SQUG / SEQUAL Newsletter

November 2008

Welcome to the second SQUG/SEQUAL Newsletter of 2008. There continues to be a lot of action in the seismic world. Several significant earthquakes have occurred, we continue routine support for our operating plants, and new plant activities are on going. We hope you find this brief update on SQUG/SEQUAL and other seismic related activities informative and useful.

John Richards

SQUG/SEQUAL Chairman

In This Edition

Recent Earthquake

A number of earthquakes have occurred since the last Newsletter. Several are highlighted below.

We'll review all of the significant 2008 earthquakes at the Winter meeting in December.

Pakistan

The most significant earthquake in the second half of the year was the M6.4 earthquake on October 28 in Pakistan, followed about 12 hours later by a second M6.4 earthquake in the same region.

At least 300 people were killed, over 500 injured, and approximately 120,000 were left homeless. This is thankfully, a far cry from the more than 87,000 people killed in China in May but it is still an enormous tragedy for the region.

Kyrgyzstan

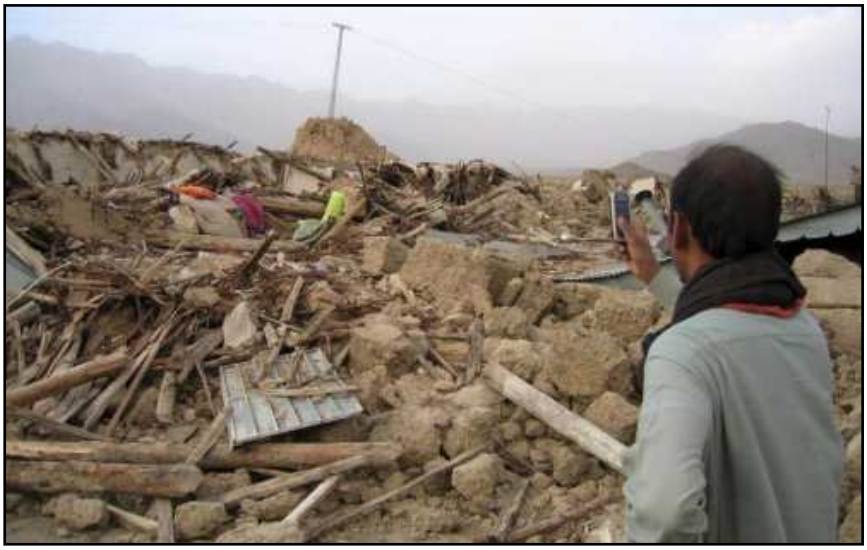
A M6.6 earthquake occurred on October 5th near the intersection of the borders of Kyrgyzstan, Tajikstan, and China. At least 74 people were killed, 140 injured and dozens of buildings destroyed.

Los Angeles

A M5.4 earthquake occurred in the Los Angeles area July 29th. The earthquake was felt across southern California with strong shaking reported to the north in the Chino Basin and to the southwest in the Los Angles basin. Little serious damage was reported as a result of the earthquake.

Ongoing Earthquake Investigations

We are currently working to collect data on two recent earthquakes; the October 2006 earthquake in Hawaii, and the July 2007 earthquake near the Kashiwazaki-Kariwa nuclear plant in Japan.



When the Hawaiian earthquake happened, several of us on the Steering Group traded e-mails joking about running out to these beautiful islands to do an investigation. After a while, we saw the recorded ground motions and computed response spectra (see the June 2008 Newsletter) and we stopped joking. The investigation was delayed by a few legal disputes about how long it took to get power returned but, those disputes are close to resolution and the Hawaiian utilities are as anxious to discuss lessons learned with us as we are to collect the data. Thing are moving ahead and we'll provide a more detailed update at the Winter meeting.

The Niigataken Chuetsu-oki earthquake near the Kashiwazaki-Kariwa (KK) nuclear plant was

serious from the start and despite the excellent performance of seismically designed SSCs, all seven units at the world's largest nuclear plant are still working to achieve restart. Our investigation activities to date have consisted of supporting TEPCO's restart activities and participation in the IAEA EBP. Excellent progress is being made and TEPCO hopes to restart some of the units in the first quarter of next year. In performing their restart activities, they have completed numerous walkdowns and have already collected much of the data we would collect under a SQUG investigation. As they get units back on line and have a chance to come up for air, we'll work with them to get the equipment performance data.

SQUG Training

Two SQUG training classes were offered this year. In August, Duke Energy sponsored a session of the SQUG Relay Reviewer training. Eight students attended representing 3 utilities. The course was taught by Dick Starck and Bob Carritte, with Duke Energy (Rusty Childs) handling the registration and administrative duties. The class was well received by the students.

In November, a Seismic Capability Engineer (SCE) Walkdown course was hosted by Bruce Power in Tiverton, Canada. The course was initially requested by our Canadian and British members, although participation was opened to all SQUG members. Twenty-eight students representing 8 companies from Canada, the U.K. and the U.S. attended.

The format of the SCE course was adjusted from previous sessions to include:

- a half-day overview of seismic qualification based on two of the modules from the PSE Seismic Orientation Training and the SQUG/NARE awareness training,
- a presentation on the piping guidelines, and
- an overview of seismic margins and fragilities.

SCE Walkdown Training in Ontario

The students appreciated these general presentations as valuable supplements to the SQUG video training.

Another highlight from the class was a presentation by Bruce Power about the history and operation of CANDU nuclear technology, the eight reactor Bruce A and B power complex, life extension activities at Bruce A, and new plant plans in Canada.

HVAC Training Module

A while back, we published HVAC Evaluation Guidelines providing criteria for performing walkdown based seismic evaluations of HVAC. The guidelines follow the GIP cable tray methodology, adapted for HVAC-specific details. Southern Company performed a pilot application at the Hatch plant, which was reviewed and accepted by the NRC. We have been developing a training module to supplement the SQUG SCE training and we'll do a dry run of the module at the upcoming Winter meeting on Friday morning. It should take about 3 hours and will include a workbook and exercises.

Seismic Housekeeping Benchmarking

We have been working on a Benchmarking report on Seismic Housekeeping practices. A draft of the report was distributed to members earlier in the year and the Steering Group reviewed the final draft in October. The official report is working its way through EPRI publishing and is expected to be out by the end of the year (EPRI 1018352).

The body of the report identifies the various issues most often addressed in utility seismic housekeeping guidelines. Report appendices summarize NRC Inspection Reports and provide examples of the typical practices identified in the 68 documents submitted by members for review. We'll provide an overview of the report in the December meeting.

GI 199 Update

Over the last few years the industry and NRC have been working towards

performing an evaluation of the potential impact of updated seismic hazards on the existing plants (see the June 2008 Newsletter for the background). More recently, the NRC has gotten pretty close to completing their risk-based screening process.

Working in parallel, EPRI recently completed an update of the site-specific seismic hazard estimates for most of the Central and Eastern United States (CEUS) nuclear plants (EPRI 1016736).

A process is now being developed to perform site-specific screening evaluations using the Seismic Margin Assessments (SMA) or Seismic Probabilistic Risk Analyses (S-PRA) performed in response to the Individual Plant Examination for External Events (IPEEE) Program.

EPRI is planning to meet with NRC Research representatives through their Memorandum of Understanding (MOU) to discuss the various screening processes considered. The MOU permits EPRI and NRC research to exchange information and engage in discussions for specified research purposes.

Industry is working towards completing an initial screening by January, which should give utilities enough time to consider future activities prior to the NRC final decisions in the 1st quarter of 2009.

For most sites, the screening evaluation is expected to conclude that the impacts are minimal but, that may not be the case for all sites. **If someone from your utility is not engaged with this work, we strongly suggest that you contact Bob Kassawara or Alex Marion at NEI (202-739-8080, am@nei.org) for additional information.**

Piping Evaluation Guideline

We will soon be issuing an update to the Piping Evaluation Guideline. The updates will include earthquake and test data for tubing and compression fittings, minor corrections in the Guideline text, and a title change to "Experience Based Seismic Verification Guidelines for Piping and Tubing." A significant amount of experience and test data for tubing and compression fittings was added to the eSQUG database in 2007, and the report guidance was enhanced to incorporate this information. We do not currently plan to review this information in the Winter meeting but the experts will be at the meeting if you have any questions.

Updated G-STERI Evaluations

On September 30th EPRI issued an update to the G-STERI Evaluations. The updated evaluations are in EPRI report 1016694, Generic Seismic Technical Evaluations of Replacement Items for Nuclear Power Plants – Item-Specific Evaluations: TR-105849. An additional report describing the technical basis for the updates was published in 1016691, Periodic Review of G-STERI Evaluations.

Some adjustments were made to a number of evaluations. G-STERI users should pay particular attention to a new DIN Rail evaluation and the following items, which have new restrictions or limitations.

- Three items (Terminal Block, MCCB and Fuse Block) added restrictions for DIN Rail Mounting.
- Five items (Thermal Overload Relay, Disconnect Switch, Solenoid Operated Valve, Circuit Breaker, and Timer) excluded specific Makes / Models. For example, the Westinghouse "QuickLag" Type E Circuit Breaker (a GIP GERS outlier) was excluded.
- Two items (Electrical Analog Indicating Meter and Transmitter) added mounting restrictions.
- Four items (Position Switch, Pneumatic Controller, Solenoid Operated Valve, and Air Position Actuator) clarified the 3g limit, which may have been misunderstood.
- Two items (Manual Gate/Globe valves and Check Valves) corrected an ASME Code reference and added a requirement to not reduce the pressure rating.
- One item (Compressor) added a requirement for pedestal material in some applications.

If you have used any of the G-STERI evaluations listed above, you might want to review the updated G-STERI document, and determine if it has an impact on the evaluations you previously performed.

IAEA EBP on Seismic Safety of NPPs

The IAEA Extra Budgetary Project (EBP) on "Seismic Safety of Existing NPPs" has completed its first year of operation. John Richards attended the annual Steering Committee meeting in October and received updates on the first year's activities and the second year's plans (kind of like the annual SQUG/SEQUAL meeting).

The Reader's Digest version of the update is that significant progress was made on most topics in the first year and positive plans were developed for the next two years.

Of particular interest to U.S. utilities might be an enhanced guideline on Pre-Earthquake Planning and Post-Earthquake Actions that mimics the current EPRI guideline (NP-6695,

Dec 1989) but provides substantial enhancements for responding to an earthquake above the SSE. This is currently out in draft form and provides a number of "Action Levels" which depend on the amplitude of the earthquake and the damage level of the plant.

The IAEA also announced a new International Seismic Safety Centre as a "global focal point on seismic safety for nuclear installations worldwide." The scope and activities of the Seismic Safety Centre are still in the formative stages. We'll keep up with those developments though the EBP.

IEEE 344 and DG-1175

The NRC issued DG-1175 in May 2008 with proposed revisions to RG 1.100. This update will provide the NRC's endorsement, with exceptions and clarifications, of IEEE 344-2004 and ASME QME-1-2007.

A number of organizations provided comments and the NRC is in the process of scheduling a public meeting on the afternoon of December 9th to discuss and reach resolution on several items.

The Draft Guide took a number of exceptions to the earthquake experience-based methods and numerous comments were submitted in those areas.

Recent discussions in an IEEE 344 Working Group meeting indicate that the NRC may be considering different criteria for existing operating plants as opposed to the new plants. While we don't see a need for this distinction, this may be a workable solution depending on where they draw the boundaries. We'll have to see how the December meeting turns out.

The NRC is also having some difficulty with the test motion coherence and correlation coefficient requirements. This criterion was not changed in 344-2004 but the NRC is leaning towards tightening those requirements, much to the chagrin of a number of test labs who suggest the tighter values are not warranted and may be very difficult to achieve.

If you're interested contributing to the outcome, or just keeping up with the decisions, plan to attend the December 9 meeting. The NRC is trying to schedule a large meeting room!

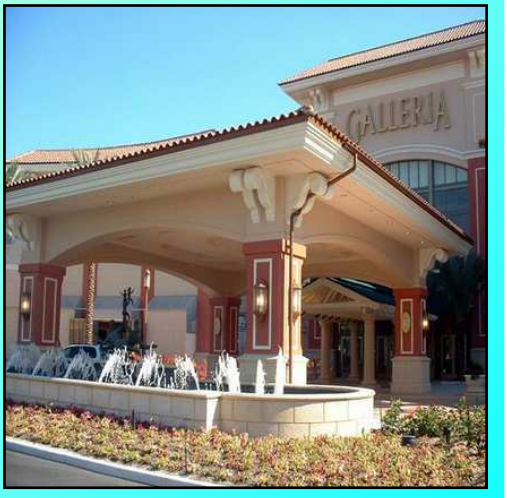
2008 SQUG/SEQUAL Winter Meeting

The 2008 SQUG/SEQUAL Winter meeting is just around the corner. We hope you plan to join us on December 3, 4, and 5 at the Gallery One Doubletree Guest Suites Hotel in Fort Lauderdale, Fla.

You should have received an e-mail invitation from EPRI with links to confirm your attendance as well as instructions for making your hotel reservations. The meeting will start at 1:00 pm on Wednesday the 3rd and end at noon on Friday the 5th. If you need any information about the meeting, please contact Bob Kassawara.

At the meeting you'll receive updates on our activities, have a chance to network with your peers, and guide the organization to best meet your needs.

If you will be attending the meeting, please come prepared to discuss seismic issues at your plant(s). For several years now we have invited attendees to mention current seismic issues at their plants. It has been a terrific way to stimulate discussions and identify potential SQUG support activities.



MCEER Partnership

We haven't talked about it much lately but the lawyers have been working on an agreement between EPRI/SQUG and MCEER. It looks like it might actually be moving towards completion! The last sticking point was the export control language and the MCEER and SUNY lawyers have agreed with the latest criteria.

So, now we need to sign the agreements and get on with exchanging information.

As an aside, there continues to be significant outside interest in the SQUG data from researchers, vendors, and equipment manufactures. We have yet to resolve the challenge of developing reasonable and mutually beneficial rules for access to the information, but it is a lively topic in Steering Group meetings.

New Plant Update

With several new plant Combined Construction and Operating License

(COL) Applications under NRC review, we seem to be moving towards a fairly new phase of seismic issues focused on NRC Requests for Additional Information (RAIs). RAIs are being sent to numerous applicants asking for information related to seismic hazard calculations, foundation conditions, seismic analyses, and equipment qualification processes and schedules. Each of these RAIs come with 30 day response schedules, which means you pretty much have to come up with the response in about week in order to get through the contractor and utility reviews in time to meet the scheduled response times. Needless to say, this makes for interesting times, not to mention very little opportunity to discuss responses with industry peers in any attempt to achieve consistency. Fortunately the NRC is frequently, although not always, issuing draft RAIs and asking the utilities if they need conference calls to understand the questions. This offers a bit of a head start in developing answers but schedules are still very, very tight.

In Closing

As always, we hope this Newsletter helps keep you up to date on our SQUG/SEQUAL activities and other significant seismic issues. If you have any comments, thoughts, or contributions for the Newsletters please let us know.

We look forward to seeing you at the Winter meeting in Ft. Lauderdale and we hope everyone has an enjoyable and safe holiday season!

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