BlueView TECHNOLOGIES

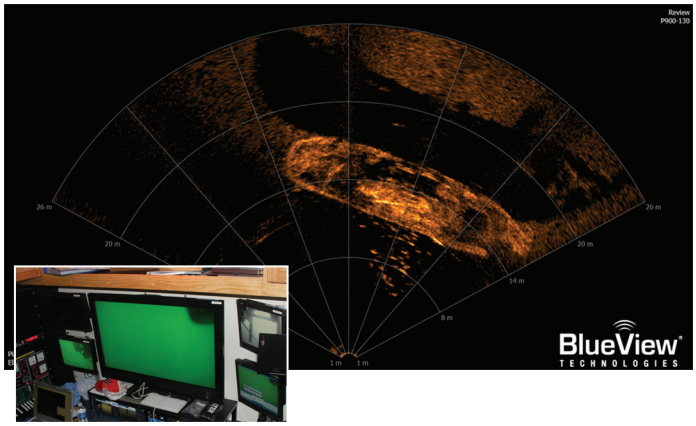
Application Bulletin

Improving Offshore ROV Efficiency with BlueView 2D Imaging Sonar (Acoustic Cameras)

The Challenge – Reduce offshore operation costs by minimizing downtime and maximizing ROV efficiency.

Maximize Mission "Uptime"

BlueView's 2D acoustic cameras will operate in low and even zero visibility conditions. ROV operators can minimize the downtime associated with poor visibility conditions with BlueView, enabling real-time navigation, operations monitoring, target tracking, and equipment placement despite poor water clarity conditions.



Inset image shows the low visibility conditions that can be encountered during ROV operations while the corresponding BlueView sonar image reveals the target structure.

Example 1: Avoid Costly Delays Caused by Poor Visibility

Assume that a time-sensitive ROV mission was estimated to take 5 days to complete at a cost of $225,000/day. While on site the ROV operator encounters poor visibility conditions, resulting in a 24 hour delay waiting for conditions to improve. The following calculation applies if using a BlueView 2D Imaging Sonar enabling ROV operations to continue despite poor visibility conditions:

Description	Value
Total time loss	1 day (24 hours)
Daily cost	$225,000
Cost of delay (poor visibility)	$225,000*

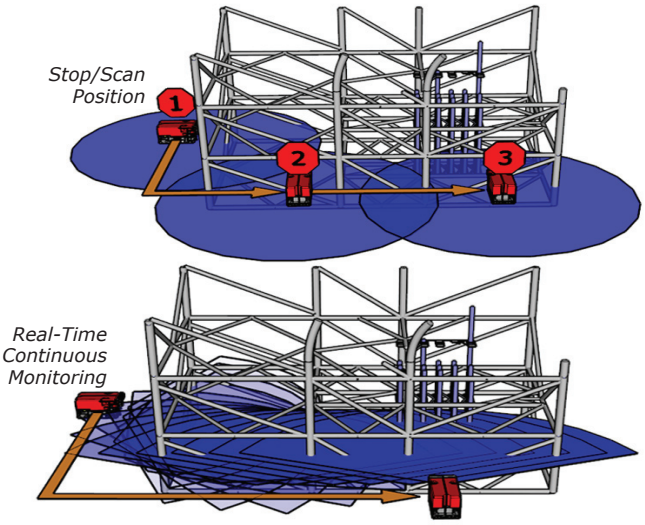
**Using a BlueView 2D Imaging Sonar can reduce/ eliminate delays and the associated costs attributed to poor visibility conditions. Actual costs could be different, and delay costs could be less if a downtime contingency rate was in effect.*

Continuous Operation and Situtational Awareness

BlueView's 2D Imaging Sonar operates while in motion or from a stationary position, providing ROV operators with real-time, high resolution sonar imagery and data continuously, much like streaming video. ROV mission times are significantly improved by eliminating the need to stop and scan the area required with traditional scanning sonar.

Example 2: Improve Mission Time

Working in a complex environment with a marginal visibility range of 50 ft. a work-class ROV conducting an observation mission for a damaged structure is tasked to travel a total distance of 6,000 ft. along the structure. An ROV pilot determines that at a traveling speed of



BlueView's video-like sonar imagery eliminates the stop-and-scan time associated with traditional scanning sonar, and turns the cumulative time savings into real opertating time.

1/4 knot (~25 ft./minute) he will stop the ROV every 2 minutes to take a sonar scan of the area to determine his position and the position of the structure (situational analysis). It takes an average of 30 seconds to make each scan and analyze the data. Assume that operation costs $225,000/day ($9,375/hr.), the following calculation applies:

Description	Value
Total stops for sonar scans *6,000 ft. / 50 ft. (distance between scans)*	120
Total scan time *120 stops X 0.5 minutes per stop*	60 min. (1 hr.)
Total time for ROV to run mission distance *6,000 ft. / 25 ft. (distance traveled per minute)*	240 min. (4 hrs.)
Total mission time, with sonar scans *1 hr. (for sonar scans) + 4 hrs. (ROV)*	5 hrs.
Mission time savings *A mission time savings of 20%**	1 hour*

**Using a BlueView 2D Imaging Sonar eliminates having to stop the ROV to make a sonar scan replacing it with real-time sonar imagery and data while the ROV is in motion. In this example the time efficiency improvement is 20% (1 hour) representing a margin improvement for the ROV operator, a cost savings of $9,375.*