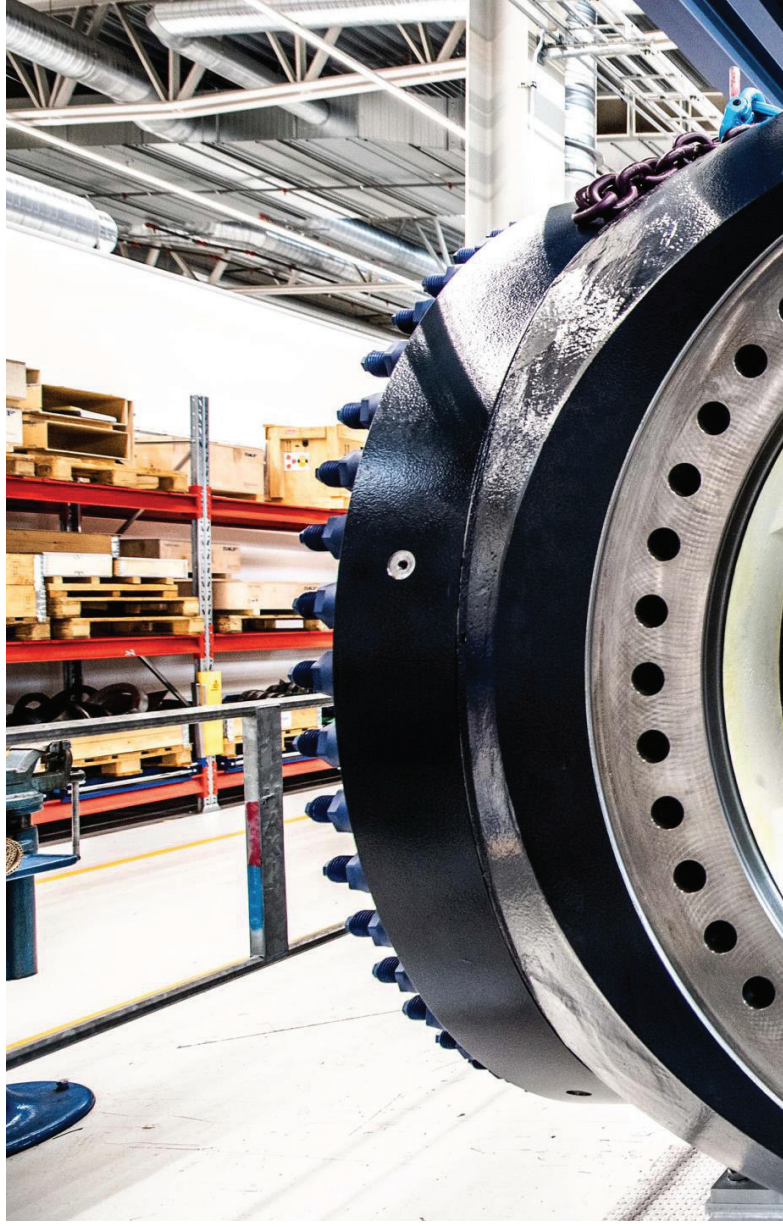
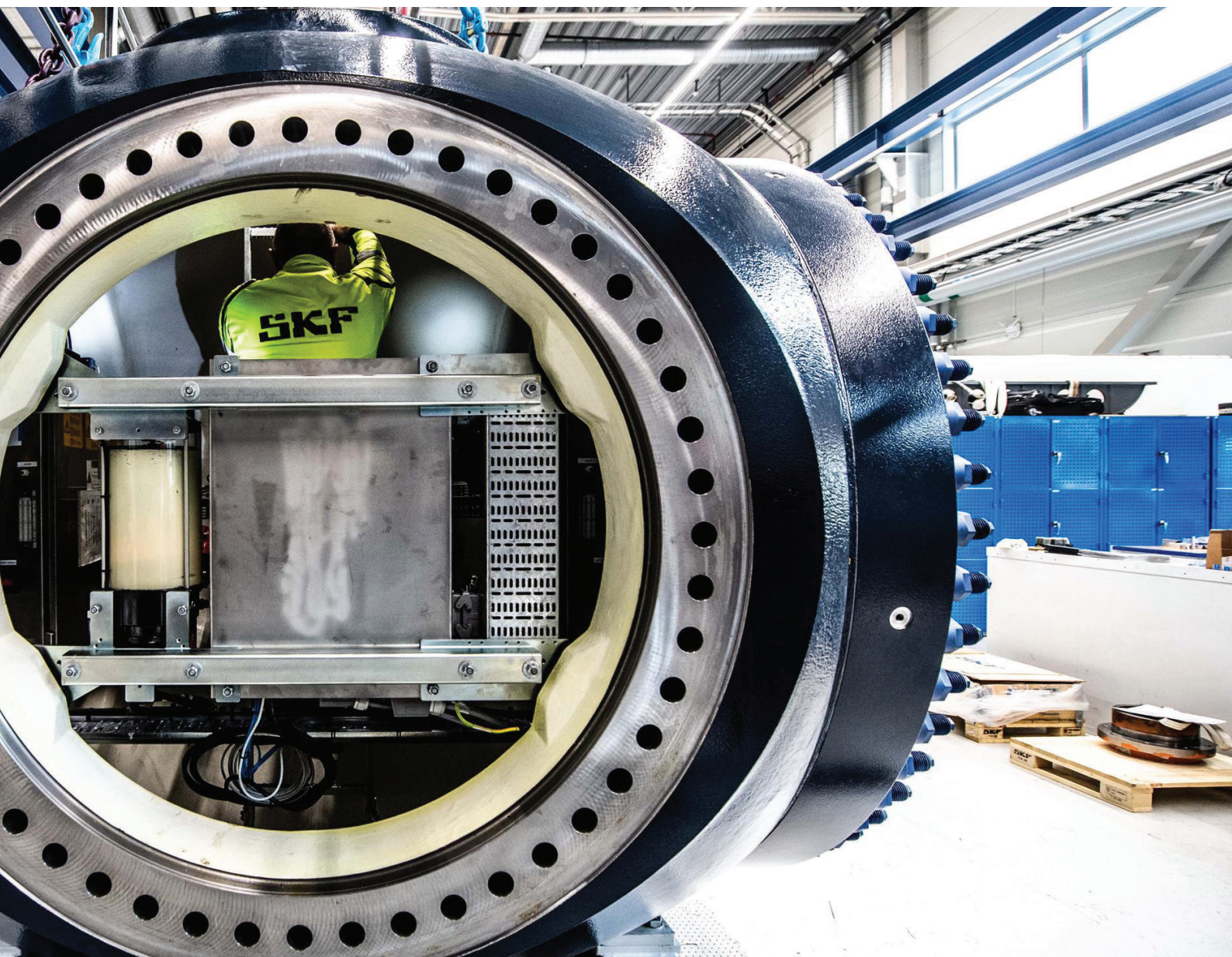


Configurators for engineers:

Focus on machine design
– not on bearing selection







The way we configure our new car has improved lately. Now, configuration technology is doing the same in engineering offices. Just as we shouldn't need to be a car expert to configure the car, why would a gearbox design engineer need to be a bearing specialist to design that gearbox?

Choosing the right bearing for a new product has always been a time-consuming process. Design engineers need to consider hundreds of factors, many of which they need to estimate, in order to reach an optimum machine design.

Working in loops, a design engineer has to reach compromises. In a compact machine such as a gearbox, bearings compete for space with other components.

Designers need to consider assembly, and whether bearings will need to be replaced during its lifetime. They also need to ensure that the solution chosen will fit within budget and overall weight limitations, to name a few. This is the performance-cost optimization that every engineer knows well. Once you are through, there's the availability. If you are unlucky, you'll need to start again because the product you chose was a special one, with too long delivery time to meet the start of production (SoP) date.

With the first version of the new SKF configurator which is launched end of last year, we caught up with Victoria Van Camp, CTO at SKF, to hear about the impact of the configurators for the industry and the challenges that we are all facing due to the pandemic.

How did SKF react to the COVID-19 pandemic? Have there been any big changes in your strategy?

We reacted very fast and became much more flexible. We typically now have regular house meetings with the leadership, sales, manufacturing and engineering teams to keep everyone informed on what is going on at all levels of the company. That's been a powerful change for us.

What I see now is that there is of course, ups and downs, with some industries going up and other industries struggling, and different geographical regions are certainly going a different pace. What's required is not sitting around and crying over spilt milk. What you thought was the truth last week, might not be relevant now. And if you accept that you live in a changing world, it's better. And that was actually almost a relief during the spring, when that realisation hit home for us. It doesn't matter what we said two days ago, because now somebody shut down and we have to approach it differently!

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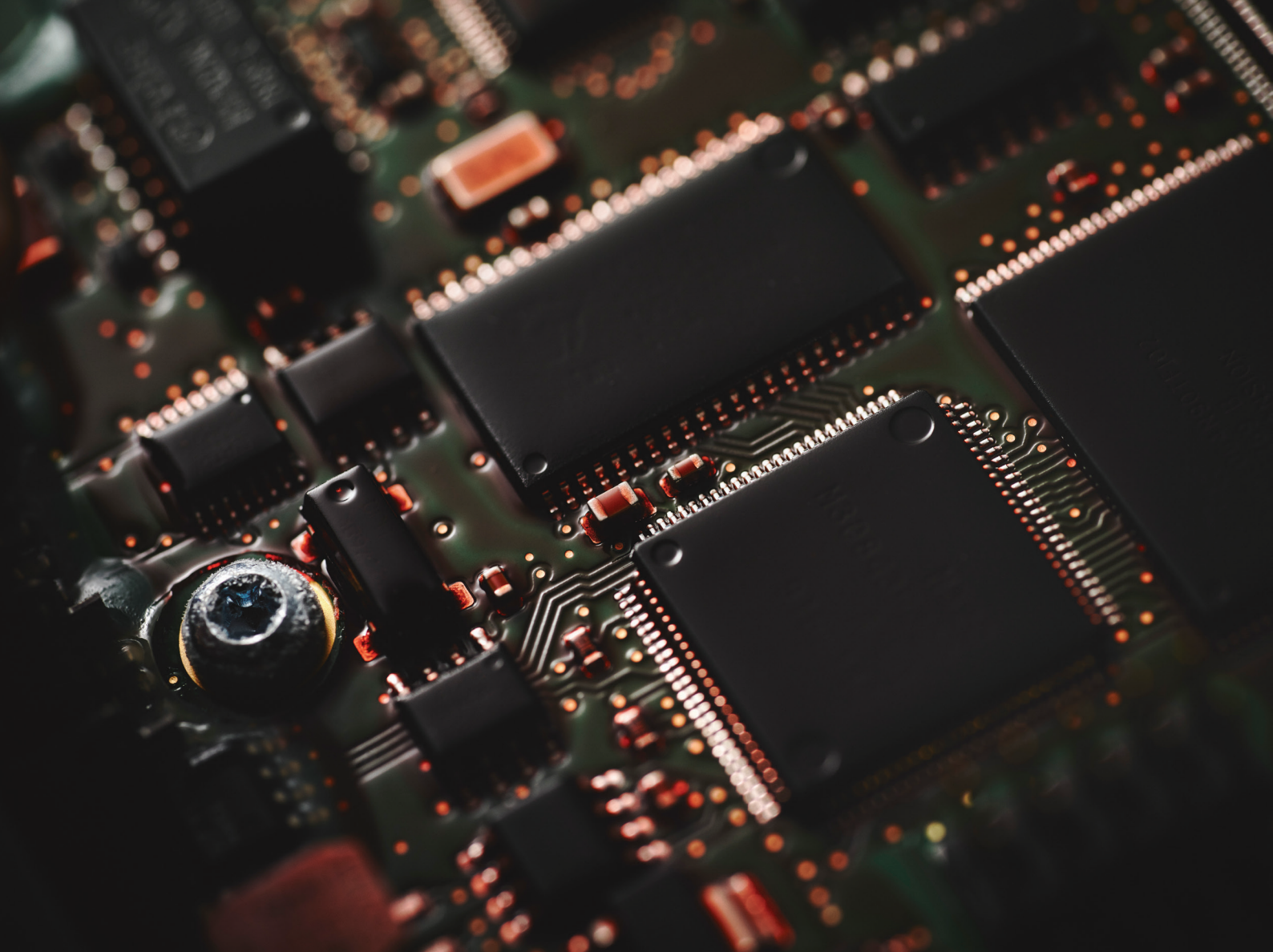
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Victoria Van Camp, CTO at SKF

What's next, strategy-wise?

We've been thinking about what we can do to take care of making the company stronger, and how we can move out of the crisis. We've spoken a lot about mental health, making sure our colleagues aren't worried or panicking while isolating. We've all been much closer as a result, so our community has benefitted. We've since been looking at long term trends, like the green shift and circular economy which isn't new to us. And with less travelling and focus on what comes

beyond COVID, we decided to just keep doing what we're doing. We've become remote with a digital focus, and we've just had to push the accelerator even further past. We don't have those two, three years guaranteed to do it now. So the mindset we adopted was also a beta. So we are in pain, our customers are in pain, how can we help them? Because customers will also not know what happens in the future. So is there something we can do now? So we put together a little package of sensors, apps, connections, that will be easy for our customers to



implement quickly, as an example. And that was a result of thinking, how can we help them through tough times?

Can you explain to us the core message of your presentation regarding “The Configuration Revolution”?

Configuration was certainly one thing that we already had in the SKF strategy, but we realised this very clear fact, nobody wants an engineer on site in the current climate. While the configurator is certainly not the solution to everything, it certainly will ease the work for us and the customer together. In the future, we will likely see the customers doing at least the simple configuration completely themselves. And when the more difficult stuff happens, we'll be able to help customers to solve issues themselves. So the configuring absolutely came out of focusing on how we can do even advanced engineering remotely. To do it now, and to accelerate it.

Can you tell us more about your presentation regarding R&D in an outcome-based business environment? How can you summarize your message?

In a way we always work in an outcome based environment. But on a technology readiness level, where you start from research, to prototype to release. That's the linear way of thinking. And while yes, there is an outcome, that outcome is very far away when you work in the research area. So what we did was to compress it, but we also put it in parallel. So to the researchers, we have made it very clear that electric vehicles, for example, are a key area, and we can't wait for 10 years until your research becomes something, we act now.

We are working with customers, and this, to me, is outcome based R&D because you frequently have to see what the outcome is. We obviously can't endanger the

customer, but we feed all data back into research. Now the customers actually communicate what worked or what didn't or they report a new problem which needs addressing. So we've learnt that it's best to keep the end fairly close in mind. It's a sort of long term view with a real short term delivery approach. Science is still science even when you work like this.

What do you mean with the 3 A's? Agility, Accessibility, AI (artificial intelligence)

With agility, it was the realisation that we needed to be much faster in our processes. COVID 19 taught us that lesson, and it's a lesson we will never forget. Because everybody in business tried to sit and predict the future at the same time. We always only have a one year business plan, and we have five year technology plans. But that's not agile, actually, at all. Being agile is to admit to yourself that the world changes. The world is a fluid thing.

*Victoria Van Camp,
CTO at SKF*



So the big learning out of that is don't cry, because the world changes and new technology is needed. If a customer goes somewhere else, or a competitor shows up, then you just have to be better, faster, And if you think about software development, they make assumptions, they test it out with the customer and they take in the feedback, they make the change. You make things more accessible this way.

The configurator is one way of looking at accessibility that just makes our products easier to find, easier to design and users don't need to be a specialist to get its value. You don't have to be an expert to mount a bearing. And so many engineers have this idea that expertise is so important, and that you lower yourself to some kind of bad or low-quality level if it's too easy. Something can arrive with ease and be good!

Where does SKF currently stand today with automated machine learning? Is it already widely applied with customers or is this all just starting now?

It was when we acquired the company Presenso in October of 2019. When we started, we did not do the sort of classical owners approach of integrating or putting the company in a separate little incubator. Instead, we took this company and the first thing we did after acquisition was to start training SKF people in the software that they had. The second thing we did was get them started working with a real customer case, on a big contract that we have, one of the big service contracts with lots of data points.

We have managed to employ people during the lockdown phases, there have really been no limitations on employment. And this team was already very used to working remotely. Because they have contractors in Eastern Europe for more routine tasks, and they have a system for that. So with their system, we have been able to keep working with customers during COVID. Just doing remote. So we have experimented ourselves a fair bit.

How will AI affect the overall accepted manufacturing models?

I have to say it's very hard to make

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predictions there. But you can see that AI is being used to detect phenomenon, that us humans just can't fathom. Because AI can see connections between so many patterns. So what appears to be completely unrelated, actually is not unrelated. It could be the connection between the type of paper you are making with the type of maintenance you're doing, with the changes that you did to your procurement three years ago. It's really those patterns that are going to be changing. And we don't even know what they are.

I think the hardest thing for us humans, is to accept these patterns. Because they will be to us like a mystery that can't be solved. We can't really start arguing with the AI because we won't be able to see what the AI sees. So how do we make peace with living based on the AI recommendations?

Which part of the world/countries will have the highest market and rapid increase in demand for AI in the near future?

Everywhere, but very much in developing economies. America, for sure. You certainly see China and Asia. It's almost like in China, people didn't used to have landline phones, and instead they had to basically go out in the street and talk in a phone booth. But they went from there straight to smart phones. So, the smart phone use just went through the roof. And now you can see the same with AI. If you come from nothing, then you take the new technology, rather than going through all the old stuff, that gives them speed in production. You don't have the luxury to sit and be afraid of AI, you take all the tools that you can, and you see where it takes you.

What are the features of SKF's Fibre Optic bearings?

We recommend it for measuring load. You can either use it to predict (if you know the load of a bearing) how much longer it will last, that sort of thing that you need to know. But the other thing is you can also use it as a kind of scale up for the machine. A bearing could measure what's happening inside a washing machine, and alert you when something is wrong. There are other ways of doing this, but they're not very precise. And they usually rely on electronics, which is not so good. You can't really put electronics inside a bearing because it gets messy; there is oil, there is rust, there's water.

So the fibre is a glass fibre, it's the same as what delivers the internet to our home so well. It's light that goes to a fibre and we take such a fibre, wrap it in a very small tract around the bearing, and then it goes to a device that translates changes in the bearing. This way, the bearing suddenly becomes something you can use to measure low power. You can use tonnes of data flow in all kinds of things. It becomes so much more than a bearing, actually.

Can you tell us a little bit about your personal background and other activities you get up to outside of work?

I'm a mother of two sons who are now in their 30s, so I try to spend time with them. They cook for me these days. I taught them well, I think! I live in Gothenburg and I have a summer house with a pretty big garden out north. So, I do gardening, I love gardening. And in the dirt, you see things happening, but not fast. Things change slowly. And you don't think about bearings when you're out there!