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DOCKET
09-IEP-1O
DATE MAY 28 2009
RECD. MAY 29 2009

May 28, 2009

California Energy Commission
Dockets Office, MS-4
Docket No. 09-IEP-10
1516 Ninth Street
Sacramento, CA 95814-5512

RE: *2009 IEPR - OTC - Committee Workshop on Options for Maintaining Electric System Reliability When Eliminating Once-Through Cooling Power Plants*

AES Southland (AES), the owner of a significant share of coastal generation, appreciates the opportunity to provide comments at the California Energy Commission (CEC) *2009 Integrated Energy Policy Report Committee Workshop on Options for Maintaining Electric System Reliability When Eliminating Once-Through Cooling Power Plants* held on May 11, 2009. AES applauds the CEC's efforts to address this complex issue that could have significant consequences to California if a once through cooling (OTC) policy is enacted that reduces the impacts of entrainment and impingement but fails to also take into account grid reliability, electricity cost, greenhouse gas emissions, criteria pollutants and implementation feasibility. California is at a critical juncture as it works to define its long term energy, water, and environmental future while at the same time maintain an affordable and reliable supply of electricity. Every decision made has a critical impact on other important policy objectives and these decisions cannot be made in isolation. Rules regarding OTC will affect electric reliability, electricity rates, greenhouse gas and other air emissions, renewable generation, and water supply. The challenge at hand is to balance these often conflicting priorities and develop coherent policies that do not harm overall state-wide objectives. AES recognizes that this challenge is difficult but we are committed to working with the CEC and all other relevant agencies while the State Water Resources Control Board continues to move forward with regulations to address OTC. AES respectfully offers the following additional comments to supplement the comments it made at the Workshop.

The complete elimination of OTC on existing units should not be the objective.

The purpose of Rule 316(b) Phase II is to minimize the adverse environmental impacts of impingement and entrainment (I&E) in existing plants, not to eliminate these plants or OTC systems in their entirety. AES supports a policy that promotes the gradual modernization of the OTC fleet in California while also allowing some older units that are only required during critical periods and have a relatively low capacity cost to continue operating for as long as they are needed. This approach is reasonable and consistent with the Clean Water Act because AES has already substantially reduced or offset the I&E impacts of its units through installation of feasible control technology, modifying its operating procedures and funding a mitigation project. Details of these actions are summarized below:

- Velocity caps have been installed on the intakes at Huntington Beach and Redondo Beach and are estimated to reduce impingement by approximately 80%. The canal intakes at Alamitos do not support the use of velocity caps.

- The AES units do not run as frequently as they used to and therefore impacts are already significantly reduced from their design parameters. Contrary to what many people believe, the circulating water pumps are shut down when units are not operating. In fact, based on AES's 2008 operating profile, circulating water flow volumes were 70% less than permitted flows. Since I&E impacts are approximately proportional to circulating water flow, the impacts on the marine environment were similarly reduced.

- Based on AES's review of the dispatch of the units, about 1/3 of unit operations are at minimum load. Each unit is served by two circulating water pumps. AES has experimented with shutting down one of the circulating water pumps when operating at minimum load. This results in a further reduction in impacts of approximately 50%. Similar reductions could be achieved through the installation of variable speed drives.

- AES has also spent $5.5 million to restore 67 acres of coastal wetlands to offset entrainment losses at Huntington Beach. This project is nearing completion and now has tidal flow in the previously dry wetlands adjacent to the AES facility.

AES can accept operational limitations, commit to changes in how we operate our circulating water systems and offset any remaining impacts from OTC systems that stay in service by performing coastal improvement projects.

However, we do not support a policy that completely eliminates OTC systems on every existing unit.

Reduction requirements should be based on existing permitted flows and not current actual flow volumes.

The goal of 316(b) is to reduce impacts and AES's calculations indicate that impacts have already been decreased by as much as 80% when compared to permitted levels. Requiring further reductions of up to 90% on a unit by unit basis would result in de minimis environmental gains at a wholly disproportionate cost. This is due to the fact that it is unlikely that any units could comply with this requirement without either retrofitting with closed cycle cooling or retiring.

The original federal 316(b) rule properly accounted for this unreasonable requirement by exempting units with capacity utilization factors of less than 15% from meeting the entrainment standard; an exemption that would have captured about 2/3 of AES's portfolio. This provision makes sense given the relatively high cost of compliance and the fact that the environmental benefits of eliminating OTC on these units would be negligible given they don't operate very often.

The compliance period must be realistic.

AES owns 14 generating units at 3 power plants that are capable of producing over 4,200 MWs of electricity. All three facilities are located in the Los Angeles Basin local reliability area. AES wants to be a preferred long term supplier of efficient, environmentally friendly and flexible generating resources, but the timeline required for modernizing the existing fleet must be reasonable. With the complexities associated with permitting, contracting, financing and constructing new capacity and the need to phase in the unit replacements in order to assure a reliable supply of electricity, AES believes that a full transition to new technology may not be complete until 2030.

When developing a compliance schedule, the regulatory agencies must also consider the other important resource demands that will make any construction during this time frame challenging. In particular, the Renewable Portfolio Standards and the AB 32 mandated greenhouse gas reductions will require significant infrastructure additions that must be studied through the already congested interconnection queue, permitted through a variety of resource constrained agencies at the state and local level, and constructed with a limited pool of qualified construction crews. The SWRCB should not establish a compliance schedule or other regulatory mandates that will cause the failure of such important policy objectives.

The Policy should focus on minimizing overall fleet wide impacts.

A "one size fits all" policy is not optimal. The primary objective of any policy on OTC should be to reduce the overall volume of OTC flow that is being used to generate power in California. This is different than establishing a policy that achieves a specific level of reduction on each and every single OTC unit in the state. For example, if you assume similarly sized units, achieving a 90% reduction in impacts on a single unit that runs 80% of the year has a similar environmental benefit as achieving a 90% reduction on 8 units that only run 10% of the year. At the same time, the cost of achieving the reductions on the 8 units that only run 10% of the time would likely be far greater than achieving the reductions on the single unit. An ideal policy would encourage a new facility to be built that would displace the unit that ran most of the year and push it into the category of units that only ran during peak periods thus reducing its impacts from 80% to 10%. This should in turn lead to the retirement of one of the units that only ran 10% of the time and result in further reductions. This solution would be far less costly than a policy that forced the premature shutdown and subsequent replacement of the 8 units that only ran 10% of the time. A policy that focused on fleet wide reductions would be more economical and flexible than a unit by unit, "one size fits all" approach.

Retrofitting Aging Power Plants is not the solution.

AES agrees with the CEC staff assessment that imposing a retrofit requirement to eliminate OTC systems will likely lead to the retirement or repowering of the generation fleet, although this may not be true for every generator owner. AES has performed high level retrofit studies of both wet and dry cooling. As one might expect, costs are significant, there are land use constraints and the efficiency and environmental impacts of closed cycle cooling are substantial.

Even if AES were to receive guaranteed recovery of the installation costs, retrofitting is not a good solution from both an economic and environmental perspective. The size of the steam turbine on a new combined cycle plant is roughly 1/3 the capacity of the entire plant. This significantly reduces the amount of closed cycle cooling a new plant would require compared to a conventional steam unit. A smaller closed cycle cooling system would result in less environmental and visual impacts. The cooling requirement would be further reduced for new peaking units. AES believes that the better solution from both a ratepayer and an overall environmental perspective is to replace selected units through repowering and allow other units to continue to use their OTC systems provided operational measures are implemented and any remaining impacts are offset through appropriate mitigation.

The desire to reduce impingement and entrainment must be balanced against the cost of implementation and the benefits of the measures being mandated.

AES was very concerned with the policy recommendations made in the original scoping document published by the SWRCB in March 2008. From our perspective, the proposed regulations would have resulted in arguably the most costly solution with the smallest overall environmental benefit. By requiring the lowest capacity factor units to comply first, the policy would have captured the largest number of units that had the smallest overall environmental impacts. Further, because these units generally only operate during peak periods, a retrofit of the existing OTC system with closed cycle cooling would not be practical. Therefore, generator owners would likely have chosen to either shut down or repower, rather than retrofitting. Again, given the quantity of units that would have been captured in phase one, if generators did choose to retire, the reliable supply of electricity would be at significant risk. On the other hand, repowering or replacing this amount of capacity would be extremely costly and likely impossible to accomplish on the timeline required.

AES has seen several analysis on the impact that retrofitting might have on the cost of electricity, but to our knowledge there has not been any analysis done on the cost to replace the existing OTC plants, which is the more likely outcome if a policy is adopted that prohibits the continued use of OTC systems on existing units. To illustrate, based on publicly available information, the approximate cost of new capacity in the most recent RFO conducted by SCE is $18/kw-month. This represents about $100 million annually for a 480 MW facility. The estimated cost for one of the existing OTC steam units is less than half this amount since most of the capital cost of these units has already been recovered. Over a 10 year term, this equates to a difference of $500 million dollars for a single 480 MW unit. If this is scaled up to the 14,000 MWs of vintage non-nuclear OTC plants in the state, the total difference in cost reaches $14 billion over the 10 years. The analogy is similar to the payments incurred when buying a new car to replace an existing car that has already been paid for.

Finally, studies have been performed to estimate the additional transmission costs that must be incurred in order to accommodate the shut down of the aging OTC fleet. While the results of these studies are informative, they have failed to also include the cost of new generating resources that must be built on the other side of the transmission lines. The costs of replacement generation are real and they are significant as outlined above. They must be included in any analysis regarding transmission alternatives.

AES is concerned with protecting our environment but we are also concerned with maintaining a reliable and affordable supply of electricity to California. A policy that prohibits any continued use of OTC does not strike an equitable

balance between all the important environmental and economic factors that must be considered.

The procurement process must accommodate the repowering of units.

The current procurement process, which mainly consists of investor owned utility (IOU) based Requests for Offers (RFO), should include a mechanism to accommodate projects that are neither new incremental resources nor existing resources. Generator owners should be able to bid projects into RFOs that include both the shut down of an existing resource and the commercial operation of a new replacement resource. To accommodate this approach, the RFO process should be "adaptive" in that the amount of capacity an IOU is allowed to procure should adjust based on whether the resources they are procuring are truly new greenfield projects or simply replacement capacity that is being bundled with a unit retirement. This is especially true of OTC plants that are providing local reliability services in transmission constrained zones. These valuable additional attributes are difficult to value appropriately using typical methodologies that are applied to RFO bids, especially since the procurement group at the IOU's are prohibited from interfacing with the transmission personnel. For this reason, competitively priced brownfield projects that are relatively equal on a cost-benefit basis with greenfield projects should be given preference in any RFO. This position is supported by multiple California agencies, including the CEC, that have stated a preference for brownfield development. The legislature has also demonstrated its preference for repowering by adopting AB 1576 which highlights the efficiency gains, increased reliability, displacement of older plants, utilization of existing infrastructure and the environmental improvements that can be achieved through the repowering of units needed for local reliability.

AES appreciates this opportunity and looks forward to working cooperatively with all stakeholders in creating the best solution for California that safeguards reliability while balancing the environment, vital services, and economics. Please do not hesitate to contact me at (562) 493-7855 or Julie Gill at (916) 509-0598 with any questions or clarifications.

Kindest regards,

Eric Pendergraft
President
AES Southland