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Web-based Maintenance Optimization Platform providing Preventative Analysis and a Comprehensive Library of Asset Strategies for Industrial Equipment and Nuclear Power Plants

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"In heavy industries which are often called asset intensive industries, safety plus reliability equals profitability. My company helps you improve the safety and reliability of your equipment so that you will be profitable in the global economy."- Mark S. Benak

CEOCFO: ***Mr. Benak, what is the focus for Asset Performance Technologies today?***
Mr. Benak: Our primary focus is the Nuclear Promise Initiative. I do not know if you have heard about it in the popular press yet, but America's nuclear power plants are struggling to be competitive in the power markets. That is to say that it is cheaper to produce electricity from natural gas plants. We are reading about certain plants being shut down. As a result, the industry banded together and created the Nuclear Promise Initiative, which is an initiative to cut O&M (Operations & Maintenance) costs by thirty percent. The original goal was 2018. I think they are a little behind schedule. However, top on that list for cutting costs in the nuclear power plant is optimizing their maintenance plans and that is exactly the products & services my company offers.

CEOCFO: ***Is cost the only factor that is barring people from nuclear today?***
Mr. Benak: I am sure it does at some level, depending on who you talk to. I think the accident at the Fukushima Daiichi plant in Japan nearly six years ago reminded us that, although nuclear power is clean, safe and reliable in general, when things go bad they can go really bad. However, that was in isolated incident in my opinion, and there is probably a whole other interview to talk about some of the perhaps design issues and other things that could have been avoided in that case. However, let me put it this way, that accident in Japan slowed down the construction of many new plants in the US and probably globally, from which we are just starting to recover. Now, when I talk about the industry having to become more cost competitive, it is low electricity prices from natural gas or it is aging infrastructure. These are older plants. Many of them were on forty year licenses that are now coming up for renewal. They are trying to extend to sixty years, so they are "boldly going where no one has gone before". Hence, those questions are coming out as well as historically, nuclear has had relatively high fixed costs. They are trying to address all those issues.

CEOCFO: ***What gives you the confidence that you can address some of these in a way that the group will be happy with? What do you understand to help you craft a solution or strategy?***
Mr. Benak: Unlike most industries I think the nuclear industry, and this dates back twenty-five plus years ago, realizes that a problem at anyone's plant is really a problem for the industry. I think that is probably what drives it. Let me say that up front. They work very well together. In banding together around the Nuclear Promise Initiative there have been, for the past probably close to two years, a variety of committees and discussions within the greater initiative to talk about, "Okay, how are we going to cut costs and what are our priorities for doing so?" High on that list is maintenance optimization. I think the nuclear industry realizes that it is probably over maintaining certain assets that are less critical in nature and perhaps there is a need to maintain other assets better, although I think it is more the former point.

CEOCFO: ***Why have they turned to you? What is it that you bring to the table, giving the nuclear industry confidence in APT?***
Mr. Benak: That is a very good question. There are actually two aspects to my response to that question. The first aspect is that the data portion of our solution has its history in the nuclear power history from the Electric Power Research Institute or EPRI. This template based approach to maintenance offers the RCM (Reliability Centered Maintenance) analysis on a variety of equipment types for all known operating contexts; the nuclear industry championed that approach through the expert facilitation of my colleagues twenty plus years ago. My colleagues, the cofounders of our company, have been the ones exclusively facilitating that data collection for over 2 decades. Therefore, we have got that connection on the content or data side of the equation to the Electric Power Research Institute, which gives us some credibility for the industry. The second aspect is that we have developed software that runs on top of those data to make them better, to make these maintenance strategies more appropriate for any plant, including a nuclear power plant. We are very fortunate that one of our marquis customers is the Palo Verde Nuclear Generating Station; they have been a customer since 2010. They not only were an early adopter of the technology, but they took our tools and they built a process around it called Value Based Maintenance (VBM) - which is now being adopted by the industry. The reason that is important is, as we talked in our last interview, it is one thing to optimize your strategies and predict what is going to happen. It is another thing to track what is truly happening, to track the results of those predictions. Palo Verde has done that! They have shown that this works. They have shown that their costs are coming down and the entire industry is now taking notice.

CEOCFO: ***How are you working with these companies now? Are you working with them as a group?***
Mr. Benak: We would like to work with them in groups. We are now working with them individually as we propose the idea of working more as a group. However, the way we engage individually is really two-fold when it comes down to it. It is licenses. Software licenses to use our cloud based tools. That is another thing we have launched since we last spoke; that all of our tools are available in a web-based format. You just need a browser and an internet connection to access them. The software license is one aspect. The second is services; whether we are training you how to use the software, or more importantly, we are now being asked to come in and help do the work for the plant. That is because experienced reliability personnel are in high demand, but they are in short supply these days. Often, these companies need to contract out those services.

CEOCFO: ***Would you give us a couple of examples?***
Mr. Benak: I will offer some examples from one of our customers. Palo Verde Nuclear Generating Station, of whom I just spoke. Non-critical, low voltage breakers. In Palo Verde, those are outside. Palo Verde is just outside of Phoenix, so it is hot and dusty. These breakers were outside; they had a roof over them, but no walls near the cooling towers. Therefore, they were being exposed to heat and probably dust. Occasionally the Phoenix area gets those crazy Middle Eastern type dust storms called “haboobs,” not to mention it can be windy and blowing sand everywhere, not to mention moisture and perhaps corrosive chemicals coming off the cooling towers. I forget the exact details, but at the time a few years ago Palo Verde was simply replacing the breakers every six years or so. Instead, by using our platform they realized if that they just built an enclosure around the breakers, put those breakers into a mild, but not a severe operating environment, they could save something like $3,000 per year per breaker. They have 158 of those breakers. Therefore, in round numbers, that is a half a million dollars in annual cost savings, just by putting a wall around those breakers. That is savings every year from now going forward, because they are not overspending on their breaker maintenance. Another example would be non-critical, low voltage motors. Notice that I am not talking about critical equipment. I am not talking about the reactors themselves. I am talking about all the stuff that goes around the reactors; for example, non-critical, low voltage motors. When Palo Verde went to analyze their low voltage motor maintenance program using our tools, they realized that they were spending about 3 hours per motor to grease them. Three (3) hours for the entire lubrication process. That is, a person gets the order to go do the work, collects up the paperwork, collects up the tools, goes and finds the motor, greases the motor and reports back out to the computerized maintenance management system (CMMS). That was taking 3 hours. Our software concluded, “Wait a minute, if it is taking you 3 hours, do not bother greasing them, just let them run to failure. That is too expensive.” That did not sit well with the engineers. Therefore, maintenance and engineering sat down and discussed, “We are uncomfortable letting them run to failure. It is rotating equipment. We need to lubricate it.” Because of those discussions, instead of doing these single motor lubrications, they created what they call their Lube King program. Now, I am told they have maintenance personnel, who every day get a list of all the motors they need to lubricate that day. They were able to take that 3-hour time to lubricate a motor down to half an hour. Our software tool concluded, “At half an hour, sure! That is very beneficial of you to lube your motor; you should do that. You will save money.” For one further example, they also looked at non-critical Air Operated Valves or AOVs. There were able to optimize the maintenance programs to show significant cost savings on the order of several hundred thousand dollars per year. However, I will never forget the day when the head of Reliability, the PM Program Owner at Palo Verde called me and said, “You know Mark, we are looking at our non-critical AOVs, and we realize in using your tool that several valves

were very critical. As a matter of fact, they are single point vulnerabilities (SPVs). That means when they fail, the plant trips. We have had failures in the past that cost us 2 million dollars per day. We looked at your library and realized we were missing a maintenance task that probably would have prevented those failures from happening!"

CEOCFO: ***That is a big deal! How do you help guide your clients at what to look for in your asset library?***
Mr. Benak: During the sales process, we offer trial evaluations of our tools. They are 30 days free of charge, no strings attached. In the process of getting to a trial, we try to encourage the customer to think about which equipment types are causing problems today, which are failing more often than they should. For example, which ones are costing you too much money? That is generally how we engage a customer with the software licenses. If we are providing services around Value Based Maintenance, there is a step-by-step approach to this methodology. Step one is understanding your cost basis, meaning understanding what your equipment is costing you to run today. The mantra here is the Pareto principle. Find those couple of equipment types that are causing you the most pain: apply the 80/20 rule where twenty percent of the equipment is probably causing you eighty percent of the headaches and cost. Identify which equipment types are costing you too much money; those are they types you seek to optimize first. That is because you are going to get the biggest gains from this type of analysis.

CEOCFO: ***Can companies use your tools or look to you proactively when thinking of replacing equipment?***
Mr. Benak: Definitely! That is the life cycle costing issue that is also referred to nowadays as Asset Investment Planning (AIP): when do I need to replace or purchase new equipment. We play a role in that in that and we hope to play a bigger role in the future – for which we are exploring partnerships now. However, we play a role in those discussions in that as an asset ages, you likely have some history on failures it has already seen, if any. Our tools can help you analyze what is the anticipated failure rate of this equipment, given how it is operated as well as the costs associated with operating it. I am thinking of a particular example from a certain semiconductor manufacturer (that will remain nameless), where they had industrial chillers that were over twenty years old. They asked us the question, "What do we need to worry about now?" This offered us the opportunity to explain, "You just need to look at all the failure modes which can occur after twenty years. Those are the ones you need to be concerned about now."

CEOCFO: ***What else is going on at APT?***
Mr. Benak: Certainly, the Nuclear Promise Initiative has put a lot of attention around optimizing equipment maintenance cost; that is to say, to get the reliability you need at a maintenance cost you can afford. This is where much of our attention has been lately. We also focus on partnerships around our content and software. We are pleased to report that one of our partners, a company called Meridium, who resells our content library in its APM software, was recently acquired by GE Digital. That has been good for APT. We are developing new partnerships as well. Many of those seem to be forming around the Internet of Things (IoT), of which you may have heard. This is the industrial internet; sensors in the plants that are connected to the internet so equipment health data can be easily collected and analyzed. There are many vendors out there that provide those systems and provide some of the algorithms to analyze those data. What they are interested in talking with us about at APT is, "I want to provide better prognostics to my customer, the operator of the equipment." I will give you a concrete example. For example, let's say there is a bearing temperature alarm on a motor. What subset of failure modes could have caused it and what is the probability of each of those occurring. That is the type of information that my company can provide.

CEOCFO: ***Can you keep up with the demand?***
Mr. Benak: We are a small company that is looking to scale quickly. Our approach is to high key personnel out of the nuclear industry, who not only know most of the other companies and personnel, but also have the expertise and knowledge to help us scale quickly.

CEOCFO: ***Why choose Asset Performance Technologies?***
Mr. Benak: That is a good question. We talk a lot these days about competitiveness of American and/or North American manufacturing and processing operations. Politics aside, the world economy is essentially "flat" now. As a country, we have got to be able to compete globally. Part of that competition is being able to provide goods and services at a competitive cost. That is, to build and sustain profitable businesses. In heavy industries which are often called asset intensive industries, safety plus reliability equals profitability. My company helps you improve the safety and reliability of your equipment so that you will be profitable in the global economy.