STREAMLINING INDUSTRY'S ABILITY TO BE MORE AGILE AND COMPETITIVE IN AN ESA CONTEXT

HOW A NEW APPROACH TO ESA'S MANAGEMENT OF PROCUREMENT RULES COULD ENHANCE INDUSTRY'S PERFORMANCE FOR A STRONG EUROPE IN SPACE

Preamble

In its effort to increase ESA's value for citizens and society and pave the way for a long-term ambition for Europe in space, ESA Agenda 2025[1] outlines five specific priorities with clear targets for 2025. The last one, "*complete the ESA transformation*" is all the more important that **it directly impacts the European space industry's ability to be competitive**. This ability needs to be supported, especially on the export market where the **European space sector is making between 35-50% of its turnover on the open "commercial" market**: it is the only space "power" in the world where this situation exists.

To achieve competitiveness, **balanced risk management, strong supply chain and good financial industry health are pre-requisites** that do not need to be neglected by ESA at a time where proposal costs are eroding a good portion of the possible Gross Margin of industry (that is becoming thinner and thinner in several programmes).

Accelerating time to contract, reducing the number of procurement constraints that make proposal preparation extremely expensive will allow industry to offer high-quality and innovative products in a cost-effective manner, while putting less pressure on an **already-low profitability in an ESA context**. The digitalisation of ESA processes, at all stages of the procurement process, will be a key support to this endeavour.

Profit is used for self-investment and innovation, which paves the way for the future of industry. Hence, the European space industry sees profitability as a prerequisite to sustainability and an important contributor to one of the major objectives of ESA, which is to increase the competitiveness of the European space industry on the international market. In a context where little or no profit will force industry to reduce investments levels in a highly demanding business, cause some companies to go bankrupt with very significant impact on programmes, or prevent new actors to enrich the European space industry due to lack of attractiveness, **streamlining industry's ability to be more agile and cost-effective in an ESA context is an urgent necessity**.

Against the soaring of the costs of proposals in an inflationary context that are further eating low profitability margins, **the European space industry wishes to share its eight steps of an agile and cost-effective ESA procurement process.**

[1] https://esamultimedia.esa.int/docs/ESA_Agenda_2025_final.pdf

The eight steps of an agile and cost-effective ESA procurement process

1. Simplification of tender

The European space industry considers that **ESA procurement process could be further simplified and streamlined without impacting its added value**, while at the same time allowing for **proactiveness and diversity on the industry side**.

Better scheduling in the publication of the invitations to tender

Most invitations to tender (ITTs) are often announced in one way or another (publication as intended, specific work plans). Yet, frequent delays in their publications, inconvenient release dates (e.g., during Christmas time) or quasi simultaneous publications of multiple ITTs causes **important work peaks at industrial level**.

- The European space industry would appreciate a **better appreciation of its needs and time constraints in the scheduling of the publication of the ITTs**. Moreover, it is proposed to receive **clarifications on the ITTs in less than one week to speed up the process**, as the industry only has 4-6 weeks to work on proposals.

Earlier and better-shared insight on opportunities and procurements rules

There is a need for **earlier and better-shared insight on opportunities and procurement rules** for fairer and more competitive bids across geographies. This could be done through:

- **Systematic and timely distribution of information & documents relevant to the tender** (i.e., programmatic decisions, mapping, specific constraints in terms of industrial shares, decision steps) equally available to all ESA MS companies, to facilitate preparation of the bid;
    - In particular, **Procurement Proposal and Contract proposal documents at IPC should be subject of a timely debrief to industry**, with the intention to let bidder know what will be at stake along with information regarding the timeframe of N-1 and below procurements.
- Systemic, well anticipated and more interactive **industry days that allow exchange between various stakeholders**. As a best in class example, for LEO-PNT IOD, ESA organised a physical industry day that allowed many interactions between industry and ESA. Such transparency and discussions, several weeks before publication, allowed solid and balanced consortia to be built.

Better size the documentation

There is the need to **better size the documentation** (including ESA Procedures Specifications and Standards - PSS) requested by ESA, versus the added-value it represents at the very first stages of the ITT (and for smaller contracts).

- Checking the risks and benefits of such an approach could be implemented on pilot ITTs before being enlarged.

The issue of co-funding for phase A/B and further

Several large ITTs are requiring **co-funding either for phase A/B or even further** (e.g., Euralio):

- Early phases are dedicated to **concept maturation and derisking**. In this regard, these phases shall be **fully funded by ESA**;
- However, when the business case is consolidated, the **principle of PPP** (private public partnership) can be implemented
    - Industry could therefore accept upfront investments in early phases studies as long as those studies are addressing **topics that could credibly lead to viable business cases** and that sufficient time is given to properly analyse said business cases.

A better management of reviews

Regarding reviews, the ones related to intermediate acceptances (Preliminary Design Review and Critical Design Review) are held in colocation and can issue hundreds of "review item discrepancies" (RIDs) upon reviewer identification of non-compliances. This process generates a **tremendous amount of administrative work** and is often a source of delay. While certain comments are fully relevant to the stage and require immediate attention, others could be managed differently.

- The European space industry therefore proposes a modified concept of **streamlining the RIDS per theme** so that it can proceed through themed gates toward the final acceptance/blessing:
    - Reviews are currently flowed down to subcontractor and down the work breakdown structure to minor physical items. Based on the level of reuse or Technology Readiness Level (TRL), and agreed during early dialog or at kick off, it **could be decided how to lighten the process and define the level of flowing down of the process**;
    - A possible **delegation to industry** according to the level of maturity of the project/product could be granted:
        - Project management & Product Assurance with the possibility to discriminate according to the mission type;
        - Tailor review process and documentation effort according to TRL or Mission critical versus Commodity SubSystem with the possibility of more delegation to industry;
        - Fostering of documentation reuse among the programmes.

2. Flexible handling of the risks across complex programmes

For complex programmes (i.e., Full Consortium Offer procurement scheme), the **contract is awarded while specifications are often not mature and very risky**. As a result, the Prime contractor commits on the full perimeter and some provisions remain at ESA level to provision for some risks identified and put out of Management Reserve scheme.

An extension of the Class C mechanism

Therefore, **the Class C mechanism**[2] **should be extended to all complex programmes and not only for Copernicus and Earth Observation Programmes**, and must be made **more dynamic**:

- The mechanism could define a **more pro-active risk monitoring** from first phase to subsequent phases and encompass a **formal reassessment of the risk** through a **"checkpoint"** (at Preliminary Design Review and Critical Design Review) aiming at doing a **new status of the risk register**, to **secure**

[2] *i.e., ESA/Industry risk sharing mechanism excluding contractually a set of pre-identified techno or manufacturing risks which if occurred, consequences thereof will be financed by ESA.*

depletion of Management Reserve in line with occurrence of the risk and to **secure the view of the expenses at completion** on that updated basis.

A shared-risk approach for lower-than-6 TRL technologies

The need for innovation is often a common denominator in ESA programmes. This **innovation often relies on immature technologies** (at the time of contract) that **generate maturation risks** that are taken on by the Prime contractor. Therefore, regarding shared risks for low TRL/MRL[3] identified in the offer:

- Therefore, regarding risks for low TRL/MRL[4] identified in the offer, a **shared risk approach** (using the principles of Class C Contract Change Notices (CCN)) **for technologies whose TRL is lower than 6 is proposed**.

Identification and negotiation of risks eligible to risk sharing/coverage

Since the trend for industrialisation (manufacturing in series for e.g., constellation, Copernicus evolution) is promoted by ESA, the **manufacturing risk** (in addition to the cost it brings) is **now also at stake** (i.e., set up, upgrade of manufacturing chain, associated processes). This type of risks **becomes core in particular at equipment supplier level**:

- Therefore, **TRL & MRL 6 and lower-related risks eligible to risk sharing/coverage** (Class C CCN or other schemes) could be **identified in the offer and negotiated with ESA** to cover impacts for the whole industrial consortium.

Improve and complete the ECSS system

Besides, to prepare the revolution of mass production in space business, there is a need now to **improve and complete the ECSS system** to address the necessity of **implementing and optimising ground facilities and processes** for manufacturing, testing and conducting associated maintenance operations for series production. This would contribute to **optimising cost and delays while maintaining conformity to mission specification and quality level** of all the products.

Mitigating the effects of unpredictable crises

Finally, in the past couple of years, industry had to face several unpredictable crises (i.e., Covid-19, hyper-inflation). Fortunately, ESA demonstrated its willingness to support industry in these circumstances that ultimately further impacted its already-low profitability. However, the current organisation/processes within ESA does not give the Agency a proper tool to address unpredictable risks. Making a feedback on the past crisis may give some insights to find efficient approaches to address these issues that do not only rely on programmes "affordable" funding. This **could take inspiration from the principles of Hardship** recorded in the ESA statutory rules, associated with an **emergency process to be implemented in case of occurrence**.

[3] *Manufacturing Readiness Levels (MRL): are used to assess the maturity of a given technology, system, subsystem, or component from a manufacturing perspective. Technology Readiness Level (TRL): are used to assess the maturity of individual technology*

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In the same spirit, ESA could very well implement a **simplified, faster and more agile procurement process for low risk items** to run in parallel, granting primes more autonomy (with full traceability granted to ESA) for the benefit of faster programmatic procurement. Such a procurement could have the following characteristics:

- Creation in ESA star of a specific module for simplified contracting;
- This would represent a maximum % of the contract (up to 10% or 20M€);
- It would go up to TRL 6.

3. Improve supply chain resilience

Space supply chain performance is critical to the success and profitability of space projects: delays in delivery, low performances and quality issues can cause increase of Cost at Completion and schedule drifts.

More specifically, two main aspects can be highlighted:

- Technological assets, that are a prerequisite to MRL increase, are recognised and supported by early Technology Readiness Level such as ESA Technology Development Element, General Support Technology Programme, Technology Development Activities etc.;
- **Manufacturing and Assembly are less mastered**, creating issues during B2/C/D phases, with limited support on Manufacturing Readiness Level raising.

As the European space industry suggests to use the MRL as a key scale to implement ESA programmes (the MRL and TRL of each supplier should be assessed regularly and in particular before B2/C/D phases, and such assessment must begin at the earliest stages of technology), there is a **strong need to increase supplier's industrial maturity**. This is **even truer for the newcomers in the space business**, in order to **raise their Manufacturing Readiness Level** before the B2/C/D phases.

Initial attempts to increase supplier's industrial maturity are being conducted in the GSTP (i.e., Element 2 "Make"). However, its **implementation process is still rather slow**, **limited** (e.g., no enterprise resource planning or ISO 9001[5] support) and **bureaucratic** (e.g., dependency on national letter of supports whose process is different in each Member State).

Therefore, a possible approach to better achieve this objective will require **additional funding** and is affecting suppliers at three levels:

- **Processes**:
  - ESA and Large System Integrators (LSIs) could **support the suppliers to assess their current MRL** and **identify improvements actions/activities** that need to be done to raise MRL (e.g., implementation of an enterprise resource planning, implementation of Quality & Supply Chain Metrics, process de-risking).
- **Tools**:
  - Dedicated funding is necessary to **support suppliers to invest in tools & means** (e.g., digitalisation, modernisation of their manufacturing infrastructure) that will increase their industrial maturity (such investments are usually difficult for suppliers, in particular SMEs or newcomers to space business, because their ROI is negative).
- **People**:
  - A dedicated Task Force could be created, funded by ESA, with relevant expertise from ESA and from LSIs. This Task Force could rapidly **act to support suppliers to further share best**

[5] https://www.iso.org/iso-9001-quality-management.html

practices to space business standards (e.g., ECSS standards such as quality, testing and verification and production) with their workforce.

4. ESA sub-contractor's selection rules

The ESA Best Practices document is a well-established set of principles and framework with recognised value for ESA's procurement activities and industry involvement. More than 10 years after its establishment in 2012, and at times when space business undergoes a continuous and visible evolution, it is a good moment to take stock on some of its principles and propose improvements.

The following set of actions have been identified as potential areas of adaptation in the frame of ESA Transformation exercice:

Suppliers generic files

It is proposed to **create generic documents per supplier** that would be, from an administrative point of view, approved by ESA (yearly approval at the time of the nominal yearly update of registration[6]).

Administrative parts of the offer submitted to ESA will rely on those files and provide only the mission-specific administrative elements in the offer (e.g., management plan, procurement management plan, project control management plan, generic background of the company).

Suppliers documentation in two steps

Regarding supplier's documentation, a **two-step-approach is recommended for Full Consortium Offer procurement schemes**:

- Step 1: Limit the suppliers documents delivery for what regards administrative requests;
- Step 2: Only when the prime is selected after negotiation, the detailed administrative elements should be asked by ESA.

Clarification of the tole of the Tender Opening Board

The Tender Opening Board must limit itself to **enabling people to understand if all documentation is in place**, if it is **available** and the package is **comprehensive.**

Digitalisation of the ESA documentation

Enhancing the user experience can be achieved with the **digitalisation of the ESA documentation.**

- A **significant number of documents is proceeded** during the procurement process (i.e., ITT extract, Cover letter, tailored GCC, pre-TEB MoM, draft contract, specification, SoCs, evaluation sheet, TEB report, endorsement letter) which proves to be extremely **time consuming**.
    - In most of the documents (except the specification and the member evaluation), there is **about 90% of the data which could be digitalised on ESA star**. When ESA releases the requirements to the Prime contractor, it has to flow down these requirements to the supply

[6] *Yearly documents approval by ESA works since to make business with ESA it is mandatory to proceed with a formal registration & a yearly registration of this generic document.*

chain. **If these requirements would be digitalised it could help ease the flow down all through the contractual chain (and avoid copy/paste issues)**.

Therefore, **digitalisation of the ESA documentation to generate the flow down to the supply chain is a must to streamline and operationalise the process**. To do so, ESA star capabilities must be extended with this digitalisation approach in mind, while **ensuring cybersecurity** (at product and factory levels).

Suppliers, especially less experienced and small companies, **expect intuitive**, **streamlined** and **simple to use** information. An **online version** of the "Best Practices for the Selection of Subcontractors by Prime Contractors in the frame of ESA's Major Procurements" with web links redirecting users to relevant documents or other websites must be created.

With the co-financing of the Programme with a third party (e.g., EU, Eumetsat), the ITT may embed specific requirement with respect to the common ESA standard. **Digitalisation would allow to provide traceability on the deviation, modification, derogation to the standard rules** (e.g., traceability against the General Contract Clauses, leading to an acceleration of the signature of contractual documents by industry by tailoring the review and approval on the deviations/modifications from the General Contract Clauses).

Update of current Best Practices objectives

With the new Profit Policy underlining the ESA objective towards industrial competitiveness, ESA is already going beyond "*ensuring fairness of competition*" mentioned in its Best Practices.

It could therefore make sense to **complement the purpose definition of ESA Best Practices to also include the objective of "*enhancing industrial competitiveness and industrial viability*"**. Supporting the supply chain with investments (and orders) that will increase its competitiveness is key. Besides, this is aligned with the overall ambition of ESA commercialisation.

Confirming decision-making for best practices

Sometimes the last Best Practices item for an ESA mission requires subcontracting options entailing higher programmatic risk, as eligible subcontractors lack industrial maturity. For such cases, **more visibility on decision-making** would be welcome including **measures aiming to maintain programmatic risk**.

When selecting the supplier under Best Practices, the criteria or the decision shall take into account, beyond the relevancy of the Candidate/Suppliers, the **adequate recovery measures aiming to maintain the overall Programmatic risk**. **Visibility to industry** during the overall process shall also be granted.

5. Access to Management reserve

As part of the industrial cost within the cost at completion under a given project/programme, each space project includes a **Management Reserve**. This is an ESA specific risk management tool in the form of a financial provision to cover any possible risk under the responsibility of the contractor in the performance of a project allowing the contractor to provide a fixed price commitment (FPV, Ceiling Price or FFP).

The new ESA Profit Policy puts forward a way to introduce varying profit levels depending on the specifics risk linked to the contract type and complexity of the activities, as well as a way to handle supply chain considerations through a further improvement of contractual risk sharing provisions.

The ESA Profit Policy called for an updated risk sharing approach based on a Management Reserve that would act as financial provision to cover different project risks. Two key elements are defined:

- A Baseline Management Reserve (BMR) to cover classical development risks sized on the available Risk Register;
- A Subcontractor Management Reserve (SMR) to cover the risk of subcontractors not affiliated to the prime contractor as long as such risks are not caused by the said Prime.

The ESA Profit Policy defines the SMR as a replenishable reserve. However, **the availability and access conditions of the Subcontractors Management Reserve (SMR) - especially its ability to be replenished - are currently not clear and need to be clarified before ITT release**. If there is today limited experience with respect to this model, some elements are missing to understand:

- How the SMR will be established?
- How and up to which level the SMR can be replenished?
- If an agreement about the size of the SMR can be reached at the moment of contract signature?
- How could ESA communicate the eligibility conditions of SMR before the start of a mission?

In this regard, the **European space industry recommends that the size and conditions to access the SMR are clarified before the activities kick off** (and that the MR/SMR approach is not based on programmes affordability).

6. Payment plans

Without any doubt, **finally receiving payments for the contracted activity is of essence for all companies in the contractual chain**. Two important aspects are discussed here:

- First, **ensuring a well-balanced cash-flow** not only at the initial project set-up but also maintaining it **throughout the life cycle of the project** (e.g., considering cash-flow aspects when implementing changes);
- Second, **reducing the effort necessary on all sides for handling of the complete payment/invoicing process** (including via digitalisation which could alleviate burdens). Here, the price variation contracts are of special concern as in the current financial situation they will become more regular.

Therefore, the European space industry proposes the following recommendations:

Ensure a balanced cash-flow

- **Enlarge intermediate payments** beside the down payment to better match with cash out forecasted;
- **Establish the principle of split of milestones** in certain conditions.

Improved fairness of the payment plan

Some situations may lead to an unbalanced situation with respect to cash flows (e.g., overall situation after CCN). Therefore, a **mechanism to improve the fairness of the payment plan** could be envisaged to correct such unbalanced situation

Long lead items (LLI) affecting programme schedule and cost fluctuation

Whereas project schedule is endangered by the lead time of external supplies (e.g., EEE components), **a programme or a single contract should be allowed to implement an advance procurement approach for long lead items**.

The contract might be given contractual and financial coverage for LLI purchase either via Provisional Authorisation to Proceed (PATP) prior to contract signature, or through a front-loaded payment plan for contracts already in place. In addition, to schedule protection, the proposed measure could also contribute to reduce project risk again the fluctuation of supplies' cost.

Payments by primes to subcontractors

It would **alleviate the administrative burden** (e.g., validation milestones, simplification of documents) to facilitate the payment to subcontractors in due time.

When a programme requires procurement of components and external services (workshops) with high lead time that may affect the program schedule, **specific measures are needed to give the contractor contractual and financial coverage allowing to timely issue the corresponding purchase order**.

Inflation compensation and how to simplify the compensation computation/payment

The way escalation is computed is already relatively smooth (one per year/ not one per milestone). However, there is a **need to continue to be proactive as it creates a significant additional burden**. Actions of simplification could include:

- Continue to work on a **simplified/accessible/unified database of escalation indices** with recognised indices;
- **Reducing the number of indices**;
- **Simplifying the control of the ESA computation** (digital access to the parameters);
- Allowing the **computation of the subcontractor part using an ESA interface or use the ESA direct payment to the subcontractors** (the combination of indirect payment with the Fixed Price with Variation (FPV) scheme leads to a very complex escalation formula all through the contractual chain)
- Discussion around **direct payment as an alternative solution for timely payment** and **easier mechanism to handle price variation**:
    - This would avoid that lower-tier contractor are not receiving payments due to “financial issues” of upper level even when all contractual milestone requirements are fulfilled;
    - As FPV will become more common, the complete escalation part (preliminary and final) can be separated from the actual milestone and its approval process. After approved milestone achievement, the escalation invoices (preliminary and final) is handled directly between ESA and the (sub) contractor without involvement of the intermediate contractual chain. This would offload those companies, that don’t add real value to this process.
- **Exchange rate where some non-Euro Countries in particular may suffer from hedging issues**
    - A **compensation mechanism could be set to offset this risk**: on a yearly basis and referring to the Milestone payment plan, the price is reviewed according to the variation of exchange rate. The resulting delta (+ or –) is compensated by ESA.

7. Speeding and simplifying time to contract

More and more companies are fully digital and manage their contracting process accordingly. This limits administrative efforts and allows for a focus on the key elements. In recent years, ESA has also taken good steps to simplify contracts and digitalise the contracting process for certain funding lines.

The European space industry fully supports this trend and encourages further enhanced approaches as a standard across all ESA programmes. As part of such digitalisation, the European space industry sees the following elements as key:

- **Selection of standard modules, requirements sets and contract clauses that are fit to product**:
  - They need to only cover what is needed and applicable in the particular project.
- **Application of (legal) design principles**:
  - Conditions need to be presented in a way that they are clear and can be understood by all parties in the project. They should also be fit for flow down in the contractual chain.
- **Transparent processes with set time limits for decision and approval gates communicated ;**
- **People involved to be invested in clear communication and respecting response times**.

With ESA as a driving force, the negotiation and processing time - and hence the time to contract - throughout the contractual chain can be accelerated.

8. ESA Costing Software

To do business with companies, ESA has developed a procedure and an associated ESA Costing Software tool (ECOS) for aggregating and calculating the price elements of the financial proposals through the entire contractual chain. The use of ECOS[7] is mandatory for B2CD offers, all through the contractual chain. By using the ESA Costing Software, the price proposal work is partitioned through the industrial structure, and the proposals are generated and integrated to higher levels electronically.

Whereas ESA proposed a user manual and video training courses with the purpose to reach an optimal use of ECOS, it is proposed that **ESA resumes the annual training that will allow all companies to master the online tool**.

Besides, a **return of experience from users** (ESA Alert System and industry) could be run. The **tool and process could very much be simplified** (e.g., only load PSS in ECOS instead of the current situation where the costs must be tracked using nomenclatures).

In the same spirit, it is proposed to **develop a tool for aggregating and calculating the price elements of the programme** (execution of the contract).

[7] *The software package is distributed free of charge to companies doing business with ESA.*

Annex 1 – Eurospace members status

Company	Country
Aerospacelab	Belgium
Air Liquide Advanced Technologies	France
Air Liquide France Industry	France
Airbus Defence & Space Gmbh	Germany
Airbus Defence & Space Ltd	United Kingdom
Airbus Defence & Space Netherlands B.V.	Netherlands
Airbus Defence & Space Sas	France
Airbus Defence & Space Sau	Spain
ALTEC	Italy
ALTER Technology-TÜV Nord France	France
ALTER Technology-TÜV Nord S.A.U.	Spain
ALTER Technology-TÜV Nord UK	United Kingdom
AntwerpSpace N.V.	Belgium
APCO technologies	Switzerland
Arianegroup Gmbh	Germany
Arianegroup Sas	France
Arianespace	France
Avio Spa	Italy
Azur Space	Germany
Beyond Gravity AB	Sweden
Beyond Gravity Austria	Austria
Beyond Gravity Swiss	Switzerland
CGI France SAS	France
CGI Deutschland B.V & Co. KG	Germany
ClearSpace	Switzerland
CS Gmbh	Germany
CS GROUP - France	France
CS Romania	Romania
Dassault Aviation	France
Deimos Engenharia	Portugal
Deimos Space	Spain
Deimos Space Romania	Romania
Deimos Space UK	United Kingdom
eGEOS	Italy
Elecnor Infrastrutture e Aerospaziale	Italy
Enpulsion	Austria
GMV Aerospace & Defense S.A.U.	Spain
GMV GmbH	Germany
GMV Innovating Solutions B.V	Netherlands
GMV Innovating Solutions S.R.L. (B)	Belgium
GMV Innovating Solutions S.R.L. (RO)	Romania

GMV Innovating Solutions SARL	France
GMV Innovating Solutions Sp.z o.o.	Poland
GMV NSL Limited	United Kingdom
GMV Soluciones Globales Internet S.A.U.	Spain
GMVIS Skysoft S.A.	Portugal
Indra Sistemas SA	Spain
Kongsberg Defence & Aerospace	Norway
Loft Orbital	France
MOLTEK	Netherlands
MT Aerospace AG	Germany
Neuraspace	Portugal
OHB ITALIA	Italy
OHB Systems AG	Germany
Pangea Aerospace	Spain
REOSC	France
RHEA Group	Belgium
SABCA	Belgium
Safran Aero Boosters	Belgium
Safran Aircraft Engines	France
Safran Data Systems	France
Safran Electrical & Power	France
Safran Electronics & Defense	France
Safran Engineering Services	France
Safran Filtration Systems	France
SENER Ingeniería y Sistemas, S.A.	Spain
SITAEL S.p.A.	Italy
SpaceAble	France
ST Engineering iDirect Europe CY NV	Belgium
Telespazio Belgium SRL	Belgium
Telespazio Germany Gmbh	Germany
Telespazio Italy Spa	Italy
Terma A/S	Denmark
TESAT Spacecom GmbH&Co. KG	Germany
Thales Alenia Space Belgium	Belgium
Thales Alenia Space France	France
Thales Alenia Space Germany	Germany
Thales Alenia Space Italy	Italy
Thales Alenia Space Luxembourg	Luxembourg
Thales Alenia Space Poland	Poland
Thales Alenia Space Spain	Spain
Thales Alenia Space Switzerland	Switzerland
TNO	Netherlands
TTTech Computertechnik GmbH	Austria