Automated collection assures accurate, actionable data to support decision-making

Posted on March 2, 2016 by Team CCJ

Salvatore A DellaVilla Jr, CEO, Strategic Power Systems, told the editors during a recent telephone interview that participation by LM engine owner/operators in the company's ORAP® program allows SPS to aggregate data and provide meaningful analytics to Western Turbine members.


Sal DellaVilla

"Our effort to provide the high-quality information required for decision-making demands automated collection of data from the control system," DellaVilla said. He wanted to bring this to the attention of users because SPS engineers and the company's analytics team are seeing more and more issues related to the manual submittal of data.

This is one reason why SPS does not provide any metrics for starting reliability, the CEO continued. The company's experts are concerned that information submitted to SPS regarding starts is increasingly inaccurate and they are not sufficiently confident in starting-reliability data to provide an industry benchmark.

To illustrate: As stated in IEEE Standard 762, the document SPS uses to guide the processing of ORAP data, "a starting failure is an unsuccessful attempt to bring a unit from shutdown to the in-service state within a specified period (which may be different for individual units). Repeated initiations of the starting sequence without accomplishing corrective repairs are counted as a single attempt." Absent automated collection, users may err by counting "repeated initiations" as multiple attempts.

Additionally, Team SPS is questioning much of the information reported to the company from NERC GADS. "We continually see issues in the fidelity of the data as that information relates to causes of downtime and duration," DellaVilla said. "Our engineers have conducted a data-quality comparison referencing one of our long-time customers that recently moved from submitting data directly to us versus submitting NERC GADS data.

"We found NERC GADS data are inherently high-level and do not have the same granularity of detail that ORAP requires. Additionally, NERC GADS does not require users to identify component-level root causes to forced-outage events, a detail that creates issues when

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trying to compare this customer to the rest of the fleet.

"These data also raise concerns with the manufacturer. Periodically, we conduct quality reviews with the OEMs. During these reviews we often are questioned on the accuracy of events that have been submitted from NERC GADS reporters. All the issues identified above make it difficult to use NERC GADS data to allow meaningful and accurate comparison with the rest of the fleet in ORAP."

The easiest way to remedy these issues is by use of automated data collection from the control system, DellaVilla said. By automating the data, the system records each mission, from startup to shutdown—including all major states from signal to start, through the permissives, to ignition, flame established, acceleration, breaker closure, through each change in load state, to shutdown, and then the cool-down period. In the CEO's view, this is the only way to eliminate human error and ambiguity and ensure data accuracy.

Wrapping up, DellaVilla added, "However, we still do need input from maintenance personnel regarding the symptom, corrective action, and eventually the root cause of outages to ensure that the full scope of the event is captured correctly. There always will be a human element to this reporting."

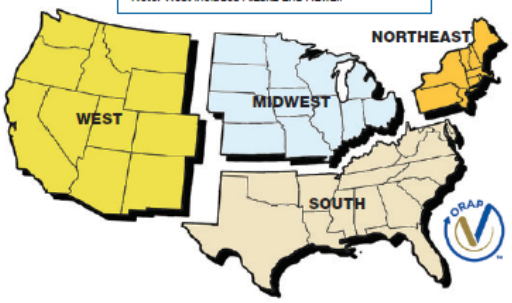
Table 1: Key performance indicators developed from ORAP® simple-cycle RAM metrics

Parameter	2015 Aero	2010-2014 Aero
Peaking units:		
Annual service hours	350	356
Annual starts	95	86
Service hours/start	3.7	4.1
Service factor, %	4.0	4.1
Capacity factor, %	4.0	4.2
Availability, %	93.6	91.9
Reliability, %	96.7	96.3
Cycling units:		
Annual service hours	1863	2193
Annual starts	166	162
Service hours/start	11.2	13.5
Service factor, %	21.3	25.0
Capacity factor, %	13.9	17.8
Availability, %	91.8	92.2
Reliability, %	96.6	96.5
Base-load units:		
Annual service hours	7185	6935
Annual starts	48	56
Service hours/start	151.2	124.4
Service factor, %	82.0	79.2
Capacity factor, %	70.6	66.5
Availability, %	93.4	92.8
Reliability, %	97.1	97.4

Table 2: Comparing capacity (CF) and reserve standby (RSF) factors regionally

Parameter	2015 Aero	2010-2014 Aero
West:		
CF, %	16.4	23.8
RSF, %	66.1	61.8
Midwest:		
CF, %	9.0	9.1
RSF, %	79.1	77.4
Northeast:		
CF, %	21.3	14.9
RSF, %	65.7	71.5
South:		
CF, %	12.5	15.4
RSF, %	76.4	75.0

Note: West includes Alaska and Hawaii



SPS recently prepared for Western Turbine users the latest RAM KPIs from ORAP (Table 1). The company's engineers conducted an exhaustive review of the data and analyzed it for accuracy. The information compiled in the table comes from 627 aero units for 2015 and 1067 units for the 2010-2014 period. The aeroderivative gas turbines in the sample include engines from GE, P&W, and Siemens AGT (formerly Rolls-Royce) and represent units operating worldwide.

Note that there was very little change in annual operating (service) hours for peaking units from the 2010-2014 period to 2015; availability was up about 1.7% for 2015 and reliability increased slightly. Cycling units operated 330 hours less in 2015 than they averaged in 2010-2014; availability dropped by 0.4% while reliability improved slightly (0.1%). Base-load units operated 250

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more hours in 2015 versus 2010-2014 while starts decreased.

The regional analysis in Table 2 shows capacity factor was down by 7.4% in the West, with reserve standby factor in that region up by 4.3%. Another significant change was the 6.4% increase in capacity factor in the Northeast in 2015 compared with the previous five-year period.

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