EUROPEAN ORGANISATION FOR ASTRONOMICAL RESEARCH IN THE SOUTHERN HEMISPHERE

For Information

COUNCIL

133rd Meeting
Garching, 3 and 4 December 2014

SCIENTIFIC TECHNICAL COMMITTEE

84th Meeting
Garching, 21 and 22 October 2014
Recommendations and Report from the 84th STC Meeting

Videocon: M. Steinmetz
Telecon: A. Alonso Herrero, S. Vennes
Excused: M. Perez Diaz (observer)

This document should be read in conjunction with the attached report of the LSP, ESC and ESAC subcommittees of the STC.

European Extremely Large Telescope

E-ELT Way Forward

The STC have been presented the E-ELT – The Way Forward (ESO/Cou-1553 rev. 2 conf.) and our recommendations are as follows:

1. The STC reaffirms that it is essential for the competitiveness of European astronomy and of the E-ELT programme, that the telescope achieves first light as close as possible to the planned date of 2024.
2. In view of this, the STC strongly supports the adoption of a two-phase approach as a back-up plan that allows major contracts to be placed in 2015 and beyond.
3. The STC believes that ESO has presented a convincing strategy for a two-phase construction. The STC understands the rationale behind the choices made in the proposed back-up plan as laid-out in Cou-1553 rev. 2 conf. The STC endorses the back-up plan outlined in Cou-1553 rev. 2 conf. The STC finds that as described the Phase 1 will provide world-leading facilities at first light and that to maintain that leadership and for a complete and competitive exploitation of the E-ELT, Phase 2 is essential.
4. The STC also endorses the decision to design the two-phase plan so that it does not diverge from the original baseline until 2017.
5. In the event that the back-up plan is needed, the STC finds that bringing the LTAO back on to the baseline schedule is the highest scientific priority and encourages ESO to explore all possible routes to make this happen.
6. The STC understands that the project will follow standard, well-established ESO procedures with studies, reviews and milestones as appropriate. This applies to the telescope, instruments and AO systems. Furthermore, it

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1 The STC reviewed conflicts of interest and Michael Meyer (METIS co-I) left the room during discussion and preparation of this recommendation.
understands that all instruments and AO systems go to PDR even in the back-up plan and that for the MOS and HIRES this includes a competitive Phase A. The STC wishes to stress that this is a fundamental part of the path to a competitive E-ELT and associated instrument suite.

7. The STC endorses that the LSP and ALMA observatories are fully protected in the back-up plan.

8. The STC encourages ESO to continue to actively explore further avenues to identify additional funding in order to either remove the need for the back-up plan or if necessary to ensure that as little activity as possible needs to be placed in Phase 2.

E-ELT GTO Policy
The STC was presented with the proposed GTO policy for the E-ELT. The STC recommends it for implementation.
While the distinction between the “general purpose” and “specialist” instrument in terms of GTO is reasonable and something the STC supports, ESO need to think carefully about a description of the two cases that will remove any pressure on PIs to add features to instruments in order to try to ensure that they are considered “general purpose”.

Additional Items
The ESC has signaled a number of technical aspects that should be noted and investigated. These are detailed in the ESC report, which is attached to these recommendations. In addition to these and the points raised above, the STC wishes to add the following:

1. The STC notes that change requests are a normal part of the scientific and technical evaluation, as well as the optimization process of a project such as the E-ELT and its instrument suite. The STC is happy to note that such request schemes are already being applied within the project and stresses the need to continue this practice.

2. ESC and STC would like to continue to be informed, to provide comments and to contribute to the prioritization. In particular, if feasible we would like to receive the first feedback on the technical assessments during the ESC/STC meetings in April 2015.

The STC stresses the importance of a clear, timely and open communication with the whole community on the content of the E-ELT Way Forward (ESO/Cou-1553 rev. 2 conf.), once the Council has approved it.

ESO Budget and Forward Look
The STC stresses the importance of appropriate indexation in the 2015 budget. A lack of indexation would have dramatic consequences on the programme, which is already stretched to the limit, in both the short and long term.

ESO is running three programmes: the La Silla-Paranal Observatory, ALMA and the E-
ELT, the third of which will hopefully start Phase 1 construction in 2015. The approval of the E-ELT was conditional on maintaining sufficient support to the ALMA and the La Silla-Paranal Observatory to retain these as world-leading facilities and as flagships of the organization while the E-ELT is being constructed.

The STC appreciates that in the BFL document no additional cuts were included for the programmes in addition to those already planned.

The STC re-iterates that once the ramping down of the resources allocated to the Paranal instrumentation programme reaches the planned level, any further budget or FTEs reduction will severely damage the programme. In the case of unforeseen events, the only way out will be to delay the schedule of existing projects or postpone future developments. Both of these responses would jeopardize the competitiveness of the programme in the long run.

La Silla-Paranal Observatory

The STC congratulates the teams from ESO and from the instrument consortia for the smooth commissioning of MUSE and Sphere, an unprecedented achievement for simultaneously dealing with two complex instruments. We are also glad to note the good progress being made towards the recovery of VISIR.

The STC has been presented with the Paranal instrumentation roadmap. The roadmap is ambitious and with an aggressive schedule but, as noted above, the programme is stretched to the limits. Therefore, we foresee that in the current context the advice from the STC will be increasingly important: hard choices will have to be made when unforeseen things happen. Here STC and its subpanels have a natural and responsive role to play.

We request clarification regarding which aspects of AOF are primarily technology demonstration and risk mitigation for E-ELT and which are critical for near-term science. This should include a review of the individual AOF subsystems and their relation to scientific goals and priorities. For VLTI, we are concerned that the plan focuses heavily on major AT upgrades and risks a timely commissioning of the key modes for GRAVITY and MATISSE on the UTs. A phased plan to cover commissioning of all capabilities might be warranted. For ERIS we are concerned that there appear to be significant technical trade-offs which have already been decided.

The LSP has signaled a few additional technical aspects that should be noted and investigated. These are detailed in their report, which is attached to these recommendations.

Public surveys
The STC is happy to note that in general the public surveys are progressing well. However, the STC is concerned with the public availability of data-products for some of the surveys. In addition the STC strongly recommends that ESO is firm with PIs and data-centres that do not deliver Phase 3 data products as agreed in the survey
Hosting telescope projects
The STC was presented with the document on hosting telescope projects (STC-545) and supports the proposed guidelines. The STC is therefore happy to recommend them for implementation.

Report of the Scientific Priorities Working Group
The STC takes note that the Scientific Priorities Working Group is making progress as reported in STC-543. The STC understands that the SPWG, although it includes representatives from the STC, does not replace the role of the STC.

Atacama Large Millimetre Array

STC notes that the ALMA construction phase was formally completed on 30 September 2014. Although a few items (including the ALMA Residencia) remain to be completed, this represents a major achievement for the project. STC was also pleased to hear of the good progress on the ALMA long baseline campaign, with phase closure now achieved on baselines out to 15 km. We were shown a spectacular long-baseline Science Verification image at 230 GHz, which gave a first taste of the transformational science enabled by the commissioning of the long baselines.

STC was pleased to hear that the scientific productivity of ALMA Cycle 0 was extremely high, including many publications in Nature and Science. The EU ARC nodes continue to provide an excellent level of support to ALMA users, and the support provided in the areas of proposal preparation, data reduction and quality assessment were rated very highly in a recent user survey.

1. **ALMA operational efficiency.** STC notes with concern that the scientific execution efficiency for the first three months of Cycle 2 (Jun-Sep 2014) was 32% for the ALMA 12-m array and 40% for the compact (7-m) array. This is significantly below the target of 50% efficiency for Cycle 2. The time lost to weather was low and the reasons for the low observing efficiency are not yet clear. A serious concern for STC is that unless the efficiency increases dramatically in the very near future, it will not be possible to complete all the remaining high-priority Cycle 2 (and Cycle 1 carryover) proposals.

   STC strongly recommends that urgent action be taken to identify the main reasons for this low efficiency, and that a plan be developed in a timely fashion (and advertised to the community) to deal with non-completed proposals ahead of the Cycle 3 call for proposals.

2. **ALMA Data Delivery Policies.** STC notes that ALMA’s scientific productivity is maximized by getting data into the hands of the PIs as rapidly as possible, and endorses the recommendations of the ASAC sub-group report on Data Delivery Policies. In particular, STC recommends that PIs should be allowed to request
delivery of partial data, without waiving the rest of their observations, under the conditions outlined in the attached ESAC report.

3. **ALMA Compact Array.** STC recommends that the ALMA Compact Array (ACA) be offered for independent (stand-alone) proposals in future cycles, provided that clear guidelines/policies are developed in advance.

4. **ALMA Large Proposals:** STC recommends that the opportunity to propose Large Programmes on ALMA should only be offered (in Cycle 4 and beyond) when the conditions outlined in the attached ESAC report are fulfilled.

5. **ALMA Development Program:** STC endorses the work being done in preparation for the ALMA development plan and ALMA 2030 document, and is pleased to see the increased level of coordination between the three ALMA regions.

**APEX**

APEX continues to work very well. STC was very pleased by the rapidly-rising number of scientific publications based on APEX data, and commends the APEX staff for the excellent support they provide for both PI and facility instruments. STC recommends that a call should be issued for Science Verification time with the new APEX Band 5 receiver when available. STC endorses the decision to decommission the APEX T2 (1.3 THz) receiver.
Appendices

1 STC 83rd Meeting Agenda
2 Reports from the STC sub-committees
   a. LSP sub-committee meeting, October 20, 2014
   b. ESAC sub-committee meeting, October 20, 2014
   c. ESC sub-Committee meeting, October 20, 2014

STC 83rd Meeting Agenda

08:30  Closed Session STC only
09:00  Closed Session with DG
09:30  Welcome
09:35  1. Adoption of the Agenda STC-541
       2. Approval of the Minutes of the extraordinary (83rd) STC Meeting
09:45  3. Report of the Director General

10:15  Coffee Break

4. E-ELT
10:30  4a. Status (R. Tamai)
11:00  4b. E-ELT Way Forward (A. Russell)
11:30  4c. Report from the E-ELT Subpanel (A.-M. Lagrange)
12:00  4d. Discussion
12:15  Closed Session

13:15  Lunch

14:15  5a. ESO Budget 2015 and Forward Look 2016-2018 (P. Geeraert)
14:45  5b. Discussion

6. Directorate of Programmes
15:00  6a. New Organisational Structure in Programmes (A. Russell)
15:10  6b. Paranal Instrumentation Roadmap (L. Pasquini)
15:30  6c. Discussion of Directorate of Programmes Fact Sheets
15:45  6d. Report from the La Silla Paranal Subpanel (M. De Vos)
16:15  6e. Discussion

16:30  Coffee break

7. Directorate for Science
16:45  7a. Directorate for Science Overview (R. Ivison)
17:00  7b. Brief Progress Report of the Scientific Priorities Working Group
17:15  7c. E-ELT GTO Policy (R. Ivison)
17:30  7d. Discussion of Directorate for Science Fact Sheets
17:45  7e. Discussion
18:00  End of Day 1
22 October
08:30  Closed Session STC only

8.  ALMA
09:00  8a. Programme Status Report (W. Wild)
09:20  8b. Science Operations (P. Andreani)
09:40  8c. Update on the ALMA Development Studies (L. Testi)
10:00  8d. Discussion of ALMA Fact Sheets
10:15  8e. Report from ESAC (E. Sadler)
10:45  8f. Discussion

11:00  Coffee Break

9.  Directorate of Operations
11:15  9a. Directorate of Operations Overview (A. Kaufer)
11:45  9b. Update on the NTT Call (A. Kaufer)
12:15  9c. Hosting Telescope Projects (B. Leibundgut)
12:45  9d. Discussion
13:15  9e. Discussion of Directorate of Operations Fact Sheets

13:30  Lunch

14:30  Closed Session
17:00  Meeting with DG and Directors
Report of the October 2014 ESAC Meeting

ESO Garching, 20 October 2014

ESAC members: Rachel Akeson, Jes Jorgensen, Huib van Langevelde, Jesus Martin-Pintado, Michael Meyer (via Videocon), Raphael Moreno, Roberto Neri, Isabella Prandoni, Elaine Sadler (interim Chair), Eva Schinnerer, Ian Smail

ESO participants: Paola Andreani, Carlos De Breuck, Maria Diaz Trigo, Robert Laing, Erich Schmid. Felix Stoehr, Leonardo Testi, Wolfgang Wild, Pavel Yagoubov, Martin Zwaan

General Remarks

ESAC met at ESO Headquarters in Garching on Monday 20 October 2014, the day before the 84th STC meeting. Since our last face-to-face meeting in April 2014, ESAC has held two telecon meetings (on 23 June and 23 September 2014). The ASAC met in Charlottesville, USA, on 8-9 October 2014. The European ASAC members are Huib van Langevelde, Jesus Martin-Pintado, Raphael Moreno and Roberto Neri, with one position on ASAC currently vacant. Rachel Akeson, Michael Meyer, Elaine Sadler and Ian Smail are also members of STC. There is currently no cross-membership between STC and ASAC.

ESAC has been without an official Chair since the previous Chair, Rob Ivison, resigned from both ESAC and ASAC early in 2014 to take up a position as ESO’s Director for Science. Jesus Martin-Pintado served as Interim Chair for the April 2014 ESAC meeting, and Elaine Sadler is Interim Chair for the period June-December 2014.

The agenda for the 20 October 2014 meeting is attached at the end of this report as Appendix 1.

Positive developments

At our meeting, ESAC was pleased to hear of many positive developments with ALMA and APEX, including:

- The formal end of ALMA construction in Sep 2014 – a major milestone for the project
- Fringes achieved on long baselines at 92 GHz and Band 10
- The publications report shows that ALMA is now achieving a high level of scientific productivity, including many papers in Nature and Science.
- The European user satisfaction survey shows very positive results
- The proposal submission software is now working well, and the Cycle 2 call for proposals and submission process went flawlessly.
- Work at the EU ARC on the QA2 system has reduced the delays in data delivery
- The ALMA Band 5 receivers are now moving to full production, with improvements in receiver noise and tuning range since the pre-production stage.
- Further progress has been made with preparations for mmVLBI, with a new maser installed and initial sky tests carried out – the first global VLBI tests with ALMA are planned for 2015
• APEX publications are increasing steadily, and APEX staff are providing excellent support for both PI and facility instruments

We were also pleased to note that the ALMA power supply, which had been an area of concern at our meetings last year, is now stable and working well.

ESAC endorses the ALMA development plan and ALMA 2030 document, and is pleased to see the increased level of coordination between the three regions

**ALMA areas of concern**

The low observing efficiency currently being achieved in ALMA Cycle 2 is a serious concern, and was a major item of discussion for ESAC at our meeting. So far in Cycle 2 (Jun-Sep 2014), the scientific execution efficiency was 32% for the ALMA 12m array and 40% for the compact (7m) array. The time lost to weather was only modest and reasons for the low observing efficiency are not yet clear

Unless the observing efficiency increases dramatically, it will not be possible to complete all Cycle 2 (and Cycle 1) proposals. Estimates prepared by the EU ARC suggest that that around 25-30% of Cycle 2A+B and Cycle 1 carryover observations will not be executed.

The total time between observation and delivery of the data to PIs also remains a concern, but should improve once the data pipeline is working more efficiently.

ESAC is concerned about the reported astigmatism in the NA Vertex antennas, and the effect this may have on high frequency and polarization observations. We would like to receive an update on this issue at our next meeting.

**APEX PI instruments**

ESAC notes that by 2015 there are likely to be 8 PI instruments supported at APEX, in addition to the regular facility instruments. While this offers exciting scientific opportunities, it also places an increased resource load on the APEX staff. ESAC suggests that this resource load should be evaluated before new PI instruments are accepted, and we would like to revisit this issue at our next meeting.

**ESAC recommendations on ALMA and APEX**

ESAC made the following **recommendations** in our report to the STC:

1. **ESAC has serious concerns about the low ALMA observing efficiency (32%) reported for Jun-Sep 2014, and the impact this is likely to have on the completion of Cycle 1 and 2 programs.** We recommend that urgent action be taken to identify the main reasons for this low efficiency, and that a plan be developed (and advertised to the community) to deal with non-completed proposals ahead of the Cycle 3 call for proposals.

At our next meeting, ESAC would like to receive a report on the status of investigations on where the time is lost, and potential plans for improving the ALMA observing efficiency. We would also like to have an update on completion projections for Cycle 2 (and Cycle 1 carryover) projects. In addition, at our next meeting, we would like to have an update on the status of pipeline processing and if/how this has improved the ability to deliver data in a timely way.
2. ESAC/ASAC membership: ESAC requests that the current ESO vacancy on ASAC be filled as soon as possible, and reiterates the value of appropriate cross-membership of ESAC, ASAC and STC.

3. ESAC recommends that the ALMA Operations Review planned for early 2015 should have a mechanism to include feedback from ALMA users.

4. ESAC endorses the decision to decommission the APEX T2 (1.3 THz) receiver.

5. ESAC recommends that a call be issued for Science Verification time with the new APEX Band 5 receiver in April/July 2015.

ASAC charges and ESAC response

The (rather lengthy) charges to ASAC are listed in Appendix 2 of this document.

ESAC endorses the recommendations of the ASAC sub-group report on Data Delivery Policies, noting that ALMA’s scientific productivity is maximized by getting data into the hands of the PI as rapidly as possible.

In particular, PIs should be allowed to request delivery of partial data, without waiving the rest of their observations, under the following conditions:

- the remaining execution blocks cannot be obtained for at least 3 more months owing to array configuration schedule or other circumstances
- data can be pipeline processed successfully
- minimal, or no, imaging by ALMA staff
- proprietary period for each subset of data begins when it is delivered to the PI

We note that this may require some additional software effort, e.g. to send a notification to PIs when their data are eligible for release.

ESAC supports offering the ALMA Compact Array (ACA) for independent (stand-alone) proposals, provided that clear guidelines/policies for how this is done (and how such proposals will be handled in the proposal evaluation process) are developed in advance.

ESAC recommends that Large ALMA programs should only be offered for observing modes that are fully commissioned and have been demonstrated to work reliably in routine operations. Such programs should not be offered until ALMA’s overall observing efficiency reaches or exceeds the 50% level.
Appendix 1: ESAC meeting agenda

Monday 20 October 2014

Morning:
09:30 Welcome, organizational matters (L. Testi)
09:40 Closed session
10:00 ALMA status update (W. Wild)
10:25 Science operations update (P. Andreani)
10:50 ASAC report (L. Testi on behalf of ASAC members)
11:30 PRP review WG report (R. Neri)
11:40 Data Delivery Policies ASAC-subgroup report (H. van Langevelde)
11:50 Publication statistics (F. Stoehr)

Afternoon:
13:30 EU-ARC review, ALMA Operations Review (W. Wild)
13:45 User survey (M. Diaz Trigo)
14:00 Discussion
14:15 Software status and plans (E. Schmid)
14:40 ALMA development plans (L. Testi)
15:10 Report on Band 5 (P. Yagoubov)
15:20 APP/mm VLBI status (R. Laing)
15:45 APEX update (C. De Breuck)
16:45 Any other business
17:00 Closed session
17:30 End of the Meeting

[Although not part of the original agenda, an impromptu discussion session with ALMA Board member Linda Tacconi, ESO Director-General Tim de Zeeuw and Director for Science Rob Ivison was held from 13:15 to 13:30 to discuss issues related to ALMA operational efficiency]
Appendix 2: ASAC charges

**Charge 1:** With the first three Proposal review cycles (Cycles 0, 1 and 2) now behind us, the ASAC should list and comment on lessons learned and make suggestions for improving the proposal submission and review processes for future cycles. In particular:

1) The ASAC should suggest ways to optimize the duplication checking and the technical assessment procedures in order to reduce the workload on both JAO staff and the APRC/ARP members.
2) Since the terms of many of the current ARP and APRC members have now ended with the Cycle 2 PRP, the ASAC should make an assessment of the scientific expertise and diversity of the membership needed for future cycles. They should suggest names for potential panel members, including those who may have theoretical/numerical backgrounds, as well as those from other observational wavelengths.
3) Assuming that the request for ALMA time will remain at or increase from the 1300+ proposals per cycle, it is important to ensure a realistic and manageable workload on panel members. The ASAC should debate and comment on the scientific pros and cons of different means of managing this workload, such as increasing the fraction of proposals that are triaged out before the panel meeting, enlisting non-traveling assessors, or suggesting other alternative scenarios.
4) Comment on the current JAO policy for change requests during the Phase 2 submission process.

**Charge 2:** Pursuant to standing Charge 2, continue to assess the status of Cycle 1 and Cycle 2 observations. Are the data meeting user expectations? Are the data products released of satisfactory quality? Are the data being released to the PIs in a timely fashion, and are adequate progress updates being communicated to the PIs and the community at large? The ASAC should comment on and suggest ways to improve data release policies, in particular policies for special cases, where release of partial data sets (not yet passed QA2) might be desirable for maximum scientific benefit.

**Charge 3:** The JAO will provide ASAC with input regarding capabilities and observing modes planned for Cycle 3. The ASAC should review and comment on these modes well in advance of the next Call for Proposals. Are the modes on offer those sufficient to address the highest impact science themes? Are there other capabilities that should be given higher scientific priority?

**Charge 4:** ALMA Development Plan Standing Charge 4: The regional project scientists and the JAO will provide timely input to ASAC such as summaries, status updates, and other information about the completed and ongoing Development studies and projects. The ASAC should assess the scientific merit of these studies (e.g., discuss the uniqueness for ALMA, the advantages and drawbacks of each capability, etc.), and comment on the scientific priority of the approved development studies. The ASAC should continue their work on the ALMA2030 document and report progress to the Board and to JAO.

**Charge 5:** After 3 proposal cycles, discussion should start about the best time to allow proposals for Large Programs in the ALMA Call for Proposals. The ASAC is invited to debate and report on:

1) The optimum cycle to introduce Large Programs
2) The minimum and maximum time request and for Large Programs; in particular, should the threshold for a Large Program be lowered from the current level of 100 hours. If so, what would
the ASAC recommend for this threshold? Or, would it be better to allow an adjustable threshold, set by the JAO, as a function of Cycle number?

3) The total duration of a Large Program: should Large Programs be run over multiple cycles or be restricted to only one cycle? Should there be a separate category for monitoring programs, or should those also be included with Large Programs?

4) Proprietary periods for Large Programs
E-ELT SUB COMMITTEE

Report from the October, 20th, 2014 meeting

Present (ESC): Simone Esposito, Sofia Feltzing, Stefan Gillessen, Anne-Marie Lagrange (Chair).
Written inputs from Almudena Alonso.

Present (ESO): Mark Casali, Peter Gray, Joechen Liske, Suzann Ramsay, Adrian Russel, Roberto Tamai, Tim de Zeeuw (part).

Report on E-ELT Project status (R Tamai):
Updates and precisions on the WBS, on the management plan, and on the organigram were provided and appreciated. The progresses in the ELT-related activities since last ESC meeting were also presented, as well as an outlook of the AIV plan, as recommended during the previous ESC meeting. More detailed information on the AIV plan is expected next April. The role of the ELT management committee (EMAC) was clarified.

The preparation of access and platform of the ELT is probably the most visible aspect of ongoing activities. Important steps are scheduled in 2015, including the decisions on major contracts that have to be awarded in time to avoid extra costs and delays on the projects.

The change requests system is now open to PIs of instrument, which will improve the exchanges between ESO and consortia, for a mutual benefit. An important change of requests concerns the Nasmyth architecture & Nasmyth focal plane.

The committee had the opportunity to visit the integration hall and the current tests on the M1 segment support & the M5 prototype. This allowed interesting technical exchanges. We hope to make such visits during future ESC meetings, whenever developments are ongoing.

TMT and GMT (J. Liske)
A short review of TMT and GMT development and instrumental plans was presented. Both projects proceed, even though their funding is not fully secured. Direct competitors to ELT first light instruments are expected to be on sky as soon as 2024-2025.

ELT way forward (A. Russell)
The funding situation of the ELT was presented. 90% of the ELT costs-to-completion are not secured, yet important contracts must be awarded in 2015 to avoid further delays. The yet to be secured Brazil participation led the Council to ask for a plan B, that was set up by ESO and proposed to the ELT WG. The committee regretted that they were informed on the plan B and its content only 3 days before the ESC meeting. The ESC understands the rationale and the need for a plan B. Plan B includes a two phase approach, whose deviation from original plan starts not before 2017.

ELT way forward (J. Liske)
The plan B was described and discussed. This plan includes choices which impact science. Yet, the ESC had time-wise no chance to evaluate in detail the scientific impact of the presented plan B.

Given the present context, the ESC endorses the proposed Plan B, and its two phase approach. In order to ensure that the ELT produces the best science under such constraints, the ESC makes the following recommendations:

We recommend detailed scientific & technical evaluations of the plan B choices (telescope, AO strategy) to be performed by ESO as soon as possible if there are no positive signs from Brazil by the end of the year. Examples of questions raised are listed below. If relevant, main science cases and TLRs should be updated accordingly. ESC and STC should be informed and kept in the loop for comments, in a timely manner, and for prioritisation if the impact on the science cases is significant. If the option (or parts of) presented here happens to present a too high risk or if other options appear to be much more pertinent, changes requests should be made possible. We would like to have first feedback on these assessments during the next ESC meeting in April 2015.

METIS vs LTAO: there is good science to be done with both instruments, which have different scientific objectives. The scientific priorities had been given earlier by STC. The ESC did not have enough material (revised science cases) to give a new opinion on the respective merits of both instruments in the plan B configuration. There is a need to update the performances and capabilities (e.g. target numbers) of HARMONI w/o LTAO and METIS w/o LTAO.

Given the importance of the LTAO for HARMONI to complete its science goals, the committee urges ESO to find ways to start the LTAO development before the end of phase 1 of Plan B. We recommend to investigate cost saving for the LTAO, taking, for instance benefit from possible changes in the architecture of the Nasmyth focal station.

The ESC felt that part of Plan B measures will impact on the cost and complexity of the instruments. Such impact should be estimated for each instrument.

A significant delay of the MOS and HRES would have important consequences for the consortia and also, more generally, on the European astronomical community. If Brazil does not join in a reasonable time frame, we would urge ESO to look for alternative solutions for funding a full ELT project on the basis of the original plan.
We finally recommend to send clear messages to the instruments consortia and to the community on how ESO sees the future (phase 1 and beyond)

List of identified questions to be addressed:
- Impact of altered pupil shape (with the removal of the 5 inner rings) on PSF shape, sensitivity & contrast performances at pertinent separations. Impact on science cases for each 1st light instrument and on the MCAO. Associated risks. Impact of the 5 missing rings on the segment phasing procedure and accuracy.
- Impact of the big central obscuration on telescope commissioning, active optic control (edge effects), and on M4 control and AO performances.
- Impact of absence of 7th segment. How many segments will be missing on average? Impact of holes in the pupil on the METIS sensitivity (and more generally thermal background).
- Impact of plan B strategy on instruments complexity & costs.
- Could the architecture for the Nasmyth platform allow cost saving for LTAO?

Miscellaneous:
- The present ESC members are pleased to hear about the additional members that will join in 2015.
- The ESC would like to get the versions of the instruments TLRs which should have been updated according to the ESC April 2014 comments.
The LSP report is not available despite several reminders to the LSP Sub-Committee Chair from the STC Chair.