SAND2020-3396PE

GMS Station SOH Capabilities

PRESENTED BY

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SAND2020-XXXX

GMS Project Status

PI 8 GMS System was released as open source Dec 2019

During 2019 AFTAC asked Sandia to “pivot” the GMS program

- “to provide operational functionality sooner, with incremental upgrades delivered to the operational US NDC, rather than entire system delivered at the end of the program as originally planned”
- This involves significant new infrastructure, operationalization, deployment, and testing effort

GMS started pivot in PI 10

- To get started, GMS is developing an operational Station SOH Display
- Described by the Monitors Station State-of-Health use case and storyboards
- Several “capabilities” over a number of PIs

Future priorities and capabilities are being discussed

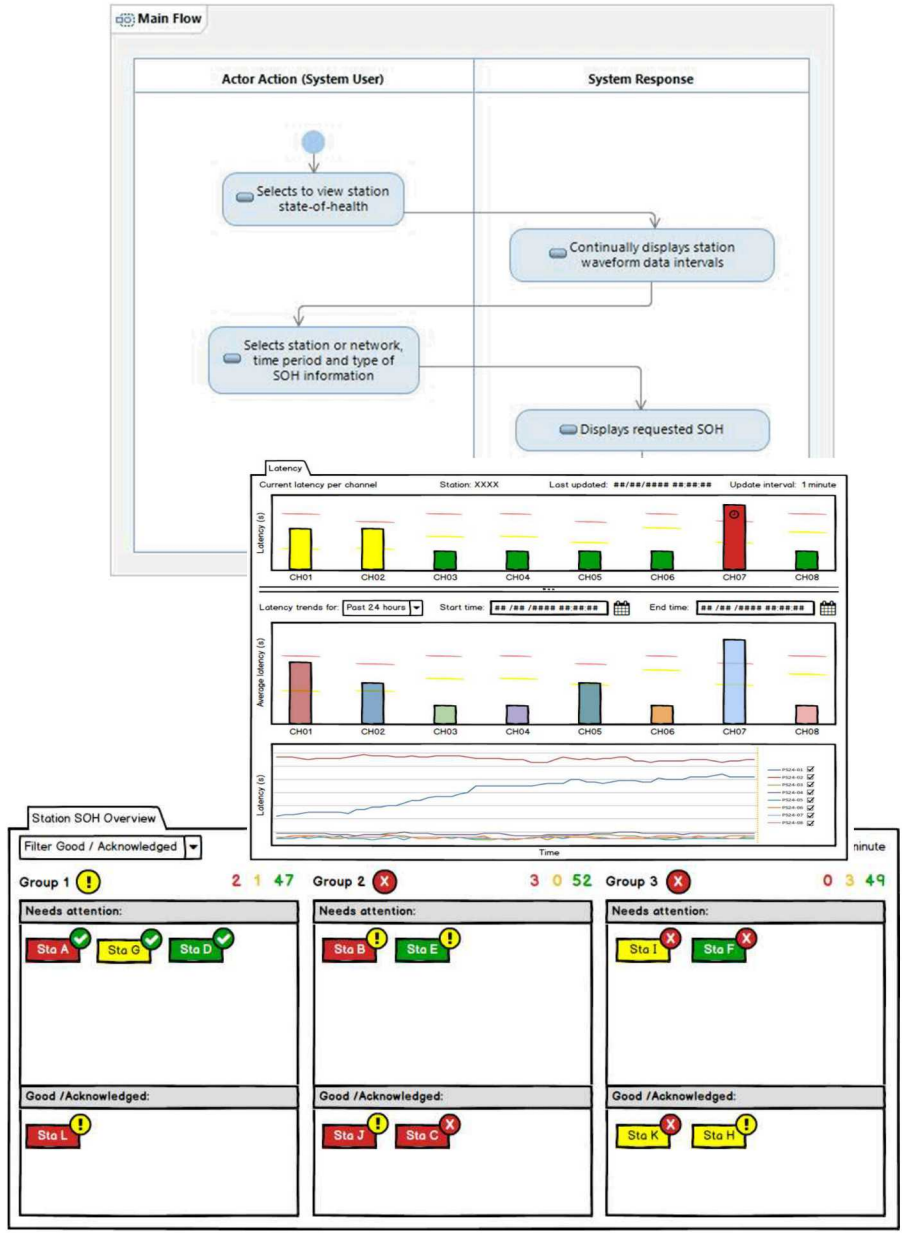
Monitors Station State-of-Health Use Case and UI Storyboard

UC Brief Description:

- This use case describes how the System User monitors station state-of-health (SOH). The System User views current station state-of-health (e.g., state-of-health values reported by the station, timeliness of waveform data intervals, station processing statistics and thresholds, and waveform QC masks) to detect problems with station data quality and availability.

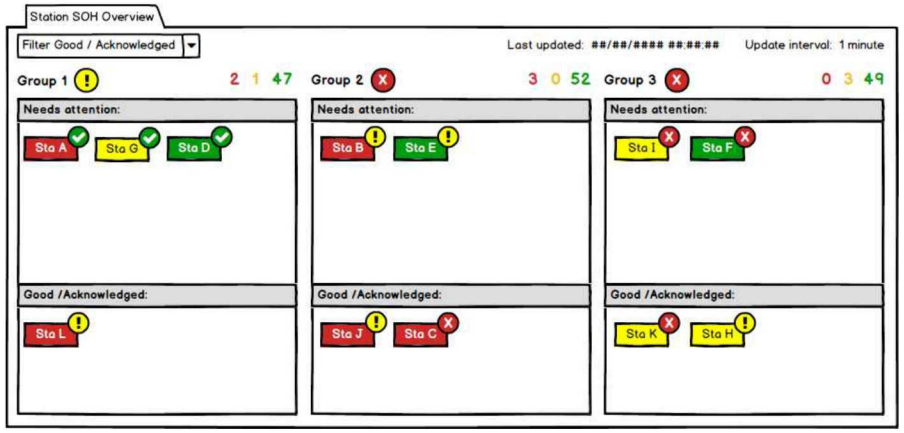
Key concepts from the UIS:

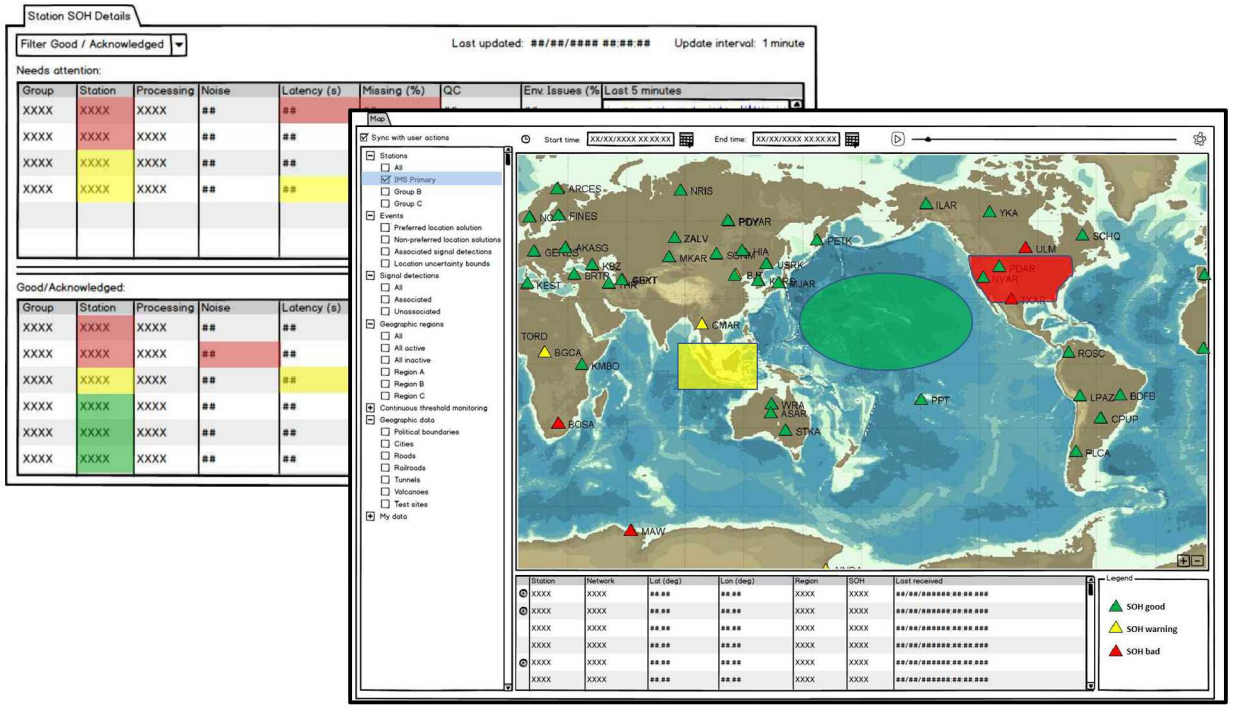
- The focus of this capability is on real-time station state of health (SOH).
- This capability is intended primarily for use by the System Controller. However, other system users (e.g., Analysts) will likely also find it useful.
- Incoming station data is monitored on a per-station basis and issues are addressed as needed.
- Users need to view both individual station status as well as the overall status of networks of stations.
- Displays provide users with an at-a-glance view of station SOH plus the ability to drill down into the details of a specific station.



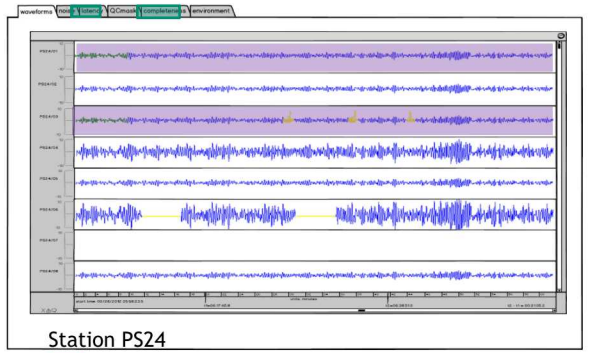
Station SOH Capability Displays

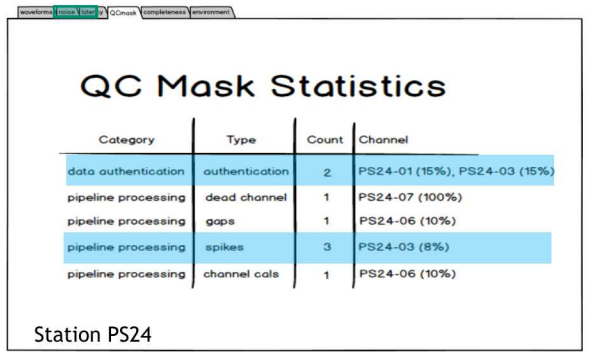
Summary Level

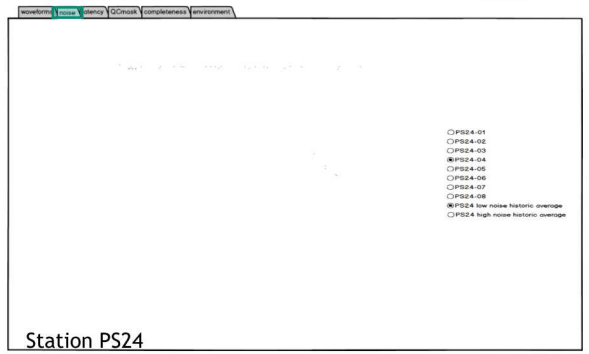


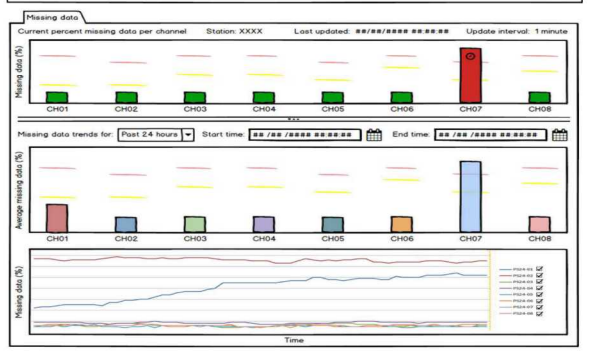


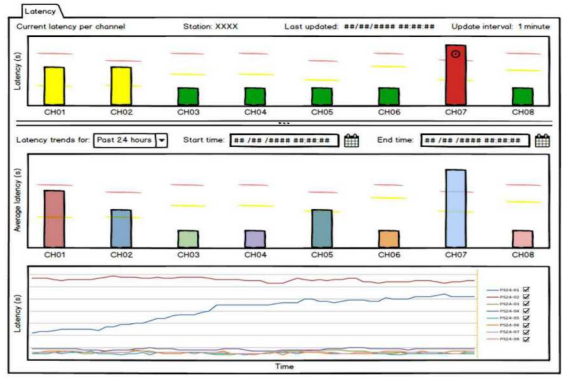
Drill-down











GMS Station SOH Capabilities

Initial (PI 10-11)

- CD1.1 only, 100 stations
- Processing for Missing Data, Latency, Station Environment Issues
- Overview and Details displays – status roll-up w/ acknowledgement
- Current view for Missing, Latency, and Environment drill-down displays

Intermediate (PI 12-13)

- CD1.1 only, 300 stations
- Store SOH data for trends, restart w/ state
- SOH Status History display
- Trend view for Missing, Latency, and Environment drill-down displays
- Data Availability (workflow) display

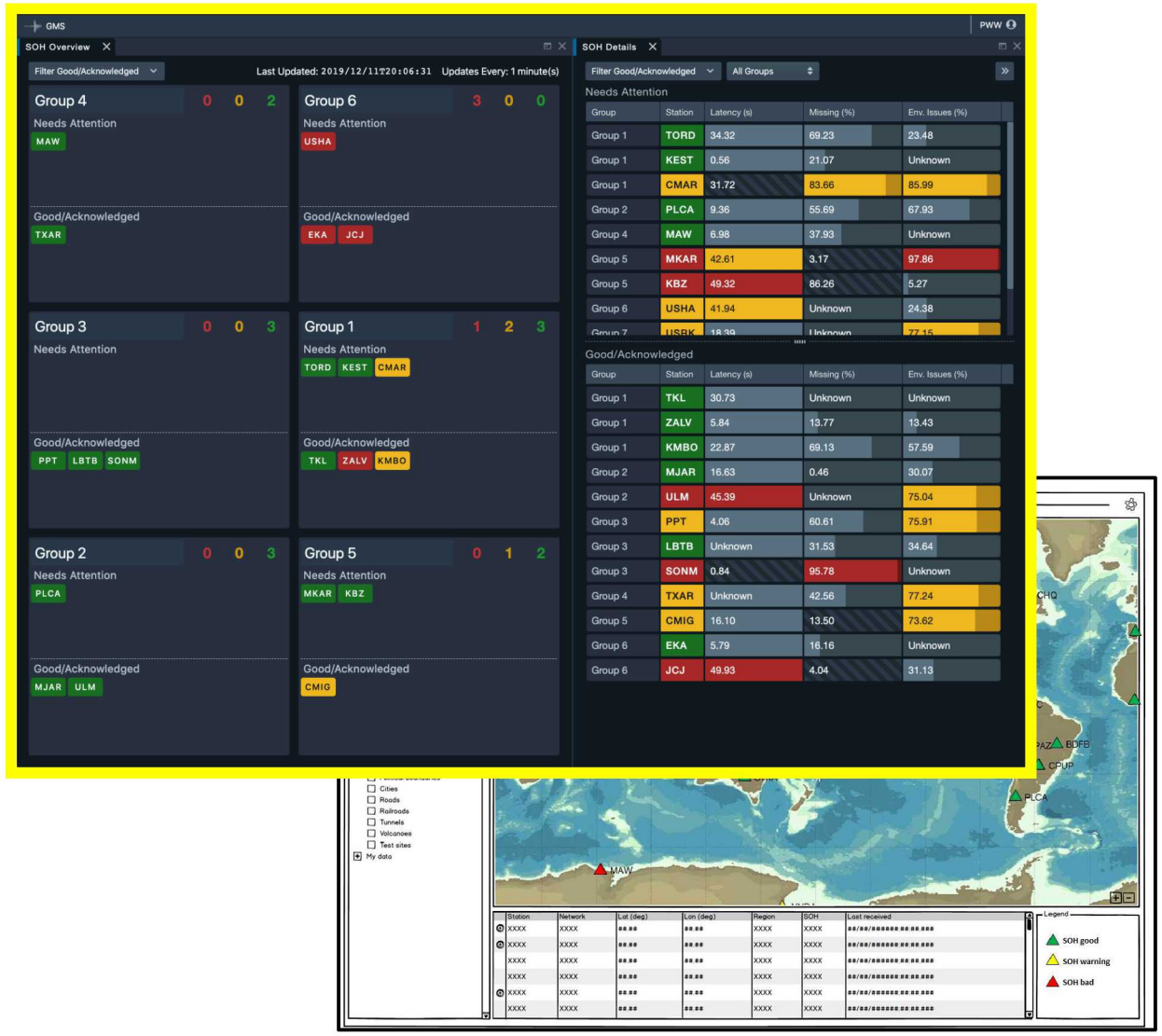
Complete (TBD)

- Other protocols, 1000+ stations
- Waveform processing for Station Noise, QC Masks
- Waveforms, QC Masks, Noise, Map displays

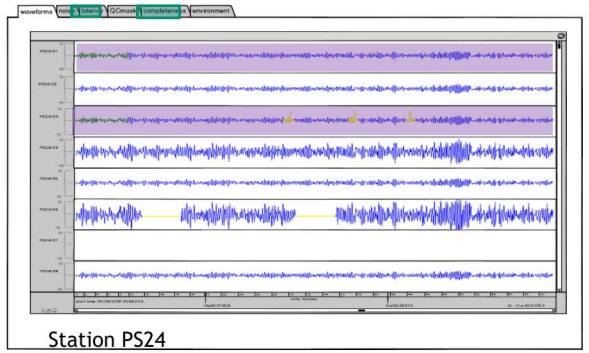
Initial Station SOH Capability Displays

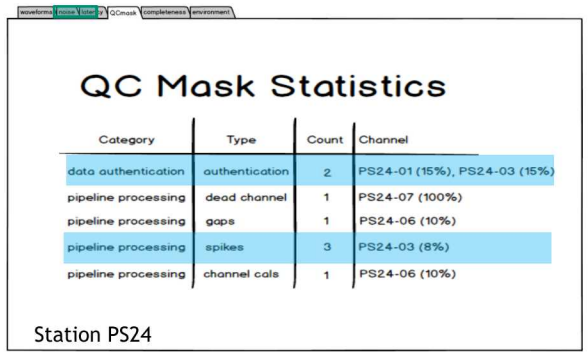
Summary Level

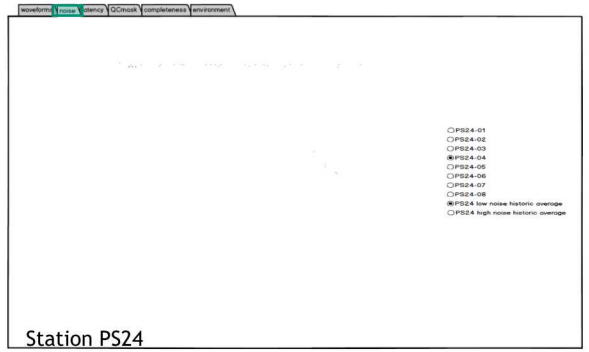
PI 10

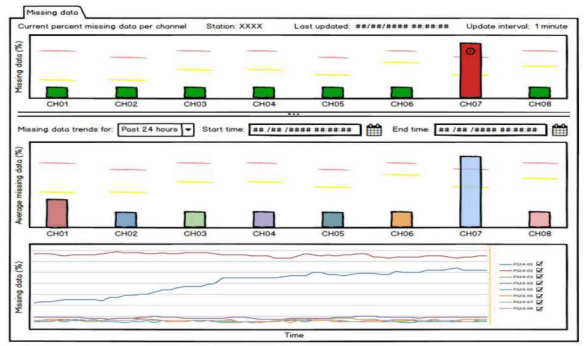


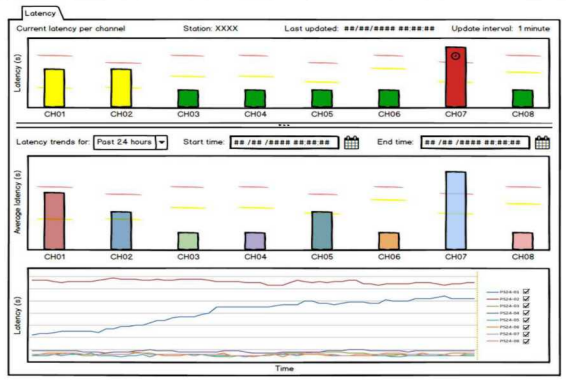
Drill-down







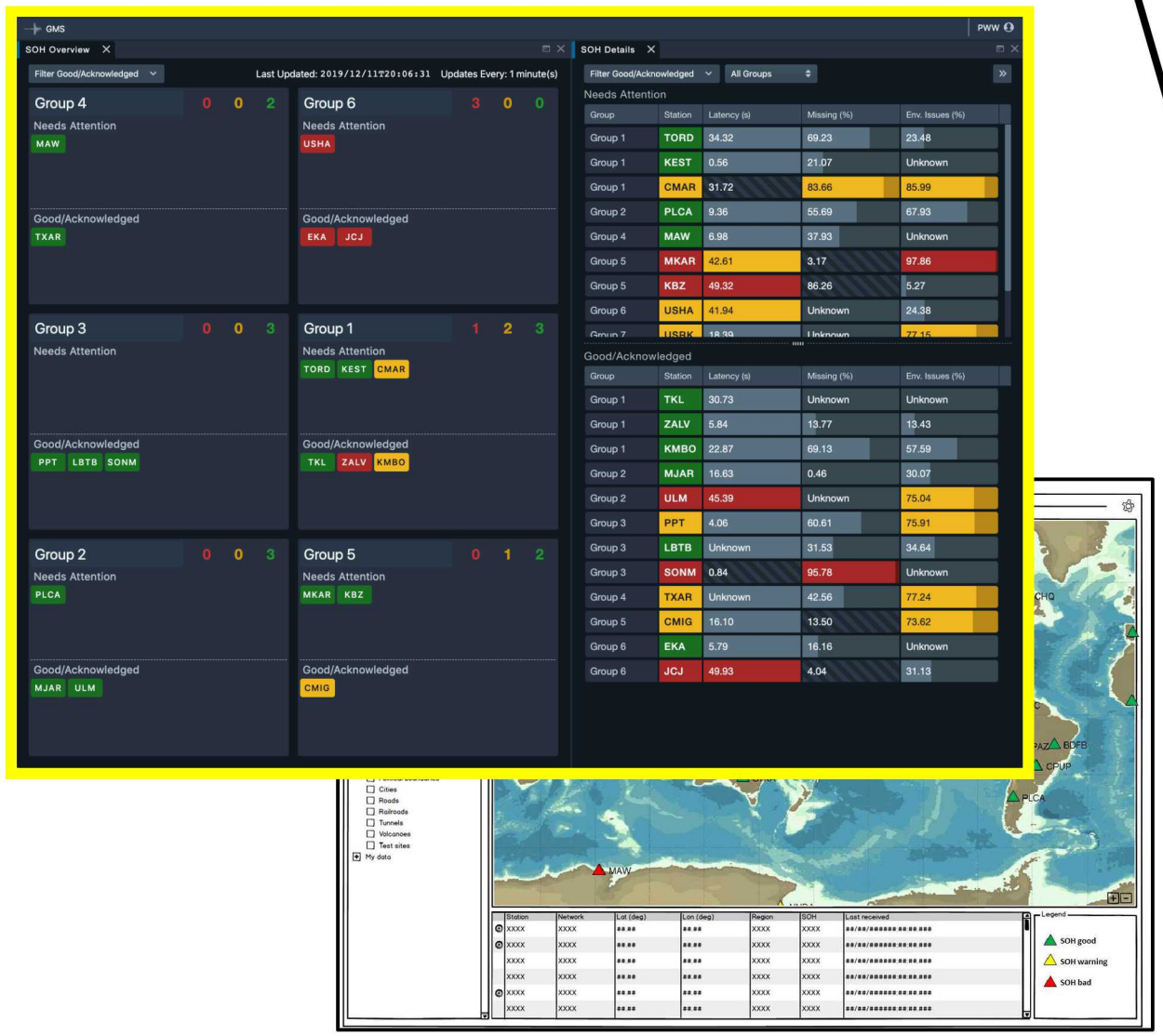




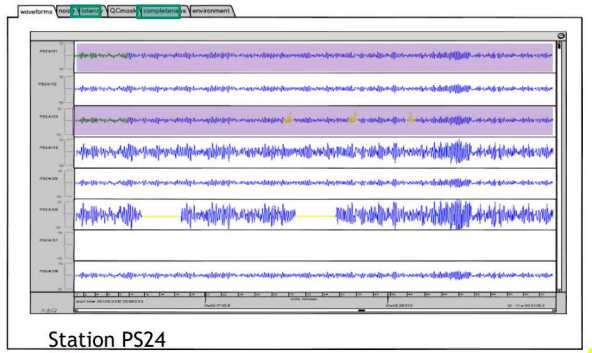
Initial Station SOH Capability Displays

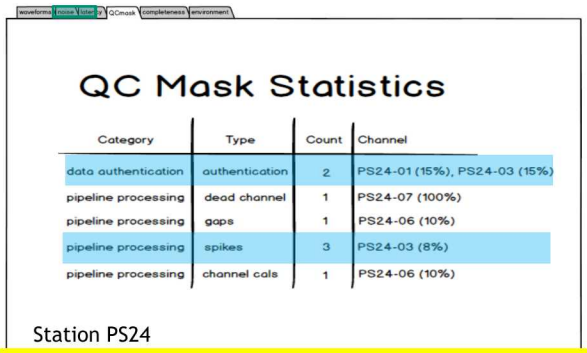
Summary Level

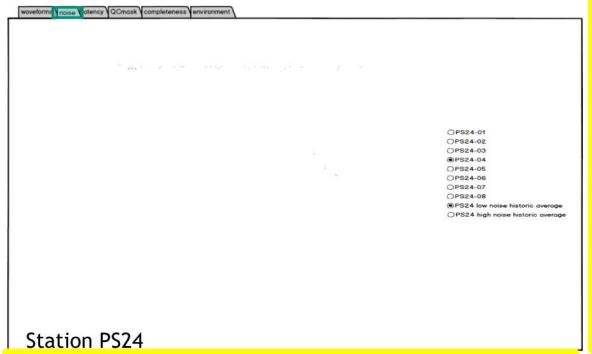
PI 11

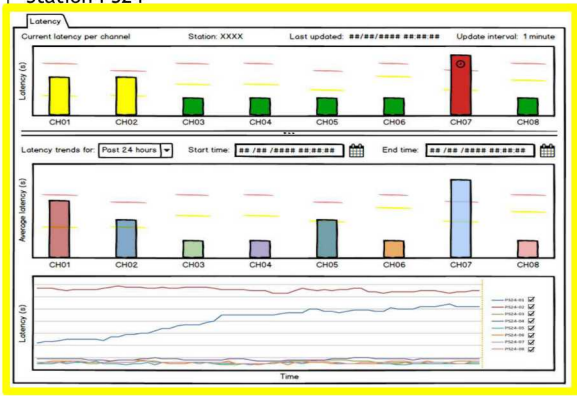


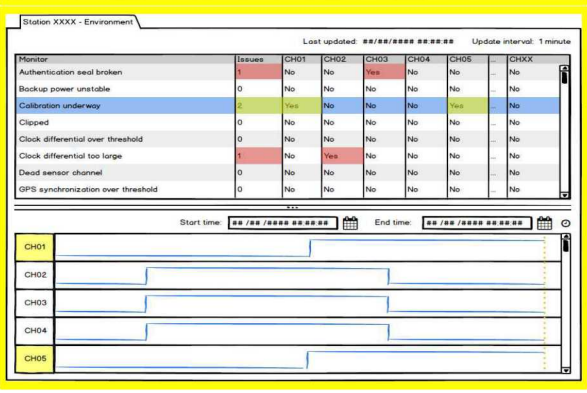
Drill-down











Initial Station SOH Functionality

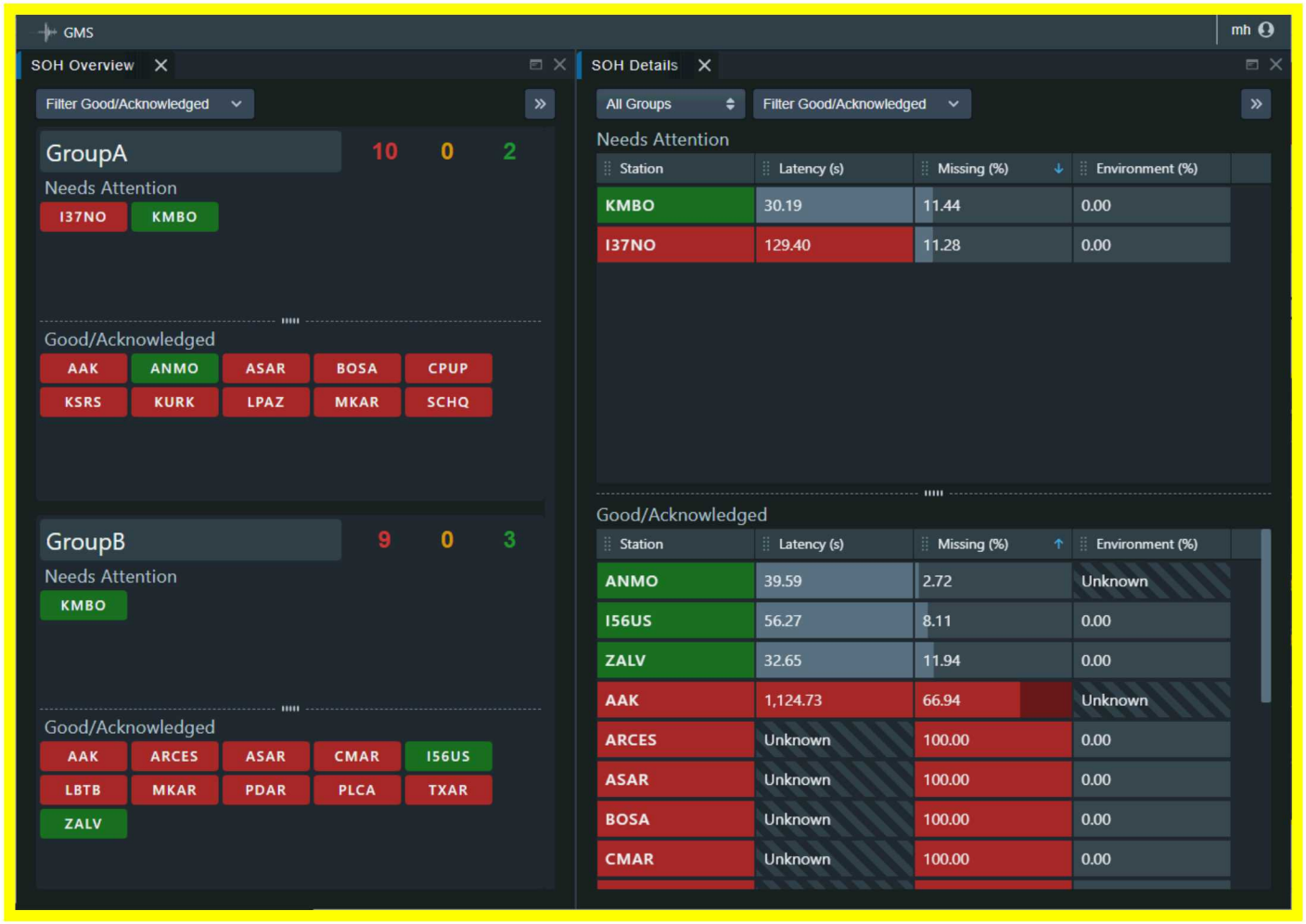
SOH Workspace displayed in browser on OPS

SOH Overview Display

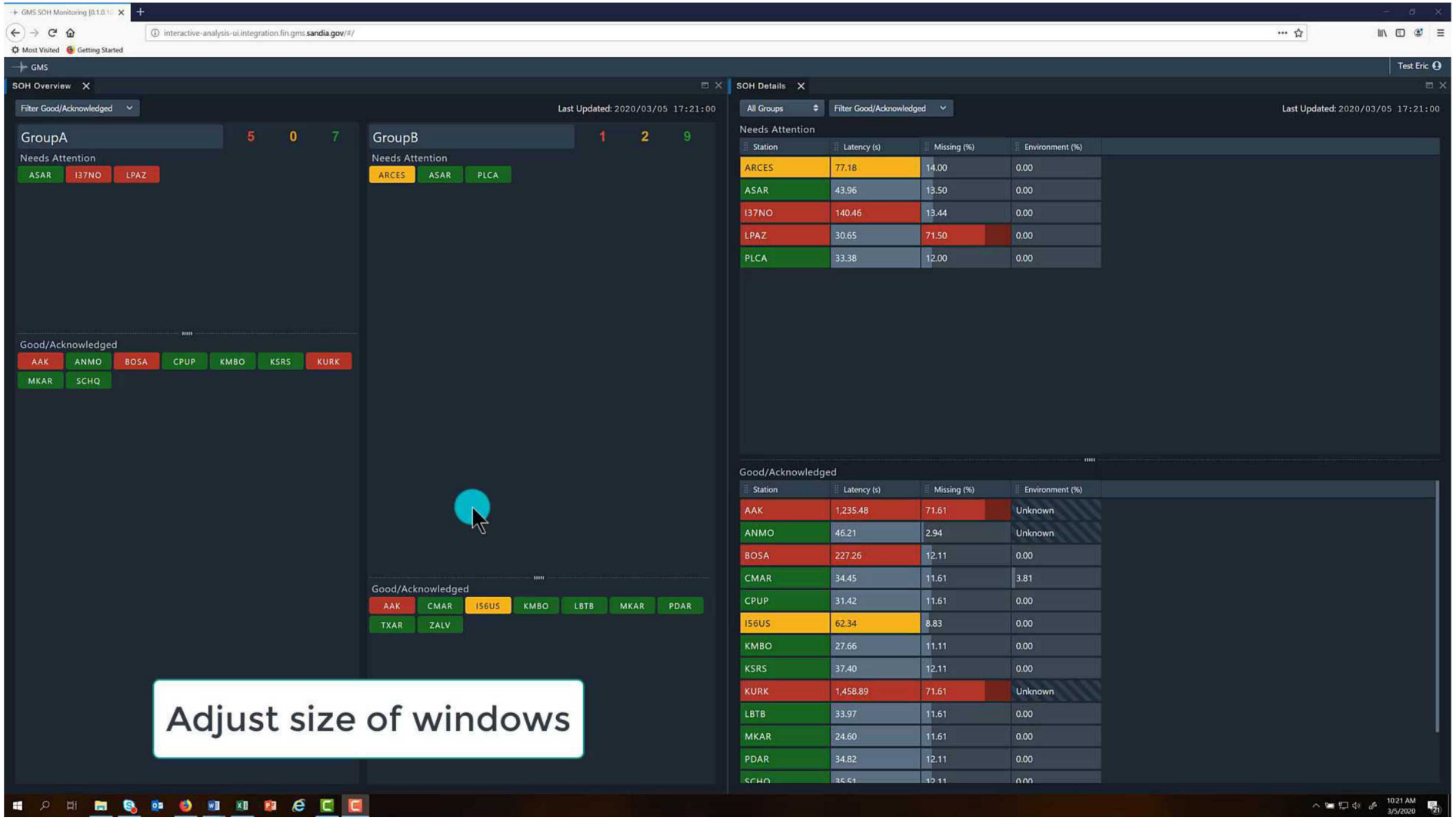
- Displays roll-up current SOH status for each station
- Stations organized by Station Group
- Changes in status are flagged as needing attention
- User acknowledges status changes, moving the station to the lower panel

SOH Details Display

- Shows per-station status for Latency, Missing Data, and Environmental Issues
- Status changes and acknowledgements synchronized with Overview Display



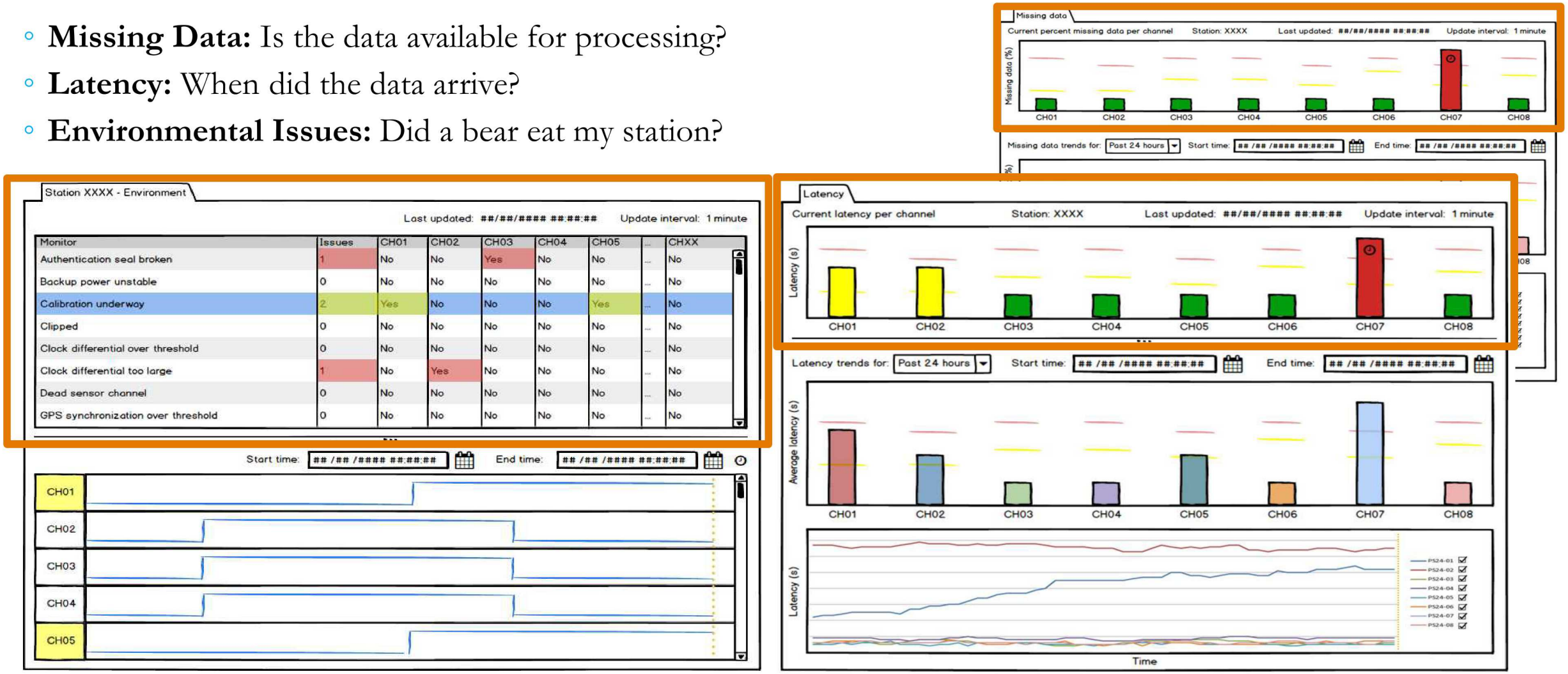
PI 10 Demo Recording



PI 11 Priority 1: Drill-down UIs

UIs showing detailed information about Latency, Missing Data, and Environmental Issues help users troubleshoot specific issues on a selected station

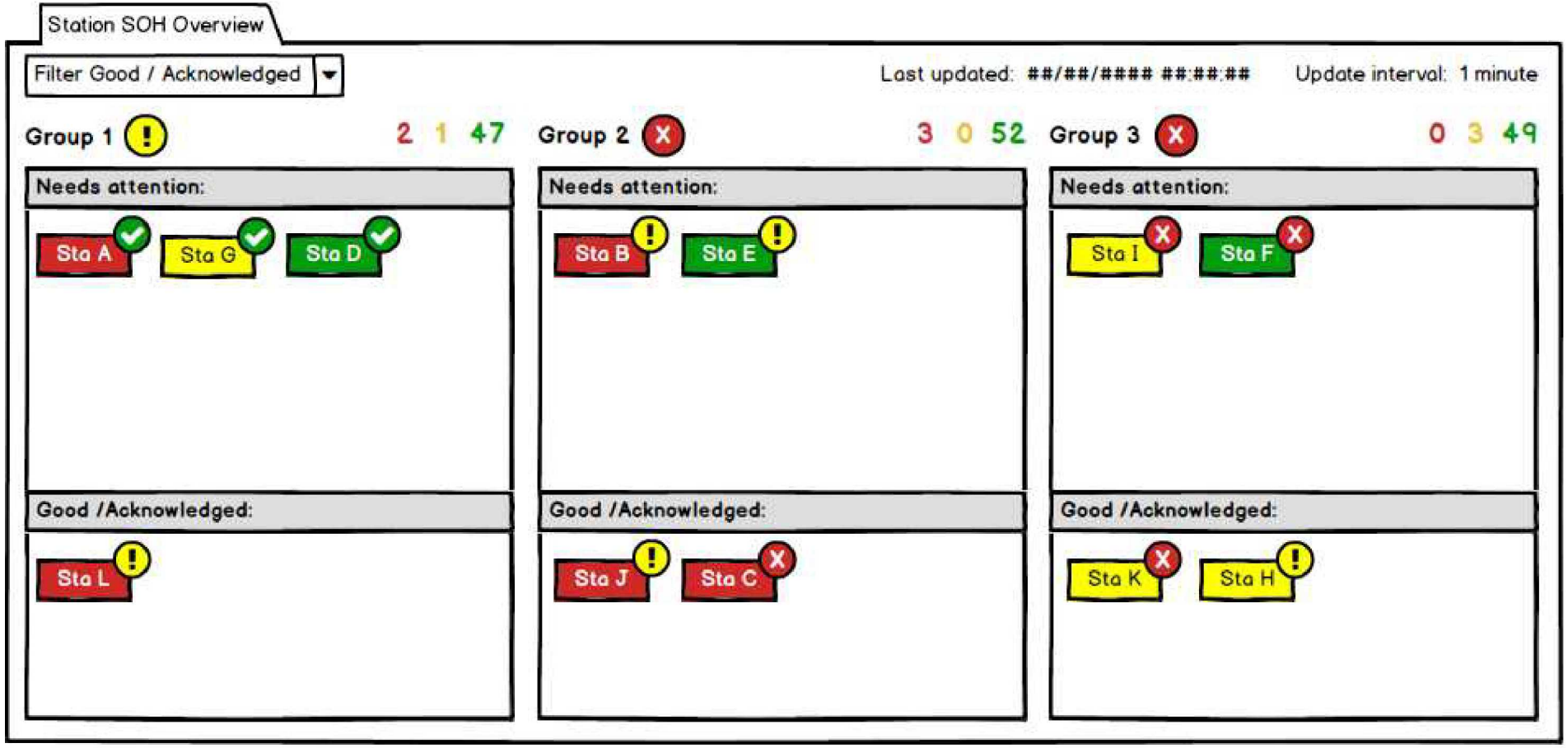
- **Missing Data:** Is the data available for processing?
- **Latency:** When did the data arrive?
- **Environmental Issues:** Did a bear eat my station?



PI 11 Priority 2: Capability-based rollup

In PI 10, we implemented a pure "worst-of" SOH status rollup – which alerts users to *any* issue on a station

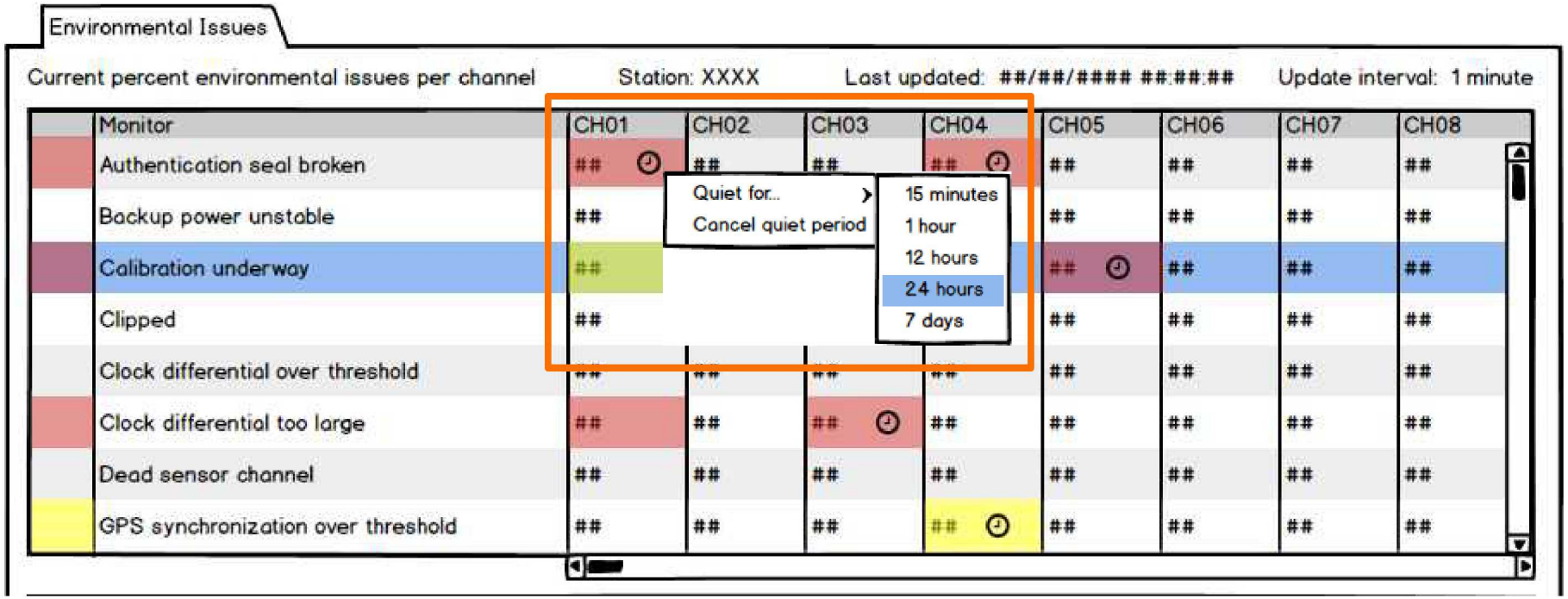
A second ***capability-based rollup*** helps users prioritize which issues to troubleshoot first based on impact to the mission



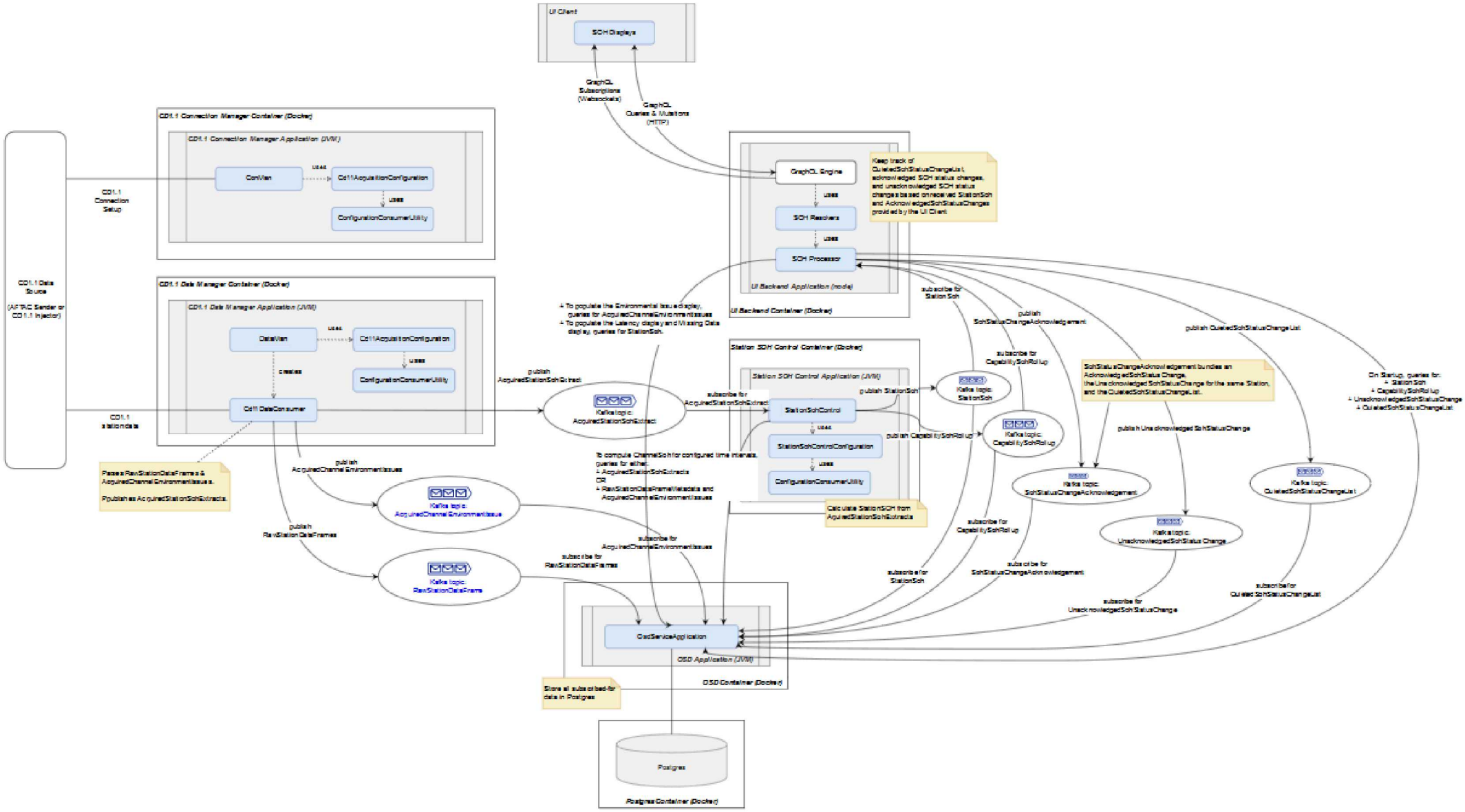
PI 11 Priority 3: Quieting issues on problematic stations

As of PI 10, users are not notified of additional status changes for issues that have already been acknowledged within a configurable period of time (i.e., a "quiet" or "cool-down" period)

Users would like to be able to ***extend that "quiet period" for issues that can't be fixed quickly*** – this prevents repetitive notifications for the same issue and helps ensure that users see notifications for any new issues that arise on the same station



Architecture Overview



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