

winter The TJCAA Quarterly

20th Anniversary Edition www.tjcaa.com 2017

Message from the President

Industry News

Message from the President, Gianna Zappettini



I took a quick trip to Yosemite at Thanksgiving and like most vacations, it was over before I knew it. Fortunately, wonderful things happened in between the start and the finish to make it memorable. This included waking up the first morning to snow falling in the valley. This year also seems to have come and gone almost as quickly as my vacation. Again, there were wonderful things that happened at TJCAA that made it a memorable year. Mostly it was due to the hard work of our excellent team members and the continued collaboration with wonderful clients and partners that bring us opportunities that make the time fly. At the close of another year, all of us at TJCAA wish each of you a cheery holiday season and a successful New Year.

Industry News – Are your PLCs obsolete?

A timely New Year’s resolution may be to make sure your critical equipment and controls are up to date. Take a look at those programmable logic controllers, in particular. Are they reaching the end of their useful lives? All of the PLCs that were installed in the 1990s and early 2000s are now approaching their “end of support.”

It plays out like this: the PLC manufacturers stop updating hardware and software but sell their remaining stock, usually at an inflated price. Once the manufacturer’s stock runs out, parts are only available on aftermarket websites, at super-inflated prices. As an example, several years ago we had a project that required a network card for a long-obsolete PLC. The original list price was \$1,600, but the aftermarket price was over \$5,000!

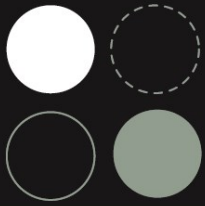
The moral is, stay current! As the end of support approaches, parts will become expensive to obtain and keeping your PLCs functioning properly will be more difficult. The table below shows examples of PLCs that are becoming obsolete. Please contact us if you would like to discuss your PLCs.

Product Line	End of Sales Announcement	End of Commercialization	End of Support
Modicon Quantum CPU	12/1/2016	12/1/2018	12/1/2026
Modicon Quantum I/O	12/1/2019	12/1/2021	12/1/2029
Rockwell PLC-5	7/31/2015	7/31/2017	7/31/2022
GE 90-30 Series	10/1/2015	10/1/2017	10/1/2022
GE 90-70 Series	10/1/2015	10/1/2017	10/1/2022

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- TJCAA’s Business Certifications
- Alameda County Small, Local Emerging Business
 - Bay Area Green Business Program, Green Business
 - City of Oakland Local Business Enterprise
 - California DGS Small Business (SBE)
 - Port of Long Beach SBE
 - Port of Oakland LIABE/SBE/VSBE
 - San Diego County Water Authority SBE
 - SoCal Network SBE
 - Sacramento Municipal Utilities District (SMUD) SEED Vendor

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What is SKM Power*Tools[®] and how do we use it?



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What is SKM Power*Tools[®] and how do we use it?

TJCAA uses SKM Power*Tools[®] for Windows, a suite of power system analysis software, to model and analyze electrical systems for our clients' facilities. **Facility owners often hire us to do arc flash studies;** for these, TJCAA uses the Arc Flash Evaluation module, in concert with DAPPER, the basic heart of the Power*Tools software .

We find that our clients are most interested in how to eliminate the arc flash hazard. An arc flash is arcing energy (plasma) released during an arc fault, and it can present a significant hazard. When an arc flash occurs, electric current leaves its intended path (e.g., wire) and travels through the air. Arc flash studies also require analysis of short circuits (paths taken by currents that bypass the desired route). *See the [TJCAA Quarterly issue from December 2016](#) for more about arc flash hazards.*

TJCAA Electrical Design Specialist Manan Bhatt, who gained experience providing technical support, troubleshooting, and system modeling with Power*Tools and other SKM software at his previous position with SKM Systems Analysis, Inc., explains what a typical arc flash study includes.

"First, our team heads to the facility to take inventory. We photograph each

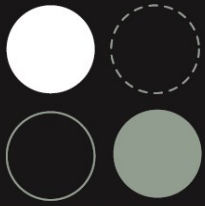
and every piece of electrical equipment." During this important research, he notes, our team looks at the circuit breakers and what they are set to. We take note of the motor ratings and cable sizes, estimate cable lengths, and record which equipment the cables feed to and from. We take detailed notes on the settings, whether they are digital displays or mechanical knobs, so that we can figure out what's going on with the system we're modeling. We then take more notes on the status of equipment that has been tweaked, modified, or replaced. We open every electrical equipment cabinet and see what's inside.

TJCAA's lead Electrical Designer Paul Giorsetto, P.E. notes that one of our partners for performing field reconnaissance and data gathering is Associated Power Solutions. "APS has trained electricians with the appropriate knowledge and equipment to access the panels properly," Paul says, "Their expertise is very helpful!"

Back at the office, we use our field inventory to build an SKM model and run a fault analysis in DAPPER, which gives us the short circuit values. This step will, for example, give us short circuit values for all of the buses, so that even simple, small panels can have labels for workplace safety (more on that below). *See also "What's a bus?" in the [TJCAA Quarterly, Spring 2017 issue](#).*

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We then run the Arc Flash Evaluation module on all of the nodes to calculate the incident energy, which is a measure of the arc flash hazard in calories per centimeter squared. Higher incident energy means a greater potential for arc flash hazard.

The National Fire Protection Association requires facilities to display equipment labels with information about incident energy. These labels alert the operators and electricians about potential hazards and indicate what kind of protective gear is necessary when accessing or working on the equipment .

TJCAA has created a customized, easy-to-understand arc flash hazard label template. We develop, print, and apply these labels for our clients, to help them stay up to date and maximize the clarity of important workplace safety information. Printing our own labels allows us to be very responsive to client needs, whether that is a fresh label during our site visit, or label updates to meet evolving standards. **(Note that the NFPA label standards are going to change again in 2018. If you have questions, TJCAA can help.)**



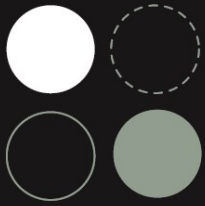
The arc flash studies are usually accompanied by a report containing the model results and describing procedures, settings, and labeling. We follow up with training, in collaboration with partners such as Martin Technical, Inc., to bring home the important points for facility staff. TJCAA engineers attend these sessions with facility staff, to further develop our understanding of our clients' needs and keep our in-field knowledge current.

Our arc flash studies, Manan explains, have many benefits for our clients. TJCAA's expert knowledge and extensive experience with these studies equip us to do the right research and apply the model correctly. We know how the facilities work, and we take practical aspects into consideration. Each facility and its equipment is unique, and getting it right requires attention to detail and good coordination with operators.

Coordination in the electrical sense is also an important result of our studies. We are able to help our clients achieve electrical system coordination that complies with National Electrical Code, while featuring adjustments that favor life safety of personnel, the most important factor. **When equipment is changed out, settings are changed, or the electric utility provider changes something, the analysis must be repeated to keep the arc flash hazard info up to date.**

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Doing these studies is fun, Manan says, "We get to go out and talk with the facility staff, turn the knobs, apply the labels, and learn more about our clients." If you would like to learn more about our Power*Tools capabilities (which also encompass the Transient Motor Starting, Harmonic Analysis, and Industrial Simulation modules) please contact us.

Did you know?

TJCAA 20th Anniversary

Did you know TJC and Associates, Inc. was incorporated on January 16, 1998? Yes, it's hard to believe it's been 20 years! Thanks in part to many of our wonderful clients, the last 20 years have been great!

What is biathlon?



Image by gograph.com

Biathlon, which means "dual event," is a competition that includes both cross-country skiing and rifle shooting, and its roots are in the Nordic countries. According to the US Olympic team website, the sport's roots were in survival, rather than competition. Rock carvings from more than 4,000 years ago depict men

stalking animals while wearing skis. The ski/shoot combination became an important part of military life beginning in the 1700s. In the 1930s, the legendary Finnish Army on skis, carrying rifles, is said to have routed the Russians from their border even though they were outnumbered 10 to 1. (teamusa.org)

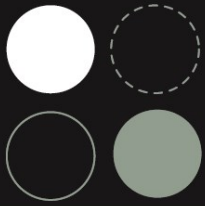
An exciting spectator sport, "biathlon combines the power and aggression of cross-country skiing with the precision and calm of marksmanship." Biathlon was first included in the Winter Olympics in the form of a "Military Patrol" demonstration in 1924 in Chamonix. It was included at the Games in its current form in 1960 in Squaw Valley. (Olympic.org)

Entertainment Review – The Last Jedi

It's go time! The latest episode in the Star Wars story is out. Pin up your Princess Leia buns, grab your toy light saber, and don your best Millennium Falcon t-shirt—it's in the theaters now! (Actually, please check your theatre's costume policy before bringing along that toy light saber.) TJCAA family members have checked it out and tell us that it's definitely worth seeing. We're not going to spoil anything for you, but we will tell you it features exciting space battles, the struggle of good vs. evil, and a lovely score by John Williams. (PG-13, 2:32)

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Sporting News

TJCAA Electrical and Lighting contract Designer, Louis Jackson, brought our attention to this great play by his grandson, Emmanuel Hopkins, a freshman defensive back at LaGrange College in the USA South Conference. This photo shows Hopkins (number 1), blocking a field goal attempt by Greensboro College's placekicker in a 59-10 win for the LaGrange Panthers in their homecoming game at Callaway Stadium, Georgia. With the college bowl games, the Super Bowl, the Olympics, and the return of auto racing, this winter will have many more great sports to take in!



Photo courtesy of LaGrange College

Employment Opportunities

TJCAA is looking for qualified engineers to work on great projects with great people. To view and apply for open career positions, visit our website at www.tjcaa.com.



Dates to Note

- Dec 21 The Winter Solstice
- Jan 1, 2018 104th Rose Bowl Game
- Jan 16 TJCAA 20th Anniversary**
- Jan 28 Kelly Park Big Band, The Sound Room, 5-8 PM
- Feb 4 Super Bowl LII
- Feb 9-25 Olympic Winter Games, PyeongChang, South Korea
- Feb 16 Chinese New Year
- Feb 18 The 60th Daytona 500
- Feb 25 Kelly Park Big Band, The Sound Room, 5-8 PM
- Feb 26-Mar 4 International Biathlon Union Youth/Junior World Championships Otepää, Estonia
- Mar 25 Formula 1 69th Season opens in Melbourne, Australia
- Mar 25 Kelly Park Big Band, The Sound Room, 5-8 PM