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Predictive AI-powered battery safety analytics
A safety first approach to battery energy storage

Pam Poulin, Market Development Manager at Thermo Fisher Scientific, and **Dr. Julian Renpenning** conducted this interview with Matt Besch, Vice President of Marketing at ACCURE Battery Intelligence.

ACCURE introduction

ACCURE Battery Intelligence is a German startup that provides predictive analytics solutions for battery energy storage systems. They aim to increase the safety, reliability and sustainability of battery operations through cloud-based data analytics. ACCURE's analytics platform uses AI and cloud computing to monitor entire battery fleets. By simplifying complex battery data, they provide insights to help their customers. Overall, ACCURE's solutions are integral to industries where battery safety is critical.

Tell us the story behind ACCURE's founding and who the key players were?

ACCURE was founded in 2020 by Dr. Kai-Philipp Kairies, Dr. Johannes Palmer and Dr. Georg Angenendt. They were all at RWTH University in Aachen, Germany. Kai-Philipp, our CEO, led a battery group in Germany for many, many years. In fact, at one point it was the largest battery research group, at least in Europe, maybe in the world.

Starting a company is never easy. What were some of the biggest challenges you faced early on, and how did you overcome them?

Let's start with the biggest challenge of all. The company was founded in the middle of the COVID-19 pandemic. So not only are you navigating the start of a new company, but you are navigating a whole new world and processes and external factors that are out of your control. I remember us fully going remote and trying to understand how this is going to work. How are we going to make connections with people? How are we going to meet people? How are we going to get our message across when we are not having face-to-face meetings?

Challenge two is something that we are still dealing with today. We have built a new business category. People are very familiar with the battery management system, the BMS, and most understand the energy management system, the EMS. But there is the question of where predictive battery analytics falls. Are you a BMS, or are you an EMS? Well, we are a different layer, a whole new category. So that's the educational piece that we are still working on today and the industry is working on. Analysts and industry experts have defined the category as predictive battery analytics.

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How exactly does the ACCURE Battery Intelligence platform contribute to battery performance and battery safety?

We monitor the voltage, current, and temperature of a battery system. We bring battery data into the cloud, and from there, we track anomalies and trends. The cloud offers massive computing power that is simply not possible by the on-site battery management system. Additionally, by taking data to the cloud, we have access to much larger battery data sets. This gives our customers even more future-forward visibility into battery challenges they will face in the future.

We use AI and machine learning as part of a larger toolset for monitoring battery assets within our battery analytics platform. By employing a data-first approach, we can identify and address problems well in advance of them becoming significant issues. Our customers have been able to transition to a condition-based asset management strategy instead of a time-based model or resorting to waiting for an asset to fail before addressing the issue. This shift in asset management enhances the safety, availability, and performance of their batteries..

How does ACCURE utilize battery data and AI to provide actionable insights for battery management?

The key is aggregating data from multiple sites worldwide into the cloud, where we can analyze it on a large scale. For example, in terms of data-driven safety, we monitor about 20 different battery safety indicators today. This allows us to detect trends and anomalies. We do use AI and machine learning, which helps us provide data-driven, reliable, and actionable insights for applications such as grid-scale storage. Our algorithms improve with every bit of data we process, becoming more refined over time.

There are other players in the battery analytics field. What sets ACCURE's analytics platform apart from the competition?

Let's start with the fact that we are an independent third-party battery intelligence business. And that's a very big deal. Our customers may ask themselves, are we going to trust some integrators to guarantee that all of your batteries are going to stay intact? So that makes us different and that has to be taken into consideration. We are not tied to a battery manufacturer or integrator, which means our customers can trust our analytics software without any conflict of interest.

Our competitors are often internal teams within large companies or integrators that may offer predictive battery analytics but lack the scale and independence that we bring. I would say it's

really the scope of what we can see across all the different data we collect that differentiates us. It is the high value of the security that we provide. That is where we started as a startup, providing security and safety. And it is kind of at the core of everything we do. Sure, battery performance is important, battery lifetime and aging predictions are important. But this battery safety piece is number one.

What are some of the most common battery problems that the ACCURE technology addresses?

We identify imbalance problems, sensor malfunctions, and a host of other issues. For example, at the top of the list of concerns for many large storage operators is state of charge inaccuracy. With today's LFP batteries, state of charge accuracy is often not where it needs to be. For instance, if my phone says it's 48% charged, I expect it to be 48%. With an LFP battery, there can be a ±15% variance. So, the charge could actually be 33% or 63%.

That is huge when you are bidding in a market or trying to supply power. With our algorithms, we can offer our customers a state of charge correction that gives an accurate real-time view of battery charge and significantly reduces SOC errors, optimizing energy use and extending battery life. Our platform helps to correct that in real-time, giving our customers the accuracy they need, especially those involved in energy storage systems where accurate state of charge data is critical for market participation. For large scale storage operators, getting this right can often be the difference between average and excellent returns.

ACCURE seems to be involved in various applications. How does your predictive battery analytics support different industries?

Our technology is versatile and supports a wide range of industries. Much of our customer base is in large-scale utility storage. They move faster than traditional car manufacturers. That is part of the reason we are quite active in this market. However, there are also multiple car manufacturers that are using our services today. We are not allowed to say who they are, but they are ones that you would recognize on the road. These manufacturers rely on our platform to monitor and improve battery performance in their electric vehicles.

Additionally, we hung our hats quite a bit on e-buses. BVG, the public transport provider in Berlin, is one of our customers. New York City Transit is also one of our customers. Those are two examples that I can mention publicly. And here again, I keep pointing back to safety. But you know, this is close to my heart. There are a lot of people that rely on buses to get around, and the last thing you want is a safety incident.

Can you walk us through your global expansion journey?

Well, one of the key milestones from a company standpoint is global expansion. The company started in Europe and established a subsidiary in the United States. Growing a new subsidiary is a challenge, and possibly the biggest challenge is getting people to believe in you within that geography. Having our first customer shortly after the subsidiary was born in the U.S. was a big milestone, and that really has propelled us within the North American market. Today, we are the most deployed predictive analytics platform in the world.

Considering geopolitical and economic factors, do you see more opportunities in the U.S. compared to Europe, or are there significant differences between the markets?

There are certainly differences, not just due to geopolitical factors but also because of market structures. For example, in the U.S., you have different markets like ERCOT (Electric Reliability Council of Texas), CAISO (California Independent System Operator), and MISO (Midcontinent Independent System Operator), each with its own set of challenges and opportunities.

Europe and Australia are also unique in their approaches to energy storage and battery management. That said, there is a global drive towards large-scale storage solutions, and we are seeing rapid growth in deployments everywhere. It is an exciting time to be in this industry because the demand is skyrocketing, and we are well-positioned to serve these diverse markets.

Contact us for more information on our chemicals for battery applications

Given that expansion, where does ACCURE stand in the market right now?

We have become the leading predictive analytics platform, which is great for our business growth. Being independent gives us a real advantage. Our ability to pull data from sites around the world into the cloud allows us to spot trends and unusual patterns that can't be done with a single site. Focusing on security is also a key differentiator for us. This is how we started, and it's at the core of everything we do.

Looking ahead, are there any exciting new products or innovations in ACCURE's pipeline that you can share with us?

Earlier, I highlighted the state of charge corrections as one of our innovations. But there is one additional innovation that we are really proud of.

For several years, we've been working with HDI Global, which is a large insurance company based in Europe. After a rigorous two-year vetting process, HDI recognized the value of our battery analytics platform and is now working with asset owners to provide enhanced insurance conditions. For instance, Gore Street Capital in the UK. In this case, by using our predictive battery analytics platform, Gore Street has been able to obtain improved insurance terms through HDI Global. This is a huge win. Insurance is usually the second largest item on anybody's balance sheet. It is the first time such a solution has been implemented in this industry, and we are proud to be a part of it.

To wrap things up, could you share your thoughts on how ACCURE plans to continue supporting the battery market and industry moving forward?

We are experiencing fantastic growth as a company. And you know, when you combine that with an industry that is growing, good things happen. The whole world is moving towards large-scale battery energy storage as a solution, and you can see that when you look at the deployments. The hockey stick curve of storage deployments is unreal; it is one of the fastest industry growth rates that most people will have seen in their lifetime. It's exciting to be at the forefront of this growth.

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