DOCKETED

Docket Number:	15-AFC-01
Project Title:	Puente Power Project
TN #:	217321
Document Title:	Supplemental Testimony of James H. Caldwell
Description:	N/A
Filer:	PATRICIA LARKIN
Organization:	SHUTE, MIHALY & WEINBERGER LLP
Submitter Role:	Intervenor Representative
Submission Date:	4/27/2017 4:20:03 PM
Docketed Date:	4/27/2017

INTERVENOR CITY OF OXNARD

EXHIBIT ___

Supplemental Testimony of James H. Caldwell

Introduction

In its March 10, 2017 ruling in 15-AFC-01 for the Puente Power Project,[1] the Committee requested additional information on the feasibility of a smaller peaker plant at an inland location and extended the AFC schedule to take additional evidence prior to briefing. The City of Oxnard provides this update with recent developments on its "Preferred Resource Alternative" which demonstrates that Puente is not needed and that long before Mandalay 1 and 2 retire, it will be possible to meet the Local Capacity Requirement for the Moorpark subarea with preferred resources. Moreover, even if the Commission determines that some amount of new gas generation is required to bolster the preferred resource procurements that are already underway, a small peaker plant at an inland location would be the feasible alternative to meet the long term LCR need for the Moorpark subarea.

The City recognizes the need to provide reliable electric service to the region and to plan for events such as wildfires interrupting the main transmission corridor into the "Moorpark Region" of the electric grid that includes the City and the proposed Puente Power Project. It does not dispute the CPUC's determination of need and authorization for Southern California Edison to procure between 215 and 290 MW of new resources in the Moorpark sub-area.[2] It does not dispute the California Independent System Operator (CAISO)'s consistent finding of a Local Capacity Requirement ("LCR need") within that

[1] 15-AFC-01 TN# 216505 Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings, March 10, 2017.
[2] TN# 215440-3, CPUC D.13-02-015, Feb. 13, 2013 at 65.

range going back several annual assessments.[3] It does not dispute that construction of Puente would, indeed, satisfy both the CPUC procurement authorization and the CAISO identified LCR need.

However, in the forty-nine months since the CPUC procurement authorization, enough incidental preferred resource procurement has taken place or will take place within the current Puente AFC schedule to more than satisfy the CPUC procurement target. Much of this activity and the new information it provides has taken place following the CPUC's approval of the Southern California Edison RFO and the selection of the Puente project as the winner of that procurement. Given what we know today, it is highly unlikely that Puente would be the preferred alternative if the RFO was announced on, say, April 1, 2017. In fact, the principal argument for Puente today seems to be that it was the cheapest viable alternative to meet an identified reliability need at the time, and we have made a "promise" to the developer that, in "fairness," we should keep. There is no such promise since the contract between Southern California Edison and the developer is specifically contingent on certification for construction by the CEC[4] and the robust discussion of alternatives to Puente was deferred to this proceeding.[5] Simple momentum is a very thin reed to rely on when the Commission must make a specific override finding to certify Puente since the project is inconsistent with the City of Oxnard general plan and cuts against the State's policy of aggressively decarbonizing the electric grid.

The identified LCR need for the Moorpark area can be met without construction

[3] The most recent such assessment yielded an LCR need without Puente of 242 MW. See Board Approved 2016-2017 ISO Transmission Plan Appendix D, March 17, 2017 at 93.
[4] A.14-11-016 Rebuttal Testimony of Southern California Edison Company On the Results of its 2013 Local Capacity Requirements Request for Offers (LCR RFO) for the Moorpark Sub-area Exhibit 7 at 5.
[5] A.14-11-06 Scoping Memo at 5.

of any new gas fired resources at a fraction of the incremental cost of Puente. Further, it is highly likely that, well before Puente could be approved and constructed, sufficient preferred resources can be procured and placed in service to allow retirement of all of the existing gas facilities at the Mandalay site as well as the Ellwood facility in Goleta. Thus, the Committee and the full Commission face a clear choice. It could override the City of Oxnard General Plan and Local Coastal Plan, and continue reliance on combustion of natural gas for electricity production to allow construction of Puente on the Mandalay site, fill in over two acres of coastal wetlands, continue to emit criteria pollutants in a non-attainment area, ignore environmental justice concerns, and tie up more than 50 acres of beachfront property for a blighted industrial use subject to the risk of sea level rise for decades to come. In the alternative, the Commission could recognize that Puente is not needed at all. At most, a much smaller peaker of 50 MW could meet any residual LCR need after the preferred resource procurements that are already underway are fully contracted and approved by the CPUC and the CAISO and Ellwood and Mandalay 3 are retired. This smaller peaker, if required, could be located at an inland site and be fitted with factory supplied options that would allow this peaker to provide essential reliability services without combustion thus reducing both criteria pollutant emissions in a non attainment area and greenhouse gas emissions. The result of denying certification of Puente would open up 50 acres of beachfront property for recreation and/or commercial development consistent with the land use goals of the disadvantaged community of Oxnard, and a lower carbon, lower cost, more efficient, more reliable electric grid for the State and the planet.

Puente and its place in the CAISO natural gas fleet

Before turning to the details of the Preferred Resource Alternative, we examine the broader results of construction of Puente beyond the specific purpose of mitigating the identified LCR need for Moorpark. We assess Puente's impact on the State's electric grid and its gas generation fleet as a whole. The Final Staff Assessment (FSA) contains an extensive discussion of this issue,[6] painting a picture of a relatively efficient Puente being added to a fleet of modern, quick start, fast ramping natural gas plants that are essential for integration of variable renewable energy resources, and asserting that construction of Puente will actually reduce overall greenhouse gas emissions. This description of Puente is myopic at best. In fact, there is a large surplus of generic natural gas plants in California, and this surplus looms large well into the future. All of the identified "need" for new gas fired resources in the past 7 to 10 years arises not from *system* requirements for generic capacity or flexibility to integrate renewables but for *local* contingency related reliability considerations like the identified Moorpark LCR need. Once the system-wide picture is examined, the situation is entirely different from that painted by the FSA.

As part of its 2016-2017 Transmission Plan, the CAISO conducted a special study titled "Risk of Early Economic Retirement of Gas Fleet."[7] In this study, the CAISO looked at the need for natural gas facilities following all of the pending retirements of the Korean War era plants along the coastline that use once through ocean cooling, the retirement of Diablo Canyon, and the large investment in new renewable resources to attain the 50% RPS target. After screening out all of the gas facilities that, by their

[6] See Final Staff Assessment Part 1 of 2, Chapter 4.1, December 8, 2016 at 141-53.
[7] Board Approved 2016-2017 Transmission Plan, March 17, 2017 at 203-13.

location, served an LCR need, and therefore, like Puente, would receive fixed capacity payments for "reliability," the CAISO identified roughly 9000 MW of natural gas plants that are "system resources" (have no LCR capability) and are available to supply generic capacity and flexibility for renewable integration. The study found that even under a conservative view of the availability of capacity and flexibility from outside the CAISO boundaries, roughly half of that 9000 MW were not needed for either capacity or flexibility within CAISO and thus would not be eligible to receive fixed capacity payments from the CPUC's Resource Adequacy (RA) program. Instead, they would only receive the revenue they could bring as merchant facilities in the energy market in competition with other gas plants that already had their fixed costs covered outside the market. Since prices in the energy market are projected to decline as zero marginal cost renewables make up a growing share of the energy supply, the study concludes that these 4000-6000 MW of gas plants are at significant risk of early economic retirement. It is worth noting that most of these at-risk plants are significantly more efficient than and at least as flexible as Puente. It is also worth noting that because there will be a large surplus of existing plants chasing a limited requirement for the fixed capacity payments, capacity prices will be well below what is called cost of new entry or "CONE" that Puente is being paid under its CPUC approved PPA with Southern California Edison. Thus, the construction of the 262 MW Puente plant will only lead to the retirement of some other plant(s) of like capacity from that list of 4000-6000 MW at-risk plants, and there will be no net incremental capacity and no incremental flexibility on the CAISO grid after Puente is operational.

Thus, leaving aside for a moment the legitimate question of how to meet the LCR

need for the Moorpark area, Puente will be one of the highest cost facilities on the grid, will have no system capacity value, and no net renewable integration value. It is likely that the overall gas fleet dispatch efficiency will decline and more gas will be burned in the non-attainment area of California (specifically Oxnard). Thus, both criteria pollutant and greenhouse gas emissions will increase. There will also be more pressure to keep the natural gas storage facility at Aliso Canyon open and more pressure to invest in the natural gas pipeline infrastructure as gas burn becomes more concentrated in the Southern California urban coastal basin.

To add insult to injury, Puente will not even be very good at performing its single remaining duty of being on standby in case of the rare but otherwise serious loss of the major electric transmission corridor into the Moorpark area. At 262 MW on one large shaft, Puente will place all of the reliability eggs in one basket. That single large shaft was not designed for the quick start/fast ramp duty it will be called upon to perform. The GE Frame 7HA.01 turbine that Puente will use is designed to operate flat out at full load in so-called combined cycle mode for maximum efficiency as a "baseload" resource. It has a high "Pmin" (minimum generation) of some 85-90 MW, which risks crowding out and curtailing renewable energy with unnecessary gas. Although capable of relatively quick starts and of being "ramped" (accelerated and/or braked at less than full output), the long heavy shaft with tight blade clearances simply does not tolerate well the high thermal and mechanical stresses associated with the emergency starts, jamming on the accelerator and stomping on the brakes that this duty implies. The result will be higher "forced outage rates", i.e., failure to answer the bell when called—potentially leading to the very catastrophe the plant was designed to prevent. Puente will also entail higher

operating and maintenance costs and/or treating the plant conservatively when called upon such as slower starts in advance of the actual potential contingency event "just in case." At only slight risk of hyperbole, Puente could be compared to using a sledgehammer to crack a walnut.

The Preferred Resource Alternative

While the long arc of history has turned against natural gas in California, in the four years since the CPUC decision authorizing the procurement that led to the proposed Puente project, "preferred resources" (energy efficiency, demand response and renewable generation along with electricity storage) have gained strong momentum. When the 2012 Long Term Procurement Plan decision was issued, the CPUC recognized that the vision of preferred resources performing real essential reliability tasks needed official recognition and encouragement. By mandating that a relatively small but commercially significant fraction of the reliability need created in Southern California by the retirement of coastal once through cooling plants and the closure of the San Onofre Nuclear Generating Station be filled by preferred resources, it created the regulatory and market space to turn that vision into a near certainty by the end of the decade. Indeed, it is now a very strong possibility today in 2017. As CPUC President Michael Picker stated at the ribbon cutting for a new battery storage facility in Ontario: "I was stunned at the ability of batteries and the battery industry's ability to meet our needs. This was something I didn't expect to see until 2020. Here it is in 2017, and it's already in the ground."[8]

Consider the following events since the PUC's decision in the 2012 LTPP:

- The CPUC commissioned a study of the technical potential for Demand Response in California by Lawrence Berkeley National Laboratory. The study concludes

[8] https://www.greentechmedia.com/articles/read/aliso-canyon-emergency-batteries-officially-up-and-running-from-tesla-green

that there is sufficient technical and economic potential for LCR qualified demand response in the Moorpark sub-area at less than one-tenth the cost of Puente.[9]

- Southern California Edison conducted an LCR RFO in Orange County called the "Preferred Resource Pilot 2." The RFO led to contracts totaling 125 MW of preferred resources that satisfy LCR criteria. These contracts are now before the Commission for approval.[10] The Orange County area covered by the RFO is similar in size to the Moorpark sub-area.

- Investments in energy efficiency (AAEE) acquired under existing utility programs plus customer sited "rooftop solar" installations have combined to reduce the Moorpark area 10-yr ahead peak electric load forecast by 20% over the past three years[11] in the face of population expansion and economic growth. It should be noted that the quantity of installed and forecast rooftop solar installations is significant enough to move the peak load hours to later in the day as the sun is setting. Thus, additional solar installations from now on will have little additional effect on peak load for purposes of setting LCR need. However, new programs to implement the SB 350 mandate to cumulatively double energy efficiency savings are not yet in place. Technical potential studies conducted as an addendum to current CEC forecasts confirm that enough technical potential exists at acquisition costs below forecasted marginal electricity prices to achieve this doubling with current technology.[12]

- The CAISO conducted field trials to verify the ability of "smart inverters" to supply a range of essential reliability services relevant to the Moorpark LCR need.[13] Several of these inverters capable of supplying at least dynamic voltage support to mitigate voltage collapse have already been installed in the Moorpark region.

- On March 3, 2017, Southern California Edison issued an LCR RFO[14] for up to 55

---

[9] Demand Response Potential for California SubLAPS and Local Capacity Planning Areas an Addendum to the 2025 California Demand Response Potential Study, April 1, 2017 at 61.
[10] TN# 215438-2, A.16-11-002, Application of Southern California Edison Company for Approval of the Results of its Second Preferred Resources Pilot Request for Offers, November 4, 2016 at 2.
[11] CEC forecasts and CAISO forecasts derived from the CEC forecasts for the Moorpark region encompass slightly different geographic boundaries. Data presentation changes over the past four years as well as changes in how AAEE is accounted for make precise direct year-to-year comparisons difficult. The 20% number is an interpolation based on data presented in the 2014 CAISO TPP vs. the 2016 CAISO TPP.
[12] Guidance on interpreting the forecast and production cost model for energy efficiency, Tierra Resource Consultants, LLC, August 7, 2015 at www.lowcarbongrid2030.org.
[13] Using Renewables To Operate a Low-Carbon Grid, CAISO, First Solar, NREL, Jan 11, 2017 at www.caiso.com/about/Pages/News/Default.aspx.
[14] Goleta Area Request for Offers https://scegarfo.accionpower.com. The addendum to this report explains why SCE's recent suspension of the RFO does not affect the viability of the Preferred Resources Alternative outlined here.

MW of distributed resources in the "Goleta" sub-area to mitigate an N-2 contingency for the transmission corridor into Santa Barbara that is similar to the N-1-1 Moorpark contingency at issue here. Any resources acquired through this RFO would count against the Moorpark LCR need as well as the Goleta LCR need. Goleta represents roughly 15% of the Moorpark region customer load. Preliminary results will be available early this summer.

- As part of its 2014 Energy Storage RFO, Southern California Edison signed contracts for 15 MW/60 MWH of LCR capacity with a 20 MW/80 MWH battery storage facility at the Wakefield substation in Santa Paula.[15] 5 MW of this installation has already been energized and cost recovery approved under the Aliso Canyon Resolution to mitigate that gas reliability need.[16] This installation not only counts towards filling the Moorpark LCR need, but also supplies 20 MVAR of dynamic voltage support to the region that raises the reactive margin and additionally reduces the LCR need.

- Southern California Edison retrofitted two of its six new peaking plants (Center and Grapeland) with General Electric Enhanced Gas Turbine or "EGT" technology.[17] The EGT package is a modestly priced relatively small battery pack and a software/firmware package that not only increases the peaking plant's effective capacity to mitigate an LCR need, but, very importantly, increases the unit's flexibility and enables treating the entire facility as "spinning reserve" and adds significant dynamic voltage support *without* combustion. Each of these features contributes toward reducing an LCR need such as Moorpark and provides greenhouse gas-free essential reliability services consistent with the long-term State goal to decarbonize the electric grid. The McGrath peaker adjacent to the Puente site is an identical model gas turbine of the same vintage as the gas turbines at Center and Grapeland and could be retrofitted in the same manner.

- There are 45 MW of so called "slow response" DR in the Moorpark region.[18] This existing resource currently does not count towards mitigation of the LCR need because it takes longer than 20 minutes to activate. This activation time, along with the 10 minutes required to dispatch the resource following the contingency event, means that the resource is not available in time to meet the NERC/WECC/CAISO reliability standard of returning the system to a secure state within 30 minutes of the N-1 event. Therefore, it cannot be counted as mitigation of the LCR need. However, the EGT package retrofitted to the McGrath peaker has sufficient battery storage to be used to bridge that 10-30 minutes of time to activate the slow start demand response. Together the EGT package and the slow

[15] D.16-09-004.
[16] SCE Advice Letter 3454-E, August 15, 2016.
[17] A.17-03-XXX, March 30, 2017. Testimony in Support of Application of Southern California Edison Company for Recovery of Aliso Canyon Utility Owned Energy Storage Costs, Section B, at 46-51.
[18] CPUC, A.14-11-016, Exhibit No. ORA 7 Data Request Responses from Southern California Edison Company, Nov 1, 2016 at 34.

response DR add 45 MW of LCR mitigation that neither alone can provide. Alternatively, this 45 MW of existing DR could be paired with other new short duration battery storage, which together would mitigate the LCR need.

- On April 10, 2017, bids were due for Southern California Edison's so called "DRAM III" (Demand Response Auction Mechanism III) RFO to procure demand response resources in its service territory. Based on results of its DRAM II RFO last year and the dramatic year-to-year increases in quantity and reductions in price for preferred resources across all similar RFOs, it is highly likely that significant preferred resources capable of mitigating the Moorpark area LCR need will be swept up in this RFO. Preliminary results will be available this summer.

- The CAISO and the CPUC are conducting a joint initiative designed to develop clear tariff rules and practices to allow a significantly larger fraction of current Demand Response resources to count for LCR capacity under CPUC procurement rules. In addition, the objective is to significantly lower the cost of actually bidding DR resources into CAISO markets and expanding the availability of new customers for participation in new programs for mitigating an LCR need such as Moorpark. Two workshops have been conducted in this process and a third Workshop scheduled for mid-May will discuss preliminary results of studies designed to quantify the impact of this initiative for next year's RA procurement. Thus, results relevant to this AFC alternative will be available this summer.

Taken as a whole, the above events lend credence to President Picker's statement about the arrival of combustion free technology to resolve current reliability issues and demonstrate that a full Preferred Resource Alternative to Puente is a near certainty long before the scheduled retirement of the Ormond Beach and Mandalay 1&2 facilities in 2021 that triggers the LCR need. Indeed, there is a strong probability of this vision being a reality as early as this year.

However, "strong probability" and "near certainty" are not sufficient to mitigate a scenario of voltage collapse in the Moorpark region. There needs to be at least a short-term backup plan to ensure reliability pending full implementation of the technically available preferred resources. As detailed in the City's Opening Testimony filed earlier

this year,[19] that backup involves a short-term contract between Southern California Edison and NRG to keep the Mandalay 3 peaking plant active and available for LCR duty until the full implementation of the Preferred Resource Plan. As shown in that testimony, the addition of Mandalay 3 to the LCR toolkit means that the LCR need with retirement of Ormond Beach and Mandalay 1 & 2 in 2021 is 88 – 92 MW based on the CAISO annual Local Capacity Technical Analysis.

All of this means that, other than what is already in place and operational, the only remaining items required for having a viable 100% preferred resource alternative to the Puente project today is the following:

- Completion of construction at the Wakefield Substation battery storage facility in Santa Paula and approval for cost recovery by the CPUC for the last 5 MW.
- Successful conclusion of the current Goleta Preferred Resource RFO. Preliminary results will be available early this summer.
- Retrofit of the McGrath peaker with EGT technology and pairing this with existing slow start demand response in the Moorpark region.

Together these developments would add 120 MW[20] to mitigate the LCR need – more than enough to fill the open 88-92 MW of LCR need.[21]

Strengthening the Grid to Move Beyond Conventional Generation

As we have seen, although certification and construction of Puente would, on paper, resolve the immediate Moorpark sub area LCR need as Ormond Beach and

[19] 15-AFC-01 TN# 215439 Testimony of Jim Caldwell Regarding Project Need and Alternatives at 4.
[20] 20 MW from Wakefield, 45 MW from upgrading slow response DR to LCR compliant DR with the batteries at McGrath, 55 MW of LCR DR from the Goleta RFO.
[21] This proposal also assumes short-term contracting for power from Ellwood as well as Mandalay 3, which is permissible under SCE's AB 57 Bundled Procurement Plan authority. However, as discussed below, neither Ellwood nor Mandalay 3 are necessary in the long run to meet the Moorpark LCR need.

Mandalay 1 & 2 retire, it is an extremely expensive, environmentally destructive solution that runs counter to the State's long term goal of decarbonizing the electric grid. Under CEQA and long-standing and legislatively mandated CEC siting protocols, the Commission cannot certify its construction if there is a viable and superior alternative available. As we have also seen, such an alternative is in hand that is much less expensive, can be accomplished with less risk in a much faster timeframe, and is clearly environmentally superior—the Preferred Resource Alternative outlined above. However, that should not be the end of the story. The Preferred Resource Alternative, as well as the inferior Puente alternative, relies to some degree upon the continued operation of two, old, obsolete gas fired peaker plants in Ellwood and Mandalay 3. Although not necessary to the immediate implementation of the Preferred Resources Alternative outlined above, common sense and good engineering practice demand that any solution here also provide a plan that allows for the retirement of these facilities in the relatively near future (5-7 years maximum). Mandalay 3 is a forty seven year old first generation gas turbine that, by modern standards, is inefficient and highly polluting. It is located on prime ocean front real estate. Ellwood is a forty three year old first generation gas turbine that is nearly as inefficient and polluting as Mandalay 3. It is located near a residential area and a school.

However, the long-term goal of retiring all of the out-of-date generating stations at Ormond Beach, Mandalay, and Ellwood will require a solution that addresses the impact of removing synchronous generation on grid reliability. This challenge is not unique to the Moorpark subarea. As California moves toward ever increasing levels of preferred resource deployment and greenhouse gas reduction targets, alternatives to grid services traditionally provided by synchronous generation will need to be identified and

deployed. It is important to note that the current generation of "smart inverters" used as the interface with the grid for all of the distributed solar and battery installations contemplated do not supply this particular Essential Reliability Service and will not operate reliably without a minimum amount of synchronous equipment on the grid.

A very inexpensive and proven short term solution to the loss of synchronous generation is readily available and consistent with the transition to any permanent plan—the immediate retirement of Mandalay 1 & 2 and conversion of these now retired gas fired facilities to duty as synchronous condensers. This would provide, essentially for "free,"[22] almost 500 MVAR of rotating mass, significant short circuit current strength and dynamic voltage support to the Moorpark area grid during the transition to the Preferred Resource Alternative. A similar conversion of the Huntington Beach units 3 & 4, two retired gas plants in Orange County, formed a critical piece of the emergency package for mitigation of similar but much larger issues in southern Orange County/northern San Diego County with the closure of the San Onofre Nuclear Generating Station (SONGS) in 2012. Once the permanent solution for the LCR need is in place and tested, Mandalay 1 and 2 along with Ellwood and Mandalay 3 can be completely retired and the Mandalay site remediated for future uses more appropriate to prime coastal property.

Permanent solutions for the loss of synchronous generation are readily available at a fraction of the cost of conventional gas generation like Puente. First, stand-alone synchronous condensers can be installed anywhere in the Moorpark region where transmission access is available. This technology was first employed in Southern

[22] Conversion to synchronous condenser operation at Mandalay would directly cost less than $1M and its operation in this mode would reduce starts of gas facilities in the Moorpark region for voltage support or other reliability concerns, reduce transmission and distribution losses, and improve "reactive margin" reducing LCR need. These benefits would probably pay off the modest investment in less than one season.

California in the 1930s by the Los Angeles Department of Water and Power to allow the importation of electricity into Los Angeles from the newly constructed Hoover Dam without compromising the reliability that more expensive local generation. Eight large stand-alone synchronous condensers are under construction in southern Orange County/northern San Diego County to stabilize the electric grid in the hole created by SONGS closure and allow for the final retirement of Huntington Beach 3 and 4.

Second, today's gas turbine technology allows a choice of whether to operate a modern peaking plant such as McGrath as either a conventional generator or a synchronous condenser by installing a "clutch," similar to an automobile clutch, that, when activated, allows the generator to spin freely without the turbine. Thus the grid operator can choose between supplying real power that requires gas consumption and emissions of criteria pollutants and greenhouse gases, or simply reactive power and inertia to mitigate weak grid conditions. Alternatively, a new, smaller peaking plant at an inland location (such as Mission Rock)[23] or the inland sites identified in the Commission's March 10 order could be constructed with the same clutch technology. These options are both cheaper and more reliable than Puente.

Third, there is active R&D on solid-state electronic solutions to replace synchronous generation. The general problem is worldwide as decarbonization policy becomes ubiquitous. New products are being installed and tested in real grids in Hawaii and Germany and new, but commercially proven solutions are expected to be available for sale in the next 3 to 5 years.

To address these longer-term need issues and guide implementation of the Preferred Resource Alternative, CAISO, in conjunction with SCE, must first assess the

[23] *See* Docket No. 15-AFC-02.

strength of the Moorpark grid and sub-sections of that grid like Goleta where Ellwood is located with the retirement of Ormond Beach 1 & 2, Mandalay 1 & 2, Ellwood, and Mandalay 3, and with and without Puente. Such a study is termed a "transient stability and short circuit current duty" analysis. Studies like this are conducted annually in the CAISO Transmission Plan. All that is required is that this year's study accurately models all of the preferred resource elements as well as the retirement of the synchronous generation listed above. It is possible to conduct this study within the current schedule of the AFC proceeding or with minimal additional delay if commenced soon and given enough priority. Grid reliability is fine today and will be fine once the permanent solution is in place, but it must also be insured during the process. This study is required to define the precise needs not only at the end, but also along the way. Meanwhile, the operation of Mandalay 1 and 2 as synchronous condensers provides the rotating mass to back up the grid during the transition. This Commission, in conjunction with the same sister agencies and utilities has accomplished much more complicated efforts for designing mitigation packages for reliability concerns and expediting procurement and construction of the recommended facilities at least twice recently in response to the unanticipated closure of SONGS and the Aliso Canyon well blowout. The challenge of a low to no-carbon solution in Moorpark is equally important, but is much smaller and simpler.

Summary and Conclusions

Virtually everyone in this proceeding agrees that, eventually, "preferred resources" will take the lead role in providing Essential Reliability Services (aka ancillary services or "ERS") and that the current near monopoly of gas fired generation will slowly but surely surrender market share. However, given that there is today a very large surplus

of gas-fired generation in California the obvious first step in that process is to stop building new gas plants. The question before the Committee and the full Commission in AFC-15-01 is simply whether to draw that line before or after Puente. Three factors are at work here: (a.) the strong and growing momentum behind preferred resources' ability to reliably and cost effectively supply ERS such as the Moorpark LCR need, (b.) the relatively unique nature of the Moorpark LCR need (significant but manageable quantity, relatively rare number of hours when resources are required to respond, quantity set by voltage collapse which can be mitigated without the injection of "real" power -- meaning there are more non-combustion options available), and (c.) the poor technical fit of the specific machine proposed for Puente plus the terrible land use efficiency that Puente requires. The City of Oxnard maintains that the combination of these three factors clearly demands that the line needs to be drawn ahead of Puente and Certification of the project should be denied.

Puente is a 262 MW open cycle gas turbine that is proposed to fill a need that was last quantified at 242 MW. If certified and constructed, it will be one of the highest priced capacity resources on the system and confer no benefits to the electric grid other than mitigating the Moorpark LCR need. On the margin, it runs counter to the State's long-term plan for decarbonizing the grid. Puente is in direct conflict with the City of Oxnard General Plan and will require a specific Commission override in order to be certified.

On the other hand, roughly half of this 242 MW of capacity has already been identified, purchased and paid for from preferred resources and is going into service or procurement has been authorized and bids are being evaluated. The other half is in hand based solely on current technology at current prices and current regulatory processes.

This other half very well could be fully authorized and underway before the end of 2017 for a need that does not arise until the end of 2020. The incremental price for this other half is a fraction of the cost of Puente. If the Committee decides to purchase a second set of suspenders to go with that belt and suspenders, it does not need to immediately deny the Application—only defer the decision to complete the record for viability and cost effectiveness and environmental superiority of the Preferred Resource Alternative for a few months at most. The decision is clear.

James H Culver
Signature

April 26, 2017
Date