

**PRODUCT SUMMARY**



# FLOWMETER SYSTEMS

Accusonic Flowmeters are used in large pipes, channels, buried conduits and rivers for high-accuracy flowrate measurement. The systems use the multiple-parallel-path acoustic transit-time method to measure flow velocities at discrete elevations in the measurement section. Real-time flowrates are determined by integration of the flow velocity profile achieving accuracy of up to 0.5% of flowrate.

Accusonic delivered its first multipath system in 1968. Since then over 2500 systems have been installed in pipelines 0.5-15 meters in diameter, and in open channels up to 500 meters wide. A wide range of transducers is available to accommodate installation in virtually any pipe or channel. Typical applications include:

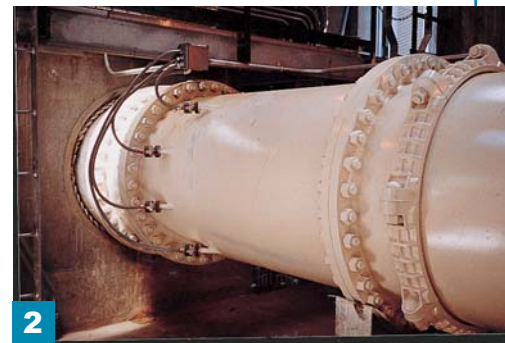
## 1 Hydroelectric and Thermal Power Plants

Multipath systems have been installed in over 700 hydroelectric penstocks and low-head intakes worldwide. Installations include those in buried and exposed penstocks, pumped-storage plants, and new and existing plants. Systems are used to determine performance curves, establish dispatch guidelines, document plant discharge and evaluate upgrade projects on a before and after basis. At thermal power plants, the meters are used for determining condensers performance and thermal loading of cooling water and receiving waters.



## 2 Water Transport and Treatment

Major water distribution projects and municipal systems, including the California Aqueduct, Central Arizona Project, New York DEP, City of Chicago, Los Angeles Department of Water and Power and Metropolitan Water District of So. California, have selected Accusonic as their supplier for large pipe and channel flowmeter systems. The systems display, record, and output data for both local and remote (via telemetry) data collection.



## 3 Wastewater Treatment, Collection Systems, and CSOs

NPDES and related regulations require accurate measurement of major wastewater and Combined Sewer Overflow (CSO) discharges. The multipath method is particularly well suited for compound sites that flow from partially full to surcharged and provides high-accuracy data over the full range of flows.

Accusonic flowmeters also provide bi-directional flow measurement capability, which makes them ideal for monitoring tidally influenced sites or conduits subject to reverse-flow conditions. Accusonic flowmeters have been installed in treatment plants, discharge tunnels, CSOs and sewer pipes up to 7 meters in diameter. Intrinsically safe transducers are available for installations in hazardous environments.



## 4 Irrigation and Waterways

Irrigation districts and large water projects use Accusonic flowmeters for accurate accounting of canal flows. With open channel flow-measurement accuracy up to  $\pm 1.5\%$ , Accusonic meters are excellent in system control and revenue billing applications.

Users such as the U.S. Geological Survey have installed Accusonic systems in rivers up to 500 meters wide as part of their nationwide river monitoring system.

Accusonic low frequency, high-power transducers are designed for operation in silt-laden and wide rivers. Over 400 river systems have been installed throughout the world.



## MONITORING SYSTEMS AND SERVICES

In addition to precision flowmeter systems, Accusonic offers associated technical products and services to support hydroelectric, water resource and wastewater project requirements. These include fully integrated data collection, monitoring and analysis systems for pumps, turbines and hydraulic conveyance works. Systems are designed for application where maximizing efficiency and ensuring continued high performance are primary concerns.

### 5 Leak Detection

Pipeline leaks can be detected quickly and easily by establishing a communications link between flowmeters placed at opposite ends of the pipeline. The system continuously compares flows at both ends. When the difference exceeds a preset threshold, an alarm contact is actuated, providing a valve closure signal. Pipelines and entire hydroelectric plants have been protected in this manner.



### 6 Turbine Efficiency Monitoring System (TEMS)

The Accusonic TEMS is used in a portable mode or as a permanently installed system for measurement of hydro turbine (or pump) efficiency. The system collects data from the flowmeter, power meter, and pressure sensors and computes unit efficiency in real-time. The system is used to improve plant operation and to provide contractually accepted pre- and post-upgrade performance data, and is designed to meet ASME PTC-18 and IEC Pub. 41 codes.



### 7 Cavitation Monitoring System (CMS)

The Accusonic CMS uses a non-intrusive sensor that detects the inception and severity of hydro turbine (or pump) blade cavitation. Erosive operation zones (gate position vs. head) are determined to allow the operator to avoid excessive damage. Condition of the runner is externally monitored over time to indicate when rework or other maintenance is required.



### 8 Field Service

Accusonic field engineers are available on a world-wide basis to install equipment or perform field tests. A network of offices and representatives in 25 countries provides prompt support services for our installations. Our turbine performance test team is available to conduct acceptance tests in accordance with ASME and IEC standards on Kaplan, Francis and Pelton turbines.



**ACCUSONIC**  
**TECHNOLOGIES**

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*Model 7657 / 7658 intrinsically safe transducer*



*Model 7500 flowmeter in NEMA 4 enclosure*



*Open channel transducer arrangement*



*Model 7601 / 7641 fully removable transducer assembly with jacking mechanism*



*Hot-tap transducer installation*



*Model 7510 flowmeter in NEMA 4 enclosure*