
ISGF White Paper

Interoperability in Smart Metering

Abstract

Interoperability in smart metering is an issue that can impede large scale deployment. However, a pragmatic approach can easily lead to seamless operation of smart meters. One options is to choose a long-term rate contract with select meter vendors whose meters are inter-operable; and that will ensure meters are provided by the same manufacturers at a low cost for future customers added to the AMI network. Another solution is to first choose the communication technology and then select the meter manufacturer/s. Utilities can also opt for third-party certification that will guarantee Device-Level interoperability. If all of the above options are not possible, a Utility may install multiple Head End Systems interfacing with a common Meter Data Management System., thereby enabling System-Level interoperability.

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About India Smart Grid Forum

India Smart Grid Forum (ISGF) is a public private non-partisan initiative of the Ministry of Power (MoP), Government of India for accelerated development of smart grid technologies in the Indian power sector. ISGF was set up in 2010 to provide a mechanism through which academia, industry; utilities and other stakeholders could participate in the development of Indian smart grid systems and provide relevant inputs to the government's decision making.

Background

The release of the new Indian Standard **IS 16444: AC Static Direct Connected Watthour Smart Meter – Class 1 and 2 Specification** by BIS in August 2015 was a major achievement. Since the communication technologies advance much faster than electrical technologies, the BIS Technical Committee decided to mandate IPv6 and IS 15959 for smart meters. And all feasible communication technologies are allowed to operate in order to encourage innovation.

With respect to interoperability, it is pertinent to mention that it can be achieved at Devices-Level or at the System-Level. Device-Level interoperability will enable smart meters manufactured by different meter manufacturers to communicate with each other. On the other hand, System-Level interoperability will enable different Head End Systems (HES) to communicate to the same Meter Data Management System (MDMS).

ISGF Recommendations on Smart Meter Interoperability

In order to solve the issue of interoperability in smart meters, ISGF suggests the following measures:

- **Long-term rate contract:** While procuring smart meters (and associated hardware and software for AMI), a rate contract of 7-10 years with select meter vendor (s) whose meters are interoperable may be considered. Hence when new customers are to be added to the AMI network, the same meter manufacturers can provide the existing/already deployed solution to the Utility at previously agreed rates. This will enable seamless integration of new smart meters.
- **Choose communications technology first:** Another approach is to first choose the communication technology and then select the meter manufacturer/s. In such a case, all meter manufacturers will have to integrate this communication technology into their meters. Hence Device-Level interoperability will be easily achieved. The communication solutions provider will certify that their network interface card (NIC) is integrated with the meters that will connect with the HES.
- **Third-party certification** – A Utility can also opt for a third-party certification for ensuring Device-Level interoperability. In such a case, a Utility will ask the meter manufacturers to present an Interoperability Certificate acquired from the certification agency.
- **Multiple HES with one MDMS** – In case multiple communication technologies for smart metering are selected by a Utility (over successive tenders) each having its own Head End System (HES), a common MDMS may be chosen that can interface with multiple HES. In such a case, all communication interfaces will have to be standardised as per IEC 61968. This option is often the last resort if all the above options are not possible.

Table of comparison

Option Parameter	Long-term rate contract	Choose communications technology first	Third-party certification	Multiple HES with one MDMS
Feasibility	High	High	Moderate	Moderate
Cost effectiveness	High	High	High	Low
Integration Time*	Minimum	Minimum	Moderate	Maximum
Expertise required by Utility	Least	Moderate	Least	High

* Integration time is the time required to integrate new smart meters into the Utility's AMI network.