Case Study

Direct Energy LP

Direct Energy

Direct Energy currently owns and operates three (3) power stations in Texas, USA. Bastrop Energy Center (GE 7FA 2x1 CC), Frontera Energy Center (GE 7FA 2x1 CC), and Paris Energy Center (GE 7EA 2x1 CC). To reliably and cost effectively meet the gas and electrical supply needs of their customers, Direct Energy is focused on achieving and delivering measurable "Best in Class" performance across their operating fleet.

The Challenge

Direct Energy had specific requirements centered on the standardization of data collection and reporting. Essential to their business were Standard Plant and Portfolio Reports (weekly, monthly, quarterly, annual) and Critical Hot Gas Path Parts Life Tracking.

Key Information

Customer
Direct Energy

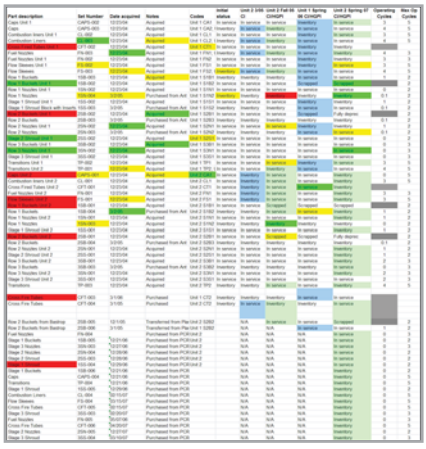
Location(s)
Based in Houston, TX USA
Unit of UK based Centrica, PLC

Challenges
- Multiple Plants Acquired with Varying Metrics, Calculations and Report Formats
- Need for Consistent, Verifiable Performance Data to Make Business Decisions
- Growing Portfolio, Increased Number of Critical Parts Lives to Manage

SPS Solution
Strategic Information Architecture *(ORAP Link, Parts Tracking, Fleet Reporting, Base ORAP)*

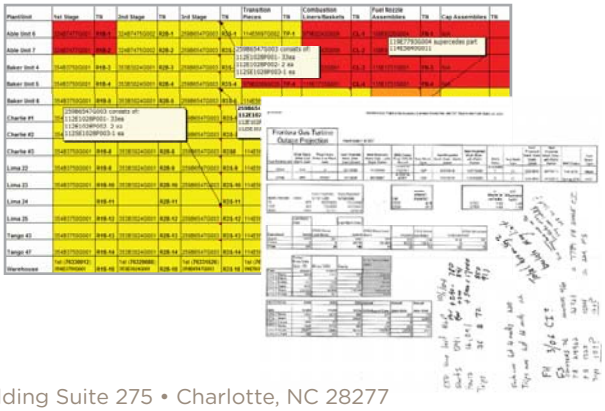
Direct Energy communicated to SPS that it was critical that there was visibility and transparency across the whole organization and that all data collection and reporting was executed in a secure manner. This need became even more paramount with the required compliance to the NERC CIP standards.

The collection of the required data was the first challenge. Ensuring that all three plants were analyzing and reporting consistent metrics was the first objective. Based on their varied historical ownership, tracking metrics was done differently among all three plants, typically through custom Microsoft Excel spreadsheets.



Tracking Serialized Critical Parts was no different in that Microsoft Excel was the obvious choice once again. Each individual Power Station was responsible for setting up and managing the spreadsheet for the units (and spare sets) at their plant. The difficulty began when units were brought down for inspection and parts were replaced repaired, and moved from unit to unit. The spreadsheet(s) began to take on a life of their own.

Then the owner of the spreadsheet got promoted.



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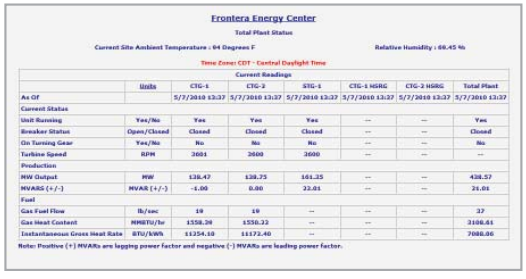
"SPS' ability to accurately gather, assemble, and report our reliability metrics to ISO standards has given us undisputable availability reporting and also enables us to benchmark ourselves against similar plants that contribute to your database. By linking this data to our turbine components you have contributed dramatically to our bottom line by maximizing our parts life while presenting no risk to our machines. Generally speaking, you have removed the guess work from reliability reporting and parts tracking."

David Selsky
Vice President Power Asset Management

The Solution

Working together, SPS and Direct Energy established the SPS Strategic Information Architecture (SIA) process for all three plants. This process uses the ORAP Family of Products and Services, including ORAP Link, Parts Tracking, Fleet Reporting and Base ORAP to collect once per second control data from the Distributed Control System (DCS) at each plant. SIA then converts this data into production-related measures: time, capacity (or energy) and events, using logic developed by SPS. This data is used to develop the specific mission profile for each unit, from start-up to shut down, along with all pertinent information. This data collection process is completed with limited to no-human effort. The only required input of the plant staff are details on Events, details that only knowledgeable plant operating staff can provide.

The data is then uploaded to the ORAP database for engineering validation by SPS personnel and then made available for reporting through the ORAP web portal.



Frontera Energy Center

Total Plant Status

Current Site Ambient Temperature : 64 Degrees F — Relative Humidity : 69.45 %

Time Zone: CDT - Central Daylight Time

	Units	CTG-1	CTG-2	STG-1	CTG-1 HSRG	CTG-2 HSRG	Total Plant
		Current Readings					
As Of		5/7/2010 13:37	5/7/2010 13:37	5/7/2010 13:37	5/7/2010 13:37	5/7/2010 13:37	5/7/2010 13:37
Current Status							
Unit Running	Yes/No	Yes	Yes	Yes	--	--	Yes
Breaker Status	Open/Closed	Closed	Closed	Closed	--	--	Closed
On Turning Gear	Yes/No	No	No	No	--	--	No
Turbine Speed	RPM	3601	3600	3600	--	--	--
Production							
MW Output	MW	138.47	138.75	161.35	--	--	438.57
MVARS (+/-)	MVAR (+/-)	-1.00	0.00	22.01	--	--	21.01
Fuel							
Gas Fuel Flow	lb/sec	19	19	--	--	--	37
Gas Heat Content	MMBTU/hr	1558.28	1550.22	--	--	--	3108.51
Instantaneous Gross Heat Rate	BTU/kWh	11254.10	11172.40	--	--	--	7088.06

Note: Positive (+) MVARs are lagging power factor and negative (-) MVARs are leading power factor.

Above is an example of the real-time "snapshot" reporting at Direct Energy. Users are able to access the status of all three plants (and the portfolio) from any computer anywhere in the world with the appropriate security access. The snapshot is of one plant and shows each unit, broken down by items such as Turbine Speed, MW Output, Gas Heat Content, etc. This instantaneous information is also integrated and can then be reported for any group of units over any specified time period.

Inspection Type	Age Criteria	Date Last Inspection Ended	Interval	High Time Part	Projected to Next Inspection	Last 12 Months Run Data	Projected Next Inspection
Combustion Inspection	GE CI Factored Starts	12/4/2008	450	292	158	205	2/2011
Hot Gas Path Inspection	GE HGPI/MOH Factored Starts	12/4/2008	900	304	596	205	4/2013

Part Description	Module Serial Number	Date In	Remaining Life Repair Cycles	Remaining Life GE CI Factored Starts	Remaining Life GE HGPI/MOH Factored Starts	Status	Installed Serialized Parts
SET - LINER CAPS	GE7FA-CA-1	12/4/2008	2	1050		Repaired	14
SET - COMBUSTION LINERS	GE7FA-CL-1	12/4/2008	2	1050		Repaired	14
SET - FUEL NOZZLES	GE7FA-FN-14	1/22/2005	3	1066		Repaired	14
SET - FLOW SLEEVES	GE7FA-FS-1	12/4/2008	2	1050		Repaired	14
SET - TRANSITION PIECES	GE7FA-TP-1	12/4/2008	2	1050		Repaired	14
SET - 1ST STAGE BUCKETS	GE7FA-R1B-5	12/4/2008	0		468	Repaired	92
SET - 1ST STAGE NOZZLES	GE7FA-R1N-2	12/4/2008	0		468	Repaired	1
SET - 1ST STAGE SHROUDS	GE7FA-R1S-2	12/4/2008	0		468	Repaired	1
SET - 2ND STAGE BUCKETS	GE7FA-R2B-9	12/4/2008	2		2396	New	92
SET - 2ND STAGE NOZZLES	GE7FA-R2N-2	12/4/2008	0		468	Repaired	1
SET - 2ND STAGE SHROUDS	GE7FA-R2S-10	12/4/2008	1		1496	Repaired	1
SET - 3RD STAGE BUCKETS	GE7FA-R3B-8	12/4/2008	1		1368	Repaired	92
SET - 3RD STAGE NOZZLES	GE7FA-R3N-2	12/4/2008	1		1368	Repaired	1
SET - 3RD STAGE SHROUDS	GE7FA-R3S-1	6/1/2002	2		448	New	1

In addition to RAM metrics and Plant Status, Direct Energy also utilizes ORAP Parts Tracking. ORAP Parts Tracking allows Direct Energy to know the current Age, Location and Transactions for all Serialized Hot Gas Path Parts, for the Portfolio.

This information is stored in the secure ORAP database and is updated using the aging information collected through ORAP Link. Parts Tracking uses the information to predict Inspections and Required Maintenance based on the High-Time part(s). By reviewing the installed parts, it can easily been seen which sets will fall out in the next inspection, or which sets have several operating cycles remaining.

Business Benefit

Automation, Scalability, Credibility, Standardization, Visibility, and Benchmarking, to name a few.

Prior to the implementation of SIA, Direct Energy estimated that it took 8 hours, per plant, per week to collect and report the RAM information alone. The majority of this information is now collected automatically and requires little human input to produce the weekly reports on-demand throughout the organization.

As a defined, consistent process SIA has credibility throughout Direct Energy; is accepted and utilized by Engineering, Finance, and Operations on a regular basis.

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