A business intelligence portal for reliability benchmarking and analytics

by Victor deBiasi

SPS' new analytics portal is seen as a paradigm shift in terms of how SPS communicates and reports reliability, availability and maintainability metrics to its ORAP customers.

SPS has introduced its real-time business intelligence platform, the ORAP Analytics Portal. This portal provides ORAP® customers the opportunity to intuitively see their reliability, availability, maintainability (RAM) benchmarking data versus the data of their comparative peer group in a totally new way.

Gas Turbine World caught up with Sal Della Villa, president and chief executive officer of SPS to explore the ins and outs of the new portal.

Q1: You have just announced the release of a new Business Intelligence Portal called ORAP Analytics, why is this important for your customers?

The ORAP® Analytics Portal is a paradigm shift in terms of how SPS communicates and reports RAM metrics to each and every owner/operator and original equipment manufacturer (OEM) who participates in, supports, and depends on SPS for unbiased performance analyses.

Sal DellaVilla: In today's world, very few people have the time to spend analyzing a 65-page report.

Today, the expectation that we share is that reliable information is available at our fingertips when we want it. The world of rapid data and knowledge, accessible over the Internet, has transformed the way we expect to receive high fidelity information – at the right level of detail. We troll the Internet for facts and figures so that we can make product selections and "buy" decisions that reflect our tastes and preferences – all based on how each of us personally demands and values product price/performance.

This is no less true for those plants that send in data to ORAP. They demand timely, accurate, and meaningful feedback that characterizes product performance in the terms that have value for each of them, and in a unique and personal way.

Q2: So what does the Portal do differently than what was done before?

First and foremost, it will replace how SPS provides participants with meaningful feedback. Gone are the days of a standardized multi-page review of a plant's performance compared with a standard peer group for comparative analysis. This report would be issued 30-45 days at the end of each quarter, and would provide RAM metrics and comparisons from a plant level down to a component level of detail. The report was a 65-page comprehensive look at current and historical performance – charts and figures. Four times a year the report would come out – current and reflective of performance up to that point in time.

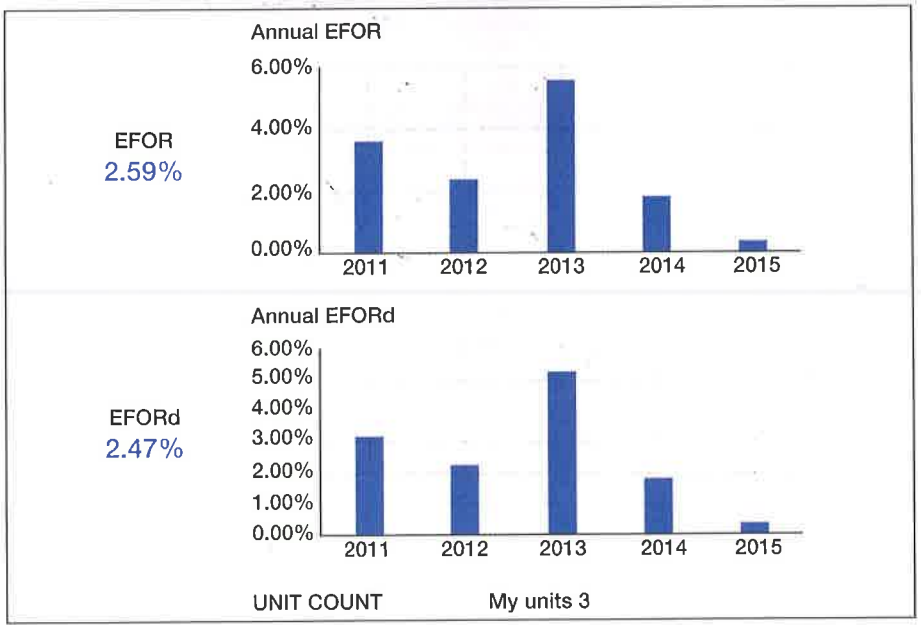
The report was very informative. But in today's world, very few people have the time to spend analyzing a 65-page report. The real issues that are facing owner/operators today constrain the time that is available to them – they are "doing more with less" and time is at a premium. When they need data or information, they need it faster and focused on the critical items of their immediate interest and need. The ORAP Analytics Portal changes all of that.

Through the use of a Business Intelligence tool, we have replaced the standard report and have put all of the metrics and more at the fingertips of the participant when they want it. If they want more, they can get it at their convenience. Nothing has been left out from the standard reports that participants have been used to receiving. In fact, there is more available to each of them – metrics that were not available in the original report.

Q3: Can you explain what this additional information is?

Yes, let's start with Total Plant performance metrics. The standard report was always focused on the "simple cycle" portion of the plant; the gas turbine (and associated control & ancillary systems), the generator, and all related balance of plant systems. If the plant was in combined cycle operation, the data collected would include the HRSG, condensate & feedwater, steam turbine and generator, and other steam systems… but the report did not provide performance metrics for these combined cycle systems.

Now, for the first time, comparative analyses of total combined cycle systems, whether single or multi-shaft can be obtained, from the system to the component level. And whether the plant is a simple cycle gas turbine, a combined cycle (irrespective of arrangement), a

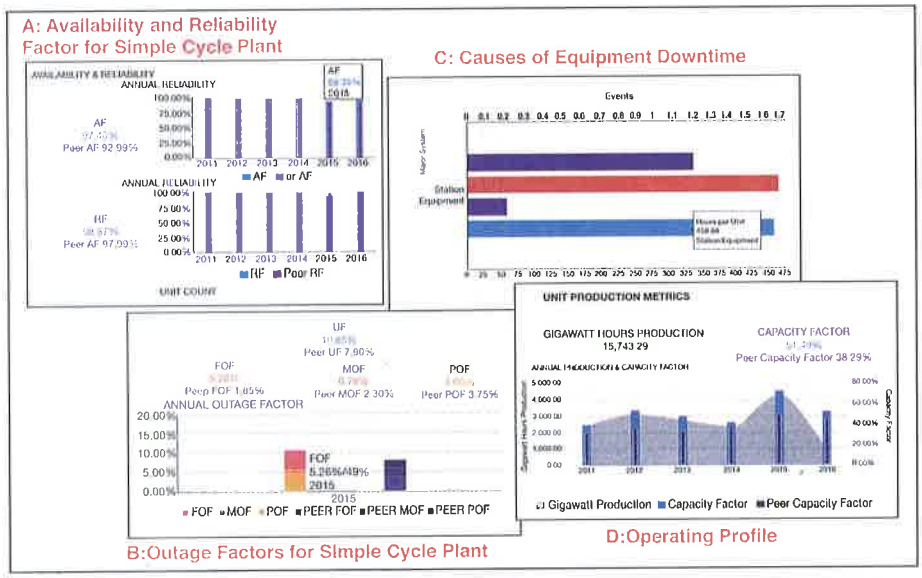


Equivalent Forced Outage Rates (EFOR). Another major improvement is the ability to see the EFOR and EFORd (EFOR as a function of demand) of the plant – outage rate metrics have broad value and use by many owner/operators.

fossil steam, a reciprocating engine, or a wind turbine, the metrics cover both total plant, and equipment level performance down to the component. No other system in the energy market can make the same claim and deliver!

Another major improvement is the ability to see the EFOR and EFORd of the plant – these Equivalent Forced Outage Rate metrics have broad value and use by many owner/operators. Now these metrics can be seen over time to determine current and historical trends. Our participants have asked for the capability, and now it is here.

And another major improvement is the ability to select the "peer group" of your choice for comparing your performance against a more meaningful fleet. This is a major departure from the current standard report, where the peer group is static, based on technology. Today, if I am operating an aeroderivative in a cycling mode of service, operating on natural gas, in the California market, and can choose a peer group that is consistent with my operation. In fact, I can have multiple peer groups.



Example of a portal. The objective is a "clean" and simple to use Graphical User Interface (GUI) from which each individual user can interact with the portal.

These are major changes, and more are coming – production and energy-based metrics are one example.

Q4: Can you show us a few of the screens in the new portal and explain to us what data we are seeing?

Certainly. The charts shown provide an example of what the portal looks like.

The objective is a "clean" and simple to use Graphical User Interface (GUI) from which each individual user can interact with the portal.

Screenshot A in the top left of the screenshot montage below shows availability and reliability figures for a specific owner/operator versus their peer group in ORAP, for a 5-year time period. You can see that a reduction in both availability and reliability is seen in 2015 indicating the existence of forced outage downtime to contribute to this trend.

Our team further analyzed this trend looking at screenshot B from the ORAP Analytics Portal, which shows the plant outage factors for the same time period. Here you can see that the forced outage factor was 5.26 during 2015. By looking into the data more closely, illustrated in screenshot C, our team drilled down from the major system level (which was station equipment), all the way to the component level to determine the true cause of the equipment downtime. For this particular owner/operator the issue was contributed to the startup transformer – HV, with an outage event lasting 1346.18 hours.

Screenshot D is an example of the operating profile, or Unit Production Metrics available in the ORAP Analytics Portal. Operators can see how their capacity factor and production compares to the peer fleet for any time period they require.

Consequently, with a few selections and clicks, the participant can see their data when they want it.

Q5: Understanding and organizing the data at power plants is big news lately, many OEMs and other IT companies are focusing on it a lot. What makes the ORAP Analytics Portal different?

Look, the value of the Internet of Things

is predicated on "big data" through access in a near real-time manner through intelligent sensors, analytics and analyses based on Advanced Pattern Recognition (APR) techniques to identify issues ahead of alarm limits, and, for SPS, transformation of data into time, capacity, events, and age through sophisticated algorithms – with oversight by Subject Matter Experts (SME). But, unless there is real productivity improvement and benefit – driven by time savings in real measurable dollars (staff savings), unless there is growth in knowledge and know-how (staff productivity and value), then the opportunity in organizing the data is incremental and the return on investment in question.

What makes the ORAP Analytics Portal unique is the recognition that the fundamental issue confronting plants today begins with how data is collected and developed. Yes, sensor data is the first step in the process. But without the transformation of the data into the operating characteristics that matter, there are limited foundational savings – and for SPS, the critical first step is data transformation – eliminating unnecessary human effort, allowing a redeployment of plant staff to more "intellectual" human operations and maintenance processes. The ability to use the ORAP Asset Insight Platform-as-a-Service (PaaS) is the basis for this activity – and the results speed up the value added output through the ORAP Analytics portal.

Therefore, the Portal is an outcome – it allows each ORAP participant to drive real measurable productivity benefit and elevate staff knowledge and know-how by freeing up the organization to address issues as opposed to collecting and reporting data.

Q6: Technology is always changing and developing, what does the future hold for the ORAP Analytics Portal?

Change is inevitable – SPS investment in technology will drive the portal to a greater focus on simplification for each participant. Improvements in any process going forward have to add benefit through productivity, with knowledge growth and transfer. The systems and tools of the future must support a changing workforce with new tools and rapid actionable information that fits the way they already interact with each other and make decisions.

Q7: Can you name one-time savings benefit?

Yes, the fact is that many of the plants that report to ORAP also report to the North American Electric Reliability Corporation (NERC) for their mandatory Generating Availability Data System (GADS). These plants must report to NERC. But the data is high level, not very granular, and not up-to-date with the latest turbine technology.

So many customers report to ORAP and we report to NERC on their behalf as a NERC Designated Reporting Entity (DRE). Our process is totally automated, with little human input, and with rapid feedback of results through the ORAP Analytics Portal. Now our customers have saved time, saved resources, and have improved the fidelity of the data, while meeting requirements.

This is real measurable savings. ■