

# Items and services for an Ariane launch

## Annex 3

Within the framework of the launch contract ARIANESPACE supplies standard items and conduct standard services.

In addition, Arianespace proposes a tailored service: the General Range Service (G.R.S.) to suit the needs of satellite operations in French Guiana. Optional items and services to cover specific customer's requirements are available on request.

These services are listed in the Technical Annexes of the Arianespace contract, they cover typically:

### 1. Hardware Supply and Services

ARIANESPACE shall supply the Hardware and Software to carry out the Mission, and provide services to the CUSTOMER as listed hereunder.

#### 1.1. Launch Service Management

##### **General Contract Management:**

Contract amendments, payments, planning, configuration control, documentation, reviews, meetings, etc ;...

##### **Launch Vehicle Production:**

Testing, acceptance, and quality aspects, etc...

##### **Mission Analyses**

##### **Launch Base Operations**

##### **Ground and Flight Safety:**

Interface with CSG for Safety Submissions.

#### 1.2. Hardware Supply

##### **Launch Vehicle Hardware:**

Including strap-on boosters, as applicable.

##### **Launch Vehicle Propellants**

##### **One Flight Program**

##### **Spacecraft Adaptor:**

Including the corresponding separation system.

##### **Umbilical Interface Connectors**

##### **Fairing or Dual Launch Support Structure**

##### **2 Standard Access Doors:**

At authorised locations, for access to the encapsulated Spacecraft.

##### **2 Check-Out Terminal Equipment [COTE] Racks:**

Compatible with the ARIANE 5 launch table.

##### **1 Mission Logo:**

Design to be supplied at L-6 by CUSTOMER.

#### 1.3. Mission Analysis

##### **Trajectory Study**

##### **Separation Analysis (Clearance, Kinematics, Collision)**

##### **Orbit Characteristics & Dispersion**

##### **Dynamic Coupled Load Analysis**

##### **Thermal Analysis**

##### **Radiofrequency Compatibility Analyses**

##### **Support for S/C Design Reviews**

##### **S/C Orbit & attitude data from L/V telemetry (immediately before S/C separation)**

##### **Launch Evaluation Report [DEL]**

#### 1.4 Operations

##### **Launch Vehicle Operations:**

All operations without S/C

##### **Combined Operations [POC]:**

S/C – Launch Vehicle Integration

##### **Countdown Execution:**

Up to Lift-Off

## 2. General Range Support [GRS]

The General range Support provides the CUSTOMER, on a lump sum basis, with a number of standard services and standard quantities of fluids ([see list hereafter](#)).

Request(s) for additional services and/or supply of additional fluids exceeding the scope of the GRS can be accommodated, subject to negotiation between ARIANESPACE and the CUSTOMER.

### 2.1. Transport Services

#### Customer Personnel & Luggage:

Transport from and to Rochambeau Airport and Kourou at arrival departure, as necessary.

#### Spacecraft & Equipment:

Subject to advanced notice and performed nominally within normal CSG working hours.

#### Transport - :

Availability outside normal working hours, Saturdays, Sundays and Public Holidays subject to advance notice and negotiations.

From Cayenne to CSG and return.

Various Freight Categories (standard, hazardous, fragile, oversized loads, low speed drive, etc...).

Limited to 24 10ft pallets (or equivalent) in 2 batches (plane or vessel).

#### Spacecraft Inter-Site Transport :

All CSG Inter-Site Transports of the Spacecraft either inside the S/C container, the ARIANE Payload Container [CCU], or encapsulated inside the Launch Vehicle Composite.

#### Inter-Site Equipment Transport :

All CSG Inter-Site Transports of CUSTOMER Equipment.

#### Logistics Support:

Support for Shipment and Customs procedures for the Spacecraft and its associated equipment, and for personal luggage and equipment transported as accompanied luggage.

**The following is included in the Transport Service:**

- Coordination of Loading/Unloading activities.

- Transport from Rochambeau Airport and/or Degrad-des-Cannes harbour to CSG.
- Return to Airport/Harbour 3 working days after Launch.
- Depalletisation of Spacecraft Support Equipment on arrival to CSG, and dispatching to the various working areas.
- Palletisation of Spacecraft Support equipment prior to departure from CSG to Airport/Harbour.
- All work associated with the delivery of freight by the Carrier at Airport/Harbour.
- CSG Support for the installation and removal of the Spacecraft Check-Out Equipment.

**The following is NOT included in the Transport Service:**

- The "octroi de mer" tax on equipment permanently imported to Guiana, if any.
- Insurance for Spacecraft and its associated Equipment.

The maximum temperature to which containers and packing may be exposed during any transport is 35°C.

### 2.2. Payload Preparation Facilities

The Payload Preparation Complex, with its personnel for support, may be used simultaneously by several customers. Specific facilities are dedicated to the CUSTOMER on the following basis:

#### EPCU Facilities

**Standard conditions for temp. and relative humidity do not exceed 24°C and 55 %, respectively:**

Spacecraft Preparation (clean Room)	400 m <sup>2</sup>
Lab for Check-Out Stations (LBC)	120 m <sup>2</sup>
Offices and Meeting Rooms	220 m <sup>2</sup>

#### Access to the EPCU:

Restricted to authorised personnel only, permanently controlled by Range Security.

Access to offices, check-out stations and cleanrooms, is controlled through a dedicated electronic card system.

Cleanrooms are permanently monitored by a CCTV camera/tape system.

**Access outside normal working hours:**

Access to the S1 facilities beyond normal working hours, is authorised, subject to the following restrictions:

- No Range Support Provided.
- No hazardous Operations
- Crane utilisation only by certified personnel
- No changes to the Facilities Configurations

**Schedule Restrictions:**

Launch Campaign duration is limited to 49 calendar days, from S/C arrival in Guiana, to actual departure of associated equipment.

Extension is possible, but is subject to negotiations.

Spacecraft Ground Support Equipment must be ready to leave the range within 3 working days after the Launch.

Transfer of S/C and its associated equipment to the S3 facilities no earlier than 21 working days before Launch.

After S/C transfer to S3, and upon request by ARIANESPACE, the S1 Cleanroom may be used by another S/C.

**Range Operations:**

Based on 2 Shifts of 8 hours per working day. 3 Shifts per day, and/or Saturday, Sunday or public holiday work is possible, but subject to negotiations.

**Standard MGSE:**

As per EPCU Manual.

**No-break Power Supply:**

S1 Building	20 kVA
S3 Building	10 kVA
Launch Pad	10 kVA

**Calibration Equipment:**

As per EPCU Manual

**Storage:**

Any storage of equipment during the campaign  
2 additional months for propellant storage

## 2.3. Communication Links

The following communication services between the different Spacecraft preparation facilities will be

provided for the duration of a standard campaign (including technical assistance for connection, validation and permanent monitoring):

Service	Type	Number
RF-Link	Ku-Band (optical fiber)	1 TM / 1TC
Baseband Link	Optical fiber	2 TM / 2TC
Data Link	Romulus Network	4, for monitoring & remote control
Umbilical Link	Copperlines / COAX	2x37 pins for S/C umbilical & 2x37 pins for auxiliary equipment
Closed Circuit TV		As necessary
Intercom System		As necessary
Paging System		TBD
CSG telephone		As necessary
Int. Telephone Link 1)	With Access Code	< 10
Facsimile in S1 1)		2
Video Conference 1)	Shared with other users	2 hours daily sessions

1) Traffic to be paid, at cost, on CSG invoice after the campaign.

## 2.4. Analyses and Operations

Service	Type	Remarks
Chemical Analyses	Propellants	4 complete 10 partial, equiv. to 8 complete
	Gas & fluids particles	40 analyses
	Cleanroom organic deposit	1 weekly
Particle Count	Clean room monitoring	1 per day, one report weekly
S/C Weighing		In EPCU buildings
Adaptor Fit-Check	Mechanical / electrical TBD	At S/C arrival

## 2.5. Fluid Deliveries

Fluid	Type	Quantity
GN2	N48 at 190 bar	24 B50 bottles
GN2	Ground Supply in EPCU	As necessary
GHe	N55 at 350 bar	24 B50 bottles
IPA	MOS-SELECTIPUR	400 liters
Water	Deionised	As necessary

## 2.6. Miscellaneous

**No-break power:**

1.4 kVA in S1 offices for Customer PCs.

**Copy machines:**

2 in S1 area (1 for secretarial duties, 1 for extensive reproduction); paper provided.

**Photo & Film processing:**

~ 500 prints (13 x 18 cm) and one broadcast quality video tape (or 16 mm movie) of 15 min duration, to document S/C operations in French Guiana.

**Video Transmission:**

Coverage of the Launch, signal available at Bercenay (France) and ETAM (USA East Coast).

**Video tape:**

Launch Coverage (NTSC, PAL or SECAM).

## 2.7. Additional Services

**Bilingual Secretary:**

(French/English) during normal working hours.

**Photographic Support:**

For technical still pictures.

**Room Reservation:**

In the ARIATEL Hotel resort at Customer's request (cancellation charges, if any, under Customers's responsibility).

**Customer Assistance - (Customer & Spacecraft Contractor):**

For housing, rental cars, flight reservations, banking, off-duty & leisure activities.

The following list is an abstract of the "Tailored and Optional Services List" available for the customer and which is updated on a yearly basis.

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