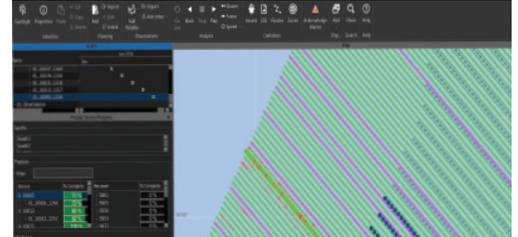


Automated OBN QA/QC System

Integrated, comprehensive, configurable and easy-to-use tools and workflows that provide a paradigm shift in automated QA/QC capabilities and data delivery.

- Automated source and receiver processing workflows and QC attributes
- Fully integrated software solution: from planning, through acquisition and QC
- QC driven edit management
- Multi-vessel capable
- Cloud based architecture enabling remote access
- Processing ready data

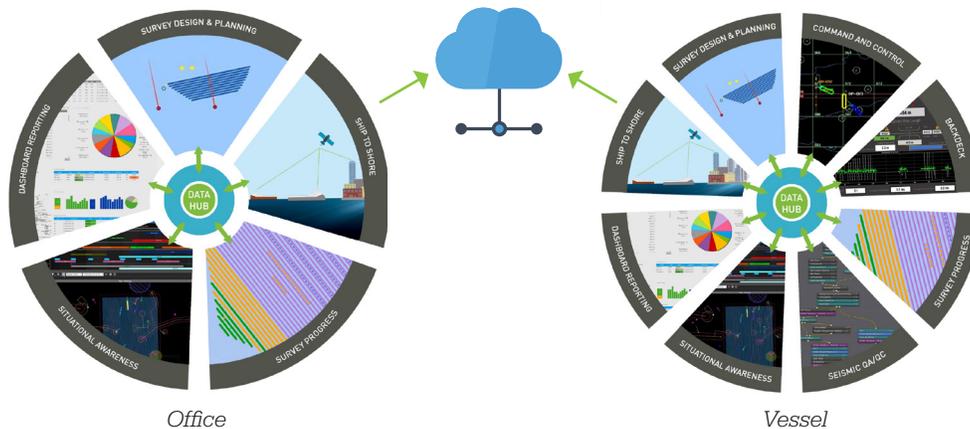


Industry Challenges:

The current QA/QC solutions for today's OBN operations, when faced with the challenges of increasing data densities and acquisition rates, are fragmented and inefficient. Separated work silos, multiple different pieces of software and no direct, unified communication between components result in too much data to look at. Using the traditional approach is labour intensive, error prone and slow.

ION's Solution

ION has developed a state-of-the-art QA/QC system for OBN operations which delivers processing-ready data off the boat. A central Data Hub and integrated software, built on industry leading software platforms, together with automated, comprehensive attribute-driven workflows, provide quality assured deliverables with flexible dashboarding and report generation.



KEY BENEFITS

Integrated

- Minimizes impact of silos, centralized data and metadata
- Integrated Command and Control, Navigation, Acquisition, QA/QC and Deliverables
- Centralized multi-vessel command and control
- Integrated data-driven edits and positioning

Automated

- Single, comprehensive, attribute-driven QA/QC workflow - minimizes operator interaction, reducing personnel overhead

Flexible

- Modular system underneath, allows changing of technology without rebuilding software

Capable

- Built on industry leading platforms (Gator™, Marlin™, Galaxy/Perseus) – proven Navigation Command & Control, Situational Awareness & Processing technologies
- Delivers quality-assured deliverables with flexible dashboarding and report generation

Connected

- Supports multiple vessels, single effective Data Hub
- Cloud-based access to Survey Progress for remote and client access
- Technical oversight/problem solving from onshore

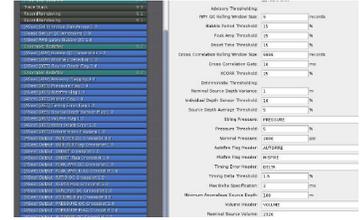
Fast

- Specifically designed to keep up with industry-leading acquisition rates

QA/QC Workflows:

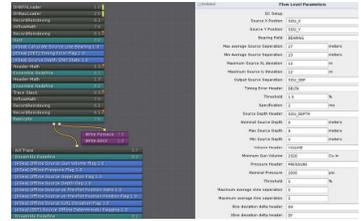
Realtime Source QC: Live View of Source Acquisition

- One flow per source line, each new shot automatically appended as it becomes available
- Reads NFH data in near-realtime during source acquisition, using realtime nav positions
- Performs realtime QC steps and generates drill-down displays for viewing in Survey Progress



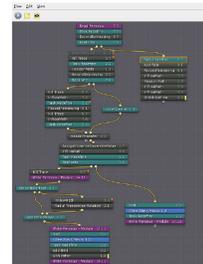
Source Sequence Summary Workflow

- One flow per source sequence, launched automatically once realtime sequence flow edits are signed off
- Reads NFH data again, now using final processed nav positions
- Performs position based QC steps, creates flags and attributes and writes them to the Data Hub for reporting
- Calculates summary shooting statistics for the source sequence and writes them to the Data Hub for reporting



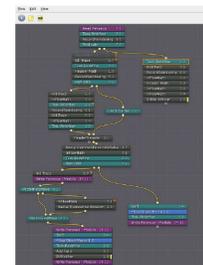
Receiver QC Workflow

- One flow per node, launching automatically as each node is recovered and data harvested
- Reads node 4-component continuous seismic recording, and performs shot registration to create a receiver gather
- Performs data quality QC steps, creates flags and attributes and writes them to the Data Hub for viewing with Survey Progress
- Optionally applies data corrections such as clock drift and field rotation to facilitate processing
- Outputs a 'Raw' shot registered dataset and/or 'Processing Ready' dataset



Receiver Sequence Summary Workflow

- One flow per receiver line, launched automatically when all nodes on line have been recovered and QCed
- Reads datasets output from individual receiver QC flows
- Outputs a receiver line stack and selected receiver gather vertical slices, creates flags and attributes and writes them to the Data Hub for reporting
- Calculates summary recovery statistics for the receiver line and writes them to the Data Hub for reporting

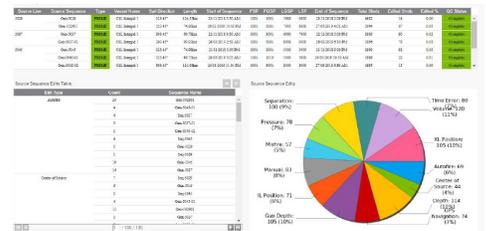


Bespoke workflows can be launched on demand for project set up, mobilization, flow threshold testing and deliverables.

Dashboard Reporting

Dashboards are integrated with Data Hub which ensures compatibility across all software.

- Centralized data
- Ship-to-shore via cloud-based data hosting survey-wide landing page
- Drill-down displays provide access to additional data



About ION

ION has been a technology leader for 50 years with a strong history of innovation. Leveraging innovative technologies, ION creates value through data capture, analysis and optimization to enhance companies' critical decision-making abilities and returns. Our offerings are focused on improving E&P decision-making, enhancing reservoir management and optimizing offshore operations.