

ESA

*GROUND SYSTEM ACQUISITION
BEST PRACTICES*

Nestor Peccia

28th March 2007



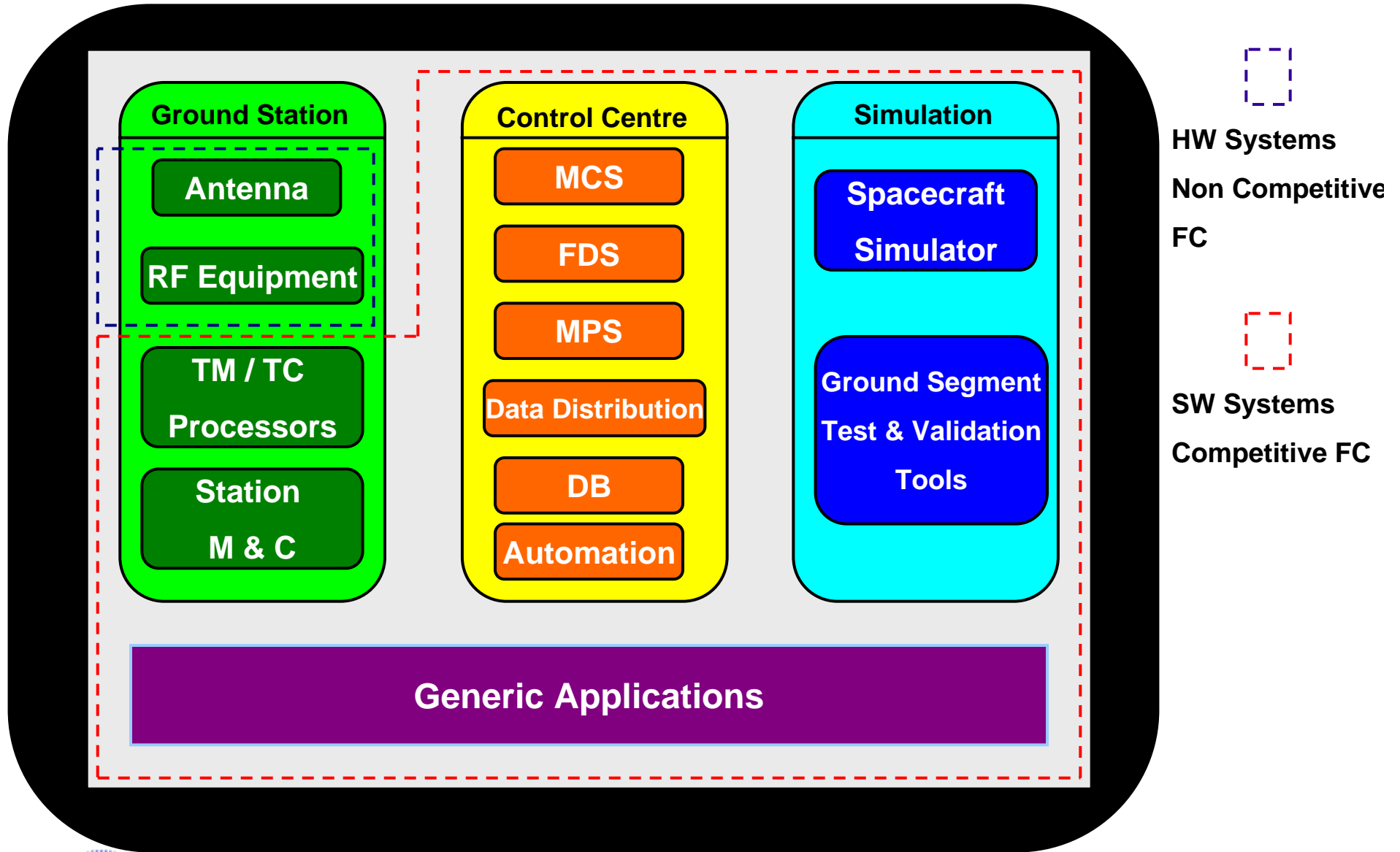
Outline

- **Acquisition Drivers**
- **Ground Segment Context**
- **Contract Types**
- **Why Frame Contracts ? Advantages and Disadvantages**
- **Typical Competitive Frame Contracts**
- **Approach to Competitive Frame Contract**
- **Competitive Frame Contract Management**
- **Additional Frame Contract for Support Activities**

Drivers of Acquisition in ESA

- **Acquisition Process / Policy highly depends from our Organization Strategy**
- **ESA / ESOC has a particular approach due to a constant policy in the last 25 years**
 - **Strictly separation of Space and Ground Segment Procurement**
 - **Ground Segment Procurement is under full ESA / ESOC responsibility**
 - **Single Operations Concept and Methodology for any class of mission / orbit**
 - ⇒ **Earth Observation, Observatory, Deep Space, Navigation, Exploration, Telecommunications**
 - ⇒ **Single, Multi-Mission, Formation Flying, Constellation**
 - **Use of common areas for any class of mission / orbit**
 - **Customization of reusable Infrastructure to meet mission specific needs (DEVELOP ONCE – USE MANY)**
 - ⇒ **"Best-in-Class" European Common Infrastructure**
 - **Data Systems Strategy**
 - ⇒ **Vendor Independence**
 - ⇒ **Full ESA IPR (Operational Software, open source alla “European”)**
 - ⇒ **European Solutions (ESA products are free for any European entity) that are commercialized on a global basis**
 - **All European Space Ground Software Companies present in our Frame Contracts (ca. 2000 staff) are sharing a similar Business Model**
 - **Generic Statement of Work and Special Condition of Tender**

Ground Segment Context



Two Different Type of Contracts

Non Competitive Frame Contracts

Competitive Frame Contracts

Request for Initiation of Contract

ESA Adjudication Committee Approval

ESA Industrial Policy Committee Approval

ITT Issue for Open Competition in Europe

TEB

Frame Contract Award

Consortia

CCNs

Internal
External
9 to 12 months

Request for Initiation of Contract

ESA Adjudication Committee Approval

ESA Industrial Policy Committee Approval

ITT Issue for Open Competition in Europe

TEB

Frame Contract Award

Consortia 1
Consortia 2
Consortia 4
WPs

9 to 12 months

5 to 10 years

Restricted Competition Within FC 5 y



WHY FCs ?

- **FC Competitive**
 - Time for development 2 to 3.5 years. Normal time for tender action / approval cycle is 9 – 15 months
 - ⇒ 20 to 60 % of available time
 - ESA needs a faster response time
 - The Engineering Department runs 30 – 40 different **s/w projects** in parallel
 - ⇒ No FC is a no go from the resource point of view
 - ESA needs a quick and flexible way of implementing all the changes before launches
- **FC Non Competitive**
 - A modular approach to ensure standardization and coherency between all ground station and minimize life cycle costs
 - **Equipment** selected through open competition
 - FC are placed with the selected supplier, which allows ESA to purchase additional equipment to reduce price + necessary sustaining engineering

FC ADVANTAGES

- **Competitive FC**

- **Industrial Policy**

- ⇒ **Specialization of firms**
- ⇒ **Co-operation between firms**
- ⇒ **Improvement of bids**
- ⇒ **Avoids 1 company leading the market**

- **Administrative efficiency**

- ⇒ **Saving in time / cost**

- **Technical / Programmatic**

- ⇒ **Increase competitive environment which leads to innovative / optimized technical solutions**
- ⇒ **Allows fast recovery in case of crisis with one contractor**

- **Commercialization**

- ⇒ **FC companies**
- ⇒ **Have sold MCSs to EUTELSAT, EUMETSAT, INMARSAT, Hispasat, Turksat, Skynet, Arabsat, Terrasar-X, etc.**

- **Non Competitive FC**

- **Minimizes the administrative burden of handling numerous and small procurements (some of them to be placed in short times)**



FC WEAKNESSES

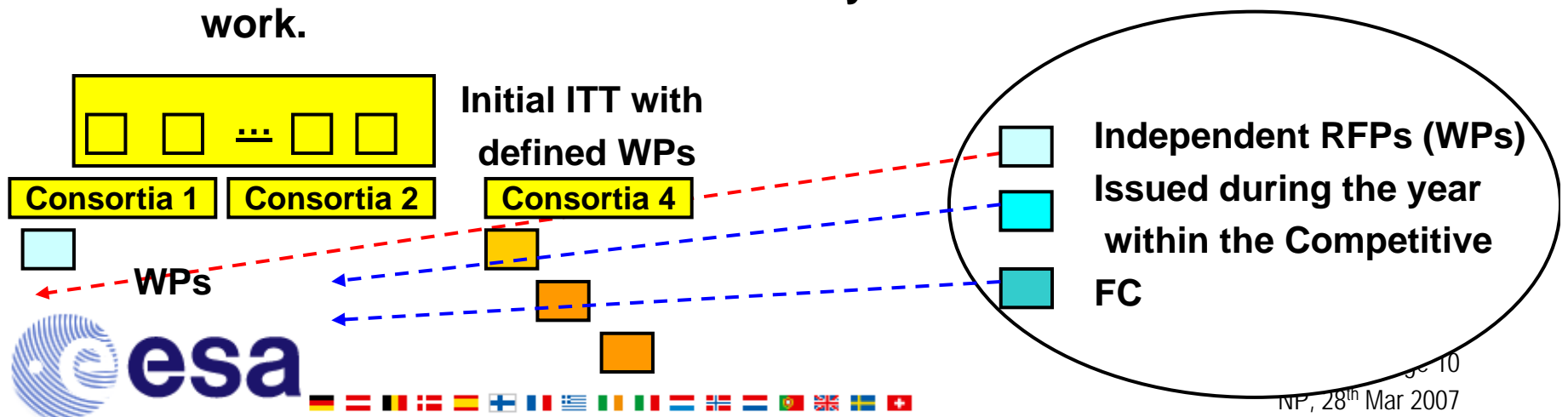
- **Too much reimbursement costs**
- **Too many small WPs resulting in a large number of CCNs**
- **Lack of transparency / control of CCNs**
- **In the Engineering Department**
 - **89% activities are FFP**
 - **11% FUP**
 - **but number of CCNs are not reduced**
- **Degree of duplication is high (Geographical return and National Programme effects)**
- **Very few actors have real critical mass → fragmentation and high demand from institutional market for SMEs**
- **ESA policy created far more suppliers than demand (when considering inclusion of new Member States)**

Typical Competitive Frame Contract

- **Frame Contract is foreseen for 5 years (3 + 2 years)**
- **FC facilitates the placement of contracts**
 - **Placement of contract takes normally 2- 3 months (from RFP to KO).**
- **Objectives**
 - **Contractual Policy: entrust complete developments to a Frame Contractor**
 - **Price Conditions: grant WPs at FFP conditions as much as possible**
 - **Location of work**
 - ⇒ maximise the proportion of work done off-site
 - **Competition**
 - ⇒ sufficient level of competition between FCs to get best industrial offer
 - **Product**
 - ⇒ Product delivery approach

Typical Competitive Frame Contract

- FC awards (at KO) committed offers made on “defined” WPs
- A FC may not get any WPs at KO, but stays (like the others) in the competition for all subsequent WPs
- Any future WP will be awarded to one of the FCs on the basis of a competitive restrictive tender between all FCs (via a RFP - Request For Proposal).
- Each FC teams up normally with other subcontractors
- Price Conditions. WPs are carried out
 - either FFP (Firm Fixed Price)
 - or FUP (Fixed Unit Price)
 - FFP versus FUP is not necessarily linked to off-site or on-site work.



Typical Competitive Frame Contracts

- **Typical Type of contracts within the Engineering Area are:**
 - **Studies:** **FFP**
 - **Infrastructure:**
 - ⇒ **SRS Production :** **FUP**
(if needed due to staff member shortage)
 - ⇒ **AD / DD / TR/ Warranty:** **FFP**
 - ⇒ **Maintenance Routine Phase:** **FFP**
 - **MCS / Simulators**
 - ⇒ **SRS Production :** **FUP**
(if needed due to staff member shortage)
 - ⇒ **AD / DD / TR / Warranty:** **FFP**
 - ⇒ **Pre-Launch / LEOP support:** **FUP**
 - ⇒ **Maintenance Routine Phase:** **FFP**
- **Note: Different combinations are possible**
 - **SRS (FUP) + AD (FUP) + Design & Implementation on FFP basis**
 - **Combined SRS /AD on FFP basis + Design & Implementation on FFP basis**

Our Approach for Competitive FC

- **Design Responsibility**
 - SRS is formal and ruling document for FFP contracts (reference for accepting the delivered system). It is the basis on which the contractor makes his committing offer for AD, DD, TR Phases. Draft ICDs and SVVP / ST are also applicable docs.
 - It is an ESA document and reflects an understanding and agreement on the requirements between the users and the provider.
 - SRS may contain also implementation requirements such as HW platform, baseline infrastructure, COTS to be used in order to achieve harmonisation and synergy between systems.
- **Flexibility:**
 - Each FFP contract includes a flexibility WP (normally 10 – 15 % of the cost) with a fixed number of man hours. Its use is always agreed between contractor and ESA. It covers late and necessary mission changes.
- **Acceptance:**
 - Factory acceptance is conducted at Contractor's premises with his SVVP/ST and his hardware environment
 - Provisional and Final Acceptance are conducted at ESOC with ESA SVVP/ST and ESA hardware environment

Our Approach for Competitive FC

- **Warranty**
 - A WP is required and costed within the FFP contract to cover bug fixing during the system operational validation.
 - Standard approach is a covering period of 6 – 12 months after successful system acceptance, to address only bug fixing.
 - MCS / Simulator Warranty period may overlap with the mission support activities (Pre-Launch, Sims, SOVs, LEOP and Commissioning) covered under an FUP contract, which in general also implements the necessary Change Requests.
 - It is a common practice on our mission specific MCSs that are facing several CRs before Launch to convert the Warranty in a fixed number of man days. This fixed manpower is included within the FUP envelope without losing the Warranty. Bug fixing is first covered by the Warranty man-days and when exhausted via an FUP dedicated WP.
- **On-Site / Off-site**
 - Normally off-site, except ADD on-site meetings, DD user meetings, I&T of deliveries at ESOC, support during certain periods (LIT, SVTs, SOVs), SRBs, Pre-Launch-LEOP Support.

Competitive Frame Contract Management

- **Facilities**

- FC shall use its own SDE
- ESOC SDE shall be used during integration on site
- SDE platform, associated CASE and COTS SW shall be jointly agreed.
- ESA / ESOC has two types of facilities:
 - ⇒ Integration Rooms: for integration / maintenance and DEV LAN connections
 - ⇒ operational support: Dedicated Control Rooms and Main Control Room with OPSLAN connections and restricted access

- **COTS Licenses**

- FC is responsible to procure and install COTS on its SDE
- FC shall include in its price the number of licenses required at ESOC on the target system.
- After acceptance the license rights shall be transferred to ESOC (sometimes preferential ESOC rate is more convenient).



Competitive Frame Contract Management

- **Management**
 - **Contract Management**
 - ⇒ The contractor shall appoint a FC Manager (FCM) to have the responsibility for the provisions of the services under the FC. The FCM shall attend MPM.
 - ⇒ The contractor is responsible for the product quality, but ESOC reserves the right to request technical visibility.
 - ⇒ For each WP, A WP Manager (WPM) shall be nominated, reporting to the FCM.
 - ⇒ WPM is the contact point for all management and technical matters concerning this WP.
 - **Interfaces with ESOC**
 - ⇒ ESA/ESOC FC initiator is the official interface to the FCM., supported by the ESOC Contract Division.
 - ⇒ ESA/ESOC Project Manager is the official interface to the Contractor WPM.
 - ⇒ ESOC PM is seconded for technical matters by a Technical Officer (TO)

Competitive Frame Contract Management

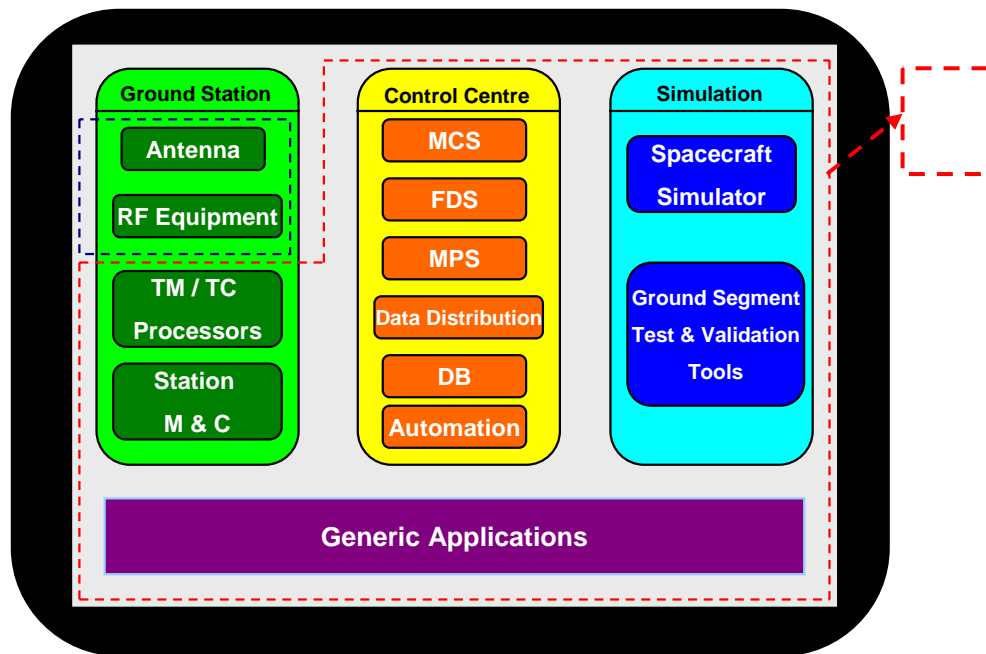
- **Allocation and Replacement of staff under FUP conditions**
 - **Categories**
 - **A: Senior SW engineer capable of leading large projects**
 - **B: Junior SW engineer capable of working autonomously**
 - **C: Programmers capable of working within a team environment**
 - **D: secretaries and documentalists**
 - **Replacement of staff under FUP conditions**
 - **The contractor shall advise ESA with a minimum of 3 months notice**
 - **ESA may interview the proposed staff**
 - **Overlap (4 to 8 weeks) with departing staff is necessary**
 - **This overlap is provided at the contractor's cost**
 - **Length of overlap and amount chargeable to the contractor can be subject to negotiation.**
 - **Grade of replacement subject to negotiation**

Competitive Frame Contract Management

- **Ground Data System Frame Contract (2005 – 2009)**
 - **Consortia 1**
 - ⇒ **Scisys** (UK)
 - ⇒ **GMV** (E)
 - ⇒ **VCS** (D)
 - **Consortia 2**
 - ⇒ **Terma** (DK)
 - ⇒ **Siemens** (A)
 - ⇒ **CS** (F)
 - ⇒ **Vitrociset** (I)
 - ⇒ **Connex** (A)
 - **Consortia 3**
 - ⇒ **Vega** (UK)
 - ⇒ **Critical Software** (P)
 - **Consortia 4**
 - ⇒ **Logica** (UK)
 - ⇒ **Dataspazio** (I)
 - ⇒ **Cap Gemini** (F)
 - ⇒ **Deimos** (E + P)
 - ⇒ **Alia Space** (I)

Competitive Frame Contract Management

- **New Approach to Data Systems Maintenance**



- All Data Systems **User & 1st Line**

Support

- Service Desk,
 - Incident & Problem Management,
 - Emergency fixes
- awarded to 1 Consortia

- **Maintenance** (i.e Bug Fixing) will be tendered via RFP per subsystem or group of subsystems and in a phased approach within the

User Support & Maintenance is based on ITIL Best Practices

Additional Frame Contract

- **Support activities on Ground Data Systems Infrastructure**
- **Two Consortias: Makalumedia (Germany) / Oristeba (P) + Serco (UK/Germany)**
 - Review of architectural design
 - Production and maintenance of technical docs, including test plans
 - Set-up, Maintenance and upgrade of the infrastructure systems test environment, including production of test procedures, test scripts and definition of test data
 - Collaboration with the Technical Officers for the acceptance tests activities of the main systems deliveries and patches (includes FAT –Factory Acceptance Tests- and SAT –System Acceptance Tests-)
 - Support to users of infrastructure systems, including troubleshooting of reported problems
 - Measurement of systems performance
 - Analysis and evaluation of the source code against the applicable coding rules
 - Installation of the delivered software on selected H/W platforms (SUNs and PCs)
 - Integration environment management
 - Configuration Management support
 - Service Desk tool administration
 - Web Portal administration

