



Measurement Overview

2nd Annual Shipper Meeting

Vince Shirk
Supervisor

Gas Measurement Group



Measurement Breakout



- Meters
- Gas Measurement Group
- Measurement Timeline
- Reports



- Types of meters
 - Positive
 - Orifice
 - Ultrasonic
- Electronic Flow Measurement (EFM) device
- Meter/Station/Delivery Point

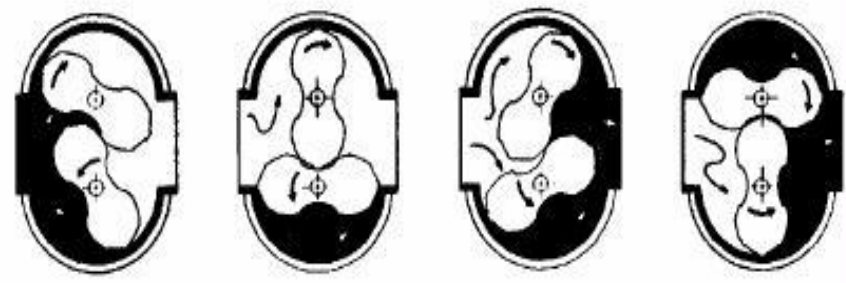
Positive Meters



Turbine



Rotary



How it works

Orifice Fitting and Plate



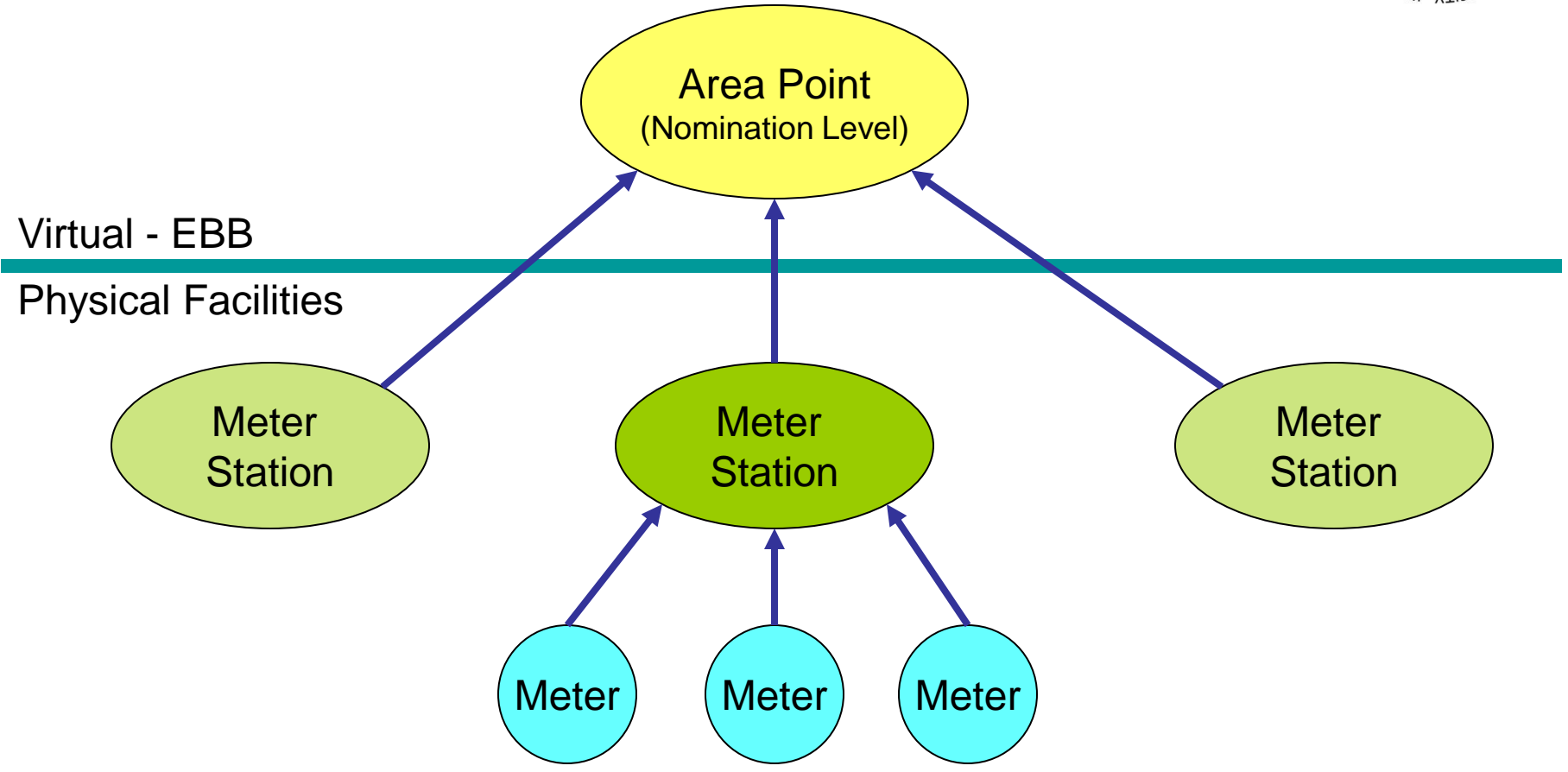
Ultrasonic Meter



Electronic Flow Measurement



Meter/Station/Delivery Point





- Responsibilities
 - Collection of hourly data from the EFM device
 - Measurement - Volumes, pressure, temperature and differential pressure
 - Event – meter test data
 - Alarm – limit notifications
 - Verification that all data is collected
 - Recollect missed hourly data



- Responsibilities (continued)
 - Analyze information collected
 - Review validation exceptions
 - Historical review
 - Verify meter tests
 - Adjust measurement
 - Meter tests
 - Estimate measurement when data is not available
 - Measurement info is transferred to EBB

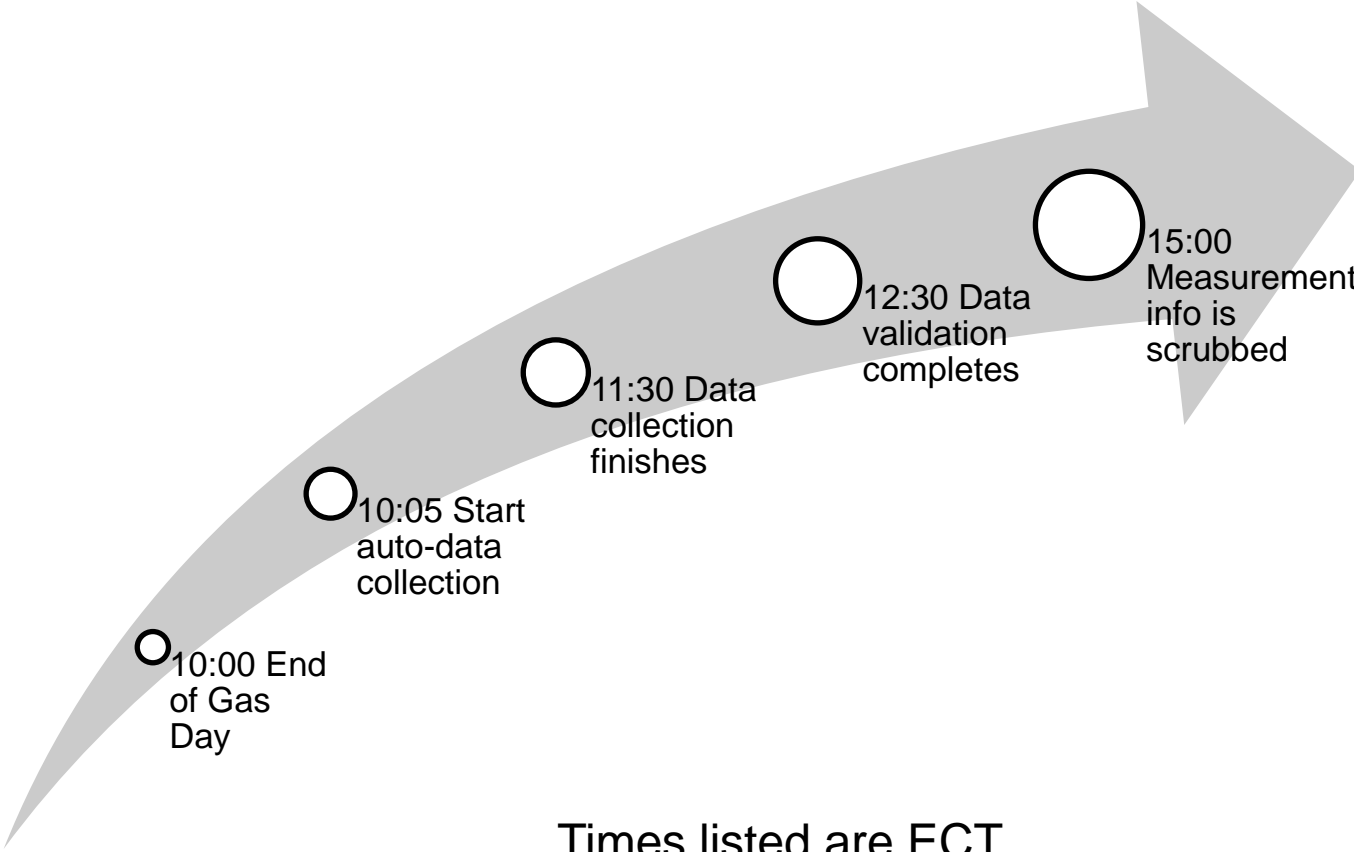
Gas Measurement Group



- Measurement adjustments
 - During the month
 - Meter test
 - BTU/Specific gravity changes
 - After the month closes
 - Meter test
 - Late charts



Measurement Timeline



Times listed are ECT



Measurement Information



- Gas day measurement
- Intraday measurement
- Gas quality

Gas Day Measurement



- Measurement – Flowing Gas
 - FG070 – Measurement Information Report
- Reports
 - TA130 – Monthly Meter/Station Totals
 - TA131 – Monthly Meter/Station Totals by Gas Day
 - TA132 – Monthly Meter/Station Totals by Gas Day and Meter

TA130 Meter/Station



Measurement Detail Report
Report Date/Time: 10/12/2008

Report No: TA130

TSP: 13-713-0213

TSP Name: Carolina Gas Transmission

	Meter ID	Gas Day	Meas Qty (Dt)	Meas Vol (Mcf)	BTU	SG	StmntBasis	Adjustment Type
Pnt Oper:	66-777-8888							
Pnt Oper Name:	XYZ Manufacturing							
Loc:	123456							
Loc Prop:	123456							
Loc Name:	XYZ Manufacturing							
Station:	123456							
Station Name:	South Carolina M & R							
	123456888							
		9/12/2008	0	0	1.0476	0.5808	Actual	
		9/13/2008	0	0	1.0455	0.5778	Actual	
Totals for Meter:	123456888		0	0	1.0466	0.5793		
Totals for Station:	South Carolina M & R		0	0	1.0466	0.5793		
Totals for Location:	XYZ Manufacturing		0	0	1.0466	0.5793		



TA132 Meter/Station



	2244558899 XYZ Manufacturing	
	123456 XYZ Manufacturing	
	123456 South Carolina M & R	
	123456888	
	Volume (MCF)	Quantity (Dt)
8/12/2008	1,234	1,345
8/13/2008	2,345	2,456



Intraday Measurement



- FG060 – Measurement Snapshot Report

Gas Day Measurement



- Gas quality
 - CGT EBB main page
 - BTU
 - Specific Gravity
 - CO₂
 - N₂
 - Methane through Hexane+
 - FG040 – Gas Quality

Gas Quality



Current Unaudited Gas Quality Snapshot

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Location	BTU	Specific Gravity	CO2	Nitrogen	Methane	Ethane	Propane	I-Butane	Butane	I-Pentane	Pentane	Hexane+
Bethune_11Sys	1.0318	0.5927	1.29%	0.55%	94.95%	2.36%	0.48%	0.10%	0.11%	0.05%	0.03%	0.08%
Bushy_Park	1.0443	0.5743	0.01%	0.01%	96.75%	2.62%	0.48%	0.06%	0.05%	0.00%	0.00%	0.00%
Dorchester_12C	1.0448	0.5746	0.00%	0.03%	96.62%	2.79%	0.46%	0.06%	0.04%	0.00%	0.00%	0.00%
Salley_Charlest	1.0311	0.5814	0.72%	0.39%	96.31%	1.91%	0.41%	0.08%	0.07%	0.03%	0.02%	0.05%
SNG_Aiken	1.0360	0.5881	0.94%	0.40%	95.73%	1.97%	0.54%	0.12%	0.13%	0.05%	0.04%	0.09%
SNG_PortWent	1.0458	0.5750	0.00%	0.02%	96.54%	2.86%	0.47%	0.06%	0.04%	0.00%	0.00%	0.00%
Transco	1.0335	0.5948	1.32%	0.60%	94.70%	2.46%	0.51%	0.11%	0.12%	0.05%	0.03%	0.10%



FG040 – Gas Quality

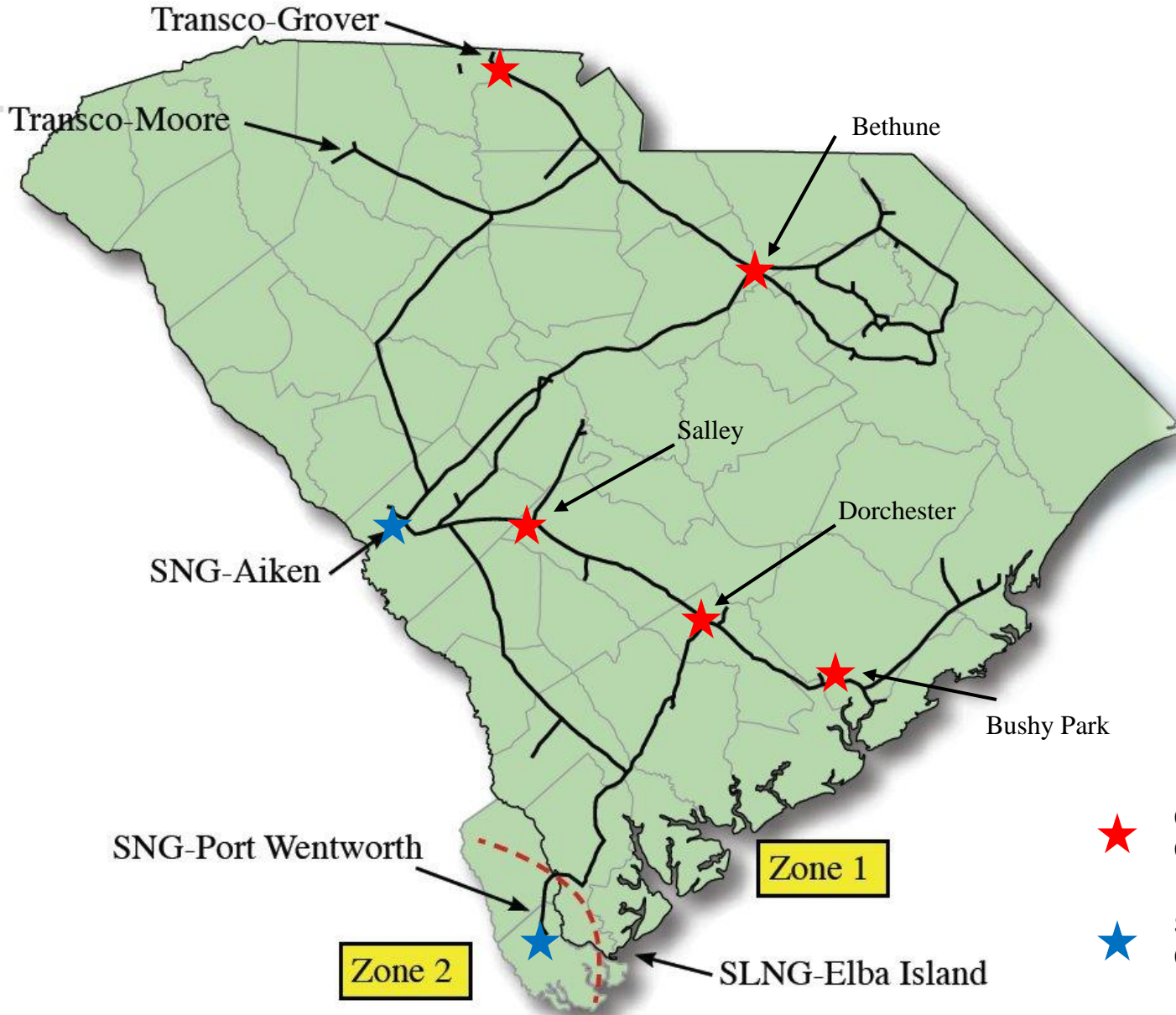


Daily Average Gas Quality Information for mainline Flow

Report No: FG040

Location	Gas Day	Heating Value (BTU/mcf)	Specific Gravity	CO2 (%)	Nitrogen (%)	Methane (%)	Ethane (%)	Propane (%)	I-Butane (%)	Butane (%)	I-Pentane (%)	Pentane (%)	Hexane+ (%)
Bethune_11Sys	10/15/2008	1.0329	0.5938	1.30	0.57	94.81	2.43	0.50	0.11	0.11	0.05	0.03	0.09
Bushy_Park	10/15/2008	1.0452	0.5749	0.01	0.02	96.63	2.74	0.48	0.06	0.05	0.00	0.00	0.00
Dorchester_12C	10/15/2008	1.0458	0.5762	0.05	0.05	96.41	2.88	0.49	0.07	0.05	0.00	0.00	0.00
Salley_Charlest	10/15/2008	1.0286	0.5809	0.79	0.39	96.40	1.81	0.37	0.07	0.07	0.03	0.02	0.05
SNG_Aiken	10/15/2008	1.0283	0.5825	0.88	0.43	96.35	1.65	0.40	0.08	0.09	0.03	0.02	0.07
SNG_PortWent	10/15/2008	1.0462	0.5753	0.00	0.02	96.50	2.89	0.48	0.06	0.05	0.00	0.00	0.00
Transco	10/15/2008	1.0333	0.5942	1.31	0.57	94.77	2.45	0.50	0.11	0.12	0.05	0.03	0.09





- ★ CGT Gas Chromatographs
- ★ SNG Gas Chromatographs



Contact Information



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Questions?