

My No. : AGM/M&E Services/SBDRC

M&E Services Division,
Ratmalana.
25.08.2011.

Addl.G.M.(Sew.)/
Chairman(SBDRC).

Outstanding SBDs and Specifications – Item D13
Guide for the Selection & Installation of Bulk Water Meters

Please find attached the Guide prepared to meet the needs of the TOR sent to me as much as possible, while accommodating whatever is possible to be included.

This gives what we carry out in the design of a selection etc of a metering solution **typically**. As a typical guide it provides the acceptable framework for the designers. They have to apply the general engineering practices in their respective areas. Also they have to make the necessary decisions and use their judgement in particular cases.

For your perusal and necessary action at the SBDRC meeting.

Guide for The Bulk Water Meters Selection & Installation

General :

This guide describes how to select Bulk Water Meters for any typical particular case. As described in this document, each case must be studied by the designers from the beginning or through the preliminary engineering reports if they have already been prepared by other engineers.

It is the Designers' responsibility to cover all peculiarities in each case and design accordingly to any complexity that might be required.

Guide could be only for a typical basic basis but the Designers may require to carry out further literature surveys to achieve a satisfactory design, depending on the needs of the particular case.

Purpose :

To provide a guide to be used in selection, procurement installation etc. of Bulk Water Meters.

Intended Audience :

Electrical Engineers, Mechanical Engineers, Electronic Engineers engaged in Design, Maintenance etc.

It is essential that they are already familiar with the General Engineering Practices in the respective specialities as they cannot be covered by a Guide, but are essential in using the Guide.

Type of Bulk Meters covered by the Guide :

These are limited to ,

1. Mechanical Meters
2. Electromagnetic Meters as they are presently used in our installations.

Meter Selection Procedure :

A. Documents Needed before selection,

The following documents are needed for this and in their absence the Designers should start from Preliminary Engineering Studies.

1. Preliminary Engineering Study

2. P&ID diagram (or written document in case of small cases)
3. Loop Diagram (or written document in case of small cases)
4. Operational Philosophy Document
5. Detailed Design drawings for the other connected civil, electrical, electronic areas of the system so that the design can be made to comply with the system.
6. Complete typical literature for at least 02 reputed meter manufacturers
7. Access to Standard Hand Books.

B. Selection

1. Identify all electrical, mechanical, SCADA operational parameters applicable from the above mentioned documents.
2. Using flow data from the above documentation, select the meter from the tables. Pay attention to any manufacturer specific instructions, if any, for this.
3. Cross check the compatibility with the other requirement of Preliminary Engineering Study like water quality, reading displays, signals/transmission, layout criteria etc. from the manufacturer's literature.

6. Design

Mechanical

1. Study the typical installation recommendations given by the manufacturers in the literature.
2. Embed adequate spacing in the civil, piping drawings (with additional allowances to be used in the preparation of the shop drawings, described below) using data from 1 above.
3. Include all general mechanical engineering features required.
4. Finalise the shop drawings only after the inclusion of relevant details of the selected meter.

Electrical

1. Study the installation recommendations given by the manufacturer.
2. Include the general electrical engineering features required.
3. Include surge protection, power supply etc.
4. Include details required in other panels.

Electronic

1. Study the installation recommendations give by the manufacturers' literature.

2. Include all control, monitoring, display etc. details.
3. Include all general electronic (and SCADA) engineering requirements.
4. Include details required in other panels.

7. Responsibilities of the Design Engineers

Mechanical

1. Study the flow data, water quality and similar requirements from Preliminary Engineering Reports and site visits (with the assistance of Civil Engineering staff, Chemists etc. if necessary)
2. Study the Civil drawings, Pipe drawings, site drawings etc. for design purposes.
3. Selection of the meter from the catalogues based on data from 1 above.
4. Finalise installation details based on manufacturer recommendations in the catalogues.
5. Complete intermediate designs based on typical literature.
6. Finalise the shop drawings after the meter make has been finalized.

Electrical

1. Study the power supply, surge problems etc. from the Preliminary Engineering Reports and site visits.
2. Design power supply, surge protection etc.
3. Finalise intermediate designs based on typical literature.
4. Finalise the shop drawings after the meter make has been finalized.

Electronics

1. Study the signals/transmission, reading displays etc. from the Preliminary Engineering Reports and site visits.
2. Design the SCADA items, Reading displays etc.
3. Finalise the intermediate designs based on typical literature.
4. Finalise the shop drawings after the meter make has been finalized.

Maintenance and Spare Parts

Shall be strictly according to the manufacturer's recommendations.

Terms of Reference for the Bulk Water Meter Committee

Objective :

To prepare a guideline for Design, Selection, Installation and Maintenance of Bulk Water Meters.

Terms of Reference

To prepare the proposed guideline including the following;

1. Identifying the different types of bulk meters available and to recommend suitable types depending on;
 - Intended use (water/sewerage, raw water/treated water , continuous vs intermittent, etc)
 - quality of water in the pipeline (Iron, Manganese, silt etc.)
 - diameter of the pipeline
 - need for automation
 - required accuracy at Minimum Flow, Minimum Pressure etc.

The committee should prepare a matrix that could be used depending on the above factors. (A sample or a guide is given below.)

Recommended Usage		Type Of Bulk Meter				
		Volumetric Type	Electro-Magnetic	Insertion Type	Venturi..	??????
Water	Raw Water					
	Treated Water					
	Diameter					
	Continuous					
	Intermittent					
	High Accuracy	?????				
Sewage						
		????				

2. Proposing a design procedure to size the diameter of the bulk meter depending on;
 - the pipeline type, material, diameter
 - required accuracy of flow at the identified pressure
 - range of demand projections to ensure the required accuracy during early years of commissioning
 - Other important considerations or parameters to be included in to the matrix.

3. Proposing a procedure to decide on the proper installation location of bulk meters in different structures in water supply installations such as;

- outlets of pump houses and storage reservoirs/towers
- inlets to storage reservoirs/towers
- Transmission mains
- Distribution mains (large diameter)
- District Meters/Zonal Meters etc.

with due consideration for the Type of Enclosures, effects of hydraulic surge and other important installation procedures.

Similarly to propose a procedure for Sewerage Installations.

4. Identification and recommending suitable types of earthing and lightning surge arresting systems for the bulk meters, sensors and other field devices.

5. Recommending suitable minimum requirements for proper maintenance of bulk meters;

- such as adequate space for maintenance
- proper access for meter reading/repairs
- silt-traps or similar protection devices
- safe custody
- availability of spares
- preventive maintenance programs etc.

6. Indicating the necessary maintenance requirements in the transmission or the distribution system in order to ensure the lifetime and functioning of bulk meters.

7. Recommending procedures for field testing the bulk meters at site including calibration procedures and indicating the preferred types and sizes of Master Bulk Flow Meters that need to be purchased and maintained in the custody of a recommended section.

8. Proposing a design procedure for selection and providing permanent bulk flow meter tapping points in all large diameter pipelines for calibration purposes.

9. Proposing suitable areas for training including target groups to execute above works.

10. Preparation of specifications for different types of Bulk Water Meters.