

*AMI Risk Mitigation and Quality
AMI Meter Qualification, Certification, and Acceptance Testing*

*New York State Electric Meter Engineers Committee Meeting
October 20, 2010*

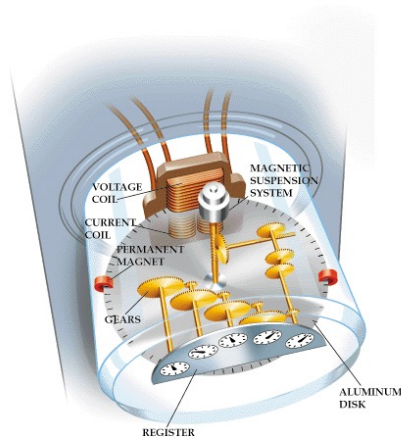


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Metering - Past, Present, and Future

- Growing List of Meter Features
- Growing List of Stakeholders
- Are you prepared?



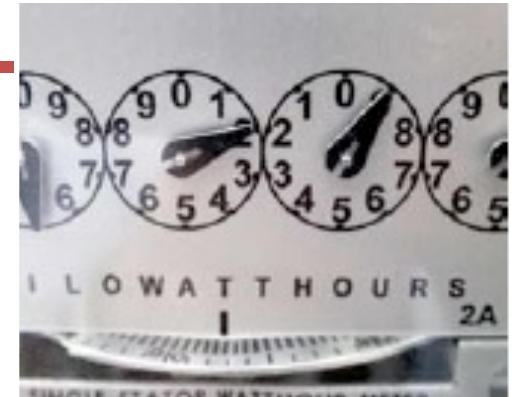
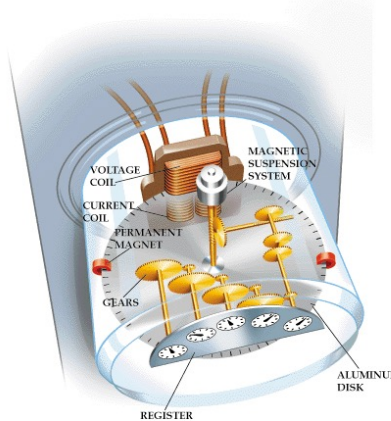


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AMI Risk Mitigation

Simpler times

- Disk & Dials
- kWh's & kW
- Major Issues
 - Accuracy
 - Solid State meters
 - Mostly for C&I Meters (5% - 10% of total)

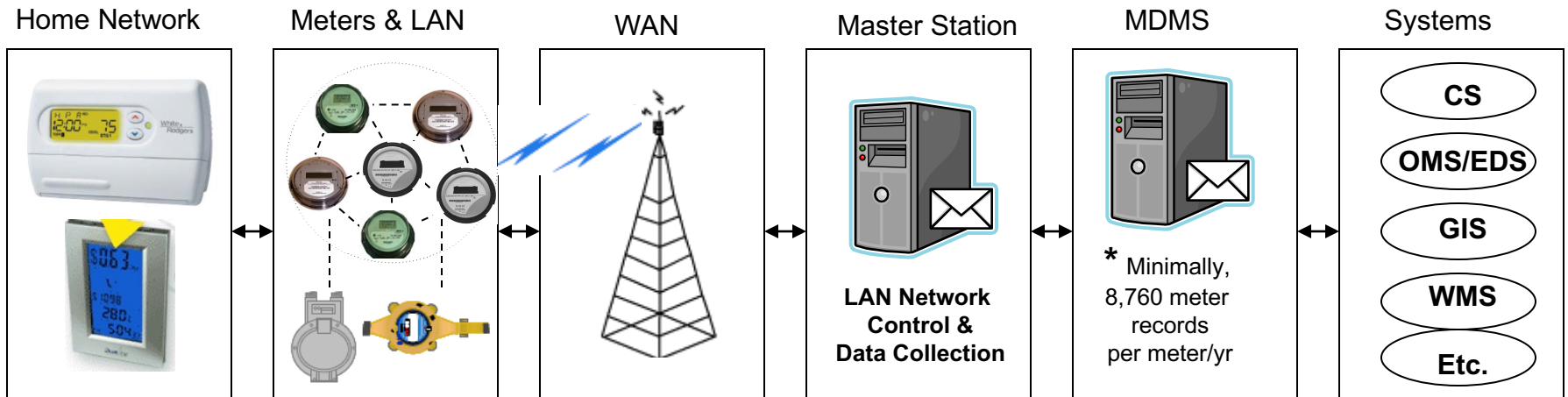




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AMI Risk Mitigation

- AMI System Components Include:
 - Home area network (HAN),
 - Meter & Local Area Network (LAN)
 - Wide Area Network (WAN) communications
 - Master Station
 - Meter Data Management System (MDMS)
 - Systems: Customer Service (CS), Outage Management System (OMS)





Metering - Growing Capabilities List





Smart Meter

Available Technology and Options

Time

METER FEATURES	AMR			AMI	
	Meter Readers	Mobile AMR	Fixed Network	1st Gen	Smart Meter
Scheduled Monthly Reads	X	X	X	X	X
Automated Monthly Reads		X	X	X	X
TOU Metering			X	X	X
Two-way Communications to the AMI Module			X	X	X
Hourly Data (# Channels, Interval length, storage)				X	X
VPP Rates (including CPP and RTP rates)				X	X
Outage Management (Super				X	X
Two-way Communications to	Two-way Communications to the meter →				X
Solid State Meters - 100%	Solid State Meters – 100% →				X
St	Standard Communications: ANST C12.22, TP2 →				X
St	Standard Data Model – ANST C12.19 →				X
Se	Security Meter Communications LAN, HAN →				X
Lo	Local Meter Communications (Optical, Radio) →				X
Re	Remote Meter Programming →				X
Re	Remote Meter Firmware (Meter, LAN, and HAN) →				X
Bi	Bi-directional metering & Net Metering (DG) →				X
Re	Reactive Metering →				X
M	Meter Service Switch →				X
P	Demand kW Reading for each customer →				X
F	Power Quality Measurement (Voltage, etc) →				X
Ho	Home Area Network (Gateway in Meter?) →				X



Metering - Growing List of Stakeholders





Smart Meter Stakeholders

Time

Stakeholders	Meter Readers	AMR		AMI	
		Mobile AMR	Fixed Network	1st Gen	Smart Meter
Departments/Functions					
Bi				Billing →	X
Ra				Rates →	X
Pl				Purchasing →	X
Da				Data Collection →	X
St				Standards →	X
Re				Regulatory Reporting & Strategy →	X
Co				Communications →	X
Int				Information Technology (IT) →	X
St				State Regulatory Control Demartment →	x
Se				Security (System Including the Meter) →	X
Co				Communication networks (WAN LAN HAN) →	X
Fi				Financial Reporting →	X
Co				Corporate Planning & Strategy →	X
Pe				Power Quality →	X
W				Work Force Management →	X
As				Asset Management →	X
Di				Distribution/Transmission Planning →	X
Di				Distributed Generation (DG) Solar PHEV →	X
Se				Sales/Marketing →	X
IS				ISO Reporting →	X
Co				Customer →	X



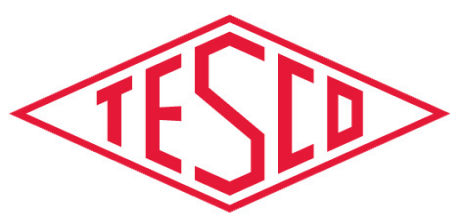
Certification and Change Management

AMI Deployment Planning - A Metering Perspective

- Meter Qualification
- Meter Certification
- Meter Acceptance

How do these differ?





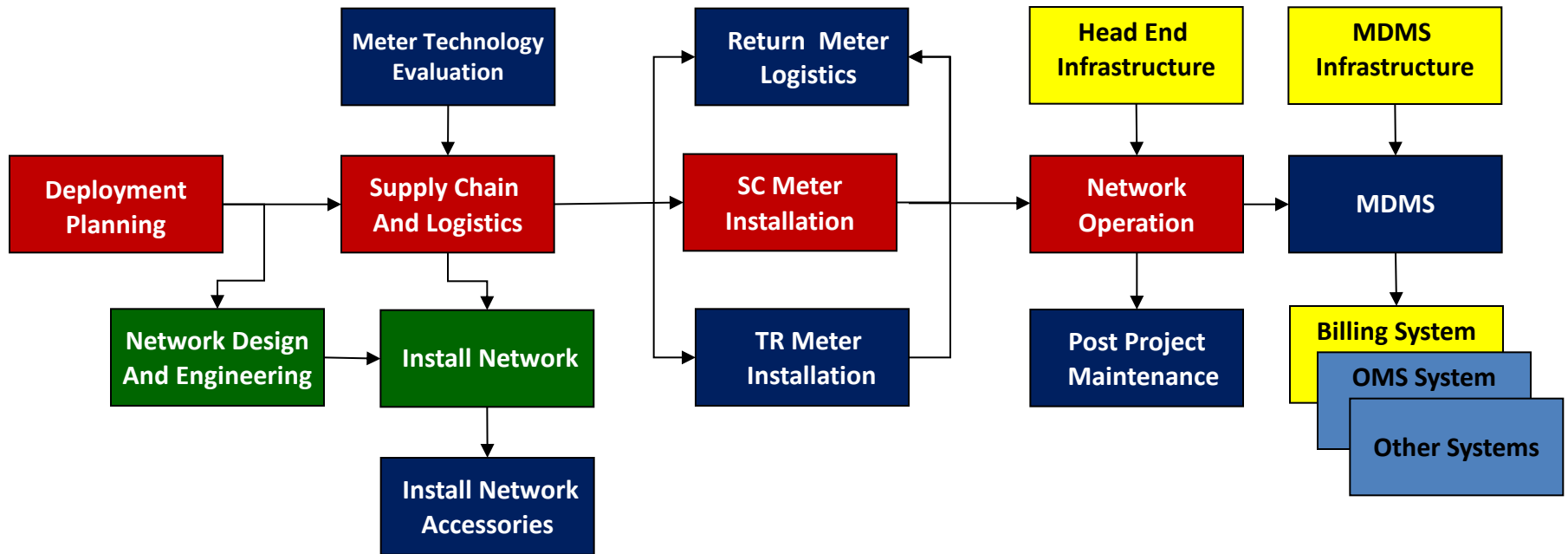
AMI Project Management Structure



Strategic Planning	Establish strategic goals and objectives aligned with the AMI strategy
AMI Requirements	Define and manage AMI business and operational requirements
AMI Project Planning	Develop and execute project deployment plans to meet AMI goals and requirements
Tracking & Oversight	Establish and utilize AMI project tracking, oversight, and control mechanisms
Communications	Identify key stakeholders and communicate AMI project information in a timely fashion
Risk Management	Identify potential risks and develop / execute an ongoing AMI risk management plan
Supplier Management	Qualify, select, and manage AMI suppliers and contractors
Change Management	Develop a process to manage changes to AMI goals, requirements, or plans
Quality Assurance	Identify and develop quality measures for both AMI installation and AMI operations
Operations Transition	Develop processes for transitioning from AMI installation to AMI operations



AMI Project Implementation

Deployment Planning Framework



-  AMI Project Team
-  Metering Services
-  Information Technology
-  AMI Vendor
-  Others – Distribution, Etc

Possible Functional Responsibilities



AMI Deployment – Common Features and sources of Risk

- Compressed time frames for pre-deployment, pilots, and deployment
- New features and functionality being added at a tremendous rate.
- Bugs, fixes, improvements being implemented constantly in the meter

How do we manage these and what can happen in the real world?



Certification and Change Management

AMI Deployment

- Meter Qualification
- Meter Certification
- Meter Acceptance

Where are the risks?

How closely should each participant be held accountable and at which steps?



Pre-Deployment Certification Test Functions

- ANSI Testing
- Meter Functionality
- Meter Data Acquisition Accuracy for Each Form
- Dual Socket Meter Comparison – Data Collection & Accuracy (Energy, Demand, Load Profile)
- Large Test Platform Meter Comparison – Data Collection & Accuracy
- Disconnect/Reconnect Functionality
- Outage Performance
- Meter Communications Performance



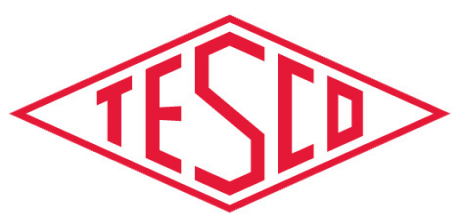
Consider Meter Vendor Quality Programs

- In plant final inspection and testing
- Plant first pass test results... some vendors are as low as 81%
- Vendor supply change management
- Validation testing of firm ware changes



Consider Meter Vendor Change Management Systems

- How does Acceptance Testing differ from Certification Testing
- When do we return to Certification Testing
- What should be built in to the AMI Vendor Contracts
- Who should be involved in developing the Certification and Acceptance Test Plans and when should this be done



Change Management – The Key to Managing the Risks

Change Management

- There are no bad manufacturers. Everyone is moving very fast to meet the market demands. Without adequate checks and balances there will be problems. Even with them, there may still be problems – that is why we call this Risk Mitigation and not Risk Elimination
- Each Utility must take a far more active role as part of this system of checks and balances



Real Life Examples

Change Management in action

- Issues in the system not the components – what is the definition of a meter and when did the meter change?
- Feature Creep – every manufacturer wants to differentiate themselves – sometimes this works in unanticipated ways
- But we only changed....lessons we should have learned from Microsoft
- Thank Goodness for testing plans and contracts – right?



Are you prepared?



Questions and Discussion



The Eastern Specialty Company

*Supporting Utility Industry Metering for over 100
years!*