Preface Rev 4 of January 2, 2010 – H. Liszt

Technical Assessment would be circular if the assessors saw nothing more than the Phase 1 inputs – the proposal – and were merely asked to use a set of system-wide tools to check the time estimates, *etc.* that the Observing Tool (OT) gave back to the PI in the first place. So the issue is to create criteria for TA that really provide other perspectives. Part of this would involve looking at the Phase 1 input and another might be to peruse the Scheduling Blocks (SB's) that are generated. The discussion here covers only the first aspect, culminating in a draft report format based on Phase 1 input and interpretation by the OT.

[Should SB's be available for TA and should their inner workings be exposed during Phase 1? If it is decided that SB's must be available for TA (generally the sentiment among people at the NAASC with whom I've disccusssed TA), a decision will have to be made as to the means. SB's can be readily interrogated in detail using the OT but giving access to the archive for TA has policy implications. Note though, that *without* access to the SB's it may be impossible to answer even such simple and obvious questions as how the data rates and data volumes were computed. Perhaps a compromise is possible whereby the OT's defaults are exposed.]

Given the structure of a proposal within the Observing Tool it seemed unavoidable that Technical Assessment would be based on a survey of the Science Goals that comprise it (is this a problem?). So on the PI side, but also as guidelines for TA, I felt compelled to formulate a discussion "How to express an observing project in terms of Science Goals" which includes both "What SG's can and cannot do" and "Do's and Don'ts: Guidelines for constructing Science Goals." That discussion is followed by a draft TA summary report page.

I. Expressing an observing project in terms of Science Goals

Science Goals are the basic units of an observing proposal or a planned observing program as managed by ObsPrep, the ALMA observing tool (OT): an ALMA proposal or project is expressed as a set of appropriately-constructed Science Goals prefaced by identifying information, an abstract and a science justification. In simple cases, a single Science Goal in the tool may contain all of the science that is proposed. But more likely a proposal will contain multiple Science Goals. And in most cases the number of Science Goals and their contents will be influenced by practical considerations, not just the intended scientific results.

A. Things to remember about Science Goals inside the Observing Tool: What A Single Science Goal Can and Cannot Do

i) A Science Goal may have one or more targets (separately-named spatial field centers) but will only make a pointed mosaic synthesis map when there is but a single target. This restriction to mosaicing a single target inside one SG is real but somewhat arbitrary and could be removed.

ii) A Science Goal contains only one spectral setup, for one ALMA receiver band. That is, all of the targets in one Science Goal share the same line list (set of frequencies) and correlator setup (in OT terms, the same spectral elements) **and** all of the science observations for one Science Goal are done using one and the same single ALMA receiver band. All of the spatial targets in a Science Goal are treated equally in these terms. However the spectral setup of frequencies and correlations fully reflects ALMA capabilities and may be quite complex and do quite a lot, for instance observing multiple lines in both sidebands, or line and continuum (at full 2 GHz bandwidth) at the same time.

iii) A Science Goal contains only one set of Control Parameters – a requested spatial resolution, a sensitivity (rms in flux units) and a largest structure (angular size) expected within a map area. All of the spatial targets in a Science Goal are treated equally in these terms as well. An integration time is not explicitly requested by the user (this is in the requirements), rather it is the responsibility of the OT to infer observing times from Control Parameters using algorithms that support the various observing modes whereby synthesis and total-power data or AEA and ACA observations are combined. At present, only the case of a single AEA pointing on one target within a SG is fully supported with an integration time estimate that accurately reflects the time implied by the radiometer equation to reach the stated rms; observing overheads for calibration, etc. require algorithms which also remain TBD.

Finally, note that one Science Goal will generate one or more Scheduling Blocks – the basic unit to be scheduled on the telescope – depending on its structure. But any one Scheduling Block cannot express more than one Science Goal (don't cavil about dependencies). Therefore, things which really should be observed together, and which should end up in the same Scheduling Blocks, should probably be placed together in a Science Goal in the proposal (see the discussion below).

So, for example, one Science Goal could do a flux-limited survey of identical single-point observations of any number of targets (or rectangular mosaics of them in the near future probably), although the same survey could be done (and sometimes should be done – see below) with different Science Goals for each target.

B. Do's and Don'ts: Guidelines for Constructing Science Goals and Expressing a Proposal in Terms of Science Goals

[To be fed nto the next section as appropriate, but I am totally making it all up here, this may depend on operational considerations TBD. Please review ruthlessly.]

Use as few Science Goals as possible without turning them into makeshift contraptions solely for this sake. Upside: sources inside a Science Goal are more likely to reuse calibrators and be observed together, so a small snapshot survey of relatively nearby sources is a good candidate for one Science Goal. Downside: sources inside a single Science Goal are more likely to be grouped for scheduling in such a way that none of the data is accessible until most or all of the data has been taken. Grouping 10 targets to be observed for 7H each into a single Science Goal is probably a mistake if sources can be done in a single transit and you would like to access the data for each source as soon as possible.

Use spectral setups that observe lines simultaneously within the same Science Goal and do line and continuum observations together whenever possible – this may mean that you must learn more about the LO system than you would otherwise prefer. Please refer to “Le Systeme LO ALMA Pour Les Nuls” (available in French). Possible downsides: having to study the LO system and learn some real “radio astronomy”. [NB: A primer on the LO system and sidebands will have to be written for reference while using the OT, I don’t see a full graphical editor on the horizon]

After creating a proposal, review its use of ALMA capabilities to ensure that resources that could be included at no cost in observing time are being used; for instance, an unused sideband or passband which could have been taking useful continuum or line data. Upside: get more information, impress the TAC. Downside: need more system resources (beware data rates!).

II. Guidelines for technical assessment of the Phase 1 Proposal

[The intention is to feed these back into the previous section as guidelines as needed and to use all the guidelines and criteria to assist in formatting the material which is shown to the assessors.

Yes/no phrasing in the following doesn’t eliminate the need to explain.

Discussion within the Ph1M (Phase 1 or proposal Manager) group now points to a simple text file as the output of TA, but with an overall summary judgment to be checked off at submission, chosen from among a small set (TBD) which might be: Is OK; Could optionally be tweaked; Needs Improvement; Cannot be executed]

a) Will the project actually achieve its desired sensitivities, resolutions, dynamic ranges, as proposed?

> If not, can it be straightforwardly modified during TA and allowed to proceed for scientific review?
>
> If so, could it be improved in any important way?

b) Can the project's data rates and data volumes be accommodated?

c) Are the time estimates and other derived quantities fed back by the OT reasonable? Stringency, pel and atmospheric quality octile required?

d) Is the project well-structured in how it is expressed in terms of Science Goals? Are targets and spectral elements that could be observed together actually grouped this way?

e) Within each Science Goal, are the control parameters – resolution, sensitivity, largest structure, area to be mapped – appropriate?

f) Is the AEA synthesis properly supported by mosaicing, ACA deployment, addition of total power data, *etc*?

g) Will the project cover a large enough region of the sky and attain sufficient uv-coverage to meet its imaging requirements, dynamic range, etc, as well as S/N?

h) Are the spectral elements in good shape? Are the spectral resolutions appropriate to the expected line widths?

j) Are ALMA's capabilities being well-exploited? Are there relevant observations that are being ignored, for instance untapped spectral elements/sidebands that could profitably be co-observed without occupying more observing time?

k) Are there requirements within the text of the proposal (abstract, science justification, etc) that were not otherwise captured by the OT?

m) Does the sum of the Science Goals constitute a project that meets its scientific objectives?

III. Guidelines for TA based on Perusal of Schedule Blocks arising from the Proposal

[Alan and I didn't know how to approach this, especially given the lack of experience of newbie TAs and overall lack of experience with the system. However, some system parameters are ONLY available inside SB's and this group should make a recommendation about whether the SB's to be furnished for TA]

IV. A draft TA proposal summary page format – I reformatted this report in the form of multiple tables based on the general sentiment that the previous version did not scan easily. So what follows is generally new.

Attached is a draft TA proposal summary report for a single Science Goal; there would in principle be one such report for each SG in a proposal (although it is easy to imagine circumstances where not every Science Goal needs its own page). In sum, here's what you see there:

At top some basic ID info:

A line noting that this SG is #5 of 12, that its name (given by the PI) is such and such, and that it has 11 targets

A section heading giving Band 03's RF range and sideband scheme (one of the possibilities shown would have been chosen) and a table quoting:

> The IF range;
>
> The range of receiver and median zenith system noise temperatures across the band (presumably as used in the observing time calculations);
>
> The median atmospheric optical depth range across the band (for a semester…);
>
> The number of km/s in 1 MHz of bandwidth at the band center;
>
> The range of Kelvin/flux units across the band (from the λ^2 dependence) at 1" resolution;
>
> The range of HPBWs of the 12m and 7m antennas;

The ranges of resolution of unprojected array baselines for the extended and compact arrays in their prospective configurations

Next, a section heading and a table of the Science Goal's input control parameters including:

The desired resolution;

The largest angular structure in the map;

The desired rms flux;

The input dynamic range;

A polarization accuracy goal -- I made this up, is it needed?

There follow 3 similar section headings and tables describing use of the AEA50x12m, ACA12x7m and ACA4x12m antennas (this information is summed on the cover page). Each table shows, for each possible observing mode:

The time per target (expressed here as an explicit fraction, i.e. 22 Hours of supposed total time allotted for 11 sources in the Science Goal);

The map size (leave it blank for single pointings?)

The number of synthesis pointings or antenna hpbw in the map area;

The spacing of synthesis mosaic pointings (not relevant for OTF mapping);

Whether the observations are to be carried out jointly with other of the ALMA resources (here, the ACA12x7m evidently);

The data volume per target and the data rate (is there any ambiguity left at this level between peak and mean rates?)

[Regarding the TIME quoted above … for multiple pointings, the quantity which determines the resultant rms varies between two limits, depending on the density of spatial sampling: for nyquist or better sampling, it is the total on-source time per beam area and for non-overlapping pointings, it is the time per pointing. Either of these can be straightforwardly derived by the reviewer, is it OK not to quote them directly? See below for the discussion of how noise estimates are generated for component observations]

Next on the page is a table of targets for this Science Goal; in principle this is the most open-ended entry and it might best come last, but for present purposes I used the available space. This table has, for each target:

The order and source name

The celestial position (other choices for moving objects, etc?)

OT-derived galactic coordinates (to give context, for instance to know if there may be problems observing in crowded sky regions);

How it is to be tracked;

Sky-velocity information (for spectral line work)

Three parameters that the OT does not solicit as of 1 January 2010:

a linewidth (to check that the correlator setup will capture the line)

a source continuum flux and expected (continuum) polarization.

[Discussions within the NAASC pointed to the dichotomy between all the parameters needed to capture the spatial aspects, and the absence of a comparison between the width of the lines to be detected and the correlator bandpass width. The source flux and polarization spec are an interpolation of mine, related to (see above) the spectrum dynamic range and polarization parameters). Are these needed or can the tool and the TA do their work without?]

[Should it be noted how much of the source path during the coming semester is in day or night? Should the TA page show the LST range of the Sun during the semester?]

Next come another section heading and 1-4 blocks corresponding to the four or fewer possible spectral sets: each “set” may have up to 8 entries corresponding to partial uses of the baseband. For each block there are two tables (which before I tried to express as one, but that had too many columns …).

In the first table in each block, expressing the setup input parameters, are:

The center (rest) frequency

A line id or could be "continuum"

The number of Stokes parameters correlated

The number of channels in each Stokes

The bandwidth in frequency and velocity for each Stokes

The channel spacing in frequency and velocity for each Stokes

A polarization spec (if needed)

[Should the table also quote the number of bits and sampling depth in the correlator?]

In the second table in each block, again for each frequency in the spectral setup, are:

The center (rest) frequency repeated as in the previous table

The range of median system temperatures expected at this frequency between some minimum elevation and the zenith.

Individual rms noise estimates for the various observing modes, all expressed in both flux and brightness temperature units

But what are these noise estimates supposed to be -- only one overall rms and synthesized spatial resolution were input for this Science Goal. However, the OT interprets the control information and instructs ALMA, via SB's, how to allocate resources, including observing modes and time. Thus, after the OT has calculated the time to be allocated in each mode, it is possible to achieve the partial rms noise estimates in the table. The synthesis rms estimates are naturally done first in flux units and then converted to temperature at an appropriate resolution, and vice-versa for the OTF. Here is a proposed decision path:

AEA Synthesis:

Calculate a "per-pointing" flux rms for each pointing of the array (basically the radiometer equation with time equal to total on-source mapping time per pointing).

Calculate a "per-beam" flux rms, basically the radiometer equation with the per-beam time equal to total time * area of the 12m antenna beam/area of map.

For non-overlapping pointings use the "per-pointing" rms and for nyquist or better-sampling use the "per-beam" flux rms. For intermediate cases … hmm is there a formula hiding in the wings, there should be one for every convolution kernel … is there a kernel hiding in the wings …? But what did the OT do in the first place to apportion the time? Shhhhh …

Convert the appropriate flux rms into brightness temperature units at the input control parameter resolution for the experiment (2" in this example)

ACA synthesis:

Do the same, but convert flux rms into temperature at the natural resolution of the ACA at the wavelength of observation (~21" in this example)

Any OTF or total power observing:

Calculate a brightness temperature rms using the radiometer equation with the per-beam integration time estimate noted above. Convert to flux using the known gain (flux/temperature conversion) of the telescope.

TA's ID Proposal ID **ALMA SEMESTER 2016A**

SG: 05 of 12 Science Goal (as named) .... has 11 Targets

ALMA Band 03 General Properties: 84 – 116 GHz (dsb,2sb,ssb,usb,lsb)

IF GHz	Trx	50% Tsys	50% zen. opacity	1MHz	1mJy @1"	HPBW 12m	HPBW 7m	resolution 50x12m	resolution 12x7m
4.0-6.0	37-51K	50 -90K	0.03 – 0.08	3 km/s	0.12,0.19K	48-64"	82-107"	0.049-4.5"	9-21"

Science Goal Control Parameters (blue stuff is new 31.12.09, and TBD, see discussion)

Resolution "	Largest Structure "	Rms mJy	Dynamic range	Polarization
2	50 -90	2	100	12%

Use of AEA 50x12m antennas

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol Per target	Data Rate
Synthesis	22/11 hr	300"x140"	98	22"x22"	yes	6/11 TB	7 MB/s
OTF-TP	5/11 hr	300"x140"	14		no	4/11 TB	5 MB/s

Use of ACA 12x7m antennas

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol Per target	Data Rate
Synthesis	22/11 hr	300"x140"	32	38"x38"	yes	1/11 TB	1 MB/s
OTF-TP	5/11 hr	300"x140"	5		no	1/11 TB	1 MB/s

Use of ACA 4x12m antennas

Mode	Time	Map Size	# ptgs or hpbw	Spacing	Joint?	Data Vol Per target	Data Rate
OTF-TP	5/11 hr	300"x140"	18		no	1/11 TB	1 MB/s

Target list for Science Goal 05

(the 3 right-most columns are NEW as of 31/12/09 implementation is TBD)

Target	Ra,Dec (J2000) Or other	l,b (derived)	Motion	V,def,frame --OR-- z	Linewidth v or freq	Source Flux	% Pol'n
1-Sgr A*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
2-Sgr S*	17:42:30.225,-28:55:00.55	-0.050,-0.050	ephemeris	40km/s,lsr,rad	312 km/s	4 Jy	12
3-Pluto	17:42:30.225,-28:55:00.55	-0.050,-0.050	Is a planet	40km/s,lsr,rad		0.03 Jy	
4-Halley	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	9.2 km/s	0.004 Jy	6
5-Sgr F*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
6-Sgr G*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
7-Sgr J*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
8-Sgr H*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
9-Sgr P*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
10-SgrQ*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12
11-Sgr R*	17:42:30.225,-28:55:00.55	-0.050,-0.050	Sidereal	40km/s,lsr,rad	312 km/s	4 Jy	12

Frequency/correlator/spectral Info
(repeats in freq. order for 1-4 Sets, each may have 1-8 frequency entries -- there are new fields as of 31/12/09)

Set 0 - setup

Frequency GHz	Line ID or “cont”	# Stokes (1,2,4)	# Chans per stokes	Bandwidth MHz, km/s	Chan Spacing kHz, km/s	Polarized %
100.652241	Di-ethyl-BS	4	2048	62.5, 187.5	30.52, 0.092	12

Set 0 – rms

Frequency GHz	50% Tsys min, max	AEA12m synth	AEA12m OTF-TP	ACA7m synth	ACA7m OTF-TP	ACA12m OTF-TP
100.652241	55K, 222K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K

Set 1 - setup

Frequency GHz	Line ID or “cont”	# Stokes (1,2,4)	# Chans per stokes	Bandwidth MHz, km/s	Chan Spacing kHz, km/s	Polarized %
102.352241	Cis-formica	4	2048	62.5, 187.5	30.52, 0.092	

Set 1 – rms

Frequency GHz	50% Tsys min, max	AEA12m synth	AEA12m OTF-TP	ACA7m synth	ACA7m OTF-TP	ACA12m OTF-TP
102.352241	55K, 222K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K	xx.x mJy, yy.y K

Annex I:

Chief references to Technical Assessment in the current draft DSO Implementation plan (13 September 2009).

DSO=Dept of Sci. Ops
PHT=Proposal Handling Team
Ph1M = Phase 1 Manager (Ph1 = submission [to the will of al-ma])
ESDP = Early Science Decision Point

5.3.4 DSO activities after the ESDP and before Early Science

DSO will produce the CfP and announce the CfP on the JAO web pages. Operations staff including the PHT will monitor the proposal submission process, and provide support to the whole proposal review process (see Section 1). The technical assessments of proposals will be led by DSO and ARC staff, supported by CSV.

And:

11.2 *Proposal Assessors*

Science Assessments by ALMA Review Panel (ARP) members and Technical Assessment by JAO and ARC staff shall be made available to the ARP members in advance of the ARP meetings. The Technical Assessors (TAs) shall comment on the capabilities of ALMA to accomplish the desired scientific objectives. The proposal scientific and technical assessments shall be conducted in parallel.

And:

11.2.2 Technical Assessors

The technical assessment of a proposal is performed by one Technical Assessor (TA). All TAs are DSO and ARC astronomers, and it is estimated that there will be approximately 45 TAs in total. TAs shall be assigned by the Ph1M under the supervision of the PHT. The system for proposal assignment for technical assessment purposes has yet to be established. Despite this, the system shall be subject to some constraints, such as:

- No PI/Co-I for a given proposal may be assigned as the TA for that proposal;
- Where possible, assignment of a proposal to a TA occupying the same office as the PI/Co-Is should be avoided.

It is currently anticipated that each TA shall be assigned approximately 22 proposals. TAs shall compose a report on the technical feasibility of each assigned proposal. The Ph1M shall be used to submit these reports, and additional tools may be used in order to technically address the feasibility of the proposal. These might include:

- Exposure Time Calculators (ETCs): to assess requested time allocations;
- OT: to check the expected data rate and frequency settings;
- ALMA beam simulator to examine the *u-v* coverage of the sources and expected beam pattern: CASA already includes the *almasimmos* task for beam simulation and *u-v* coverage prediction. A web-based interface for PI and TA use would be helpful for proposal preparation and technical evaluation respectively;
- A tool that evaluates the need for ACA use. This is currently under development.

And:

11.3.5 Generation and Distribution of the Proposal Packages

The Ph1M shall be able to automatically generate packages of proposals for download (PDF versions of proposals for science assessors, and full XML+PDF versions for technical assessors). The PHT shall be able to use the Ph1M tool to monitor the download logs of the proposal packages via a summary through a UI, in order to ensure that all assessors and Chilean TAC members experience minimal technical problems that might impede the review process.

And:

11.3.8 The ARP Stage

(…some text omitted)

In the event that an assessor fails to submit a report, the system must be robust enough to proceed without it, to allow continuation of the entire process. In the event that an assessor does not submit a report by the deadline, the system should notify the PHT, and offer the default option of registering a null submission with no subsequent impact on the overall ARP 1-10 grade. The PHT may also reassign a proposal to a different TA/PA/SA throughout the process, in the event of (e.g.) the sudden illness of a TA. The review process could more easily withstand the lack of a single science assessment than a single technical assessment, and so the PHT shall still need to be able to perform reassignments on relatively short notice.

And:

11.4 *Requirements*

There are several software subsystems and tools needed for the support of the Proposal Review Committee activities during Early Science and Full Operations, and these are being developed by the CIPT for delivery by CSV. Many of the tools used to assist PIs in proposal preparation (e.g. the latest OT release, Exposure Time Calculator, etc.) shall be needed to assist in the technical assessment process. The UP shall address user authentication requirements and allow the provision of access to content specific to individual users (e.g.

And: (note the word "consistently" in 11.5)

11.5 *Interfaces*

The DSO shall need to interact with a number of groups in order to allow the proposal review to proceed smoothly. The DSO shall often interact with these groups through the PHT, and the JAO astronomers shall fill some of the TA roles.

- DSO/PHT – JAO/ARC staff: This is necessary in order to ensure that the proposal technical assessment is being conducted consistently, and in accordance with approved review process guidelines.

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And:

11.7 *Staffing and Resources*

In order to carry out the proposal review process, a considerable number of people will be needed. Most of them are not part of the ALMA staff (DSO and ARC staff), but shall be astronomers with affiliations external to the project. The DSO staff involved in the review process are as follows:

- Technical Assessors: all DSO Operations and System Astronomers. As stated above, it is currently anticipated that each TA shall be assigned approximately 22 proposals during Full Science Operations, and that each technical assessment shall take (on average) approximately 0.5 hours, resulting in a total workload of approximately 11 hours of assessment work per TA per proposal submission cycle.

Annex 2

Chief references to Technical Assessment in

"THE ALMA PROPOSAL REVIEW PROCESS

ALMA TAC Subcommittee

K. Y. Lo (Chair), T. de Zeeuw, S. Miyama, T. de Graauw, M. Rubio

Draft 25 July 2009

The ALMA proposal review process will proceed in 4 stages:

1) Written Science Assessment by ALMA Science Review Panel (ARP) members, and Technical Assessment by JAO and ARC staff, to be made available for ARP panels when they meet. The technical assessors will comment on the ability of ALMA to accomplish the desired scientific objectives.[1]

2) Meeting of science category-based ALMA Science Review Panels (ARPs), which will provide a ranked list from each panel based on scientific merit only.

3) Synthesis of the rankings from each panels into an overall ranking by the ALMA Proposal Review Committee (APRC). This committee recommends projects to be submitted to the observing queue, considering distribution across RA, frequency, weather, *etc*. It also incorporates Chilean prioritized projects and recommends resolution of duplications or overlaps.

4) The ALMA Observing Council (OC) will make the final decisions on the observing queue, taking into account primarily the APRC science rankings and prior regional time allocations. The OC will aim to balance the observing time among the ALMA partner regions and Chile according to their shares. Other regional scientific preferences can be considered by the OC but should not materially alter the APRC scientific rankings.

[much verbiage omitted]

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1 Most problems are expected to have been caught beforehand by the Observing Tool (ObsTool) in the proposal validation stage.

AND:

Each proposal is also assigned a Technical Assessor (TA). The HSO and the ARC Managers assign TAs, drawn from the pool of all ARC and JAO astronomers, to comment on whether the proposal can achieve the stated goals given ALMA's current capabilities.

The JAO packages the proposals for secure electronic download by the ARP panel members and the TAs, and alerts each panel member and TA when the packages are available for downloading. Paper copies will not be sent, except under unusual circumstances. The package will include a full set of proposals; a summary of all proposals in both the panel in question and the other panel addressing the same topic (title, list of investigators and abstract); an evaluation sheet for each proposal; a list of primary and secondary reviewers; the name and location (JAO or an ARC) of the technical assessor; automated reports, as appropriate, from the ObsTool (such as S/N estimates and *stringency*2); and a summary of previous scheduled and archived proposals in the science category, including percentage observed and rollover status.

Over a period of about 4 weeks the Primary, Secondary and Technical Assessors will enter comments into the centralized on-line review system. Assessors will only be able to have access to their own comments.

Over the same time period, all panel members enter grades, on a scale of 1 to 10, 10 being highest, for all proposals in their panel, unless they have a conflict of interest with a given proposal. These grades are strictly science merit-related, to facilitate the ranking process, and do not at this stage reflect an anticipated A/B/C/Reject grade.

2 *Stringency* has been defined by the ASAC as t_a/t_p, where t_a is the total time available and t_p is the time during which the proposal can be executed. The ASAC has suggested that ALMA might want separate *stringency* values for water vapor, phase stability, and wind conditions (pointing accuracy).