

## OTC Nuclear Review Committee 7-26-12 Meeting Summary

<b>Committee Chair</b>	
Dominic Gregorio	SWRCB
<b>Committee Members</b>	
David Asti	Southern California Edison
David Barker	San Diego Regional Water Board
Mark Krausse	Pacific Gas and Electric
Melissa Jones	California Energy Commission
Peter Von Langen (listening in only)	Central Coast Regional Water Board
Rochelle Becker	Alliance for Nuclear Responsibility
Tom Luster	California Coastal Commission
<b>Staff in Attendance</b>	
Joanna Jensen	SWRCB
Mariela Paz Carpio-Obeso	SWRCB
Laurel Warddrip	SWRCB
Marleigh Wood	SWRCB
Shuka Rastegarpour	SWRCB
Michael Gjerde	SWRCB
<b>Public in Attendance</b>	
Partho Raysircar	Bechtel
Doug Dismukes	Bechtel
Bryan Cunningham	Pacific Gas and Electric
Peter Wilkens	SCE
Robert Heckler	SCE
Joe Dillon	NMFS
Eric Wilkins	DFG
John Geesman	A4NR
Angela Kelley	NRDC

1. Welcome Introductions and Updates
2. Overview of agenda
3. Review and approve meeting notes  
Meeting Minutes from June 20, 2012 Approved
4. Discuss preliminary reports on special studies

### **Velocity speed drives – not able to meet the Policy as a stand-alone technology**

The technology for pumps of the size at DCNPP and SONGS make it hard to reduce the flows lower than 20-30% and maintain having a properly operating pump. Reductions of 80% at SONGS and 75% Diablo cannot support the thermal cycle needed. Variable speed pump changes speed, so water to condenser is lessened, this would meet velocity reductions, but heat load would have to be brought down since not enough cooling, lowering the thermal load is an issue. No other way to remove the heat in the heat sink, discharge water temperature goes up.

David Asti - (if condensers were oversized, they may be able to do this since surface area has increased, but this is not the case). Sizing criteria is a very detailed design, and carefully planned out. The reason they are where they are at SONGS, was to increase/maximize efficiency.

Q: Aside from this being an issue on a plant efficiency, would this also be a potentially safety issue?

A: Bechtel did not look at safety – this is a Phase 2 element. Not operation security, but thermal effects rule. Discharges at 22 deg cannot be permitted to discharge. To meet power out put, can only remove so many BTUs. So power and permitting are an issue.

Melissa Jones: Could Bechtel look at feasibility of reaching the 30% Impingement and Entrainment (I & E) reduction and evaluate options at that juncture? Bechtel: potentially but have not done that yet. Bechtel could come up with some kind of correlation of power reduction to flow reduction and velocity in the system. The equipment is at optimal efficiency, if changed, there may be a significant impact to the equipment, the Committee would like to understand exactly what these significant impacts may be to determine/discuss feasibility. VSP/VSD are not appropriate for the SONGS and DCPD design.

Pumps at this size are not even commercially available.

Nuclear plants may not be able to get to the BTA levels in the policy, however maybe incremental improvements. Considering more than one technology applied to get closer to meeting the Policy, for example if can only reduce to 30% over 80%, this could be documented in these meetings. Combining technologies may show some improvements, this work can be done, but not in the framework of the scope of work.

Bechtel: thought that each technology was to be evaluated as meeting the policy requirements or not, however the scope of work does discuss combinations of these technologies for viability. It was not clear that a range of combining the technologies and the result were to be evaluated with each other, this would exponentially grow, huge project to report on combined technologies in meeting the policy.

Upshot: these reports are providing information about the technologies, and decisions on how the technologies work and how they could be used to comply with the policy would be what we get out of the reports, the committee may request certain actions by Bechtel to further this decision making, Bechtel states that they think that the reports provide enough information to seek viable I & E reduction options.

**Parking lot:** can we in the future get a feel for how much a reduction in power there would be for certain flow rate reduction percentages. This one was eliminated, so would like to make sure that this is not combined as a potential option in combination

Seasonal operations – cooling water can be controlled in times of high biological activity (item 7) has been looked at before (seasonal operations). Temperatures do not vary much over 10 degrees year around. Larvae densities highest late spring to summer, which is high use of the power plants.

Doesn't the scope say suites of technology should be considered. Section 3.5 (pg 6) of the scope of work does discuss combined technologies, Bechtel may need more guidance on implementing this part of the scope of work.

**Operation source controls** – not viable

Reduce flow rates max extent, If a higher amount allowed across the condenser it can reduce infiltration impacts. Having a reduction that would be enough is infeasible and you still have to meet the thermal needs for the condenser,  $\Delta T$  goes up with reduced flows and on the discharge, helps a little with entrainment, but can't reduce enough.

Determined Phase 2 – Category 1 get more detailed evaluation, potentially feasible

Category 2 in Phase 2 can partially meet requirements for a reduction of I & E

This technology should not go to Phase 2 because it is not able to fully or partially meet the policy, some fatal flaw. Hopefully at the end of the day we have a better idea on how these technologies can or cannot be used to reach I & E reductions.

Bechtel: proposes a 20% derating as infeasible, if Committee can agree to that then Bechtel will have a threshold to shoot for. Bechtel needs a benchmark, otherwise it is a moving target. At the end of the day we need to understand what still needs to be measured.

Consistency and global edits on Reports from David Asti and Tom Luster – if not captured in these notes, were in their comments to Bechtel

Examples:

PVL comments – email comments were distributed, 5 vs 9 members 7 for regional boards due to combining resources is correct. No morris at central coast regional board, bob morris at region 9 B will confirm who was to be cited.

Merging fed and state terms – it is not 316b Phase 2 rule – rec a standard definition. Standard terms in policy need to be used in the reports.

25 degrees  $\Delta T$  for SONGS approved, exception for heat treats. 22 degrees is normal. DCPP at 19-20 degrees normally.

Board members and Regional Boards will be presented the outcomes of the RCNFPP, and they will make a decision, information on viable options, even if less than Policy, is crucial to present to the Board members/EOs the options and trade-offs. This will be discussed further in the meeting.

Operational Strategy Report – DCPP 2 items and SONGS 3, why? DCPP does not have a fish return system the addition of such a device would be discussed in another report, as stated.

**Public Comments on Operational Source and VSD**

Angela NRDC – helpful to have the information on technologies to what they could meet, if not meet the Policy requirements in full. To have knowledge to what can we do if we cannot meet Policy in full.

Executive summaries – boilerplate language, unclear if this CEQA contention/lengthy statement was stated as specific to these permits or in general. If it is specific, it should be stated why.

Bechtel was not intended to be inflammatory, intended to be realistic. Term contentious needs to be qualified. Bechtel will re-read with this in mind (take under advisement) and revise this statement or clarify in the final report.

### **Source Water Substrate Collection Systems - realistically scale-able**

A system could be sized and meet requirements for these units. We are talking 100s of acres. A lot of damage to ocean bottom upon installation due to lattice structures and top materials. Safety concerns and no assurance on zero impact. Bechtel feels very strongly on not recommending this technology for Phase 2.

DCPP – would not work due to rocky habitat. SONGS – sandy bottom, huge area but installable. The Committee asked for 2 things:

- (1) sand well collection (vertical) vs. (2) substrate filtration (horizontal)

Drill sand at a certain depth, were these looked at separate from the substrate filtration systems? Filter buried in the sand, basically. Putting a vertical well at the beach, has some dewatering issue. Bechtel discussed with technical team and said that there is no difference, this needs to be addressed in the report as to why there are issues/why there is “no difference”.

Dominic: there may be issues that differ in environmental impact (large area horizontal vs vertical well) even if different flow dynamics, there are also different environmental impacts that need to be at least stated in the report. These were evaluated in relation to flow and power plant needs. Bechtel will expand description on why these don't work, especially for the vertical wells. Add in a discussion about  $\Delta P$ , this was done for substrate filtration but needs to be discussed for the vertical wells.

Presence of other projects in the area of SONGS, may be used as a possible desalination source/makeup water. This needs to be punted to the CCW discussion, but this needs to be a potential consideration for combined technologies.

### **A.I. Tom send Doug and Joanna the information on Japan example**

-break for lunch-

### **Deep Water Offshore Intake**

Doug: studies done concern the same amount of fish, just different fish species. A different array of species will be affected.

Limitations: suction forces on pumps and species composition and effect on entrainment measured by flow (no change in flow)

Depth was 70ft-90ft for DCPP and SONGS, not 40ft

To make a real difference of Entrainment, you may have to go out over 200-250ft. Description (2 parag discussion) on truly deepwater intakes vs marginally deep intakes. If the intakes are too far out they may not work.

Security screens on deep water intakes do not cause problems

## **Intake Relocation**

SONGS – relocating to shoreline intake would provide no improvement to I & E and may increase these rates. Damage to biological environment on shoreline would be extensive. By coming in closer to shore, more species may be adversely effected.

Diablo – tunnel out to a velocity cap sized ½ fps. No Entrainment saved, but Impingement could be helped. A fish return system may deal with Impingement to a certain degree but it has its own negative impacts.

Screen changes for moving the SONGS intake, were screens considered? Yes, but travel normal screen size.

- End of technologies that are not viable -

## **Inshore Fine Mesh Screens**

SONGS Viable, but trying to find space for screens, would need an auxiliary screen house built. What happens with water screened out and organisms? There would be a high and low pressure screen washing system and send them back out.

DCPP viable to install dual flow screens in the existing pump house, have to be designed and built for existing pump area. It would double the screen area, however there would have to be a fish return system and high/low wash system. DCPP has a better chance for success. This would catch most of the entrainment species.

Dual flow screens are widely used in the industry believed in the marine environment.

## **A.I. Bechtel will ask technical team**

Desalinization research (applies to OTC)– size of the fish larvae head capsule drives mesh size? Yes John Steinbeck works for Tenera as well as research on most viable organism size. This may be a Phase 2 consideration as far as understanding screen selection and optimization. Several small scale research projects are in progress which may provide some more information in the near future that could assist with decision making for this technology.

## **Wedge Wire Screens**

For both DCPP and SONGS are a viable technology. The application of these in the marine environment has not been done according to Bechtel. This technology is scale-able. SONGS would be a little easier since the intake duct to velocity cap already exists and the channel for water (there so no significant suction condition increase). DCPP – issue is that would have to tunnel out, which has been done (lake Michigan), not easy but doable. Access tunnels would be out to screen sets. For DCPPP could be done online. Impacts – disposal of the cuttings, fill would have to be disposed of and closing the intake cove.

Smaller screen size can be a potential issue with maintenance (biofouling, suction and leeching issue). Discussing 6-8mm filtering capacity, optimum 1-2mm. Bechtels proposed wedge wire slot size of 6-8mm too big and will not reduce E, but smaller may be an issue for maintenance.

Research needs to be done on real biofouling issues and sizes of wedgewire can use smaller than 6-8mm. Wedge wire design needs to preserve .5 fps speed, so that I is not and issue, due to suction.

## **A.I. Tom Luster Send existing studies on wedge wire screens and biofouling to Bechtel**

### **Closed Cycle Cooling**

Finding from Bechtel: have to use recycle or fresh water. Recycle water and fresh water around, but not at site boundary. This assumption was to assess the viability of the use of the technology, assuming availability of water, the availability of water in real life could and is an issue. DCPD has mentioned that they cannot use fresh water.

## **A.I. Melissa Jones send out research on using salt water for closed cycle cooling and research on fish deterrents**

## **A.I. Joanna send information on calc for pm10, which has been revised based on new studies.**

A mechanically drafted plume abated tower would be the choice tower. DCPD mountains would have to be removed. SONGS mesa taken over and move buildings, large pipes under unit 5 installed. Technically if willing to take on output hits, doable from technology POV. Air cooling (natural draft) towers have a larger footprint. None in California to date.

Discussion – how to get water to the power plants and distance, both need to be evaluated. These considerations are more of a Phase 2 concern, since Phase 1 is more on viability of the standalone technologies. Look at POTWs permitted flows and other options with the water in a 20 mile radius from the facilities.

SWRCB water recycling policy, encourages treatment plants in state to reuse vs dump. impetus may be in this Policy

Consider desalinization as an option. Hybrid 56 mgd Wet tower: 63 mgd dry tower: doable via desalinization. Freshwater towers need to be ruled in or out in Phase 2. Solving OTC with Desalinization is not a solution, unless zero Entrainment achieved in desalinization.

Bechtel discussed land rights with Camp Pendleton and the answer was not a definite no for access rights.

Feasibility for cost and nuclear safety comes in at Phase 2.

DCPD & SONGS need 2.5bgd take in 100mgd 95% control level. If looked at by volume of water coming in, desalinization (with Entrainment controls) is a huge reduction in intake water, but mountain may still be torn down and could be cost prohibitive.

## **5. Public comments**

John Geesman – Committee needs to avoid precluding options that an authority (Board members) may want to overview. Realistic alternatives need to be presented to the Board. It is the Committees role to pass forward these alternatives to the Board, especially in the case of excluding freshwater or tearing down mountains. Options need to be put up in front of decision makers. Bechtel has recommended with technologies with fatal flaws, and some assumptions have been criticized by the committee.

Bechtel: not recommending anything in regards to solutions, just if flawed or not and just the facts.

Joe Dillon – Intake relocation for SONGS question: has a RWQCB employee done a survey on the studies to qualify? Before this is thrown out, there should be an official qualifier that it is not a viable option on the areas in question.

**A.I. David Barker will survey the EPRI studies on I and E data for any concerns and discuss with NBC (worked with data) Bob Moore 714 850 4830 has to do with intake relocation**

## 6. Wrap Up

Comments: compiled version of Committee comments, does the committee see compiled version before sent to Bechtel?

Bechtel hopes that you are not intending to send 500 individual comments, Bechtels impression is that comments need to also be in agreement internally. Bechtel also needs to know who made what comment and are satisfied with the comment answer.

Bechtel expects to have the consolidated comments from Laurel by August 4<sup>th</sup> as the deadline, Bechtel team supposed to be transitioning to Phase 2, when do they need comments by? After August 15<sup>th</sup> Committee members and public get anonymous version, Bechtel gets version with names.

Written comments can include ideas about what goes to Phase 2, but a vote has to be made for Bechtel will have to look at 50/59 process, but not following it or applying. (costs, factors, resolutions)

Bechtel will be working on some of this project before the August 15<sup>th</sup> meeting

Still an interest to evaluate any incremental improvements per % of power loss vs velocity. Committee members need to think of viable combinations of technologies interested in seeing go to Phase 2

Phase 1 ends August 23<sup>rd</sup> there was a concern that Committee may have enough comments, provoking changes in technologies, even against Phase 1 recommendations.

Committee agreed to change the next meeting time from 10 to 4 for August 15<sup>th</sup>

## 7. Next committee meeting

**August 15, 2012  
10 am to 4 pm  
Cal/EPA Building  
Room 2210 Sacramento**

## 8. Adjourn