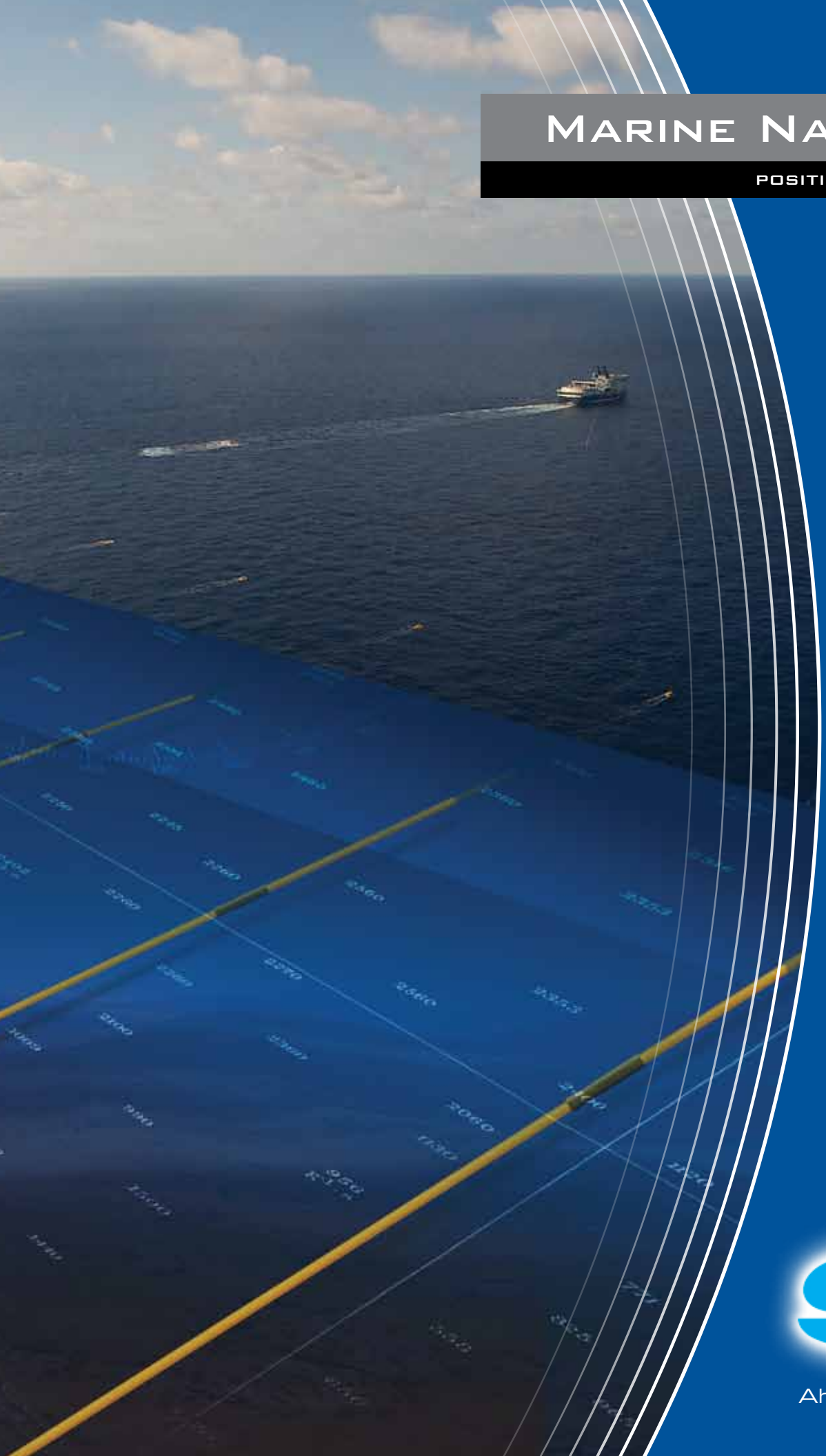


Marine Navigation

positioning and control

Sercel

Ahead of the Curve℠

INTRODUCTION

HIGH-PERFORMANCE PORTFOLIO
- 2D, 3D, 4D, WAZ planning, acquisition and processing

EASE-OF-USE
- Windows/Linux flexible platform
- Seal 428 and Nautilus advanced support

REMOTE ACCESS TECHNOLOGY
- Internet access to navigation data in real time

Today's major challenges for marine seismic acquisition include increasingly accurate positioning for enhanced productivity of 2D and 3D surveys and improved repeatability of 4D surveys.

Sercel offers a unique combination of considerable experience in navigation-based technologies and an unrivalled position in seismic acquisition to deliver a high-performance navigation platform for the latest and future marine seismic techniques.

SeaPro Marine Navigation which includes SeaPro Nav, SeaPro Bin, SeaPro Current and SeaPro Resolve, offers a powerful integrated portfolio from planning to data QC and processing.

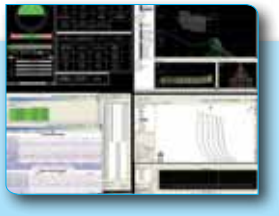
Thanks to SeaPro Marine Navigation's architecture, the client has secure access to navigation and binning data in real time, from anywhere, at any time.

COMPLETE INS PACKAGE

Sercel offers a complete navigation software portfolio for continuous data workflow.

SURVEY DESIGN DATA

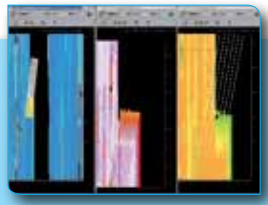
Integrated Navigation System



SEAPRO NAV

REAL TIME POSITIONING,
DATA PROCESSING
& MANAGEMENT

Coverage Analysis & Line Optimization



SEAPRO BIN

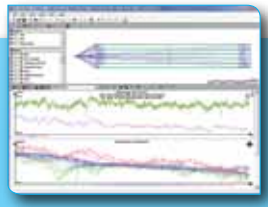
REAL TIME & OFFLINE BINNING
ATTRIBUTE ANALYSIS

Data Analysis

SEAPRO CURRENT

CURRENT PREDICTION
COVERAGE OPTIMIZATION

Data Processing



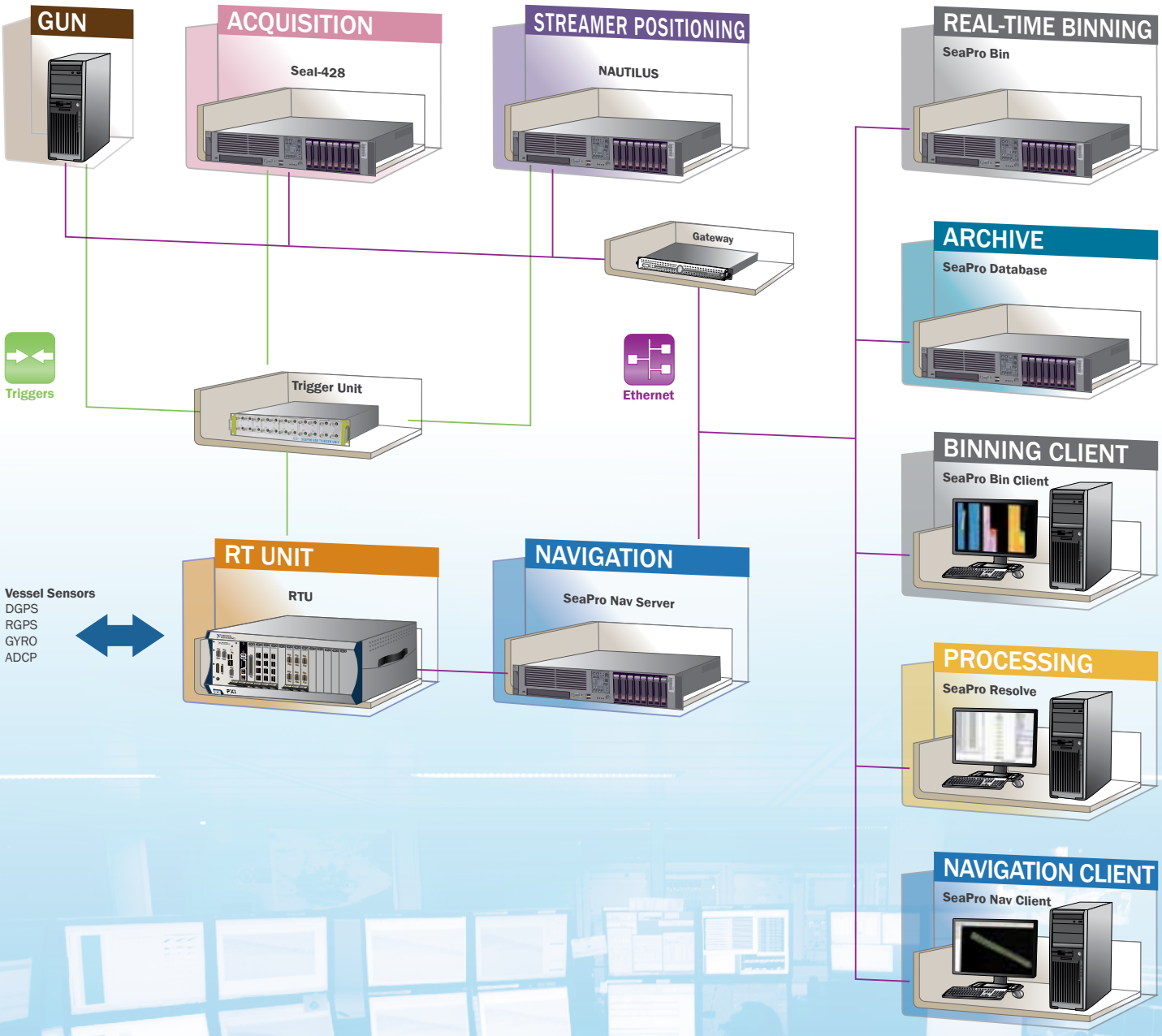
SEAPRO RESOLVE

DATA PROCESSING,
QC & ANALYSIS FOR
TOWED STREAMER

SURVEY POSITIONING DATA

ARCHITECTURE

MARINE NAVIGATION NETWORK



SeaPro Nav Server

POSITIONING DATA GATHERING, FORMATTING AND EXPORT
- Red Hat Linux operating system
- UKOOA formatting

SeaPro Nav Trigger Unit

INPUT-OUTPUT TRIGGERS INTERFACING
- 4 Inputs / 12 Outputs / 4 Contact closures (BNC type)
- GPS Antenna link

RTU

REAL-TIME UNIT
- Management of Triggers and Serial and Ethernet communications
- GPS time stamping and triggering
- Power-supply redundancy

Database Server

NETWORKED STORAGE SYSTEM
- UKOOA files, reports and log repository
- 1.5 TB RAID-5 Disk Feature

SeaPro Nav

INTEGRATED NAVIGATION SYSTEM

MORE SEAMLESS

- Easy integration with Sercel products

MORE FLEXIBLE

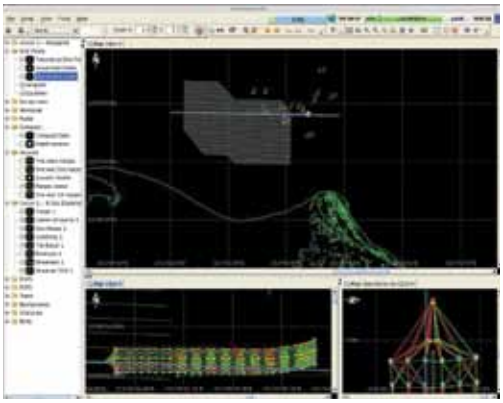
- Architecture allowing fast adoption of new seismic techniques

SAFER

- Sophisticated alarms based on GIS technologies

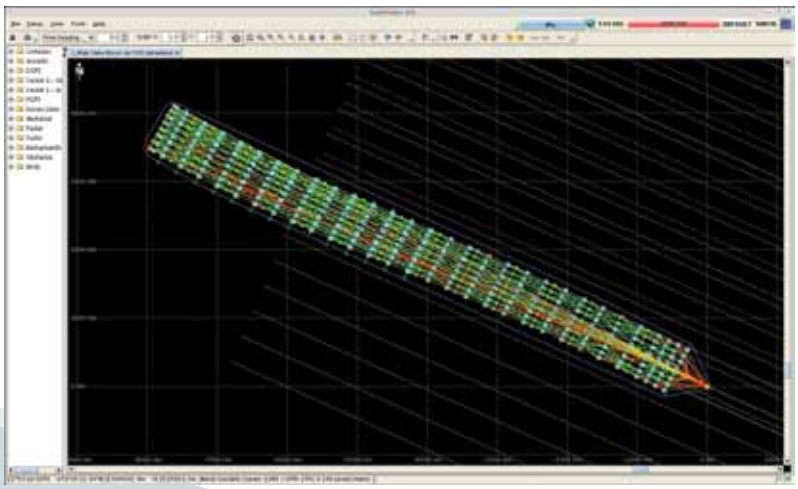
SeaPro Nav is a real-time positioning solution for all marine towed-streamer seismic surveys including multi-vessel capability for undershooting and wide-azimuth techniques.

With a client/server architecture, complex real-time data can be easily accessed from anywhere for data quality and decisions made by experts either onboard or at the office.



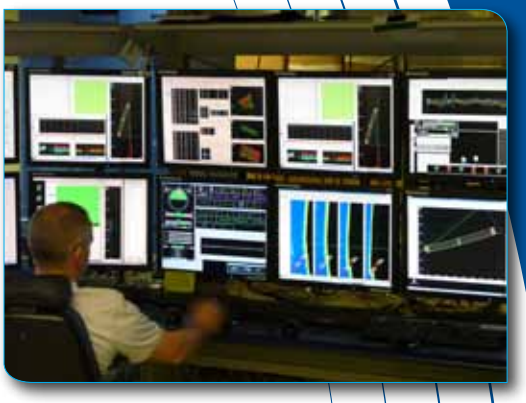
► FEATURES:

- Flexible and innovative Multi-Vessel architecture
- Advanced positioning algorithms
- Simple, visual data displays and alarms
- Remote access using technologies established in other Sercel products
- Off-the-shelf hardware
- Client/Server data distribution
- Survey Planner



CONTROLLING VESSEL SOURCE & ACQUISITION

SeaPro Nav uses off the shelf hardware to provide sensor interfacing and true GPS timestamping and triggering.
Modular design isolates steering, shot prediction and line management providing support for advanced techniques.



DISTRIBUTING NAVIGATION INFORMATION

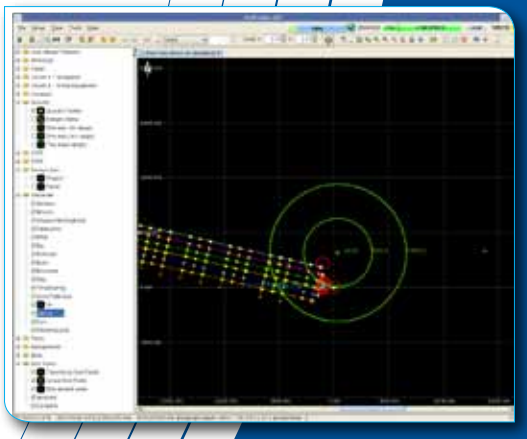
With a client/server architecture, real time data can be easily accessed from anywhere; data quality and decisions can be made by experts either in the field or at the office.
Using simple and intuitive graphical interfaces greatly enhances the usability of the system and allows the operator to get rapidly acquainted with it.

MANAGING SAFETY & DATA QUALITY

The network positioning solution, available at any time (acquisition, deployment, retrieval and turns), has a high level of QC and data analysis exceeding the standard UKOOA requirements.
Logging of Real Time P2/94 and automatic P1/90 is complemented by:

- Off-the-shelf web based user configurable reporting tool.
- Off-the-shelf scalable database allows powerful survey analysis and reporting.

For congested survey areas, sophisticated features have been implemented to distribute warnings and alarms around all users. Alarms include collision avoidance directly within GIS displays.



SeaPro Bin

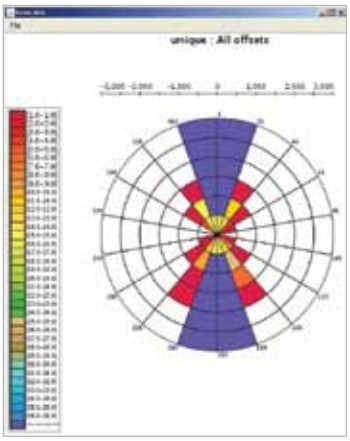
BINNING SOFTWARE

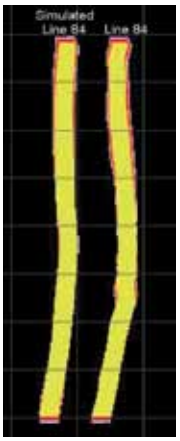
COST-EFFECTIVE
- In-fill minimization

QUALITY ASSURANCE
- Rapid shore-based data verification

FLEXIBILITY
- Advanced seismic survey binning in real time

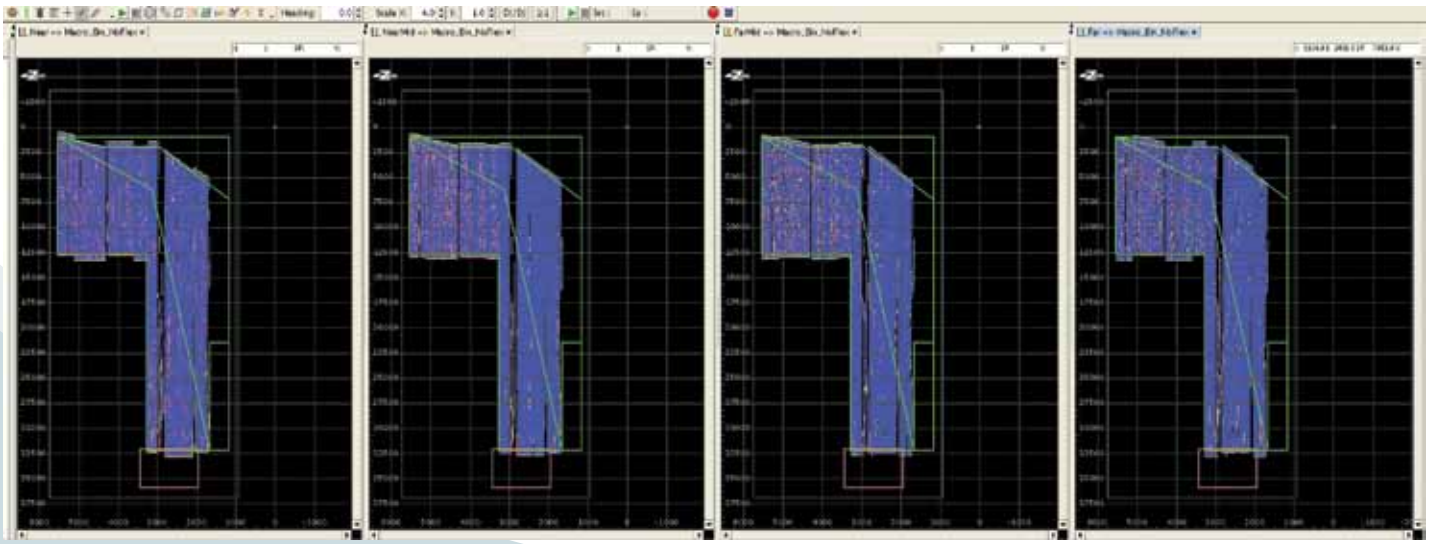
SeaPro Bin is a binning tool that manages several 3D seismic marine surveys for different users in a professional environment. SeaPro Bin provides flexible tools to interactively manage the seismic surveys from 3D through to WAZ.





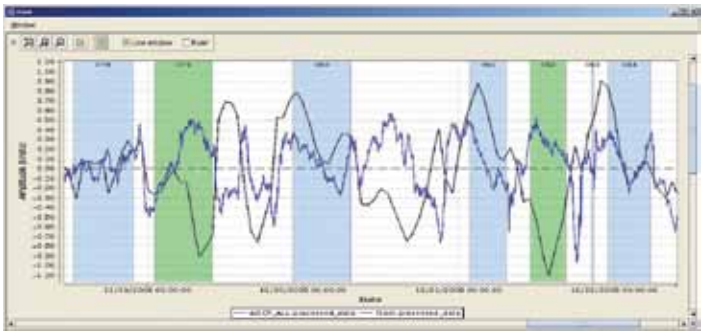
► FEATURES:

- Advanced seismic survey binning (3D, 4D, Undershooting, WAZ)
- Full real-time binning capabilities
- Offline binning analysis
- GIS view of coverage and seismic attributes
- Integration with SeaPro Nav



SeaPro Current

CURRENT ANALYSIS TOOL



IMPROVED QUALITY
- Improved 4D reliability of streamer positions

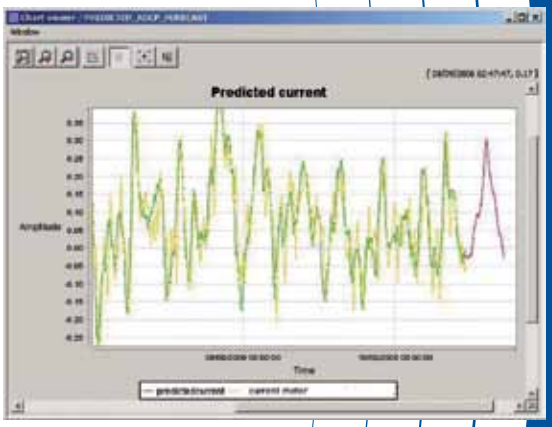
INCREASED SAFETY
- Close path prediction/obstacle avoidance

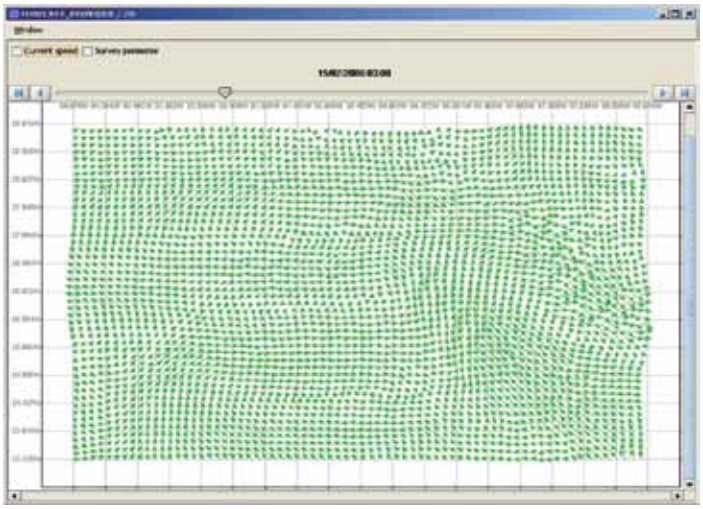
MORE PRODUCTIVITY
- Maximized infill coverage

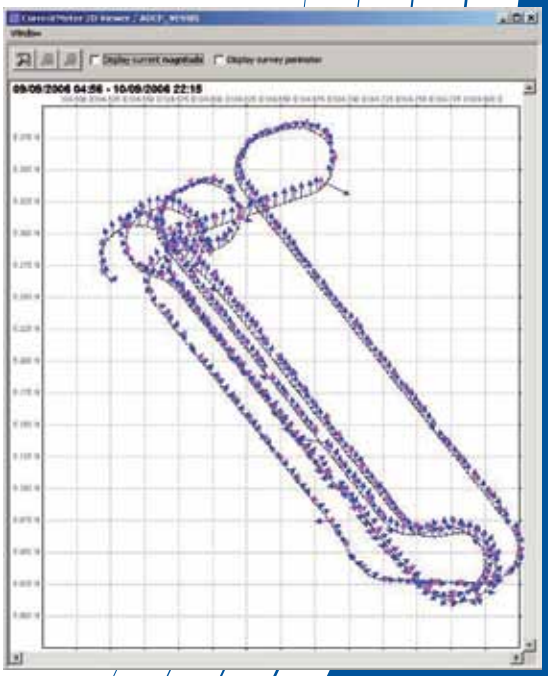
SeaPro Current is a current management tool able to import, analyze and forecast currents, so as to compute a predicted current and a predicted feather. Knowing the predicted current, SeaPro Current helps to reduce holes of coverage and compute the optimal shooting sequence.

► FEATURES:

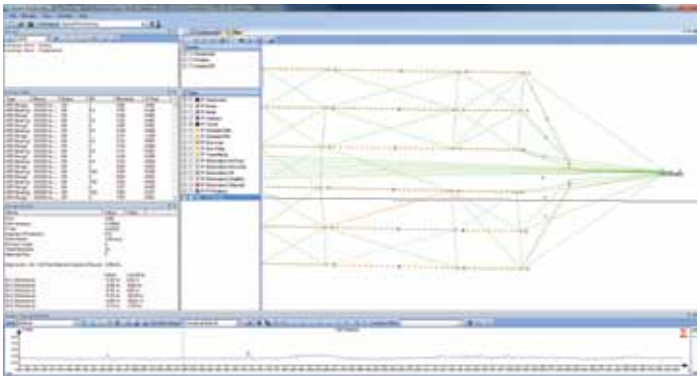
- Current prediction
- Processing of forecast and multi ADCP currents
- Streamer shape prediction
- Line feather analysis and current feather comparison
- Line shooting optimization







NAVIGATION DATA PROCESSING



HIGH-PERFORMANCE PROCESSING

- 2D to WAZ, fully braced advanced processing

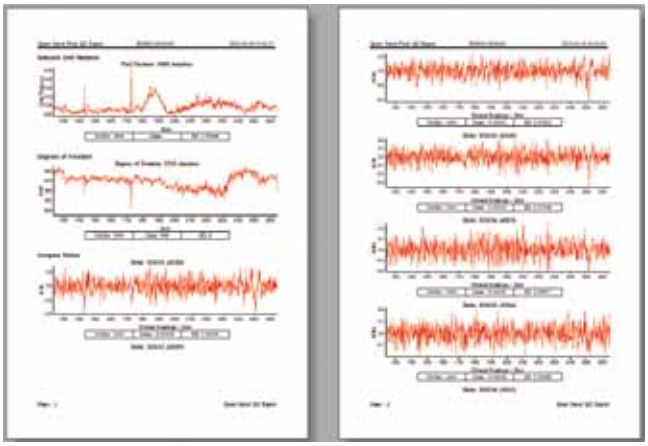
EFFICIENCY

- Automatic processing and transfer of deliverable outputs (P1s)

HIGH QC

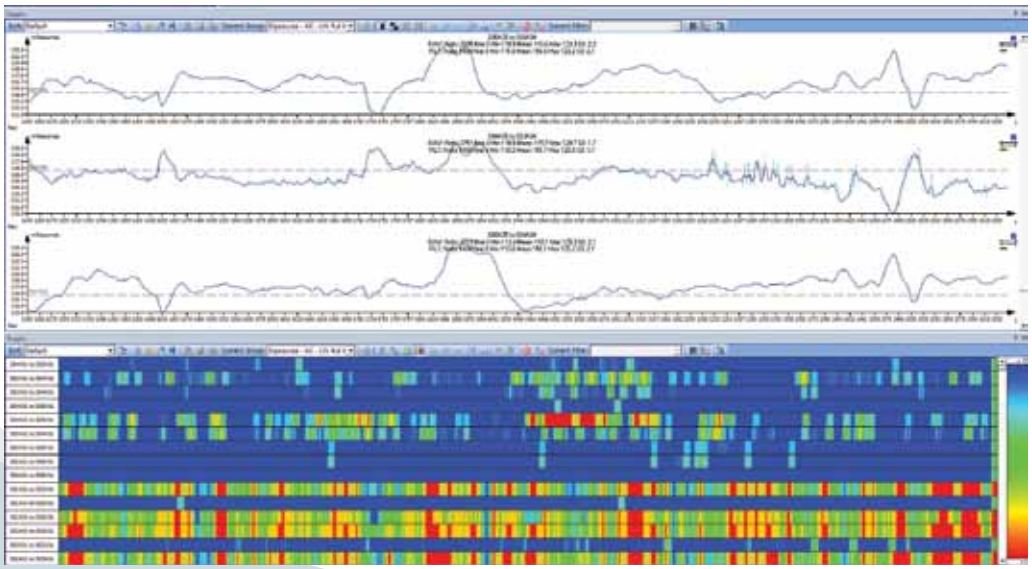
- Automatic qualification of network positioning

Sea Pro Resolve is a data processing suite for marine towed-streamer seismic surveys. Using a workspace control system, the user can import, process and analyze data to produce deliverable processed positions along with reporting.



► FEATURES:

- Advanced algorithms for all progressive acquisition techniques (WAZ, fully braced networks)
- Automatic processing
- Multiple UKOOA P1s
- Full range of reporting
- Work space control with flow-based processing



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