

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
Agenda ID 15744
ENERGY DIVISION **RESOLUTION E-4840**
June 15, 2017

R E S O L U T I O N

Resolution E-4840. Authorizing Southern California Edison to develop and implement a microgrid demonstration project with the United States Department of Defense at the United States Army National Training Center, Fort Irwin, California.

PROPOSED OUTCOME:

- Approves Southern California Edison's requested relief in Advice Letter 3510-E, with certain modifications, to develop and implement a microgrid demonstration project with the United States Department of Defense at the Army National Training Center, Fort Irwin, California.
- Approves Southern California Edison's requested relief to expand its normal functions under Rule 2.H. to support the construction of the microgrid, as well as to control various aspects of the generation connected to the microgrid when in island mode.¹
- Southern California Edison will submit three reports on its findings regarding the design, installation, operation, control and management of microgrid systems after one, three and five years of operating the microgrid. These shall be filed with the Commission as information only Tier 1 Advice Letters.

¹ "Island mode" or "Islanding" refers to "[a] condition on Distribution Provider's Distribution System [SCE in this case] in which one or more Generating Facilities delivers power to Customers using a portion of Distribution Provider's Distribution System that is electrically isolated from the remainder of the Distribution Provider's Distribution System." See SCE Rule 21 at Sheet 17. As applied with respect to the microgrid project here, "island mode" refers to the operating condition when Distributed Energy Resources (DERs) and interconnected loads act as a single controllable entity without connection to SCE's grid.

SAFETY CONSIDERATIONS:

- Southern California Edison shall operate the microgrid facilities in accordance with prudent and safe electrical practices.
- The microgrid's installation may have ancillary safety benefits for Fort Irwin residents and staff by improving the reliable provision of electricity to Fort Irwin.

ESTIMATED COST:

- This Resolution will not result in any additional costs to ratepayers. The costs for the installation, operation, and maintenance of the microgrid infrastructure will be the responsibility of the Department of Defense. Any control operation costs as well as other operations and maintenance costs will be paid by the Department of Defense as part of Southern California Edison's routine billing for electricity service as line items on the customer's bill.

By Advice Letter 3510-E, Filed on November 16, 2016.

SUMMARY

This Resolution approves Southern California Edison Company's (SCE's) requested relief in Advice Letter (AL) 3510-E to: (1) develop and implement a microgrid demonstration project with the United States Department of Defense (DOD) at the United States Army National Training Center (NTC), Fort Irwin, California, and (2) expand its normal functions under Rule 2.H.² to support the construction of the microgrid, as well as to control various aspects of the generation connected to the microgrid when in island mode. Southern California Edison will submit three reports on its findings regarding the design, installation, operation, control and management of microgrid systems after one, three and five years of operating the microgrid. This Resolution does not authorize any rate-payer funding for the microgrid—the costs for the installation,

² Rule 2.H. outlines the description of service of added facilities.

operation, and maintenance of the microgrid infrastructure will be the responsibility of the DOD. The microgrid's installation will be pursuant to a standard Added Facilities Agreement ("AFA") to be executed between SCE and the DOD. Any control operation costs as well as other operations and maintenance costs will be paid by the DOD as part of SCE's routine billing for electricity service as line items on the customer's bill.

BACKGROUND

Fort Irwin is an Army base located 32 miles east of Barstow in northern San Bernardino County, California. The base is located on federal land, under the jurisdiction of the DOD and the U.S. Army and is within SCE's service territory. Fort Irwin experienced three major outages exceeding twenty hours over the last five years which threaten the base's energy resilience and mission-critical activities.

The DOD has an established objective to enhance resilience at its bases. In August 2016, the DOD made recommendations to enhance energy resilience and encourage cost-effective solutions that improve mission readiness, including planning of large and small scale microgrids. In October 2016, the Commander of the NTC and the U.S. Army Garrison Commander at Fort Irwin requested the assistance of SCE "to develop and install a micro-grid system [at Fort Irwin] to provide a reliable source of energy during prolonged power outages to allow NTC's critical training mission to continue unabated for thirty days or more."³

Advice Letter 3510-E

On November 16, 2016, SCE submitted AL 3510-E, seeking authority to:

- (1) develop and implement a microgrid demonstration project with the DOD to support Fort Irwin's energy resilience and renewable energy goals; and
- (2) expand its normal functions under Rule 2.H. to support SCE's construction of the microgrid, as well as to control various aspects of the generation connected to the microgrid when in island mode.

³ SCE's Proposed Microgrid Demonstration project with the United States Department of Defense (Advice Letter 3510-E), Attachment C.

Proposed Microgrid Demonstration Project

SCE estimates the project will be constructed and placed in service in the 4th quarter of 2019. The components of the proposed microgrid infrastructure will be installed on the customer's side of the meter and include:

- Switching equipment and field devices to enable transitioning to and from "island mode";
- Communications infrastructure including remote terminal units and cabling for the transmission of monitoring and control signals;
- Protection devices to avoid damage to the distribution system feeders, conduit, poles, vaults, panels, *etc.* that will distribute electricity to base facilities;
- Protection equipment including relays, circuit breakers and fuses; and
- Controllers, associated devices and software to monitor and regulate the operation of the microgrid and supporting generation when in island mode.

SCE will control the operation of the microgrid when it is "island mode" and anticipates that this will be approximately 35 hours per year, but can support the electrical needs of the base during grid outages lasting up to thirty days.

Ratemaking Treatment; Impact of Demonstration Project on Non-Participating Customers

Under the terms of Rule 2.H., SCE proposes that the costs for the installation, operation, and maintenance of the microgrid infrastructure will be the responsibility of the DOD. As mentioned above, SCE states it will also control the microgrid's operation when Fort Irwin is in "island mode." SCE currently anticipates that Fort Irwin will operate in island mode approximately thirty-five (35) hours per year (approximately 0.4 % of the time).⁴

⁴ According to SCE this "estimate is based on the time Fort Irwin actually experienced outages over the past five years. Notably, such an estimate does not include routine outages engaged for testing purposes, so the effective number of outage hours at the

Footnote continued on next page

SCE does not anticipate employing additional resources in support of this control function. As such, SCE expects any control operation costs to be *de minimis*. These, as well as other operations and maintenance costs will be paid by the DOD/Fort Irwin directly as part of SCE's routine billing for electricity service as additional Added Facilities line items on the customer's bill pursuant to the terms of the AFA. As part of the Study Program, SCE intends to observe the incremental time, effort and costs (if any) involved in facilitating the proper maintenance and control of the microgrid.

Given the as yet unknown costs of SCE's control of the microgrid and the expectation that they would be *de minimis* for this project, SCE is not proposing to impose a separate charge to DOD/Fort Irwin for this activity. Rather, SCE anticipates that any such operation and maintenance costs associated with SCE's control of the microgrid "will be negligible and covered within the added facilities charges imposed pursuant to the anticipated AFA for the Microgrid Project."⁵ SCE also states that "depending on the findings of SCE's Study Program, SCE reserves the right to seek additional cost recovery from the DOD/Fort Irwin associated with the Microgrid's control."⁶

SCE's Rule 2, Subsection H Deviation

The equipment SCE intends to install in support of the microgrid will be at the customer's expense and is comprised of behind-the-meter "added facilities" as described in SCE's Rule 2, Subsection H. The installation will be pursuant to a standard Added Facilities Agreement (AFA) and will utilize existing AFA forms. SCE intends to monitor and control the variations of the generator's outputs for load following, frequency and voltage characteristics.

Base may exceed 35. Given the uncertain nature of predicting future outages, this number may under- or over-predict the number of hours and/or frequency with which the Microgrid will be engaged." (Advice Letter 3510-E, p. 9).

⁵ Advice Letter 3510-E, p. 9.

⁶ Advice Letter 3510-E, p. 9.

SCE seeks authority to deviate from the traditional scope of work pursued under Rule 2.H. in order to construct the microgrid and control its supporting generation when in island mode. SCE points out that there are two unique aspects of this project that qualify as a deviation from the standard Rule 2.H. tariff:⁷

1. Consistent with Rule 2.H., the Project consists of “equipment normally installed by SCE in the development of its electrical transmission and distribution systems and facilities or equipment related to SCE’s provision of service to a customer or a customer’s receipt or utilization of SCE’s electrical energy.”⁸ However, the term “microgrid” is not referenced within Rule 2.H. and while the project’s equipment is a typical “added facilities” offering, its function as part of a “microgrid” is not.
2. Rule 2.H.1. provides that “Added Facilities may include...load control devices and meters,” but here SCE is proposing to operate and control the equipment to vary a generator’s output for load following, frequency and voltage characteristics when in island mode.

SCE’s Study Program

SCE proposes to publicly report its learnings over a five-year period and proposes a Study Program to gain knowledge regarding the design, installation, operation, control and management of microgrid systems. SCE also intends to observe the incremental time, effort and costs (if any) involved in facilitating the proper maintenance and control of the microgrid. The Study Program is expected to run from the first quarter of 2020 through the end of 2025.

SCE states that it is willing to work with the DOD and its contractors to prepare a report of its finding after one, three and five years of operating the microgrid. Some of the objectives include:⁹

⁷ Advice Letter 3510-E, p.2.

⁸ Advice Letter 3510-E, p.2.

⁹ Advice Letter 3510-E, p.8.

- Gaining knowledge about the design, installation, operation, control and management of microgrid systems;
- Studying the role of the utility, if any, in the provision of microgrid services, including installation as added facilities, control, and when such services are appropriate;
- Gauging the extent to which microgrids may be replicated and scalable (possibly with modifications) to develop potential energy resilience and renewable energy solutions for other DOD facilities and/or other retail customers;
- Improving knowledge regarding the scope and mix of energy resources required to support the microgrid, including the extent to which on-site renewable generation may reliably support load requirements;
- Studying the interaction between energy storage and microgrid systems if possible, and developing best practices for the implementation and operation of such systems; and
- Exploring the role that “added facilities” installed under Rule 2.H. may play in enabling the modern electricity grid.

NOTICE

Notice of AL 3510-E was made by publication in the Commission’s Daily Calendar. Southern California Edison states that a copy of the Advice Letter was mailed and distributed in accordance with Section 4 of General Order 96-B.

PROTESTS

SCE’s AL 3510-E was not protested.

DISCUSSION

The Commission has reviewed SCE’s AL 3510-E and we approve SCE’s request with one minor clarification on the reporting process as explained below.

PROPOSED MICROGRID DEMONSTRATION PROJECT

SCE's proposed microgrid demonstration project with the DOD is approved.

SCE's proposed microgrid with the DOD can support the electrical needs of the base during grid outages. It will also allow the DOD to meet its established objective to enhance resilience at its bases by providing a reliable source of energy during prolonged power outages to allow critical training missions to continue.

RATEMAKING TREATMENT; IMPACT OF DEMONSTRATION PROJECT ON NON-PARTICIPATING CUSTOMERS

SCE will collect any and all costs of the microgrid from the DOD pursuant to its AFA and will not seek additional cost recovery from non-participating customers.

The costs for the installation, operation and maintenance of the microgrid infrastructure will be the responsibility of the DOD and will not impact SCE's other customers. We appreciate that SCE anticipates that these costs will be "de minimis" and therefore we direct SCE to pass any and all costs of the microgrid to DOD/Fort Irwin pursuant to its AFA.

SCE's RULE 2, SUBSECTION H DEVIATION

SCE's request for deviation from Rule 2, Subsection H is approved for this particular project. This decision has no effect on future projects which will still require Commission approval to deviate from Rule 2, Subsection H.

The Commission finds there is good reason to deviate from Rule 2, Subsection H. While the term "microgrid" is not referenced within Rule 2.H. we find this project as described by SCE is a typical "added facilities" offering. Additionally, SCE proposes to operate and control the equipment to vary a generator's output for load following, frequency and voltage characteristics when in island mode, a function not specified in Rule 2.H.

In no way should this be construed as a tariff change. The Commission is allowing this deviation for this particular project and future projects will have to go through the generally applicable process for approval of deviation from Rule 2, Subsection H.

SCE's STUDY PROGRAM

SCE will submit three Study Program reports on its findings after one, three and five years of operating the microgrid. These reports shall be filed with the Commission as Information Only Tier 1 Advice Letters.

The Commission finds value in SCE's proposed Study Program to report its learnings about the design, installation, operation, control and management of the microgrid. SCE, though, is unclear on the reporting format other than to state it will "publicly report on its learnings." Therefore we clarify that SCE should submit these reports as information only filings to Energy Division's Central Files as well as served via email on the service list of the Distribution Resource Plan Rulemaking (R.14-08-013). The utilities shall follow the current guidance from the Energy Division about submitting documents to Energy Division's Central Files. Energy Division's Central Files may be contacted by email at energydivisioncentralfiles@cpuc.ca.gov. The reports will be filed after one, three and five years of operating the microgrid.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS

1. Fort Irwin, an Army base, experienced three major outages exceeding twenty hours over the last five years which threaten the base's energy resilience and mission-critical activities.
2. The DOD has an established objective to enhance resilience at its bases.

3. The Commander of the National Training Center and the U.S. Army Garrison Commander at Fort Irwin requested the assistance of SCE to develop and install a microgrid system to provide a reliable source of energy during prolonged power outages.
4. SCE's proposed microgrid with the DOD will serve to provide a reliable source of energy for the base to continue its mission-critical activities during power outages.
5. The equipment SCE intends to install in support of the microgrid will be at the customer's expense and is comprised of behind-the-meter "added facilities" as described in SCE's Rule 2, Subsection H.
6. The installation and operation of this microgrid project will not increase costs to SCE's ratepayers.
7. There are two unique aspects of this project that qualify as a deviation from the standard Rule 2.H. tariff.
8. The term "microgrid" is not referenced within Rule 2.H. and while the project's equipment is a typical "added facilities" offering, its function as part of a "microgrid" is not.
9. SCE is proposing to operate and control the equipment to vary a generator's output for load following, frequency and voltage characteristics when in island mode.
10. There is acceptable reason to deviate from Rule 2, Subsection H for this particular project.
11. SCE's Study Program will provide valuable information on microgrids.

THEREFORE IT IS ORDERED THAT:

1. Southern California Edison's proposed microgrid demonstration project with the Department of Defense is approved.
2. Southern California Edison's Advice Letter 3510-E is approved.
3. Southern California Edison's request for deviation from Rule 2, Subsection H is approved for this particular project. This decision has no effect on future

projects which will still require Commission approval to deviate from Rule 2, Subsection H.

4. The costs of building and operating the Fort Irwin microgrid project will be borne by the Department of Defense and not passed on to Southern California Edison's other customers.
5. Southern California Edison will submit three Study Program reports on its findings after one, three and five years of operating the microgrid. These reports will be submitted as information only filings to Energy Division's Central Files as well as served via email on the service list of the Distribution Resources Plan Rulemaking (R.14-08-013). The utilities shall follow the current guidance from the Energy Division about submitting documents to Energy Division's Central Files. Energy Division's Central Files may be contacted by email at energydivisioncentralfiles@cpuc.ca.gov.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on June 15, 2017; the following Commissioners voting favorably thereon:

TIMOTHY J. SULLIVAN
Executive Director