair. The response addressed the concerns regarding post-processing software.