



**Wyoming Natural Gas Fair**  
**September 15-17, 2010**  
**Jackson Hole, Wyoming**  
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# Can SCADA drive a greener operation?

- Identifying the major factors in the operation of an Up-Stream Gas Field Operation that impact the environment:
  - Emissions from
    - Natural gas engines (compression equipment)
    - “Fired” equipment
    - Temporary emission sources
      - Gen sets
  - Vehicles
  - Accidental releases
    - Blow-downs, venting of Gas, ESD
    - Spills
- Tracking, trending and historical records

# Building a sound foundation for a successful SCADA system...

- What information is important?
- How does the company want to use SCADA?
- How does SCADA feed company back-office platforms?
- Is SCADA seen as a historian of events?
- Should SCADA be a driver of how the field is operated?

# Monitoring Emissions

- Gas engine emission compliance
  - Testing
  - Permanent monitoring of engine conditions, loading, key components
- Diagnostic & Operational Monitoring
  - Preventive Maint.



# The Operation Approach can impact the “footprint” of the field

How is the field operated?

- The Milk Run

Vs.

- Dispatch Mode



# The Milk Run

Are the well sites visited on a schedule?

The Federal 22-16 is usually visited around 10:00 AM every morning.

Why? That's when the pumper usually gets to the site each day.



# The Dispatch Mode

The Federal 22-16 gets visited when there is a reason to be there.



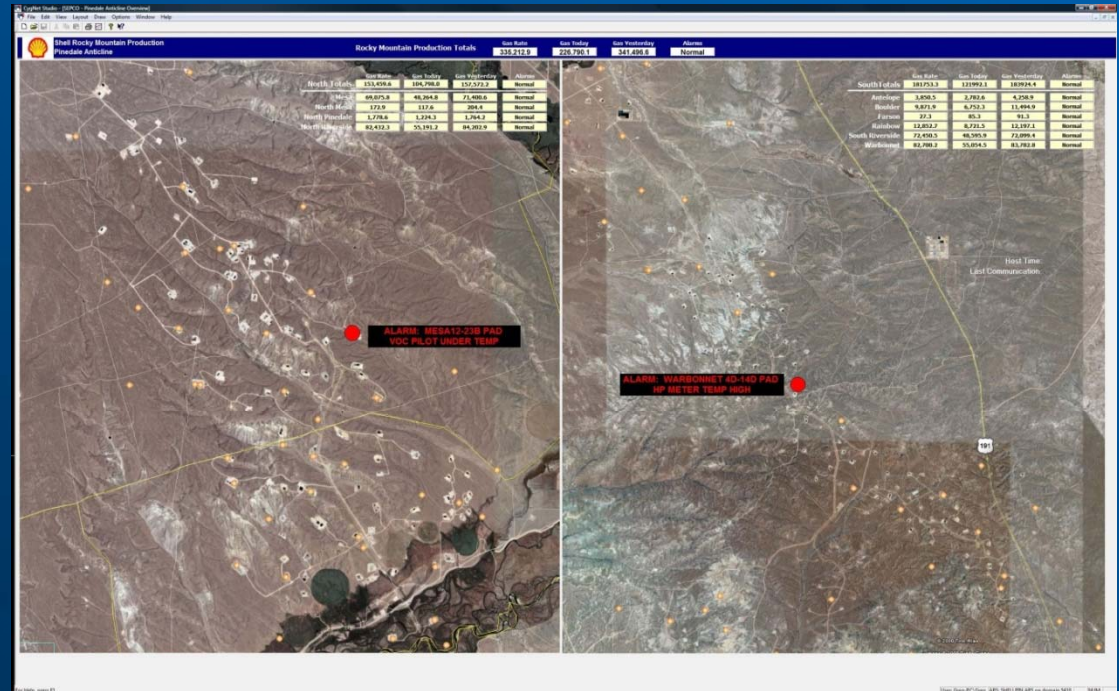
The operator is dispatched by the SCADA control room based on observed events and indications.

# Benefits of a Dispatch Mode

- Sites are visited when they need to be visited
- Fewer vehicles on the lease roads at any one time
- Less miles driven in a year
- Each Pumper/Operator can handle more assets
- Reducing the number of site visits translates to a better safety performance – fewer opportunities for incidents/accidents

# Building Screens that Drive Operating Modes

- SCADA HMI screen layout should reflect the operations team's vision of the field or plant
- Navigation from screen to screen should mirror the actions driven by an alarm



# Building Screens To Support Operator's Workflow & Daily Needs

Data Tables

Process Flow Mimics

CyberNet Wiser - [Well Summary]

Shell Rocky Mountain Production  
Pinedale Anticline

Jensen 11A-2 CDP

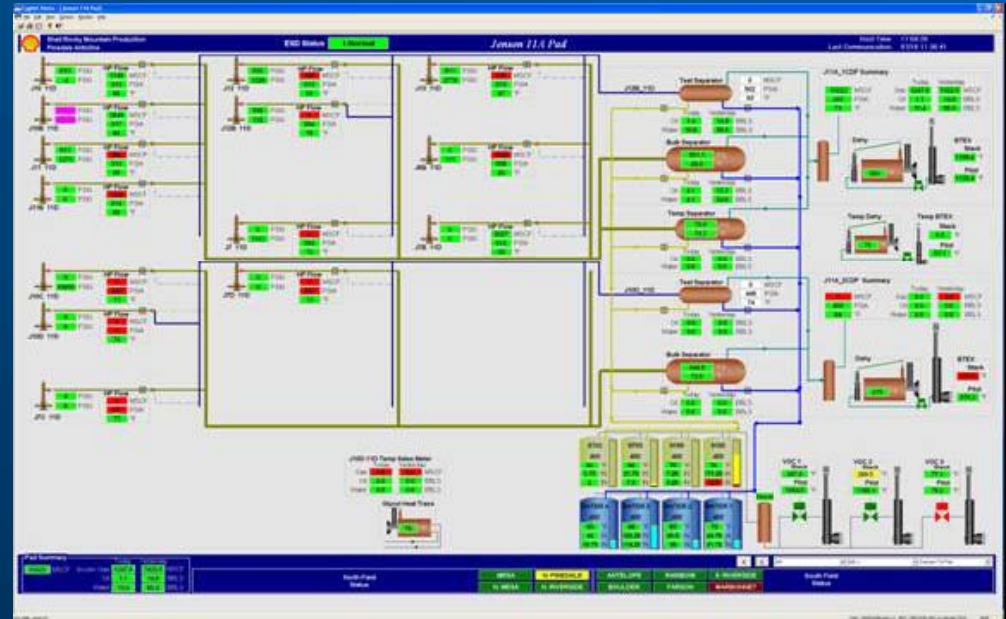
Host Time: 11:52:33 AM

	Flow Rate	Static	Temp	Gas/Dy	OIL/Dy	H2O/Dy	Gas Ydy	OILYdy	H2OYdy	StaticYdy	TempYdy	DPYdy	HSYdy	Volts	LastConn	
Antelope 1-9	0	243	88	85	572.7	1.7	537	9.6	10.8	239	79	72	12.6	12.0	07/16 11:50	
Antelope 11-4	106.1	244	79	171	1.2	7.8	1066	7.0	42.9	236	77	50	24.0	12.1	07/16 11:50	
Antelope 12-4D	560	246	84	67	7.4	447.9	804	2.1	63.3	245	81	229	23.9	12.1	07/16 11:50	
Antelope 13-4D	605	244	84	81	6.4	87.0	644	6.5	89.4	238	84	46	24.0	12.1	07/16 11:50	
Antelope 14-4	0	230	79	0	0.0	0.0	61	0.0	0.0	233	76	46	2.3	12.1	07/16 11:50	
Antelope 2-6	855	246	73	124	1.1	3.9	724	5.7	15.1	238	72	103	23.2	12.1	07/16 11:50	
Antelope 2-9	0	0	0	0	0.0	0.0	0	0.0	0.0	0	0	0	0.0	12.0	07/16 11:50	
Antelope 7-5D	299	243	82	46	0.0	1.9	439	4.3	37.9	236	81	37	24.0	12.0	07/16 11:50	
Antelope 8-5D	0	23	83	0	0.0	0.0	0	0.0	0.0	23	75	0	0.0	12.0	07/16 11:50	
Antelope 9-5D	0	20	89	0	0.0	0.0	0	0.0	0.0	19	77	0	0.0	12.0	07/16 11:51	
Boulder 14b-32D	3529	492	84	430	1.3	3.6	4916	57.3	175.0	490	81	55	24.0	12.0	07/16 11:50	
Boulder 32A-1 CDP	3587	522	86	487	8.3	50.1	4236	45.6	301.5	520	84	51	24.0	12.0	07/16 11:51	
Boulder 32B-2 CDP	12884	524	85	1609	22.4	175.3	12909	130.0	1160.7	522	83	109	24.0	12.0	07/16 11:51	
Falcon 1-36	919	248	88	73	0.5	1.4	476	3.1	8.6	242	89	99	12.0	12.0	07/16 11:51	
Falcon 2-36D	830	248	83	107	1.0	4.6	851	7.2	25.1	240	82	79	24.0	12.0	07/16 11:51	
Falcon 7-36D	763	247	88	98	1.6	1.9	777	9.7	12.1	240	86	67	24.0	12.0	07/16 11:51	
Meter CAO	432	247	78	70	0.1	0.0	442	0.6	0.0	239	77	36	24.0	12.0	07/16 11:51	
Pad CAO	35	208	71	14	0.0	0.0	33	0.0	0.0	210	68	2	24.0	13.7	07/16 11:12	
Well Summary	10230	492	73	1248	1.1	10.4	7422	14.8	85.8	490	83	71	17.6	12.1	07/16 11:51	
Pumper	0	459	85	0	0.0	0.0	0	0.0	0.0	457	75	0	0.0	12.0	07/16 11:51	
Tank Details	0	489	85	0	0.0	0.0	0	0.0	0.0	498	91	1	0.0	12.1	07/16 11:51	
Trend-Multi	0	460	518	76	1494	13.3	40.5	8544	85.0	341.7	516	79	75	24.0	12.0	07/16 11:51
Trend-Build	10706	519	76	1550	15.4	102.5	9823	82.8	465.3	517	75	62	24.0	12.0	07/16 11:52	
Alarm View	0	32	85	0	0.0	0.0	0	0.0	0.0	38	74	0	0.0	12.0	07/16 11:51	
Pad Summary																
Corros Summary																
Big Piny																

Well Summary | Poll Well | Poll All | Rocky Mountain Pro. | All | METER | [JBL.] | Jensen 11A-2 CDP

North Field Status: MESA, N. PINEDALE, ANTELOPE, RAINBOW, S. RIVERSIDE, South Field Status: N. MESA, N. RIVERSIDE, BOULDER, FARSON, WARBOHNET

User: ONR\pdpolpoc@1 AHS: SHELLPINARS on domain 5410 NUM



# Prioritizing Alarm Events

Consequences					Potential to Result in Shut In or Major Safety Risk				
People (Safety Risk)	Asset Damage / Deferment (Financial Risk)	Environment	Reputation / Personal Welfare	Production Shut-In	Severity	No potential or only very slight risk	Potential may result in safety risk or shut in if not addressed within 1 month	Potential may result if not addressed within shift	Immediate Response Required
P	A	E	R	S		Nil	Slight	Moderate	Major
Slight Injury or Health Impact	Slight Damage Deferment <\$10k	Slight Effect	Slight Impact	No Shut In	1	1	1	3	3
Minor Injury or health Effect	Minor Damage Deferment < \$100k	Minor Effect	Minor Impact	No Shut In	2	1	2	3	3
Major Injury or Health Impact	Major Damage Deferment > \$100k	Major Effect	Major Impact	Limited curtailment	3	2	3	3	4
Permanent Disability or Fatality	Extensive Damage Deferment > \$10M	Massive Effect	Massive Impact	Site Shut In Status	4	2	3	4	4

# Using Operations to set Priorities

Response Priority		
Severity	Priority Setting	Latest Allowed Response
4	90 - 99	Immediate
3	80-89	Within 4 hours
2	50-79	Within 1 week
1	10-49	Scheduled Maintenance Item within quarter

# Automating Reports

Automate report processes around “morning reports” or weekly reporting

The screenshot shows a Microsoft Excel spreadsheet titled "Morning Report" for July 16, 2008. The spreadsheet is divided into two main sections, each with a header row and a data table. The first table lists various meters and their corresponding flow rates, static pressures, gas usage today and year-to-date, and hours. The second table lists HP meters and their corresponding flow rates, static pressures, gas usage today and year-to-date, and hours.

Meters	Flow Rate	Static	Gas Today	Gas YDay	Hours	Comments
A14 4	0	230	0	61	2	
A1 9	0	243	86	537	13	
J11A 2CDP	0	459	0	0	0	
J11C 11D	0	489	0	0	0	
J15 11D	0	490	84	508	10	
M1 27	0	481	45	324	6	
NF13 10	0	486	0	0	0	
NF13 32	0	521	0	0	0	
PD13 2A	0	484	80	527	19	
RB13 32D	0	244	0	0	0	
RS13A 1CDP	0	446	0	9423	24	
RS1 13D	0	481	0	1510	24	
RS7 13	0	483	0	1171	24	
TM1 30H	0	12	0	0	0	
WB12D 10D	0	448	80	3785	24	
WB1D 6D	0	11	0	0	0	
WB2C 6D	0	11	0	0	0	
WB8D 6D	0	39	0	0	0	
WB9B 2CDP	0	12	0	0	0	

HP Meters	Flow Rate	Static	Gas Today	Gas YDay	Hours	Comments
J10C 11DHP	0	444	0	0	0	
J10D 11DHP	0	0	0	0	0	
J12B 11DHP	0	503	10	4	0	
J14B 11DHP	0	675	68	1211	17	
J1B 15DHP	0	682	0	0	0	
J3 14HP	0	508	0	0	0	
J4 14DHP	0	674	0	3547	14	

# Differentiating Data, Information, and Actionable Information

- What information is important?
- How much data is digestible?
- How will data be converted into Actionable Information?
- Data & alarm management

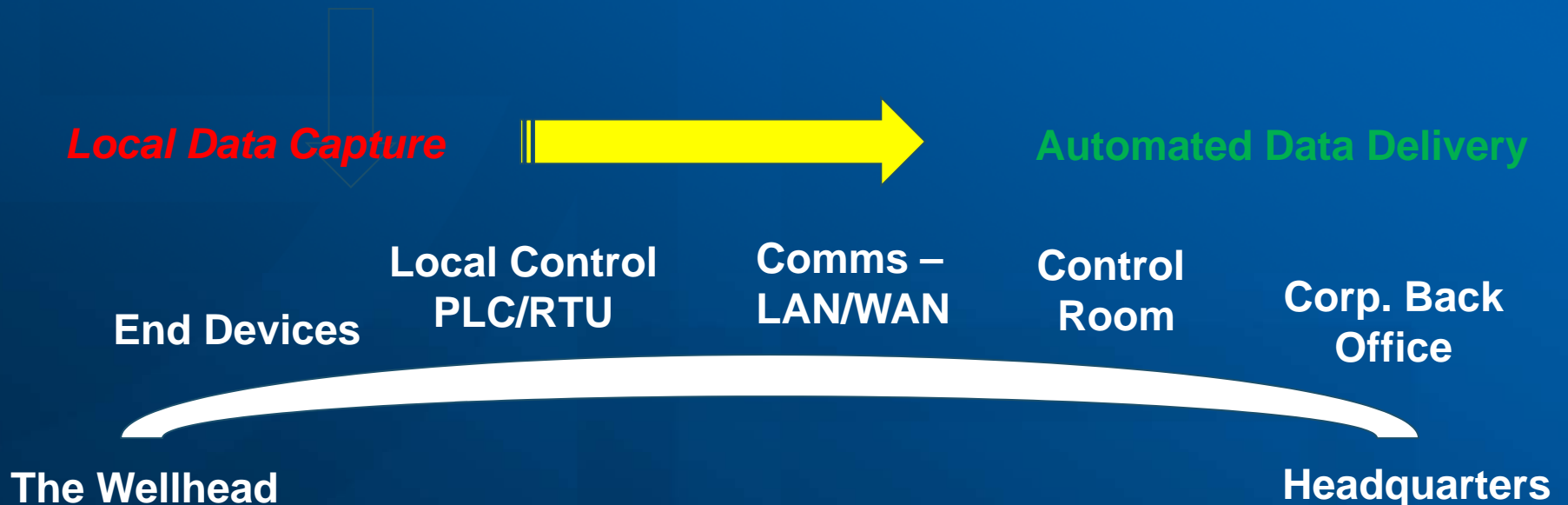


# Integrating Operators' Input

Operators can provide insight into questions like these:

- How current is the information?
- What information does management need?
- What is the data path, and is it easily traceable through the system?
- What happens to data after it leaves the SCADA system?
- What are limitations to growth in the current SCADA system?
- What are the company's security concerns?
- Are there custody transfer or hydrocarbon allocation issues?

# The Data Path – Moving from Manual Data Collection to a Fully Realized SCADA system



Moving the decision making from the field to the office makes for a safer and more green operation.

# Can a SCADA system lead to a greener operation?

Yes it can.

- By using SCADA to monitor emissions
- By reducing vehicle traffic through a true dispatch mode driven by a fully realized SCADA system with a real control room
- Driving faster responses to accidental releases

And it will also lead to a **safer** and more profitable operation.



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