

Rehabilitation of Venturi Flow Meter Primaries for Extended Service Life.

Introduction

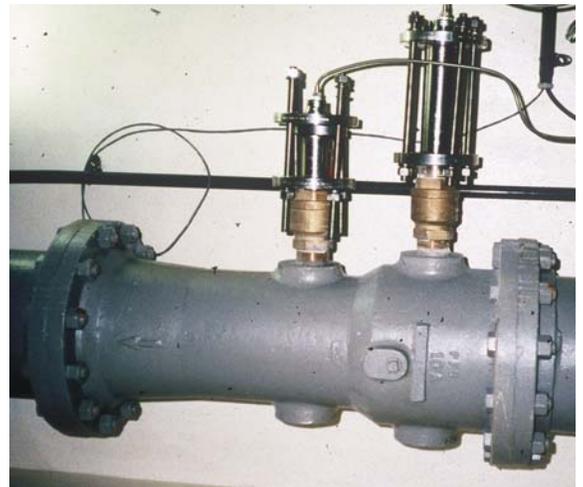
A well known feature and benefit of properly manufactured Venturi Flow Primaries, in addition to the inherent high accuracy and reliability is the relatively long service life offered when compared to short service life typical of electronic technologies like magnetic or ultrasonic meters.

Nevertheless, over time and the effects of various constituents of particular process fluids, as well as certain Venturi design conventions prevalent in decades past, conditions detrimental to obtaining proper performance and use of aging Venturi flow elements can emerge.

While it is the opinion of Primary Flow Signal, Inc. that where feasible, Venturi flow primaries exhibiting some of the problems listed below, be replaced with new HVT (Halmi Venturi flow meter) flow primaries, budgetary constraints on expanding municipal facilities often preclude such actions. Therefore, the results may be the continued use of failing flow primaries, leading to inaccurate, intermittent or complete lack of flow measurement in some cases.

Recognizing the foregoing, Primary Flow Signal, Inc. has developed and implemented a program geared especially to rehabilitate (where possible) the aging Venturi flow primaries that exist in numerous major markets, offering the benefits of the performance envelope originally intended when the meters were newly installed, but a substantial discount to the current capital requirements of entirely replacing old meters.

PLEASE NOTE: *Rehabilitation is capable of returning Venturi primaries to proper operating capabilities consistent with the original flow parameters for which they were designed. In applications where flow conditions have changed, flow primaries will most likely need to be replaced. Primary Flow Signal, Inc. will survey installations to ascertain whether rehabilitation is an appropriate option.*



PROBLEMS SOLVED

The typical problems encountered in the field that often can be remedied by the **Primary Flow Signal, Inc. Venturi Meter Rehabilitation Program** include but are not limited to:

- Plugging of one or more impulse taps;
- Plugging of annular chambers(averaging rings) leading to impulse taps;
- Plating or scaling of interior surfaces, particularly those integral to producing differential or affecting inferential calculation of flow rate;
- Corrosion on interior or exterior surfaces;
- Removal of mercury filled secondary instrumentation or contaminated flow primaries;

TYPES OF SERVICE

Primary Flow Signal, Inc., is equipped to provide this service in a variety of configurations including:

- On-site rehabilitation, directing qualified third party contractors;
- On-site rehabilitation performed by Primary Flow Signal, Inc. factory technician;
- Factory Rehabilitation of Venturi flow primaries in the Primary Flow Signal, Inc., facility in Warwick, RI;
- Independent Flow Lab Calibration after rehabilitation work is completed;
- NIST traceable calibration in the Primary Flow Signal, Inc., in-house calibration facility;

SIZE DOES NOT MATTER

Primary Flow Signal, Inc., has extensive experience and expertise with rehabilitation of Venturi flow primaries in a broad range of venues including concrete subsurface preformed flow meters (two 72 inch Classical Venturi meters

VENTURI METER REHAB

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General Information (cont.)

in Scituate, RI), as well as cast iron Venturi flow primaries (30 inch BIF circa 1950.)

TYPICAL REHABILITATION SERVICE ENGAGEMENT

Though each engagement generally involves requirements unique to the application and service conditions, every engagement begins with an initial site survey designed to inspect and identify the condition of flow primary including key exterior features and interior survey. This initial survey will evaluate whether the subject Venturi flow primary is a suitable candidate for rehabilitation, and if so, whether field rehab, or factory rehab will be recommended.

In cases where the flow primary contains an integral flow control valve, a determination is made as to whether at least the flow primary portion can be rehabilitated. Where possible a recommendation for properly sized replacement butterfly valve is then offered together with the flow primary rehabilitation.

The initial site survey will determine whether on-site, field rehabilitation is advisable or whether factory rehabilitation is recommended.

The rehabilitation work itself may vary in detail, however, the result will always include a flow primary that is once again ready for service as accurate and reliable as the day it was originally installed.

Included among the critical elements of any rehabilitation are cleaning, surface blending as required to meet original design specification, re-coating to meet service specification, measurement of dimensions critical to hydraulic performance, hydraulic lab calibration (if required), and preparation of new flow calculations based on rehabilitation results allowing the production and use of correct flow rate data from the rehabilitated Venturi flow primary.

TURN-AROUND TIME

Over the quarter century that this service has been provided, Primary Flow Signal, Inc. has determined that Venturi flow primaries experiencing less than forty years of service are usually candidates for field rehabilitation service. Units seeing forty to sixty or more years of service will generally require factory service, except when the flow primaries are built-in, extremely large, or cannot be moved.

Especially when time is of the essence, rapid and experienced service is critical to success and minimized facilities downtime.

Field rehabilitation usually requires no more than a few working days, and factory rehabilitation can be completed in as little as five working days.

Specific costs and lead-times must be provided by Primary Flow Signal, Inc. personnel and depend upon the particular circumstances of each engagement.

UPDATING SECONDARY SYSTEMS

Often, the secondary systems on aged flow measurement installations require updating and/or reconfiguration. Primary Flow Signal, Inc. provides complete secondary instrumentation system design, sales and installation that will assure modern and efficient reporting and computing capabilities for the rehabilitated Venturi flow primary.

In addition, Primary Flow Signal, Inc. will dispose of mercury type mechanical transmitters through authorized mercury contamination specialists, providing a truly one-stop and turn key service that within a short time frame can bring most aged Venturi meter installations back to full performance, regulatory compliance, and ready for the next quarter century of service or beyond.



Viewing upstream through throat section of BIF Venturi meter prior to Primary Flow Signal, Inc. rehabilitation work. Note scaling, corrosion, and substantial deterioration of interior geometry that can occur in Venturi meters in service four or five



The same view after rehabilitation work is completed. Note the smooth unblemished wall surfaces, clear of scale, corrosion and defect along with clean throat region. The internal geometry has been precisely surveyed, recorded, and new flow calc provided.



The skidded Venturi rehabilitated and ready for return to service. The annular chambers at entrance and throat were thoroughly descaled and cleaned of blockage similar to figure #1 above.