

Energy/Utility Meter Data Integration & Management

April 2013

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- **Tammie Learned**, Energy Optimization Branch Chief, Energy Programs Division, US Army Engineering and Support Center, Huntsville
- **Ben Harbin**, Senior Vice-President, Carina Technology Inc.
- **David Marconnet**, Program Manager, TGI
- **Ted Briggs**, Executive Manager, IGS
- **Elizabeth Bennett**, Executive Manager, IGS

Intergraph Government Solutions

Energy & Utilities Technology and Capabilities and Overview

SMARTERDECISIONS



Intergraph® is the leading global provider of engineering and geospatial software that enables customers to visualize complex data.

- Founded in 1969, Intergraph provides industry-leading enterprise engineering and geospatial intelligence software:
 - Enables customers to manage and understand complex data through intelligent visual representations
 - Operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I)
 - No other company in the geospatial market has the range of capabilities that Intergraph and its Hexagon partners provide. Together, our companies, bring complete solutions to customers in multiple industries around the globe.

- **Intergraph Key Facts:**
 - **Divisional Presidents:** John Graham (SG&I), Gerhard Sallinger (PP&M)
 - **Employees:** >4,000; 1,800 in Alabama
 - **Headquarters:** Huntsville, AL, USA



Intergraph Business Overview: Two Distinct Operating Divisions

- Intergraph goes to market through its two operating divisions, Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I):
 - Intergraph PP&M provides the broadest software portfolio in the industry used by nearly all of the Fortune Global 500 chemical, petroleum & pharmaceutical companies around the world
 - Intergraph SG&I's geospatial-powered solutions are utilized by governments in more than 80% of the world's largest countries and security technologies help protect over 500 million people worldwide

Process, Power & Marine



Industry-leading design & data-centric information management software for plants & marine facilities

Security, Government & Infrastructure



Geospatially-powered solutions for the security, intelligence, military and infrastructure industries



Information Worker Solutions



Microsoft Windows SharePoint Services 3.0
Application Development



- Small business Government contractor
 - Headquartered in Cummings Research Park, Huntsville, Alabama
 - NAICS codes 541330, 541511, 541512, 541712
- Innovative information technology services
- Specializing in **Microsoft SharePoint and Business Intelligence Solutions**
- Highly qualified staff
- Experienced leadership team

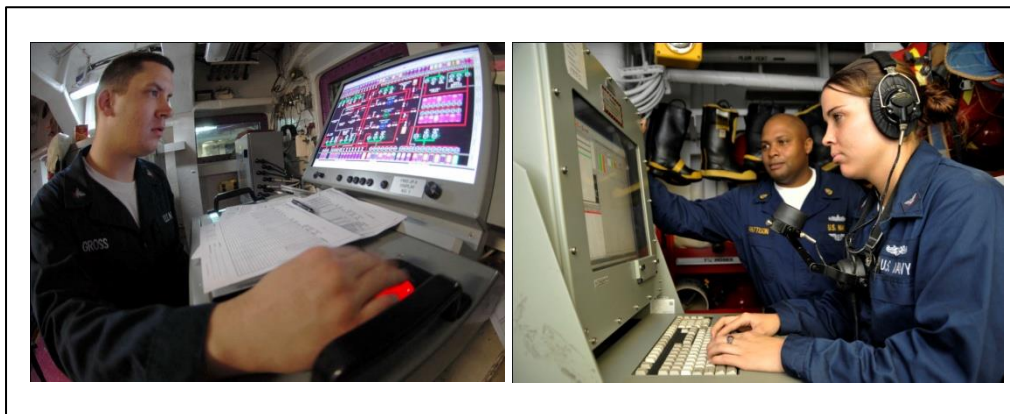
We Innovate. You Succeed.

Intergraph Energy Technology & Capabilities



Intergraph provides complete geospatial infrastructure management and operations software for **electric, gas, water, pipeline, utility, and communications** companies. Our solutions address all aspects of network and infrastructure management – from **planning, analysis, design, Cyber Security through Smart Grid operations and maintenance**. We provide a suite of industry specific solutions to address work **design, network asset management, outage management, and integrated mobile work force management.**

Navy "GreenFleet" Initiatives 2012 & 2016



- Environmentally responsible, drawing less than one amp (about 0.1 kW) and producing only about 300 Btuh
- Consumes 20% power of standard computer
- Designed to withstand the broadest conditions and demands of users
- Sealed to prevent the introduction of outside air, water, dust, or other contaminants that cause system failures
- Expect ~30% increase in useful life
- Designed to meet or exceed DoD specifications for shock, vibration, humidity, and temperature
- Available for any mounting configuration



TD-R™ 4X27B Bulkhead Mount Computer

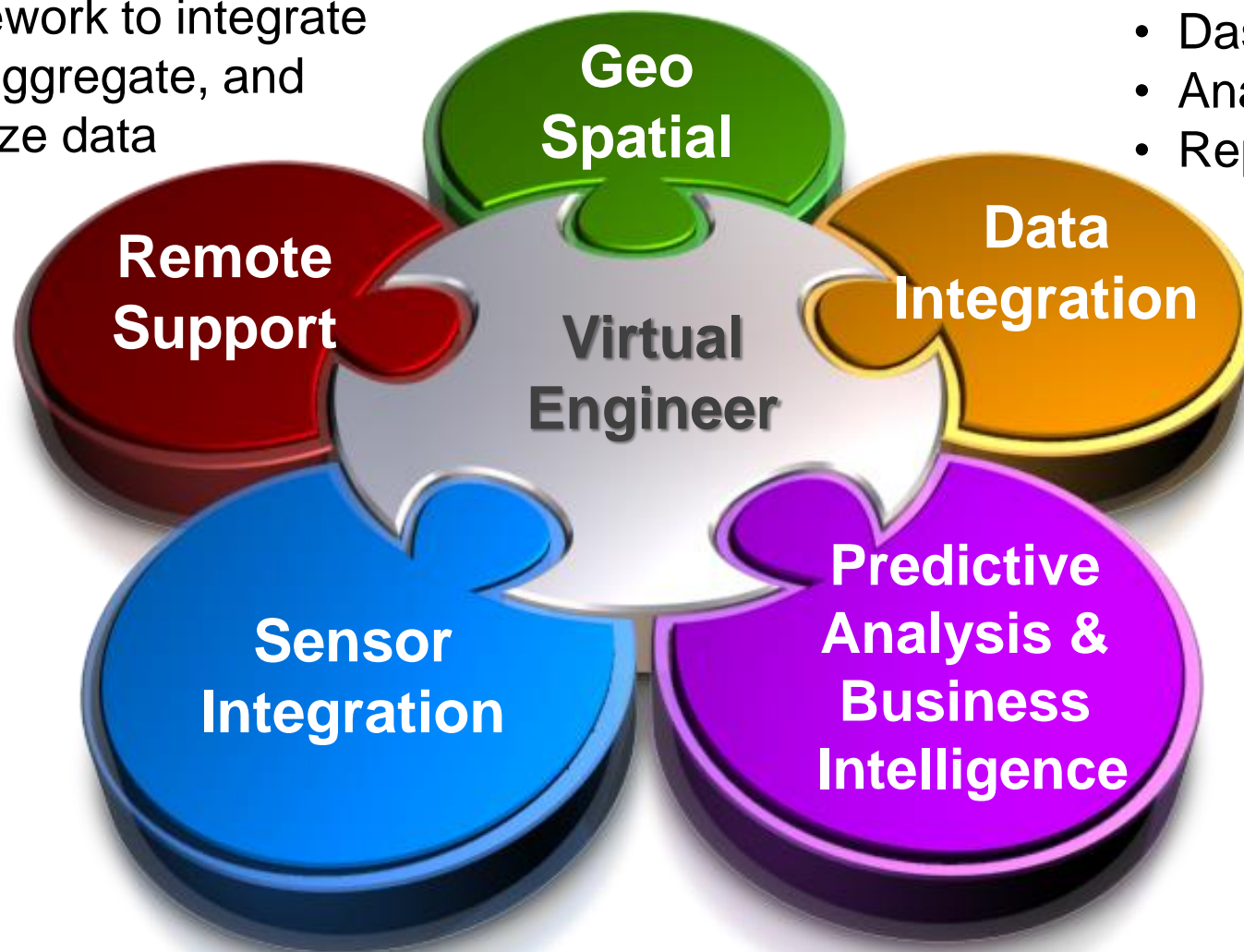
- Low Power Consumption (less than 0.1 kW)
- 2nd Gen Intel® Core™ i7 2.7GHz or higher
- High Storage capacity
- Bootable SATA based Compact Flash (CF) Reader
- Room for two (2) 2.5" SATA Drives (Hot Swap capable)
- Customizable to meet a range of user requirements
- Fully Solid-state construction (no fans or spindle drives)
- I/O Interface ports (standard): Two (2) GigE RJ-45 ports; Audio (Line-In, Line-Out, MIC); Two (2) Serial Ports; Six (6) USB 2.0 ports (2 USB 3.0, 4 USB 2.0); One (1) DVI-I Port; One (1) DVI-D port; One (1) HDMI
- Operating System Support: Windows XP Professional (32/64bit), Windows 7, Windows 2008 R2, Linux
- Input Power: 12-25 VDC (standard). Includes AC power brick, 100-240VAC, 1.8A, 50/60Hz



Modular and scalable framework to integrate and aggregate, and analyze data

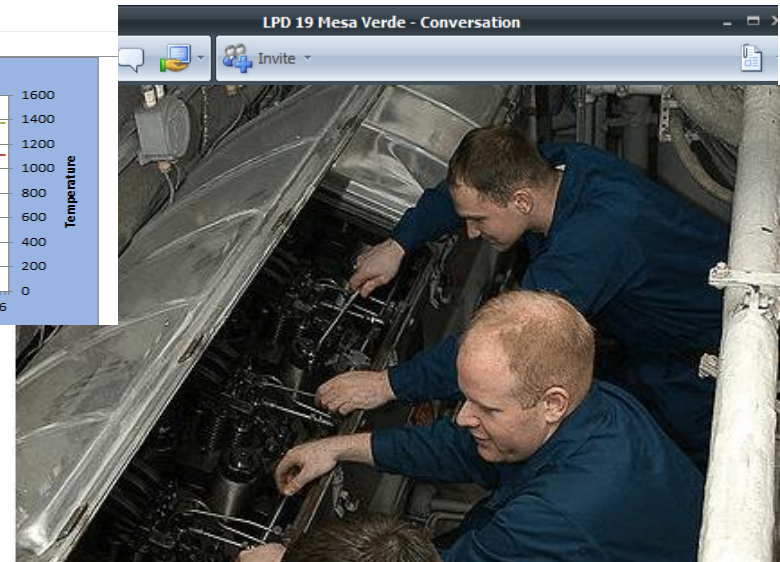
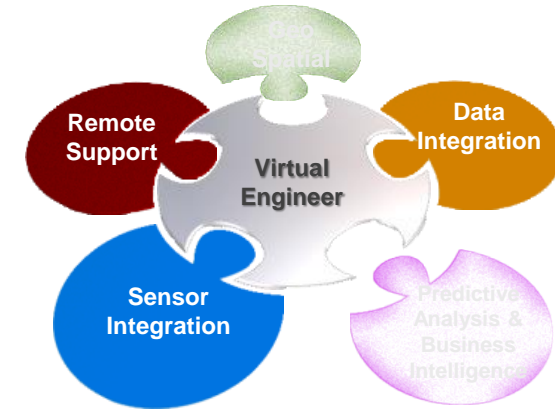
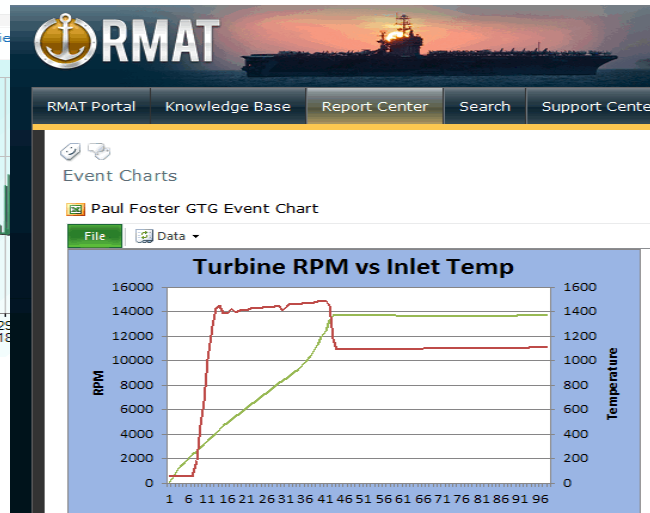
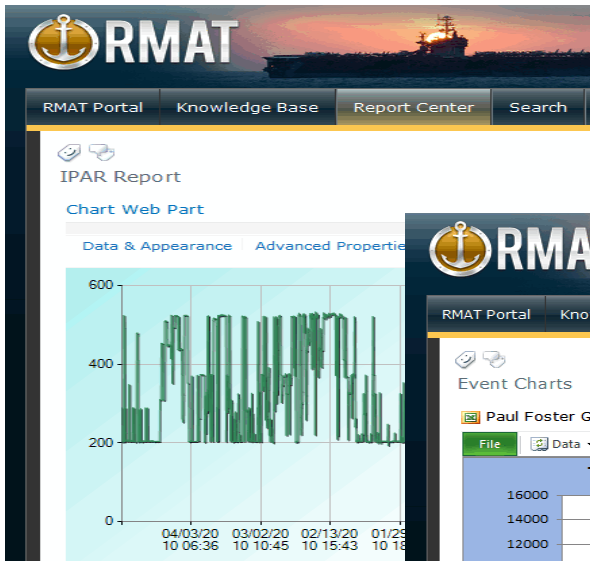
User Interfaces

- Dashboards
- Analysis Tools
- Reports

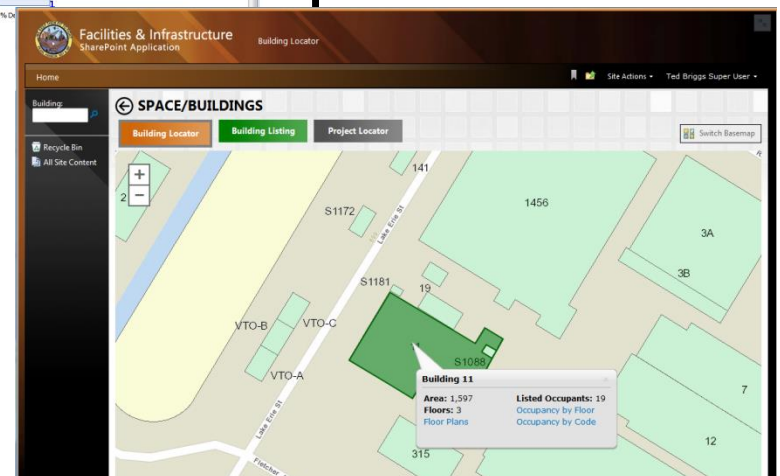
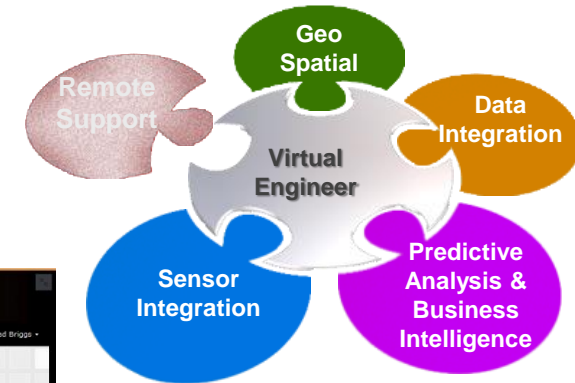
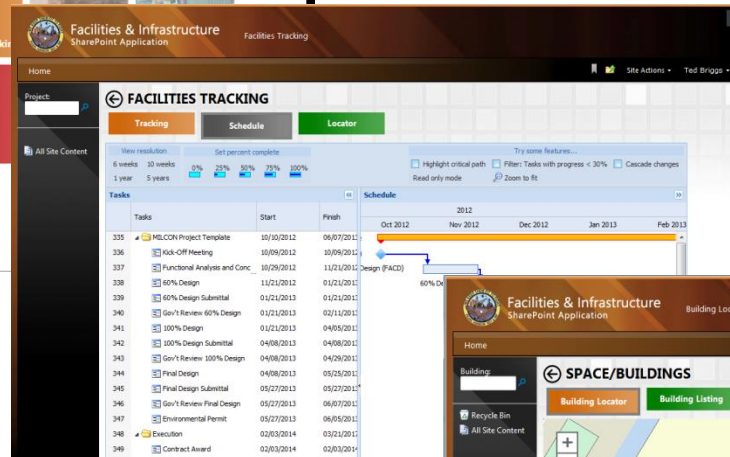
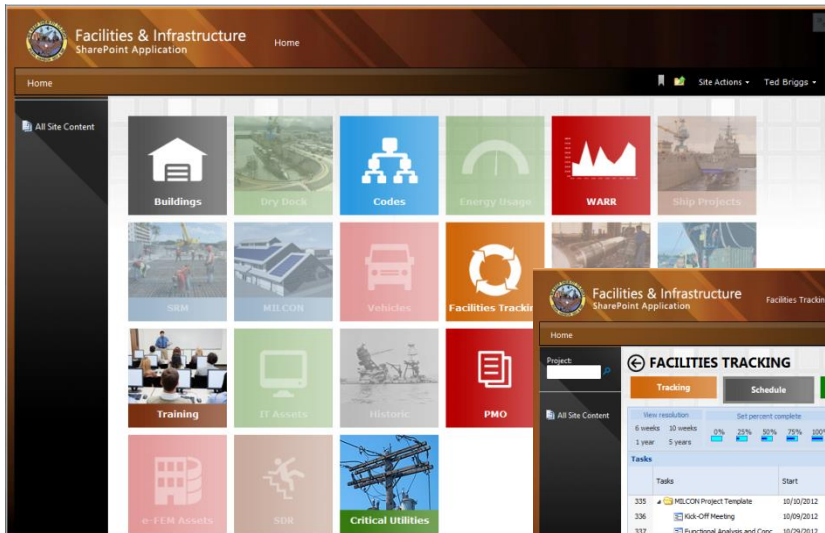


Distance Support

Enable the Navy enterprise to effectively and innovatively support the warfighter to remotely diagnose and troubleshoot problems in near real-time with a secure, integrated environment which provides monitoring, data integration, collaboration and knowledge sharing.



Provide geospatially based space management tools, facilities project management, and facilities workforce planning.



Installation Status Report



Utility Billing System



Year	Month	Usage	Rate	Amount	Balance
2010	12	1000	1.00	1000.00	1000.00
2011	01	1100	1.10	1210.00	1210.00
2011	02	1200	1.20	1440.00	1440.00
2011	03	1300	1.30	1710.00	1710.00
2011	04	1400	1.40	2030.00	2030.00
2011	05	1500	1.50	2400.00	2400.00
2011	06	1600	1.60	2820.00	2820.00
2011	07	1700	1.70	3290.00	3290.00
2011	08	1800	1.80	3810.00	3810.00
2011	09	1900	1.90	4380.00	4380.00
2011	10	2000	2.00	5000.00	5000.00
2011	11	2100	2.10	5670.00	5670.00
2011	12	2200	2.20	6400.00	6400.00
2012	01	2300	2.30	7190.00	7190.00
2012	02	2400	2.40	8040.00	8040.00
2012	03	2500	2.50	8950.00	8950.00
2012	04	2600	2.60	9920.00	9920.00
2012	05	2700	2.70	10950.00	10950.00
2012	06	2800	2.80	12040.00	12040.00
2012	07	2900	2.90	13190.00	13190.00
2012	08	3000	3.00	14400.00	14400.00
2012	09	3100	3.10	15670.00	15670.00
2012	10	3200	3.20	17000.00	17000.00
2012	11	3300	3.30	18390.00	18390.00
2012	12	3400	3.40	19840.00	19840.00
2013	01	3500	3.50	21350.00	21350.00
2013	02	3600	3.60	22920.00	22920.00
2013	03	3700	3.70	24550.00	24550.00
2013	04	3800	3.80	26240.00	26240.00
2013	05	3900	3.90	28000.00	28000.00
2013	06	4000	4.00	29820.00	29820.00
2013	07	4100	4.10	31710.00	31710.00
2013	08	4200	4.20	33660.00	33660.00
2013	09	4300	4.30	35670.00	35670.00
2013	10	4400	4.40	37740.00	37740.00
2013	11	4500	4.50	39870.00	39870.00
2013	12	4600	4.60	42060.00	42060.00
2014	01	4700	4.70	44310.00	44310.00
2014	02	4800	4.80	46620.00	46620.00
2014	03	4900	4.90	49090.00	49090.00
2014	04	5000	5.00	51720.00	51720.00
2014	05	5100	5.10	54510.00	54510.00
2014	06	5200	5.20	57460.00	57460.00
2014	07	5300	5.30	60570.00	60570.00
2014	08	5400	5.40	63840.00	63840.00
2014	09	5500	5.50	67270.00	67270.00
2014	10	5600	5.60	70860.00	70860.00
2014	11	5700	5.70	74610.00	74610.00
2014	12	5800	5.80	78520.00	78520.00
2015	01	5900	5.90	82590.00	82590.00
2015	02	6000	6.00	86820.00	86820.00
2015	03	6100	6.10	91210.00	91210.00
2015	04	6200	6.20	95760.00	95760.00
2015	05	6300	6.30	100470.00	100470.00
2015	06	6400	6.40	105340.00	105340.00
2015	07	6500	6.50	110370.00	110370.00
2015	08	6600	6.60	115560.00	115560.00
2015	09	6700	6.70	120910.00	120910.00
2015	10	6800	6.80	126420.00	126420.00
2015	11	6900	6.90	132090.00	132090.00
2015	12	7000	7.00	137920.00	137920.00
2016	01	7100	7.10	143910.00	143910.00
2016	02	7200	7.20	150060.00	150060.00
2016	03	7300	7.30	156370.00	156370.00
2016	04	7400	7.40	162840.00	162840.00
2016	05	7500	7.50	169470.00	169470.00
2016	06	7600	7.60	176260.00	176260.00
2016	07	7700	7.70	183210.00	183210.00
2016	08	7800	7.80	190320.00	190320.00
2016	09	7900	7.90	197590.00	197590.00
2016	10	8000	8.00	205020.00	205020.00
2016	11	8100	8.10	212610.00	212610.00
2016	12	8200	8.20	220360.00	220360.00
2017	01	8300	8.30	228270.00	228270.00
2017	02	8400	8.40	236340.00	236340.00
2017	03	8500	8.50	244570.00	244570.00
2017	04	8600	8.60	252960.00	252960.00
2017	05	8700	8.70	261510.00	261510.00
2017	06	8800	8.80	270220.00	270220.00
2017	07	8900	8.90	279090.00	279090.00
2017	08	9000	9.00	288120.00	288120.00
2017	09	9100	9.10	297310.00	297310.00
2017	10	9200	9.20	306660.00	306660.00
2017	11	9300	9.30	316170.00	316170.00
2017	12	9400	9.40	325840.00	325840.00
2018	01	9500	9.50	335670.00	335670.00
2018	02	9600	9.60	345660.00	345660.00
2018	03	9700	9.70	355810.00	355810.00
2018	04	9800	9.80	366120.00	366120.00
2018	05	9900	9.90	376590.00	376590.00
2018	06	10000	10.00	387220.00	387220.00

AEWRS Data

ANNUAL SUMMARY ANALYSIS

27 March 2011 Page 1 of 1

3720	FOST BRAGG	2001	2002	2003	2004	2010
TOTAL CONSTRUCTION						
Energy Cost	1,001,102	1,075,102	1,177,504	781,474	-	-7,12
Thermal Cost	1,811,300	1,848,017	1,972,296	301,201	-	-2,04
Electrical Cost	1,017,071	1,034,086	1,060,010	100,405	-	-6,10
Energy \$	\$2,829,473	\$3,957,205	\$4,209,810	\$1,182,680	-	-12,16
Thermal \$	\$8,203,555	\$11,733,854	\$16,031,986	\$2,962,470	-	-44,14
Electrical \$	\$2,084,405	\$2,068,099	\$2,049,796	\$1,465,890	-	-10,18
Energy Unit \$	\$0.89	\$0.87	\$0.86	\$0.86	-	-0.18
Thermal Unit \$	\$0.66	\$0.64	\$0.70	\$0.70	-	-0.18
Electrical Unit \$	\$0.83	\$0.78	\$0.69	\$0.67	-	-0.17
Real Prop Bldg	2,536	2,107	2,292	2,201	-	-4,08
Real Prop MW	22,770	26,036	26,202	26,620	-	17,14
Real Prop KW	19,819	19,916	19,160	20,130	-	-6,04

Environmental

Project	Title	Scope	Subst	Fund	Stat	PM	Env	Lebor
FA2003A-02	Utility Monitoring Control System	DEV	OPEN	MFD		Jennifer McKenzie	●	●
EZ201010-12	1-1326. Remove calcium build-up from perimeter fence	DEV	OPEN	FUND		Ron Eabrey	●	●
GR000119-02	Front Stairway Railing, Bldg 1-1326	DEV	HOLD	SAF		Dawn Hester	●	●
Q200004-12	1-1326. Renovation Current Operations Center XVII ABN CORPS HQ	DEV	DOC	FUND		Matt McCullough	●	●
FA000109-02	Install UMCS HVAC Air Filter Unit Off Function	EXE	OPEN	FUND		Brad Guesenberry	●	●
IA11007-02	Remodel Command Suite, XVII ABN HQ, Bldg 1-1326	EXE	OPEN	FUND		Sey Nam	●	●
FA2003A-02	Repair and Integrate UMCS into various Bldgs	EXE	OPEN	FUND		Brad Guesenberry	●	●
FA5001-02	Renovate HQ Bldg Basement for MSE Director & Staff, Bldg 1-1326	WAR	OPEN	FUND		Sey Nam	●	●
Q200201-02	Renovate Room # 316 (War Room), Bldg 1-1326	WAR	OPEN	FUND		Sey Nam	●	●
Q200202-02	Renovate AC/S, G2 Area, Bldg 1-1326	WAR	OPEN	FUND		Sey Nam	●	●

Total Facility Projects: 47 Outstanding Environmental Requirements: 8

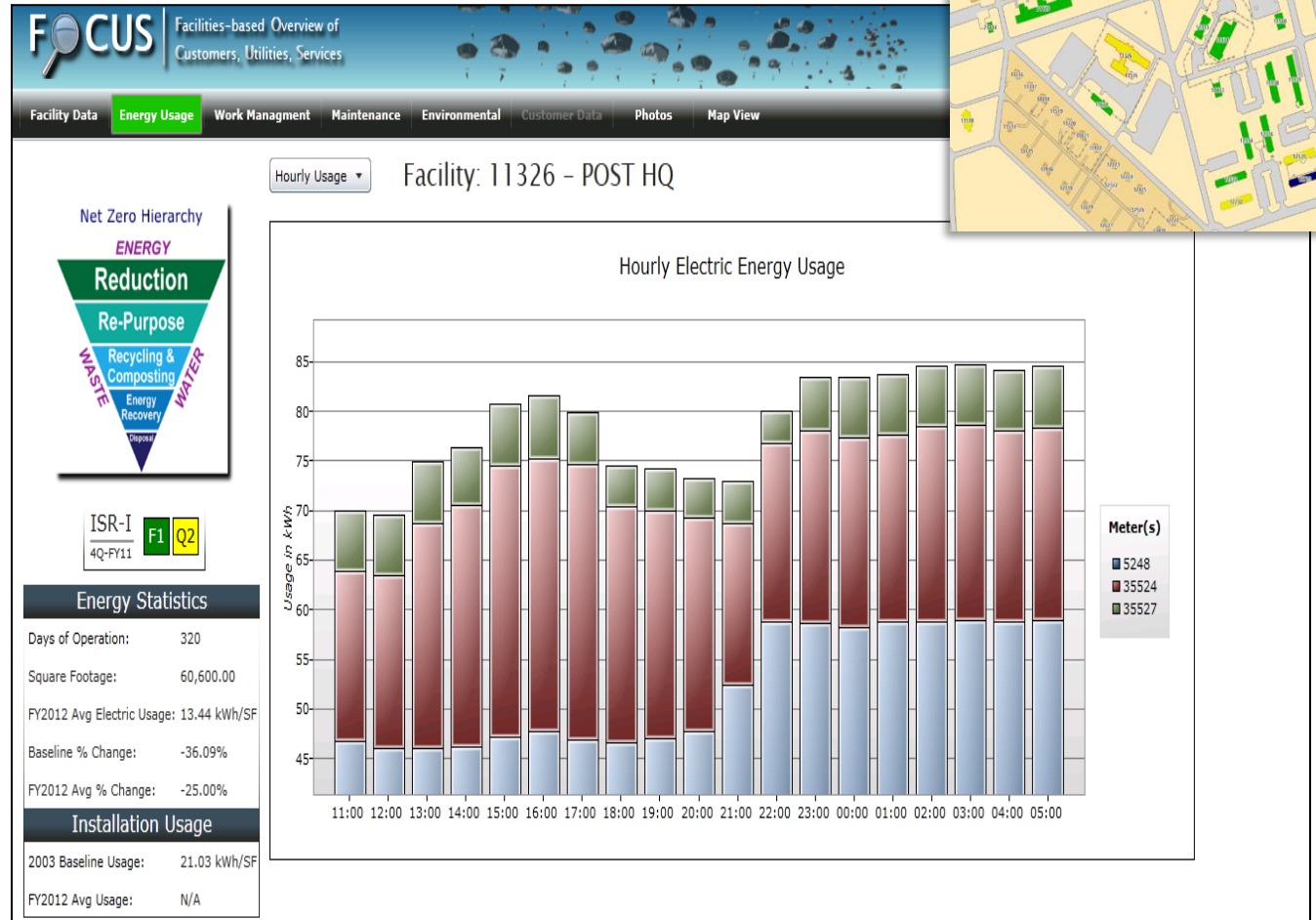
LEED-EB Checklist

LEED for Existing Buildings v3.0 Registered Building Checklist

Project Address: XVII ABN Corps HQ Bldg # 11326

Req	Code	Yes	No	Points
1	1	●	●	1
1	2	●	●	1
1	3	●	●	1
1	4	●	●	1
1	5	●	●	1
1	6	●	●	1
1	7	●	●	1
1	8	●	●	1
1	9	●	●	1
1	10	●	●	1
1	11	●	●	1
1	12	●	●	1
1	13	●	●	1
1	14	●	●	1
1	15	●	●	1
1	16	●	●	1
1	17	●	●	1
1	18	●	●	1
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1	36	●	●	1
1	37	●	●	1
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1	40	●	●	1
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1	57	●	●	1
1	58	●	●	1
1	59	●	●	1
1	60	●	●	1
1	61	●	●	1
1	62	●	●	1
1	63	●	●	1
1	64	●	●	1
1	65	●	●	1
1				

Integrates and presents energy consumption by meter as captured by the Utility Monitoring & Control System (UMCS). Indicates performance compared to installation baseline and FY average.



Utility Billing System Data

Provides ready access to utility bills for reimbursable customers as well as generation of “mock” bills for other facility tenants to promote energy awareness.

Fort Bragg Directorate of Public Works

Utility Services Mock Bill Statement

08-Apr-2011

Bill Period: February 2011

Amount Due: \$11,526.98

Account ID: 18

Comments:

Name/Unit: 18TH ABN CORPS HQ

Address: 111 Armistead St
Fl Bragg, NC 28307

Remit To: This is a mock bill. Please do not remit payment

Credit Appropriation: Cust No: 18ABNC

DPW Director: Gregory Bean

Attention: If you have any questions reference this bill please contact us.

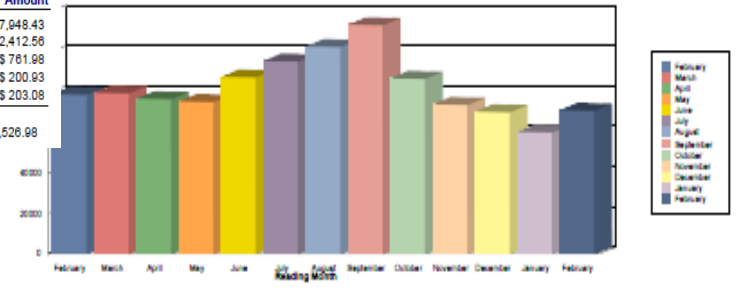
Bldg	Meter	Unit ID	Unit of Measure	Service Days	Previous Reading	Current Reading	Consumption	Rate	Amount
I-1326	18ABN001E1	18TH ABN CORPS HQ	KWH	29	8,287	8,386.00	71,280.00	0.111510	\$ 7,048.43
I-1326	18ABN001G1	18TH ABN CORPS HQ	CU/FT	29	340	836.00	297,800.00	0.008107	\$ 2,412.56
I-1326	18ABN001R1	18TH ABN CORPS HQ	TON	28	0	0.80	4.80	158.745450	\$ 761.98
I-1326	18ABN001S1	18TH ABN CORPS HQ	GAL	28	31,108	31,203.00	46,560.00	0.004316	\$ 200.93
I-1326	18ABN001W1	18TH ABN CORPS HQ	GAL	28	31,108	31,203.00	58,200.00	0.003489	\$ 203.08
Total Amount:									\$11,526.98



Usage Report
Utility Billing System
Fl Bragg Directorate of Public Works

ND01 18TH ABN CORPS HQ Page 1 of 6

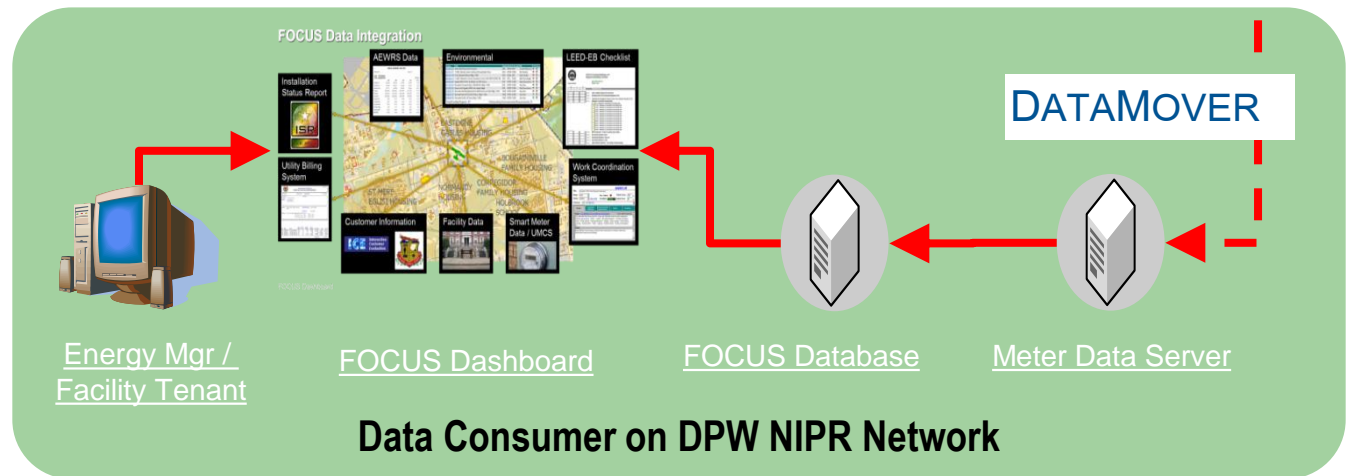
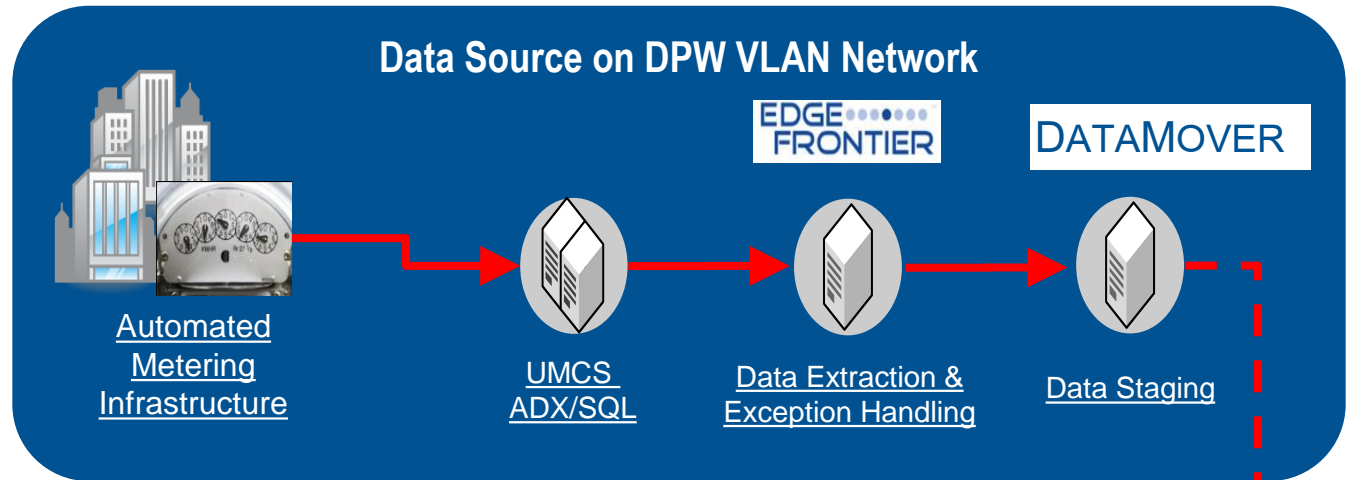
Electricity	Billing Period	Usage (KWH)	Amount
	February 2010	79,200.00	\$8,831.59
	March 2010	79,920.00	\$8,911.88
	April 2010	77,040.00	\$8,590.73
	May 2010	75,600.00	\$8,430.16
	June 2010	87,840.00	\$9,795.04
	July 2010	95,760.00	\$10,678.20
	August 2010	102,960.00	\$11,481.07
	September 2010	113,760.00	\$12,685.38
	October 2010	87,120.00	\$9,714.75
	November 2010	74,160.00	\$8,269.58
	December 2010	70,560.00	\$7,868.15
	January 2011	60,480.00	\$6,744.12
	February 2011	71,280.00	\$7,948.43
Totals		1,076,880	\$118,848.08



Fort Bragg UMCS / FOCUS Integration

IGS DataMover allows data integration from the UMCS server on the VLAN to the FOCUS data server on the NIPR.

EdgeFrontier is configured to alert the UMCS manager if any meter fails to transmit over a period of time. Can be configured to alert the Energy Manager or facility tenants when heating or cooling temperatures reach or exceed a preset threshold.



- **Intergraph provides unique technology, products and services for Commercial and Government Energy projects**
- **Design & Develop Energy-Efficient, Rugged, Sealed Computers**
- **Develop Web-based Energy Data Acquisition and Analysis Dashboards**
- **Virtual Engineer integrates Distance Support, Energy Conservation and Facilities Management capabilities**
- **Apply unique Cyber Security expertise to Energy projects**



Virtual Engineer Demo



Advantages & Benefits:

- Common Security framework for Users, Groups & Permissions
- Built-in Navigation Structure for common look & feel
- Deployment as an add-on for scalability and security
- Faster application development and deployment
- Content Management features like Document libraries, Lists, Tasks
- Modular design for feature reuse
- Powerful Search Crawling & Indexing
- Business Connectivity Services for external systems
- Social features for Team Collaboration