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June 13, 2003

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California Energy Commission
1516 Ninth Street
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Subject: Morro Bay Modernization Project, Docket No. 00-AFC-12, Public Comment on Preliminary Decision of Presiding Commissioner

Dear Public Advisor Mendonca:

Thank you for this opportunity to comment on the Presiding Commissioner's preliminary decision in the Morro Bay Modernization Project licensing proceeding. Our comments relate to the presiding commissioner's endorsement of continued use of once-through seawater cooling at the site. **We urge the Presiding Commissioner in the strongest manner possible to reconsider his preliminary decision to allow the use of once-though seawater cooling at the Morro Bay Modernization Project, and to adopt the recommendations of California Energy Commission (CEC) staff, the California Coastal Commission, and the U.S. Fish & Wildlife Service incorporate dry cooling at the site.**

Power plants are complex facilities. Power plant developers are very familiar with the design of these facilities, the subsystem options available to them, the cost of these subsystems, and the optimum design of these subsystems. The CEC is also quite familiar with power plant design. The CEC is the representative of the citizens of California at the table with the project developer, tasked with assuring that energy projects built to meet California's energy needs while also protecting other vital California resources.

Public officials and citizens in communities such as Morro Bay generally have little or no knowledge of power plant design. These officials and citizens rely to some degree on the applicant to describe the project and the reasons for choosing certain design elements, for example the choice of once-through cooling instead of dry cooling. However, all actors are generally aware that the developer has a financial incentive to minimize project costs and will likely propose "least cost" solutions to environmental protection issues that arise. Unlike the project proponent, the CEC is the agency of the state tasked with

licensing power plants and assuring that the plants are licensed in a manner that minimizes, to the extent practical, the associated environmental impacts of these power plants. The CEC's function is to critically analyze the developer's proposal and ensure that it incorporates feasible, state-of-the-art remedies to potentially significant environmental impacts. The CEC must consistently fulfill this function if it is to be perceived as credible by the citizens of the state. The CEC staff recommendation endorsing dry cooling for the proposed Morro Bay Modernization Project is credible based on the evidence. The preliminary decision of the presiding commissioner(s) is not credible for the same reason.

The evidentiary record in this case indicates that the increase in mortality to aquatic species in the Morro Bay/Estuary (Morro Bay) will be in the range of 17 to 33 percent.[1] The evidentiary record also indicates a flow equivalent to *the entire volume* of Morro Bay passes through the existing plant's once-though cooling system *every seven hours* when the plant is operating at its 5-year (1997-2001) average cooling water throughput.[2] When the original plant was built in the 1950s, these impacts were not measured, documented, and understood in the ways the impacts are known now. We now understand what the impacts are and what they will be. It is unacceptable for the CEC to authorize the continued destruction of this unique marine resource when a technically and economically feasible dry cooling option is readily available, an option in common use throughout the United States, that would eliminate damage to Morro Bay caused by once-through seawater cooling.

The status of dry cooling in California, and the issues raised by the presiding commissioner for not requiring dry cooling, are addressed in the following paragraphs.

California Power Plants and Dry Cooling

California has two utility-scale dry-cooled power plants in operation, the 540 MW Sutter Power Project and the 240 MW Crockett Cogeneration Plant. Sutter is essentially identical to the combined-cycle configuration proposed by Duke Energy for the Morro Bay site. Sutter consists of one "power block" of two gas turbines and one steam turbine. This configuration is known as a "2-on-1" power block configuration in the power industry. The Morro Bay Modernization Project will consist of two identical "2-on-1" power blocks. The CEC has also permitted a third dry-cooling power project, the Otay Mesa Project, that will use a "2-on-1" power block configuration. In each of these cases the applicant voluntarily chose to use dry cooling. It does not appear the CEC has ever explicitly required the use of dry cooling over the objections of a project proponent.

[1] CEC , Final Staff Assessment Part 3 – Docket No. 00-AFC-12, February 2002, pg. 2-17 (Table 6).
[2] Ibid, pg. 2-5. Average volume of Morro Bay is 9,200 acre-ft (2,300 acre-ft surface area with average depth of 4 feet), or 3 billion gallons. Five-year (1997-2001) average once-through cooling water throughput of the existing Morro Bay plant is 437 million gallons per day (pg. 2-25).

Power Plant Efficiency and Dry Cooling

It is instructive to quote from the CEC's Final Decision on Sutter to put the efficiency impact of dry cooling in perspective:[3]

"Both Staff and Applicant stipulated that, to the extent that the project is likely to displace generation from older, less efficient utility power plants currently serving the system, the net result is likely to be a beneficial, rather than adverse, impact on energy resources.

Testimony of record also compared the efficiency of the originally proposed wet cooling towers versus the required dry cooling in the form of an air cooled condenser. The wet cooling system described in the Application for Certification would have yielded the highest efficiency, while use of the air cooled condenser will reduce plant efficiency by approximately 1.5 percent during most of the year. When temperatures are at or above 100 ^{o}F the efficiency of the dry cooling technology is expected to be 5 percent less than that of wet cooling. Applicant confirmed this reduction in efficiency. Staff viewed this efficiency loss as a minor reduction which is reasonable in light of the accompanying reduction in environmental impacts as a result of switching to dry cooling. These reduced impacts occur in the area of water supply, waste disposal, and visual resources."

Notwithstanding this reduction in efficiency, Staff determined that in actual operation the project may displace the generation of other older, less efficient power plants in the utility system. The witness concluded that the end result is likely to be a beneficial impact on energy resource use. He added that the proposed project is likely to have an annual average thermal efficiency of approximately 52 percent. This represents the most fuel-efficient power plant configuration feasible for the intended service. Thus, Staff concluded that the project will present no significant adverse impacts upon energy resources."

Height and Noise Issues Associated with Dry Cooling

The principal difference between the Sutter site and Morro Bay site is the rural location of the Sutter project. The dry-cooled system at Sutter is not optimized for either low height or low noise because of its rural location. The air-cooled condenser (ACC) is 100 feet high and standard cooling fans are used. However, the CEC licensed the dry-cooled Otay Mesa Project in 2001. Otay Mesa is a 2-on-1 power block, combined-cycle power plant, the same configuration used at Sutter and the same configuration proposed for Morro Bay. The Otay Mesa site is located on the edge of the San Diego urban area and is

[3] Energy Commission Decision, Sutter Power Plant Project – Docket No. 97-AFC-2, April 1999, pp. 268-269.

designed for minimum height and noise. The Otay Mesa ACC is just over 75 feet high and will employ ultra-low noise fans. An elevation view of the Otay Mesa Project that includes the ACC, taken from the CEC Otay Mesa Project webpage, is attached. The CEC determined during Otay Mesa licensing proceedings that the there would be no significant noise impacts at the nearest receptor as a result of the use of ultra-low noise fans at the Otay Mesa site.

The CEC has approved two types of ACC designs for 2-on-1 combined-cycle power blocks, one for rural sites (Sutter) and one for urban sites (Otay Mesa), each voluntarily proposed by the project proponents. The attached Otay Mesa ACC elevation view was included in the March 2000 supplement to the "Application For Certification" (AFC) prepared by the applicant. The Otay Mesa Project AFC was actually approved by the CEC in April 2001. The CEC did not issue a preliminary staff assessment of the Morro Bay Project until May 2001. At the time the CEC began reviewing the Morro Bay Project AFC, CEC staff had at hand an ACC design approved by the CEC for an urban/suburban setting for the same equipment proposed at Morro Bay. However, this urban/suburban ACC design was not used as a "scale-of-measure" to assess the applicant's analysis of the feasibility of dry cooling at the site, nor was it used by the CEC when CEC staff conducted its evaluation of ACC for the Morro Bay site.

The overall result of neither Duke Energy nor the CEC using the CEC-approved ACC design for an urban/suburban setting as a "scale-of-measure" or template, was that a great deal of time and energy was spent on all sides dealing with issues of visual bulk and noise coming from the ACC alternative evaluated for Morro Bay. CEC staff ultimately endorsed the use of dry cooling at the Morro Bay site to protect marine fauna and flora in Morro Bay, although staff noted that use of ACC would potentially result in significant and negative visual and noise impacts.

Neither ACC height or noise would have been significant areas of dispute in the Morro Bay licensing process had CEC staff used the Otay Mesa ACC design as a scale-of-measure in their dry cooling evaluation. Alternatively, the CEC could simply have insisted that the applicant explicitly identify why an ACC approved by the CEC (Otay Mesa) and designed for the same type of equipment (2-on-1 power block) in the same type of setting (urban/suburban) is infeasible at Morro Bay. This does not put the CEC in the position of designing the ACC for the applicant. It does put the CEC in the position of utilizing its experience to prevent applicants who clearly do not want to consider ACC from proposing ACC designs that raise needless controversies over height and noise. These needless and preventable controversies also, inappropriately, provide the CEC commissioners with a plausible justification for rejecting use of dry cooling at the site if they choose to do so.

Space Required for Dry Cooling

Duke Energy's has asserted that there is insufficient space for an ACC at the Morro Bay site. This contention hinges on the CEC accepting that, of the two plots identified by Duke as available for an ACC, neither plot has sufficient space to accommodate all of the ACC cells required. The number of ACC cells required ranges from 40 to 60 in the CEC staff analysis to 80 in the Duke Energy's February 15, 2002 response to the CEC staff analysis. The ACC cells are shown in two side-by-side groups of 40 cells each in Duke's February 15, 2002 analysis (Figure 7). The purpose of Figure 7 is to demonstrate that ACC is infeasible at the site due to lack of adequate space.

Simply moving one of the 40-cell ACC sections proposed by Duke to the second plot identified by Duke as suitable for dry cooling would have resolved this issue and provided ample space for either the smaller CEC staff ACC design of 40 to 60 cells or the much larger Duke design of 80 cells. This was pointed-out by the intervenors at the June 5, 2002 evidentiary hearings held by the CEC in Morro Bay, both verbally and using a scale model. This testimony was televised and is in the evidentiary record of the Morro Bay Modernization Project licensing proceedings.

Cost of Dry Cooling

The CEC staff analysis an ACC for the Morro Bay assumes that 40 to 60 ACC cells will be required. Duke Energy's very conservative February 15, 2002 analysis assumes that 80 ACC cells will be required. Duke also states in its January 7, 2002 "*Updated Analysis of Alternative Cooling Systems for the Morro Bay Modernization Project*" that upgrades to the existing once-through seawater cooling infrastructure will cost $25 million. Duke has also agreed to provide $12.5 million for habitat enhancement of the Morro Bay in place of using dry cooling. It is understood that Duke will pay a fee in the range of $250,000/yr to discharge cooling water to the sea. The net present value (assume 7% over 30 years) of this $250,000/yr fee is $3 million. Therefore, the known costs associated with Duke Energy's use of once-through cooling system sum to approximately $41 million.

The CEC staff installed capital cost estimate for 40 ACC cells is $48 million. The Duke Energy capital cost estimate for 80 ACC cells is $80 to $85 million.

The CEC staff of estimate of $48 million is very conservative. It is instructive to note that, in the current 560 MW Palomar Energy Project CEC licensing proceeding, there is essentially no difference between the applicant (Sempra Energy), CEC staff, or intervenor cost estimates for a 36-cell ACC. All three parties concur that the installed cost of a 36-cell ACC is in the range of $30 to $32 million. A linear scale-up from 36 to 40 ACC cells equates to an installed capital cost for a 40-cell ACC of $33 to $36 million. Based on these ACC installed cost values, that industry, CEC staff, and intervenors have

corroborated, the cost of the smaller 40-cell dry cooling system evaluated by CEC staff for the Morro Bay site is actually $6 to $8 million less than the known costs associated with the use of once-through seawater cooling.

A $41 million investment, the net present worth of the once-through seawater cooling option at Morrow Bay, represents the installed capital cost of a 50-cell ACC. A 50-cell ACC represents the mean size of the 40- to 60-cell ACC range analyzed by CEC staff for the Morro Bay site. The CEC staff assessment of ACC was based on Duke Energy constructing a replacement power plant with the same capacity as the existing power plant, slightly over 1,000 MW. The basis of the comparison used by CEC staff in the cooling analysis is entirely appropriate. It is important to note that Duke Energy provided CEC staff with the specifications for the 1,000 MW plant. The CEC staff simply conducted its alternative cooling options analysis based on the data provided by Duke Energy.

However, Duke Energy conducted their own alternative cooling analysis in parallel with the CEC staff's effort on a much larger power plant, 1,200 MW, with a cooling load more than 50 percent greater than the cooling load assumed in the CEC staff analysis. Of course this drove up the cost and size of the ACC, and resulting in the ACC begin too large to fit (completely) on either of the two sites proposed by Duke for the ACC.

Final Summary

Is it legitimate for the project applicant, who clearly is opposed to giving serious consideration to dry cooling, to alter the plant specifications it has given to CEC staff when the primary intent of the modified specification is to justify the applicant's claim that dry cooling is technically and economically infeasible at the site? Clearly this is not a legitimate action, yet the CEC has not challenged the applicant on this point. In one stroke, by CEC silence on this issue, the applicant was given: 1) tacit authorization to expand the capacity of the proposed project 200 MW beyond the capacity of the existing 1,000 MW plant, and 2) a plausible rationale for rejecting dry cooling on size and cost grounds due to the added cooling capacity required to produce the additional 200 MW.

The credibility of the CEC commissioners and the entire CEC licensing process is on the line. If applicants can simply present scenarios unchallenged by the CEC that effectively eliminate design elements that the project proponent considers inconvenient, the entire CEC licensing process is called into question. If the applicant's claims of infeasibility are given preference by the CEC commissioners over CEC staff recommendations or well-researched and documented evidence presented by intervenors, the CEC licensing process serves no function. In reality, it serves only the cynical function of giving the appearance of careful technical analysis and due consideration to serious public input when in fact none is occurring. The standard of CEC review at the present time appears

to be, "what the applicant wants the applicant ultimately gets." This standard is not a careful balance of the public interest and private interest, but a complete capitulation to the private interest. This standard is unacceptable to the citizens of California.

We, the undersigned, urge you in the strongest manner possible to reconsider the Presiding Commissioner's preliminary decision to allow the use of once-though seawater cooling at the Morro Bay Modernization Project, and to adopt the recommendations of CEC staff, the California Coastal Commission, and the U.S. Fish & Wildlife Service to incorporate dry cooling at the site.

Sincerely,

Border Power Plant Working Group, San Diego
Butte Environmental Council
California Coastkeeper Alliance
Center on Race, Poverty, and Environment
Center for Energy Efficiency and Renewable Technology
Coast Action Group
Coastal Alliance on Plant Expansion (CAPE)
Communities for a Better Environment
Environmental Defense Center
Environmental Health Coalition, San Diego
Heal the Bay, Southern California
Latino Issues Forum, San Francisco
Ocean Conservancy, Pacific Regional Office
San Diego Audubon Society
San Diego Baykeeper
Santa Monica Baykeeper
Sierra Club, Santa Lucia Chapter, Executive and Conservation Committees
Sierra Club, San Diego Chapter, Conservation Committee
Southern California Watershed Alliance
Surfrider Foundation, San Diego Chapter