

**RESOLUTION EUM/C/105/24/Res. I****ON THE****EUMETSAT POLAR SYSTEM STERNA PROGRAMME  
(EPS-STERNA PROGRAMME)**

**presented for adoption at the 105<sup>th</sup> Meeting of the EUMETSAT Council  
on 26-27 June 2024,**

**and adopted on 19 January 2026**

**The EUMETSAT Member States,**

**HAVING REGARD** to the EUMETSAT Convention, which provides that the primary objective of EUMETSAT is to establish, maintain and exploit European systems of operational meteorological satellites and that a further objective of EUMETSAT is to contribute to the operational monitoring of the climate and the detection of global climatic changes,

**HAVING REGARD** to the EUMETSAT Convention, which establishes that mandatory Programmes are the basic Programmes required to continue the provision of observations from geostationary and polar orbits,

**RECALLING** the successful development of the EPS-SG Programme and the expected first launch of the first Metop-SG satellite in the second half of 2025,

**RECALLING** that EPS-Sterna also addresses user requirements already expressed in the context of EPS-SG for microwave sounding measurements, offering new observations which have the highest impact on NWP, and that EPS-Sterna will thus be complementary to the EPS-SG mandatory programme,

**RECALLING** the evolution of observation infrastructures and related opportunities presented to Council in 2018 (EUM/C/90/18/DOC/44) and the Opportunities related to evolution of observation infrastructures: update and planning presented to Council in 2019 (EUM/C/99/21/DOC/03), including the roadmap for the planned activities,

**NOTING** the decision taken by the ESA Space19+ Council at ministerial level in November 2019 to adopt an Arctic Weather Satellite (AWS) Earth Watch Element programme, covering the development of a micro-satellite equipped with a small microwave sounder designed to be compatible with a potential follow-on constellation,

**NOTING** the successful development of the protoflight demonstrator developed under the ESA Arctic Weather Satellite (AWS) Element of the European Earth Watch Programme, which serves as the prototype for the further development of the EPS-Sterna Satellites forming the EPS-Sterna System,

**RECOGNIZING** the European heritage built by capitalizing on the investments made by ESA Member States to the Arctic Weather Satellite Element, demonstrating also the value of systems,

**NOTING** the successful cooperation between ESA and EUMETSAT on the Arctic Weather Satellite between 2019 and 2025 as defined in the Exchange of Letters between EUMETSAT and ESA on ESA-EUMETSAT Cooperation Regarding the Arctic Weather Satellite signed in December 2020,

**NOTING** the decision of the EUMETSAT Council at its 101st meeting to name the previously called AWS Constellation Programme the “EPS-Sterna Programme” (EUM/C/101/22/DOC/38),

**TAKING INTO ACCOUNT** the Council Resolution on the increase of the ceiling of the General Budget to fund the phase B activities of both the EPS-Aeolus and EPS-Sterna Programmes (EUM/C/102/22/Res. I), allowing for an approval of the programmes in 2025 as an expansion of the mandatory EPS-SG Programme,

**NOTING** that the EPS-Sterna Programme is a European contribution to the fulfilment of the 2040 WMO Vision for the Global Observing System (WIGOS 2040), and as also reflected in the EUMETSAT strategy: Destination 2030,

**EMPHASISING** the positive results of the socio-economic benefits study performed in 2022-2023 and as presented to Council on 28 November 2023,

**NOTING** the draft Agreement with ESA Concerning Cooperation on the EPS-Sterna Programme (EUM/C/105/24/DOC/17),

**FOLLOWING** the roadmap for the approval of the EPS-Sterna Programme as agreed at the 99<sup>th</sup> Council meeting (EUM/C/99/21/DOC/03),

**TAKING INTO ACCOUNT** the Programme Proposal on the EPS-Sterna Programme contained in document EUM/C/105/24/DOC/16,

**BEARING IN MIND** that for the further accomplishment of the EUMETSAT objectives in the polar orbit, the first six satellites of EPS-Sterna Programme should be available for launch in 2029,

**IN CONFORMITY** with Article 2, 3, 5 and 10 of the EUMETSAT Convention,

**AGREE:**

- I** To establish the EPS-Sterna Programme as a mandatory programme and as an expansion of the EPS-SG Programme with an initial Constellation of six EPS-Sterna Satellites and a total of 20 Satellites, to achieve a nominal lifetime of the Constellation of thirteen years.
- II** That the mission objectives, system description and Programme content shall be as described in the EUMETSAT EPS-Sterna Programme Definition attached to this Resolution.
- III** That the financial envelope of the EPS-Sterna Programme shall amount to M€ 858.5 in 2024 economic conditions, with an indicative expenditure profile as described in the Programme Definition.

## **EPS-STERNA PROGRAMME DEFINITION**

### **1. INTRODUCTION**

The establishment of the EPS-Sterna Programme derives from the EUMETSAT Convention, where the primary objective of EUMETSAT to establish, maintain and exploit European systems of operational meteorological satellites is stated, together with the further objective to contribute to the operational monitoring of the climate and the detection of global climatic changes. The EPS-Sterna Programme will complement and expand on the mandatory EPS and EPS-SG Programmes and as such is a mandatory Programme.

### **2. EPS-STERNA MISSION OBJECTIVES**

The EPS-Sterna mission will continue and expand the number of observations from the EUMETSAT microwave missions namely EPS (i.e. MHS and AMSU-A/B) and EPS-SG (i.e. MWS), and allow the generation of similar products, as the EPS-Sterna observational requirements have been derived from the EPS-SG MWS ones. Furthermore, the EPS-Sterna mission will contribute to the long time series of microwave temperature and humidity sounding data which started with the United States Microwave Sounding Unit (MSU) in 1978, and continued with AMSU-A/B and ATMS as well as SSM/T, SSM/T2 and SSMIS, and the comparable Chinese instrument series of MWTS and MWHS since 2008.

EPS-Sterna will expand the EPS-SG microwave sounding capacity with a constellation of micro-satellites, which will have significant positive impacts on the accuracy of Numerical Weather Prediction (NWP) providing frequent observations for Nowcasting especially at high latitudes which are not well covered by MTG.

The high-level EPS-Sterna objectives are:

- To expand and complement the microwave sounding observations from the Metop-SG and NOAA JPSS polar-orbiting, meteorological satellites;
- To improve accuracy of global Numerical Weather Prediction models by increasing the number of microwave sounding observations;
- To contribute to Nowcasting applications at high latitudes through an increase in the frequency of microwave observations;
- To contribute to climate monitoring by improving global reanalysis based on NWP models and by adding to the record of upper tropospheric humidity with increased spatiotemporal sampling.

The primary objective of the EPS-Sterna mission is to support Numerical Weather Prediction (NWP) at regional and global scales, through the provision of spectral radiance measurements with information on:

- Water-vapour profile;
- Temperature profile;
- Earth surface emissivity;
- Cloud liquid water;
- Cloud ice.

The availability of EPS-Sterna radiances can also support climate-monitoring by integration into the microwave sounding Fundamental Data Record starting with the United States MSU instrument in 1978 that is essential for global reanalysis as produced by ECMWF for the Copernicus Climate Change Service.

### **3. EPS-STERNA MISSION**

The EPS-Sterna system consists of the following main elements:

- Space Segment;
- Ground Segment;
- Launch Services.

#### **3.1. EPS-Sterna Space Segment**

The EPS-Sterna space segment consists of a Constellation of nominally 6 active satellites flying in the Constellation. During the mission lifetime, a total of up to twenty satellites will be launched. Satellites whose instrument has degraded may be kept operational for a while if the quality of the data is considered useful or to gain experience on the evolution of the instrument.

Each satellite of the constellation will be equipped with a cross-track self-calibrating microwave radiometer that will feature 19 different channels allowing the retrieval of the above products. These channels are mostly based on heritage from MWS on EPS-SG and AMSU and MHS on EPS with the exception of the new sub-mm channels at 325 GHz which are used to better exploit the water vapour sounding information in all-sky conditions, support climate modelling (in synergy with ICI on EPS-SG) and nowcasting at high latitudes.

The space segment also includes all necessary Ground Support Equipment (GSE) for satellite AIV, such as mechanical, electrical and optical GSE's test facilities to support test and qualification of the satellites.

Specific tools used for system verification and validation and linked to the space segment will also be needed, such as for instance Network and Data Interface Unit (NDIU) used for Satellite System Validation Tests (SSVT).

The satellites' configuration will vary according to the orbital plane of destination; in particular, the position of the thermal radiators, star trackers as well as the position and size of the solar arrays, will change to cope with the different solar illumination conditions expected on the three different orbital planes.

### **3.2. EPS-Sterna Ground Segment**

The EPS-Sterna ground segment will support all the ground functions required to meet the mission objectives. It comprises a set of core functions, supplemented by functions provided by services in particular:

- Mission Control and Operations;
- Telemetry Acquisition, Telecommand Uplink;
- Payload Data Acquisition;
- Payload Data Processing;
- Data Distribution, Archiving, Monitoring and Reprocessing.

The EPS-Sterna ground segment functions will be implemented by physical elements located at the EUMETSAT Headquarters and other sites. The full complement of sites contributing to the EPS-Sterna ground segment is:

- The Mission Control Centre (MCC) at EUMETSAT HQ, comprising:
  - Mission Control and Operation (MCO) sub-segment;
  - Payload Data Processing (PDP) sub-segment;
  - Multi Mission Elements (MMEs) as part of the EUMETSAT Internal Services.
- The Remote Mission Control Centre (RMCC) is located at a remote location and provide capability to monitor and control the Space Segment in the case of partial or total loss of the MCC;
- The Ground Stations sites for:
  - Tracking, Telemetry and Command/Control (TT&C), located in Svalbard and other sites;
  - The Ground Station sites for payload data reception, both polar stations for global data, and regional stations.

The EPS-Sterna Ground Segment will deliver Level 1 data while the Satellite Application Facilities (SAFs), which are distributed across EUMETSAT Member States, will perform Level 2 data processing.

### **3.3. Launch Services**

The launch services are inclusive, i.e. they cover also facilities and logistic services needed to support the transportation of the satellite, equipment and teams to the launch site; to perform the satellite checkout and assembly of the satellites with the launch vehicles; to perform the pre-launch tests; and to perform the launch and monitor the launcher until the separation of the satellite from the launch vehicle. Launch services will be procured to launch up to 20 satellites. Small dedicated launchers will be used for EPS-Sterna. Rideshares may also be considered for both phases, but only when the uncertainty on the designated orbital plane is acceptable with respect to the required EPS-Sterna mission performances.

#### **4. EPS-STERNA IN-ORBIT DEPLOYMENT PLAN**

The initial nominal configuration will consist of a total of six satellites in three orbital planes with two satellites per each plane, flying at an altitude of about 595 km.

The EPS-Sterna satellites will be deployed in three different sun-synchronous orbital planes, chosen to be complementary to EPS-SG and JPSS satellites (LTDN 03:30, 07:30, 11:30) as well as to maximise the constellation performance in terms of “time to achieve 90% global coverage”.

The constellation launch and replenishment strategy foresees two main phases:

- The initial deployment phase (first six satellites in 3 orbital planes);
- The replenishment phase.

The initial deployment phase will consist in establishing the constellation by launching the first batch of six satellites in the three designated orbital planes. Either single or dual launches are considered for this phase which means to select a launcher service for either three (i.e. one per orbital plane) or six launches.

The replenishment phase will ensure the required system performances throughout at least the thirteen years of operational lifetime by replenishing orbital planes in case of satellite and launcher failures or when the satellites have exceeded their nominal lifetime. Single dedicated small launchers services are considered for this phase, which will require a maximum of fourteen launches.

The nominal satellite lifetime will be 5 years. The launch and replenishment strategy is designed to maximise the probability of mission success by ensuring the availability of at least four operational satellites in three orbital planes as the minimum configuration to meet the constellation performance.

Two spare satellites are necessary to cope with satellite or launcher failures increasing the number of replenishments from 12 to 14 satellites.

#### **5. SCOPE OF EUMETSAT PROGRAMME**

The scope of the EPS-Sterna Programme encompasses the following main elements:

- Constellation of six satellites, to be replenished successively by up to 14 satellites (in total up to 20 satellites);
- Full funding of the EPS-Sterna Programme in the amount of M€ 858.5 at 2024 economic conditions;
- Procurement of 20 EPS-Sterna satellites;
- Procurement of launch services for 20 satellites;
- Establishment of a ground segment system to support operations of the EPS-Sterna system;
- Thirteen years of nominal lifetime of the mission;
- SAF activities in charge of level 2 products.

## **6. IMPLEMENTATION ARRANGEMENTS**

### **6.1. Interaction with Users and Experts**

The process for involvement of users, experts and mission teams established during the initial phases of the EPS-Sterna activities will continue during the development and operations phases to ensure that the EPS-Sterna, as a whole, will fully meet the mission objectives. The EPS-Sterna End User Requirements Document (EUM/C/104/23/DOC/13), owned by Council, is at the highest level in the EPS-Sterna specification tree and is the applicable user's reference for the design and the development of EPS-Sterna at system level and segment levels (space and ground segments).

Accordingly, a downward traceability from the EURD to the System requirements Document (SRD) and further down to the lower level requirements documents has been established and is maintained.

### **6.2. Cooperation with ESA**

The roles of EUMETSAT and ESA are detailed in a dedicated Agreement with ESA on EPS-Sterna approved by the EUMETSAT Council EUM/C/105/24/DOC/17, specifying, amongst others, the roles of EUMETSAT and ESA within the EPS-Sterna Programme, financial liabilities, procurement policy, implementation mechanism, and ownership of data.

## **7. PROGRAMME ENVELOPE AND INDICATIVE EXPENDITURE PROFILE**

The proposed EUMETSAT EPS-Sterna Programme Envelope amounts to M€ 858.5 at 2024 economic condition.

The following table shows the indicative expenditure profile of the EPS-Sterna Programme:

<b>Year</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034 to 2042</b>
<b>MEUR in 2024 e.c.</b>	29.48	88.93	99.30	71.83	78.63	58.28	61.13	57.72	48.39	264.81

**RESOLUTION EUM/C/106/24/Res. I****ON THE****CEILING OF THE GENERAL BUDGET 2026-2030****adopted at the 106<sup>th</sup> meeting of the EUMETSAT Council  
on 3-4 December 2024****The EUMETSAT Member States,**

**HAVING REGARD** to Article 2.5 of the EUMETSAT Convention, which establishes that the General Budget comprises activities not linked to a specific programme,

**CONSIDERING** that these activities shall represent the basic technical and administrative infrastructure of EUMETSAT including basic staff, buildings and equipment as well as preliminary activities authorised by the Council in preparation of future programmes, not yet approved,

**RECALLING** EUM/C/Res. XVIII establishing the first General Budget, a ceiling for the years 1990-1995 and contributions based on a GNP scale of contributions,

**RECALLING** EUM/C/95/Res. VI establishing the second General Budget, a ceiling for the years 1996-2000 and contributions based on a GNP scale of contributions,

**RECALLING** EUM/C/99/Res. V establishing the third General Budget, a ceiling for the years 2001-2005 and contributions based on a GNP scale of contributions,

**RECALLING** EUM/C/57/05/Res. I establishing the fourth General Budget, a ceiling for the years 2006-2010 and contributions based on a GNI scale of contributions,

**RECALLING** EUM/C/67/09/Res. III establishing the fifth General Budget, a ceiling for the years 2011-2015 and contributions based on a GNI scale of contributions,

**RECALLING** EUM/C/82/14/Res. III establishing the sixth General Budget, a ceiling for the years 2016-2020 and contributions based on a GNI scale of contributions,

**RECALLING** EUM/C/92/19/Res. I establishing the seventh General Budget, a ceiling for the years 2021-2025 and contributions based on a GNI scale of contributions,

**EXPRESSING** the need to establish a new ceiling,

**AGREE:**

- I** To fix a new ceiling of the General Budget for the years 2026-2030.
- II** To link this ceiling to contributions from Member States on a GNI scale.
- III** To limit these contributions to a total amount of M€ 141.4 at 2025 economic conditions, comprising M€ 86.3 for Core Activities, M€ 9.0 as Third Party Programmes' Risk Margin, M€ 16.0 for Infrastructure Sustainability Investments, M€ 13.1 for the Prospective activities, and M€ 17.0 for EPS-Aeolus Phase B.