Contributions of the SDR Task Network Tool to the Calibration and Validation of the NPOESS Preparatory Project Instruments

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Overview

The National Polar-orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Calibration and Validation (Cal/Val) team is planning post-launch activities to calibrate the NPP sensors and validate Sensor Data Records (SDRs). The IPO has developed a web-based data collection and visualization tool in order to effectively collect, coordinate, and manage the calibration and validation tasks for the OMPS, ATMS, CrIS, and VIIRS instruments. This tool is accessible to the multi-institutional Cal/Val teams consisting of the Prime Contractor and Government Cal/Val leads with the NASA NPP Mission team, and is used for mission planning and identification and resolution of conflicts between sensor activities. Visualization techniques aid in displaying task dependencies, including prerequisites and exit criteria, as well as allowing for the identification of a critical path. This presentation will highlight how the information is collected, displayed, and used to coordinate the diverse instrument calibration/validation teams.

SDR Cal/Val Task Identification

SDR Cal/Val Tasks have been identified and described by the NGAS Cal/Val leads, in coordination with government and NASA members of the collaborative Cal/Val team. Each discipline has taken a slightly different approach to task organization and categorization, in correlation with the diverse needs of each of the individual instruments. However, SDR Cal/Val tasks can generally be described by the following categories:

- Sensor Activation and Algorithm Initialization
- Comparison of on-orbit sensor characteristic to laboratory measurements
- Assessing and trending of the sensor behavior overtime
- Performing regular measurements of sensor calibrations and subsequent look-up table (LUT) and algorithm tuning.
- Monitoring the performance of the sensor, SDRs outputs, and EDR products for accuracy, completeness, and precision.

CasaNoaa Tool

CasaNOSA is a controlled-access web site which aims to support collaboration amongst the NOAA community in areas of project development and resource management. CasaNOSA stands for the "home" of the NOAA Observing System Architecture (NOSA).The SDR Cal/Val tasks and their associated metadata will be entered into CasaNOSA, which will be maintained as the common resource of the SDR Cal/Val Task Network, accessible to all members of the Cal/Val community. Providing this common tool for task visualization and manipulation will allow for efficiency of task network management and ease of collaboration. The SDR Cal/Val Task Network tool will be used to display a master timeline for all sensor Cal/Val tasks. Task ordering will be based on individual task scheduling constraints, task durations, task-to-task dependencies, and prioritization.

Tool Components

Task List Display Manipulation Tools

Hierarchy Order

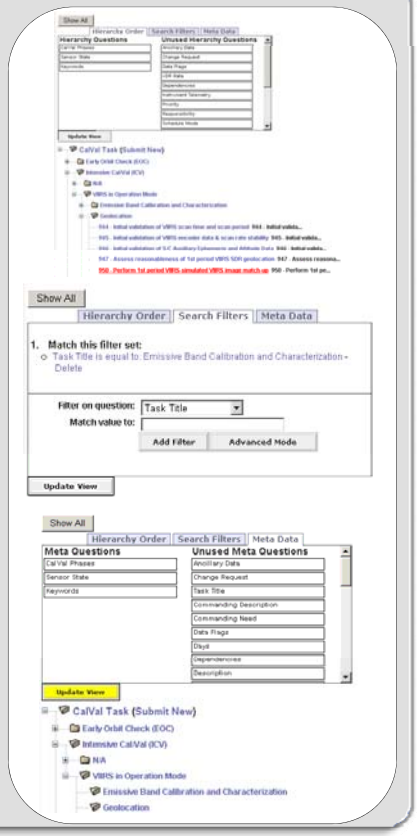
Allows the user to prioritize task metadata and sort tasks based on their selection. Any unused hierarchy questions will not be considered in the task sorting. In this example (right), the tasks are sorted by Cal/Val Phase, Sensor State, and Keyword, sequentially.

Search Filters

Allows the user to put certain filters on which tasks they would like displayed. The user can set a certain metadata component to a selected value, and their task list will be altered accordingly. In this example (right), the filter would be set on the task title.

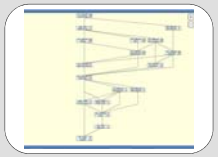
Metadata Exclusion

Allows the user to exclude certain metadata from the task list display. Metadata that is excluded will not be considered when tasks are sorted.



Task Dependency Tree

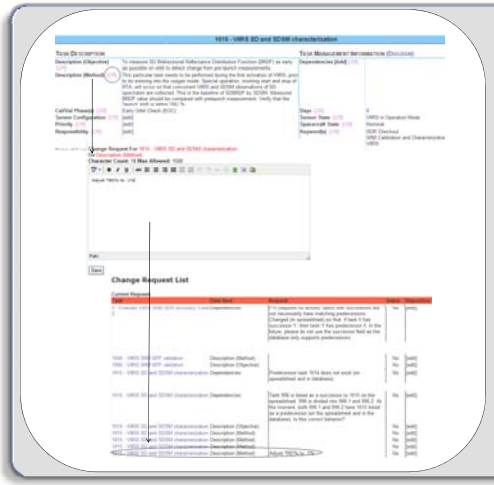
From the individual task web display, users can navigate to a Task Dependency Tree associated with that individual task. This diagram provides a visualization of all task dependencies along with their duration, allowing for the identification of a critical path for task execution.



Task Metadata View

The task metadata includes information about task objectives, methods, prerequisites and exit criteria, along with many other data specific to each individual task. This metadata can be displayed in one of two ways: by generating a Printed Report or utilizing the individual task web display. By generating a Printed Report, the user is able to export an excel sheet that contains all tasks with their associated metadata. The web display provides a one-page display of all metadata associated with a single task.

Task Metadata Manipulation



The SDR Cal/Val Task Network will be a living entity. Changes may be required as lessons are learned from testing and post-launch analysis, and as new science and technology may be available as resources for calibration and validation efforts. For this reason, the CasaNOSA tool will allow for users to submit "change requests" to the Task Network content. In the individual task web display, there is an option to submit such a request next to each field. Users can click on this option, populate the requested fields in the provided form, and add their request to the "Change Requests List". Users can track and observe the progress of their requests, as well as any others, through this list. Any change request will be required approval by a designated board before being incorporated into the Task Network.