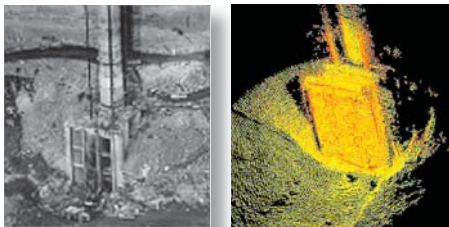




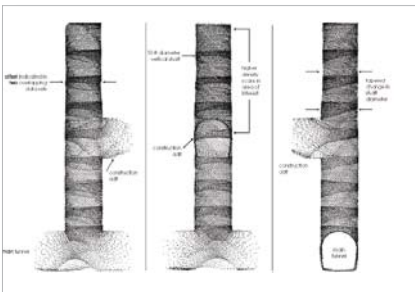
Dual-axis 3-dimensional Sonar Inspection and maintenance is critical to the performance and longevity of underwater infrastructures. As technology has evolved, inspection of these structures has been performed with the use of commercial divers and robotic vehicles. However, these methods require costly shut down periods and provide highly qualitative results. Aquatic Sciences L.P. has designed and built a dual-axis sonar system using a Mesotech scanning sonar as the basis for development that is capable of operating in high flow conditions and provides accurate dimensional information regarding the structure and accumulated debris.



Applications of Dual Axis Sonar Surveys

Inspection and monitoring of:

- ♦ Intake structures under full flow operating conditions
- ♦ Submerged shafts and vaults
- ♦ Dams and headwalls
- ♦ Bridge pier scour
- ♦ As-built dimensioning of submerged structures
- ♦ Underwater archaeological surveys



Dual-Axis Sonar Surveys

using sonar signals to provide 3-dimensional representation of submerged structures

The system employs two axes of rotation aligned perpendicular, resulting in the ability to point the transponder in any direction. By calculating the distance to objects from the transponder head at multiple angular positions, a three dimensional point cloud representation of the structure and any surrounding debris may be obtained. Sensors on board the system can dynamically monitor and account for changes in temperature, pressure and salinity, used in speed of sound calculations. Changes in the attitude (roll, pitch and yaw) of the system, as a result of high flow past the system, can also be dynamically corrected.

Recently, the system has been used to scan the intake structure of hydro electric penstocks and the fore-bay of a nuclear plant, both while under fully operational conditions. Dimensioned maps were generated providing data regarding debris accumulation on the face of the structure, "as-built" information, and sediment deposition (bathymetric information) in the vicinity of the structure.

This technology provides underwater infrastructure operators accurate inspection data, without the burden of costly downtime.

Aquatic Sciences L.P.
40 Centre Drive
Quaker Centre Business Park
Orchard Park, NY 14127
716-667-3507 Tel
716-667-3509 Fax

This new technology was used to obtain a full coverage scan of a flooded surge shaft in late 2004.

www.aquaticsciences.com

