BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate Procurement Policies and Consider Long-Term Procurement Plans	))))	R.06-02-013

PROPOSAL OF GOOD COMPANY ASSOCIATES FOR WORKSHOP ON REVIEW OF POLICY PROPOSALS TO SUPPORT NEW GENERATION

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COMMENTS OF GOOD COMPANY ASSOCIATES

Good Company Associates, an Austin, Texas based energy consulting firm, submits these comments on behalf of TAS, a manufacturer of Turbine Inlet Cooling (TIC) plants. TIC is a technology which can provide immediate and substantial benefits to the California energy market, by maximizing electricity capacity from combustion turbines and combined cycle plants during high demand periods without incremental environment impacts. TIC works by countering generation unit deratings due to high ambient temperatures. TIC can be quickly retrofitted to existing facilities with minimal regulatory delays, and can also maximize the effective capacity of new generation, an important consideration in regions with limited viable greenfield generation sites. The potential for implementing TIC in California is currently hobbled by commercial and regulatory barriers to entry, which prevent potential purchasers from realizing a commiserate return on their investment. Overcoming these barriers would provide significant incremental generating capacity at just those times when it is most needed.

Attached to this proposal is a report, *Turbine Inlet Cooling: An Immediate Solution to Southern California's Peak Capacity Shortage That Also Expands The Operational Characteristics Of Combustion Turbines***,** that provides further details.

I. INTRODUCTION

The first order of business for this proceeding will be to review policies needed to support the development of new generation in California, including consideration of transitional and/or permanent mechanisms which can ensure construction of and investment in new generation in a timely fashion. Encompassed in the review of the need for new generation will be an evaluation of practices and procedures to maintain existing California generation online. This is particularly critical for existing generation which provides resources needed for reliability in resource constrained areas.[1]

Significant capital investments in conventional power plants will be needed, despite the emphasis on energy efficiency and demand response, to ensure that

[1] CPUC, Order Instituting Rulemaking to Integrate Procurement Policies and Consider Long-Term Procurement Plans, filed February 16, 2006, p. 10.

California's electrical supplies will meet current and future needs at reasonable prices. The Commission has promised to work toward the establishment of a regulatory climate that encourages investment in environmentally-sound conventional electricity generation resources.[2] The Commission has also stated that energy must be reliable and affordable to ensure reasonably priced energy for all Californians.[3]

Parties submitting comments to previous workshops generally agreed that the mechanisms designed to attract private investment in California generation are not meeting expectations. While independent power producers do not require the Commission's authority to build generation, CPUC authorized procurement processes can stimulate such investment.[4] Given the decision by the Commission to adopt June 1, 2006 as the date to achieve full implementation of the 15-17 percent reserve margin goal,[5] short-term incentives will be required to encourage sufficient investment to meet this goal. However, the Commission does not interpret the need to provide mechanisms to pay competitive market costs to new and continuing suppliers as justification to "pay any price" or require utilities to sign contracts that meet these requirements at any cost.[6] In this context, a technology which provides additional capacity during peak demand periods at competitive prices is an attractive candidate for expedited action to remove barriers to implementation.

II. TURBINE INLET COOLING AS A SOURCE OF NEW CAPACITY

Turbine Inlet Cooling ("TIC") is a well known technology in widespread use around the world. It is not a panacea for the resource adequacy woes that will beset California over the next decade, but a potentially important part of the solution. TAS, formerly known as Turbine Air Systems, is the leading provider of packaged cooling systems for the commercial/industrial and energy industries. TAS's internal studies indicate a potential to "recapture" approximately 1,500-2,000 MWs in California at a cost that is less than or equal to that of similar capacity from new peaker turbines.

TIC uses advanced, modular and energy-efficient chiller technologies to negate the impact of higher ambient conditions on combustion turbine ("CT") generators. Combined with thermal energy storage ("TES"), which is utilized to further increase additional capacity available at peak temperatures, this technology can help squeeze out additional energy production from existing and future resources during the very hours

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[2] State of California, Energy Action Plan II, October 2005, p.10 (EAP II).

[3] EAP II, at p.2.

[4] CPUC, Order Instituting Rulemaking to Integrate Procurement Policies and Consider Long-Term Procurement Plans, filed February 16, 2006, p. 12.

[5] CPUC, Interim Opinion Regarding Electricity Reliability Issues, Decision 04-10-035, October 28, 2004, at p. 14.

[6] CPUC, Interim Opinion Regarding Electricity Reliability Issues, Decision 04-10-035, October 28, 2004, at p. 15.

when capacity and energy is most valuable. In effect, TIC creates a "Virtual Peaker" that can provide dispatchable capacity.

When combined with a heating system that captures some of the waste heat from the CT exhaust, TIC can provide a means to quickly adjust the output of the facility. This capability allows a CT to have quick-response and load following capability, providing the ability to participate in ancillary services markets for spinning and non-spinning reserves, as well as regulation services. This operational enhancement for CTs, particularly larger combined cycle configurations, is important for system reliability because a number of older boiler-based generating technologies will be replaced over time, resulting in a loss in the pool of resources with load-following capabilities.

TIC provides a number of advantages over new generation:

- TIC provides additional capacity at the point in time when it is most needed
- TIC does not require siting, new permitting, or trigger other regulatory barriers
- TIC will not impose additional interconnection or transmission capacity requirements

Thermal unit capacity is derated to reflect summer operating conditions. The summer derate capacity used for the California Energy Commission's supply and demand analyses ranged from 90 to 96 percent of nameplate capacity based on the type of unit and location.[7] However, these are average values, while the actual decline in available capacity is a function of temperature.[8] Since the increase in demand also is a function of higher temperature,[9] these two factors combine to increase the resource adequacy "gap" as temperature rises.

TIC provides greater efficiency and productivity from existing generating assets, and therefore can be seen as a supply-side energy efficiency investment at the generation plant. While TIC has some minimal loads associated with running the chiller and associated pumping equipment, using TIC along with TES that draws on off-peak power can increase the overall efficiency and productivity of the generation asset and provide "demand-elasticity" by shifting some station power load to off-peak periods.

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[7] California Energy Commission, Summer 2006 Electricity Supply and Demand Outlook, December 2005, p. 8.

[8] A modern CC plant loses about 0.25% per 1°F increase in ambient temperature, while an combustion turbine peak plant loses about 1.13% per 1°F increase.

[9] Page 20 of the *Electric Supply and Demand Outlook* shows a linear relationship between temperature and load for SCE and SDG&E. The coefficients shown, 317.33 and 66.53, for SCE and SDG&E, indicate the MW increase in peak demand for each degree the temperature rises. Id. at 19-20.

TIC should be considered an energy efficiency technology that increases supply during critical periods. Alternatively, it could be considered a supply response tool, analogous to demand response which applies rate design, incentives and technology to induce changes in customer demand. The Commission and the CEC have stated their common objective to adopt cost-effective demand response programs that improve system reliability and mitigate utility system costs. EAP II finds that energy efficiency and demand response should be "first resources" to be used by the utilities in resource planning.[10] Currently, each of the three utilities has a variety of demand response programs that are designed to motivate customers to reduce energy usage during periods when system demand is straining the system or supplies are expensive.[11] TIC, in a similar fashion, increases energy supply when system demand is straining the system or supplies are expensive

TIC clearly falls within Key Action Nos. 3 & 4 under the Electricity Reliability and Infrastructure heading of EAP II:

> 3. After incorporating higher loading order resources, encourage the development of cost-effective, highly-efficient, and environmentally-sound supply resources to provide reliability and consistency with the State's energy priorities.
>
> 4. Establish appropriate incentives for the development and operation of new generation to replace the least efficient and least environmentally-sound of California's aging power plants.

TIC should require a minimized environmental review, have few to no substantive permitting issues and therefore gain fast regulatory approval. For projects that are subject to the jurisdiction of the California Energy Commission ("CEC"), the TIC system can be licensed as an amendment to an existing project. The amendment process at the CEC can be completed in a matter of weeks, as opposed to new applications, which would be processed in the regular twelve-month CEC permitting process. For smaller projects where the local permitting process would apply, where the general plan and zoning are favorable, the local permitting process can move swiftly. New facilities are subject to applicable California Environmental Quality Act (CEQA) review when development of the facility is undertaken or proposed. However, the operation and maintenance of existing electric power generation facilities is exempt from CEQA review.[12] This means

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[10] Proposed Decision of ALJ Malcolm, Decision Adopting Settlement, Application 05-06-006, Application of Pacific Gas & Electric Company, Application 05-06-008, Southern California Edison Company's Application, Application 05-06-017, Application of San Diego Gas & Electric Company, February 14, 2006, pp. 3-4.

[11] Ibid at p. 4.

[12] CPUC, Interim Opinion Regarding Electricity Reliability Issues, Decision 04-07-028, July 8, 2004, at p. 25.

that TIC can be retrofitted to existing plants without time consuming regulatory proceedings with regard to siting, interconnection and the CEQA, permitting far more rapid response to current capacity shortfalls than greenfield generation projects. .

TIC is not limited to retrofit applications, as TIC's modular design provides for easy integration of into new turbine construction. TIC is a technology that is currently being used by the leading manufacturers of advanced combustion turbine designs. Accordingly, there should be no issues with its addition to plant configurations from the original equipment manufacturers or the engineering. The application of TIC does not raise new or additional environmental impacts on the project. Since there is a limited supply of new generation sites in the more urbanized areas of California, a technology which can maximize the peak capacity of new plants has obvious value.

III. TIC AND COMMISSION QUESTIONS IN THIS PROCEEDING

(1) Is there a need for the State to adopt additional policies to support the development of new generation and long-term contracts in California? If so, describe a policy proposal that serves that goal, such as the consideration of a transitional and/or permanent cost allocation or alternative mechanisms that would serve the same goal. Proposals should include detailed information about how costs and benefits of new generation contracts will be allocated and shared, how the policy will be implemented, over what timeframe, and with what safeguards.

The failure to adopt TIC on a widespread basis in California, despite its obvious advantages, both economically and with respect to bypassing serious institutional constraints on capacity additions, reflects various regulatory and economic barriers to adoption. Like other sources of new capacity, TIC will require a period of time to amortize capital cost recovery, generally requiring a contract term of at least 5 years in a retrofit context. This makes investment in TIC a risky proposition for a facility owner who lacks a clear avenue to recover his costs and receive a return on his investment.

1. Procurement of Capacity

Under the existing CPUC-approved procurement processes, the utilities undertake requests for offers ("RFOs") to secure additional capacity. Given the absence of a formal capacity market that drives investment peak generation, the RFO process is the primary regulator-approved means for an IOU to secure competitive supply to meet its resource adequacy requirement ("RAR") reserve margin. However, there is no clear path for a TIC-based "Virtual Peaker" to directly participate in solicitations for capacity. The solicitation designs to date have separated "new" and "old" capacity, and generally discouraged "non-conforming" bids.

For example, SCE's recent 5-year RFO looked for unit contingent tolling agreements and dispatchable call options from existing generation.[13] Under the initial

[13] See http://www.sce.com/AboutSCE/Regulatory/SCEIssues5YrRFO/.

terms proffered by SCE, MWs made available on an existing generating asset through the installation of TIC would not qualify as they are not a distinct unit. It is unclear whether a TIC retrofit project would lead to "new capacity" (capacity which, absent the investment in TIC, would not otherwise be available during certain expected weather conditions), and hence unable to participate. Similarly, the recent PG&E RFOs have the same shortcomings.

Solution: The Public Utilities, CPUC, CEC and CAISO Should Take Steps To Recognize TIC as an Efficiency/Load Management Program, and Authorize Bilateral Arrangements By Utilities, And Fast-Track Permit Modifications.

Recognize TIC deployment as an Efficiency/Load Management Program under the EAP: The CPUC and the CEC should explicitly recognize that adding TIC, or similar cost-effective efficiency enhancement to existing turbines, is a supply-side "efficiency program" and therefore a favored resource under the EAP II Loading Order. Accordingly, deployment of TIC would have a Loading Order priority, allowing existing generation potential to be maximized during the highest peak demand periods. This recognition could be allowed in the context of an expedited CEC review of the technology, and the CPUC administrative notice or other recognition of CEC Staff review. In order to move this effort quickly, the CEC Staff could issue a draft report that would provide a strong informational record for the CPUC to use when projects are presented via advice letter, or for the CEC (or other permitting entities) to use during permitting processes.

*Create "Fast-track" regulatory approval processes for TIC permits***:** The CEC, and other entities with potential "critical path" permitting authority, should create a *pro forma* approval mechanism. Under this approach, projects that meet certain pre-reviewed characteristics for the technology and have no other changes in the project's overall physical footprint would be given amendments or modifications on a ministerial basis. The CEC (or other similar agencies) would need to create the fast-track rule for these efficiency modifications that would be an expedited paper-hearing process with a rebuttable presumption favoring approval. Only if there were clear and convincing evidence that the project diverged materially from the *pro forma* project template would additional review processes be needed. By undertaking this step, regulatory agencies could fast track additional environmentally preferable and quickly achievable capacity in time for Summer 2007.

Efficiency improvements should be given pre-approved procurement product status for Summer 2007 and beyond, allowing for bilateral arrangement for the capacity: In order to deploy TIC on existing resources in time for Summer 2007, commercial arrangements with IOUs and generating asset owners should be secured very soon. Accordingly, the CPUC could recognize that investments in supply-side efficiency improvements are valuable and "pre-approve" bilateral arrangements between the public utilities and asset owners to support the purchase and installation of TIC. This would be done by modifying the CPUC's last procurement decision that updated the listing of pre-approved transaction types and processes to include TIC-based supply-

side efficiency projects and the related energy and capacity.[14] The CPUC could make this change on its own via a fast-tracked Order in the procurement proceeding or via Resolution. Expedited treatment is appropriate given the timing concerns if this hidden capacity is to be recaptured in time for Summer 2007.

RFOs structures should accommodate bidding by TIC "Virtual Peakers:" The utilities should modify their RFO approaches to accommodate bidding by TIC "Virtual Peakers" in future solicitations. The additional capacity could be contractually secured either in terms of providing additional resource adequacy requirement (RAR) capacity, or additional energy sales during the highest peak demand periods under a call option or toll. Alternatively, TIC could be bid in as a retrofit supply-side efficiency proposal to existing CTs. The RFO process should be technology neutral, other than in the context of the renewable portfolio standard solicitations.

RAR "counting rules" may require adjustment for generators with TIC: The CPUC, CEC and CAISO should work together to review and revise how the additional capacity recovered through increased TIC-based efficiency will count as "Qualifying Capacity" under the RAR program.[15] Unless this capacity—which would not be available absent TIC—is explicitly acknowledged under the RAR rules, the value of this additional efficiency measure may be lost to the market. .

2. Commercial Power Purchase Contracts

Existing commercial power purchase arrangements are often interpreted in a fashion that impedes the deployment of TIC. For example, certain tolling arrangements entered into by the California Department of Water Resources required the seller to guarantee capacity levels and efficiency during the term of the contract.[16] The contract quantity in any hour is adjusted according to anticipated weather conditions in recognition of the ambient derate problem. In this case, it is not clear whether deployment of TIC would simply provide the buyer with a "free good" consisting of this incremental high value capacity. Absent contractual provisions that allow for capital improvements (or an agreement that the enhanced efficiency would be addressed under a separate arrangement) there is a good probability that a contract dispute would arise if TIC is implemented. While the Seller may see an investment in TIC as a means of reducing risk (by improving the heat rate and ability to provide promised capacity or energy), the Buyer may presume that they are entitled to the benefit of the improved

[14] See CPUC Decision 04-12-048 in docket R.04-04-003, pages 115 – 116. By pre-approving a bilaterally contracting process for a TIC-based supply-side efficiency project, the IOUs could secure additional peak period capacity and/or ancillary services capabilities from existing or new CTs . D.04-12-048 is available at http://www.cpuc.ca.gov/word_pdf/FINAL_DECISION/43224.pdf.

[15] See CPUC Decision 04-10-035 in docket R.04-04-003 regarding the Resource Adequacy Requirement ("RAR"), including adoption of counting conventions at pages 21 – 30, and Attachment A. D.04-10-035 is posted at http://www.cpuc.ca.gov/word_pdf/FINAL_DECISION/41416.pdf.

[16] See for example the original Sunrise contract § (n) under Capacity Testing at page 26. Also see definition of "contract capacity" at page 27. The Sunrise contract is available at http://wwwcers.water.ca.gov/pdf_files/power_contracts/sunrise/062501_sunrise_final_ppa.pdf.

efficiency. Accordingly, there may be little commercial incentive to cause the application of TIC during the duration of an existing contract.

Solution: The CPUC and the CAISO should explicitly encourage the public utilities to enter contracts with owners of combustion turbines to maximize generation potential during peak hours and to secure that capacity as an overlay to any other existing contract. Other buyers should take a similar position to expedite recapturing these latent MWs.

The CPUC and CAISO should encourage the public utilities and other purchasers of energy and capacity to recognize any additional MWs or MWhs made available through an investment in TIC as a separate product or capability; i.e., the "virtual peaker." This type of approach would allow for new, overlaying contracts that address this "new" capacity without requiring parties to renegotiate the existing contract. This approach is reasonable because there is a strong argument that the parties did not expect to have access to that capacity due to the ambient derate issue. It is also equitable because the seller's decision to deploy TIC will turn on the value in the market for the additional MW and/or MWh.

3. Incentives or Requirements Needed To Maximize Implementation of TIC

Currently there appears to be no regulatory requirement to consider the installation of TIC on new combustion turbines where that technology is particularly appropriate, such as in hot and arid interior valley locations. Moreover, it is unclear whether the marketplace or regulatory environment provides any direct incentive to maximize the efficiency of a combustion turbine.

Solution: The CPUC and CEC should encourage the use of TIC on new projects by considering TIC equipment to be "efficiency measures" favored under the loading order, and the CEC should consider requiring TIC to maximize production from generation assets.

In terms of incentives, the marketplace should provide some incentive for generating units to maximize their offering of sustainable and efficient operation. TIC essentially removes the ambient derate problem, allowing new projects locating in drier and more arid locations where load is growing to produce more energy and provide more capacity during the most trying system conditions. Therefore, TIC should be seen as a generation-side efficiency enhancement and provided a preference under the EAP Loading Order. Moreover, TIC should be seen as a technology that reduces environmental impact per MWh of production in certain locations because it helps avoid operation of less efficient peaking combustion turbines. Within the context of the CEQA review process, project proponents and regulators should consider the application of TIC as a means to reduce overall environmental impacts and maximize the productivity of the asset under peak demand conditions.

(2) Is there a need for the Commission to act on the proposal urgently? What are the relevant timelines that will be affected by the Commission's action on this proposal? Are there new generation projects or solicitations that will be delayed if this proposal is not acted upon?

In order to make additional capacity available for the summer of 2007, it will be necessary for the Commission to expedite the elimination of regulatory barriers and to implement policies encouraging and/or requiring the installation of TIC at existing facilities. TIC implementation can be initiated and completed in a relatively short time frame, approximately 9 months, it shows particular promise in adding much needed capacity in Southern California, but until the above issues have been addressed, it is unlikely that owners of generation facilities will make the investment decisions required to get the technology on the ground and providing incremental capacity.

(3) Why is the existing regulatory authority insufficient to ensure that contracting for new generation occurs?

Existing regulatory authority is sufficient to ensure contracting for TIC if the steps described in question 2 are implemented.

(4) How will ratepayers be affected by adoption or rejection of the policies proposed?

Implementation of TIC on a widespread basis, by providing relatively low cost peaking capacity, will moderate energy prices and benefit ratepayers. The attached study shows that retrofitting an existing combined cycle gas turbine, even to a plant which currently uses evaporative cooling of its inlet air, will provide California ratepayers additional energy at peak times at about half the cost as would a very efficient new peak plant. Retrofits to combustion turbines are not quite as cost effective, but can still provide peaking capacity at similar costs to new CTs, and can be implemented in a much shorter timeframe.

(5) How much new generation would the new policies apply to? If the policies apply to all contracts for new generation, on what date would application begin, and until what date/event would it continue?

Incentives and/or requirements for TIC should apply to all eligible combustion turbine and combined cycle facilities in California. Any facility where TIC can be shown to be a cost effective source of additional peaking power[17] should be required and/or encouraged to install this technology. All new combustion turbines and combined cycle plants, where the economics permit, should also be required to implement TIC to ensure that the maximum peaking capacity is obtained from new generation.

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[17] It may not be economic to install TIC in facilities located along the Northern California coast where temperatures are relatively moderate. Smaller combustion turbine configurations may not see the same efficiency benefits or economies of scale as newer, larger units. However, in Southern California and the Central Valley, which experience temperature extremes that are strongly correlated with peak power consumption in those regions, TIC is likely to be cost effective for most facilities.

(6) How does the proposal apply to the need determinations made by the Commission for Pacific Gas and Electric Company and Southern California Edison Company in Ordering Paragraphs (OP) 4 and 5 in D.04-12-048? Does the proposal apply only to the amount of new generation authorized in D.04-12-048? Does the proposal apply to a larger amount of new generation? If so, how much and how is that larger amount determined?

See (5).

(7) How will the proposal affect the Commission's ability to consider capacity markets in a R.05-12-013? Are there steps the Commission can take to ensure that new policies do not foreclose the possibility of capacity markets? When feasible, proposers should follow the outline of questions posed above as they prepare their proposals.

Not applicable to this issue.

Respectfully submitted,

GOOD COMPANY ASSOCIATES, INC.

March 7, 2006

By:

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document on all parties of record in the above captioned proceedings by serving an electronic copy on their email addresses of record to each party on the Commission's official service list for this proceeding.

This Certificate of Service is executed on March 7, 2006 in Austin, Texas.

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Steve Isser