

File ALMA

New Comments/
Text
in Brown:

AGREEMENT
CONCERNING THE CONSTRUCTION AND OPERATION
OF THE
ATACAMA LARGE MILLIMETER ARRAY
(ALMA)

BY

The National Science Foundation of the United States of America, Arlington VA
hereinafter referred to as "NSF",

The National Research Council of Canada, Ottawa
hereinafter referred to as "NRC",

and

The European Southern Observatory, Garching
hereinafter referred to as "ESO",
acting for a consortium of European organizations and institutes,

~~The European Southern Observatory, Garching~~
~~hereinafter referred to as "ESO",~~
~~acting for a consortium of European organizations and institutes,~~

all hereinafter called “the Parties” to this Agreement

TABLE OF CONTENTS

| | |
|---|------------|
| ARTICLE 1: DEFINITIONS | <u>54</u> |
| ARTICLE 2: GUIDING PRINCIPLES | <u>65</u> |
| ARTICLE 3: OBJECTIVE | <u>76</u> |
| ARTICLE 4: SCOPE | <u>76</u> |
| ARTICLE 5: VALUATION <u>OPERATING TERMS</u> | <u>76</u> |
| ARTICLE 6: AMENDMENT | <u>86</u> |
| ARTICLE 7: DURATION and TERMINATION | <u>87</u> |
| ARTICLE 8: WITHDRAWAL | <u>97</u> |
| ARTICLE 9: PRECEDENCE | <u>108</u> |
| ARTICLE 10: OWNERSHIP | <u>108</u> |
| ARTICLE 11: NEW MEMBERSHIP | <u>119</u> |
| ARTICLE 12: ALMA BOARD | <u>119</u> |
| ARTICLE 13: EXECUTIVES | <u>134</u> |
| ARTICLE 14: JOINT ALMA OFFICE | <u>154</u> |
| ARTICLE 15: ALMA MANAGEMENT ADVISORY COMMITTEE | <u>154</u> |
| ARTICLE 16: ALMA SCIENCE ADVISORY COMMITTEE | <u>164</u> |
| ARTICLE 17: KEY PERSONNEL | <u>164</u> |
| ARTICLE 18: ORGANIZATION IN CHILE and RELATIONS WITH HOST STATE | <u>174</u> |
| ARTICLE 19: FINANCIAL PROVISIONS - GENERAL | <u>184</u> |
| ARTICLE 20: DEFAULT | <u>204</u> |
| ARTICLE 21: OBSERVING TIME AND DATA RIGHTS | <u>214</u> |
| ARTICLE 22: ACCESS BY OTHERS | <u>214</u> |
| ARTICLE 23: INTELLECTUAL PROPERTY | <u>224</u> |
| ARTICLE 24: LIABILITY & INDEMNITY | <u>234</u> |
| ARTICLE 25: NOTICE | <u>242</u> |
| ARTICLE 26: DISPUTES | <u>242</u> |
| ARTICLE 27: ANNEXES | <u>242</u> |

Desiring to

- contribute to the global advance in understanding of the physics of the Universe;
- ensure a continuing active program of astronomical research in Europe and North America;
- encourage further scientific collaboration between the Parties, and other organizations with an interest in millimeter and sub-millimeter astronomy; and
- achieve full intellectual and economic benefits to all organizations and institutes participating in ALMA, with a fair and equitable division of responsibilities and benefits among them, consistent with their contributions and the cost-effective and timely execution of this project;

and recognizing

- the potential of large interferometric arrays operating at millimeter and sub-millimeter wavelengths to contribute to the study of a wide range of astronomical problems;
- the interest of the astronomical communities of Europe and of North America in developing such an array;
- the interest of other astronomical communities in participating in a large millimeter and sub-millimeter interferometric array project;
- the advantages of combining these aspirations in a single global project;
- the necessity to locate such an instrument at a dry, high altitude site;
- the identification of a suitable site in a region of the Altiplano in northern Chile known as Zona Chajnantor–Cerro Chascon; and
- that, by virtue of a Memorandum of Understanding (MoU) dated 10 June 1999, as amended, between the U.S. National Science Foundation (NSF), the European Southern Observatory (ESO), the Centre National de la Recherche Scientifique of the French Republic (CNRS) of France, the Max-Planck-Gesellschaft (MPG) of Germany, the Netherlands Foundation for Research in Astronomy/Nederlandse Onderzoekschool voor Astronomie (NFRA/NOVA) of the Netherlands, the Particle Physics and Astronomy Research Council (PPARC) of the United Kingdom, the National Science Research Council (NFR) of Sweden, the Oficina de Ciencia y Tecnologia and the Instituto Geográfico (OCYT/IGN) of Spain, and the National Research Council (NRC) of Canada, an extensive joint Design and Development program has been carried out in preparation for the Construction and Operation of the Atacama Large Millimeter Array project,

the undersigned hereby agree to the following articles.

ARTICLE 1: DEFINITIONS^{[PWD1][RLD2]}

“Agreement^[PWD3]” means the “Agreement concerning the Construction and Operation of the Atacama Large Millimeter Array (ALMA)” including all Annexes

“Annexes” means the documents in Article 27 of the Agreement

- 1.1. **“Assessment Point”** means the time(s) at which the Parties must decide whether or not to continue their collaboration.
- 1.2. **“ALMA”** means the collaborative project involving the Construction, Commissioning, and Operation of the Atacama Large Millimeter Array.
- 1.3. **“ALMA Board”** (hereinafter referred to as “the Board”) means the Board established under Article 12.
- 1.4. **“Budget”** means an estimate of income, commitment and expenditure within a specified financial year.
- 1.5. **“Commissioning”** means those activities by which the telescope and instrument systems are integrated and tested with instrumentation then available and brought into proper operation. Construction, Commissioning and Early Operations activities may take place in parallel.
- 1.6. **“Construction”** means the planning, design, construction, and installation of antennas, infrastructure, and instrumentation. Construction, Commissioning and Early Operations activities may take place in parallel.
- 1.7. **“Deliverables”** means the components of ALMA which have been assigned ~~value~~ Value as set out in Annex “D” of this Agreement.
- 1.8. **“Early Operations”** refers to the scientific use of ALMA prior to the installation of the full complement of antennas. Construction, Commissioning and Early Operations activities may take place in parallel.
- 1.9. **“Engineering”** means the activities necessary for both the maintenance and improvement of ALMA and its instrumentation.
- 1.10. **“European organizations and institutes”** means those listed in Annex “L” to this Agreement.
- 1.11. **“Executives”** means the entities designated under Article 13 of this Agreement to carry out the specific tasks required to construct and operate ALMA.
- 1.12. **“Intellectual Property”** means intellectual and industrial property produced or generated during the performance of the Work which is capable of protection by patents, trademarks or copyright; and industrial design, technical information, inventions, prototypes and specifications produced or generated in the performance of the Work which are capable of being licensed.

- 1.13 “**Joint ALMA Office**” means the entity established and described in Article 14 to be responsible for the overall management of ALMA Construction, Commissioning and Operations.
- 1.14 “**Key Personnel**” are the individuals in the positions described in Article 17, who play a central role in the Construction , Commissioning and Operation of ALMA.
- 1.15 “**North America**” ~~or the “North American Coalition”~~^[i4] refers to the National Science Foundation of the United States and the National Research Council of Canada, acting together in ALMA.
- 1.16 “**Europe**” refers to the consortium of European organizations and institutes represented in this Agreement by the European Southern Observatory.
- 1.17 “**Observing Time**” means the time scheduled for the observing of astronomical objects for scientific purposes, excluding the time required for Engineering, Commissioning, testing and calibration ~~Activities~~^[RLS5].
- 1.18 “**Operations**” means the stage after all ALMA antennas and their associated instrumentation as specified in Annex A have been fully commissioned and ~~the correlator is-are in full-scale~~ operational. This represents the steady operational state of the project and requires all major telescope and building functions to have been tested and accepted.
- 1.19 “**Early Operations**” refers to the stage prior to Operations, when scientific observations are carried out by ALMA before its full completion as specified in Annex A.
- 1.20 “**Party**” means any signatory to this Agreement.
- 1.21 “**Value**” ” means the agreed worth to the project of a Deliverable, expressed in cash terms according to a model agreed upon by the Parties for estimating the cost of providing or procuring that Deliverable, and as means the estimated cost of providing or procuring a deliverable, expressed in cash terms according to a costing model agreed upon by the Parties given in Annex D-
- 1.22 “**Work**” means any activity approved by the Board relating to ALMA according to the Project Description attached to this Agreement as Annex “A”, and as set out in Annex “C”.

ARTICLE 2: GUIDING PRINCIPLES

- 2.1 Parity: North America and ESO will each make equal ~~value~~-Value contributions to ALMA. To the maximum extent possible, work shall be equally and equitably shared between North America and ESO.
- 2.2 Equity: It is intended that the Parties² ~~participating in so~~ organizations and institutes shall obtain intellectual and economic benefit from ALMA in all its phases in proportion to the ~~value~~-Value of their contributions and consistent with the execution of assigned tasks on time and within budget.

- 2.3 *Merit*: Key ALMA personnel shall be selected through international search, solely on the basis of merit and qualification, and their performance shall be subject to annual review.
- 2.4 *Utilization of Existing Institutions*: Wherever possible, ALMA will utilize existing institutions. Personnel shall be provided through secondment.
- 2.5 *Free Movement of Materials*: The Parties shall use their best efforts to facilitate the free movement between the United States and Canada and Chile and Europe of materials, equipment, and other items necessary for the execution of ALMA.

ARTICLE 3: OBJECTIVE

- 3.1 The Parties shall jointly carry out ALMA in accordance with the project scope, ~~project science~~ requirements, schedule and work breakdown structure, and schedule of ~~values~~ Values and assigned deliverables, which are affixed to this Agreement as Annexes “A”, “B”, “C”, and “D” respectively.
- 3.2 Parties to this Agreement shall carry out their obligations under this Agreement within the framework of their conventions or statutes.

ARTICLE 4: SCOPE^[PWD7]

- 4.1 This Agreement covers Construction, Commissioning and Operations, including Early Operations, of ALMA, and provides the framework whereby the Parties contribute to the execution of ALMA.
- 4.2 This Agreement is comprised of Articles and Annexes^[PWD8].

ARTICLE 5: ~~OPERATING~~^[RLS9] TERMS VALUATION

- 5.1 The Parties shall use a single, mutually agreed upon costing model to determine the ~~V~~value of their contributions to ALMA. Construction ~~valuation~~ is specified in Annex “D” to this Agreement, and may be modified only with the subsequent unanimous agreement of the Board. The ~~v~~Value of ALMA operations will be determined by the Board in a manner chosen by the Board and appended to this Agreement.
- 5.2 ~~The C~~components provided to ALMA shall be subject to common specifications and acceptance criteria. Defining, maintaining, and implementing ALMA specifications and acceptance criteria shall be the responsibility of the Joint ALMA Office (Article 14).

ARTICLE 6: AMENDMENT

- 6.1 This Agreement may be amended at any time by the unanimous agreement of the Parties. Except as provided in Article 6.2, no amendment of this Agreement is in effect unless it is dated and signed by all Parties, and specifically states the intention to amend this Agreement[PWD10][PWD11].
- ~~6.2 Annexes to this Agreement may [PWD12]be amended by unanimous agreement of the Board provided any amendment does not significantly alter the purpose of this Agreement. Such amendments [PWD13]shall be recorded in the minutes of the Board, and signed and dated by the Chair[PWD14]~~

ARTICLE 7: DURATION and TERMINATION

- 7.1 This Agreement shall become effective on the date on which the last Party signs~~when signed by [redacted] the Parties~~ and shall expire on 2022 December 31 subject to the provisions in Article 7.2[PWD16].
- 7.2 At pre-agreed Assessment Points, ESO and North America shall decide whether to extend this Agreement for a further period, normally of at least 5 years. In the absence of such a decision, this Agreement shall terminate on the expiration date set on the last date the Agreement was extended.
- 7.3 The first Assessment Point shall be 2019 January 5[PWD17]. Subsequent Assessment Points shall be on the 5th of January at succeeding 5-year intervals unless otherwise jointly determined by North America and ESO.
- 7.4 In the event that this Agreement is terminated during Construction, Commissioning, or Operations, property shall revert to the owners as described in Article 10 of this Agreement. ~~and a~~Any additional costs or benefits shall be shared by the Parties in proportion to the value of their contribution to the Value of ALMA up to the time at which the project is terminated. ~~value~~
- 7.5 Before this Agreement is terminated, the Parties shall agree on the date and the manner in which the assets and obligations of ALMA shall be disposed of. Unless otherwise agreed, the owners of property shall be responsible for the disposal of that property. The costs, ~~or~~ benefits and net proceeds from the sale ~~arising from the disposal~~ of equipment or facilities which are comprised of assets purchases by more than one Executive and which have been physically integrated with one another jointly owned assets[PWD18], ~~including [PWD19]the net proceeds that may arise from the sale of such assets~~, shall be divided between the Parties in proportion to their contribution to those assets.

ARTICLE 8: WITHDRAWAL

- 8.1 A Party wishing to withdraw from this Agreement prior to the termination date set out in Article 7 shall provide written notice of withdrawal to the other Parties. Such withdrawal shall take effect at the end of the following financial year. To enable the remaining Parties to continue with the project, the withdrawing Party must negotiate with the remaining parties the terms and conditions of its withdrawal or – failing this – shall pay in cash through the appropriate Executive (see Article 19 of this Agreement) either (1) 50% of the value of its total unpaid scheduled contribution or (2) the total of its scheduled payments (as specified in Annex “F”) for 5 years commencing with the date of the notice of withdrawal, whichever is the greater. Payments shall be made in the amounts and on dates to be determined by the appropriate Executive after consultation with the withdrawing Party.
- 8.2 A withdrawing Party’s payment may be reduced or cancelled if the withdrawing Party finds a successor acceptable to the remaining Parties. The reduction or cancellation shall be determined by the remaining Parties after consultation with the withdrawing Party and, if appropriate, the succeeding Party or Parties. The remaining Parties shall not unreasonably withhold their acceptance of a successor Party.
- 8.3 The extent to which the funds already paid and, where relevant, Work already completed and delivered, entitle a withdrawing Party to Observing Time after withdrawal shall be determined by the remaining Parties after consultation with the withdrawing Party. A withdrawing Party may not transfer any rights to Observing Time without the prior agreement of all remaining Parties.
- 8.4 A withdrawing Party shall, at the request of the remaining Parties, transfer, to the extent necessary for the continuation of ALMA, its right, title, and interest in any property, contracts (to the extent allowed under those contracts) or work in progress funded out of money contributed to ALMA under this Agreement to such other persons or parties as the remaining Parties direct and shall otherwise cooperate in order to facilitate the continuation of ALMA by the remaining Parties.
- 8.5 A withdrawing Party shall not transfer any right, title, or interest in any property, contracts (to the extent allowed under those contracts) or work in progress funded out of money contributed to ALMA under this Agreement without the prior unanimous agreement of the remaining Parties.
- 8.6 Notwithstanding Articles 8.4 and 8.5, a withdrawing Party shall retain its rights in Intellectual Property acquired as at the effective date of withdrawal.
- 8.7 Except as provided in Articles 8.4, 8.5, and 8.6 of this Agreement or as otherwise agreed by the remaining Parties, all rights and benefits conferred on a Party under this Agreement shall be forfeited at the effective date of withdrawal. In particular, the withdrawing Party shall not be entitled to any compensation for its prior contribution to the project other than that provided for in Article 8.3 of this Agreement.

- 8.8 The Parties acknowledge that exports from the United States, Canada and Europe will be made in accord with requirements of applicable export regulations. Such controlled exports may involve either material or intellectual property transferred from the United States, Canada or Europe to foreign countries, foreign entities or foreign nationals for the purpose of ALMA construction or operations.

ARTICLE 9: PRECEDENCE

- 9.1 This Agreement shall prevail over all prior communications, negotiations and agreements between the Parties concerning ALMA .
- 9.2 The Articles of this Agreement take precedence over the Annexes.
- 9.3 The Parties shall not enter into agreements concerning ALMA that conflict with the terms of this Agreement. This Agreement shall prevail over any other agreement that appears to conflict with this Agreement.

ARTICLE 10: OWNERSHIP

- [PWD20]10.1 Deliverables supplied by ~~the North American Coalition~~ North America shall be the property of the Government of the United States. Deliverables supplied by ESO shall be the property of ESO, ~~unless otherwise agreed to with the supplier~~. Intellectual Property shall be subject to the provisions of Articles 8 and 23 of this Agreement. Developments or enhancements of ALMA in addition to the ~~deliverables~~ Deliverables described in Annex “D” and carried out under this Agreement shall be apportioned according to Annex “J” of this Agreement. Material property delivered to, or developed for, ALMA shall not be disposed of, in whole or in part, during the period of this Agreement without the written consent of all the Parties, except as described in Article 10.2 of this Agreement.
- 10.2 The Executives may dispose of equipment [PWD21], the value of which does not exceed a limit set from time to time by the Board, subject to the said equipment being either surplus to the future requirements of ALMA or unserviceable and beyond economic repair. Initially, that limit shall be 0.1% of the total ~~construction~~ V value of ALMA as described in Annex “D” of this Agreement. Surplus equipment shall be offered for sale to the Parties before being offered for sale elsewhere. The Executives shall use their best efforts to ensure that all proceeds realized from such sales shall be reinvested in ALMA in a manner approved by the Board.
- 10.3 Where the value of equipment identified for disposal exceeds the limit referred to in Article 10.2 of this Agreement, the Executives shall seek the approval of the Board before disposing of that equipment.
- 10.4 The Joint ALMA Office (Article 13) shall maintain an itemized description of equipment disposed of according to the annual Program Plan submitted to the ALMA Board (Article 14.3).

10.5 The Joint ALMA Office shall maintain a single asset tracking system to identify the ownership, location and disposition of all equipment delivered by the Executives.

ARTICLE 11: NEW MEMBERSHIP

~~A party joining ALMA shall become a Party to this Agreement, which shall be amended for this purpose under the provisions of Article 6.1.~~^[i22] 11.21 Non-Parties shall be permitted to join ALMA subject to the unanimous agreement of the Parties, who shall determine the terms under which the Non-Party shall be invited to join.

11.32 Where a Non-Party joins ALMA, this Agreement shall be amended for this purpose under the provisions of Article 6.1 such that the Non-Party becomes a Party to the Agreement and accepts and abides by its terms.

ARTICLE 12: ALMA BOARD^[PWD23]

12.1 A Board shall be established by the Parties as a supervisory and regulatory body for ALMA, and to be the primary forum for interactions and decisions between the Parties to this Agreement.

12.2 The Board shall not be a legal entity and shall not employ staff or own assets.

12.3 The Board shall ensure that ALMA Construction, Commissioning and Operations are carried out in accordance ~~is constructed, commissioned, and operated~~ in accordance with the terms and provisions of this Agreement. The Board ~~and~~ shall exercise budgetary oversight and policy control over ALMA as ~~foreseen~~ set forth in this Agreement.

12.4 The Board shall, *inter alia*,

- report at least once per year in writing to the Parties to this Agreement on the progress status of ALMA, including the financial situation, progress on Construction and projected timescales, estimated cost to completion, and the status of ~~e~~Operations, once they ~~have begun~~;
- determine the dates of completion of Construction and of Commissioning ~~of ALMA~~, the date of the start of Early Operations, and any reapportionment of project value ~~between among~~ Construction and Commissioning and Early Operations where those periods may overlap;
- determine the policy and manner in which ALMA Operations will be carried out;
- determine the policy and procedures for the allocation of Observing Time;^[PWD25]
- approve/authorize -an annual program plan ^[PWD26]and budget^[PWD27]

- undertake such other duties and responsibilities as may be attributed to it by the Parties.
 - Resolve disputes between and among the Parties pertaining to costs incurred by a Party or Executive due to the actions of another Party or Executives[PWD28].
- 12.5 Europe and North America shall each appoint 5 members to the Board, ~~and the North American Coalition~~North America shall appoint 5 members to the Board; 4 of the North American members shall be appointed by NSF, one of whom shall be designated to speak for NSF, and 1 member shall be appointed by NRC.
- 12.6 [The role of Chile on the Board will be specified after negotiations with the host country are concluded.]
- 12.7 The Board shall meet not less than two times per year.
- 12.8 Such other persons may be invited to attend meetings of the Board as the Board from time to time determines. [PWD29].
- 12.9 The Board shall designate one of its members as a Chairperson. The Chair for the Board shall rotate every 2 years between a Board member appointed by ~~the North American Coalition~~North America and a Board member appointed by ESO, with the member designated by [North America] serving as Chairperson beginning in [2002, June 01]. In the event that a Board member cannot complete a full 2-year term as Chairperson, a successor appointed by the appropriate Party or Parties shall be designated for the remainder of the Chairperson's term.
- 12.10 The Board shall designate one of its members as Vice Chairperson. The Vice Chair for the Board shall rotate every 2 years between a Board member appointed by ESO and a Board member appointed by ~~the North American Coalition~~North America, with the member designated by [ESO] serving as Vice Chairperson beginning in [2002, June 01]. In the event that a Board member cannot complete a full 2-year term as Vice Chairperson, a successor appointed by the appropriate Party or Parties shall be designated for the remainder of the Vice Chairperson's term.
- 12.11 A Secretary to the Board shall be employed by the Executives to be responsible for the support of the Board including keeping records of the meetings and decisions of the Board[PWD30][PWD31] The Secretary shall be appointed by the Chair, subject to the Board approval.
- 12.12 The Parties shall advise the Chairperson and Secretary, in writing, of the members they have appointed to the Board and of the duration of the appointments.
- 12.13 A Party may change its appointed members by notifying in writing the Chairperson and Secretary, who shall be responsible for notifying the other Parties.
- 12.14 The Parties may appoint alternate members to attend and vote at specific Board meetings in place of regular members, by notifying in writing the Chairperson and Secretary, who shall be responsible for notifying the other Parties. Alternates may not serve as either Chairperson or Vice Chairperson.

12.15 The Board may adopt common oversight and management activities chargeable to ALMA, and may request the Executives to arrange for the employment of staff to assist in such tasks[PWD32]. Expenses related to such oversight functions as may be required by individual Parties to this Agreement shall be the responsibility of that Party. Expenses for oversight and management activities undertaken at the request of the Board shall be equitably shared by the Parties

12.16 The Rules of Procedure for the Board shall be subject to the unanimous agreement of the Board. The Rules of Procedure shall include a list of contact persons for this Agreement and their addresses. These Rules shall form Annex “E” to this Agreement.

12.17 English shall be the working language of the Board and of ~~the ALMA project~~.

12.18 Parties are responsible for the expenses of their members.

If this Article isn't to include a statement that the Parties are responsible for the expenses of their members, it should at least cross refer to Article 19.12, which does say so.

12.19 Unanimous [PWD33]Board approval is required for the issues listed below, otherwise a majority vote is require: -admission of new Parties,

-admission of new parties

-withdrawal of existing parties

-approval of the project scope and changes thereto,

-annual and long range program plans

-approval of Annex E “Rules of Procedure”

-??????

-??????

ARTICLE 13: EXECUTIVES

13.1 The Executives ~~shall to~~ carry out the specific tasks to Construct, Commission and Operate ALMA. The European Executive- shall be ESO and the North American Executive shall be Associated Universities Inc., in its capacity -as manager of the National Radio Astronomy Observatory (NRAO). The Parties may change their Executives.

13.2 Funding and deliverables for ALMA shall be provided by the Parties through the Executives.

13.3 The Executives shall, inter alia:

~~(a)~~(a) receive, track, and maintain records of contributions from the Parties;

(b) forward such records with appropriate evaluations to the Joint ALMA Office (article 14) to enable it to fulfill all reporting requirements to the Board;

- (c) ensure that all contributions for [PWD34]ALMA are auditable on an annual basis;
- (d) carry out the decisions of the Board;
- (e) ensure that at all reasonable times and with reasonable advance notice, during Construction and Commissioning [RLS35]representatives of the Parties have access to all non-proprietary Work and associated documents related to ALMA on the premises of the Executives, and to all non-proprietary ~~work~~ Work at the Joint ALMA Office and its subsidiaries and at all ALMA sites within Chile[PWD36].
- (f) report regularly to the Board as required by this Agreement, and at other times when in ~~their~~ the judgment of the Executives such reporting is warranted.

~~What about employing a Secretary, disposing of assets and establishing the Joint ALMA Office (or are Articles 12.11, 10.2 and 14 respectively sufficient? I would have thought these should be included in the tasks unless there is to be a general category of "other tasks identified elsewhere in this Agreement" and "other tasks as assigned by the Board").~~

- 13.4 When leadership and responsibility for a task are assigned to a particular Executive, they shall be exercised in cooperation with the other Executive.

ARTICLE 14: JOINT ALMA OFFICE

- 14.1 With approval of the Board, the Executives shall establish a Joint ALMA Office (JAO; “the Office”) and shall provide the necessary funding, infrastructure and personnel support to operate the Office.
- 14.2 The Executives shall employ, or arrange for the employment of, the staff required to carry out the functions of the Joint ALMA Office, ~~as set out in Article 14.3~~^[i37]
- 14.3 The Joint ALMA Office shall, *inter alia*:
- (a) be responsible for the overall management of ALMA construction and operations;
 - (b) define, maintain, and apply specifications and acceptance criteria for ALMA deliverables. In the event that ~~deliverables~~ Deliverables fail to meet acceptance criteria, the ~~Office~~ ^[RLS38] shall notify the responsible Party and the Board, and shall devise a recovery plan for the approval of the Board.
 - (c) propose for the Board by September 30 of each year a ~~draft~~ ^[PWD39] Budget and Program Plan for the following year and a Long Range Plan, ~~including long range financial estimates~~ encompassing anticipated project needs for a period no less than 5 years in the future;
 - (d) provide for the Board quarterly reports of the status of ALMA.

ARTICLE 15: ALMA MANAGEMENT ADVISORY COMMITTEE

- 15.1 ~~The Parties North America and ESO~~ shall establish an ALMA Management Advisory Committee (AMAC) to report to the Board on the technical, cost, and management status of ALMA. ESO ~~and North America~~ shall each appoint 5 members to the AMAC, ~~and the North American Coalition North America sha.~~ AMAC members shall serve for a term of 3 years, but may be reappointed^[PWD40].
- 15.2 The AMAC shall be kept informed of progress and developments in ALMA through periodic reports and briefings organized by the Joint ALMA Office, and will normally meet at least twice a year to assess ALMA’s overall status and the performance of the Joint ALMA Office. Reports of these assessments shall be made in writing to the Board by the Chair of the Committee on a schedule specified in advance.
- 15.3 ~~The Chair of~~ At each meeting, the AMAC shall select a Chair for its next meeting. At successive meetings, the Chair shall alternate between representatives appointed by ESO and representatives appointed by North America. The selection of the AMAC Chair shall be subject to the approval of the ALMA Board. ~~he AMAC shall be selected by the members of the AMAC, subject to the approval of the ALMA Board.~~

ARTICLE 16: ALMA SCIENCE ADVISORY COMMITTEE

- 16.1 The Parties shall establish an ALMA Science Advisory Committee (ASAC) to advise the Board on scientific, technical, and operational issues. ESO shall appoint ~~5~~ 5 [PWD41] ASAC members and ~~the North American Coalition~~ North America shall appoint ~~5~~ 58 ASAC members. Each ASAC member shall serve a term of 3 years^[i42]. ASAC members may be reappointed^[PWD43].
- 16.2 The ASAC shall be kept informed of progress and developments in ALMA through periodic reports and briefings organized by the Joint ALMA Office and shall meet at least twice a year to assess the project's scientific and technical status. Reports of these assessments shall be made in writing to the ~~Project Director~~ Board by the chair of the ASAC on a schedule specified in advance. The ALMA ~~Project~~ Scientist (Article 17) shall serve on the Committee *ex officio*.
- 16.3 The Chair of the ASAC shall be selected by the members of the ASAC, subject to the approval of the Board^[PWD44]. The Chair shall serve for one year. The Chair shall alternate between representatives appointed by ESO and representatives appointed by North America.

ARTICLE 17: KEY PERSONNEL

- 17.1 ~~17.1~~ The organizational structure of the ALMA project will be subject to the review and approval of the Board, and Key Personnel shall be designated from time to time by the Board. Initially, the Key Personnel shall include:
- a) The ~~Project Director~~: responsible for ~~shall~~ leading ALMA. He/she will report to the ALMA Board, and will have the responsibilities detailed in Annex "K" to this Agreement.
- The Project Manager: will be responsible for the overall coordination of ALMA construction and commissioning, including setting and maintaining technical specifications, establishing and controlling interfaces between major subsystems, and for enforcing acceptance standards for major deliverables; also responsible for overall coordination of the construction of ALMA and its subsequent technical development program.
- b) The ~~Project~~ ALMA Scientist: responsible for providing scientific guidance to the project with respect to trade-offs and to optimize ALMA's scientific capabilities in the face of changes in scope. ~~will serve as the primary contact between ALMA and the scientific community.~~
- c) The ALMA Project Engineer: responsible for insuring that the astronomical requirements of ALMA are fulfilled by the instrument's technical specifications and that the instrument is maintained in such a way as to insure its full operational capabilities.

17.2

Key Personnel shall be selected through an open, world-wide search carried out jointly by the ALMA Executives in a manner approved by the ALMA Board. The job descriptions and appointment of all Key Personnel shall be subject to the unanimous approval of the ALMA Board.

17.3

~~17.2~~—The Executives shall be responsible for the employment, or for arranging for the employment of, the Key Personnel.

17.4

~~17.3~~—The job performance of all Key Personnel will be reviewed ~~on a yearly basis~~annually by the Executives through a process approved by the Board. The results of this review shall be reported annually to the Board, whose agreement will be required for the continued appointment of all Key Personnel.

~~17.4 The organizational structure of the ALMA project will be subject to the review and approval of the Board. Initially, the Key Personnel shall include:~~

~~(a) The Project Director shall lead ALMA. He/she will report to the ALMA Board, and will have the responsibilities detailed in Annex “K” to this Agreement.~~

~~(b) The Project Manager will be responsible for overall coordination of the construction of ALMA and its subsequent technical development program. Other duties of the Project Manager are listed in Annex “K” of this Agreement.~~

~~(c) The Project Scientist will serve as the primary contact between ALMA and the scientific community. Other duties of the Project Scientist are listed in Annex “K” of this Agreement.~~

~~(d) The Project Engineer will insure that the astronomical requirements of ALMA are fulfilled by the instrument’s technical specifications. Other duties of the Project Engineer are listed in Annex “K” of this Agreement.~~

ARTICLE 18: ORGANIZATION IN CHILE and RELATIONS WITH HOST STATE

[Specifics of this Article are subject to the results of negotiations with Chile]

18.1

[The organization and representation of ALMA in Chile ~~during Construction, Commissioning and Operations~~ shall be determined by the Board.]

18.2

[Liaison with relevant bodies in Chile on behalf of the Board will be carried out by []. The Parties will be consulted where necessary.]

18.3

[title to the ALMA land in Chile]

- 18.4 [commitment to environmental protection]
- 18.5 [responsibility for the site]
- 18.6 [decommissioning]
- 18.7 [other issues] – legal responsibility in Chile? Responsibility for Personnel?

ARTICLE 19: FINANCIAL PROVISIONS - GENERAL

- 19.1 The Parties expect that the funds that they will set aside and obligate from time-to-time to ALMA will meet their obligations under this Agreement. However, ~~pursuant to the restrictions contained in the national laws of the Parties~~, the ability of ~~each Party North America~~ to obligate its full commitment, or its ability to satisfy any contingent liability that may arise under Article 8 (Withdrawal) or Article 20 (Default) of this Agreement will depend in part upon the availability of ~~must be subject to funds that are available from the appropriated ions by the United states Congress. which their respective governments have made for the Parties~~.
- ~~19.2 Financial matters before the Board as set out in this Article shall require the unanimous agreement of the Board [PWD48].~~

Accounting and Audits [PWD49]

- 19.3 ~~Where cash accounting is required, records shall be kept of costs in both US dollars and Euros. Costs in these currencies shall be determined using the exchange rates obtaining at the time of the expenditures [PWD50].~~
- 19.4 The program [PWD51] ~~financial~~ year of ALMA shall be the calendar year (January 1 through December 31).
- 19.5 On or before November 30 each year, the Board shall approve a Program Plan [PWD52] ~~Budget~~ for the following year.
- 19.6 At least ~~Within~~ two months ~~before of~~ the end of each program ~~financial~~ year, the Executives shall provide the Joint ALMA Office with ~~financial~~ reports for ~~monies spent and value~~ Value earned during that ALMA program ~~financial~~ year. The Joint ALMA Office shall in turn provide to the Board a final ~~financial~~ summary report for the program ~~financial~~ year in question no later than three months after the conclusion of the program ~~financial~~ year. ~~Any Party may request through the Board that its Inspector General, or equivalent, audit and certify the accuracy of the annual report [PWD53].~~
- 19.7 For each program ~~financial~~ year the amount and timing ~~of that part~~ [RLS54] of the contribution to ALMA from the Parties shall be agreed at the Board meeting that considers the Program Plan. ~~Budget~~.

- 19.8 The ~~value~~ Value of the contributions of the Parties shall be calculated as a fraction of total construction or annual operations value. Construction ~~valuation~~ is specified in Annex “D” to this Agreement, and may be modified only with the agreement of the Board. The ~~value~~ of ALMA operations will be determined by the Board in a manner chosen by the Board and appended to this Agreement.
- 19.9 ~~Where cash payments are required by~~ Where the Parties are required to make cash payments, ~~the such~~ payments shall be made to the appropriate Executive through a mechanism selected by each Party. Payments for Construction and Commissioning shall normally be remitted to the Executives in accordance with the payment schedule attached to this Agreement as Annex “F”. For Operations, a payment schedule shall be approved annually by the Board. A Party may reschedule payments in any phase of the project subject to the prior approval of the Board.
- 19.10 Any Party may elect to make additional contributions in an ALMA financial year in excess of those due. In the case of cash contributions, any allowance for interest or inflation shall be at the discretion of the Board. Any such contributions shall be credited against contributions due in future fiscal years, and shall be subject to the approval of the Board.
- 19.11 Deliverables [PWD55] ~~Funds~~ provided ~~by to~~ the Executives to the Project shall be subject to ~~an annual~~ external audit when requested by the Board.; ~~The results of such audits which~~ will be made available to the Parties via the Board [PWD56].

ALMA Board Expenses

- 19.12 Parties hosting meetings of the Board shall be responsible for the local costs of the meetings. Each Party shall be responsible for the expenses of its members attending meetings, including travel and accommodation costs.
- ~~19.13 The full costs of employing staff [RLS57] for Work, wherever they are located, shall be chargeable to the appropriate Executive, subject to such work being authorized in advance by the Joint ALMA Office and approved by the appropriate Executive.~~

Contracts

- 19.13 The Executives shall, to the maximum extent practicable, make subawards on the basis of competitive international tender in a manner which shall enable competitive bidding by companies within the respective Party's ~~Parties'~~ countries on terms which are not selectively to the disadvantage of the companies of any of those countries [PWD58]. ~~Such awards shall be subject to external audit, the results of which will be reported to the~~ Board [PWD59].
- 19.14 The Executives shall consult with the Board regarding all contracts valued at more than \$1,000,000 U.S., or more than €1,000,000.

Observing

- 19.15 Funding of the travel and subsistence costs of observers or others wishing to use ALMA is outside the scope of this Agreement.

ARTICLE 20: DEFAULT

- 20.1 ~~20.1~~—If a Party is in arrears on a payment ~~or obligation for a deliverable~~ by more than 180 calendar days during Construction, the appropriate Executive shall immediately inform the Board Secretary in writing, who shall notify the Chair. If no explanation for the arrears has been accepted by the Board, the Chair shall notify the defaulting Party, in writing, that the remaining Parties consider that Party as having withdrawn from the Agreement and the relevant provisions of Article 8 to this Agreement shall apply.
- 20.2 If a Party is, or expects to be, in arrears with an obligation for a deliverable during Construction, the appropriate Executive shall immediately inform the ALMA Director and the Board Secretary in writing, together with an explanation of the causes and proposed actions to be taken. The ALMA Director shall provide the Chair and the Board Secretary with an evaluation of the likely consequences of such arrears, and advise them of the actions the Project Director intends to take to minimize the impact on ALMA. In consultation with the Executives, the Chair shall decide whether Board approval for such actions is required, and how such approval should be obtained[PWD60].
- 20.3 The ALMA Director may recommend to the Chair that the Board establish a mechanism to re-assess the value of the said deliverable, taking into account the proposed remedial action and its impact on the Parties, so that the Board may take such steps as are necessary to ensure that the Guiding Principles of this Agreement are maintained.
- 20.4 ~~20.2~~—If a Party is in arrears on a payment ~~or obligation for a deliverable~~ by more than 180 calendar days during Operations, the Board may suspend the observing privileges of that Party until the arrears are paid or the obligation is satisfied; when ~~this a suspension~~ occurs, observing time will normally be reallocated between the remaining Parties.
- 20.5 If a Party is, or expects to be, in arrears with an obligation for a deliverable during Operations, the general provisions of 20.2 and 20.3 shall apply.
- 20.6 ~~20.3~~—If a Party is in arrears for more than 360 calendar days during the Operations phase of the project, the appropriate Executive shall immediately inform the Board Secretary in writing, who shall inform the Chair. If no explanation for the arrears has been accepted by the Board, the Chair shall notify the defaulting Party, in writing, that the remaining Parties consider that Party as having withdrawn from the Agreement, and that the relevant provisions of Article 8 of this Agreement shall apply.
- 20.7 ~~20.4~~—Where an explanation for a delay has been accepted by the Board, a single further period of not more than 180 calendar days may be granted by the Board for the completion of the obligations.
- 20.8 ~~20.5~~—At the conclusion of such further period, in the event that the arrears remain unpaid, the Chair ~~of the Board~~ shall notify the defaulting Party in writing that the

remaining Parties intend to consider that Party as having withdrawn from the Agreement and that the relevant provisions of Article 8 of this Agreement shall apply.

ARTICLE 21: OBSERVING TIME AND DATA RIGHTS

21.1 At the start of Early Operations, North America and ESO shall each receive 30% of the available observing time and Chile shall receive 10%. Either partner's fraction of the remaining 30% of the observing time shall be their fraction of the total earned Value in ALMA up to the month in which Early Operations begins. The earned Values shall be determined by the ALMA Project Manager and be reassessed every [6] months thereafter, until the start of Operations. All Early Operations Observing Time shall be divided equitably according to the seasons of the year.

21.42 Subject to the financial contributions being maintained ~~as at of equal~~ Value, as stated in Article ~~20-2.1~~ of this Agreement, the Observing Time during ALMA Operations shall be divided between North America, ESO and the Chilean astronomical community equitably according to the seasons of the year, as follows:

| | |
|---------------|-----|
| North America | 45% |
| ESO | 45% |
| Chile | 10% |

21.23 The Executives shall arrange for the maintenance of a log and an archive copy of each observation and its relevant calibration data in a single, uniform data format accessible to qualified researchers as approved by the Board. For this purpose, the Executives may chose to employ mirrored data sites for the convenience of their respective user communities.

21.34 The Board shall set policies for data storage, archiving, access, and subsequent use by the astronomical community.

21.45 Any observer who takes data from ALMA shall have exclusive use of that data for 18 months after the collection of the data has been completed. Thereafter, the data shall become available to any qualified researcher in accord with general principles approved by the Board. The rules relating to observing time and data rights shall be reviewed periodically by the Board.

ARTICLE 22: ACCESS BY OTHERS

22.1 Any Party may, with the agreement of the other Parties, assign its Observing Time, in whole or in part, for a fixed period of time, to ~~another-third~~ entity not a Party to this Agreement. ~~participating in ALMA~~ RSO The agreement of the Parties to such arrangements, which must be in accordance with this and any other agreements concerning ALMA, shall not be unreasonably withheld.

- 22.2 Third parties receiving the assignment of Observing Time under Article 22.1 of this Agreement shall abide by all rules pertaining to ALMA operations and data release.

ARTICLE 23: INTELLECTUAL PROPERTY

- 23.1 Except as provided in Articles 21.~~23~~ through 21.~~45~~ of this Agreement concerning data acquired with ALMA, the inventor or creator of Intellectual Property or his or her assignee or employer shall have ownership or the option to own all Intellectual Property arising out of the Work done pursuant to this Agreement.
- 23.2 Subject to Article 23.6 of this Agreement, for all Intellectual Property created during Work under this Agreement the appropriate Executive shall provide and obtain a non-exclusive, non-transferable, irrevocable, paid-up license (1) for use in ALMA and (2) for each of the Parties to use or have used on their behalf throughout the world for non-commercial research purposes of any such Intellectual Property.
- 23.3 The provisions of any NSF Award to AUI or any successor organization, supporting the operations of the NRAO will, if applicable, contain the patent right provisions required by Chapter 18 of Title 35, United States Code, including a requirement as authorized by 35 USC 202 (c) (4) that the organization managing the NRAO provide or obtain, in addition to the license rights of the United States, a non-exclusive, nontransferable, irrevocable, paid-up license for each of the non-U.S. Parties to practice or have practiced on their behalf throughout the world for research purposes any subject inventions. The license rights which the organization managing the NRAO will obtain for the United States under subawards or other arrangements with persons or organizations from countries of the non-U.S. Parties shall be limited to a non-exclusive, nontransferable, irrevocable, paid-up license for NSF to practice or have practiced on its behalf for research purposes any subject inventions created during Work under this Agreement. NSF or its appointed Executive shall provide corresponding license rights to ESO.
- 23.4 It is recognized that some arrangements made by the Executives for the undertaking of research or development work for ALMA may involve funding agreements that are not subject to Article 23.3 of this Agreement. These might include, for example, the detailing of employees of one Party to participate in projects carried out by a second Party while retaining their status as employees of the first Party. The provisions of the NSF Award to AUI or any successor organization managing the NRAO, or provisions applied to ESO, will contain terms and conditions designed to assure the identification and reporting of inventions on a basis comparable to that contemplated under Article 23.3 of this Agreement and the granting of licenses to all affected Parties by the owner of the inventions that are substantially the same as those required for non-US Parties under Article 23.3 of this Agreement. Each Party recognizes that when arrangements involving its employees are made that are subject to this Article, the Party will have to enter into appropriate arrangements with the appropriate Executive to accomplish the intent of this Article.

- 23.5 In the case of scientific or technical papers, reports, books or similar materials (whether in print or electronic form) prepared by the Executives or their subawardees and provided to the Parties or the Board, each Party shall be free to translate, reproduce and publicly distribute such materials, subject to any restrictions which may be placed on the document pursuant to Article 23.6 of this Agreement, or restrictions which are necessary to obtain appropriate protection of intellectual property rights in particular patents.
- 23.6 The Parties recognize that in some cases the Executives or their subawardees may have to obtain goods or services from organizations that limit the uses made of certain technical data, software, know-how, or other information provided to the Executives or their subawardees because the organization providing the data, software, know-how or other information treats it as proprietary or trade secret and normally restricts its use. This is likely to be particularly true where pre-existing technical data or software is involved. In such cases, the Parties recognize that it may not be cost-effective or possible for the Executives or their subawardees to obtain license rights for the Parties of the type normally contemplated by Articles 23.2 and 23.5 of this Agreement and do not expect the Executives or their subawardees to obtain such rights in such cases, provided that whatever license rights are obtained should be the same for all the Parties.

ARTICLE 24: LIABILITY & INDEMNITY

- 24.1 The Executives shall procure and maintain for their own benefit, and at their own cost, comprehensive general liability insurance.

ARTICLE 25: NOTICE

25.1 Any notice contemplated by this Agreement, unless a different address is subsequently notified by one Party to the others in writing, must be sent to the Parties at the addresses stated in Annex “H” to this Agreement, and copied to the Secretary to the Board, by either

(a) certified mail or courier, and then it is considered to have been received ten days after it is sent;

or

(b) electronic mail or facsimile, and then it is considered to have been received only when acknowledged by letter or facsimile.

ARTICLE 26: DISPUTES

26.1 Any disagreements regarding the interpretation, implementation or application of this Agreement shall be resolved by consultation among the Parties. Disagreements shall not be referred to any national or international tribunal or non-Party for settlement.

ARTICLE 27: ANNEXES

27.1 The following Annexes are incorporated by reference and shall form an integral part of this Agreement:

- (a) Annex “A” Project Description
- (b) Annex “B” Scientific Requirements Document
- (c) Annex “C” Project Time Schedule and Work Breakdown Structure
- (d) Annex “D” Schedule of Values and Assignment of Deliverables
- (e) Annex “E” Rules of Procedure for the ALMA Board
- (f) Annex “F” Payment Schedules
- (h) Annex “H” Addresses of Parties and Board Members
- (i) Annex “I” Guidelines for the Executives
- (j) Annex “J” Apportionment of Developed Property
- (k) Annex “K” ALMA Organization and Management Plan
- (l) Annex “L” European Organizations and Institutes New Article: Early Operations

File ALMA

Page: 5

[PWD1] Article 1--Suggest the term "Agreement" be defined in this Article instead of in Article 4.2. All other defined terms are in Article 1.

Page: 5

[RLD2] Article 4 is not a definition of term "Agreement", but a statement of the *scope* of the Agreement. These are slightly different and, as such, I don't think that

Page: 5

[PWD3] Definitions The terms "Agreement" and "Annexes" need to be defined. They are the only "capitalized" terms in document that are not defined. We believe it is important to define it here so as to avoid any possible "definition creep" as the Board, Parties, Executives, etc. create more ALMA documents.

[i4]We do not need both terms.

Page: 6

[RLS5]Superfluous – see definition of Commissioning at 1.5

Page: 6

[RLS6]This needs thinking about – do NRC/NSF have "participating organizations and institutes"? And wouldn't ESO's participants be "Participating countries"? (We wouldn't designate, say MRAO or ATC to be counted – we'd be counted as 'UK') The answer to the first part is "yes", but as I recall, this article has evolved away from its initial form, which stated that the Parties received the benefits in proportion to what they provide. How they devolve those benefits – just as how they actually contrive to provide Value – is not necessarily transparent to the Agreement, nor, in my view, does it have to be. What about the revision as given?

Page: 7

[PWD7] Article 4—What happened to the provision about the agreement not creating any obligation under any international law? Pat, it was dropped to create a stronger document.

Page: 7

[PWD8] Article 4.2—See prior comment about moving this to Article 1 "Definitions" See my response.

Page: 7

[RLS9]This should be re-located to sit alongside the financial sections, and should include the statements referred to at my Comment 5 on Value. Not clear to me why it should be relocated. Note title change.

Page: 8

[PWD10] Article 6.1--Very careful consideration should be given to the requirement for unanimous approval for ALL amendments to the ALMA agreement. The annexes will cover some very minute details....are we sure that we want a single dissenting vote to block even minor changes? Serious consideration should be given to limiting unanimous approval for major, substantive amendments and simple majority votes for other types of amendments. The alternative – especially when and if Chile and Japan become ALMA Board members is not pleasant to contemplate, however – for then we can have the formation of voting blocs on the Board and things could degenerate fast. If you have a specific proposal, however, let's discuss it, by all means.

Page: 8

[PWD11]Article 6 Amendment With respect to the "unanimity" requirement for amendments, our proposal would be for the working group to identify the specific subjects for which unanimity is required...e.g. the admission of new Parties, the re-valuation of contributions. The Working Group needs

to examine the Agreement, provision by provision, and ask itself what are the essential items for which unanimity is essential. See our proposed wording for a new Article 12.19 pertaining to Board votes.

Your comments regarding the necessity to maintain a separate amendment procedures for the Agreement (6.1) and Annexes (6.2) perhaps provides an entrée into the unanimity issue. Perhaps unanimous votes should be required for the Agreement with majority votes required for the Annexes?

Page: 8

[PWD12] Article 6.2---is “may” the correct term? Who determines when it is or is not required?

Page: 8

[PWD13] Article 6.2 Is “agreements” the intended term?...should this refer to “amendments”?

Page: 8

[PWD14] Article 6.2 Not sure what this Article is meant to accomplish. As long as the unanimity provision governs and the “Agreement” is deemed to include all Annexes, Article 6.1 seems to sufficiently cover all situations.

PAT: This is streamlining mechanism. Changes which are necessary but non-substantive, can be amended simply by this process, without having to go through – for example – NSF chain of command (which, as you know, can sometimes take a long time).

Page: 8

[RLS15] We have always been advised (by our Contracts section) that this is an undesirable formulation, since it is not specific. They prefer a clear date to be stated, but failing that, it should say “on the date on which the last Party signs” – the date of entering into force, and of any anniversary actions etc, is then absolutely clear. OK.

Page: 8

[PWD16] Article 7.1—Given that the effective date is not yet know, perhaps it is better to cite the 20th anniversary of the effective date of the agreement instead of a date certain.

PAT: Dates changes as per Paul vanden Bout’s suggestions.

Page: 8

[PWD17] Article 7.2—date certain or anniversary date?

Comment as above.

Page: 8

[PWD18] Article 7.5 What are “jointly owned assets”? I USED THE TERM TO REMIND US THAT BUILDINGS ON SITE, AND SO FORTH COULD BE JOINTLY OWNED. Article 10 “Ownership” deals only with assets that are owned solely by either one Executive or the other but not by both.

PAT: I do not see that Article 10 is inconsistent with the possibility of joint ownership. Perhaps this

Page: 8

[PWD19]Article 7.5 Duration and Termination Legally speaking, there will be no “jointly owned” assets. The physical integration of equipment owned by one Executive into equipment owned by another Executive does not suddenly make them jointly-owned. Recommended language has been inserted.

Page: 10

[PWD20] Article 10—Suggest a new provision requiring the Joint Project Office to maintain a single asset

tracking system to identify the ownership, location and disposition of equipment delivered by the Executives.

Page: 10

[PWD21] Article 10.2—Suggest a better term than “assets”. Assets can mean property such as licenses, rights and privileges, etc....suggest using “equipment”.

[i22]This paragraph is redundant with 11.3

Page: 11

[PWD23] Article 12 The Agreement still fails to deal with the issue of situations where one Party or Executive causes its counterparts to incur costs. The latest draft of the ALMA Management Plan recognizes this situation as a possibility (it uses the terms “collateral costs”) in the context of making approved changes to work packages). I believe the draft Management Plan refers the situation to the Board for resolution. Therefore, the Agreement needs to deal with this situation. (Note: “collateral costs” will not be limited to planned changes. Undoubtedly there will be missed schedules which cause the other side to incur “marching army” costs. As unpleasant as it may be to deal with this very difficult issue, it needs to be addressed now.

PAT: First, I think there is a fundamental misunderstanding – to my knowledge, no one has failed to take up this issue because it is “unpleasant”. Rather, it is a difficult one, because it stems from an *ab initio* asymmetry in the partnership due to the fact that we have “marching army costs” that must be supported and accounted for, and Europe does not. Remedies which attempt to impose compensatory mechanisms to redress potential damages which result from our organizational structure are difficult to justify and politically problematic. I am not saying that we should hesitate to engage the issue – but I am saying is that dealing with the issue will take some delicacy. I frankly, cannot see Europe agreeing to “reparations” to us for their failures to meet schedule. It seems to me that the best we can do is to make our part of the project as independent as we can, and to penalize failures to meet the agreed-to delivery schedule through withholding Early Observing time. Other substantive suggestion as to specific language for a better or more a viable solution are, of course, welcome.

Page: 11

[RLS24] Wouldn't it be better to say “ALMA Construction, Commissioning and Operations are carried out in accordance...” – then the terms defined in Article I are used and consistency is maintained.

Page: 11

[PWD25] Article 12.4, 4th bullet—Does the wording mean that there will be a single TAC for Europe, North America and the Chile?

PAT: I don't think the wording locks us into anything specific in this area. As you recall, this issue is up in the air (and I have not yet accepted Riccardo's argument that multiple TACs are the right way to go).

Page: 11

[PWD26] Article 12.4 5th bullet We agree with the change that the Board should approve “an annual program plan” but strongly recommend that the words “and budget” be deleted. The Parties **must** retain exclusive domain over the approval of it Executives budgets...the legitimate concern of the Board is deliverables.

Page: 11

[PWD27] Article 12.4 5th bullet—After having read this section for the past year or so, it has occurred to me that perhaps the Board should not be approving budgets but deliverables. It really does not matter what a Party spends or what their funding level is. What matters is on-time delivery of work irrespective their cost (and funding). Shouldn't the Board be reviewing the proposed work packages to ensure conformance to a Board-approved schedule?

PAT: That's a very good point. However, there will be a need for a cash budget as well. I perhaps the language should be "authorize an annual program plan and budget." What do you think?

Page: 12

[PWD28] Article 12 ALMA Board Regarding the difficult issue of costs incurred by one party due to the fault of another, we again strongly recommend that this Article include a statement that this issue falls within the legitimate purview of the Board. As mentioned in our previous comments, the draft annex "ALMA Organization and Management Plan" identifies "collateral costs" as an issue that is to be referred to the Board for resolution. Let's at least provide linkage between this Annex and the Agreement. (Note: The draft Annex deals with "collateral cost" only in the narrow context of Board-approved changes in project scope that cause the other Executive to incur unanticipated costs. However, this is the first recognition that "collateral costs" must be addressed.) At this point in time, we don't need address the issue of how to solve the problem (e.g. early observing time, revaluation of work packages)...but at least it starts to deal with the issue.

Page: 12

[PWD29] Article 12.8 Does this provision mean that support staff can not attend unless specifically invited? Also, if invitations are to be issued, shouldn't the Chair consult with the Parties?

PAT: I think this was meant as a simplification of process. How about if we delete the offending language, as shown?

Page: 12

[PWD30] Article 12.11—How is the Secretary appointed? Does the person holding this position change in a manner similar to the rotation of the ALMA Chair and Vice Chair?

PAT: Obviously, it's currently TBD. Do you have a specific suggestion?

Page: 12

[PWD31] Per your suggestion we have added some proposed language.

Page: 13

[PWD32] Article 12.15—A provision stating that expenses for oversight and management activities undertaken at the request of the Board shall be equitably shared by the Parties. DONE.

Page: 13

[PWD33] Here's an attempt at defining a list of issues that unanimous votes. The Working Group first needs to embrace this concept, and then develop a more definitive list. We would make

this list very restrictive.

Page: 14

[PWD34] Suggest "contributions" be replaced by "deliverables" because what matters is deliverables. "Contributions" is too easily confused with funding.

PAT: I think that "contributions" is appropriately general – it includes deliverables, but allows for cash as well.

Page: 14

[RLS35] Presumably, during Operations, there will need to be a different provision, since there won't then be Work going on? Not sure. It is more difficult to imagine a compelling need to see such work records once Construction is over. Modification OK?

Page: 14

[PWD36] Article 13.3 (e) –This section should be modified to (1) include provisions that provide access to documents "with reasonable advance notice" and (2) exclude documents that may contains proprietary data.

PAT: Check wording. I am assuming that only documents associated with proprietary Work contain proprietary data. If this is not adequate, please re-word.

[i37]Unnecessary and potentially dangerous, since 14.3 is neither exhaustive nor exclusive.

Page: 15

[RLS38] Isn't this the specific responsibility of the Project Director and Project Manager? Yes, but they're not mentioned yet. What do you suggest?

Page: 15

[PWD39] Article 14.3 c Delete the words "Budget" and "long-range financial estimates" as items prepared for Board approval. The Board should approve annual and long range plan. The Parties, not the Board, should approve their respective Executives budgets. Certainly, funding issues must be discussed by the Board, but they should only program plans...not budgets.

Page: 15

[PWD40] Article 15.1—Suggest members' terms be staggered so as to provide for some continuity of membership.

PAT: This is a good idea, but I suggest letting each partner handle the issue through its own re-appointment process.

Page: 16

[PWD41] We again strongly recommend that the size of the ASAC be reduced. Five from each side should be adequate. With all the supporting cast, a bilateral ASAC meeting can easily involve more than 20 persons travel expenses.

[i42]ASAC decided it wanted 8+8 with 7 Japanese observers. Shouldn't there be a specification that (at least) one of the North American members is Canadian?

Page: 16

[PWD43] Article 16.1-- This is a very large committee...couldn't it be reduced without sacrificing its effectiveness? Also, members terms should be staggered to provide for continuity.

PAT: See IC comment above.

Page: 16

[PWD44] Article 16.3 Should the ASAC Chair be rotated between the Parties?

Page: 17

[RLS45] Doesn't that just mean "at all times" – so does it need to refer to any time at all? Right.,

Page: 18

[RLS46] Does this work for ESO? What is the 'national law' of ESO, given that this is referring to the national laws governing the contribution of funds? It must surely be the ESO member countries' laws – in which case this wording is not quite right. This article arose because the budget of any NSF-supported enterprise is constitutionally constrained by the availability of appropriated funds. The complexity of the article developed out of an attempt to make this point broad enough to encompass both Parties. If ESO must qualify its ability to provide funds, you now formulate an equally satisfactory sentence to round out the article.

Page: 18

[RLS47] As for comment 42 above. Ibid.

Page: 18

[PWD48] See Article 12.19

Page: 18

[PWD49] Article 19—Not sure why 19.3 is necessary? If contributions are to be in the form of a pre-agreed work package value...what is the point of tracking Euros or dollars?

PAT: There will have to be some cash contributions, right?

Page: 18

[PWD50] Article 19.3 Still don't see the need for each Executive to track Euros and Dollars. While some cash may be sent from one Executive to another to purchase work these transactions don't affect the Value assigned to a partner. During the Construction phase Value is the only commodity that counts. If this is necessary for the operations phase, then revised language should be developed.

Page: 18

[PWD51] Change consistent with Board's role of program oversight...not financial manager.

Page: 18

[PWD52] Same comment as 19.4

Page: 18

[PWD53] The last sentence of this section allows the Europeans to task NSF's Inspector General to verify ALMA's annual report. IG (or its EU equivalent) involvement in ALMA should NEVER be up to anyone except the Parties and their respective Executives.

Page: 18

[RLS54] That part of the contribution that does/is what? Better?

Page: 19

[PWD55] Audits should be used to certify Value delivered in accordance with the Board approved program plan...not to certify funds spent. Also, let's not REQUIRE annual audits...instead authorize on an "as needed" basis.

Page: 19

[PWD56] Article 19.11 What is the purpose of annual external audits? There is no purpose served in conducting separate financial audits for ALMA. Whose audit standards are to be used? The Board should audit "deliverables" (not funds expended) to assure the Executives have delivered their work packages as promised.

PAT: See comment after [PWD43]

Page: 19

[RLS57] Does this include the admin staff in the Joint ALMA Office? (See definition of Work at 1.20)

Page: 19

[PWD58] The last sentence stating that ALMA sub-awards shall be subject to "external audit" should be deleted in its entirety. The Board has no procurement authority, therefore how can it audit procurements? AUI must follow NSF's procurement procedures as mandated in the Cooperative Agreement. AUI's compliance with these procedures must remain a matter solely between AUI and NSF. (Note: We endorse the deletion of the old Article 19.14. We also agree with the current wording of renumbered Article 19.14 with respect to the deletion of the Board ratification of subawards.

Page: 19

[PWD59] Article 19.13 What kind of "audit" is envisioned here? Whose audit standards are used?

Certainly each Executive has different standards for procurements. Is North America going to become involved in auditing European (and vice versa) procurements. What about proprietary data issues? The last sentence should be deleted.

PAT: Your input is needed here to make this and 19.11 work. The idea is simply to have a mechanism that creates an assurance of mutual openness.

Page: 20

[PWD60] Article 20.2—The last sentence should be modified to require the Chair to consult with the Executives in making determinations as to whether and how Board approval needs to be obtained. OK

Page: 21

[RLS61] Shouldn't this say either "not a Party to this Agreement" or "not participating in ALMA through one of the Parties to this Agreement"? Or could time be sold to Chile without any restriction as to agreement by other Parties? OK