Interview with New CSP Lead

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TJCAA's Business Certifications

- Alameda County Small, Local Emerging Business
- Bay Area Green Business Program
- California DGS SBE
- City of Colton SBE
- City of Los Angeles SBE
- City of Oakland LBE
- CPUC Women Owned Enterprise
- Eastern Municipal Water District SBE
- Inland Empire Utilities Agency SBE
- Metropolitan Water District of Southern California SBE
- San Diego County Water Authority SBE
- Port of Long Beach SBE
- Port of Oakland LIABE/SBE/VSBE
- PWC Registration— Dept of Industrial Relations (DIR)
- West Basin Municipal Water District SBE

Since February of 2022, Andrae Rauch has been helping TJCAA expand our Control Systems Programming (CSP) group and find technically sound, cost-conscious solutions for our clients' system integration and SCADA challenges. Andrae's extensive background and varied experience, ranging from oil and gas telemetry to software systems integration to treatment plant instrumentation and control, gives him a diverse background of solutions and best practices to optimize our clients' control systems and infrastructure.

Beginning in January of this year, Andrae took over leadership of TJCAA's CSP group, filling the large shoes of Michael Erwin, who is stepping back as he approaches retirement. As Andrae settles into his new role, we thought we'd put him on the spot and ask him a few questions about what CSP is, the state of the industry, and what's next for TJCAA's CSP group.

Q: If you had to explain what control systems programming is to someone who had never heard of it, what would you tell them?

A: As simply as possible, control systems programming, or CSP, is using software instructions that tell one or more computers what actions to take based on the status or value of one or more inputs and input from plant operators. In the case of the water and wastewater industries in which we work, that action might be opening or closing a valve, releasing a prescribed dose of a chemical, or letting an operator know that a flow through a process isn't what it should be and they need to look into the situation. Those are some common examples.

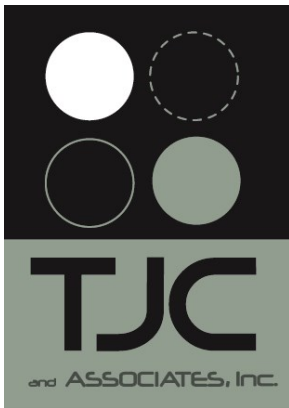*Q: It sounds like the computers are kind of running the plant. Is that correct?*

A: Yes and no. The computers are doing what they've been programmed to do based on the needs of the client at their facility. That might include completing routine, scheduled tasks, or moment by moment adjustments for process control, but the human factor is one of the most important components of CSP, and our solutions are designed with them in mind. Think of it this way: the operators have the license to run the plant—it's their responsibility. The CSP programming we do helps them do more with their existing personnel, simplify some of their more mundane, continuous tasks, and be able to tell in real time how the plant or a specific process is operating. But the operators make the ultimate decisions; the computers are just doing what they are told to do.

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Q: What do you like most about programming these systems?

A: I love the mixture of art and science in programming that accomplishes something useful. Programming combines math, logic, and algorithms in a beautiful and elegant manner. It's like conducting an orchestra, but instead of violins, clarinets, and trumpets, we're arranging the operation of sensors, actuators, and motors to play beautifully for the audience. When we work on a CSP project and get to see our hard work executed flawlessly in a client's system, it's a very proud moment for me and my team.

Q: What would you say are the top three challenges that clients face when improving or expanding their instrumentation and control systems?

A: Two of the three challenges could be characterized as lack of consistent implementation of programming standards and a mixture of devices and programs. Those sound like the same thing, but when clients build their systems piece by piece over a long period of time and use different vendors, different technologies, and different software packages, it's challenging to achieve a high level of integration and smooth operation. Now, operators are resilient, and over time they figure out workarounds and implement procedures to keep the system working. But that resiliency

leads to the third challenge—resistance to change. Once an operations team has their system and routines dialed in, they usually don't want anyone to swoop in and tamper with it. So, in addition to programming, we sometimes need to be salespeople and clearly demonstrate to the client's operations team why they are going to love what we are going to do for them.

Q: It seems like almost every industry is racing to adopt artificial intelligence applications or platforms. Do you see AI becoming a part of the CSP work TJCAA does in the water industry?

A: Well, we're studying it—we have a focus group that is looking at technology innovations, including AI, for potential benefits in our industry. Right now, the push for AI is coming from vendors interested in selling AI-related products, but I have not seen it used directly in a treatment plant... AI is not foolproof and the consequences of an AI failure at, for example, a drinking water plant are just too great to ignore. In other words, while the capabilities continue to grow, we are a long way from turning a plant over to a "thinking" algorithm. In addition, an AI solution typically requires a lot of planning, computing resources and good data to accomplish tasks that are accomplished today with certainty and consistency using comparatively simple solutions people can understand. It is difficult to justify the benefit in our industry,
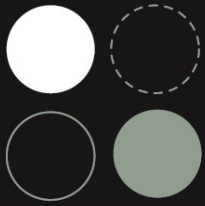
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except perhaps in the case of using AI to analyze data, which we can do today. Some clients may be interested in exploring those tools, but they are typically implemented away from the

plant control system or in an advisory role to assist the operator. The programs we develop result in very predictable actions, are comparatively simple, and work well. Sure, we'll stay up to date on the technology as it evolves and help our clients consider its use.

Q: What is your vision for the future of TJCAA's CSP group?

A: Our vision is continued success, which is going to come from great clients, great supporters, and great programmers writing great code and providing great service. I'm fortunate to be taking over an established group, and I'm looking forward to seeing what our solutions to our clients' future challenges will be!

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