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STAFF REPORT

Mitigation Options for Contingencies Threatening Southern California Electric Reliability

California Energy Commission
Edmund G. Brown Jr., Governor



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Michael R. Jaske, Ph.D.

Lana Wong

Primary Authors

Michael R. Jaske, Ph.D.

Project Manager

Sylvia Bender

Deputy Director

ENERGY ASSESSMENTS DIVISION

Robert P. Oglesby

Executive Director

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ABSTRACT

The California Energy Commission, California Public Utilities Commission, California Independent System Operator, and California Air Resources Board are working together to track resource development and electricity demand, and are identifying contingency mitigation options, should they be required, to assure electric system reliability in Southern California. A preliminary plan was developed by an interagency staff team and presented at a 2013 Integrated Energy Policy Report workshop in September 2013. Like most reliability assessments, there are risks (contingencies) and solutions (mitigation measures). The mitigation measures developed as part of the plan are designed to guard against the contingencies of less savings from preferred resource development, delays or termination of planned generation additions, or delays or poorer performance than planned of Independent System Operator-approved transmission system upgrades.

This report is a work in progress for one part of the overall contingency project. It identifies two options for addressing projected deficits of resources compared to local capacity requirements. One option is short-term deferral of scheduled compliance dates for power plants that use once-through cooling technologies. A second option is developing a generating project that has already been permitted, but which has not been constructed because there is no approved power purchase agreement. Each option satisfies a specific pattern of resource shortfalls that threaten reliability. This effort would have a range of options available for deployment if projections for the total amount of resource capacity fall short of local capacity requirements in one or more of the Southern California local capacity areas.

Keywords: Electricity policy, contingency, mitigation measures, power plant permitting, local capacity requirements, reliability

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EXECUTIVE SUMMARY

Immediately following Southern California Edison's June 27, 2013, announcement closing the San Onofre Nuclear Generating Station, Governor Edmund Brown Jr. requested that energy agencies, utilities, and air districts develop a plan for replacement of the power plant and the assurance of electric service reliability in Southern California. The Energy Commission, California Public Utilities Commission, California Independent System Operator, and California Air Resources Board developed a preliminary plan and presented it at a September 9, 2013, workshop as part of the *2013 Integrated Energy Policy Report* proceeding.

The preliminary plan was a multipronged effort to satisfy California Independent System Operator estimates of resource requirements to assure reliability, as measured by local capacity area requirements. Local capacity areas represent portions of the electricity grid for which load cannot be fully satisfied by imports; therefore some resources must be located within the boundaries of such areas. For example, the California Independent System Operator has determined that the Los Angeles Basin is such a local capacity area, and within it in year 2025 about 8,300 MW of resources must be located and available to the Independent System Operator. Preferred resources (such as energy efficiency savings, renewable generation, and demand response programs) and conventional natural gas-fired generation were expected to be part of the resource mix. The preliminary plan was not finalized or adopted by any agency, but both the California Public Utilities Commission and the California Independent System Operator subsequently examined the issue in their respective proceedings and have made decisions compatible with the plan.

The California Public Utilities Commission has authorized procurement for Southern California Edison Company and San Diego Gas & Electric Company and has approved power purchase agreements for most of these resource additions. The Energy Commission is processing permits for a variety of proposed generation projects, some of which correspond directly to California Public Utilities Commission-approved power purchase agreements. The California Independent System Operator has authorized transmission system upgrades that address the voltage instability concerns created by the retirement of San Onofre Nuclear Generating Station.

However, reliability in Southern California rests upon close coordination between retirement of large amounts of fossil-fueled, once-through cooling power plants and the development of appropriate resources in locations needed to assure that local capacity requirements are satisfied. If this resource development continues as planned, reliability in Southern California would likely be assured. Accordingly, the energy agencies and the California Air Resources Board have been working collaboratively to track all types of preferred resource, conventional power plant, and transmission upgrade deployment and develop a contingency plan.

Contingency mitigation measures to ensure electric service reliability need to be developed that can be triggered if resource development expectations do not match requirements. A short-term measure is a possible request to the State Water Resources Control Board to defer compliance dates for specific once-through cooling facilities for which a specific new power plant, once it becomes operational, would allow retirement of the older facility. (*Once-through cooling* involves water that is withdrawn from a source, circulated through the heat exchangers of the power plant, and then returned to a water body at a higher temperature.) A longer-term option would be conventional power plant development relying upon facilities that have already obtained siting permits, but still require approval of a power purchase agreement to satisfy financial requirements and allow construction.

This staff report represents a work in progress to establish contingency mitigation options. It builds upon work described in the *2015 Integrated Energy Policy Report*. Two mitigation options have been developed:

- **Once-Through Cooling Compliance Date Deferral Option:** Use the process established by the State Water Resources Control Board to defer the compliance date for an existing generating facility until replacement resources are built and synchronized to the grid.
- **New Generation Construction Option:** Rely upon already-permitted projects.

Energy Commission staff prepared this report with input from the technical staff of the other agencies included in the Southern California Reliability Project.

CHAPTER 1: Background

The California Energy Commission, California Public Utilities Commission (CPUC), California Independent System Operator (California ISO), and California Air Resources Board (ARB), with input from State Water Resources Control Board (SWRCB), are developing a comprehensive contingency mitigation proposal to assure electric system reliability in Southern California.¹ Like most reliability plans, there are risks (contingencies) and solutions (mitigation measures). The mitigation measures developed in the plan will be available for implementation, if needed, to guard against the adverse reliability impacts resulting from scheduling delays for preferred resources, planned generation additions, or California ISO-approved transmission system upgrades. Mitigation measures will still follow approved processes for procuring electricity with appropriate transparency. As of the preparation of this report, two types of mitigation measures have been developed—short-term once-through cooling (OTC)² compliance date deferral for selected facilities and an option to develop a new conventional generator.³ Close monitoring of resource development and expectations for future development would be used to project whether local capacity requirements were likely to be satisfied and, if not, to recommend that one or more of the mitigation measures be triggered. This paper describes both mitigation options included in this overall contingency mitigation program.

This report is the most recent in a series of papers and reports.⁴ In previous papers, workshop presentations, and discussions with utilities and agency staff, other variants of new generator construction options have been described in conceptual terms, but they have received substantial criticism from reviewers and have been dropped. Three mitigation options were described in detail at the *2015 Integrated Energy Policy Report (2015 IEPR)* workshop held August 17, 2015.⁵ All options require a series of steps to get

1 A workshop providing an overview of the approach being developed and a status report on various elements was conducted on August 20, 2014, as part of the Energy Commission's *2014 Integrated Energy Policy Report Update* proceeding. See http://www.energy.ca.gov/2014_energy_policy/documents/#08202014.

2 *Once-through cooling* involves water that is withdrawn from a source, circulated through the heat exchangers of the power plant, and then returned to a water body at a higher temperature.

3 Initially, a focused renewable distributed generation program was proposed as a mitigation measure, but the CPUC chose to move forward and augment an existing program and develop the projects.

4 An initial draft dated October 2, 2014, was circulated to selected stakeholders, and initial comments were obtained through a series of teleconferences. This draft incorporates some of that feedback.

5 A workshop providing an overview of the approach being developed and a status report on various elements was held as part of the *2015 IEPR* proceeding. An Energy Commission staff paper was posted at http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-07/TN205700_20150812T141329_GasFired_Generating_Plant_as_Mitigation_for_Contingencies_Threa.pdf.

them to the point where they would “sit on the shelf” waiting to be triggered by contingencies.⁶ If triggered, then any remaining approvals necessary to allow implementation would have to be obtained. Other mitigation measures could be developed in addition to, or in lieu of, these two options.

Chapter 2 of this report describes the OTC deferral option.

Chapter 3 of this report describes the new generation construction option.

In a separate report, Energy Commission staff described an analytic tool to project whether there are expected annual surpluses or deficits from 2015 to 2025 in five regions of Southern California.⁷ This tool uses the results of California ISO studies of local capacity requirements for key study years as inputs to make projections of surpluses or deficits for intervening years.⁸ The OTC compliance deferral option seems appropriate to use when there is a short-duration deficit linked to a specific cause, for example, schedule delays for a power plant under construction. Such deferral requires the approval of the SWRCB. The new generation construction option seems appropriate to use when long-term deficits are projected due to changed expectation of peak loads and success of demand-side management programs. If this option were triggered, then any final permitting and power purchase agreement (PPA) approval would be completed, and construction would start as quickly as possible.

6 These generator mitigation options could be viewed as an insurance policy that would be used only as a last resort in the event of contingencies.

7 Jaske, Michael R. and Lana Wong. 2015. *Assessing Local Reliability in Southern California Using a Local Capacity Annual Assessment Tool*. California Energy Commission. Publication Number: CEC-200-2015-004. http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-07/TN205657_20150807T153238_Absessing_Local_Reliability_In_Souther_California_Using_A_Local.pdf.

8 A fresh analysis using this tool has been completed and an updated report is in preparation as background document for the planned August 29, 2016, workshop in the *2016 IEPR Update* proceeding.

CHAPTER 2:

Once-Through Cooling Compliance Date Deferral

This chapter describes the OTC compliance date deferral option that was developed as part of the overall contingency mitigation program. The initial approach was outlined orally by SWRCB staff at a *2014 IEPR Update* workshop⁹ and a subsequent discussion among SWRCB, California ISO, and Energy Commission staff on September 4, 2014. The detailed descriptions in this chapter are consistent with a staff presentation at a *2015 IEPR* workshop held August 17, 2015.¹⁰

Due to the foresight of the SWRCB, the adopted OTC policy recognizes the possible conflict between aggressive OTC compliance dates and electric system reliability. Two mechanisms for changing OTC dates are built into the policy:

- 90-day emergency – automatically granted based on California ISO request with concurrence of Energy Commission and CPUC.
- Longer-term delays recommended through Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS), which require an amendment to the policy by SWRCB.

In the context of electricity planning, only the second option makes sense. Energy agencies should not wait until an emergency erupts. Rather, the shared electricity planning processes should be used to develop solutions to possible problems. Given that SWRCB specifically created SACCWIS to review reliability-based rationales for deferring compliance dates, SACCWIS should be the mechanism used if the member agencies of the Southern California Reliability Project believe that a deferral request should be made to SWRCB.

This chapter details how this opportunity for compliance date deferral could be implemented so that, when such a deferral request seems desirable, the steps and timeline for the request are understood. Although most of these steps are within the domain of the SWRCB, establishing the financial arrangements that enable an OTC facility to run have to be resolved within the processes available to the CPUC or California ISO.

9 Presentation by Chief Deputy Jon Bishop, SWRCB, to the Energy Commission's *2014 IEPR Update* workshop held August 20, 2014. The essence of this approach was presented at the August 17, 2015, *IEPR* workshop.

10 Energy Commission's *2015 IEPR* workshop presentation.
http://doCKETpublic.energy.ca.gov/PublicDocuments/15-IEPR-07/TN205727_20150813T151857_Projection_Tool_to_Support_Contingency_Mitigation_Decisions_by.pptx

Basic Approach

Any compliance date deferral request has to consider:

- (1) What the SWRCB might be willing to consider.
- (2) Additional requirements that may be triggered by delaying the compliance date.
- (3) The timeline needed to develop, submit, and process a deferral request.

Suggested Framework for a Successful Request

Discussions with SWRCB staff clarified some common-sense considerations in proposing a compliance date deferral that could be expected to reduce the scope of issues that SWRCB would have to address in evaluating the request.

Be Specific: A deferral request should be limited to a specific facility or even units within such a facility, and a request should clearly identify the need for a deferral and the solution that will enable compliance. An OTC facility for which a delay is requested because a replacement facility under construction will not come on-line in time is straightforward. It is evident that an end to OTC usage is in sight when the deferral request is made and will actually occur once the replacement facility comes on-line.

Assure Compliance: Any reasonable request should clearly identify how compliance will be achieved. OTC facility delay requests due to unexpectedly slow development or unforeseen difficulties in recruiting participants in preferred resource programs would be harder for the SWRCB to evaluate since it may be unclear how to solve the problem. SWRCB staff members are not energy experts or preferred resource development experts. A deferral request predicated on the desire for additional time to develop preferred resources should identify a credible, time-specific benefit for the delay.¹¹

Use the Existing Process: A request should be presented to the SACCWIS and if SACCWIS is supportive, it should report its recommendations to the board. SACCWIS was created by SWRCB to assure that any compliance requests were considered in light of the knowledge and expertise of energy agencies and other state agencies with coastal responsibilities.

Be Timely: The OTC policy is equivalent to a regulation and there are mechanisms in place to assure public input into development or revision of a regulation. The request should be submitted at least a year in advance of the compliance date for the facility in question.

¹¹ The environmental benefit resulting from the 2011 Los Angeles Department of Water and Power (LADWP) request for delays was LADWP's agreement to design all replacement facilities using dry-cooling technologies, thus reducing ocean water usage beyond Track 1 requirements.

Additional Factors to Consider

Requests for deferral of compliance dates beyond December 31, 2022, will trigger additional mitigation measures, including evaluation of screening technologies. In early stages of OTC policy implementation 2015 was established as the deadline for completion of these evaluations so any deferral past December 31, 2022 suggests this deadline would need to be changed. Consideration of a deferral request requires careful review; namely whether a delay creating additional mitigation is necessary, since the mitigation measures may not be cost-effective for a short-term deferral.

Steps for a Deferral Request

Developing the rationale for, preparing needed documentation about, and processing a deferral request involves many steps. One group of steps is preparing new analyses or adapting existing analyses that justify a deferral request for reliability reasons. A second group focuses on the public process of a SACCWIS request. A third group includes all the steps necessary for the SWRCB to review, consider, and act upon the request.

Group 1 Steps: Analysis and Documentation

Group 1 steps are undertaken by technical staff of the energy agencies. Appropriate reliability studies are conducted and interpreted for possible OTC unit deferral, and a draft report for SACCWIS to consider is prepared. Steps include:

- Preparing analyses and draft documentation by staff of Southern California Reliability Project's participating agencies.¹²
- Reviewing by technical staff of SACCWIS agencies using the Inter-Agency Working Group process.¹³
- Preparing the draft report by the Inter-Agency Working Group for SACCWIS consideration. (Preparation of the report and supplemental materials could take 5-6 months.)

Group 2 Steps: SACCWIS Consideration

Group 2 steps involve the consideration of a proposed report by SACCWIS and its ultimate recommendations to SWRCB. Steps include:

- Noticing for a SACCWIS meeting, releasing a draft report, and providing opportunity for public comment (30 days).¹⁴

¹² The circumstances of each specific OTC facility might require different amounts of time to develop an appropriate deferral interval and to document that persuasively. If new, complex analyses are required, 4-6 months might easily be required.

¹³ The Inter-Agency Working Group is a technical staff body whose members are drawn from the SACCWIS agencies.

- Conducting the SACCWIS meeting to review the draft report, receiving comments and proposed changes, and making revisions in response to comments¹⁵ (45 days).
- Submitting the final SACCWIS report to SWRCB.

Group 3 Steps: SWRCB Staff Review and Board Consideration

Group 3 steps¹⁶ are conducted by SWRCB staff and include the staff and the board reviewing proposed change(s) to the OTC policy, making decision(s), and packaging any changes in conformance with Office of Administrative Law (OAL) requirements. Other steps are:

- Reviewing and preparing the staff report and proposed change(s) (2 months).
- Noticing the public and announcing the comment period (60 days).
- Responding to comments (30 days).
- Noticing the board meeting to consider the amendment(s) (30 days).
- Conducting a public hearing with presentations by staff and interested parties, and board discussion (the board meets twice per month).
- Preparing a revised amendment, supporting staff report, and board decision on revised amendment (60 days).¹⁷
- Packaging any modification of OTC policy for OAL review (60 days).
- OAL review and approval (30 working days).

The total time from publication of a draft SACCWIS report to OAL approval is about 12 months.

This process needs to be concluded sufficiently in advance of the original OTC compliance date so that the generator owner/operator has enough time to conduct any maintenance that had been deferred on the belief that the facility was going to shut down on the original OTC compliance date.

14 To date, documents prepared for SACCWIS meetings have not been subject to a comment period. Creating a comment opportunity assures that SACCWIS has not acted without considering all views.

15 The Inter-Agency Working Group may assist with developing responses to comments for SACCWIS review.

16 The Group 3 Steps could be streamlined by as much as 60 days. For example, the SWRCB response to comments could be shortened depending on the number of comments, or the hearing and adoption could occur on the same day.

17 This step is not expected for a simple adjustment to the compliance date for a facility. More complex changes may require a formal amendment.

Once-Through Cooling Facility Contracting Issues

If the SWRCB approves a deferral request and the power plant, or some of the related units, continues to operate, the facility owner/operator still requires a mechanism to recover its costs of operation. There are two options:

- (1) A power purchase agreement (PPA) between one or more investor-owned utilities (IOUs) that would be approved by the CPUC.
- (2) A reliability-must-run (RMR) contract between the facility and the California ISO.¹⁸

The following sections identify contracting questions that need to be resolved before the OTC deferral option can be considered complete.

Potential CPUC Contracting Issues

For most contracts for energy or ancillary services other than short-term market purchases, the CPUC requires an IOU to prepare and submit a PPA to the CPUC for approval.

To encourage IOUs to find non-OTC power generation sources, the CPUC adopted restrictions and benefits demonstration requirements in D.12-04-046.¹⁹

...[W]e will allow contracts to extend beyond the SWRCB OTC compliance date, but only if such contracts: 1) allow for utility purchase or receipt of power generated by a unit using non-compliant OTC only up to the SWRCB OTC policy compliance date in effect on the date the contract is signed. The contract shall not allow the utility to continue to purchase or receive power generated using non-compliant OTC beyond that date even if SWRCB extends the compliance date; 2) protect utility ratepayers against stranded costs; 3) protect ratepayers against the risk of future unspecified cost increases resulting from increases in the cost of the generation unit compliance with the SWRCB OTC policy. For a utility to recover such cost increases from ratepayers it must obtain the necessary approval from the Commission; 4) are consistent with a need authorization from the System Track of the Long Term Procurement Plan proceeding; and 5) are consistent with other procurement rules, including this decision's requirement to file either a Tier 3 Advice Letter or an application. (pp. 26-27)

Item 1 of these restrictions and benefit demonstration requirements needs to be interpreted by the CPUC to determine whether it precludes deferring the compliance date of an OTC facility as proposed in this paper. If the SWRCB OTC policy compliance

18 An RMR contract between the California ISO and a generating facility is used when the ISO has determined that a resource is needed to satisfy one or more elements of local reliability, and the power plant is unlikely to continue to operate solely with the revenues it can earn in normal market mechanisms.

19 CPUC, *Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans*, April 19, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/164799.PDF

date is extended before the utility enters into a contract with the OTC, will the contract meet the demonstration requirements?²⁰

Assuming the CPUC is willing to support the concept of a PPA for the period between the original OTC compliance date and the extended date, at least three questions must be answered so that an OTC compliance date deferral mechanism can be fully understood as part of the suite of contingency mitigation measures:

- (1) Are the costs of obtaining a resource adequacy reliability contract with the owner/operator to be borne strictly by the incumbent IOU's bundled service customers or allocated to all load-serving entities with load in the applicable service area?
- (2) How long will it take the CPUC to approve such a PPA?
- (3) Is it necessary to delay the maintenance needed to extend the operation of a facility reliably beyond the original OTC compliance date until both CPUC and SWRCB regulatory actions have been completed, or is the SWRCB agreement to defer the compliance date sufficient for the owner/operator to undertake needed maintenance?

Potential Reliability-Must-Run Contracting Issues

Before developing the resource adequacy process, the California ISO entered into RMR contracts with key generators. The tariff authority to do so exists, and there are now RMR contacts with a small number of plants. The California ISO RMR tariff authorizes two conditions of arrangement. Condition 1 contracts pay a fraction of the fixed costs of the facility, but the facility is allowed to participate in the California ISO markets and keep any revenues earned. The fraction is negotiated. Condition 2 contracts reimburse the facility for all fixed and variables costs. In both instances, the California ISO costs are paid by the entities benefiting and, if these are IOUs, they would presumably have to assure that CPUC cost-recovery mechanisms covered this type of cost. This could require some action by the CPUC.

Cost Recovery

Either CPUC-approved PPAs or California ISO RMR contracts require a determination of which end users are benefiting and who should pay any costs incurred. California ISO local capacity studies suggest that the combined Los Angeles Basin/San Diego area affected by the San Onofre Nuclear Generating Station (San Onofre) retirement is influenced by capacity in either San Diego or in the Los Angeles Basin. Local effectiveness studies have shown that facilities in San Diego are more effective than those in the Los Angeles Basin, and effectiveness diminishes the farther north such

²⁰ In making a decision about a specific PPA, it is possible that the CPUC could decide to bypass these requirements for that PPA or any other PPA with the same circumstances.

plants are located from the San Onofre site. Thus, if a PPA approved by the CPUC is selected, then either ratepayers of San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE), or both could be impacted to the degree there is a difference in the costs that would have otherwise been incurred for resources that did not materialize and for which reason the OTC extension is required. An RMR contract approved by the California ISO could extend cost recovery to additional CPUC-jurisdictional load-serving entities, as well as POUs within the affected portions of the California ISO control area. The California ISO has a complex settlement process that allocates many narrowly defined types of costs to specific entities, so the allocation of any capacity or operating costs to specific categories of end users may create few or no problems.

CHAPTER 3:

New Generation Construction Option

This chapter describes a new generation construction option as another element of the overall contingency mitigation proposal. It identifies the preferred choice as selected from three alternative generator-based mitigation options by the joint agency team as presented at the August 17, 2015, workshop in the 2015 IEPR proceeding.²¹ The preferred choice focuses on the existence of a small set of power plants that have received preconstruction permit approval, but an IOU/developer PPA has not been signed nor has CPUC approval been obtained.²² This preferred choice, like all options, requires a series of steps to get it to the point where it would “sit on the shelf,” waiting to be triggered by contingencies.²³ Only some contingencies would likely justify triggering development of such new generation. Once triggered, any final permitting and PPA approval would be completed, and construction would start as expeditiously as possible.

A few specific steps required to finalize this preferred choice are not fully understood, especially the possible need for action by the CPUC to modify its PPA approval process, but there may be some time savings by IOUs acting upon the language of the March 2014 Decision in the 2012 Long Term Procurement Plan (D.14-03-004, Section 5.4, page 102) relative to Contingency (Options) Contracts.²⁴

Proposed Approach

The proposed approach relies upon three sequential steps to identify a pool of eligible projects, finalize any permits and contractual arrangements, and construct the plant. **Table 1** provides detail and a timeline for each step.

21 Jaske, Michael R. and Lana Wong. 2015. *Gas-Fired Generating Plants as Mitigation for Contingencies Threatening Southern California Reliability*. California Energy Commission. CEC-200-2015-005. http://doCKETpublic.energy.ca.gov/PublicDocuments/15-IEPR-07/TN205700_20150812T141329_GasFired_Generating_Plant_as_Mitigation_for_Contingencies_Threa.pdf.

22 “Preconstruction permit” is used to differentiate from other permits that may be needed once the plant is operating.

23 These generator mitigation options could be viewed as an insurance policy that would be used only as a last resort in the event of contingencies.

24 CPUC D.14-03-004, Section 5.4, reviews SCE’s proposal for contingent contracting authority. It outlines a series of questions that the CPUC might ask if SCE submitted such a proposed contract for approval. The decision authorizes SCE and SDG&E to submit contingent contracts and highlights the requirement that the utility must fully address the questions in any such application.

Step 1: Monitor Pool of Projects

The Energy Commission and ARB staff would monitor the status of all permitted projects in the San Diego and Los Angeles Basin load pockets and maintain an updated list.²⁵ **Table 2** provides a preliminary list of projects that are permitted or that might qualify for inclusion in the pool should the permitting processes for these projects be completed satisfactorily. Since previous discussions with air permitting agencies have made clear that air preconstruction permits have a finite life, ongoing monitoring and coordination with air district staff would be necessary to determine whether, or to what extent, such permits can be extended and still remain valid. For those permits nearing expiration dates, it may be necessary to request that the developer submit permit extension requests or re-engage the permitting process to update the original preconstruction permit.

Discussions with air permitting agencies suggest that two extensions would be possible before a major review akin to a re-submittal of the permit application would be required. It is likely that the preconstruction permit life of each project and any extension requests will need to be evaluated on a case-by-case basis. Permit life and extension requests for projects that have multiple phases with one phase constructed and the second phase pending have a unique set of circumstances and will need to be evaluated case-by-case. Clearly this would add to the costs that a generator has to front with no clear path to cost recovery if the project is never built.

Step 2: Project Selection and Approval (If Triggered)

This step involves selecting a specific generator from the pool of eligible projects, assuming that a reliability issue has been identified and that choosing the new generation option is the solution selected by decision makers.

First, the pool is reviewed to determine that the valid permits exist. The passage of time may require that all projects in the pool demonstrate that one or more permit conditions continue to be satisfied to assure compliance with all applicable laws, ordinances, regulations, and standards to obtain a valid preconstruction permit. A specific element of an approved preconstruction permit may have to be updated. One or both of these conditions may have to be satisfied. A demonstration may have to be made that only ministerial steps are required to finalize the permit. The project developer essentially has to interact with the permitting authorities one final time. There is a set of projects capable of going forward expeditiously to be constructed if selected and a PPA approved by the CPUC.

²⁵ It is possible that projects near the end of the permitting process might be worth including in the pool, since such projects could complete the permit while the PPA was being reviewed by the CPUC. Of course, since permitting conditions might not yet be finalized, costs to the developer would not be fully known.

Second, the IOU has to conduct a request for offer (RFO) from among this pool of eligible projects to select the specific one to go forward to the CPUC for PPA approval. The IOU and selected developer have to negotiate a proposed PPA. The PPA would have to be submitted to the CPUC for review and approval.

Step 3: Actual Project Development (If Triggered)

This step would commence immediately upon receipt of an approved PPA from the CPUC. All the usual project construction steps would be required before the project would be operational.

Table 1 provides a step-by-step description and estimate of the elapsed times required for each of the three steps of this preferred approach.

Table 1: Key Steps for the Proposed New Generation Option

Step	CEC or CPUC Activity	Developer or IOU	Time Required
Step 1: Monitor Pool of Projects With Permits			
Periodically Monitor Status of Projects	CEC would periodically review all projects in permitting processes, and those with final permits, to determine pool of projects by local capacity area and technology		0 months
Step 1 Total			0 months
Step 2: Project Selection (If Triggered)			
Trigger Contingency Measure	Interagency decision to proceed and initiate processes in affected agencies		3 months
Verify Pool of Projects Have Valid Permits or Expectation of Obtaining One	CEC and ARB review projects in pool and determine whether all needed permits remain valid	Developers may need to interact with CEC and ARB or local permitting agencies	1 month
Issue RFO		IOU tweaks already developed RFO and issues it to pool of projects provided by CEC	1 month
Solicit and Select Developers		IOU reviews bids and selects developer(s)	3 months
Review Permit Status of Selected Project		Permitting agencies determine whether selected project requires any permit changes, if so, the developer submits permit to amend (PTA)	0-3 months

Step	CEC or CPUC Activity	Developer or IOU	Time Required
		and modifications to ATC ²⁶	
CEC Completes PTA Review, and Air District Completes ATC Review	CEC reviews and approves PTA with conditions (and air district approves project with its conditions)		0-6 months ²⁷
PPA Prepared and Submitted		Developer and IOU negotiate/submit final PPA	3 months
Revised PPA Approved	CPUC reviews and approves PPA with modifications and/or conditions		3 months ²⁸
Step 2 Total			14-23 months

Step 3: Actual Project Development (If Triggered)			
Project Development Launched	CEC CPM signs off start of construction letter and CPUC approves go-ahead for project	Developer completes construction plans and receives preconstruction approvals	3 months
Equipment Ordering		Project developer orders equipment from suppliers	2-3 months
Construction		Project developer and construction team build a power plant	12-24 months ²⁹
Final Testing and Acceptance		Project testing results in commercial project	1-2 months
Construction Concludes	CEC CBO issues certificate of occupancy	Developer team completes project	3 months
Step 3 Total			21-35 months

Source: California Energy Commission staff

26 Three types of projects may be in the pool when the contingency is triggered: (1) a project with a valid preconstruction permit that meets the needs of the RFO; (2) a project that is nearing permitting process completion to get a preconstruction permit; and (3) a project that already has a valid preconstruction permit but requires modifications to meet the RFO terms and therefore the preconstruction permit needs to be amended.

27 The length of time depends on whether any change in permit is required, and if so, the extent of the change. A project with a permit in hand and no changes required would skip this step.

28 This elapsed time assumes CPUC has established an expedited process for a contingent resource PPA justified by the reliability concerns in Southern California.

29 This range reflects the difference between a peaker (12 months) and a combined cycle (24 months).

Concept Implementation Issues

The following concept implementation issues are yet to be resolved:

- Is the idea of a pool of projects with preconstruction permits but without PPAs a valid, ongoing concept or is it viable for a short period as an aberration from the likely project development pattern? If it is an aberration, can it still be a useful approach until projected supply and demand in Southern California (4-5 years ahead) can be restored to “normal” levels?
- To what extent will a permit issued by the Energy Commission for a generator project on the shelf still be valid if it is triggered several years following approval? Is it appropriate to take into account the expected use of that permit (including timing thereof) as a resource contingent on a reliability shortfall in permit conditions themselves? To the extent that the Energy Commission permit does not substitute for permits of other agencies, how long will agency permits be valid?
- Will it be necessary to provide cost recovery to generators to induce them to update air preconstruction permits so that the projects within the pool remain fully permitted? If so, what regulatory mechanism would accomplish this?
- A project that requires a Prevention of Significant Deterioration permit and is located in a non-delegated air district may encounter re-permitting requirements earlier than one that did not, based on current U.S. EPA policy regarding extension of Prevention of Significant Deterioration permits under 40 Code of Federal Regulations 52.21(r)(2).³⁰

Preliminary Assessment of the Preferred Approach

The proposed approach is different from previous options in how a project is conceived, designed, located, and approved. Rather than purposefully developing projects designed to satisfy a specific reliability contingency, the preferred approach relies upon the “normal” power plant development process. A developer conceives of a project, acquires site control, and initiates the permitting process with the Energy Commission or other appropriate licensing authority without direct guidance from IOUs or agencies. For a project to be considered for this approach, it either receives a final construction permit or is so close to getting one that only ministerial steps remain. A limited pool of such projects exists at any point in time. **Table 2** provides an initial listing of potential projects.

³⁰ <https://www.epa.gov/sites/production/files/2015-07/documents/extend14.pdf>.

Table 2: Hypothetical Pool of Projects (Permitted or Now in Permitting Pipeline)³¹

Project Name	Capacity	Location	Expected Date Permit Granted	Nominal Date Permit Expires	Permit Status
Carlsbad, Unit 6	100MW	San Diego	October 2015	October 2017	Permitted in October 2015 by the CEC as part of NRG's 600 MW Carlsbad project
Huntington Beach, Phase 2	200MW	Orange County	Fall 2016	Fall 2018	In CEC AFC permitting process as part of AES's 840 MW Huntington Beach project ³²
Alamitos, Phase 2	400MW	West LA Basin	Fall 2016	Fall 2018	In CEC AFC permitting process as part of AES' 1,040 MW Alamitos project ³³

Source: California Energy Commission staff

Minimizing Elapsed Time After Triggering: The preferred approach takes the least amount of time compared to other options considered in earlier versions of this working paper series; it bypasses the project development and permitting steps by limiting participation to projects with approved permits. This feature is important because a reduction in the elapsed time from the point that reliability concerns cause a project to be triggered until this project is commercially operational reduces the need to rely upon analyses of the future with increasingly uncertain conditions.

Costs: There is no reason to believe that a power plant constructed using the preferred approach will cost substantially more or less than other approaches. It was selected to provide capacity and energy as a result of a normal IOU procurement effort. It is possible that some relatively small costs will be incurred to undergo permit “refreshing” efforts to assure that a project in the pool remains ready to start construction when a PPA is approved.

Flexibility of Project Design and Location: The preferred approach, which depends upon a small set of projects already permitted (thus fixed by location and generating technologies), is not especially flexible. Only chance will determine whether one project

31 AES' Redondo Beach repowering project - a suspending AFC project at the Energy Commission - is excluded because of the apparent intent by AES to remove the existing facility and develop the land as commercial real estate.

32 Only the 640 MW combined cycle is part of the SCE/AES PPA approved by the CPUC.

33 Only the 640 MW combined cycle is part of the SCE/AES PPA approved by the CPUC.

in the pool would address specific thermal overload or voltage instability issues as effectively as a project that would be custom-designed to address a specific problem. The results of California ISO power flow studies identify different system problems in each of the California ISO's annual studies of local capacity issues. Sometimes, the California ISO determines that the limiting contingency involves a broad area and that the specific location of a mitigating power plant is not critical. In other instances, the California ISO finds that specific transmission lines are overloaded. These concerns have been voiced in the assessments of the problems resulting from retirement of San Onofre or the more general issue of fossil OTC power plant retirement. Therefore, it is possible that all facilities in the pool of projects have features that are desirable mitigation for some contingencies but are a less than optimal mitigation for other contingencies.

The preferred approach depends upon a match between projects selected by a developer and the reliability needs of Southern California. Since most of the likely sites are former OTC power generation facilities, there may be some match, but it might not be optimal for any specific reliability problem.

Modifications to California Energy Commission Permitting or CPUC Power Purchase Agreement Approval Processes

Implementing the preferred approach seems to require little, if any, change to existing Energy Commission power plant permitting practices. Some changes by the CPUC may be required to allow an IOU to select a project from a limited pool of eligible projects and for the CPUC to process a PPA application in the time frame desired herein. Several issues need to be considered:

1. In recent procurement decisions, the CPUC has directed IOUs to conduct all-source Request For Offers, and that guidance seems incompatible with the specialized nature of this contingency mitigation approach.
2. Typically, the CPUC takes a year or more to approve a PPA for a major gas-fired power plant, and that timeline works against the accelerated time frame desired for this specialized contingency mitigation approach.
3. No example has been identified in which the CPUC authorized payment to a generation developer simply for undergoing necessary permit updating costs. Normally these would be the responsibility of the project developer and recovered as part of the bundled price negotiated between project developer and the IOU. However, in this instance, payments may be necessary to induce project developers to make additional expenditures over time to keep preconstruction permits updated. In the context of this contingency mitigation approach, projects will likely never go forward to construction, and thus, the developer will never have an opportunity to recover any of its project development costs.

The CPUC may wish to consider some modest modifications to its bundled resource procurement rules to clarify that projects going forward as a resource triggered by

reasonably expected reliability concerns will be treated in the manner needed to have a replacement resource on-line in a very short timeline compared to normal procurement practice. Both the IOU RFO design and selection effort and the intervener community expectations about participation in the review/approval process would benefit from clarification of the PPA processing considerations.

Next Steps

The preferred approach discussion in this report is similar to that in earlier versions of this series. Following the August 17, 2015, *IEPR* workshop, joint agency staff determined that this approach (then called Option 3) had the fewest difficulties of the three options then under consideration. This newest iteration fleshes out the preferred approach selected by the joint agency team from three options for creating a generator mitigation measure.

Further discussions with the air districts in which these facilities would be located—the South Coast Air Quality Management District and the San Diego Air Pollution Control District—would be beneficial. This paper will be the basis for a presentation and discussion at a workshop on Southern California Reliability to be held as part of the *2016 Integrated Energy Policy Report Update* proceeding in summer 2016. Comments received at the workshop could be useful to refining this approach.

Acronyms and Abbreviations

Acronym/Abbreviation	Original Term
<i>2015 IEPR</i>	<i>2015 Integrated Energy Policy Report</i>
AFC	Application for certification
ARB	California Air Resources Board
ATC	Automatic temperature compensation
California ISO	California Independent System Operator
CBO	Congressional Budget Office
CPM	Capacity procurement mechanism
CPUC	California Public Utilities Commission
Energy Commission	California Energy Commission
<i>IEPR</i>	<i>Integrated Energy Policy Report</i>
IOU	Investor-owned utility
MW	Megawatt
OAL	Office of Administrative Law
OTC	Once-through cooling
PPA	Power purchase agreement
PTA	Permit to Amend
RFO	Request for offer
RMR	Reliability must run
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
San Onofre	San Onofre Nuclear Generating Station
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
SWRCB	State Water Resources Control Board