DOCKET
09-IEP-1O
DATE Aug 12 2009
RECD. Aug 13 2009

August 12, 2009

Jeffrey D. Byron
Commissioner and Presiding Member
Integrated Energy Policy Report Committee
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Docket No. # 09-IEP-1O - RRI Energy comments on July 28, 2009 Workshop on Once-Through Cooling (2009 IEPR – OTC)

Dear Commissioner Byron:

RRI Energy, Inc. (RRI) operates the Mandalay and Ormond Beach Stations near Oxnard, California which rely on once-through cooling (OTC). We appreciate the opportunity to provide these comments on the "Workshop on Inter-Agency Analysis of Generation and Transmission Options for Eliminating Reliance upon Once-Through Cooling Power Plants" held on July 28. We also believe that the California Energy Commission ("Commission") sponsorship of these forums could provide an important opportunity to discuss both the cost and reliability impacts of regulating the use of OTC.

We offer these comments to assist your Committee in balancing the complex tradeoffs involved in assuring electric system reliability at reasonable cost while preserving environmental quality.[1] In our comments below, we first affirm RRI Energy's commitment to environmental stewardship and compliance, then offer some observations regarding the adequacy of the Commission's review of the impacts and options related to OTC regulation, and finally provide suggested enhancements to the proposal published by the Commission, the California Independent System Operator ("CAISO") and the California Public Utilities Commission ("CPUC"), (together the "Energy Agencies"), for energy infrastructure planning and procurement.

RRI Energy is Dedicated to Environmental Quality and Responsible Operations

RRI is committed to fully complying with all applicable laws and regulations, and to minimizing adverse environmental impact of our operations. However, as will be fully

[1] RRI Energy respectfully asks that the Commission accept these comments one day out of time, and include them in the record supporting the 2009 Integrated Energy Policy Report.

developed in RRI Energy's comments on the State Water Resource Control Board's (Water Board) Substitute Environmental Document (SED), we believe that environmental impacts of the Mandalay and Ormond Beach facilities are over-stated in the SED, which also fails to reasonably recognize the significant reductions in impacts that have resulted from the stark reduction in operating hours that the Mandalay and Ormond Beach units have experienced in recent years. We expect these units to continue to operate only infrequently during normal conditions for the remainder of their operating lives as currently configured.

When they were constructed, these plants were operated as baseload plants with high capacity utilization rates, and were only occasionally shut down during the year. RRI has successfully transitioned to a market environment in which these plants operate much less frequently while still contributing to the reliable operation of the grid. To illustrate, in 2008 one of the Mandalay units was committed and started 239 times, with 239 successful starts. Additionally, the CAISO has instructed RRI to start one of its OTC units outside of normal market commitments more than 130 times this year, demonstrating the continued contribution of these facilities to system and local reliability.[2]

The conventional wisdom is that OTC is an antiquated cooling system, but the fact is that OTC is much more efficient than either closed cycle wet cooling or air cooling. At full load these plants approach the emission performance standard for carbon established by SB 1368 of 1100 lbs CO2 per MWh, which equates to a heat rate of 9400 Btu/kWh on natural gas. The Ormond Beach and Mandalay stations have high availability factors, state of the art emission controls, including selective catalytic reduction, low NOx burners, and flue gas optimization. They are fast-ramping thermal resources which are valuable in reliably integrating intermittent renewable resources.

Ormond Beach has a deep offshore intake with a velocity cap and excluder bars, which substantially reduce the impingement of fish. Mandalay withdraws water from a flow through the harbor and the canal, and there would be some undesirable effects in the harbor and canal if there were no pumping, as the circulation in the harbor and in the canal would be reduced.

Both Mandalay and Ormond Beach limit operation of the circulating pumps when the plants are off line. Due to the reduced hours of operation, the plants use significantly less seawater for cooling than when they were operated as base load plants. Circulating water pumps are cut back or fully curtailed consistent with plant operating levels, leading to much less impingement and entrainment, and RRI Energy is considering several measures to further mitigate environmental impacts, including variable speed drives.

[2] These out-of-market instructions were structured as "must-offer waiver denials" until March 31, 2009, and as "Exceptional Dispatch" instructions since April 1, 2009, when the CAISO's new market was implemented.

RRI has supported research by the Electric Power Research Institute (EPRI) on alternate intake technologies and on the ecological impacts of existing OTC operations at the CA facilities. RRI provided a preliminary site-specific assessment of the feasibility and efficacy of these technologies in our submitted Proposal for Information Collection to the State Water Resources Control Board ("PIC").[3] In the PIC, RRI Energy went beyond the plain requirements of the EPA Phase 2 rule to cooperate with the Los Angeles Regional Water Quality Control Board (LARWQCB) staff to report preliminary findings as part of the PIC. Likely compliance alternatives were identified, and among the options that RRI Energy has identified for further analysis include the use of a barrier net, acoustic deterrence systems, reduction of pumping during grunion runs and reduction in heat treatment frequency and duration.

RRI Energy is committed to continued cooperation with the Water Board and the LARWQCB to explore feasible measures that may reduce impacts, such as possible additional measures including variable speed drives. Of course, any significant investment can only be undertaken if these units have sufficient remaining life, and if the market structure provides reasonable assurance that the investment could be recovered, as further explained later in the these comments.

RRI Energy is also committed to responsible management of climate change impacts. In September 2007, RRI Energy joined the Chicago Climate Exchange, a voluntary greenhouse gas registry, reduction and trading system. By joining the exchange, we have committed to reduce our greenhouse gas emissions to six percent below the average of our 1998-2001 levels by 2010. We expect to satisfy our reduction targets through previously implemented unit retirements and capacity factor reductions, ongoing heat rate improvement efforts and transacting on the exchange.

Scope of CEC Responsibility

We recognize that the Commission is obligated to "protect the environment" in developing its energy policies and preparing the Integrated Energy Policy Report (IEPR).[4] However, the Commission's responsibilities are broader, as the Public Resources Code further requires the development of energy policies that

1) Conserve resources and
2) Enhance the state's economy.[5]

[3] These reports are available at the following location: http://www.waterboards.ca.gov/losangeles/water_issues/programs/power_plants/

[4] California Public Resources Code Section 25301(a).

[5] Ibid.

The Commission's IEPR workshop process and related work must also consider how these objectives are fulfilled in developing plans and policies related to "least cost" compliance with OTC regulation.

Unfortunately, no forum for a full discussion has been provided through the Commission's workshops. The notice for the July 28 workshop included the following statement: "The energy agencies support the SWRCB's long-term goal of substantially eliminating OTC, and this workshop will not provide a forum to debate this goal."[6] At the July 28 workshop, Ms. Korosec reiterated the statement that was in the notice of the workshop that "the energy agencies fully support the Water Board's Long-Term goal of eliminating once-through cooling, and this workshop is not the forum to debate that goal."[7]

RRI Energy believes there are several questions that must be addressed by the Commission to fully consider whether the proposed elimination of OTC "conserves resources" and "enhances the state's economy."

Has the California Energy Commission performed sufficient analysis to support a policy that may lead to retirement of many OTC steam units?

The Water Board published a proposed policy that would require existing OTC power plants to reduce the instantaneous "intake flow rate" to a level "commensurate with that which can be attained by a closed cycle wet cooling system."[8] The proposed policy would allow "alternative, less stringent requirements" to be established if costs are determined to be "wholly disproportionate" to the environmental benefits – but this path would only be available to nuclear power plants and gas-fired units with a heat rate of 8,500 Btu/kWh or less.[9]

RRI Energy believes that the Water Board's proposed policy inappropriately applies a heat rate threshold for eligibility to demonstrate that the cost of compliance is wholly disproportionate to the benefits. In so doing, the SED concludes, without factual foundation, that it is appropriate to impose costs that are completely out of proportion to the associated benefits for one category of OTC units defined by an electrical efficiency

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[6] Notice of July 28, 2009 workshop available at:
http://www.energy.ca.gov/2009_energypolicy/notices/2009-07-28_workshop.html

[7] Workshop transcript at page 10, available at:
http://www.energy.ca.gov/2009_energypolicy/documents/2009-07-28_workshop/2009-07-28_TRANSCRIPT.PDF

[8] State Water Resources Control Board, *Appendix A – Statewide water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling*, page 3. Available at:
http://www.waterboards.ca.gov/water_issues/programs/npdes/docs/cwa316/draft_otcpolicy.pdf

[9] Ibid, page 9. The 8,500 Btu/kWh threshold is intended to exclude any gas-fired OTC unit that has not been repowered from eligibility for the "wholly disproportionate cost" determination.

criterion that is – in fact – inversely related to the magnitude of harm to the marine environment. This is because generating units with a heat rate higher than 8,500 Btu/kWh are more expensive to operate, leading to less frequent commitment and dispatch, reduced hours of operation, and therefore a smaller volume of seawater used for cooling - leading to reduced environmental impacts.

The irony of the Water Board staff's proposed threshold for eligibility to apply the wholly disproportionate cost criterion is that less efficient units will generally have less significant impacts on the marine environment since they will be committed and dispatched less frequently. Additionally, discrimination against OTC steam units fails to consider the role or value of such resources to the grid, or to the cost of the transmission and generation investment required to accelerate the retirement of the OTC resources.

By endorsing the proposed policy, the Commission is affirming that such costs should be imposed without regard to their benefits, and that a criterion based solely on fuel efficiency is appropriately applied in the proposed policy. This begs an important question - has the Commission performed sufficient analysis to assure that this discriminatory policy conserves resources and enhances the state's economy?

What is the cost to consumers of a policy to replace OTC units with new transmission and generation investment?

California faces extraordinary challenges including a tenuous state budget, the lowest credit rating of any state, and a significant economic downturn. These conditions serve to emphasize the importance of considering the cost of this proposed policy. RRI Energy supports the comments from Commissioner Bohn of the CPUC who noted that in this complex process there appears to be only limited reference to cost, that it is important to understand what cost will be imposed on the State of California for this mitigation, and that some analysis of the incremental cost of this policy would be very helpful. In response to Commissioner Bohn's question regarding the cost analysis supporting this policy, CEC staff acknowledged that only very limited work had been completed, and pointed to the preliminary transmission study the CAISO performed in 2008 that is posted on the CAISO website.

Concern about the cost was affirmed by Southern California Edison, the company whose balance sheet would apparently be expected to carry the bulk of the responsibility for the cost of investment in transmission and generation infrastructure required to accelerate retirement of OTC units.

This is a complex undertaking, and preservation of environmental quality is an important value. However, it is equally important that the Commission be thorough in understanding the costs, and make the trade-offs transparent.

How much investment in new transmission and generation is appropriate for the sole purpose of retiring OTC power plants in light of California's commitment to reducing GHG emissions?

The Commission should consider whether or not investment in new transmission facilities (and the associated environmental impacts) could be avoided by relying on "Smart Grid" investments and new technologies to which California has made enormous commitments. For example, California has several billion dollars invested in smart meters which would facilitate significantly increased demand response through dynamic pricing. California has approximately $2 billion dollars budgeted for the California Solar Initiative to provide incentives to customers for installing PV systems, increasing generation on the existing distribution circuits. With this level of investment in other technologies, could some of the expense and environmental impacts of replacement generation and transmission investments be avoided?

Such a question appears appropriate given concerns acknowledged by the Commission's Chairman at a recent workshop. *Will replacement generation investments necessary to retire OTC generation be "an impediment" to achieving the transition to a lower carbon energy system?*[10]

According to the Water Board staff's analysis, its proposal may result in a net increase in the amount of carbon dioxide and nitrous oxide emissions for all OTC facilities combined.[11] Has the Commission considered these impacts in developing its stated support of the Water Board's proposed policy?

[10] On June 23, 2009, the California Energy Commission's Siting Committee and Integrated Energy Policy Report (IEPR) Committee held a joint workshop to review the consultant report "Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California" and to take comments and discuss its potential use in the Energy Commission's siting program and its environmental review of new power plants. Chairman Karen Douglas commented that this was "a very important proceeding . . . and it has gotten us to a watershed moment in our siting process where, when we look at power plant siting cases, we are now explicitly . . . looking for a more thorough and greater analytical framework to use in analyzing greenhouse gas implications to power plants. . . So the framework that we have before us is a way of taking the system-wide view and asking ourselves specifically not only how much might this plant emit, but what do the characteristics and attributes of this plant say to us about how it will be used in California and whether it will serve a role as potentially advancing and even making possible the transition towards a lower carbon energy system, or whether it will be, as I think the fear is of many of the community groups and concerned citizens who participate in some of our study proceedings, an impediment to that transition" (transcript, pages 6-7).

[11] State Water Resources Control Board and California Environmental Protection Agency, *Water quality control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, Draft Substitute Environmental Document*, July 2009 (SED), page 101.

Does the California Energy Commission affirm the Water Board's analysis of electric system impacts?

RRI Energy questions the adequacy of the Water Board's analysis of electric system impacts. The Water Board's Substitute Environmental Document (SED) relies on a consultant report to draw conclusions regarding the likely impacts of the proposed policy on electric reliability.[12] The SED states that the electric industry could likely tolerate and compensate for mass OTC plant retirement at relatively modest costs to the ratepayer. The document also states that "in all but one of the cases examined in the 2015 time frame" OTC plant retirements could be compensated for "solely through transmission upgrades"[13] and further that "under all but the most extreme scenarios, more than enough power plants are expected to be operating in 2015 to more than compensate for any or all OTC plant retirements."[14]

These conclusions appear to be speculative at best, and at odds with the facts, including the schedule included in the energy agencies' plan,[15] the CAISO's preliminary analysis of transmission system impacts of restrictions on once-through cooling,[16] and the reliability criteria considered by the California Coastal Commission in approving Southern California Edison's McGrath peaker.[17]

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[12] ICF Jones and Stokes, Global Energy Decisions, Matt Trask, *Electric Grid Reliability Impacts from Regulation of Once-Through Cooling in California*, April 2008.

[13] SED, page 105.

[14] SED, page 106.

[15] California Energy Commission, CEC-200-2009-013-SD, *Implementation of Once-Through Cooling Mitigation Through Energy Infrastructure Planning and Procurement,* July 2009, Appendix B, available at: http://www.energy.ca.gov/2009publications/CEC-200-2009-013/CEC-200-2009-013-SD.PDF

[16] Impacts on Electric System Reliability from Restrictions on Once-Through Cooling in California, PRELIMINARY California ISO Scenario Analyses, November 25, 2008. Available at: http://www.caiso.com/208b/208b8ac831b00.pdf

[17] See, for example, SCE California Coastal Commission Appeal A-4-OXN-07-096: "The emergency or "black start" function of the proposed McGrath Beach peaker fulfills an important reliability need in the coastal Ventura and Santa Barbara County area that helps ensure the electric system is well situated to be restarted quickly in the event of a widespread electric grid failure which results in a regional blackout. Such failures can be caused by fires, earthquakes, transmission line shorts, or other types of natural and man-made disasters. When this type of failure occurs, neither the Mandalay nor the Ormond Beach generating station would remain on line. Therefore, neither station would be available to provide the power needed to restart the electric system."
…
"Once the new "black start" peaker has started the Mandalay Generating Station, Mandalay can be used to start Ormond Beach. Consequently, the location of the 45 MW peaker at the Mandalay site is strategically important to assure that reliable "black start" capability is in place for both the Mandalay and Ormond Beach stations. This will in turn secure the grid restart capability for SCE's entire Ventura and Santa Barbara County coastal service territory."

The Energy Agencies' proposal must minimize uncertainty, and provide maximum lead time

Decisions regarding additional investment, or the mothballing or retirement of a power plant, requires as much lead time as possible, and uncertainty about deadlines for compliance must be minimized. The plan should be modified as follows:

1) Make clear that the energy agencies have principal responsibility for advising the SWRCB of the status of projects necessary to assure equivalent reliability if OTC plants are retired,

2) Provide for an annual report from the energy agencies (rather than a biennial report from the energy and environmental agencies), and

3) Specify that any change in the schedule identified by the energy agencies for projects essential to replace the OTC plants be reflected in revised NPDES permit terms by the regional Water Boards.

Although we believe repowering or cooling system retrofit is consistent with the Local Coastal Program, we expect acquiring permits for cooling system retrofit or repowering to be very challenging, creating significant uncertainty around the timing and feasibility of individual projects. This uncertainty demands flexibility in OTC regulation.

Even if an RFO is successfully completed, it would be important to make sure that sufficient milestones on any replacement capacity are achieved before OTC is prohibited. In particular, OTC should not be prohibited for any particular unit until the CAISO has determined that no decrease in reliability in either the local area or the CAISO Control Area will result if the associated OTC capacity is retired.

Enhanced LCR Process Must Assure Equivalent Reliability

Some groups have asserted that only a few of the coastal plants are considered by the CAISO to be essential to ensure grid reliability. The CAISO has shown leadership in recognizing that both local and system impacts need to be considered. A study published last November by the CAISO showed that shutting down multiple OTC power plants would require enormous investment in transmission and generation infrastructure.

In April 2009, the California Coastal Commission approved the construction of a Southern California Edison's McGrath peaker project, which would be located on the property immediately adjacent to the Mandalay station. This decision was based in part on a critical need for a reliable "black start" capable unit in Ventura County. In the event of a widespread electric grid failure which results in a regional blackout, as might be caused by fires or earthquakes or other natural or man-made disasters, the new peaker could be used to "black start" Mandalay, and then Mandalay could be used to start

Ormond Beach to operate to serve load,[18] thereby reducing the risk of a long-term power outage for 1 million people living in 25 cities in Ventura and Santa Barbara counties.[19] As further evidence of the system and local reliability benefits, the CAISO urged the Coastal Commission to approve the Oxnard peaker project as a necessary and important addition to the California electric system.[20]

Renewable integration

The CAISO has determined that it will need additional ramping and regulation to reliably integrate 20 percent renewables, but has concluded that it is possible to maintain reliable electric service with the expected level of intermittent renewable resources associated with the current 20 percent renewable portfolio standard, "provided that existing generation remains available to provide back-up generation and essential reliability services."[21]

The Ormond Beach and Mandalay Stations provide enormous value for integrating intermittent renewable resources as they have large ramping range, and unlike many combustion turbines, which are environmentally restricted from operating at loads less than 60% to 70% of rated capacity, the units at Ormond Beach and Mandalay can cycle up and down across their full operating range several times each day. RRI Energy is evaluating possible additional flexibility, including hot stand-by, reduced minimum load levels where technically feasible, and increased ramp rates (up to 30 MW/minute by Ormond Beach units).

Action to Establish a Multi-Year Forward Resource Adequacy Framework is Essential

One premise of the discussion of OTC regulation is that without regulatory action, the use of OTC will continue indefinitely. The truth is that the economics of operating these plants has declined and the future is uncertain. There are circumstances today where these plants are started for reliability, operated at minimum load, and then shut down, in some circumstances with revenues below variable cost. One possible outcome that policy makers must consider is that without an effective long-term resource adequacy

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[18] Ibid.

[19] Ventura County Star, *Peaker will benefit 1 million residents,* Sunday, April 5, 2009, available at: http://www.venturacountystar.com/news/2009/apr/05/peaker-will-benefit-1-million-residents/

[20] The CAISO letter is available in the Addendum to Commission Packet, Item No. Th 15b, A-4-OXN-07-096, April 9, 2009, at page 124, available at: http://documents.coastal.ca.gov/reports/2009/4/Th15b-4-2009-a5.pdf

[21] See California ISO, *Integration of Renewable Resources, Transmission and operating issues and recommendations for integrating renewable resources on the California ISO-controlled Grid*, November 2007, page i.

structure, the remaining economic life of some of these plants may be **shorter** than the period over which they are required for reliable local or system operations.

RRI Energy believes that immediate action on long-term resource adequacy framework is essential. The current resource adequacy framework, which is focused on a short term look one year ahead, must be changed to provide a transparent, competitive, multi-year forward framework for assuring that sufficient capacity resources are available by location. The existing market is purely bilateral, with no transparency, and with nothing contracting parties can use as an index, there is insufficient incentive for new investment in existing or new capacity. We also believe that a centralized forward capacity market (CFCM) is the appropriate structure to assure competitive market results and long-term resource adequacy, and once a CFCM is established, the role of utility contracting and the RFO process must be shaped accordingly.

The success of competition is measured by investment. In California, this means investment in preferred resources such as renewables, demand resources and high-efficiency conventional power generation. These investments can be facilitated by a centralized forward capacity market.[22]

A Centralized Forward Capacity Market Complements Bilateral Contracting

Several comments were provided at the workshop in support of a centralized forward capacity market based on the benefits of a transparent and systematic means of pricing capacity several years forward. However, some of the workshop discussion might lead an observer to inappropriately conclude that a capacity market is incompatible with long-term contracts. This is not the case. A capacity market would provide several important benefits that would complement bilateral contracting. First, the availability of a transparent, competitive forward price for capacity by location would be a valuable benchmark or index for use in bilateral contracting. An additional important benefit of a CFCM is that while it might not eliminate the need for long-term power purchase agreements, it can reduce the value of those agreements, as the revenue a capacity resource earns from a CFCM can be considered in defining the residual compensation required under the power purchase agreement.

For example, a bilateral contract might define fixed compensation in terms of the difference between the capacity market clearing price, and the compensation level required to cover the developer's costs. That difference might be an additional payment to the developer, or a refund if the clearing price exceeds some specified value. In any event, the developer can be assured of the revenue stream required to procure financing, and the buyer has clear information about the cost of the capacity purchased under contract relative to its market value.

[22] See comments and paper included in the IEPR record at: http://www.energy.ca.gov/2009_energypolicy/documents/2009-07-28_workshop/comments/Leuze_Eric_comments.pdf

One of the critical issues with long-term power purchase agreements is how the costs will be allocated between the utilities' bundled customers and other retail customers served by competitive energy service suppliers. The CPUC has an ongoing proceeding to assess the rules under which retail competition will be reinstated after power purchase contracts entered by the California Department of Water Resources are assigned or novated. A key benefit of a CFCM is that the issue of who bears the costs is determined in the delivery year, reducing the risk that customers will bear costs for capacity from which they do not benefit.

Conclusion

Once again, RRI Energy appreciates the forum the Commission has established for discussion of the reliability impacts of OTC regulation, and we look forward to the discussion of the broader questions of how this policy should be changed to conserve resources, enhance the state's economy, and be consistent with the state's goals for reducing GHG emissions.

Sincerely,

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