What CMOSS Means to the US Army
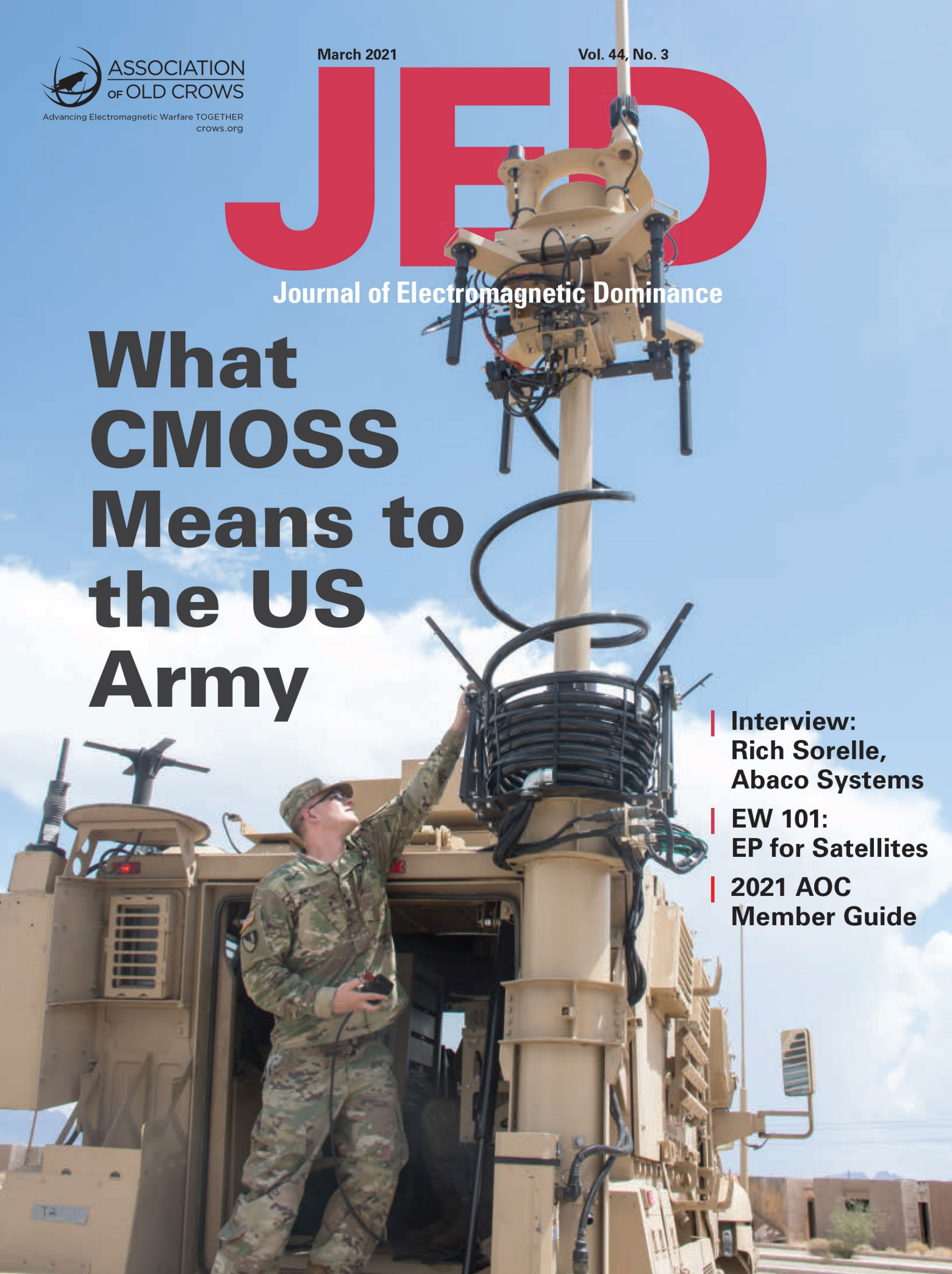
Rich Sorelle, CEO, Abaco Systems

Rich Sorelle is an industry leader who has spent most of his career in electronic warfare (EW). He started as an engineer at Grumman Aerospace, where he worked on various Navy aircraft programs, including the EA-6B Prowler. After Grumman, he took a position at ITT Industries, where he would spend the next 20 years focusing on EW systems. When ITT Industries spun off their defense business to become Exelis, Sorelle's duties evolved from engineering and program management to executive management. In 2012, he was named President of Exelis Electronic Systems and managed the company's EW business during its acquisition by Harris. After retiring from Harris in 2015, he became a board member in an investment group that had acquired Abaco from GE in 2015. Sorelle was named CEO of Abaco in 2017, and he has shaped the embedded computing company to additionally focus on opportunities in the EW and signals intelligence (SIGINT) markets.

John Knowles spoke with Rich Sorelle about his career and his plans for Abaco.

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Please tell me about your first job as an engineer and how your career brought you to Abaco.

Rich Sorelle

My first job in engineering was modeling the entire Texas Instruments microcircuit product line. In 1982 and 1983, it was a yellow, hard-covered data book, and that contained all of the Texas Instruments products. It gave me a really great view of both hardware functionality and software because I had to use the software to model the hardware. That functionality in software was used as software models in one of the first functional design and test capabilities. This type of software modeling was new to the industry, and it taught me about microcircuits at an early age.

I worked at Grumman Aerospace for 13 years, where I helped support five production airplanes for the Navy while also earning my engineering degree. It was an easy transition for me from manufacturing into design engineering. My background in manufacturing was very helpful because I understood as a design engineer what manufacturing needs in order to be successful. I went into program management from engineering. I spent a lot of time with customers, but I also spent a lot of time working with different functions in the company; it's almost like being an orchestra conductor to make progress on complex projects and programs. The various departments must work together to produce the product. This includes everything from understanding the requirements up front to understanding the project schedule, technical specifications and cost.

After Grumman, I went to ITT, where I spent 20 years working primarily in EW. I retired from ITT/Exelis in 2015 and in 2017 joined an investment firm, where I was asked by those investors to lead Abaco. Abaco is a carve-out from GE, which had a long history in embedded computing that goes back to Radstone Technology over 40 years. At Abaco, I formed a new leadership team, and we have introduced new products that have allowed us to open significant new opportunities, primarily in the EW and SIGINT markets, with first to market disruptive technologies.

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What are some of the valuable career lessons you have learned on your journey from an entry-level engineering position to your current role as President and CEO of Abaco?

Rich Sorelle

I learned that if you treat people with respect, if you tell them the truth, if you listen to them and give them a vision of a shared future, they give you their best effort. I learned that there is no substitution for good engineering talent. This is especially true in EW because it's a very difficult undertaking with both hardware and software.

The other thing that's really important is the need to accelerate growth by continuing to develop new products, especially ones that allow you to move into near-adjacent markets to accelerate growth. For example, when I first arrived at Abaco, I looked around with an understanding of where the EW world was headed, having spent 30 years in that market. We invested heavily in the RF System-on-a-Chip (RFSoC) from Xilinx, and in 2018, we released the first to market product. We used that disruptive technology to move into the EW and SIGINT market, where Abaco hadn't had a presence before. We are now growing over 15% a year on the top line and even more than that on the bottom line.

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In terms of the defense market that Abaco serves, what do you think are some of the most significant challenges you will need to address over the next five years?

Rich Sorelle

The defense market is our primary vertical. We do about 85% of our work for the defense market. The other 15% is primarily for commercial aviation, as well as industrial applications, such as oil and gas drilling. In terms of challenges, the first is the worldwide autonomous initiative, which require massive amount of data processing, onboard computing and digital signal processing. Autonomous capabilities blanket both defense and commercial markets and require additional levels of certification to ensure safe and secure operation, whether that's unmanned air systems (UAS) or autonomous ground vehicles similar to what Google, Ford, GM and Tesla are working on. We provide significant computing capabilities for those types of autonomous platforms. In addition, the autonomous programs include some degree of artificial intelligence and machine learning. Solutions for these platforms are typically constrained in terms of size, weight and power (SWAP) – and cost. Abaco is very good at ruggedizing the best and newest processing capabilities designed to align to the SOSA™ technical standard, which allow our customers to quickly and effectively upgrade their systems with new technology.

Another opportunity for rugged embedded computing is in the hypersonic arena. Those platforms need ruggedized embedded hardware that perform way above the current norms for temperature, shock and vibration, altitude, and acceleration. These platforms will require the next level of performance to meet their computing and processing needs.

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As the DOD moves toward embracing Sensor Open Systems Architecture (SOSA) standards, how is Abaco responding to this?

Rich Sorelle

Over three years ago, we realized the importance of the emerging SOSA initiatives and the benefits it would bring. When we think about the US Army having a suite of open architecture standards and we think about the C5ISR Modular Open Suite of Standards (CMOSS), it's really about enabling the sharing of hardware and software components. It prevents vendor lock, which has been a DOD objective for the past 20 years. It also allows smaller companies, like Abaco, to pursue a larger number of opportunities by offering the best technology.

At Abaco, we spend more than 10% of our revenue on R&D. Customers choose us because we stay closer to the state of the art of processing. If someone comes to me (as a prime) and says, "I developed, at my own cost, the best single board computer that's out there, using the best gaming processor that's out there, with the best RFSOC that's out there, and spent $30 million dollars of my own money doing it," you get attention. Our customers can have all this and can ride their domain specific software on our hardware. This allows our customers the ability to start their hardware/software integration earlier than ever before. Today, Abaco has a very comprehensive portfolio of solutions designed to align to the SOSA standard. For example, we launched our IPN254, a multiprocessor solution aligned with the SOSA standard, which incorporates the latest Intel Xeon CPU with NVIDIA's Quadro RTX GPU and a Xilinx Zynq Ultrascale FPGA on a 3U Open VPX board which is aligned with the SOSA standard. Our roadmap includes over twenty products that are designed to align with the SOSA standard; twelve are currently scheduled for release in 2021.

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How do you want to position Abaco in the defense market going forward?

Rich Sorelle

Our vision is to be the leading supplier of ruggedized advanced 3U and 6U VPX boards and systems for system-level mission computing. Our portfolio provides end-to-end offerings for the entire sensor-to-shooter chain, which includes digital signal processing, graphics processing and networks. So, it's about interoperability and interchangeability in a full-up board sets to help speed our customer's system integration.

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How is Abaco addressing the demand for more AI/ML in EW, SIGINT and other defense electronics systems?

Rich Sorelle

We are seeing a huge interest, of course, in deploying AI and ML in EW and SIGINT systems to help identify and act upon novel waveforms without any human interaction. On the hardware front, we are deploying boards and systems based on the general purpose processors that are available today – GPGPUs that the gaming community uses, FPGAs that are extremely large and that have the room and capability for different AI applications. We've been working with some partner companies to port their AI accelerated signal classifiers to our hardware, and that's been very beneficial. We can specialize in the hardware portion, which allows the freedom to our Tier 1 systems customers who have the significant domain knowledge in EW, as well as AI or machine learning algorithms, to be able to port their algorithms on to our hardware. That's really our strategy.

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Lastly, how do your recruit and develop the talent that you want at Abaco?

Rich Sorelle

We are always looking for top talent. Most of the young engineers that we bring in are paired up with one of our senior engineers at the outset, to serve as a mentors. We have also created a completely technical career path, which is not something that companies our size usually do. Not all scientists or engineers are interested in pursuing a management role, so our company offers two paths to our engineers. One is a management path, and one is a technical fellow or chief scientist role, which is equivalent to a VP in most companies.

We also have an early career technical talent intern and co-op program. We select students and, where possible, we keep the students beyond the traditional 12-month work-study process. More often than not, we offer them full-time employment well before their graduation. So that's how we get some of our new talent.

We are spending a lot of time and a lot of R&D on new products, and that is driving 20 to 30 new designs per year. This really attracts some of the best engineers because they like working on the latest technology that's available from our silicon partners, like Intel, NVIDIA and Xilinx. In our case, it is 6 to 18 months for design, and then they will move on to a new one, which is a really exciting pace for many of them. ✎