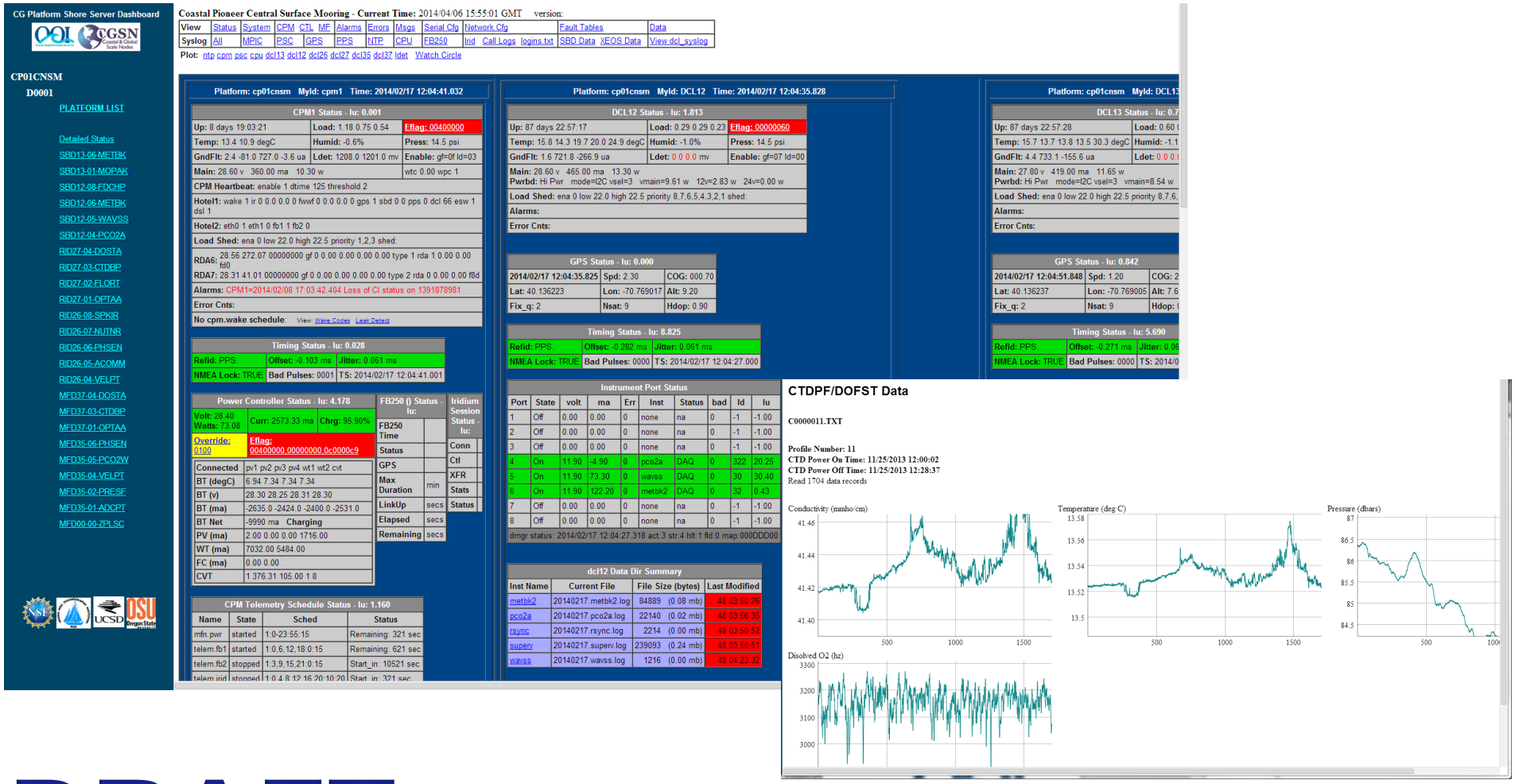
OMC Operations: Asset Status and Health

- Current System
  - Developed as an “interim solution,” pending delivery of the full featured Cyberinfrastructure.
  - Engineering, single level, fixed Displays with no scope for further maintenance or modification post-MREFC.
  - GUIs provide a mix of useful, non-useful and incomplete information for the Marine Operator. Difficult to use.
  - Incomplete Alerts and Alarms.
  - Application is useful for Integration, Test and Installation, not for monitoring status and health of multiple moorings.

Present Day: OMC Platform Status



DRAFT

Going Forward:
Marine Operator Requirements for Cyberinfrastructure

- "Assets at a Glance" world screen, with overlays and drilldown.
- Asset Tracking
  - Marine Operator responsible for entry of "As-Built" Asset Information.
  - Connect TBD Asset Tracking Database to Operations.
- Alerts: Configurable notifications that indicate an event that requires attention
  - Ex: moisture level increasing within pressure housing, missed telemetry connection, incomplete data, and instrument measurement out of range, spikey, zeroed, etc.
- Alarms: Configurable notifications that indicate an event that requires 24/7 action
  - Buoy moves out of pre-defined range circle.
  - XEOS Beacon on bottom of Surface Buoy begins transmitting.
  - AUV or Glider position is consistent with an unapproved recovery.
- Action Management
  - JIRA-Based
  - Provides method to track problem resolution through assigned actions, Engineering Investigations and FMEA.
- Associations
  - User configurable capability to display "side by side" measurements from different instruments and/or systems for cross comparison.
- Activity Log Files
  - Support Troubleshooting and Lessons Learned
  - Provides for Marine Operator Handoff
  - Integrated with TBD Asset Tracking Database
- Trouble Tickets
- Support to Asset Deployment/Recovery

DRAFT

CGSN Mooring Status Items: Initial Strawman List of Alerts

- Communication functionality
  - Telemetry logs for all comms/ beacons
  - Cross-ref with FTP call logs if doubt
  - Instruments/profilers to the CPM or STC
  - DCL link and telemetry schedule
- Major platform controller components (CPM, DCL, STC)
  - Critical variables include voltage, humidity, leak detect, port status
  - Error codes
  - Look for anomalies and compare against previous day(s)
- Power System Controller
  - Inspect data graphically (battery charge, charge cycle, etc.)
  - Compare to weather and previous day/ week/month
  - Load-shedding may be necessary, algorithm is not automated
  - Supervisor logs to review the voltage & current draws
- Instrument
  - Presence of data, file size comparison to usual, and in range
  - View engineering
- MMP profiling functionality
  - Last profile, profile summary
  - Supervisor stc log data

3204-xxxxx CG Pioneer System Health Procedure (2013-11-26)

These Alerts can be Tiered based on Level of Concern

DRAFT

Tier 1 Items

Item	Resource
• Geolocation – Watch circle “geofence”	• Status_stc file
• Telemetry and Communication	• Call logs, telem logs
– Fleet Broadband – Iridium ISU (RUDICS) – Iridium SBD – Beacons – Instruments to the CPM or STC – DCL link and Schedule Variance	• Config files vs. call logs • Asset Tracking Database • As-Built TDP

DRAFT

Tier 2

Item

- Power System Controller
  - Battery charge, charge cycle
  - Voltage and current draws
- Status of platform controllers
- CPM, DCL, STC, MPEA status
  - Voltage, humidity, leak-detect, port status
  - Error codes
  - Anomalies and trends
- MMP Profiling function
  - (Tier 2/3 because it drives telem)

Resource

- PSC logs
  - Supervisor logs
- Supervisor logs for CPM, DCL, STC, and MMEA
- Config files vs. call logs
- PSC status logs
- MMP logs
- Asset Tracking Database
- As-Built TDP

DRAFT

Tier 3

Item

- Instrument Function
  - Data file presence, size
  - Data range and trend
  - Anomalies and trends
  - Specific instrument outputs
- MMP profiling function
  - (Tier 2/3 because it drives telem)

Resource

- Instrument logs and data files
- MMP logs
- Asset Tracking Database
- As-Built TDP

DRAFT

Status and Health Support from Contextual Data

- Connect Tier 1 parameters to geographic/geophysical context, including location, bathymetry, and METOCEAN.
- Visual cue and drill down details are provided that provide context for status, alerts and alarms.
- Display METOCEAN data from mooring sites (wind, waves, currents, temp).
- Layer environmental data (2d fields, wind, waves, currents, temp, altimetry).

Status and Health Support from Mooring Context

- Connect displays to mooring “as-built” TDP and Asset Tracking information.
- Link to separate displays for each instrument, w/ relevant metadata and user defined statistics.
- Allow drill-down “hotkeys” to minimize access time to specific instrument, or display of sub-system time series or stats.
- Visual cue for alerts and alarms.
- Display deploy/recover ship overlay to support turn cruise operations.

DRAFT

Metrics

- Displays provide support to aggregate and display of metrics.
- Data volumes per time.
- Telemetry link attempt versus actual time.
- Percentage of instrument data versus expected.
- Mooring/Subsystem Reliability.
- Engineering Investigations, FMEAs and Actions.
- Power Metrics, including charging, spikes, outtages, and wind, solar and fuel cell production, etc.

Usual Operations

- Glider and AUV Piloting and Planning.
- Monitoring of Asset Status and Health.
- Problem triage, including Vendor Interaction, data analysis, alert and alarm response.
- Asset Tracking Database Data Entry, including management and scheduling of refurb/repair/replacement of assets.
- Assurance of Data delivery to CI.
- OMC Maintenance – management, configuration and troubleshooting of OMC servers and software.
- Operation Watch Transitions.
- Managerial Oversight, including scheduling, forecasting, workload, training, mission planning and review, performance assessment.
- Interaction with outside community.

Unusual Operations

- Mooring out of Range Circle.
- Mooring, Vehicle, or Component shows unusual behavior.
- Alarm and Alert Response.
- Deployment and Recovery Operation Support and Handoff.
- Identifying and correcting issues working with relevant Design Engineer.
- Vendor Interactions.
- Asset Loss Response.