Closed-Pipe Installation with No Shut-Down or Bypass

Indianapolis, IN, USA *Case Study*

TELEDYNE ISCO
A Teledyne Technologies Company

Expertise in Flow

Shutting down the pump station and/or doing bypass pumping to install a full-pipe flow meter would have meant high costs for the City of Indianapolis Department of Public Works when it came time for an upgrade. Teledyne Isco's ADFM Hot Tap Insertion flow meter with Pulse Doppler technology saved tens of thousands of dollars by removing the need for bypass or shutdowns.

ADFM Hot Tap Sensor

Benefits:

- 2% Flow accuracy
- Quad-redundant sensors in a single housing
- No calibration necessary
- Minimal straight-run requirements
- No bypass needed
- No pipe shutdown/ dewatering needed for installation and maintenance
- No calibration required

System Options:

- Additional safety equipment for pressures of 200-300 psi
- Custom length sensors available
- Stationary or portable
- Communication:
  - Data logging
  - Analog (4-20mA)
  - Digital (MODBUS/ Ethernet)
  - Relay Alarms
  - GSM/GPRS
  - CDMA/1xRTT

"The Future of Flow!"™

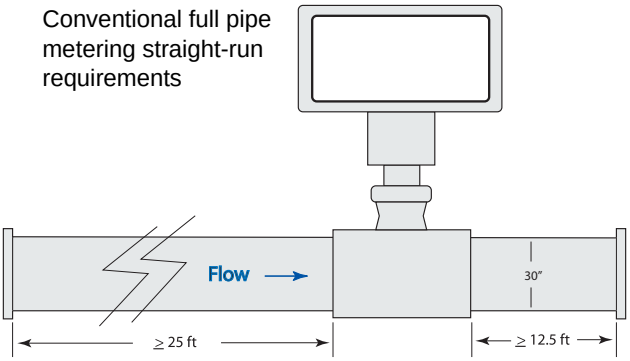
Overview

Upgrades to an existing wastewater pumping station meant the City of Indianapolis needed to add a flow meter to the system in order to accurately measure the rate of flow being pumped.

The Challenge

Installation of a mag meter or other conventional full pipe flow meter would not only require expensive bypass pumping; it would also require minimum straight runs; in this case, 25 feet upstream and 12.5 feet downstream for the 30-inch force main. There was not nearly enough straight run in either direction at this station for such an installation.

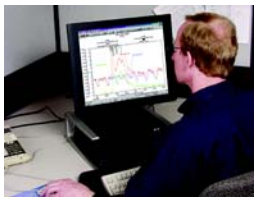
Conventional full pipe metering straight-run requirements



Isco ADFM Hot Tap Insertion Flow Meter

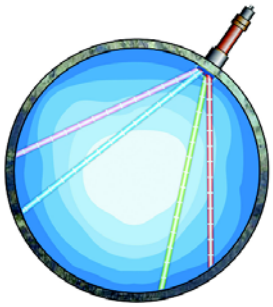
The Hot Tap can be inserted into pressurized lines, without disrupting flow, through a standard 2" corporation stop or tap. It installs near bends, pumps, and tees, and still yields reliable data. Protruding into the flow stream less than $^{1}/_{2}$", the sensor tip emits four velocity beams, two pointing upstream and two downstream. Each beam is made up of multiple, distinct cells pinged hundreds of times per minute, yielding thousands of velocity data points throughout the water column.

Flowlink® Software



- Data analysis
- Diagnostics
- Graphs/tables
- Editing

Operation Within the Pipe

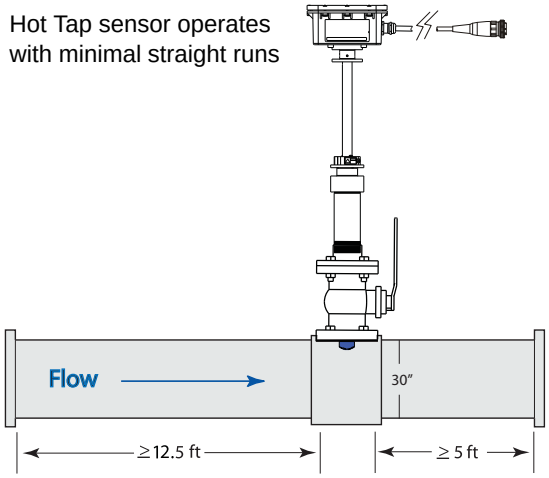


Each data point represents a discrete velocity measurement from an individual "bin" along the Pulse Doppler beam.

"We were upgrading our pump station and did not want to spend the high costs of bypassing while installing a mag meter. We were able to install an ADFM Hot Tap meter without taking down the pump station."

–Charles R. Davidson, Wastewater Lift Station, Indianapolis, IN

Hot Tap sensor operates with minimal straight runs



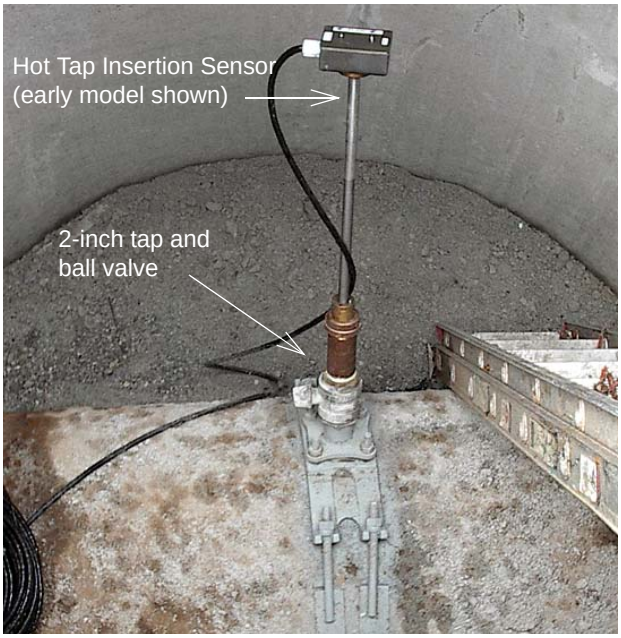
While most closed-pipe flow measurement technologies require the costly construction of a full vault around the pipe for installation and maintenance, in this case the city simply built a small "dog house" (chamber exposing only a portion of the pipe) over the force main outside the pump station for access to the top side of the pipe.

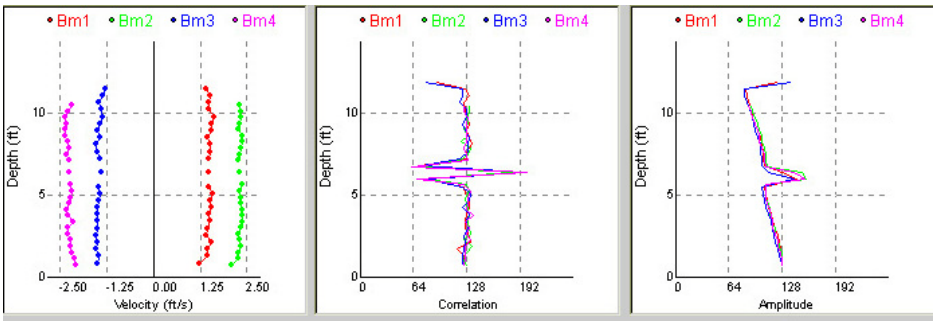
The Hot Tap sensor was installed without shutting off the WWPS or requiring any bypass pumping. The sensor cable runs from the chamber through conduit to the ADFM electronics housing inside the pump station.

Accurate Flow Measurement + Comprehensive Diagnostic Data

Data obtained from the return signals not only provides a complete velocity profile of the flow cross section; it also contains diagnostic information used by the software to continually monitor the quality of each signal, detecting air or debris in the line, as well as sediment buildup and fouling of the sensor.

The graphs below display an example of excellent data quality parameters for all four velocity beams:





The Hot Tap enabled the department to obtain flow rate accuracy while still maintaining cost effectiveness. The city continues to utilize ADFM flow meters with ongoing WWPS upgrades.

Teledyne Isco, Inc.
P.O. Box 82531, Lincoln, Nebraska, 68501 USA
USA & Canada: (800) 228-4373 • Phone: (402) 464-0231 • Fax: (402) 465-3091
Web site: www.isco.com • E-mail: IscoInfo@teledyne.com

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