

Another Successful GRC Workshop and Field Trip

by Ian Crawford

After a short course held in Java, Indonesia in March, the latest GRC Workshop was held in June in Sacramento, California. The two-day course was held at a hotel on the banks of the Sacramento River and was followed by a GRC Field Trip to The Geysers, just over 100 miles away, the next day.



GRC Executive Director Steve Ponder welcomes the attendees at the GRC Workshop. PHOTOS BY IAN CRAWFORD.

Speakers Jim Lovekin, Minh Pham, Ethan Chabora, Paul Spielman, Magaly Flores Armenta, Chris Klein and Marco H. Rodríguez gave well-received presentations on subjects and case studies related to geothermal resource assessment and optimization.



The attendees from Mexico enjoy the environs of the workshop hotel.

Fifty attendees from six different countries had an informative and successful experience.

After the GRC Workshop many attendees set off next day for The Geysers Geothermal Field for the GRC Field Trip.

After winding our way up from the Napa Valley into the Mayacamas Mountains we arrived at the Calpine Visitor's Center in Middletown. After a look around the newly expanded exhibit hall we were led by Calpine employees Karl Urbank, Vice President—Technical Services and Sarah Pistone, Reservoir Engineer on a tour of the area.

At the Geysers Administration Center we were shown the control room that monitors and remotely controls all 15 Calpine geothermal plants in the field. As all the wells are interconnected by



Karl Urbank, Vice President—Technical Services Calpine answers questions beside one of the excellent displays at the Calpine Visitors Center.

"It is always good to get a new perspective on (geothermal) topics. The case histories were very interesting, especially those from Mexico. It was a great opportunity for me to see The Geysers—one of the most famous in the world. It was very well organized and very interesting to talk to the tour guides, Karl Urbank and Sarah Pistone."

- Saeunn Halldorsdottir (Iceland Geosurvey, Reykjavik, Iceland).

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"The classes were informative and I learned a bunch! The Geysers were cool to check out."
- Matthew Sophy (New Mexico Institute of Mining & Technology, Socorro, New Mexico).



Karl Urbank talks outside the Socrates power plants. The yellow device attached to his hard hat is a hydrogen sulfide gas detector.

a system of over-ground pipes steam flows can be managed easily. Also monitored at the control room is the input from two large-scale wastewater injection projects from Lake County and the City of Santa Rosa. Together, these projects provide approximately 20 million gallons of reclaimed water per day for injection into The Geysers reservoir.

Over lunch we had an update on the Calpine and U.S. Department of Energy Enhanced Geothermal System (EGS) Project at The Geysers. By "injecting" water under vacuum conditions down the Prati 32 well (depth 11,143 feet) into 750 °F rock, Calpine expects to increase permeability in the rock, increase steam production through the Prati State 31 well (depth 10,134 feet), and reduce the concentrations of naturally occurring noncondensable gases (NCGs) such as carbon dioxide (CO₂), hydrogen (H₂) and hydrogen sulfide (H₂S).

"I thought the workshop was good, easily understandable for beginners. It was amazing to look at The Geysers and a good opportunity to see a working power plant." - Fernando Del Cueto (Grupo Dragon, Mexico City, Mexico).



The GRC Field Trip at the Calpine Visitors Center.

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"The workshop was well organized with good topics that are important for people out in the field. It was great that Calpine was so open to questions." - John Akerley (Ormat Nevada, Reno)

Calpine reports that an EGS has been created in the hot dry rock of the north west Geysers. The evidence for this comes from the analysis of microseismicity data, isotope data, temperature data, pressure data and Prati State 31 flow response.

Back on the bus we visited the Calpine Unit 18 (Socrates) power plant. Wearing hard hats, protective goggles and ear-plugs (much needed!) we toured the multi-storey facility which on that day was delivering 46.19 MWe to the California grid. We saw spare Toshiba turbines that had been retained after operation to be used for spare parts.

"It's always nice to see surface expressions of geothermal activity. The workshop was enthralling. I enjoyed it very much." - Clay Jones (University of Utah, Salt Lake City, Utah).



Admiring the innards of the Calpine Socrates geothermal power plant.

"I thought the GRC Workshop was excellent. The field trip was great, especially being able to go inside a power plant." - Cheryl Closson (California Energy Commission, Sacramento)



Don't get too close! Peering into mud pots at the Sulfur Springs.

Finally, we got to see some natural geothermal features at the Sulfur Springs area. Even on a warm day there was plenty of steam and that instantly recognizable smell of bad eggs! The mud pots were bubbling energetically and we were even allowed to see a brand new mud pot that had formed just recently.

The GRC would like to thank Calpine for its generosity in providing access to their facilities and for providing such excellent guides.

The next GRC Workshops will be held before the GRC Annual Meeting & GEA Expo, Sept. 29-Oct. 2 at the MGM Grand, Las Vegas, Nevada. They will be on *New Developments in Power Plants* and *Geothermal Exploration in the 21st Century*.

The next GRC Field Trips will be before and after the GRC Annual Meeting & GEA Expo. They will view the fascinating geology of the Las Vegas valley, the world famous Hoover Dam, the innovative Goodsprings Waste Heat Facility and the geothermal features and facilities of the Imperial Valley, California. ■

For more photos (and videos) from the GRC Workshop and Field Trip, scan the QR Code using your mobile device or go to the GRC Flickr web page at www.flickr.com/photos/geothermalresourcescouncil.

