Manage the present without ever losing sight of the future

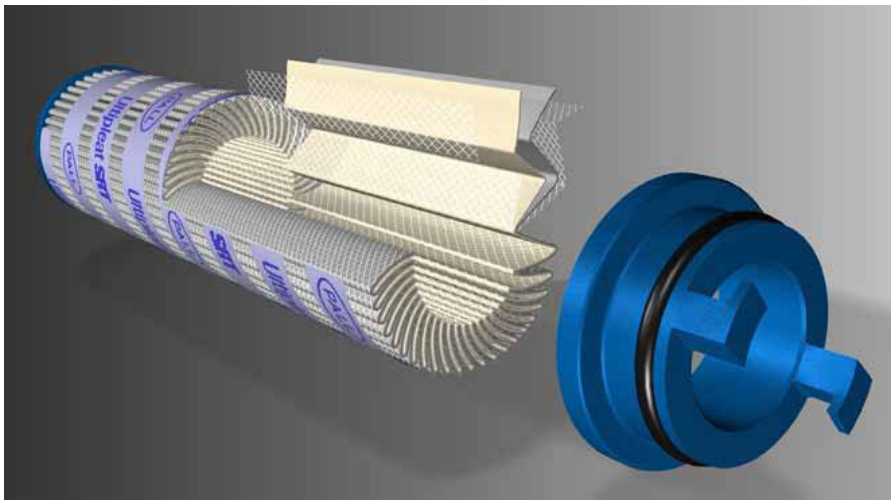
As Global Marketing Manager of one of the 'greenest companies' in America, Pall's Daniel Alessandri has a duty not only to his stakeholders, but also to the global community as a whole. It's a responsibility he ably administers, driven by a zeal for innovation and corporate success. Here, he tells PES about the company's rapid growth, its creative technological developments, and its focus on European operations.

PES: Welcome back to PES magazine, can you tell us how your company has been performing within the wind market since we last spoke?

Daniel Alessandri: Pall Corporation's wind energy business has grown tremendously over the past few years. Sales, to this application, doubled last year. We have expanded our reach away from our traditional European base towards America and Asia. The key wind turbine application currently in our portfolio is the protection of the turbine gearbox lubrication system for bearings and gears. Pall filters are also used to protect the hydraulic systems inside the nacelle.

PES: And how much of your total business is now dedicated to wind energy? Is this still an area in which you wish to see continued growth?

DA: From one per cent five years ago, wind energy is fast approaching 10 per cent of Pall's sales to the power generation market. Within that market, we're working with producers of emerging renewable sources including wind, solar and biofuels, to help them overcome issues of capacity, efficiency, cost and convenience. Removing these barriers will help clear the way for broader adoption and a sustainable and clean energy supply.



Helping customers to protect the environment is in Pall's DNA. In essence, our job is, and has always been to remove things – solids, liquids, gases – from a given environment we wish to protect. It can be a turbine lubrication system, a nuclear reactor, a glass of wine, or simply the air we breathe. Pall has been called the "original clean technology company" since so many of our products deliver sustainable social benefits. Last year Pall was named one of the highest ranked of the greenest companies in America, so not only is the wind industry a good business to be in, but it's the right business for Pall to be in, naturally. It's also a true technological challenge, and that plays into what we know best: innovation and product performance.

PES: With turbines sited in remote locations, up in the air and at the mercy of the elements, reliability is a paramount concern. How do you facilitate this?

DA: In the energy sector, and especially wind energy, Pall's key competence is the

protection of critical machinery against wear and premature failure. We've applied this to nuclear reactor systems, steam and gas turbines and other generating equipment over the years. Wind turbine gearboxes are a special breed however. They are especially prone to rapid mechanical degradation of their bearings and gears.

In some ways, this wear process is well understood: areas with the tightest clearance, typically in the bearings, will lose their protection first. The film of oil designed to protect the bearing surface can be contaminated by particles, or moisture. Reasons for this contamination are many, but they result in bearing wear, which in turn generates more particles. This is called "the chain reaction of wear". It's a well known process and Pall's job to counter for many years. The heart of the problem is that this chain reaction of wear can happen much faster in a wind turbine gearbox than in most other industrial applications.

The machinery is subjected to ever-changing loads from wind gusts, movements of the tower, or vibrations. A short lapse in bearing protection may be inconsequential for an industrial gearbox but could be catastrophic in a wind nacelle. A localized problem inside the machine can rapidly spread to other components if it is not stopped. The same wear mechanisms also apply to the very precise hydraulic controls inside the turbine.

Beyond the gearbox and hydraulic controls, the entire structure will need protection against aggressive weather, humidity, ice and snow. Moisture and salts are enemies of electronics, so the air inside the nacelle may have to be filtered as well, especially in offshore installations.

PES: What benefits in particular does the Pall Ultipleat®® SRT range offer the wind industry?

DA: The Pall Ultipleat® SRT filter is a technology developed specifically for its excellent resistance to stress (SRT: Stress Resistant Technology), hence its name. It is particularly well adapted to tough environments and extreme operational conditions because it can sustain its removal efficiency much better than traditional high-efficiency filters. Regardless of how well they perform in standard lab tests, these filters will see their efficiency drop dramatically in cyclic load conditions such as the ones found in wind turbines. Because the environment is so tough for the machine, any lapse in filtration of the fluid could have a potentially catastrophic impact on the bearings first, then the gears, and this "chain reaction of wear" may ultimately wreck the entire drive train if not stopped in time

Essentially Pall's Ultipleat® SRT filters are designed to never drop their guard. In technical terms, the filtration ratio (called beta ratio) is sustained for a longer period of time, even in harsh conditions. This is one of the major advances Ultipleat® SRT filtration brings to the industry.

PES: Similarly, do you offer any systems that monitor the efficiency of bearings and mechanical components?

DA: Not exactly, but almost… The efficiency of bearings or other components depends on many factors including materials, shapes, alignment, etc. Actually, Pall products monitor the contaminants inside the lubricating or hydraulic fluid, mainly particles and moisture. Oil is the lifeblood of the machine and most reliability problems start with contaminated fluids. While it can take many forms, solid contamination in a fluid is an early symptom of component wear, and hence a very good predictor of machine or component failure. Being able to track minute particles in a fluid system allows operators to catch potentially catastrophic failures before they happen. The earlier the alarm is sent, identified and processed, the lower the maintenance or repair costs will be.

PES: Pall is a sizeable corporation, but does that make it difficult to react quickly to market conditions and opportunities?

DA: In fact, Pall's size is overwhelmingly beneficial. More than sheer size, the markets that Pall serves are also very diverse, from healthcare to defence to energy or food & beverage. In each segment, Pall holds a reputation for innovation and product performance. This is because, as diverse as they are, all Pall divisions have shared access to a formidable pool of technologies, materials and products that cross-fertilize each other. Harnessing and leveraging such a diverse portfolio is a great advantage. It betters our chances of finding the right solution for a given contamination issue, not just the one we are used to. Size and diversity fuel innovation.

But faster solutions also need faster understanding. Here again size helps. To put it in layman's terms, Pall has more ears to the ground, and in more places. Pall global coverage and closeness to the users of our products mean that information can be gathered quickly, and used efficiently. Some of our structures and processes are designed to facilitate this flow. Pall SLS (Scientific and Laboratory Services) epitomizes this effort. SLS is a very unique, global but distinct structure from traditional R&D or engineering. Staffed with high level engineers, scientists and technicians, SLS goal is to understand our customer's contamination issues, assist them in the solution, and feed information to fuel R&D efforts. This worldwide structure is another example of the advantages that size and scope have for Pall.

PES: The reliability of your components presumably depends – to a certain extent – on the skills of those fitting and maintaining them. What steps do you take to ensure a high level of service in this regard?

DA: I guess we've covered the first of these steps in your previous question; staying close to customers and markets is where it starts. Direct user feedback has affected the way the Ultipleat® SRT filter is configured for example. From the light weight materials in the element to its replacement procedure, Pall has revisited the design to make it easy to use and service in constrained environments, such as the one found in a wind turbine nacelle. Even our service instructions have been revisited for better reading and visual instructions. That's just for the product. A complete Pall customer experience will often include classroom or field training; start up assistance, fluid analysis and troubleshooting are also available.

PES: Do you collaborate with gearbox manufacturers to refine your products? Do you find collaboration to be an effective business strategy?

DA: For Pall, technical collaboration is not only an effective business strategy; it is a modus operandi since its inception over 60 years ago. The examples of

products jointly developed with our industrial partners or customers are too numerous to cite. Without this early collaboration it's much harder to keep the technological leadership and spur the innovation Pall is known for. Pall also participates in public research and development programs, whether in the US with the DOE or with the European Union.

Specifically for our subject at hand, Pall collaborated for many years with major bearings manufacturers to help them understand the link between fluid cleanliness and roller bearing life. Because these bearings are the most sensitive components in a gearbox, this work also influenced gearbox specifications, testing, and operation and maintenance practices.

PES: Have you noticed a move towards offshore installations in recent years?

DA: Evidently yes, but so much remains to be achieved. For the foreseeable future land based wind energy will remain the easiest and least expensive to harness. Grid integration, logistics, accessibility, and of course, reliability improvements will be the enablers of viable offshore wind energy. But the mix of political and regulatory issues makes the future difficult to predict. That said, I think that there is a bright future for offshore wind, and that Europe will lead the way. We are approaching the point where real large scale projects will emerge…literally.

The first few years of operations will be critical to evaluate the technical and economic viability of offshore wind. These developments offer many technical opportunities for Pall because contamination issues, including protection against marine air, will be at the centre of offshore wind feasibility.

PES: Where in Europe is a growth market for you at the moment? Which other geographic areas are showing promise for your operation?

DA: Europe has remained the epicentre of wind technology development. Germany, Denmark and Spain are still the most important designers and makers of wind turbines. "Newer" wind countries like the UK and France show some of the greatest potential for Pall in Europe.

Much of what happens in the worldwide wind energy market still originates, or is influenced, by Europe. For a technical leader presence in Europe is almost mandatory, regardless of its spot market growth rate. This epicentre has fuelled growth in Asian and American markets in the past few years. And today, the Chinese and US markets probably represent our most promising areas.

PES: Forgive us going off-track, but we've read that you've been applying your technology to the US oil spill. Can you explain how you've been involved in this – and perhaps if the situation will stimulate demand for wind energy?

DA: Many Pall products are made with polypropylene, a material with a strong affinity for hydrocarbons: it can absorb 25 times its weight in oil while repelling water. In June, Pall employees in our Pensacola, FL facility volunteered to fit this material into large netting "socks" used to protect Florida shores against the incoming oil spill. This response demonstrated Pall employees' dedication to their community, and the ingenuity and innovation that drive Pall's success. We are all very proud of them.

We don't know the full consequences of this tragedy. As of today, its impact on wind energy demand is as murky as some of the water drifting towards the US coasts. But one thing is certain; this event has kept environmental issues on the front page. Awareness is always the beginning of change.

PES: The company's financial position remains extremely strong. To what do you attribute your continued success?

DA: That's the easiest question of all: Good technology, good people, and a strong commitment to do what's right for our customers. It sounds simple enough, but so does wind energy at first glance, no? And just like for wind energy, applying a simple principle to real life takes people, science, drive and commitment. The other key is to manage the present without ever losing sight of the future. Once you have that, I think the rest falls into place. ■

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