

DRAFT
Conference Call Between
DWR-DRMS team members and Bob Gilbert, Ph.D. *University of Texas, Austin, TX*
September 24, 2007, 10:00 to 11:00 am (pacific time)

Participants:

Les Harder (DWR)
Bob Gilbert (Univ. Of Texas, Austin)
Mike Healy (CALFED)
Said Salah-Mars (URS)
Marty McCann (JBA)
Dave Mraz (DWR)
Ralph Svetich (DWR)
Sean Bagabhan (DWR)

The question that Bob Gilbert had, was related to the results shown in Figure 13-1 regarding the frequency of island failures under future seismic events. His concern, as an example, was that the analysis estimates show one or more island failures have a 0.10 annual frequency of exceedance, or one island failing every ten years, appeared to him to be high in the context of the Delta history.

Les asked Bob which of two potential areas is of concern: 1) the probabilistic seismic hazard analysis (PSHA), or 2) the seismic fragility of the levee segments. Les also referred to “tomb-stone” chart showing the cyclic nature of earthquakes in the Bay Area. The chart shows clustering of events in some periods and dormancy during other periods. Les also indicated there were no recent and significant earthquakes in the Delta region to calibrate the model against.

In response Bob indicated that both areas should be looked at. He indicated that we should look at the source recurrence models and their uncertainties, particularly for the smaller more frequent earthquakes. As far as the fragility curves, Bob did not see anything that jumped out, but thought it would good to also look at those in terms of the predicted levee performance for low magnitude or distant historic earthquakes in the region.

Marty McCann indicated that in the absence of earthquake-induced failures in the Delta, there is no empirical data to calibrate the risk model against. He further indicated that to that end, there was no bench mark to use to say a 0.10 or a 0.02 estimate rate of occurrence was better.

Said indicated that the one (1) failure in 10 years in Figure 13-1 is based on the contribution from all earthquakes, small and large, in the region, and was also based on the observation that some seismic events will cause more than one island to fail. A de-aggregation of the sources and earthquake magnitude contribution will help get more insight into the results.

Said indicated that for the major Bay Area faults, the USGS seismic source model was used, and for other faults, aside from those in the Delta, a model was used that is consistent with the work used by others in the practicing community. The parameters for the local Delta sources (Midland faults etc.) was developed as a result of some additional work by the DRMS geologists (Lettis & Associates) who were also part of the CALFED 2000 seismic vulnerability study.

Said also indicated that the DRMS team ran the recent earthquakes (Livermore, 1980, 1992 and Morgan Hill, 1984) against the levee fragility model and the results showed no, to insignificant levee deformation. These are the only set of historic data we have.

Bob talked about the lack of correlation between the vulnerability classes (modeling vulnerability classes as independent) and that could also be a source of conservatism. Bob also asked about the CALFED 2000 seismic report, which he believes used a time independent model, whereas the current DRMS PHSA is based on a time dependent model. Said mentioned that he thought that Ivan Wong had also run a time independent model. Said was to verify this.

At the end of the call, it was agreed the Phase 1 documentation would be improved by providing more detail (a deaggregation) of the seismic risk analysis. Below is a list of action items to address during the response to the IRP comments.

Action items agreed upon as a results of the phone call:

- 1) De-aggregate the seismic hazard (Source, Magnitude, stiff soil site PGA) to identify the contribution to the frequency of levee failures. The de-aggregation will help identify the contribution also from the small less frequent earthquakes.
- 2) Review and highlight the uncertainties around the mean hazard curves for the controlling sources.
- 3) Look at factors in the seismic hazard analysis to assess the importance of the time dependent model on the rate of earthquake occurrences.
- 4) Add a seismic stability analysis to simulate the 1906 San Francisco Earthquake to determine the effect on Delta levees if the same event were to occur today. Incorporate the existing analysis results from the Livermore (1980, 1992) and Morgan Hill earthquakes (1984) in the seismic model to verify if low level seismic events cause any levees to fail. Historically, we know these seismic events did not cause any significant damage to the Delta levees.
- 5) Provide a detailed description of the simultaneous probability of failure of multiple reaches for a given island.