

Operational Direct Broadcast Systems Status Report & Status of Implementation of Best Practices at EUMETSAT

Presented to CGMS-54 Working Group I session, agenda item 6.3

Operational Direct Broadcast Systems

The Status of Operational Direct Broadcast Systems at EUMETSAT is summarised in the Tables below:

Instruments	METOP-B	METOP-C
AMSU-A	Operational	Operational
ASCAT	Operational	Operational
AVHRR	Operational	Operational
HIRS	Non operational	N/A
IASI	Operational	Operational
MHS	Operational	Operational

Instruments	EPS-SGA1	EPS-SGB1
MWS	In commissioning	N/A
IASI-NG	In commissioning	N/A
METimage	In commissioning	N/A
SCA	N/A	Launch mid 2026
MWI	N/A	Launch mid 2026
ICI	N/A	Launch mid 2026

List of Best Practices

This presentation describes the implementation status at EUMETSAT for the CGMS Agency Best Practices in support to Local and Regional Processing of LEO DB data (V1C). (*) EPS-Sterna subject to approval of the programme targeted in mid-2025.

Direct Broadcast Best Practices		METOP	EPS-SG	EPS-Sterna
01	Global Specification for Direct Broadcast	Compliant	Compliant	Compliant
02	Timely Provision of Space-to-Ground Interface Control Documents	Compliant	Compliant	Will be C.
03	Provision of Current Orbit Information	Compliant	Compliant	Will be C.
04	Provision and Maintenance of Product Processing Packages	Compliant	Will be C.	In preparation
05	Provision of Auxiliary Data for Instrument Product Processing	Compliant	Will be C.	Will be C.
06	Recommendations of Hyperspectral Channel Selection	Compliant	Will be C.	N/A
07	Spacecraft and Instrument Operational Status	Compliant	Will be C.	Will be C.
08	Operational Announcements	Compliant	Will be C.	Will be C.
09	Satellite Direct Broadcast and Reception Station Performance	Compliant	Compliant	N/A
10	Monitoring of the Direct Broadcast Downlink	Partially C.	Partially C.	Partially C.

BP.01 Global Specification for Direct Broadcast

BP.01 version endorsed by the CGMS-44 plenary

METOP

- Compliant.
Details available in: [METOP Space-to-Ground Interface Control Document](#);

EPS-SG

- Compliant.
Details available in: [EPS-SG Space-to-Ground Interface Control Document](#);

EPS-Sterna

- Compliant.
Direct broadcast to follow CCSDS standards in L-band.

BP.02 Timely Provision of Space-to-Ground ICDs

BP.02 endorsed by the CGMS-44 plenary

METOP

- Compliant.

Details available in: [METOP Space-to-Ground Interface Control Document](#);

EPS-SG

- Compliant.

Details available in: [EPS-SG Space-to-Ground Interface Control Document](#);

EPS-Sterna

- Will be compliant.

EPS-Sterna Space to Ground ICD to be provided 6 months before launch.

BP.03 Provision of Current Orbit Information

BP.03 endorsed by the CGMS-45 plenary

METOP

- Compliant.
See <https://service.eumetsat.int/tle/> webpage;

EPS-SG

- Compliant.
See <https://service.eumetsat.int/tle/> webpage;

EPS-Sterna

- Will be compliant.

BP.04 Provision and Maintenance of Product Processing Software Packages

BP.04 endorsed by the CGMS-45 plenary

METOP

- Compliant.

Software available in: <http://nwp-saf.eumetsat.int> for AAPP & OPS-LRS (AVHRR, AMSU, MHS and IASI);
<http://nwc-saf.eumetsat.int> for PPS (NWC);

EPS-SG

- Will be compliant.

EPS-SG software packages will be made available in a similar way to the METOP software packages:
<http://nwp-saf.eumetsat.int> for EPS-SG L0 and L1 processors (MWS, IASI-NG, METimage, SCA, MWI, ICI).
<http://nwc-saf.eumetsat.int> for PPS software (NWC).

EPS-Sterna

- In preparation.

BP.05 Provision of Auxiliary Data for Instrument Product Processing

BP.05 endorsed by the CGMS-44 plenary

METOP

- Compliant.
Data is provided by the EUMETSAT SAFs, see previous BP.04.

EPS-SG

- Will be compliant.
Scope and provision of auxiliary data to be detailed within provision of EPS-SG software package.

EPS-Sterna

- Will be compliant.
Scope and provision of auxiliary data for instrument product processing under consideration.

BP.06 Recommendations of Channel Selection for Hyperspectral Instruments

BP.06 endorsed by the CGMS-44 plenary

METOP

- Compliant.
The channel selection for the IASI hyperspectral sounder is provided in the [EUMETSAT Product Navigator](#) under [IASI reduced products](#)

EPS-SG

- Will be compliant.
To be provided within EPS-SG direct broadcast software package.

EPS-Sterna

- N/A.

BP.07 Spacecraft and Instrument Operational Status

BP.07 endorsed by the CGMS-45 plenary

METOP

- Compliant.

The Spacecraft and Instrument Operational Status is available in the [Operational Service Status Indicator](#):

- [METOP-B status](#)
- [METOP-C status](#)

EPS-SG

- Will be compliant.

To be provided once EPS-SGA1 is operational.

EPS-Sterna

- Will be compliant.

To be provided starting from the deployment of the EPS-Sterna constellation.

BP.08 Operational Announcements

BP.08 endorsed by the CGMS-45 plenary

METOP

- Compliant.

To receive email notifications provided through the UNS, register via the [EUMETSAT User Portal](#). Once your account has been created, login to manage your email subscriptions via “My Notification Subscriptions”.

EPS-SG

- Will be compliant.

To be provided once EPS-SGA1 is declared operational.

EPS-Sterna

- Will be compliant.

To be provided starting from the deployment of the EPS-Sterna constellation.

BP.09 Satellite Direct Broadcast and Reception Station Performance Requirements

BP.09 endorsed by the CGMS-45 plenary

METOP

- N/A as METOP Direct Broadcast is in L-Band.

EPS-SG

- Compliant.
See link budget analysis in “Implementation of CGMS Best Practices for LEO Direct Broadcast Data at EUMETSAT.docx” [CGMS-50-EUMETSAT-WP-06].

EPS-Sterna

- N/A as EPS-Sterna Direct Broadcast is in L-Band.

BP.10 Monitoring of the Direct Broadcast Downlink

BP.10 endorsed by the CGMS-48 plenary

BP.10 Operators of satellites with DB should routinely monitor the quality of the DB downlink and address any anomalies in accordance with each organisation's established procedures, and notify users of degraded performance. Monitoring should include:

- a) For each satellite, during the six months following DB signal activation, a validation that nominal reception is possible for a DB reception station anywhere within the footprint of the satellite DB antenna by acquiring all passes at an elevation of 5 degrees or more above the local horizon throughout a full satellite ground track repeat cycle. Nominal reception implies a positive link budget margin as well as the signal and data quality parameters defined under d) and e) below, being in their nominal range for a reception station corresponding to the minimum requirements of BP.09;
- b) During at least one pass per day for each satellite, monitoring of the signal quality parameters and the data quality parameters, as defined under d) and e) below respectively, for the part of the pass which is at an elevation of 5 degrees or more above the local horizon;
- c) During at least one pass per day for each satellite, monitoring of the data quality parameter degradation, attributable to frames or packets discarded or degraded on the spacecraft, prior to transmission to the ground;

where

- d) Signal quality parameters should include receive signal strength, signal to noise ratio, spectral power distribution, and carrier, bit and frame lock statistics; and
- e) Data quality parameters should include discarded frames and packets (failing error free decoding/reconstruction), missing frames and packets (calculated from measured frame and packet sequence counters), bad lengths (frame or packet out of tolerance length), and sequence errors (frame or packet detected gaps/sequence error) per Virtual Channel Identifier (VCID) for frames and Application Process Identifier (APID) for packets.

BP.10 Monitoring of the Direct Broadcast Downlink

BP.10 endorsed by the CGMS-48 plenary

METOP

- Partially compliant.
 - a) N/A;
 - b) Partially compliant. Monitoring is performed manually in case of anomalies;
 - c) Compliant;

EPS-SG

- Partially compliant.
 - a) Compliant.
 - b) Partially compliant. Monitoring of the signal quality is performed only up to frame level (VCID). The signal quality at APID level is checked manually when L0 and/or L1 processing raise errors/warnings;
 - c) Compliant.

EPS-Sterna

- Partially compliant.
 - a) Expected to be compliant for selected satellites in the constellation;
 - b) Partially compliant. Monitoring is performed manually in case of anomalies. Signal quality (BP.10.d) and data quality (BP.10.e) parameters are recorded from the EARS network for at least one pass per day;
 - c) Under assessment.

Summary

- WG-I members are invited to take note and comment on the status of operational direct broadcast systems and implementation of the CGMS Best Practices at EUMETSAT in support to local and regional processing of LEO direct broadcast data.