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Space Object Registration by the European Space Agency: current policy and practice

I. Introduction

The European Space Agency (ESA) was the first international intergovernmental organisation to declare acceptance of the rights and obligations provided for in the Convention on Registration of Objects Launched into Outer Space. ESA attaches importance to the accurate registration of its space objects and has recently enhanced its related best practices by an internal, binding space object registration policy as well as a new, multi-functional national space object registry. Both steps underline ESA's on-going commitment to respond to obligations rooted in international space law, in particular since the sustainable use of outer space for peaceful purposes is key to ESA's self-concept.

This conference room paper provides information on the current space object registration and notification practice by the Agency.

II. ESA's registration obligations under international space law

The Convention on Registration of Objects Launched into Outer Space (UNTS vol.1023 no.15020; in the following: Registration Convention or REG) was adopted by the UN General Assembly through its resolution 3235 (XXIX) of 12th November 1974, opened for signature on 14th January 1975 and entered into force on 15th September 1976.

Two years later, in December 1978, and based on the provisions provided for in Article VII REG, the Council of ESA's predecessor, the European Space Research Organisation (ESRO), declared acceptance of the Registration Convention ("Council Decision on the Declaration of Acceptance of the Convention on the Registration of Space Objects", 12th December 1978, subsequently attributed to ESA after the entry into force of the Convention for the Establishment of a European

Space Agency in 1980). Through this legal act, which it lodged on 2nd December 1979, ESRO/ESA became the first international intergovernmental organisation (IGO) to accept the rights and obligations provided for in the Registration Convention. To date, two more IGOs have followed ESA's example: the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) in 1997 and the European Telecommunications Satellite Organisation (EUTELSAT-IGO) in 2014.

III. ESA's contribution towards an enhanced registration practice

Since ESA's declaration of acceptance of the rights and obligations provided for in the Registration Convention, the Agency has responded to the following obligations (the first two being of non-recurring and the latter two of recurring nature):

1. Establishment of a "national" (in the case of ESA: agency-internal) space object registry (Article II para.1 REG);
2. Information of the UN Secretary-General of the establishment of this registry (Article II para.1 REG);
3. Registration of space objects launched by ESA as launching State into Earth orbit or beyond, by means of entry in this registry (Article II para.1 REG);
4. Notification to the UN Secretary-General of certain information regarding each space object carried on its registry (Article IV para.1 REG);
5. Notification to the Secretary-General of space objects concerning which ESA has previously transmitted information, and which have been but no longer are in Earth orbit (Article IV para.3 REG).

In 2013, coupled with an inter-disciplinary effort for the update of the Agency's space debris mitigation policy, it was considered a beneficial and constructive step to formalise ESA's internal practice of registering its space objects. To this end, the ESA Director General in his function as the Agency's executive organ issued a policy for the registration of ESA space objects, based on the best practice of the Agency and developing it further to meet the goals of guaranteeing, at any time, up-to-date, centralised information about all ESA space objects and giving a "guiding example in space object registration".

IV. The new ESA Space Object Registration Policy

The ESA Director General's administrative instruction "ESA Space Object Registration Policy" (in the following: the ESA Registration Policy) entered into force in March 2014. Within the ESA legal system, the Director General's administrative instructions and policies are a way of implementing tasks that the ESA Convention, Rules and Regulations assign to the internal competence of the Director General. As such, they are binding for all ESA staff, who, in applicable cases, have to ensure the correct implementation of such acts also in ESA's relation with third parties. The ESA Registration Policy formalises the elements of ESA's space object registration process, i.e. that:

1. All ESA space objects shall be registered in an ESA-internal register maintained by the ESA department in charge of legal affairs;
2. All related information is to be provided for that purpose by the respective programme / project / mission manager in accordance with a structured process;

3. ESA will continue to notify the UN Secretary-General of ESA space objects in conformity with its international obligations, and

4. This notification shall be furnished to the UN in reasonable time after the launch or status change of an ESA space object, but not later than one month after the launch or status change.

To allow for an accurate implementation of these requirements, the ESA Registration Policy establishes several working definitions, including of the term “ESA space object” as:

a) ESA assets embarked on an ESA or non-ESA launch, entering an orbit around Earth;

b) launcher stages for launches under an ESA development programme, entering an orbit around Earth;

c) adaptors, fairings and other elements associated to a) or b).

d) ESA space objects being launched beyond Earth orbit are also registered and notified accordingly.

The ESA Registration Policy furthermore contains a list of implementation requirements including a staggered timeline for the ESA-internal provision of information necessary for meeting ESA’s obligations under the Registration Convention.

V. The new ESA Space Object Registration Policy

A central element for implementing the ESA Registration Policy is the establishment of a multi-functional “ESA Space Object Register”. This register represents the “national registry” required under Article II REG. Its implementation is based on the fact that the Registration Convention leaves room for determining the contents of each registry and the conditions under which it is maintained. The ESA Space Object register was developed over the course of 2014 and released in March 2015 as internal administrative tool maintained by the Legal Services Department.

The ESA Space Object Register presents the authoritative list of all ESA space objects that currently are or ever have been in Earth orbit or beyond. It is divided in a main section containing all ESA space objects registered and duly notified to the UN Secretary-General in response to the Agency’s obligations under the Registration Convention, and an annex section listing additional objects such as non-functional ESA space objects, in particular operational debris. For each registered or listed ESA space object, an associated sub-section contains:

1. The space object name, type and international designator;
2. Physical, launch-related and orbit-related information;
3. Registration, notification and, where applicable, additional legal information.

From a technical point of view, the ESA Space Object Register is linked to the ESA DISCOS database. DISCOS represents the Agency’s “single-source reference for information on launch details, orbit histories, physical properties and mission descriptions for about 38.700 objects” (ESA 2014) and is maintained by the Agency’s Space Debris Office. The electronic link between DISCOS and the new

ESA Space Object Register allows retrieving, at any time, up-to-date orbital status information for each registered or listed ESA space object, including re-entry prediction.

Such, the ESA Space Object Register is not only a comprehensive legal database but allows full visibility and traceability, at all times, of relevant information related to the entirety of catalogued ESA space objects. The list of ESA space objects registered in accordance with the Registration Convention is open to the public via the respective notifications submitted by ESA to the UN Secretary-General and can be accessed under the Online Index of Objects Launched into Outer Space maintained by the UN Office for Outer Space Affairs.

VI. A reinforced practice of information provision

With its Registration Policy and the new Space Object Register, ESA reinforced its practice of information collection, centralisation and provision.

First, ESA responds to the obligation provided for in Article IV para.3 REG, i.e. to notify the UN Secretary-General [...] of space objects concerning which ESA has previously transmitted information, and which have been but no longer are in Earth orbit, the programme / project / mission managers shall notify the department in charge of legal affairs six months before a foreseen controlled or un-controlled re-entry and provide additional information such as the predicted re-entry time window and the expected object fragmentation. Two re-entries of previously registered ESA space objects have occurred shortly before and after the entry into force of the ESA Registration Policy: the Gravity field and steady-state Ocean Circulation Explorer (GOCE) satellite (2013; un-controlled re-entry) and the Automated Transfer Vehicle (ATV) 5 cargo craft (2015; controlled re-entry). Both objects remain in the ESA Space Object Register with a different status information.

Second, in line with the recommendations of the UN General Assembly resolution A/RES/62/101 of 17th December 2007 (“Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects”), ESA also responds to the provision of Article IV para.2 REG which foresees that each State of registry may, from time to time, provide the UN Secretary-General with additional information concerning a space object carried on its registry. To this end, and complementing the established practice of reporting changes in the supervision of a space object, the implementation requirements of the ESA Registration Policy define that such additional information includes:

1. significant, permanent changes of orbital parameters of a space object;
2. permanent changes of the space object status and functionality.

Third, while the Registration Convention establishes that only those space objects shall be registered which are launched in Earth orbit or beyond, ESA has recently added to its practice of transparent information provision by informing the UN Secretary-General of a sub-orbital object, ESA’s Intermediate eXperimental Vehicle (IXV), and listed this object in a special section of its register. The vehicle performed a sub-orbital flight in February 2015 with a duration of 100 minutes including its re-entry, descent and landing in the Pacific Ocean.

It is understood that ESA has provided the information related to the IXV voluntarily and beyond the obligations and scope of the Registration Convention, based on the understanding that the responsible exploration and use of outer space

for exclusively peaceful purposes can be further enhanced, where practicable and feasible, by providing additional information.

VII. Conclusion

ESA attaches importance to the accurate registration of its space objects. It does so sharing the views expressed in resolution A/RES/62/101, namely that it is desirable to achieve the most complete registration of space objects and enhance adherence to the Registration Convention. ESA's enhanced practice of space object registration is summarised by:

- a) an internal, binding policy to substantiate and develop the various obligations provided for by the Registration Convention;
- b) a new, multi-functional "national registry" according to Article II REG;
- c) an internal interpretation of the terms "as soon as practicable" used in Article IV para.1 REG and "additional information" used in Article IV para.2 REG.

The current ESA policy and practice in space object registration underlines ESA's on-going commitment to respond to obligations rooted in international space law, in particular since the sustainable use of outer space for peaceful purposes is key to ESA's self-concept and viewed by the Agency as a pre-requisite of responsible behaviour towards the international community.
