bsi.

Document: ACE/68_17_0134

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Our Ref: ACE/068
Date: 2017/05/05

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Dear Member,

CEN NEW WORK ITEM PROPOSAL (NWIP)

> DEFAULT UK VOTE: UK ABSTAIN – NO UK INTEREST
> COMMENTS TO delme.stephenson@bsigroup.com BEFORE 2017/06/05

Please find attached the following New Work Item Proposal [NWIP]:

CEN/CLC/TC 5 N 522, Space - Space Situational Awareness Monitoring - Observation System Data Message (OSDM)

CEN National Committees have been invited to approve this proposal based on the outline standard given.

As a member of the responsible BSI committee you are now asked to give your opinion on the vote to be returned to CEN and your comments on the attached draft.

If the UK is going to participate in the drafting for the standard then we need to supply the name of the UK expert for this project and would appreciate your recommendations.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard:

i)   has any issues related to 3rd party IPR, patent or copyright
ii)   affects other national standard(s)
iii)   is likely to require additional national guidance or information

If we do not hear from you by the above date, we will submit a vote of abstention and non-participation on behalf of the UK.

Yours sincerely

Delme Stephenson
Secretary to ACE/068

No.	Questions	Possible Answers
1	We agree that a European standard on this subject is feasible and therefore agree to the addition of the proposed new Work Item to the program of work of the committee.	Yes No * abstain/No interest
2	Standard(s), regulation(s) and other relevant documentation existing in our country, with any remarks concerning their application if necessary and consequences for global relevance, as well as copyright information on these documents are attached.	Yes (references provided below) * No
3	Do you wish to add any additional comments?	Yes * No
4	We are committeed to participate in the development of the project, at least by commenting on working drafts.	Yes (and we nominate experts below) * No

(*) A Comment is required for this answer value.

NEW WORK ITEM PROPOSAL

Closing date for voting	Reference number (to be given by the Secretariat) ....
Date of circulation	**CEN/TC / SC** N ....
Secretariat	**CENELEC/TC / SC** (Sec)…

IMPORTANT NOTE: Incomplete proposals risk rejection or referral to originator.

☒   The proposer has considered the guidance given in Annexes 1 and 2 during the preparation of the NWIP

Proposal (to be completed by the proposer)

Title of the proposed deliverable
(in the case of an amendment, revision or a new part of an existing document, show the reference number and current title)

English title   **Space - Space Situational Awareness Monitoring - Observation System Data Message (OSDM)**

French and German title (if available)

Scope of the proposed deliverable

Standard describing a message used to exchange information about observation systems (eg telescopes and radars) for celestial objects, near-Earth objects (NEOs) and objects orbiting the Earth.

Purpose and justification of the proposal

Enable exchange of observing system description for Space Surveillance and Tracking and Near-Earth Objects monitoring systems.

Is the proposal actively or probably in support of European regulation / legislation or established public policy?

☒ **Yes** ☐ **No**

If Yes, indicate if the proposal is

▪ **in relation to EC mandate(s): M/496**

▪ **in relation to EC Directive(s)/Regulation(s):**

▪ **in relation to other legislation or established public policy: ………..(give details)**

Indication(s) of the preferred type or types of deliverable(s) to be produced under the proposal.

☒ European Standard   ☐ Harmonization Document* ☐ Technical Specification   ☐ Technical Report

* for CENELEC only

Envisaged track

☒ Enquiry and vote (see 11.2.3 of IR Part 2) ☐ UAP (see 11.2.5 of IR Part 2)

Preparatory work (at a minimum an outline should be included with the proposal)

☒ A draft is attached   ☐ An outline is attached   ☐ An existing document to serve as initial basis

The proposer or the proposer's organization is prepared to undertake the preparatory work required   ☒ Yes   ☐ No

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If a draft is attached to this proposal,:

Please select from one of the following options (note that if no option is selected, the default will be the second option):

☐ Draft document will be registered as a preliminary project in the committee's work programme (stage 00.60)

☒ Draft document will be registered as a new project in the committee's work programme (stage 20.00)

☐ Draft document can be submitted to UAP (FprEN – stage 50.20)

Known patented items

☐ Yes   ☒ No   **If "Yes", see CEN-CENELEC Guide 8 and provide full information in an annex**

A statement from the proposer as to how the proposed work may relate to or impact on existing work, especially existing CEN, CENELEC, ISO and IEC deliverables. The proposer should explain how the work differs from any apparently similar work, or explain how duplication and conflict will be minimized.

`Currently there is no work covering this topic.`

A listing of relevant existing documents at the international, regional and national levels.

`CCSDS 503.0-B-1 Tracking Data Message Blue Book, ISO 13526:2010`

A simple and concise statement identifying and describing relevant affected stakeholder categories (including small and medium sized enterprises) <u>in particular those who are immediately affected by the proposal</u> (see Annexes 1 and 2) **and how they will each benefit from or be impacted by the proposed deliverable(s)**

Government – easier operation of SST/NEO systems

Academic and research bodies – they will need to provide the standardised message to an SST/NEO system if they operate an observing system used for SST/NEO

Liaisons:	**Joint/parallel work:**
A listing of relevant external European or international organizations or internal parties (other CEN, CENELEC, ISO and/or IEC committees) to which a liaison should be established (in case of ISO and IEC committees via Vienna and Dresden Agreements).	**Possible joint/parallel work with:**
	☐ CEN (please specify committee ID)
	☐ CENELEC (please specify committee ID)
`ISO/TC 20/SC 13 (CCSDS) – Liaison established`	☐ ISO (please specify committee ID)
	☐ IEC (please specify committee ID)
	☐ Other (please specify)

Candidate for European – International cooperation?
Vienna Agreement (ISO-CEN Agreement):

☐ **Yes** ☒ **No ('Yes' meaning joint ISO-CEN development)**

Dresden Agreement (IEC-CENELEC Agreement):

☐ **Yes** ☒ **No ('Yes' meaning that the NWI, if approved, is to be offered to IEC for taking up)**

Name of the Proposer	**Proposed Project Leader**
(include contact details)	*(include contact details)*
Tim Flohrer	Tim Flohrer
ESA-ESOC	ESA-ESOC
Robert-Bosch-Strasse 5, DE-64293 Darmstadt, Germany	Robert-Bosch-Strasse 5, DE-64293 Darmstadt, Germany
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Tim.flohrer@esa.int	Tim.flohrer@esa.int

Supplementary information relating to the proposal

☒   This proposal relates to a new document;

☐   This proposal relates to the adoption as an active project of an item currently registered as a Preliminary Work Item;

☐   This proposal relates to the re-establishment of a cancelled project as an active project.

☐   This proposal relates to a research project outcome

Members already known to support the proposal and willing to participate to the activities:… *[Note: The proposal cannot usually be approved without a minimum of 5 national Members]*

Annex(es) are included with this proposal (give details)

☒   **ESA-SSA-CEN-MEMO-00010 "Observing System Data Message (OSDM) proposed contents"**

Informative Annex 1 "Principal categories of market needs"

- Consumer protection and welfare
- Environment
- Innovation
- Support to:
    - public policy
    - European legislation/regulation
- Market access/barriers to trade, i.e. enhancing the free movement of:
    - services
        - goods
        - people
- Interoperability
- Health/Safety
- Terminology

Informative Annex 2 "Principal categories of stakeholders"

- Industry and commerce,
    where particularly appropriate, to be identified separately as
    - Large enterprises (those employing 250 staff or more)
        . Small and medium sized enterprises (SME), (those employing 250 staff or fewer)
- Government
- Consumers
    including those organizations representing interests of specific societal groups, e.g. people with
    disabilities or those needing other particular consideration)
- Labour
- Academic and research bodies
- Non-governmental organisations (NGO),
    including organizations representing broad or specific environmental interests
- Standards application business (e.g. testing laboratories, certification bodies)

Sometimes it is valuable also identify the immediate affected stakeholders from industry and commerce in terms of their position in a product value chain, as follows:
- Supplier
- Manufacturer
- Intermediary (e.g. warehousing, transport, sales)
- Service provider
- User of the product or service
- Maintenance / disposal

NOTE: 'Immediately affected stakeholders' are considered to be those who, within the context of the proposal, would be in a position to implement the provisions of the intended standard(s) into their products, services or management practices.

MEMO

Date	22/03/2017	**Ref**	ESA-SSA-CEN-MEMO-00010
From	Alexandru Mancas/ESA	**Visa**	

To	Daniel Fischer/ESA
Copy	Tim Flohrer/ESA, Holger Krag/ESA, CEN/CENELEC TC5 WG2

Subject: Observing System Data Message (OSDM) proposed contents

1 INTRODUCTION

A Space Surveillance and Tracking (SST) system detects and predicts the orbits of man-made space objects. The data generated by an SST system can be used to predict hazards to operational spacecraft, such as a conjunction with a debris object, or to ground-based infrastructure from a re-entering object. Any SST system can be considered – in a very simplified way – a 'processing pipeline' for observation data acquired by sensors (telescopes, radars or laser ranging stations). The end product of an SST system is an object catalogue, which must contain up-to-date orbit information for all objects over a certain size threshold.

Standardised messages already cover some of the SST data exchanges:
- Tracking Data Message (TDM) – exchange of measurements from an observing system to the SST data processing pipeline
- Orbit Data Messages (ODM) – include the Orbit Parameters Message (OPM), Orbit Ephemeris Message (OEM) and Orbit Mean Elements Message (OMM) and standardise the exchange of orbit data
- Conjunction Data Message (CDM) – covers close approaches between space objects (sees widespread use these days)
- Re-entry Data Message (RDM) – (in development) covers re-entry data
- Fragmentation Data Message (FDM) – (proposed) covers fragmentations

One gap was identified in the ingestion of TDM data by an SST data processing system. The TDM identifies the observing system by a name and contains some extra information (eg signal path and band). One information missing is the location of the sensor, as this does not change and should be covered by an ICD. There is also other useful sensor information

(like MTBF or pointing limitations) that are useful for simulating the sensor or scheduling measurements from said sensor.

Once TDM data is ingesting, it is used for the following:
- Object correlation – the actual measurements are compared to synthetic measurements for the objects in the catalogue to identify which object is observed (this can be done by the observing system as well)
- Orbit determination – either initial orbit determination (for newly detected orbits) or refining an existing orbit

Both uses require knowing the exact position of the sensor, as all the reference systems are defined with the origin at the sensor. Information about the sensor type, wavelength and location are also needed to apply corrections to the measurements (eg annual aberration for optical measurements and ionospheric corrections for radars).

The Observing System Data/Description Message (OSDM) contains information on the sensors (radars, telescopes, laser-ranging stations) used in an (SSA) observation. It is not intended to contain the measurements themselves (the TDM exists for that purpose) or pointing information (the TCM or CCSDS PRM can serve those needs). The OSDM will bridge the gaps in sensor description identified above and ease both the operation and simulation of SST systems.

2   PROPOSED TABLE OF CONTENTS

1. Introduction
    a. Purpose and scope
    b. Applicability
    c. Document structure
    d. Conventions and definitions
    e. References
2. Overview
3. Observing System Data Message structure and content
    a. General
    b. OSDM header
    c. OSDM metadata/data
4. Observing System Data Message data and syntax
    a. Overview
    b. Common OSDM syntax
    c. The OSDM in KVN (ASCII/plain text)
    d. The OSDM in XML
5. Annexes
    a. Examples
    b. Summary sheet
    c. Informative annexes

3   OSDM DRAFT CONTENTS

The proposed OSDM follows the same conventions as the CCSDS (Consultative Committee for Space Data Systems) standards (eg TDM and OPM), which are already used by space agencies and industry. It is divided into a header (information about the message) and metadata/data section (actual data contained). The KVN (Keyword Value Notation) convention is used.

The table below shows the proposed contents of the OSDM header:

Keyword	Description of values	Normative Values/Examples	N/E	Obligatory
CEN_OSDM_VERS	Format version in the form of 'x.y', where 'y' is incremented for corrections and minor changes, and 'x' is incremented for major changes.	0.6 1.0	E	Yes
COMMENT	Comments (allowed in the SDM Header only immediately after the SDM version number).	This is a comment	E	No
CREATION_DATE	File creation date and time in UTC.	2001-11-06T11:17:33 2002-204T15:56:23	E	Yes
ORIGINATOR	Creating agency or operator (value should be specified in an ICD). The country of origin should also be provided where the originator is not a national space agency.	CNES, ESOC, GSFC, GSOC, JPL, JAXA, INTELSAT/USA	E	Yes

The table below shows the proposed contents of the OSDM metadata/data section:

Keyword	Description of values	Normative Values/Examples (N/E)	N/E	Obligatory
COMMENT	Comments (allowed only at the beginning of OSDM metadata)	This is a comment	E	No
SENSOR_NAME	name of the sensor	HUBBLE SPACE TELESCOPE	E	Yes
SENSOR_ID	identifier of the sensor (if any exists); it can be the COSPAR ID for an orbiting sensor. The Observatory ID from the IAU should be used for ground-based telescopes, if one exists.	IAC-80 2012-068A	E	No
SITE_NAME	name of the site where the sensor is located	EUROPEAN SOUTHERN OBSERVATORY MAUNA KEA OBSERVATORIES	E	No
SITE_ID	identified of the site (if any exists)	OAM1	E	No
SENSOR_TYPE	type of the sensor	ACTIVE OPTICAL PASSIVE OPTICAL RADAR	N	Yes
OPERATOR	entity operating the sensor	ESA NASA ESO	E	Yes
OPERATOR_CONTACT_	Contact position of the	ORBITAL SAFETY	E	No

POSITION	owner/operator of the sensor	ANALYST (OSA), NETWORK CONTROLLER		
OPERATOR_PHONE	Phone number of the contact position or organization for the sensor.	+123456789	E	No
OPERATOR_EMAIL	Email address of the contact position or organization of the sensor.	JOHN.DOE@ SOMEWHERE.NET	E	No
SUCCESS_RATE	statistical success rate of the sensor (0 to 1)	0.994 0.341	E	No
MTBF	Mean Time Between Failures in hours	3394494934	E	No
MTTR	Mean Time To Recover from a failure in hours	0.44	E	No
WEATHER_PREDICTIO N	probability of bad visibility due to bad weather (from 0 to 1)	0.00007 0.898	E	No
REF_SLEW_TIME	reference time needed for pointing [s]	3.634	E	No
REF_MIN_DEAD_TIME	minimum dead time between two different exposures of a give field [s]	10.0	E	No
LOCATION_TYPE	where is the sensor located; the values allowed should be specified in an ICD	GROUND-BASED ORBIT SHIPBORNE AIRBORNE	E	Yes
CENTRAL_BODY	celestial body on which the sensor is locater or which the sensor is orbiting	EARTH MARS	E	Yes
REFERENCE_FRAME	reference frame for the sensor's coordinates	ITRF-97 GCRF	E	Yes
REFERENCE_EPOCH	Epoch at which the state vector is given. Mandatory for inertial reference frames	2001-11- 06T11:17:33 2002- 204T15:56:23	E	No
X	x-coordinate of the sensor's state vector [km]; may be omitted if position is given as lon, lat, alt, otherwise compulsory	3145.122	E	No
Y	y-coordinate of the sensor's state vector [km]; may be omitted if position is given as lon, lat, alt, otherwise compulsory	2341.23	E	No
Z	z-coordinate of the sensor's state vector [km]; may be omitted if position is given as lon, lat, alt, otherwise compulsory	1231.234	E	No
X_DOT	x-component of the velocity [km/s] (for orbiting telescopes mainly)	3.142	E	No
Y_DOT	y-component of the velocity [km/s] (for orbiting telescopes mainly)	3.142	E	No
Z_DOT	z-component of the velocity [km/s] (for orbiting telescopes mainly)	3.142	E	No
LON	Sensor location longitude [deg] in WGS-84 (only for ground based sensors); compulsory if position is	3.452	E	No

	not given in X,Y,Z, otherwise optional			
LAT	Sensor location latitude [deg] in WGS-84 (only for ground based sensors); compulsory if position is not given in X,Y,Z	25.234	E	No
ALT	Sensor location altitude [m] in WGS-84 (only for ground based sensors); compulsory if position is not given in X,Y,Z, otherwise optional	2245	E	No
EPHEMERIS_FILE	identifier of an ODM (OPM/OEM/OMM) with the orbit of a space-based sensor		E	No
RADAR_FENCE_MIN_E LEV	the min radar fence elevation [deg]	11.33	E	No
RADAR_FENCE_MAX_E LEV	the max radar fence elevation [deg]	90	E	No
RADAR_FENCE_MIN_A ZIMUTH	the min radar fence azimuth [deg]	90	E	No
RADAR_FENCE_MAX_A ZIMUTH	the max radar fence azimuth [deg]	270	E	No
MINIMUM_MOON_DIST ANCE	minimum angular distance to the Moon (in degrees) for telescopes	5.342	E	No
MINIMUM_SUN_DISTA NCE	minimum angular distance to the Sun (in degrees) for telescopes	94.44	E	No
MINIMUM_GP_DISTAN CE	minimum distance to the Galactic Plane (in degrees) for telescopes	3.22	E	No
RADAR_REF_DISTANC E	distance at which the reference RCS is given [km]	3400	E	No
RADAR_REF_RCS	minimum cross-section (in m**2) the radar will detect at RADAR_REF_DISTANCE	0.22	E	No
TELESCOPE_MAX_VM	Faintest (VM) the passive optical sensor can observe	16	E	No
RANGE_SIGMA	Expected accuracy for range [km]	0.040	E	No
DOPPLER_SIGMA	Expected accuracy for Doppler range rate [km/s]	0.010	E	No
ANGULAR_SIGMA	Expected accuracy for angular observations [deg]	0.0001	E	No
VM_SIGMA	Expected accuracy for visual magnitude	0.1	E	No
TIME_BIAS	Time bias of the sensor [s]	0.2	E	No
TIME_DRIFT	Time drift of the sensor [s/s]	0.002	E	No
TELESCOPE_CCD_DET ECTOR_SIZE	CCD detector size [pixels]	2000x2000	E	No
TELESCOPE_APERTUR E_DIAMETER	Aperture diameter of the telescope [mm]	20.0	E	No
TELESCOPE_APERTUR E_AREA	Aperture area of the telescope [mm**2]	200.0	E	No
TELESCOPE_FOCAL_L ENGTH	Focal length of telescope [mm]	500.0	E	No
TELESCOPE_TRACKIN G_MODE	Tracking mode of telescope. It can be sidereal (= following the stars), fixed (w.r.t. the Earth, e.g. used for	'SIDEREAL' 'FIXED' 'OFFSET'	N	No

TELESCOPE_CCD_TEM PERATURE	The temperature of the CCD. This must be given at least if the images are not calibrated, preferably all the time	20	E	No
TELESCOPE_X_BINNI NG	Binning in axis 1 of the telescope camera	2	E	No
TELESCOPE_Y_BINNI NG	Binning in axis 2 of the telescope camera	2	E	No

4   OSDM EXAMPLE

Below you can see an example OSDM for the European Extremely Large Telescope in Chile:

```
CEN_SDM_VERS        = 0.1
COMMENT This is a comment in the header.
CREATION_DATE       = 2015-07-07T07:07:07
ORIGINATOR          = ESOC

COMMENT This is a comment in the metadata.
SENSOR_NAME         = EXAMPLE TELESCOPE
SENSOR_ID           = ESOC/ET
SITE_NAME           = TENERIFE
SITE_ID             = TF
SENSOR_TYPE         = PASSIVE OPTICAL
OPERATOR            = EUROPEAN SPACE AGENCY
LOCATION_TYPE       = GROUND_BASED
CENTRAL_BODY        = EARTH
REFERENCE_FRAME     = ITRF-2000
X                   = -6038.5
Y                   = -1943.7
Z                   = 644.55
LON                 = -3.453
LAT                 = 25.234
ALT                 = 2245
TELESCOPE_MAX_VM    = 15
ANGULAR_SIGMA       = 0.0001
VM_SIGMA            = 0.2
TIME_BIAS           = 0.2
```

Chairman	Wolfgang Veith
Secretary	Kristofer Proll
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Draft Decision C62/2017 via Correspondence

Adoption of a New Work Item

„Space - Space Situational Awareness Monitoring - Observation System Data Message (OSDM)"

Expected Action	Use CIB to vote on the adoption of a New Work Item
Who	CEN/CLC/TC 5 members
Due Date	2017-06-19
Background	CEN/CLC/TC 5/WG 2 proposed to register and develop the following European Standard as shown in document CEN/CLC/TC 5 **N 522**: "*Space - Space Situational Awareness Monitoring - Observation System Data Message (OSDM)*" According to CEN rules, at least 5 member states are needed for the registration of a New Work Item. Please cast your vote on the CEN Balloting Portal.

Draft Decision CEN/CLC/TC 5 C62/2017 taken on 2017-XX-XX

Subject: Adoption of a New Work Item

CEN/CLC/TC 5 - Space

- having considered the proposal for a new work item as documented in CEN/CLC/TC 5 N 522

- having considered the Guidance - Adoption of a new work item in a CEN Technical Committee as documented in the BOSS

- confirming that the new work item falls within its scope

- confirming that the new work item corresponds to real market needs

- confirming that the resources to complete the work below are available

- decides to register the work item described below in its active programme of work

Section	Details
1. Deliverable	EN
2. This item corresponds to	A new project
3. Document developed in drafting body	CEN/CLC/TC 5/WG 2 - Space Situational Awareness Monitoring
4. Title	Space - Space Situational Awareness Monitoring - Observation System Data Message (OSDM)
5. Scope	This Standard describes a message used to exchange information about observation systems (e.g. telescopes and radars) for celestial objects, near-Earth objects (NEOs) and objects orbiting the Earth.
6. Environmental aspects	None of the above: No environmental aspects apply for this work item.
7. How do you plan to address these environmental aspects?	Bring in environmental expertise to the WG
8. Vienna Agreement	No or expected CEN lead
9. The project is linked to	No document from another organization
10. Track	Enquiry + Formal Vote (ENQ+FV)
11. Related mandate(s)	Yes M/496
12. Related directive(s)	No

DIN Deutsches Institut für Normung e. V.

13. Commitment	The following CEN members (at least five) are committed to participate in the development of the project:
14. The decision was taken by	