



SMART METERING TESTING OF OVER ALL RELIABILITY

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SMART METER RELIABILITY TESTING-OBJECTIVE

- Mass Replacement of existing meters in India .
- Development of New Hardware, Software & technology.
- No performance Data or field experience of the Same.
- Impact of failure may be huge due to technology transition .
- Extensive testing is required to meet the Challenge .
- Validation of Reliability Test cases required at product and component level.
- Proactive action to avoid huge loss/pain of all stack holders.



NEED OF RELIABILITY TESTING

Hardware problems are more difficult and takes longer time to resolve ,simultaneously they can not be upgraded remotely like software related problems.

Existing type testing system is like medical certificate of current fitness of the metering system . For longer sustainability of the same Performance testing is required ,

Life cycle test for Hardware, Software Shall be performed on Smart meters to increase Muscular strength in real sense , In other sense meter shall be capable of identify the problem domain from Metering, Sever, Module or service provider.



COMPONENT OF RELIABILITY IN SMART METERING

Reliability of Hardware (Metering Function, Relay)

Reliability of Software/Firmware (Metering Features, Data Register, Real time, Rollover tests through time configuration) .

Reliability of Communication -Meter communication capability, Sever, Modem service provider ,SIM or end to end communication.

Reliability of various thresholds , logics ,upgrade feature etc.



INTENDED CONDITIONS

SMART METERING SHALL WITHSTAND

Power ON-OFF , Electrical surges ,Low & High Voltages

>4000 times operation than traditional static meter Back end billing ,
analysis of Millions of Households half hourly reporting

Extreme weather condition Rain, Snow fall, fog ,UV radiation, Dust
,storm , clouds, temperature, humidity and damped conditions .



RELIABILITY TESTS

Communication between all stack holders Manufacturer, Utility, Service providers, Test Labs for being realistic.

Stress Test (85/85 test)

Highly Accelerated Life cycle testing (HALT) component as well as product level.

Endurance test /Long term testing for Service Switch.



RELIABILITY TESTS-Contd i

Damped Heat cyclic test ...with increased cycle .

Cold and Heat Test ...with increased cycle .

Power cycling test ..(with on-off configurable) for 15k times (min 5 meters) Check for functionality ,RTC , Cum energy increase and data validity for no corruption etc.

Weather simulation tests (IP tests with Solar radiations) .

Low and High voltage test for Metering/communication etc .



RELIABILITY TESTS-Contd ii

Extreme water intrusion Test

Threshold voltage test -For power up & communication

Plug and play type battery, Industrial Grade SIM

Test of complete solution of smart meter Communication ,HES,MDM in worst case scenario.

E-SIM without connector soldered on Board .



CONCLUSION

Adoption of new technology is always based upon the experience on old technologies . Being a big technological change, deployment of Smart Meter without adequate Reliability testing may result mass failure/Huge Loss to all stack holders involved. Since some reliability test will be added in the standards, Same time some unwanted test shall be deleted from the standard to save the wastage of money and efforts. It is the responsibility of stack holders (Manufacturers, Test Labs and utility) to frame one national specification of smart meters as national asset avoiding the frequent changes that certainly affects the reliability of Smart metering solution.



At Last

THANK YOU