

Contract n. 212243
Deliverable 5.5

***INVENTORY OF NATIONAL
STANDPOINTS , POLICIES
AND GOALS***

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2 FOREWORDS

The Square Kilometre Array (SKA) will be a revolutionary international radio telescope for the 21st Century, designed to address fundamental unanswered questions about our Universe. It will challenge scientists and engineers to create and develop technology performance beyond that currently available, and be highly demanding of professional project practitioners charged with managing the construction programmatic.

The total collecting area will be approximately one square kilometre giving 50 times the sensitivity, and 10,000 times the survey speed, of the best current-day telescopes. With receptors extending out to distances of 3,000 km from the central core of the telescope, the SKA project stretches the limits and risk profiles of several leading edge technologies.

More than 70 institutes in 20 countries, together with industry partners, are participating in the scientific and technical design of the SKA telescope which will be located in either Australia – New Zealand or Southern Africa extending to the Indian Ocean Islands. The target construction cost is €1,500 million, with preconstruction planned to commence following the host site decision in 2012.

In 2008, PrepSKA, a 4 years lasting project funded by the EC within the 7th Program Framework, started the development of the preparatory phase towards the construction of the SKA, mainly focusing the activities of planning the legal, financing and procurement issues of both pre-construction and construction phases. The PrepSKA/Work Package 5 (WP5) was then charged with researching options of procurement models to adopt in the construction phase as well an overall policy for industrial involvement.

SKA is a challenging project, in which scientific goals will be conditioned by the ability to make the right choices in technologies, procurement strategies, team organisation and management, fund raising and management. Moreover, determining the correct supply chain models and market involvement strategies is the mandatory baseline for design of any Procurement Model, yet only the final step of a complex overall Procurement Strategy.

In arriving at this WP5 final output, the authors undertook a serious and lengthy investigation of high-technology procurement activities and literature sources (see references), with interim reports. Additionally, many practical artefacts (e.g., sample contracts, templates, and project reports) were examined and support the findings. Two main reports have been delivered, “*Guidelines for Procurement for WP2*”, and “*Towards a Procurement model for the SKA*”, the first one providing a deep analysis of the basic assumptions required to set up an acquisition process in the framework of a large scale multinational project, the latter the interaction between engineering and procurement and the different procurement models suitable to be used.

This document is one of the three documents making up the final report, that is an organic review of all the findings described in the previous documents, completed with a risk analysis for SKA procurement and guidelines for procurement in the Pre-construction phase. The three documents are organised as follows:

1. Del 5.3 Report on procurement models
2. Del 5.4 Draft options paper on procurement
3. Del 5.5 Inventory of national standpoints , policies and goals.

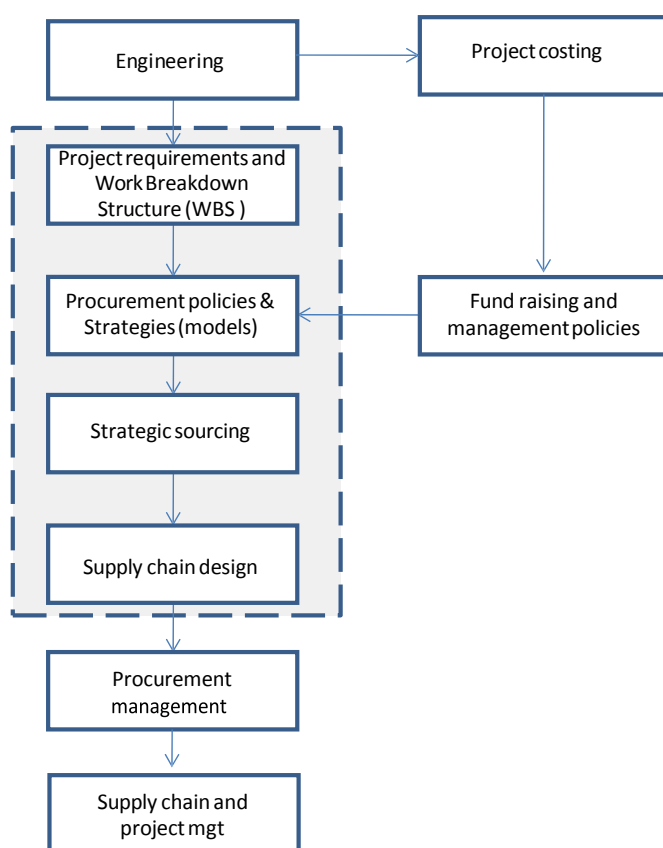
Global projects are projects involving a large number of stakeholders, mainly different countries, with large investments, unique in their scope. In this environment issues such as Value for Money, Input vs. Outputs, Whole Life Approach, Ethical and Political Boundary Conditions, IP management are of primary importance, together with the ability to drive design and market capabilities. Procurement models of ITER, CERN, ESO and ESA have been investigated and summarised.

This document is intended to explain how to define a procurement policy and how to set up procurement processes to build the Square Kilometre Array (SKA), by analysing the main outcomes from the experience of very large projects, both in the industrial environment, and mega science.

The dimension and cost of those projects, and the complexity of their organisation, make procurement a critical factor, so the section describes how to go through the overall project to set up procurement strategies and processes, starting from the interaction with engineering (project description) in order to devise procurement needs and risks, and to set up strategies. The importance of project structures is emphasised, especially the structural models such as the Work Breakdown Structure - WBS, so crucial in defining Work Packages for ultimate contracting.

This is followed by the design of the supply chain and the supply chain management issues resolution. The conceptual flow for the job is shown in Fig. 1.

Fig 1. Conceptual flow for strategic mega-projects procurement



The usually long life of the projects, both in terms of development and operations, cost estimation over the total life cycle for the project/product is required together with the evaluation of general procurement risks and risk mitigation actions.

Acquisition general methods, policies, tools are covered, such as purchasing procedures, contracts structures, and contract management processes.

In order to cope with the final SKA organisation, there may be external constraints as a consequence of the type of legal entity of the contracting organisation. In order to have a view of the different possibilities, the main legal environment have been investigated, from the WTO Government Agreement of Procurement (GAP) as well as the rules for public procurement in countries/regions that might be involved in the SKA procurement process.

The In-Kind Contribution model has been often adopted as a funding scheme of other science projects. In which case, the participant institutions will normally contribute to the project by providing turn-key sub-system. The procurement issues of an In Kind model are mainly focused on the procedures to allocate the tasks (or Work Packages) and define protocols to assess and accept the deliverables rather than on the contracted performance of the tender, that in this case would be carried out by the supplying organisation. In all the three cases, the option of 'juste retour' policy has been investigated.

The last point in the section is the procurement risk analysis specifically carried out for SKA, taking into consideration its technical characteristics compared with similar structure systems (e.g. the GSM communication networks).

3 Procurement experiences from large research projects

Large research projects are usually finalised to build research infrastructures to be used by the international scientific community. For this reason, the owner organisations are set up with the participation of many national scientific agencies and, in the end, funded by different countries. The ways to manage procurement by the different organisations depend on a number of factors, such as:

- The number and dimension of projects in charge to the single organisation;
- The payback of the projects, in terms of industrial returns;
- The legal structure of the organisations;
- The policies set up by the participating countries about the management of economic returns.

In order to consider the problems related to procurement management in large international research projects, this chapter provides a brief overview of the basic procurement models adopted in the construction of the current largest research facilities in the world.

The cases of organisations as ITER, CERN, ESO and ESA, that make strong use of procurement as the tool to deploy its institutional (agency) mission, offer a wide view on the way to manage complexity of procurement procedures in large infrastructures for different scientific goals.

3.1 ITER International Thermonuclear Experimental Reactor

The ITER Organization was formally established through the ITER Agreement that brings together the People's Republic of China, the European Atomic Energy Community, the Republic of India, Japan, the Republic of Korea, the Russian Federation and the United States of America. Further negotiations established the Joint Implementation Agreement detailing the construction, exploitation and decommissioning of ITER, as well as financing, organization and staffing.

The work of the ITER Organization is supervised by its top body, the ITER Council. It has the authority to appoint senior staff, amend regulations, decide on budgeting issues, and allow additional states or organizations to participate in ITER. About 90% the components will be contributed by the Members in-kind, under a procurement sharing arrangement.

The ITER Organization's Procurement and Contract Division is responsible for procuring goods and services which ensure the best value for money for the Organization in a timely and efficient manner. The Procurement and Contract Division is committed to achieving a competitive, fair and transparent procurement process while ensuring quality and reliability.

The juste-retour procurement approach distorted the procurement landscape, and this is being unravelled now – it's not thought an effective buying approach. A formal contractual framework for procurement function is pursued, with basic principles that are not-negotiable.

3.1.1 Contracting Models & Notes Cash procurements

“Standard” process includes expression of interest, call for tenders etc.

Competitive tenders are on a basis of transparency and non-discrimination among the Members of the ITER Organization.

ITER presents annually to the ITER Council a summary of the procurement actions for the coming twenty four months, on the basis of which Members shall solicit expressions of interest from among qualified firms in their respective regions.

Bids are selected on the basis of an evaluation of the technical acceptability, price and the financial status, technical capacity and professional competence and any other criteria announced; the reason for the selection is recorded.

Direct agreements/contracts are possible with approval of the Council. These may be highly tailored.

If the services or supplies to be procured are of an advanced technical or scientific nature, discussions may take place with interested firms before award of the contract in order to reach the best technical solution. In such event, all such tendering firms must be treated equally.

3.1.2 Contracting Models & Notes In-Kind procurements

Complex technology integration is an important factor. There are seven Parties (about 150 Procurement Arrangements for 95 Procurement Packages).

The approach is collaborative, rather than a cold client-supplier relationship, however compliance to an agreed schedule is expected.

A Framework is applied for a common language, agreement and common understanding of rules, and compliance with quality and safety standards.

There are no limitations of nationality in ITER's collaboration with industry. Members of any and all countries are encouraged to contact ITER with potential offers.

ITER advise to plan for supplier inspections, don't trust vendor QA. Important to be your supplier's main customer if you want timely attention.

3.2 CERN Large Hadron Collider (LHC)

CERN is an Intergovernmental Organization, was established in 1953 by the “Convention for the establishment of a European Organization for Nuclear Research”. CERN is not a legal entity under national law but governed by public international law, and benefits from immunity from national jurisdiction and execution. Thus, legal disputes between CERN and its suppliers and contractors are not submitted to national courts but solved via international arbitration.

CERN is entitled to establish its own internal rules necessary for its proper functioning, e.g. the Procurement Rules under which it acquires equipment and services. The most important objectives of the procurement procedures are:

- to ensure that bids fulfil all the necessary technical, financial and delivery requirements;
- to keep overall costs for CERN as low as possible;
- to achieve well balanced industrial return coefficients for all the Member States.

Not less than three competitive tenders must be sought for the purchase of plant, equipment, and services. Invitations to tender to be limited to manufacturers and contractors located within

the territories of CERN member states; and all CERN contracts are divided into two separate classes – supply contracts and service contracts

National interests are protected by a (balancing) system of target return coefficients. For the purposes of adjudication of supply contracts, a Member State is considered to be poorly balanced if its supply contract return coefficient fell below the industrial return targets, and well balanced if it is equal to or greater than that value.

For contracts exceeding 200.000 CHF in value, CERN applies alignment rules which, under certain well-defined conditions, allow bidders offering goods originating in poorly balanced Member States to align prices to that of the lowest bidder and thereby be awarded the contract, provided that the bid with the realigned price complied with all the stipulated requirements.

Contracts shall be awarded on the basis of one of the following:

- Lowest compliant bid: i.e. to the firm whose bid complies with the technical, financial and delivery requirements and is the lowest, subject to the rules aimed at achieving well balanced industrial return coefficients for the Member States;
- Best VfM: to the firm whose bid is the economically most advantageous, but not subject to the rules aimed at achieving well balanced industrial return coefficients for the Member States

In principle, the adjudication on BVFM applies to mainly to Service contracts (as well as certain intangible supplies e.g. exhibitions), and the adjudication shall be based on both price and quality criteria (experience, qualification of personnel, etc.). Adjudication criteria shall be defined prior to sending the call for tenders and bidders shall be informed of these criteria, and the price should account for at least 50% of the total weighting. Double Envelope opening procedure: only technically compliant bids to be evaluated and scored by an evaluation panel

CERN's requirements can be sub-divided into three categories:

- Standard industrial products (off the shelf)
- New high-tech products requiring a conceptual design phase. The manufacturing methodology has to be developed.
- Non-standard products which can be produced with existing manufacturing techniques and/or technologies, but industry has no experience of manufacturing the products.

Different contracts require different tendering and contracting strategies. For example;

- international recognized contract standards for the civil engineering;
- the dipole cold masses were developed at CERN and the contracts based on build-to-print drawings. CERN supplied the main tooling and all major components for the assembly, and
- the QRL contract was based on a functional performance specification where the design and development was performed by the supplier.

Special care is given to prototyping, as it is likely to offer risks whenever new development are needed. There for different cases taken into consideration with specific procurement procedures:

- Case A: CERN needs prototypes for its own development. The specifications for the series may change considerably between the prototype and the series deliveries. Typically, a significant amount of time passes between prototypes and series

deliveries. Bidders are unable to quote prices for the series and the advantages seen by the supplier of prototypes are of limited value.

1. Enquiry for the prototype order
 2. Order(s) for prototypes
 3. Invitation to tender for the series order (not limited to suppliers of prototypes)
 4. Order(s) for series adjudicated to the lowest bidder(s) of the series.
- Case B: no, or very limited, change in the specification between prototypes and series deliveries. The technology is relatively known and bidders can, without uncertainty, calculate series prices before having built the prototype.
 1. Invitation to tender for the series order including prototypes or pre-series.
 2. Order(s) adjudicated to the lowest bidder(s) for the series and the prototypes or pre-series. Orders may be placed as follows:
 3. orders for prototypes (or pre-series) with several firms, without commitment from CERN as regards the series. The series order(s) is/are thereafter signed with the supplier(s) having delivered prototypes to specification and whose total price (for prototypes and series) is/are the lowest, or
 4. orders for prototypes (or pre-series) and series to one or several firms. CERN reserving the right to terminate the order and not proceed with the series, should the prototypes (or pre-series) not fulfil specifications.
 - Case C: qualify technical solutions as well as bidders. I.e. only firms having supplied prototypes which fulfil CERN's requirements will be invited to tender for the series. Some new technology is involved but few, if any, changes of the specification are expected between prototype and series phase. The cost of prototypes is high and CERN cannot order prototypes from more than a very restricted number of suppliers. Bidders are able to estimate series prices with some certainty, but may not be able to take production improvements (the learning curve) into consideration.
 1. Invitation to tender for the series order including prototypes or pre-series. Prices for series to be given as ceiling,
 2. Adjudication based on the lowest price(s) for the series and the prototypes or pre-series.
 3. Orders for prototypes (or pre-series) with several firms, without commitment from CERN as regards the series (series order only as option).
 4. New Invitation to tender for the series order. Only firms having delivered prototypes fulfilling CERN's requirement are invited. It has to be made clear to the bidders that new prices cannot exceed the ceiling prices initially submitted.
 5. Order(s) for series adjudicated to the bidder(s) having submitted the lowest total overall tender(s), i.e. new price for series plus price paid for prototypes (or pre-series).
 - Case D: qualify technical solutions as well as bidders. I.e. only firms having supplied prototypes which fulfil CERN's requirements will be invited to tender for the series. New technology is involved and changes of the specification may occur between prototypes and series. The cost of prototypes is limited. Bidders have difficulties in calculating series prices before having built the prototypes.
 1. Enquiry for the prototype order

2. Orders for prototypes (or pre-series) with several firms. As a principle, all firms having made technically acceptable offers for prototypes should be awarded an order for prototypes (the Purchasing Service to ensure that prices for prototypes do not vary unreasonably between the bidders).
3. New Invitation to tender for the series order. Only firms having delivered prototypes fulfilling CERN's requirement to be contacted.
4. Order(s) for series adjudicated to the bidder(s) having submitted the lowest total overall tender(s), i.e. new price for series plus price paid for prototypes (or pre-series).

As far as Intellectual Property is considered, any supplies and services provided shall include a license to all intellectual property necessary for the free and unlimited use of such supplies and services, including for their repair, modification and replacement by CERN or by any third party designated by CERN, within the scope of CERN's activities. The contractor shall ensure that the use of such intellectual property does not infringe third-party intellectual property rights and shall hold CERN free and harmless from, and indemnify it for any loss or damage, including legal costs, arising from any claim related thereto. Any intellectual property generated in the performance of the contract shall be vested exclusively in CERN and the contractor shall execute all documents and perform all acts required by CERN to ensure such vesting.

Among the lessons learned by CERN, there are a number of advices, such as:

- Acquisition strategies may be changed, and success is dependent on flexibility and innovation in the procurement process;
- Supplier selection is subject to careful consideration. Avoid the "grab and run" attitude, or over-extending capabilities (contract's dimension mismatched with supplier's dimension). Frequent inspections to supplier's premises and verification of the contractor-subcontractor interfaces in the supply chain are required;
- Competition in tenders based on sound evidence about capabilities;
- CERN procurement policy does not encourage investment at prototype stage, as they may not be chosen for production contract;
- Avoid going to production too early. Freeze design for lower risk
- Procure spares during construction phase, not after. This may require operations money during construction phase.

3.3 ESO – European Southern Observatory

ESO, the European Organisation for Astronomical Research in the Southern Hemisphere, is an inter-governmental organisation with 15 Member States, established in 1962. It builds and operates a suite of the world's most advanced ground-based astronomical telescopes. The ESO headquarters are located in Garching, near Munich, Germany. This is the scientific, technical and administrative centre of ESO where technical development programmes are carried out to provide the observatories with the most advanced instruments.

ESO's ruling body is its Council, which delegates day to day responsibility to the Executive under ESO's Director General. Other governing bodies of ESO are: the Finance Committee (FC), the Scientific Technical Committee (STC), the Observing Programmes Committee (OPC) and the Users Committee (UC).

ESO is the pre-eminent intergovernmental science and technology organisation in astronomy. It carries out an ambitious programme focused on the design, construction and operation of powerful ground-based observing facilities for astronomy to enable important scientific discoveries.

ESO is an intergovernmental organisation, with an international status and specific legal and fiscal conditions. ESO contracts are subject to the regulations adopted by ESO by virtue of its international status and subsidiarily to German law.

The procurement is in charge to the Contracts & Procurement Department, whose main responsibility is to perform price inquiries, preliminary inquiries, calls for tenders, assess the offers and tenders received for their commercial adequacy, coordinate the Contracts Award Committee, place and follow-up the purchase orders and contracts in conformity with the ESO policy. The ESO procurement activities are based on the following documents:

- General Conditions of Purchase Orders, Munich, May 2007
- General Conditions Governing Invitations to Tender and Tenders, Munich, May 2007
- General Conditions of ESO Contracts, Munich, December 2009
- Annex 1: General Conditions Governing Invitations to Tender and Tenders, Munich, May 2007
- Annex 2: General Conditions of ESO Contracts, Munich, December 2009

Participation to tenders are restricted to invited bidders. As a general rule invitations to tender shall be issued only to manufacturers or contractors established in the territory of Member States. Invitations to tender are issued in the form of selective invitations. In establishing lists of firms to be approached, ESO may seek advice from the relevant authorities and professional associations of the Member States.

The ESO Procurement and Sales Procedures are established by the ESO Director General: they define the rules which apply for the purchase and sale of all goods and services which the Organization requires to fulfil its purposes. They ensure that the procurement process is transparent, traceable and that it guarantees equal treatment among companies. The Procurement and Sales Procedures respond to general principles set by the ESO Council:

- Contracts shall be awarded to the lowest price tender which complies with the technical, contractual and delivery requirements;
- All efforts shall be made to distribute contracts as fairly as possible among the ESO Member States;
- Single source procurements shall be avoided whenever possible.

Depending on the monetary values of a procurement, ESO issues either a Price Inquiry (<150 kEUR) or a Call for tender (>150 KEUR). As a general rule, a Preliminary Inquiry, whose purpose is to qualify bidders, precedes a Call for tender (CFT).

ESO does not have an obligation to deliver “juste retour” to its Member States. It is nevertheless committed to maximise opportunities for the industries of all ESO Member States to submit tenders for ESO work. In this respect:

- The ESO Industry Liaison Officers (ILOs) are given the opportunity to suggest bidders from their respective Member State for all procurements expected to exceed 150,000 EUR in value;
- Price Inquiries, Preliminary Inquiries and Calls for tender are selective, i.e. they do not take the form of an open invitation through for instance an advertisement on the ESO web page. ESO selects potential bidders from companies within ESO Member States on the basis of its database/ own knowledge, plus the ILO inputs;
- For supplies to be delivered at the ESO headquarters, the award is made on the basis of Ex Works prices, unless transportation prices are out of proportion to the value of the procurement, so as to not disadvantage companies which are geographically far from ESO HQ.

ESO may, from time to time, limit competitive procurements to companies belonging to ESO Member States with a “low geographical return coefficient”. This is done in particular when ESO has a reasonable idea of what constitutes a fair price for that work, so as to ensure that it does not pay a premium by limiting competition.

In general, procurement procedures are carried out with three levels of evaluation:

- Selection of bidders;
- Evaluation of technical proposals;
- Price evaluation.

In order to be invited to submit proposals, suppliers must have characteristics suitable with the dimension and complexity of the supply, such as:

- Dimensions coherent with the effort required by the supply (e.g. manpower, financial data, equipment, etc.);
- Technical experience, ability to manage technologies, etc. related with the supply;
- Management capabilities, ability to plan and manage all the supply process phases;
- Organisation and managerial resources to be dedicated to the project.

If the proposer subject is made of different organisations, it must be made clear the added value of the joint venture, the roles of each party, responsibilities against the contracting organisation.

Except for very low value procurements, the compliance with the technical, managerial, schedule and quality requirements for competitive procurements is evaluated independently from the contractual compliance, as well as from the knowledge of the prices.

For the purpose of evaluating compliance, both technical and contractual, ESO sets:

- “knock-out” criteria which are disclosed in the CFT documentation: failure from a bidder to comply with a single one of these criteria is a cause for elimination;
- Other, non eliminatory criteria, which are also disclosed in the CFT: the assessment of each tender against each such criterion constitutes the basis for establishing or not overall compliance. The weighting factors to perform the consolidation are however not disclosed.

Technical evaluation of proposals generally takes into consideration elements such as:

- Technical compliance with functional and performance requirements;
- Delivery plans ability to meet ESO delivery requirements;
- Coherence with ESO contract conditions;
- Quality and effectiveness of the proposed management organisation.

Generally the score is between 1 and 5, and proposals with even one element scored 3 or lower are rejected.

Contracts are then awarded to the company which has submitted the lowest price among all the compliant tenders.

3.4 ESA - European Space Agency

ESA's activities fall into two categories – 'mandatory' and 'optional'. Programmes carried out under the General Budget and the Science Programme budget are 'mandatory'; they include the Agency's basic activities (studies on future projects, technology research, shared technical investments, information systems and training programmes).

All Member States contribute to these programmes on a scale based on their Gross Domestic Product (GDP). The other programmes, known as 'optional', are only of interest to some Member States, who are free to decide on their level of involvement.

Optional programmes cover areas such as Earth observation, telecommunications, satellite navigation and space transportation. Similarly, the International Space Station and microgravity research are financed by optional contributions.

Contributions to ESA programmes - the Mandatory Programmes - are required from all member countries at GDP rate. These cover the General Studies Programme; the Technology Research Programme; general infrastructure and staff costs; and most importantly the Science Programme. Member States can also choose to subscribe to a range of Optional Programmes.

ESA operates a system of "Juste Retour" which, put simply, is that members of programmes can expect to receive back in industrial contracts an amount roughly equivalent to its contributions, less overheads. ESA determine that the return to countries should be 0.98.

Policies, and procurements over a certain size, are decided by ESA's Industrial Policy Committee (IPC), which meets at least six times a year in Paris.

Any organisation willing to bid for contracts in the ESA programmes must register its details with ESA's industry and electronic ITT database, called EMITS ([link opens in a new window](#)).

ESA runs a unit dedicated to small and medium enterprises. The ESA SME website aims to strengthen communication with SMEs and act as a meeting place, where SMEs and those seeking to work with them can come together. This is made possible by the website's databases which list SMEs and their past achievements.

The ESA procurement process is designed to achieve the best possible trade-off between the objectives of technical excellence, economy and industrial policy as defined in the Convention and in the Contracts Regulations.

It is also implemented so as to give bidders the guarantee that the competitive procedure will be conducted in complete fairness, and that their proposals will be evaluated with the care and impartiality.

The implementation of the procurement procedure is a joint task of technical initiating services and the Contracts Department. A major task of the Contracts Department is to ensure that the rules and procedures, established in order to achieve the objectives stated above, are strictly observed.

The acquisition procedure consists of eight phases:

- a. Planning and Preparatory Phase;
- b. Initiation Phase;
- c. Preparation of the Invitation to Tender I Request for Quotation (ITT / RFQ);

- d. Distribution of ITTs/RFQs;
- e. Tendering Phase, Preparation and Submission of an Offer;
- f. Admission and Evaluation of Offers;
- g. Award and Placing of Contracts;
- h. Debriefing of unsuccessful Bidders.

3.4.1 The Planning and Preparatory Phase

The key person in ESA's procurement procedure, on the technical side, is the initiator who is nominated by his hierarchical superior (Director, Head of Department, Head of Division or Head of Section). He/she has the responsibility, and the budget, to handle one (or more) procurement procedures, supported by other Agency services, in particular the Contracts Department. The latter is in charge of the correspondence between the approved programme and budget allocations, and to establish the plan for the preparation and implementation of all the phases of the acquisition cycle.

For medium and large acquisitions, a Procurement Plan will be delivered, setting out the overall process, identifying the main procurement items which will be the subject of individual Procurement Proposals.

Depending upon the costs and the nature of the acquisition, the procurement proposal must be submitted for approval to the Industrial Policy Committee or to an internal Adjudication Committee for approval.

3.4.2 The Initiation Phase

The Initiator starts a procurement action by transmitting to Contracts Department a 'Request for Contracts Action' (the 'Cor-1'). This request bears the signatures confirming all the necessary prior approvals and is accompanied by the technical/management requirements (technical specifications, work-statement, management plan, written in English and French for competitive actions).

The documents will be prepared by the technical service requiring the acquisition, in co-operation with the Contracts officer. They will constitute the main part of the Invitation to Tender /Request for Quotation(ITT/RFQ).

3.4.3 Preparation of the Invitation to Tender / Request for Quotation (ITT / RFQ)

The Contracts officer, working in close co-operation with the Initiator, will complete the preparation of the ITT documentation by preparing and adding to the technical and management requirements a Cover Letter, Special Conditions of Tender (SCT) and a Draft Contract.

The Cover Letter contains a number of essential features of the ITT/RFQ namely:

- the reference to the programme/activity concerned (item number in the list of ESA intended Invitations to Tender for the year concerned);
- the name of the contracts officer who will be the only point of contact during the whole tendering procedure;

- an outline of the main conditions of the ITT/RFQ: subject and type of procurement, type of contract/price, planning, geographical distribution requirements;
- the formal conditions of submission: tendering date and time of delivery of the tender. Some ITTs/RFQs, and most of them in the field of technology and research, mention an amount which corresponds either to a guideline for the preparation of the price submission, or to an absolute budgetary limit of the funding available. This latter element represents a substantive requirement of the ITT/RFQ, and bidders should never exceed it if they do not want to see their offer rejected ab initio.

The documentation contains a number of very important formal and substantive conditions for the preparation of tenders: general standards of presentation, nature of the commitments and undertakings to be given in the tender, planning and costing requirements (standard forms to be completed and delivered with the offer), conditions relating to intellectual property rights, conditions relating to subcontracts, amendments to documents, communications with ESA during the tendering period, dispatch and receipt conditions. They are not attached to the ITT/RFQ documentation.

The Special Conditions of Tender (SCT) specify and complete the various points of the GCT concerned: number of copies, planning and costing forms selected from the standard package to be used and other specific requirements.

ESA ITTs/RFQs always contain a draft contract (or several in the case of a multi-phase procurement). Bidders are invited to accept the terms, but may comment on them within certain boundaries indicated in the GCTs. This approach enables bidders to know the 'rules of the game' when they prepare their offers, and minimises or avoids the subsequent effort of negotiation of the contract terms.

The evaluation criteria includes:

- Background and experience of the company and staff (general and related to the particular field concerned)
- Understanding of the technical requirements
- Quality of the technical proposal
- Adequacy of the management approach
- Compliance with the tender requirements (in particular costing and planning) and acceptance of contracts conditions.

The TEB also establishes the weighting factors, which determine the relative importance of the various evaluation areas and criteria in the final marking (see below).

This is done not more than 48 hours before receipt of offers, in order to avoid creating an unbalance of emphasis in the preparation of the offers. For the same reason, these weighting factors will be kept in a sealed envelope which will only be opened at the very end of the evaluation, after all the individual markings have been extensively discussed and agreed on.

3.4.4 Distribution of ITTs/RFQs

The complete ITT / RFQ documentation is available on line and accessible to all the EMITS registered users. At the same time a copy is sent to the National Delegations (normally delegates to the Industrial Policy Committee), whose task is, inter alia, to assist the Agency in finding qualified and suitable potential bidders in their State who might not be EMITS registered users.

EMITS is also the only information tool for providing the following type of information:

- All news of relevance for the current ITTs (Change of closing dates, clarifications, convocation to briefing meetings, etc.);
- News announcing the organisation by industry, within major ESA programmes of competition at subcontractor level;
- General news of relevance for industry on policy issues.

ESA Standard contractual texts and applicable documents are

- General Conditions of Tender
- General Clauses and Conditions for ESA contracts
- Specifications for the production of ESA study contract reports
- PSS documents(ESA Procedures, Specifications and standards)

3.4.5 The Tendering Phase: Preparation and Submission of an Offer

In a normal open competitive situation, tenderers are given a minimum of six weeks to prepare their offer, although ESA tries as far as possible, subject to programmatic constraints, to extend this period to at least eight weeks.

3.4.6 Admission and Evaluation of Offers

As already stated, the responsibility for the proper conduct of the tendering and evaluation phase is under the authority of the Tender Evaluation Board, the organisation and role of which have already been described above.

The first formal step to be taken, upon receipt and registration of the offer by the central mail office of the ESA establishment concerned, is for the Tender Opening Board to verify, on the closing date, that the offers received constitute valid offers

3.4.7 Awarding and Placing of Contracts

In conformity with the principles of the Contracts Regulations, the Agency awards its contracts, following competition, to the tenderer(s) offering the best technical quality for an acceptable price.

On completion of the evaluation process described in the previous paragraph, the final TEB recommendation is transmitted to the appropriate authority for making the final decision (see below) i.e. to award one contract, or in some cases to award several contracts, or even (exceptionally) not to place any contract at all.

Depending on the nature and importance of the acquisition, this final decision may be taken either at the level of the Head of the Technical/Project Department concerned and the local Head

of Contracts Division/Unit, or by a specialised internal committee for the awarding of contracts known as the Adjudication Committee or, for major procurements, by the Industrial Policy Committee already mentioned.

3.4.8 Debriefing of unsuccessful Tenderers

The Agency is always prepared to debrief unsuccessful tenderers. Such a debrief has proven useful, especially to newcomers, as it helps to improve the quality of their tendering and to increase their chances of success in subsequent actions. In particular, it may prevent firms from losing evaluation marks through unnecessary and formal non-compliance's.

Normally, unsuccessful tenderers are informed immediately after the decision of awarding a contract has been taken (signature of COA2), but occasionally, when there is doubt as to the success of the final round of negotiation, the Agency prefers to delay the notification. This delay is kept to a minimum to avoid long periods of uncertainty for tenderers. To avoid uncontrolled and/or endless discussion and/or arguments on the content of internal evaluation reports, the Agency do not provide written debriefs on the evaluation of offers.

4 International legal frameworks for Procurement

Procurement models for large projects should be chosen in accordance with the legal entity that will be built to carry out the project. If the legal entity is subject to follow national regulations of the host country, it is reasonable that its specific public procurement processes should be adopted – perhaps with modified by-laws.

In order to guarantee access to global bidders, the regulations should be coherent with recognised trading protocols. For example the World Trade Organisation (WTO) – Government Procurement Agreement allows the access of all companies established in the WTO adhering countries to local tenders.

If the legal entity gains the status of an international research organisation, with exemption from national obligations such as taxes or public rules, the research consortium should be free to choose its own procurement regulations. In this case, the only limitations could come from agreements among the funding agencies about the financial balance between contributions and industrial returns. Different approaches may be found in the large international research institutions, such as the specific procurement regulations set up and used by the large international projects.

Differences between a “business” and “public” approach to procurement come from the number of related interests. Business has the goal to protect and make grow the asset capital supplied by shareholders. Governmental organisations use public money, i.e. money supplied by taxpayers, individuals and business revenues. The general vision for public procurement is to deliver on a timely basis the best value product or service to the customer, while maintaining the public’s trust and fulfilling public policy objectives.

Usually, public procurement rules for countries adhering to WTO follow the general lines set by the WTO-GPA, aimed to assure

- Open access and non-discrimination
- Competition
- Fairness and transparency
- Accountability and equity.

A well-regulated government procurement system, embodying the above principles helps to ensure optimal value for money in public purchasing. In general, it may be considered that public money should be spent by means of public procurement procedures and rules at both a national and regional level.

Local public procurement policies may be increasingly affected by wider agreements and rules. For example, a department covering a particular area of government in a US state will often be subject to oversight from its federal equivalent. Meanwhile, rules agreed by the European Union imply that member countries are not usually allowed to have public procurement rules which favour suppliers in their own country.

The consideration of public procurement principles as established by WTO-GPA and by different countries is useful as a reference for the widely accepted basic principles about procurement for large projects, i.e. projects involving many international interests.

4.1 The WTO Government Procurement Agreement

The World Trade Organisation (WTO) Government Procurement Agreement (GPA) forms the basis for regulating the procurement policies and practice of WTO GPA member countries. It is a "plurilateral" agreement, binding its signatories to comply with principles of non-discrimination and to implement procedural rules to guarantee it in those public procurements covered by individual signatories. Suppliers of each GPA member have the right to compete for other GPA members' government contracts, according to each Party's commitments contained in country specific Appendices of the GPA Annexes. All traditional developed economies (US, Canada, Japan, Korea, Hong Kong China, EU-25) except Australia and New Zealand are Parties to the WTO GPA. Though developing countries are allowed to have a "special and differential treatment – such as promoting the establishment and development of domestic industries - in order to meet their specific development objectives", none of them - including Mainland China and India have yet joined WTO GPA.

The most comprehensive agreement is the 1994 "GPA" (Government Procurement Agreement) multilateral agreement, which is more ambitious than the previous 1979 GATT agreement. The agreement covers, in addition to supplies, works and services. Furthermore, it is not limited to procurement by central state authorities, but also covers contracts awarded by public authorities at regional and local level. The "GPA" also covers the ports, airports, water, electricity and urban transport sectors. The "GPA" opens up government contracts to international bidding.

The "GPA" is built on the general principles of national treatment, non-discrimination and transparency and follows the EU Directives closely. The new agreement obliges each signatory to provide non-discriminatory and transparent procurement procedures. The "GPA" also provides for a system of thresholds which trigger these obligations, a prohibition on discriminatory technical specifications, an obligation to publish tender notices and an obligation to use objective and non-discriminatory criteria to contract selection and award.

The "GPA" also provides for challenge procedures for aggrieved suppliers as well as a dispute settlement mechanism for the parties.

A Summary of the Final Act of the Uruguay Round

- Agreement Establishing the WTO
- General Agreement on Tariffs and Trade and Uruguay Round Protocol GATT 1994
- Agreement on Agriculture
- Agreement on Sanitary and Phytosanitary Measures
- Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries
- Agreement on Technical Barriers to Trade
- Agreement on Trade-Related Investment Measures
- Agreement on Implementation of Article VI (Anti-dumping)
- Agreement on Implementation of Article VII (Customs Valuation)
- Agreement on Preshipment Inspection
- Agreement on Rules of Origin
- Agreement on Import Licensing Procedures

- Agreement on Subsidies and Countervailing Measures
- Agreement on Safeguards
- General Agreement on Trade in Services
- Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods
- Understanding on Rules and Procedures Governing the Settlement of Disputes
- Decision of Achieving Greater Coherence in Global Economic Policy-Making

All big trade blocks negotiated exceptions in the WTO GPA annexes protecting those parts of public procurement markets from international competition where their indigenous supplier base aspires to be world market leader. Pre-commercial R&D services are by definition an exception case in the WTO GPA. Only the US however has translated the WTO R&D exception in combination with the Buy-American restriction into explicit access restrictions to US controlled suppliers in US R&D public procurements. Besides excluding foreign suppliers, a predefined and growing part of the federal government R&D procurement market is set aside for example to Small Business Concerns (SBCs). All procurement contracts below \$100.000 have to be awarded to SBCs and 2,5% of procurement budget is reserved for high-tech innovative R&D carried out by SBCs. The US also makes use of the WTO R&D and defence exceptions to engineer specific lightweight acquisition procedures for R&D exempt from procurement regulations, such as the "Other Transactions" procedure. "Other Transactions" are contracts "other than" standard procurement contracts and financial assistance instruments such as cooperative agreements and grants to fund R&D including prototype projects. Most laws applicable to procurements, cooperative agreements, and grants are not applicable to contracts negotiated under "Other Transactions Authority."

Other WTO GPA members such as EU, although they did not commit R&D services under WTO GPA either, appear not be to so concerned with innovation considerations in public procurement, and award especially the big, cost sensitive ICT R&D contracts on an internationally competitive basis. Mainland China and India are a category on their own.

Developing countries or not, they are fast growing world class R&D magnets. Their restrictions, requiring 50% of R&D in big public procurement contracts to be carried out by domestically controlled suppliers, exerts heavy pressure on EU suppliers, especially in the ICT sector which, due to its sheer pace of innovation and 'electronic portability' of R&D labour, is extremely sensitive to globalisation and delocalisation of R&D. The openness of the Japanese and Korean R&D procurement market is very limited.

4.2 Principles of the European Community

In the EC, the basis of public procurement comes from the Treaty of Rome of the 25th March 1957, which does not lay down any specific rule relating to public procurement (left to the Commission), but it does, however, establish four fundamental principles that apply to public contracts whatever their value:

1. no discrimination on grounds of nationality (Article 6 of EC treaty);
2. free movement of goods and the prohibition of quantitative restrictions on imports and exports and measures having equivalent effect (Articles 30 et seq.);
3. freedom of establishment (Articles 52 et seq.);
4. freedom to provide services (Articles 59 et seq.).

The current regulations come from the Commission, which stated procurement policies by means of 2004/17 and 2004/18 directives, plus an handbook of general guidelines on environmental public procurement. Those policies include non-discrimination between member countries in the procurement process.

Contracts which involve defence or national security are not subject to EC regulations.

The aim of the directives is to coordinate national contract award procedures by introducing a minimum body of common rules for contracts above a given threshold. The common rules are the following:

1. rules defining the type of public purchaser and the scope of contracts subject to the Directives;
2. rules defining the type of contract award procedure which public purchasers should normally use;
3. rules on technical specifications, whereby preference is to be given to Community standards, and discriminatory technical requirements are banned from the contract documents;
4. advertising rules, whereby tender notices must be published in the Official Journal of the European Communities, must comply with specific requirements concerning time-limits and must be drawn up in accordance with pre-established models;
5. common rules on participation, comprising objective criteria for qualitative selection and for the award of contracts (either the lowest price or the most economically advantageous tender, at the contracting authority's choice);
6. obligations about statistical reporting, allowing the Commission to have a practical knowledge concerning the functioning of these rules.

It should be noted that the European Commission is currently consulting on the modernisation of the European Public Procurement Market in order to ensure the most efficient use of public funds, with a view to supporting growth and job creation. This open debate with interested parties will focus on the modernisation of the rules, tools and methods for public procurement to deliver better on these goals. The deadline for responses to the Green Paper is 18 April 2011.

4.3 Principles of the Australian Commonwealth

In Australia, the Finance Minister issues Commonwealth Procurement Guidelines (CPG's) which outline Australian federal procurement requirements. Australia has developed lists of approved suppliers, called common use arrangements (CUA), for the purchase of a wide variety of goods ranging from stationary and supplies to temporary labour. In most regions, governmental agencies are required to use a CUA if it exists for the products being purchased. Larger contracts which require an open bid process are advertised on an electronic system called AusTender.

The CPGs establish the core procurement policy framework and articulate the Government's expectations for all departments and agencies subject to the Financial Management and Accountability Act 1997, and their officials when performing duties in relation to procurement.

- *The Principle of Value for Money*

Value for money is the core principle underpinning Australian Government procurement. In a procurement process this principle requires a comparative analysis of all relevant costs and benefits of each proposal throughout the whole procurement cycle (whole-of-life costing).

- *Encouraging Competition*

Competition is a key element of the Australian Government's procurement policy framework. Effective competition requires non-discrimination in procurement and the use of competitive procurement processes. Specific issues are:

- Non-discrimination

- Small and Medium Enterprises (SMEs)

- Competitive Procurement Processes

- *Efficient, Effective and Ethical Use of Resources*

Efficiency relates to the productivity of the resources used to conduct an activity in order to achieve the maximum value for the resources used. In relation to procurement, it includes the selection of a procurement process that is consistent with Government policy and is the most appropriate to the procurement objective under the prevailing circumstances.

Effectiveness relates to how well outcomes meet objectives. It concerns the immediate characteristics of an agency's outputs, especially in terms of price, quality and quantity, and the degree to which outputs contribute to specified outcomes.

Risk management should be built into agency's procurement processes. The extent of risk management required will vary from following routine procurement processes, to a significant undertaking involving the highest level of planning, analysis and documentation.

Ethics are the moral boundaries or values within which officials work. Ethical behaviour encompasses the concepts of honesty, integrity, probity, diligence, fairness, trust, respect and consistency. Ethical behaviour identifies and avoids conflicts of interests, and does not make improper use of an individual's position.

A procurement conducted in an ethical manner will enable purchasers and potential suppliers to deal with each other on a basis of mutual trust and respect. Adopting an ethical, transparent approach enables business to be conducted fairly, reasonably and with integrity.

A specific aspect of ethical behaviour relevant to procurement is an overarching obligation to treat all participating potential suppliers as equitably as possible. For example, when providing further information to potential suppliers during the course of a procurement, agencies need to ensure that procedures are in place to treat all potential suppliers fairly. The procurement process rules need to be clear, open, well understood and applied equitably to all parties to the process.

- *Accountability and Transparency*

Accountability and transparency encourage the efficient, effective and ethical use of Commonwealth resources. An agency and its officials have the responsibility of ensuring that any procurement process is open and transparent and that decisions are justified. Agencies need to have procedures in place to ensure that procurement processes are conducted soundly and that procurement related actions are documented, defensible and substantiated in accordance with legislation and Government policy. Accountability and transparency are primary considerations throughout the procurement process from the initial identification of need through to the final disposal of any property.

4.4 Principles of the Republic of South Africa

South Africa's General procurement guidelines relate to the so called "five pillars of procurement", i.e. the core principles of behaviour:

- *Value for money*
- **Open and effective competition**
- **Ethics and fair dealing**
- **Accountability and reporting**
- **Equity.**

In these frameworks, the Government is committed to a procurement system which enables the emergence of sustainable small, medium and micro business able to add to the Country's wealth and enhance the social well-being.

4.5 Principles of the United States of America

In the United States, federal procurement policies are determined by legislative action and by recommendations from the Office of Federal Procurement Policy, a subdivision of the Office of Management and Budget, established in 1974. Those policies are published in the Federal Acquisition Regulation (FAR), which is issued jointly by the Department of Defense (DoD), the General Services Administration (GSA) and the National Aeronautics and Space Administration (NASA). The FAR applies not only to direct purchases made by the government, but also to purchases made by federal grant recipients. Periodic audits called contractor procurement system reviews are conducted at federal contractors and grant recipients to insure federal regulatory compliance.

The Federal Acquisition Regulations System consists of the Federal Acquisition Regulation (FAR), which is the primary document, and agency acquisition regulations that implement or supplement the FAR. The FAR System does not include internal agency guidance.

The vision for the Federal Acquisition System is to deliver on a timely basis the best value product or service to the customer, while maintaining the public's trust and fulfilling public policy objectives. Participants in the acquisition process should work together as a team (Acquisition Team) and should be empowered to make decisions within their area of responsibility. The Federal Acquisition System will:

- Satisfy the customer in terms of cost, quality, and timeliness of the delivered product or service by, for example:
 - Maximizing the use of commercial products and services;
 - Using contractors who have a track record of successful past performance or who demonstrate a current superior ability to perform; and
 - Promoting competition;
- Minimize administrative operating costs;
- Conduct business with integrity, fairness, and openness; and
- Fulfil public policy objectives.

Federal procurement generally requires competitive bidding on contracts which exceed a certain monetary threshold. In these instances, a request for proposal (RFP) is issued with specific guidelines, and bids are submitted for review.

Proposal evaluation is an assessment of the proposal and the bidder's ability to perform the prospective contract. The relative strengths, deficiencies, significant weaknesses, and risks supporting proposal evaluation shall be documented in the contract file. Evaluation factors are:

- Cost or price
- Past performance evaluation
- Technical evaluation
- Cost information
- Small business subcontracting evaluation (Solicitations must be structured to give offers from small business concerns the highest rating for the evaluation factors).

Exemptions to this policy can occur in cases where only one source of supply exists, or when one supplier has proven to be far superior in performance to the others.

The Acquisition Team consists of all participants in Government acquisition including not only representatives of the technical, supply, and procurement communities but also the customers they serve, and the contractors who provide the products and services. Government members of the Team must be empowered to make acquisition decisions within their areas of responsibility, including selection, negotiation, and administration of contracts consistent with the Guiding Principles. In particular, the contracting officer must have the authority to the maximum extent practicable and consistent with law, to determine the application of rules, regulations, and policies, on a specific contract.

4.6 Public procurement references

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4.6.3 Australia

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6 ACRONYMS

ALMA	Atacama Large Millimetre Array
BTP	Build to Print
CERN	European Organization for Nuclear Research
COO	Cost of Ownership
COTS	Commercial off the shelf
DFM	Design for Manufacture
EC	European Community
ELT	Extremely Large Telescope
ESO	European Space Observatory
IP	Intellectual Property
IT	Information Technology
ITER	International Thermonuclear Experimental Reactor
ITP	Integrated Product Teams
LHC	Large Hadron Collider
LOFAR	Low Frequency Array
M-IPS	Manager – Industry Participation Strategy
MOU	Memorandum of Understanding
OBS	Output based Specifications
OEM	Original Equipment Manufacturer
PrepSKA	Preparatory SKA
R & D	Research & Development
RFI	Radio Frequency Interference
RFQ	Request for Quotation
RFT	Request for Tender
SKA	Square Kilometre Array
SPDO	SKA Program Development Office
WBS	Work Breakdown Structure
WLC	Whole Life Costs
WP	Work Package
WTO	World Trade Organisation