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Noordwijk, 15 March 2011

**Subject: Call for interest on in-orbit validation of payloads hosted on-board  
Telecommunication satellites**

The European Space Agency (ESA) is experiencing an ever-increasing interest in the in-orbit validation of new Telecommunication technologies and systems from the industrial community and Operators/Service providers. An efficient and cost effective vehicle for technology demonstrations as well as system and service pre-operational validation is represented by hosted/piggyback payloads in conjunction with larger missions.

Within the ARTES programme, there has been a long tradition of piggyback payloads starting in 1994 with the launch of Skyplex processor on the Hot Bird 4 satellite, followed by AmerHis on Amazonas 1 and the set of TDPs (Technology Demonstration Payloads) on the Alphasat satellite.

The Alphasat TDP opportunity led to an overwhelming interest with about 20 initial candidate payloads/missions. Four of those proposals have been selected for flight in 2012.

ESA is considering the possibility of further expanding its offer of in-orbit validation opportunities.

Two opportunities have been identified:

1. The dedicated satellite (EDRS-C) in the EDRS programme planned to be launched by late 2014, allowing for the embarkation of up to 140 kg and 1.5 kW into geostationary orbit (GEO),<sup>1</sup>
2. Up to 66 Hosted payloads of up to 50 kg and 50 W (200 W peak) each in the Iridium NEXT constellation in Low-Earth orbit (LEO). Launches start in 2015, with last launch in 2017 (background information is provided in the enclosure).

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<sup>1</sup> Part of the space on EDRS-C has been pre-allocated based on expressions of interest already received.



Additional opportunities for in-orbit validation might be pursued in the future, should the interest in this initiative be confirmed.

Hosted payloads can, in general, range from 1-5 kg purely technological payloads for the validation of components/equipment to 100-150 kg more system-oriented payloads for the validation of larger equipment and innovative system concepts. Please note that specific mass constraints exist for the two opportunities described above.

ESA would in general offer funding to cover part of the innovative payload development costs and of the payload hosting fees, provided support from one or several ESA Member States is obtained and on the basis of an associated cost/benefit assessment. A concrete programmatic framework exists for TDPs on EDRS, which would need to be established for Iridium and for additional opportunities on the basis of the responses received.

At this stage ESA is calling for your expression of interest regarding payloads and/or associated systems for the two opportunities described above and further indications of interest in validating payloads with a similar scheme in future opportunities.

Payloads for the two opportunities described above will have to be compatible on technical and schedule grounds with the EDRS or Iridium missions and shall indicate any financial requirements, support from ESA Member States, and impact of the in-orbit validation on European/Canadian Industry competitiveness.

The selection of payloads for each of the different flight opportunities will be preceded by a tendering process. The final payload selection for the EDRS programme is planned to be completed by end November 2011.

All declarations of interest will be treated confidentially.

Should you be interested in this opportunity, please send your proposal, according to the format provided in the Annex, to e-mail address: [payloadcfi@esa.int](mailto:payloadcfi@esa.int) by 29<sup>th</sup> April 2011. Upon request, a document with additional background / hosting satellites information will be provided to interested parties.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Magali Vaissiere', with a long, sweeping underline.

Magali Vaissiere  
Director of Telecommunications and Integrated Applications



## **Annex – Template for Payload In-Orbit Validation (IOV) Call for Interest responses**

Responses to the Payload In-Orbit Validation Call for Interest are requested to contain the following content, in a short form not exceeding a total of 10 pages:

### **1. Cover letter**

The signed cover letter shall contain a summary of the IOV concept and salient aspects from the content defined below. The cover letter shall identify any confidentiality requirements.

### **2. Payload name**

### **3. Proponent**

This section shall identify the company or consortium of companies proposing the payload, defining the role of each company involved. The different countries involved in case public funding would be required shall be identified.

### **4. Payload/mission description**

This section shall briefly describe the proposed payload. In case the payload will be part of a system/mission the overall system/mission shall be described.

### **5. Validation objectives**

This section shall define the objectives pursued with the validation in-orbit of the proposed concept (e.g. flight demonstration, in-orbit qualification, flight heritage build-up, new system/technological concept validation)

### **6. Benefits of proposed IOV and associated beneficiaries**

This section shall define the benefits and strategic impact of carrying out the proposed IOV. Benefits can be direct (e.g. for the company proponent of an innovative equipment) or indirect (e.g. for satellite prime manufacturers, for satellite Operators or Service Providers). The beneficiaries shall be identified, as a generic class (e.g. Operators).

### **7. Payload elements**

This section shall describe the elements constituting the payload: equipment, antennas, other appendages.



8. Orbital requirements for IOV

GEO, LEO or indifferent

9. Telecommunication and regulatory aspects

This section shall define any requirements associated to direct communication aspects from/to the proposed payload and associated regulatory aspects, if any.

10. Estimated technical budgets and accommodation and operational constraints

This section shall define the best estimate of the technical budgets (mass, power consumption –average, peak, duty cycle-, volume –for the different payload elements-, power dissipation, thermal constraints, telecommand/telemetry needs, memory, processing) and specific accommodation constraints (specific location, orientation, visibility needs) and operational requirements (ranging from TC/TM transmission to direct supervision of in-orbit performance parameters, continuous/intermittent operation, experiment duration, etc).

11. Maturity level and pre-development needs

This section shall identify the current maturity level of the proposed payload (TRL), any existing development plans (e.g. EQM already under way) and unplanned but necessary developments required to reach a PFM or FM stage, together with the associated schedule and estimated cost and funding needs.

12. Schedule aspects

This section shall define any constraints associated to the IOV (e.g. latest possible date for the IOV to make sense for the proponent or for the beneficiaries), experiment/mission min/max duration.

13. Funding aspects

This section shall define all funding-related aspects, including mention of contacts already established with ESA National Delegations and related expressions of interest, possibilities for co-funding development and/or IOV-related cost from private sources (identifying in that case the source: e.g. own company funds, beneficiaries, customers/users/etc).