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The TJCAA Quarterly

2022
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Message from the President

TJCAA Welcomes Qiying (Isabel) Huang

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
- Eastern Municipal Water District SBE
- Inland Empire Utilities Agency SBE
- Metropolitan Water District of Southern California SBE
- Sacramento Municipal Utilities District (SMUD) SEED Vendor
- 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

Message from the President, Gianna Zappettini

I have never professed to having a green thumb. Getting the chance to enjoy the beauty grown by others is always a pleasure for me. A recent trip to escape the intense heat of the Sacramento Area brought us to a retreat near the Columbia Gorge where we stayed at a home owned by the local florist. Their garden had many blooms that did not disappoint.



Fortunately, I do not have to travel far to find excellent engineers. It has been my pleasure to work with all of them as they have grown along with TJCAA. We think our staff and their skills are as beautiful as the flowers, and they will produce a great outcome for your projects. Give us a call when you need our special area of engineering expertise.



TJCAA Welcomes Qiying (Isabel) Huang

We are pleased to welcome our newest Electrical Designer, Isabel Huang! Isabel joined us after completing her bachelor's degree in Electrical Engineering from California Polytechnic State University with a concentration in Power Systems. She will be working with our Instrumentation, Controls, and Electrical group.



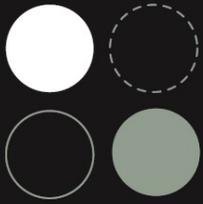
While at Cal Poly, Isabel completed a variety of projects. Almost all the classes associated with her major had labs, she notes, which usually required equipment builds or coding. The projects her professors assigned helped prepare her for professional work, Isabel says. "We got exposure to different programming languages, handled microprocessors, and built things hands-on. I could see how signals interfere with each other. Getting your hands on the devices gave me a much better idea of real world

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TJCAA Welcomes
Qiyong (Isabel)
Huang

Supply Chain
Delays for
Electrical Parts



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problem-solving than a simulation would have."

Isabel is also certified as a Mental Health Peer Educator by NASPA (National Association of Student Personnel Administrators), and she was an active volunteer with Cal Poly's PULSE program (Peers Understanding, Listening, Supporting, Educating). She tells us that the support she received from the program inspired her to join and help other students. Her work with PULSE increased her mental health-related knowledge and has bolstered her excellent communication and coping skills.

In support of our senior and staff engineers, Isabel's work focuses on electrical applications; power calculations; developing design layouts for conduit, circuiting, and lighting plans; preparing conduit schedules; and preparing engineering calculations used for equipment sizing and specifications. Welcome, Isabel!

Supply Chain Delays for Electrical Parts

Over two years ago, the pandemic began disrupting supply chains. Now in the "new normal," markets are still feeling the effects of the pandemic, and the war in Ukraine has further interfered with supply chains for electrical parts and supplies. Raw materials such as copper and



Supply chain delays for raw materials such as copper create delays for commodity items used in electrical equipment.

aluminum, along with commodity items such as relays, breakers, and semiconductors, have been affected, with significant effects on prices and delivery times.

Schneider Electric, a global energy management and automation firm that produces a wide variety of industrial automation and control products, says, "The world has changed dramatically since the onset of the COVID-19 pandemic with constrained labor availability, global shortages of raw materials, and unreliable transportation—all of which have challenged suppliers and put pressure on global and regional supply chains." (se.com)

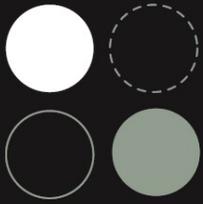
As a full-service instrumentation, controls, and electrical design provider, TJCAA has projects that include a broad range of electrical components and equipment. We're finding that our clients are curious about how to deal with equipment delivery periods that could become lengthy because of supply chain delays and could significantly affect their ability to get projects implemented within the planned timeframe.

Michael Erwin, P.E., leader of our Control Systems Programming Group, spoke with manufacturer reps about delivery times. Here's what he heard:

- Switchboards and switchgear lineups are running 50–80 weeks after approval, depending on complexity.
- Motor control centers are typically 30–40 weeks, but this can vary and go a bit longer depending on conditions when the order is placed.

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Supply Chain
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- There are no alternatives to pay a premium to expedite materials. Materials aren't available to expedite.
- Some commodity items, such as breakers and relays, may become unavailable between builds and there may be substitutions of equivalent products. On a phased project where MCCs are purchased or released for manufacturing on different schedules, you may get different components even when the equipment comes out of the same manufacturing facility.

These lead times are quite different from when Mike was involved directly on the contractor side, he tells us. "We could typically get a switchboard or MCC lineup in 12–14 weeks. On a complex project, it may have gone as high as 18 weeks." The current lead times will certainly affect some agencies' potential for doing fast-tracked projects.

"Interesting times we are living in, to say the least!" Mike adds, "The good news is that we have the technical capability to help our clients navigate these issues and produce solutions to get their projects completed within a reasonable time." TJCAA engineers are always on the lookout for opportunities to help resolve issues in the early stages of the design, and we are already applying creative approaches to address these types of delivery time issues.

If you would like help planning your instrumentation, controls, or electrical project, please give us a call.

2022 CBC Effective January 1, 2023

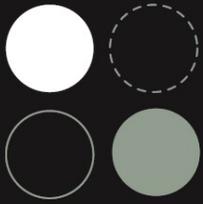
As engineers, we live by the Code. For most of our projects, that means the *California Building Standards Code, Title 24 of the California Code of Regulations* (Title 24), which is a multipart document that includes the *California Building Code* (CBC, Part 2, Volumes 1 and 2) and the *California Electric Code* (Part 3), which references the *National Electric Code*. Title 24, which has everything from structural requirements and sprinkler systems to energy efficiency and electrical wiring, sets many requirements applicable to the facilities we design.

The [2022 Triennial Edition of Title 24](#) was published July 1, 2022. What happens in the three years between the edition dates? The California Building Standards Commission explains, "During the 2021 triennial code adoption cycle, California state agencies reviewed the most recent edition of national model codes and standards and made amendments and additions to most parts of Title 24." Model codes are written by organizations such as the International Code Council and include the *International Building Code* and the *International Residential Code*. The purpose of model codes is to provide the source upon which other entities, such as the State of California, can base their own codes.

The 2022 CBC will be effective January 1, 2023. TJCAA monitors upcoming Code changes to implement those that may make a facility outdated if designed under the current Code. If you have questions about the CBC, please contact us.

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Before I Worked Here...

Before I Worked Here...

Water cooler and lunchtime stories are a staple of the office. These stories are especially interesting when you have staff members that bring with them the amazing breadth of experience that our TJCAA team does. In our last edition, we highlighted TJCAA Structural Engineer James Myers' experience working on a NASA launchpad, and we must admit, we've heard many more good ones. We selected a few of our staff members "Before I Worked Here" stories to share with you.

Andrae Rauch, P.E.

Senior Control Systems Engineer

I was asked to replace a human-machine interface on an ultraviolet system for water purification in a personal residence on Pebble Beach. The local GE distributor got the request regarding the failed HMI and reached out to my employer, who in turn gave the work to me. Meanwhile, the office staff noticed that the owner's name was that of a famous movie producer!



photo: si-f

Because the HMI was an old unit, I had to purchase a special communication cable to upload the configuration from the failed HMI unit and then convert the

application for the replacement HMI. I worked with the house staff member in charge of home automation and other electrical projects around the house. He took me on a tour to show me all the sound and lighting automation in the home and the view of the ocean and golf course from the backyard deck. He was quite proud of the work he had done. The actual work took about 30 minutes, but the trip took the whole day.

It turns out that the homeowner had made his millions selling cars, not making movies, and the name was just a sound-alike. Even though it was not the home of a famous Hollywood guy, it was a unique and memorable trip.

Mike Erwin, P.E.

Lead Control Systems Programming Engineer

Back in the early 2000s, I spent a week working at a semiconductor fabrication facility in Seremban, Malaysia. I taught a PLC and SCADA programming class in the morning and then helped troubleshoot and repair some of their PLC-controlled batch processing machines in their wafer processing facility during the afternoons. The machines included thin film sputtering coaters, evaporative coaters, and some chemical wet stations. In addition to the technical challenges of figuring out some very nonstandard programming methods (there was a PLC with no program in it and the machine was programmed in Wonderware scripts that read and wrote directly to the PLC's I/O), it was a fascinating cultural experience.

The facility was staffed by ethnic Chinese, ethnic Indians, and the native Malays, and they all used English to

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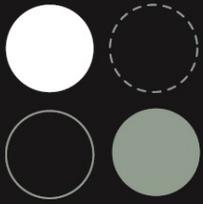
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Before I Worked Here...

communicate between members of the different groups. While there was very little intercultural interaction outside of the work environment, I was able to go to dinner each night with a member of each different group and learn more about their cultures and communities. The food was fantastic, except for a night of sushi that haunts me to this day. On my last day I was able to make it to Kuala Lumpur and took in the sites from Petronas Tower, which included a view of a lovely wastewater treatment plant on the edge of downtown!

Anne Broughton, P.E. Senior Electrical Engineer

I think a lot of TJCAA folks have already heard this one—I like to tell stories. I was the electrical engineer on my first capital project at Richmond Refinery. A fair bit of electrical equipment was being added to one of the plants, which required the electrical system for that area to be upgraded. In addition, the switchgear was underrated for the available short circuit current, a further inducement to upgrading the electrical system. This required work to be done for the 12.47 kV switchgear, as well as the 480 V switchgear.



photo: monahan

It was the 12.47 kV work that I took particular pride in. The switchgear modifications needed a new medium-voltage circuit breaker on both ends of the gear. One side already had a spare breaker, so the feeder work was routine. The other side needed a new breaker and enclosure. There was an old,

abandoned medium switchgear elsewhere in the refinery, so I got the “go” to remove the end breaker and enclosure from that gear and wire it into the switchgear that needed a new breaker. It was a complicated job, requiring a whole lot of thought. In any case, once the maintenance crew wired it up physically, it worked. I was so proud of the job that I put my handprint in the wet concrete of the new substation, with my initials and the date. It’s still there.

Vinai Vue Electrical Summer Intern

During my time in the Navy onboard the USS Carl Vinson (CVN-70), I made many memories. Some were happy, but most were memorable for other reasons; a handful involve my food adventures and experiences. One memory in particular shines brighter and more vividly than the rest: Mid-Rats.

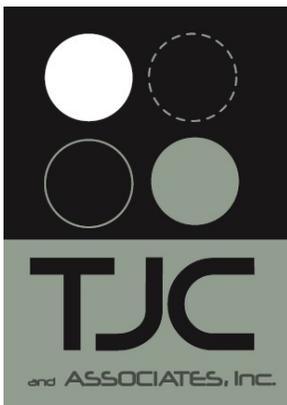


Kanagawa, Japan – August 28, 2021: USS Carl Vinson (CVN-70), Nimitz-class aircraft carrier.

Onboard the USS Carl Vinson, four meals are served to the lower-ranking enlisted sailors. These meals are Breakfast, Lunch, Dinner, and Mid-Rats (midnight rations). Breakfast consists of

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pancakes or waffles, eggs, and sausage patties or links. Lunch and Dinner consist of potato or rice, vegetable medley, and a protein. When I was on-board, Mid-Rats consisted of leftover Dinner and the easiest thing they felt like cooking that night. This led to some very interesting meals.

Most of the shipboard personnel work 8 AM to 4 PM. To maintain the warship in ready status, there are small, select groups that share the privilege, responsibility, and burden of ensuring that the ship is always ready to respond to the call of duty. I was part of this often-forgotten group working through the night, and Mid-Rats was designed to feed us. Mid-Rats was *never* known for having good food and was *well* known for having bad food.

One night, Mid-Rats had me in what I would describe as a hysterically delusional state. I was surprisingly impressed to see the choices the fine cooks had provided. They presented us with an array of self-serve options, consisting of mashed potatoes, potato wedges, breakfast potatoes, and baked potatoes. I was disappointed, while at the same time impressed with their audacity to try such a thing! It brought a smile to my face. I ate my potatoes with plenty of ketchup and then went on my merry way to monitor my station for the night.

Entertainment: Simple Minds

Simple Minds have been lighting up the stages on tour this year. The Scottish band, which has been pumping out new wave, art-rock, avant-garde, pop, ambient, and more for over 40 years, includes lead singer Jim Kerr, guitarist Charlie Burchill, and collaborators including bassist Ged Grimes, vocalist

Sarah Brown, drummer Cherisse Osei, and multi-instrumentalist Gordy Goudie. The band's official history explains that they "emerged from the ashes of Glasgow punk outfit Johnny & The Self-Abusers in November 1977. In true punk fashion, the Self-Abusers, 'atrocious and amateur' according to Jim, released one independent single, Saints and Sinners, and split up the same day."

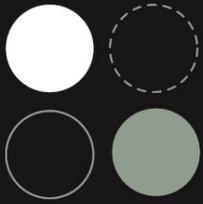


In the USA, the band is likely best known for 1980s singles "Don't You (Forget About Me)" and "Alive and Kicking." Simple Minds have released numerous studio, live, and compilation albums since 1977, and recently celebrated their long-time success with a 40th Anniversary tour. Their next album, "Direction of the Heart," is due for release October 21, 2022. Our music department listened to prereleases of three of the new tunes and we can tell you, this is pure Simple Minds. Long-time fans will find something familiar, yet fresh in this release, which Kerr describes as "Electro-Rock."

The band's website reports that the majority of the new album tracks were written and demoed in Sicily, the home of both Kerr and Burchill. Because of quarantine rules, the band could not gather in the UK, and recorded the album at Chameleon Studios in Hamburg. Ged Grimes, Cherisse Osei and Sarah Brown joined in, recording

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their parts for some of the tracks in London.

TJCAA Structural Engineer, Richard Thow, with his wife, Monica, and son, Lochlan, attended the Simple Minds concert in Edinburgh on August 13. Profits from this special second show went to [Unicef for Children in Ukraine](http://Unicef.org).

The next scheduled dates for Simple Minds were to have been September 17-18 at the Live at Leeds Concert. "Following the very sad news of the death of Her Majesty The Queen, as a mark of respect, BBC Radio 2 Live in Leeds will now not take place." (simpleminds.com)



The Thow family enjoys the Simple Minds concert in Edinburgh, Scotland.

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

- Sep 22 Autumnal Equinox
- Sep 22-25 [Presidents Cup](#), Charlotte, NC
- Oct 18 77th NBA Season Begins
- Oct 20-22 [Society of Women Engineers WE22 Annual Conference](#), Houston, TX
- Oct 23-26 [ASCE 2022 Convention](#), Anaheim, CA
- Oct 23-27 [ACI Concrete Convention](#), Dallas, TX
- Oct 24-27 [CA-NV AWWA Section Annual Conference](#), Sacramento, CA
- Oct 28 118th MLB World Series begins
- Nov 1-4 [NCSEA Structural Engineering Summit](#), Chicago, IL
- Nov 6 Daylight Savings Time ends
- Nov 7-9 [2022 ICRI Fall Convention](#), Atlanta, GA
- Nov 8 Total Lunar Eclipse
- Nov 8 Election Day
- Nov 19 125th Big Game: Cal vs. Stanford
- Nov 20 22nd FIFA World Cup begins, Qatar
- Nov 23 Fibonacci Day
- Dec 13-14 Geminids Meteor Shower