

Third Party Review Meeting
and
International Review Group
Summary Findings
of the
2nd Independent Review
June 3rd – 5th, 2014

August, 2013 Key Point

According to the NRA's definition of an "active fault" (120,000 – 130,000 years ago), and our team's independent review of the recent investigations by JAPC, we conclude that there is persuasive and powerful scientific evidence that the geological features investigated do not indicate active faults.

June, 2014 Key Point

According to the NRA's definition of an "active fault" (120,000 – 130,000 years ago), and our team's independent review of the recent investigations by JAPC, we conclude that there is persuasive and powerful scientific evidence that the geological features investigated do not indicate active faults.

Headlines from August, 2013

- JAPC has responded to our previous recommendations and collected new geological information about the Tsuruga site;
- there is clear evidence that the K and G/D-1 faults at the Tsuruga NPP are not active: they have not moved in at least the last 120,000 to 130,000 years;
- there is a sound scientific basis for JAPC and NRA to enter a dialogue on continuing and improving (kaizen) the seismic safety evaluation and management of the NPP.

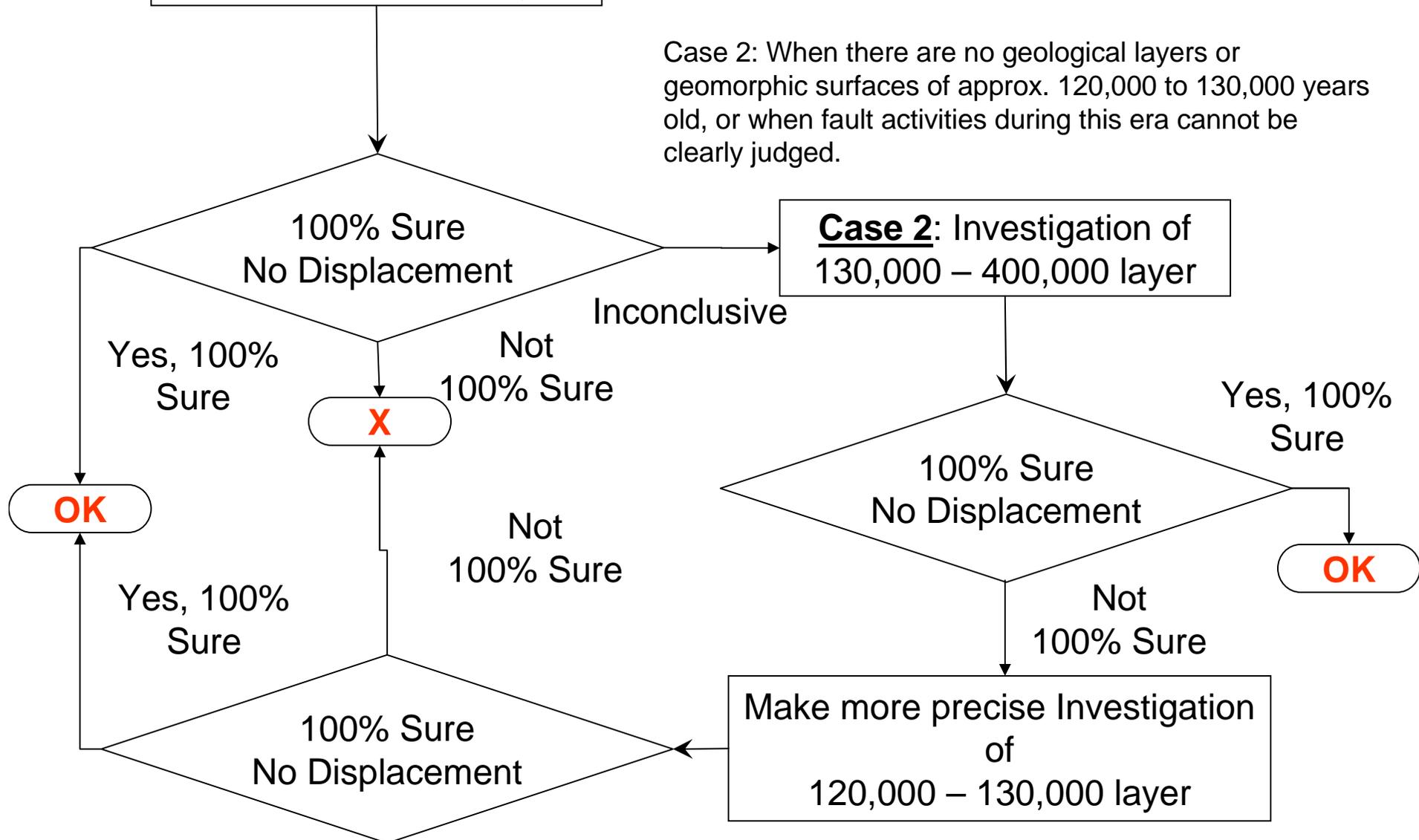
Headlines from June, 2014

- JAPC has continued investigations, made new excavations, and collected new geological information about the Tsuruga site and surrounding areas;
- there is even more clear evidence that the K and G/D-1 faults at the Tsuruga NPP are not active: they have not moved in at least the last 120,000 to 130,000 years;
- there is a sound scientific basis for JAPC and NRA to enter a dialogue on continuing and improving (kaizen) the seismic safety evaluation and management of the NPP.

Case 1: Investigation of 120,000 – 130,000 layer

Case 1: When no displacement or deformation is observed, there is no possibility the fault is capable. When there are geological layers or geomorphic surfaces of approx. 120,000 to 130,000 years old as clearly shown by evidence.

Case 2: When there are no geological layers or geomorphic surfaces of approx. 120,000 to 130,000 years old, or when fault activities during this era cannot be clearly judged.



Anzen Shinwa

Science Shinwa

- After 3.11, we all understood the safety myth: nothing is 100% safe.
- Part of the safety myth is that science always has a 100% sure explanation.
- Science does not always have a 100% sure explanation.
- So what makes a good scientific explanation?

Scientific Explanation

Although it sometimes is impossible in principle to prove with 100% surety the truth of a scientific explanation, it is possible to compare competing explanations for the same phenomena.

1. Relevance. It must be possible to use the explanation as one of the premises of a valid deductive argument whose conclusion is the event to be explained.
2. Multiple evidence threads. Strong support for an explanation exists if several different lines of evidence and reasoning lead to the same place.
3. Testability. There must be some way of acquiring evidence that would tend to confirm or disconfirm the explanation
4. Compatibility. The explanation should fit well with what we already believe about the natural order of things.
5. Predictive power. A good explanation isn't just a way of explaining events of this sort, but will be applicable to many other kinds of circumstances as well.
6. Simplicity. The best explanations are rarely intricate in structure. This is sometimes referred to as Occam's Razor.
7. Covering Explanations. The ability to cover several different explanations with one explanation; scientific explanation is a matter of providing a unified account of a range of different phenomena.

The “Cannot be denied” Syndrome

- When the NRA makes objections to scientific explanations and interpretations, they seem to always respond, “But it cannot be denied that perhaps ...”
- It cannot be denied that perhaps the Hanshin Tigers will win the Japan series ...
- It cannot be denied that an earthquake and comet hitting the earth will occur at the same time ...
- It cannot be denied that perhaps I will have dinner tonight with AKB48.

The “Cannot be denied” Syndrome

- When the NRA makes objections to scientific explanations and interpretations, they seem to always be based on the claim that “good science” is not how we do good science.
- It cannot be denied that an earthquake and comet hitting the earth will occur at the same time ...
- It cannot be denied that perhaps I will have dinner tonight with AKB48.

Context: The geological record is written in stone.



epigramma (ἔ μμ)

Putting data and results in context

Good translations from one language to another language cannot be done word-by-word. Good translations take into account the context and the story which the words tell. Professor Okumura points out that the geological record is a story which must be translated into scientific words to tell the story.

The NRA has focused on small geological structures within a limited area. To understand the potential earthquake vulnerabilities to a NPP, it is necessary to put these focused investigations into larger contexts: [geographical, tectonic, climactic, and the safety impact to the nuclear power plants.](#)

Each piece of information is important, but this is only effective when they are arranged within a firm framework.

The NRA's work reported to date concentrates on very localized issues, not stressing the overall regional geology, which in fact controls local issues. [JAPC has made a strong case by emphasizing the overall effect of the regional geology.](#)

We urge the NRA to do the same.

Diablo Canyon Power Plant's LTSP as a Model for Listening

In 1985, PG&E was required by the US NRC to conduct a Long Term Seismic Program (LTSP) study reevaluating the seismic design bases used for DCPD as a basis for continuing operations.

The LTSP continues to this day.

There are two key points about this process:

1. DCPD continued operations during the initial stages of the LTSP.
2. DCPD was required to:
 - a. Identify, examine, and evaluate all relevant geological data, seismic data, information, and interpretations developed since the 1979 ASLB hearings;
 - b. Reevaluate the magnitude of the earthquake used for the DCPD seismic design basis;
 - c. Reevaluate the ground motion analyses;
 - d. Assess the significance of the conclusions from the above seismic reevaluation studies, utilizing both probabilistic and deterministic risk analyses, as necessary, to assure the adequacy of the seismic margins.

Diablo Canyon Power Plant's LTSP as a Model for Going Forward

The LTSP was deemed effective from the viewpoint of the US NRC. Here is an excerpt from the US NRC evaluation in June, 1991:

“The NRC staff finds that the geological, seismological, and geophysical investigation and analysis conducted by PG&E for the LTSP are the most extensive, thorough, and complete ever conducted for a nuclear facility in the United States. PG&E has advanced the state of knowledge in these disciplines significantly.”

We believe that the NRA should be open to a scientific conversation with the utilities, should implement an LTSP, and should allow the plants under question to continue operations during the evaluations.

An effective process of accurate and open scientific communication between the utilities and the NRA is essential before any reasonable progress can be accomplished.

After an agreed upon scientific communication plan is finalized, then a sound technical way forward can be developed for an LTSP

“Independence is not isolation”

-- Dr. Richard Meserve
Advisor to the NRA

We believe that discussions between the NRA, the utilities, and specialists in geology and safety issues are necessary to reach reasonable conclusions.

From the Diablo Canyon seismic discussions between PG&E, the NRC, the public, and third party specialists, we can learn that open scientific discussions lead to understanding and appropriate policy.