WORLD METEOROLOGICAL ORGANIZATION

CBS/OPAG-IOS/IPET-OSDE1 / Doc. 7.2(1)
(19.03.2014)

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMMME AREA GROUP ON
INTEGRATED OBSERVING SYSTEMS

ITEM: 7.2

INTER PROGRAMME EXPERT TEAM ON OBSERVING SYSTEM DESIGN AND EVOLUTION (IPET-OSDE)
First Session

Original: ENGLISH

GENEVA, SWITZERLAND, 31 MARCH – 3 APRIL 2014

ROLLING REVIEW OF REQUIREMENTS AND STATEMENTS OF GUIDANCE

REVIEW DATABASE OF SPACE-BASED CAPABILITIES (OSCAR/SPACE)

(Submitted by the Secretariat)

SUMMARY AND PURPOSE OF DOCUMENT

The document provides an update on the Space-based capabilities module of the OSCAR database (OSCAR/Space), which provides useful qualitative support to the Rolling Review of Requirements.

ACTION PROPOSED

The Meeting is invited to note the information contained in this document when discussing how it organises its work and formulates its recommendations.

DISCUSSION

1. Status of OSCAR/Space

1.1 In addition to the observation requirements, the Observing System Capability Analysis and Review tool (OSCAR) contains an inventory of satellite instruments, missions and programmes, and an assessment of the variables that the instruments have the potential to measure. This is the scope of the OSCAR/Space module (http://www.wmo.int/oscar/space).

1.2 OSCAR/Space currently records references of 852 instruments, including 535 for Earth Observation, 267 for space weather, and 50 for other purposes such as positioning, data collection and search and rescue.

1.3 Each instrument reference is provided with a description and an indication of the satellite(s) it is flying on, with the associated programmatic information. To the extent available, detailed instrument characteristics are provided such as central wavelength, bandwidth, and radiometric accuracy (SNR or NEΔT @specified input).

1.4 Earth observation instruments are grouped in 20 instrument types, and space weather instruments in five broad types, each type being composed of a number of classes based on instrument design characteristics and expected performances.

1.5 The most original information provided by OSCAR/Space for each instrument, which is also the biggest challenge, is the correspondence established between instruments and the variables they can potentially measure. For each instrument, OSCAR provides a “Tentative evaluation of measurements”, which lists the variables that can **typically** be retrieved from instruments of the same category, with a gross ranking into five levels. Reciprocally, for each variable, the “Gap Analysis” view of OSCAR provides a list of instruments that are **potentially** relevant to measure the said variable.

2. Discussion of the measurement evaluation

2.1 It must be stressed that, although this correspondence between instruments and variables is based on objective criteria, i.e. the main design characteristics of the instrument, it can only be an approximate correspondence which does not replace a detailed assessment and gap analysis. There are many reasons to explain this limitation:

- In order to avoid a bias towards particular instruments, the evaluation is not made for individual instruments, but for classes of instruments with similar characteristics;
- Several design characteristics are driving the performance of an instrument, including number and spectral characteristics of the channels, radiometric quality, scanning mode, horizontal resolution, or observing cycle. Although each of these criteria is fully objective, their combination in a unique “ranking” is subjective and can be appropriate for one application but not necessary for all;
- Furthermore, this evaluation is only based on the design characteristics of the instrument, regardless of the mission in which it is operated. Therefore, it does not take into account the functional status of the instrument (is it working

nominally?), its calibration, or the actual availability of the data (are they available in near real time, are they accessible and well documented ?).

2.2 For these reasons, the "Gap Analysis" in OSCAR must be understood as a "short list" of instruments that can be used as a starting point for a detailed evaluation.

3. "Capability review"

3.1 In order to support the Rolling Review of Requirements, OSCAR/Space provides also a comparison of the actual or planned capabilities with the capabilities expected in the Vision of the GOS. For each category of mission identified in the Vision (e.g. "Lightning imagery from geostationary orbit", or "Microwave temperature/humidity sounding from Low Earth Orbit") OSCAR/Space displays the current and planned missions contributing to this category. A comment is also provided on the comparison of these plans with the Vision.

3.2 This analysis is normally kept under review by the Expert-Team on Satellite Systems (ET-SAT) and updated in a yearly basis.

3.3 The evaluation of instruments which is the basis for the "Gap Analysis" is currently done manually by an expert for each instrument. The feasibility of an automatic assessment of the compliance with the requirements has been investigated. It appeared however that a meaningful classification algorithm would require entering massive amounts of performance parameters for each instrument as an input, which did not appear a sustainable approach.

4. Using OSCAR/Space

4.1 The recommended way to navigate in the OSCAR/Space capabilities module is to:

(i) Select the "Space capabilities" home page: http://www.wmo-sat.info/oscar/spacecapabilities

(ii) Then type the beginning of an instrument name in the "Quick-search" window on the top right of the screen.

(iii) Select the instrument of interest to view the instrument characteristics and its evaluation, and from that instrument page follow the links to either the various satellites carrying such instrument, or the variables it can potentially measure and the other instruments measuring this variable.

5. Developments

5.1 Several developments are being considered:

- Extending the current data model to add links to data access information, links to calibration information, and instrument status information.
- It is also envisaged to replace the current evaluation of instrument classes by a more flexible scheme.

5.2 At the moment, however, these developments have been put on hold because of the absence of the OSCAR developer and the plan to migrate OSCAR to MeteoSwiss.