Industry Day of the Copernicus Sentinel-5 and Jason-CS Projects

With the present announcement, the European Space Agency and Astrium GmbH Satellites (Germany) inform the EMITS Users (European Companies and Institutes) about a presentation of the Copernicus Sentinel-5 and Jason-CS projects, their procurement plans and related business opportunities. This Industry Day common to the two projects will take place on 13 February 2014 at:

Palace Hotel,
Picképlein 8,
2202 CL Noordwijk aan Zee, (The Netherlands)
Tel. +31-71-365-3000,
Fax. +31-71-365-3001,
http://www.palacehotel.nl for directions and maps

1. The Copernicus Space Component Programme

Within the European Union’s Copernicus Programme, for which ESA is the agency responsible for procurement of the space segment assets, ESA is now in the process of implementing the Copernicus Space Component Segment 3, CSC-3. As well as a number of items related to ground segment activities, the CSC-3 includes the development of two orbital systems. These are Sentinel-5, which is an atmospheric chemistry payload to be embarked on MetOp-SG satellites, and Jason-CS, which will continue the mission of the Jason series of ocean topography satellites. This Industry Day will address both of these.

2. Jason-CS Project

Since 1992 high precision ocean topography missions have been carried out by a series of missions, the most recent being Jason-2 launched in 2008. Originally a CNES/NASA partnership, the missions have evolved and new partners EUMETSAT and NOAA introduced for Jason-2. The next satellite in the series, Jason-3, is due to be launched in March 2015.
Beyond Jason-3, the long-term availability of high precision ocean surface topography measurements to support Copernicus services will be ensured by a sequence of two Jason-CS (Jason Continuity Service) satellites, through which the continuation of high-precision altimetry observations should be secured until at least 2030.

With Jason-CS the development partnership has been expanded, with the following (partial) list of responsibilities:

- ESA is responsible for the development and procurement of the first satellite and for the managing the procurement of the second satellite;
- EUMETSAT is responsible for the development and operation of the ground segment (both command and control and data processing and distribution);
- European Union is responsible for funding the operations of both satellites and for the partial funding of the second satellite (with EUMETSAT);
- NOAA is responsible for funding the launchers for both satellites and for funding the provision of US payload instruments (procured from NASA/JPL);
- CNES provides system and mission expertise;
- NASA/JPL develops and delivers the US payload instruments and procures the launchers on behalf of NOAA.

The specific goal of the mission is to continue the high-accuracy measurement of sea-level, in an absolute Earth-fixed reference frame. This measurement is required to be both stable and precise, to continue the monitoring of this climatologically important variable to the highest levels of confidence. It is required on global and on small scales, and with some data available with a fast delivery to enable operational modeling.

The orbit of Jason-CS is not sun-synchronous and for this, and other, reasons the satellite design is based on the design of CryoSat, which is a similar altimetry mission in a non-sun-synchronous orbit. However several aspects of the satellite design have required enhancement to meet the needs of the Jason mission. The payload consists of the following instruments:

- Poseidon-4, a dual-frequency radar altimeter, derived from SIRAL on CryoSat and SRAL on Sentinel-3. It measures the range from the satellite to the ocean surface with a precision of order 1 cm and operates in high-resolution synthetic aperture and conventional low-resolution mode simultaneously.
- A DORIS receiver, which, together with the GNSS Receiver (see below), is used to determine the satellite’s orbit and location in the terrestrial reference frame, again to a precision of order 1 cm.
- A GNSS Receiver. An instrument based on the Sentinel-3B receiver is baseline, with an increase in the number of channels.
- A Microwave Radiometer to measure the disturbance on the altimeter measurements caused by refraction in tropospheric water vapour (a similar disturbance due to the ionosphere is compensated by the two radar frequencies). This is provided by NOAA and is not part of the ESA development.
• A Radio-Occultation instrument to provide measurements of atmospheric water vapour profiles is provided by NOAA and again is not part of the ESA development.
• A laser retro-reflector, also provided by NOAA, completes the payload – this is used for range calibration and to complement the DORIS and GNSS measurements.

3. Sentinel-5 UVNS Project

Since 2006, the European contribution to operational meteorological observations from polar orbit has been provided by the first generation of Meteorological Operational (MetOp) satellites. The MetOp Second Generation (MetOp-SG) series of satellites will provide continuity and enhancement of these observations in the timeframe of 2020 to 2040. MetOp-SG consists of two series of satellites, designated as “Satellite A” and “Satellite B”. The target operational system foresees 21 years of operations from both series of satellites, which implies three units in each series.

The Sentinel-5 instrument will be provided to the MetOp Second Generation Programme as In Kind Contribution (IKC) to fly on board the MetOp-SG Satellite A.

The Sentinel-5 mission objective is to monitor the composition of the atmosphere for the Copernicus Atmosphere Service. This service will provide coherent information on atmospheric variables in support of European policies and for the benefit of European citizens. Services proposed will cover air quality applications, air quality protocol monitoring, and climate protocol monitoring. Sentinel-5 is focused on air quality and composition-climate interaction with the main data products being O₃, NO₂, SO₂, HCHO, CO, CH₄ and aerosol optical depth and will provide daily global coverage with high spatial and spectral resolution.

The Sentinel-5 project will consist of a wide field high resolution UVNS imaging spectrometer covering Ultra-Violet, Visible, Near InfraRed and Short-Wave InfraRed spectral bands (270 – 2385 nm), together with the ground processor prototype. The concept relies on the integration of 5 spectrometers in push-broom configuration, covering a swath of approximately 2670 km. The instrument provides a ground resolution of 7 km at Nadir with a spectral resolution in the range 0.25 – 1 nm, depending on the spectral band.

While it is presently assumed that 3 identical MetOp-SG A spacecraft will be built (and hence that 3 Sentinel-5 instruments need to be procured) the final number of MetOp-SG A spacecraft will only be decided by the EUMETSAT Council in 2014. The number of Sentinel-5 instruments will match the number of MetOp-SG A spacecraft.
4. The combined Industry Day

Further to the Request For Quotation (RFQ) sent by the European Space Agency (ESA) in March 2013, Astrium GmbH has been appointed as Prime Contractor of the Jason-CS Phase B2.

Further to the Invitation To Tender (ITT) released by the European Space Agency (ESA) in June 2013, Astrium GmbH has been appointed as Prime Contractor of the Sentinel-5 UVNS Phase B2, C/D and support to phase E1.

Therefore, Astrium GmbH has been authorized in both projects to proceed with the competitive procurement process in order to complete the build-up of their respective industrial teams for the best practices procurement related items. In both projects, this tendering process will be governed by ESA rules which are reported in the “Best practices for the selection of subcontractors by Prime Contractors in the frame of ESA’s major procurements”. This document can be downloaded from EMITS (http://emits.sso.esa.int/ under “Reference Documentation” and “Administrative Documents”).

In advance to the announcement on EMITS of the ITTs, the objective of this Industry Day is to present to the European industry the overall Jason-CS and Sentinel-5 projects, the associated business opportunities, the bidding process and schedule for the build-up of the respective industrial teams.

You will find in paragraph 5 below a preliminary agenda for this Industrial Day. In addition, you will find as Attachment 1 the preliminary list of Jason-CS Best Practices and as Attachment 2 the Sentinel-5 list of Best Practices.

To participate to this Industrial Day, please contact
Ms. Caroline Wilson
Email: caroline.wilson@esa.int
Tel: +31 71 565 6689

not later than 03 February 2014.

For logistic reasons participation is limited to the strict minimum number of participants per company.
5. Preliminary Agenda

1. Introduction
2. Programme Overview
3. Procurement Rules

Sentinel-5
4. Mission objectives; Overall instrument design; Operations concept; Model philosophy, etc
5. Core Team and procurement responsibilities (industry points of contact)
6. List of Best Practice items and procurement calendar

Jason-CS
7. Mission objectives; Overall design, Operations Concept; Model philosophy, etc
8. Core Team and procurement responsibilities (industry points of contact)
9. List of Best Practice items and procurement calendar
10. Organisation and timetable of the afternoon sessions (in parallel)

Parallel Sessions
11. Presentation of the main features of each Best Practice item (Jason-CS and Sentinel-5 running in parallel)
Attachment 1: Preliminary List of Jason-CS Best Practices

1. Structure
2. Power Control and Distribution Unit
3. Solar Array
4. Battery
5. Thermal Control Active Hardware (heaters etc)
6. Thermal Control Passive Hardware
7. On-Board Computer
8. S-Band Transponder
9. S-Band Helix Antenna
10. S-Band Patch Antenna
11. X-Band Antenna
12. Star Trackers
13. Magnetometers
14. Gyros
15. Reaction Wheels
16. Magnetotorquers
17. Spacecraft Harness
18. On Board Software
19. Poseidon-4 Duplexer
20. Poseidon-4 Antenna
21. Spacecraft Integration Trolley
22. Spacecraft Transport Container
23. Spacecraft Lifting Device
24. Core EGSE
25. GMFE
26. Power SCOE
27. TMTC FE
28. Platform Simulator
29. Software SVF
30. RF SCOE (X-Band)
31. RF Suitcase
32. ISVV
33. Test Facilities
Attachment 2: List of Sentinel-5 Best Practices

1. Instrument Optical Module Structure and Radiators
2. Instrument Optical Module Thermal H/W
3. Calibration Subsystem
4. Telescope and Beam Splitter Assembly
5. NIR-SWIR Relay
6. UV1 Spectrometer Optics
7. UV2VIS Spectrometer Optics
8. NIR Spectrometer Optics
9. SWIR Spectrometer Subsystem
10. SWIR Gratings
11. SWIR FEE
12. UVN CCD
13. UVN Front End Electronics
14. Detection Support Electronics
15. SWIR Detector
16. Instrument Control Subsystem and Application S/W
17. Instrument Harness
18. Instrument OGSE
19. EGSE
20. Instrument MGSE
21. Calibration Test Facility
22. Instrument Test Facility
23. Level 1b Processor
24. Instrument Simulator