

## Deployment concept in OSCAR and possible enhancements

### Definition from the WMDR model ([WMDR\\_ModelAndSchemaSpecification.pdf](#)):

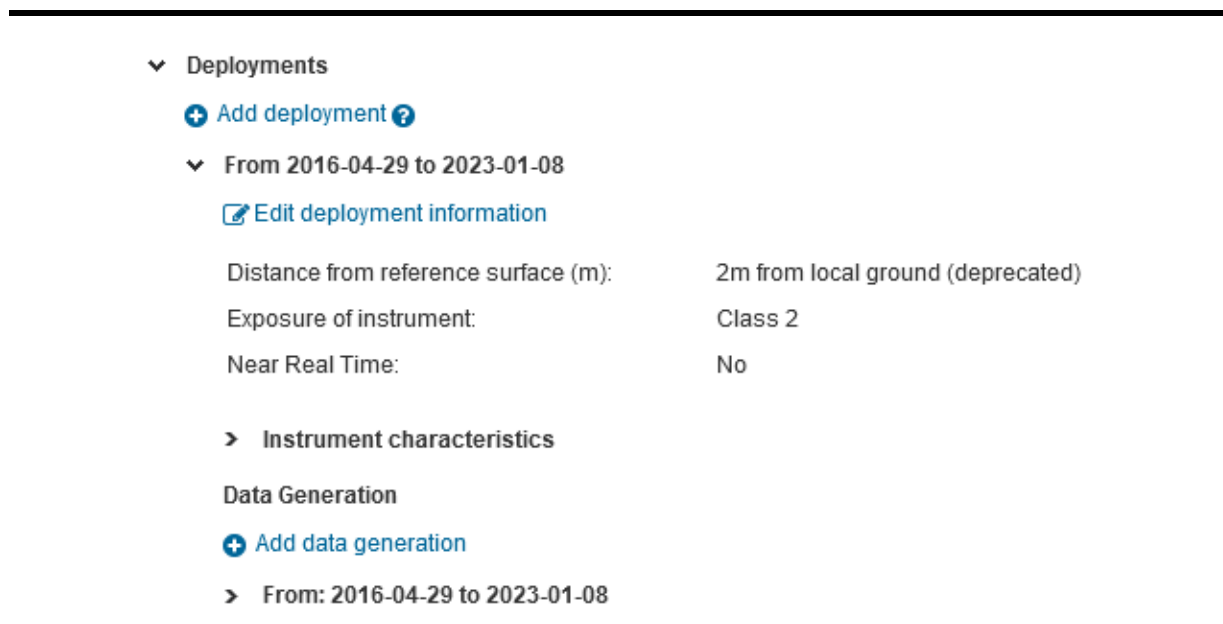
*“The Deployment describes which equipment is deployed, during which time period, and in which configuration in the course of generating observations. A Deployment can describe any period of time (equipment could be deployed for less than a day, e.g. a mobile sensor deployed in the field, or it could be deployed for many years.) A defining characteristic of the Deployment is that the configuration described in the Deployment remains, by-and-large, unchanged for the duration of the deployment. If the configuration changes, then a new Deployment must be recorded”*

### Help on the field Deployment from the OSCAR tool:

*“A data series consists of one or more deployments. A deployment is a largely uninterrupted period during which the data series variable was observed. An instrument is attached to the deployment. Create a new deployment when the character of the observation changes fundamentally.”*

### Interpretation:

A Deployment with WMDR concerned a variable and a time period, and is linked to a specific instrument and should reflect a time-series relatively homogenous. But also, the same deployment is linked to a specific Siting Classification (named Exposure of instrument in OSCAR), to a specific elevation from the ground, ...



The screenshot shows a user interface for managing deployments. It features a dropdown menu for 'Deployments' with an 'Add deployment' button. Below this, a specific deployment is selected for the period 'From 2016-04-29 to 2023-01-08', with an 'Edit deployment information' button. The deployment details are listed as follows:

Distance from reference surface (m):	2m from local ground (deprecated)
Exposure of instrument:	Class 2
Near Real Time:	No

Below the details, there are sections for 'Instrument characteristics' and 'Data Generation', with an 'Add data generation' button and a date range 'From: 2016-04-29 to 2023-01-08'.

### Oscar interface

That means that for each instrument modification or each modification of siting classification a new deployment shall be defined. At first glance it is not obvious to distinguish the reasons of creation of the different deployments for a station and for a variable. The application will have to search for the modifications between two or several deployments for the full understanding.

The Siting Classification is in fact a classification on the quality of the surrounding environment of the sensor/instrument and thus:

- ✓ The Siting Classification may change without any modification of the instrument;
- ✓ And replacing an instrument may have no effect on the Siting Classification.

For most systems in Climatological Departments, the data models for Climate Data Management Systems (CDMSs) are considering the time series for a certain variable and a certain station from the beginning date to the end date of the measurements. Without any judgment of homogeneity or inhomogeneity of the time-series. Meanwhile all modifications of the metadata are stored. Despite everything, a practice is followed by some NMHSs in case of obvious inhomogeneity and consist in the creation of another station (e.g. the displacement of the sensor is too large).

For the above definitions and reasons, an analyze of the following demands on the WMDR is suggested:

### **1 “Exposure” versus “Siting Classification”**

To rename the term “Exposure of instrument”, that is confusing, by “Siting classification” and thus avoid misunderstanding and use the real term from WMO-N. 8.

### **2 Trace the “Sitting Classification”**

As the Siting Classification may change without any modification of the instrument (e.g. modification only in the surrounding of the instrument), to allow different Siting Classifications (as the *Application area* field) for one deployment and so allow to trace the Siting Classification values along the history of the station. Currently in OSCAR there is no such possibility.

### **3 Multiple sensors for the same variable**

WMO-No. 1131 on CDMS Specifications, requires the possible management of multiple instruments for the same measurements (“Handling observations from multiple sensors per station, per phenomenon, and recording the source of each observation” page 53 WMO-No. 1131 Edition 2014).

Also, the Global Climate Observing System Surface Reference Network (GCOS-SRN) recommends instrument redundancy for **measurement** of Precipitation and Temperature: “Measurement redundancy, i.e., the use of multiple measuring instruments, is recommended. Redundancy represents one way to assess aspects of both traceability and comparability. By using multiple, co-located traceable instruments to measure the same parameter, both the single instrument values, merged instrument values, and the resultant data series can be compared. Identifying disagreement between the redundant data series provides an alternative method to detect measurement problems or sensor drift, which may be used to complement regular field verifications against travelling reference standards.” ([https://extranet.wmo.int/edistrib\\_exped/grp\\_prs/en/27831-2022-I-GCOS-GSRN-PS\\_en.pdf](https://extranet.wmo.int/edistrib_exped/grp_prs/en/27831-2022-I-GCOS-GSRN-PS_en.pdf)).

Oscar would have to manage instrument redundancy.

### **4 Be prepared for the Measurement Quality Classifications (Decision 6 (INFCOM-1))**

Measurement Quality Classifications for Surface Observing Stations on Land has been inserted into the Guide to Instruments and Methods of Observation (WMO-No. 8). As the “Siting Classification” this Measurement Quality Classifications should now be part of the OSCAR to qualify each instrument/sensor. See [https://library.wmo.int/doc\\_num.php?explnum\\_id=11197#page=180](https://library.wmo.int/doc_num.php?explnum_id=11197#page=180)

### **5 To declare the international reports from stations**

The WIGOS Data Quality Monitoring System (WDQMS) would be able to monitor Reports from stations e.g. CLIMAT, SYNOP, DAYCLI, etc. reports. Where such information is able to be declared by NMHSs in OSCAR?