

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Applications of)

HAWAIIAN ELECTRIC COMPANY, INC.,)
HAWAII ELECTRIC LIGHT COMPANY, INC.,)
AND MAUI ELECTRIC COMPANY, LIMITED.)

DOCKET NO. 2010-0015

For Approval to Modify Rule 14H,)
Interconnection of Distributed)
Generating Facilities Operating)
in Parallel with the Companies)
Electrical Systems as Shown in)
Appendices I, II, and III.)

Transmittals Nos. 10-01, 10-01H,)
and 10-01M.)

DECISION AND ORDER

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DECISION AND ORDER

By this Decision and Order,¹ the commission approves, subject to one exception, the stipulated revisions to the HECO

¹The Parties are: (1) HAWAIIAN ELECTRIC COMPANY, INC. ("HECO"), HAWAII ELECTRIC LIGHT COMPANY, INC. ("HELCO"), and MAUI ELECTRIC COMPANY, LIMITED ("MECO") (collectively, the "HECO Companies" or "Companies"); (2) the DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, DIVISION OF CONSUMER ADVOCACY ("Consumer Advocate"), an ex officio party to all commission proceedings, pursuant to Hawaii Revised Statutes ("HRS") § 269-51 and Hawaii Administrative Rules § 6-61-62(a); (3) BLUE PLANET FOUNDATION ("Blue Planet"); (4) the DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, AND TOURISM ("DBEDT"); (5) HAWAII INSPECTION GROUP, INC.; (6) HAWAII PV COALITION; (7) HAWAII RENEWABLE ENERGY ALLIANCE ("HREA"); (8) HAWAII SOLAR ENERGY ASSOCIATION ("HSEA"); (9) SOUTH MAUI RENEWABLE RESOURCE, LLC; (10) THE SOLAR ALLIANCE; and (11) ZERO EMISSIONS LEASING LLC. The INTERSTATE RENEWABLE ENERGY COUNCIL ("IREC") is a participant.

Companies' Tariff Rule 14H, governing the interconnection of distributed generating facilities operating in parallel with the utilities' electrical systems. In effect, the commission, based on its review of the Parties' and IREC's Partial Settlement Agreement Regarding Proposed Modifications to Rule 14H, filed on October 14, 2011, approves the stipulated revisions to Appendices I, II, II-A, and III of Rule 14H, with the exception of the proposed revisions to Appendix I, Section 3f, governing supervisory controls.

The stipulated revisions to Rule 14H: (1) are intended to facilitate the higher penetration and interconnection of renewable distributed generating facilities that operate in parallel with the electric utility's distribution system; and (2) represent best practices in the area of interconnection and result from a fair and consensus-based, collaborative process between the Parties and IREC.

Lastly, the commission defers until a subsequent Decision and Order its review and decision-making of the disputed issues in this proceeding, including the proposed revisions to Appendix I, Section 3f, relating to supervisory controls.

I.

Background

This docket arises out of the respective transmittals filed by the HECO Companies in January 2010, which proposed certain substantive revisions to Rule 14H.

On January 27, 2010, the commission suspended the HECO Companies' transmittals for investigation, and consolidated its investigation into this single proceeding.² On March 4, 2010, the commission granted intervention to all of the movants that sought to intervene, and on March 19, 2010, the commission granted participant status to the single entity that sought to participate without intervention.³

The Parties and IREC subsequently discussed potential areas of agreement. As a result, on April 26, 2010, they filed their Stipulation Regarding Certain Modifications to Rule 14H ("Stipulation"). By their Stipulation, the Parties and IREC agreed to certain revisions to Rule 14H, including the following substantive revisions: (1) increasing the percentage of annual

²Order Suspending the Transmittals Filed by HECO and HELCO, on January 7, 2010, and MECO on January 8, 2010.

³Order Granting Intervention to Blue Planet Foundation; the Department of Budget, Economic Development, and Tourism; Hawaii Inspection Group, Inc.; Hawaii PV Coalition; Hawaii Renewable Energy Alliance; Hawaii Solar Energy Association; South Maui Renewable Resource, LLC; The Solar Alliance; and Zero Emissions Leasing LLC, filed on March 4, 2010; and Order Naming the Interstate Renewable Energy Council as a Participant, filed on March 19, 2010.

peak kilovolt-ampere load for the feeder that triggers additional technical studies, from ten percent to fifteen percent; (2) establishing a standard three-party interconnection agreement; (3) including cross-limitation of liability and non-indemnification language with respect to projects where a State of Hawaii ("State") agency is the customer; and (4) including additional data information regarding the customer's generating facility.

On May 26, 2010, the commission, by its Decision and Order, approved the Stipulation, thereby allowing the agreed-upon revisions to Rule 14H to take effect upon operation of law, effective from May 27, 2010.⁴ In approving the Stipulation, the commission reasoned:

The stipulated revisions to Rule 14H reflect the consensus of a wide range of stakeholders in the renewable energy/distributed generation field, including the electric utilities (HECO, HELCO, and MECO), organizations which advance and promote the development of clean or renewable energy resources (Blue Planet Foundation, Hawaii PV Coalition, HREA, HSEA, The Solar Alliance, and IREC), renewable energy consultants and developers (Hawaii Inspection Group, Inc., South Maui Renewable Resources, LLC, and Zero Emissions

⁴Decision and Order, filed on May 26, 2010; and HECO Companies' letter, filed on June 10, 2010 (transmitting the revised Rule 14H tariff sheets approved by the commission in its Decision and Order, filed on May 6, 2010). Conversely, the HECO Companies' proposed changes that were not agreed to by the other parties and IREC were subject to additional procedural steps, including the filing of preliminary and final position statements.

Leasing LLC), and government entities (the Consumer Advocate and DBEDT).

HECO states that the agreed-upon revisions to Rule 14H are consistent with their commitments in the Energy Agreement, dated October 20, 2008, between the State and the HECO Companies, to revise Rule 14H to better facilitate the interconnection of distributed generation facilities. Such revisions include increasing the penetration limit to fifteen percent to allow for the acceptance of more distributed renewable generation onto a circuit before additional study is required, thereby encouraging more renewable generation interconnections. Moreover: (1) the standard three-party interconnection agreement recognizes the tri-party relationship between the electric utility, distributed generation facility provider, and customer, and supplements the existing standard interconnection agreement between the electric utility and customer; (2) the cross-limitation of liability and non-indemnification language provides that where a State agency is the customer, the respective liabilities of the electric utility and State are limited to the extent provided by law, with no cross-indemnification provisions; and (3) the purpose of the additional data information, including the facility's account number and tax map key number, is to clarify and better describe the customer's generating facility.

Upon review, the commission finds reasonable the tariff revisions to Rule 14H agreed-upon by the Parties and Participant[.]

Decision and Order, filed on May 26, 2010, at 3-4.

On November 16, 2010, the Parties and IREC filed their respective preliminary position statements. On October 14, 2011, the Parties and IREC jointly filed their Partial Settlement Agreement Regarding Proposed Modifications to Rule 14H ("Settlement Agreement"). Also on October 14, 2011,

final position statements were filed by: (1) the HECO Companies; (2) Consumer Advocate; (3) DBEDT; (4) Blue Planet; (5) IREC; and (6) jointly by HSEA, The Solar Alliance, Hawaii PV Coalition, and HREA (collectively, the "Renewable Parties").⁵ No final position statements were filed by the Hawaii Inspection Group, Inc. or South Maui Renewable Resource, LLC.

⁵The commission approved multiple requests for additional time, ultimately until October 14, 2011, for the Parties and Participant to file their final position statements. Order Modifying the Procedural Schedule, filed on August 25, 2010 (extension until December 16, 2010); Order Modifying the Procedural Schedule, filed on October 20, 2010 (extension until January 31, 2011); Order Approving Extension of Time, filed on February 8, 2011 (extension until April 4, 2011); Order Approving Extension of Time, filed on April 5, 2011 (extension until June 3, 2011); Order Approving the HECO Companies' Request, Filed on June 2, 2011, for an Extension of Time, filed on June 7, 2011 (extension until June 21, 2011); Order Approving the Division of Consumer Advocacy's Request, Filed on June 21, 2011, for an Extension of Time, filed on June 22, 2011 (extension until July 26, 2011); Order Approving the Division of Consumer Advocacy's Request, Filed on July 26, 2011, for an Extension of Time, filed on August 4, 2011 (extension until August 24, 2011); Order Approving the Request of Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, Filed on August 23, 2011, for an Extension of Time, filed on August 31, 2011 (extension until September 15, 2011); and Order Approving Blue Planet Foundation's Request, Filed on September 12, 2011, for an Extension of Time, filed on September 16, 2011 (extension until September 16, 2011). During the extended period, the Parties and Participant met on several occasions in their attempt to resolve the outstanding issues in this proceeding.

II.

Discussion

All rates, charges, classifications, schedules, rules, and practices made, charged, or observed by a public utility must be just and reasonable and filed with the commission, pursuant to HRS § 269-16(a) and (b).

Rule 14H, which governs the interconnection of distributed generating facilities operating in parallel with the HECO Companies' electrical systems, includes four appendices: (1) Appendix I, Distributed Generating Facilities/Technical Requirements; (2) Appendix II, Standard Interconnection Agreement; (3) Appendix II-A, Standard Third Party Interconnection Agreement; and (4) Appendix III, Interconnection Process Overview.

The Settlement Agreement incorporates the Parties' and IREC's stipulated revisions to the four appendices.

None of the Parties or IREC proposes any different or additional revisions to Appendices II, II-A or III, other than their agreed-upon revisions to these three appendices. That said, the Parties and IREC propose different or additional revisions to Appendix I that have not been agreed upon by all of them. These proposed revisions to Appendix I are discussed by the Parties and IREC in their respective final position statements.

This Decision and Order addresses the Parties' and IREC's agreed-upon revisions to the four appendices, as reflected in the Settlement Agreement. The commission intends to address the disputed issues in a separate, forthcoming decision and order.

Here, for purposes of expediency, the commission reviews the revisions to Rule 14H jointly agreed-upon and proposed by the Parties and IREC.⁶ Moreover, for ease of reference and review, the commission discusses the stipulated revisions to Appendix III first, followed by the agreed-upon revisions to Appendices II, II-A, and I, respectively.

A.

Appendix III

Appendix III, entitled Interconnection Process Overview, sets forth a general overview of the step-by-step process that is utilized by the electric utility in reviewing and processing an interconnection request.

⁶For ease of reference, unless clearly required otherwise by the context, quotations and references to the stipulated revisions to Rule 14H refer to the proposed revisions to *HECO's Rule 14H*, as set forth in Attachment 2 (black-lined version) of the Settlement Agreement.

Proposed Supplemental Review

The review steps presently set forth in Appendix III begins with an initial technical screening, which determines whether additional technical study, i.e., an Interconnection Requirements Study ("IRS"), is required to complete the technical review process. Presently, proposed generation facilities which fail one or more of the initial technical screens must generally proceed with an additional technical study, i.e., an IRS.

The Parties and IREC propose to revise the review steps in Appendix III by adding an intermediate Supplemental Review process, described as follows:

Initial Technical Review: Pursuant to Appendix III, Section 2, the review by the Company following receipt of an Interconnection Application to determine the following: a) if the Generation Facility qualifies for Simplified Interconnection; or b) if the Generation Facility can be made to qualify for interconnection with a Supplemental Review determining additional requirements, if any.

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Simplified Interconnection: Interconnection conforming to the Initial Technical Review requirements of Appendix III, Sections 2 and 3.

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Supplemental Review: Pursuant to Appendix III, Section 3, a process wherein the Company further reviews an Interconnection Application that fails

one or more of the Initial Technical Review screens. The intent of the Supplemental Review is to provide a slightly more detailed review of only the conditions that cause the Generating Facility generator to fail the Initial Technical Review. The Supplemental Review may result in one of the following: a) approval of interconnection; b) approval of interconnection with additional requirements; or c) cost and schedule for an Interconnection Requirements Study.

Settlement Agreement, Attachment 2, Appendix I, at B-6 and B-7.

More specifically, the Parties and IREC stipulate to revising Appendix III, Section 1, Step 3, to read as follows:

Step 3. Within fifteen (15) business days of the date the Customer's Interconnection Application and supporting materials are deemed complete, the Company will complete an Initial Technical Review of the Interconnection Application. The Initial Technical Review will result in the Company providing either: (a) if all of the Initial Technical Review Screens are passed, the Generating Facility qualifies for Simplified Interconnection, and an executable interconnection agreement for the Customer's signature; or, (b) if one or more screens are not passed, notification that Supplemental Review will be required and the results, in writing, of all Initial Technical Review screenings.

If Supplemental Review is required, the Customer shall notify the Company, in writing, to proceed with the Supplemental Review, or the Customer shall agree to withdraw its Interconnection Application. Within twenty (20) business days of notification by the Customer that it would like to move forward with Supplemental Review, the Company shall complete a Supplemental Review. The Supplemental Review will result in the Company providing either: (a) Simplified Interconnection (b) interconnection requirements beyond those for a Simplified Interconnection, and a non-binding, good faith

estimate of the Company's portion of the costs to perform the interconnection requirements identified by the Supplemental Review, or (c) a determination that an Interconnection Requirements Study (IRS) is required, and a good faith cost estimate and schedule for the completion of the IRS including an identification of the specific analysis and/or reviews that will be performed as part of the IRS.

If an IRS is required, the Customer shall agree to pay the cost estimate for the IRS provided by the Company, or the Customer shall withdraw its Interconnection Application. The Company shall complete the IRS within one hundred fifty (150) calendar days of the Customer's agreement to move forward with the IRS and payment of the IRS cost is received. The completion of the IRS shall include the Company's proposal to the Customer of the following: (a) interconnection requirements and a non-binding, good faith estimate of the Company's portion of the costs to perform the interconnection requirements; and (b) protection and synchronizing relays and settings, protection, synchronizing and control schemes, and any other equipment and/or performance requirements necessary to meet the IRS requirements.

. . . .

Settlement Agreement, Attachment 2, Appendix III, Section 1, Step 3, at 34D-4 and 35D-5; see also Settlement Agreement, Attachment 2, Appendix III, Section 2, Initial Technical Review, Supplemental Review, and IRS, at 34D-8 to 34D-22.

The Parties and IREC also stipulate to revising Appendix III by describing in detail: (1) the nine technical screens that are utilized by the electric utility as part of the Initial Technical Review (Section 2), and the significance of

each technical screen;⁷ (2) the Supplemental Review (Section 3) process; and (3) the IRS (Section 4) process.⁸ Furthermore, the stipulated revisions to Appendix III, Section 2, make it clear that: (1) a distributed generating facility of 10 kW or less may proceed directly to the Simplified Interconnection process; and (2) an inverter-based generating facility of 250 kW or less, which meets the standards of IEEE 1547, Standard for Interconnecting Distribution Resources with Electric Power Systems, and UL 1741, Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with

⁷Settlement Agreement, Attachment 2, Appendix III, Section 2, at 34D-8 to 34D-16. As an example, Appendix III, Section 2, describes technical screen 6 as follows:

Screen 6: Is the gross rating of the Generating Facility 10 kW or less?

If Yes, the Generating Facility qualifies for Simplified Interconnection. Skip remaining screens.

If No, continue to Screen 7.

Significance: The Generating Facility will have a minimal impact on fault current levels and any potential line over-voltages from loss of the Company's Distribution System neutral grounding.

Settlement Agreement, Attachment 2, Appendix III, Section 2, at 34D-12.

⁸Settlement Agreement, Attachment 2, Appendix III, Section 3, at 34D-16 to 34D-18, and Section 4, at 34D-18 to 34D-22.

Distributed Energy Resources, may bypass technical screen 8 and proceed directly to technical screen 9.⁹

The HECO Companies, in support of the Supplemental Review process, state:

The purpose of the proposed modifications is to address specific technical issues that can arise when distributed generation capacity on a feeder becomes a sizeable fraction of the feeder load present when the proposed generation is available. The supplemental review process has been incorporated with regard to this issue for the purpose of ensuring that high generation to load ratios are detected, and appropriate engineering review conducted, on circuits for which the high penetration level occurs at times other than circuit peak. Failure to perform an engineering review for high penetration conditions could expose the generating equipment, utility equipment, and other customers on the circuit to potentially damaging conditions.

HECO Companies' Final Statement of Position, at 11-12.

Blue Planet contends that Rule 14H should incorporate Supplemental Review for a number of reasons: (1) Supplemental Review creates a critically important intermediate step between the initial technical screening and IRS steps; (2) Supplemental Review is not likely to adversely impact electric system safety or reliability; (3) the Supplemental Review process is directly

⁹Settlement Agreement, Attachment 2, Appendix III, Section 2, at 34D-12 to 34D-13; and HECO Companies' Final Statement of Position, at 29 (the purpose of the proposed modifications is to allow certain distributed generation projects under 10 kW and inverter-based distributed generation less than 250 kW to be processed through an expedited technical screening process).

based on the California Energy Commission's Distributed Energy Resource Guide: Electrical Interconnection: California Requirements - Rule 21 ("Rule 21"), which is standard practice for the interconnection of distributed energy resources onto the electrical grid in California; (4) Supplemental Review has been successfully incorporated into distributed generation interconnection rules utilized by utilities in other jurisdictions, including in California (Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company); and (5) because Supplemental Review is likely to result in fewer generating facilities unnecessarily being required to complete costly and time-consuming interconnection requirements studies, Supplemental Review may increase the number of generating facilities and shorten the time period required to interconnect with the electrical grid, which is consistent with achieving the State's clean energy objectives.¹⁰

The Renewable Parties assert that: (1) the Supplemental Review process is an intermediate step that is designed to streamline the interconnection process and resolve potential interconnection issues without the need for a full

¹⁰Blue Planet's Final Statement of Position, at 7-15, 31-33, and 37-38 (Blue Planet's discussion of the Initial Technical Review, Supplemental Review, and IRS processes).

scale IRS; (2) California's Rule 21 technical screens generally track the existing Rule 14H screens and include technical screen 9, related to line configuration, which addresses the HECO Companies' ground-fault overvoltage concerns while mitigating the impact and burden on renewable distributed generating facilities; and (3) the stipulated revisions to Appendix III provide much improved clarity and transparency by adopting the technical screens and accompanying provisions in California's Rule 21.¹¹

IREC states:

Taking further inspiration from the California Rule 21 study process, the Parties agreed to include a Supplemental Review process in Section 3 wherein the Company will further review an Interconnection Application that fails one or more of the Initial Technical Review Screens in Section 2. The intent of the Supplemental Review is to provide a slightly more detailed review of only the conditions that cause the generating facility to fail the Initial Technical Review. The Supplemental Review may result in one of the following: a) approval of interconnection; b) approval of interconnection with additional requirements; or c) cost and schedule for an Interconnection Requirements Study.

IREC's Final Statement of Position, at 21; see also id., at Section IV.B, Proposed Joint Modifications to Rule 14H, Appendix

¹¹Renewable Parties' Final Statement of Position, at 15-20, 33-34, and 36-39 (Renewable Parties' discussion of the Initial Technical Review, Supplemental Review, and IRS processes).

III, at 15-24 (IREC's discussion of the Initial Technical Review, Supplemental Review, and IRS processes).

The stipulated revisions to Appendix III: (1) include the adoption of the Supplemental Review process and the streamlining of certain small-sized facilities through the Simplified Interconnection process and the bypassing of certain technical screens; and (2) are designed to facilitate and encourage the development and interconnection of renewable distributed generating facilities onto the HECO Companies' electric systems, without the need for an IRS, if technically feasible. The Parties and IREC strongly support their stipulated revisions to Appendix III, with DBEDT recommending that the commission approve such changes "as soon as possible to facilitate the interconnection of the renewable energy projects."¹² The commission finds reasonable the stipulated revisions to Appendix III, Sections 1 through 4.

2.

Resolution of Disputes

Appendix III, Section 6, currently provides that representatives from the electric utility and the customer will meet and attempt in good faith to resolve their dispute as part of the dispute resolution process.

¹²DBEDT's Final Statement of Position, at 8.

The Parties and IREC propose to revise Appendix III, Section 6, by adding language which states that the meeting be scheduled within fifteen business days of a written request.¹³

Blue Planet asserts that the proposed additional language "is reasonable and appropriate because it improves the dispute resolution process by requiring parties to meet within a prescribed time period, thus reducing potential delays and promoting efficient dispute resolution."¹⁴

The underlying purpose of the stipulated revisions to Appendix I, Section 6, is to avoid needless delay in the dispute resolution process for an interconnection application that is filed pursuant to Rule 14H. The commission finds reasonable the stipulated revisions to Appendix I, Section 6.

B.

Appendices II and II-A

Appendix II consists of the Standard Interconnection Agreement form, with exhibits, while Appendix II-A consists of

¹³Settlement Agreement, Attachment 1, Appendix III, at 3; HECO Companies' Final Statement of Position, at 32-33; Blue Planet Foundation's Final Statement of Position, at 38; Renewable Parties' Final Statement of Position, at 39; and IREC's Final Statement of Position, at 24.

¹⁴Blue Planet's Final Statement of Position, at 38; see also Renewable Parties' Final Statement of Position, at 39 (the proposed revisions will help facilitate the process in the event of any disputes and is reasonable); and IREC's Final Statement of Position, Section IV.B.5, Resolution of Disputes.

the Standard Three Party Interconnection Agreement form, with exhibits.

1.

Federal Government Agencies

The Parties and IREC propose to add certain new subsections to Appendices II and II-A to accommodate the "unique requirements" of the United States Department of Defense and other federal agencies. Specifically, the proposed revisions are intended to: (1) allow for invoice payments through a contract and to clarify that the federal government entity is responsible for paying for all costs associated with the utility's investment through a modification of its primary electric utility contract (Appendix II, Section 5b, and Appendix II-A, Section 5b); (2) meet the requirements of the Federal Torts Claim Act (Appendix II, Section 18e, and Appendix II-A, Section 18f); and (3) allow the federal government entity to self-insure where appropriate (Appendix II, Section 19b, and Appendix II-A, Section 19b).¹⁵

The stipulated additions to Appendices II and II-A are intended to: (1) remove certain perceived barriers; and (2)

¹⁵Settlement Agreement, Attachment 1, Appendix II and II-A, at 1; HECO Companies' Final Statement of Position, at 26-28; Blue Planet's Final Statement of Position, at 30; Renewable Parties' Final Statement of Position, at 35-36; and IREC's Final Statement of Position, at 15.

better enable the federal government agencies to pursue the development and interconnection of renewable distributed generating facilities. The commission finds reasonable the stipulated additions to Appendix II, Sections 5b, 18e, 19b, and Appendix II-A, Sections 5b, 18f, and 19b.

2.

Simplified Interconnection Applications

The Parties and IREC propose to include the following two simplified interconnection applications as exhibits to Appendices II and II-A (Appendix II, Exhibit A, and Appendix II-A, Exhibit A): (1) Application for Interconnecting a UL 1741 Certified Inverter-Based Small Generating Facility No Larger Than 10 kW; and (2) Interconnection Application for All But UL 1741 Certified Inverter-Based Systems Less Than 10 kW.¹⁶

Pursuant to the first proposed simplified interconnection application, an applicant must certify that:

The 10 kW Inverter Process is available only for inverter-based Generating Facilities no larger than 10 kW that meet the code, standards, and certification requirements of NEC, UL 1741, IEEE, County Electrical Building Codes, and the Company's interconnection requirements in effect at the time of signing this application.

. . . .

¹⁶Settlement Agreement, Attachment 1, Appendix II and II-A, at 1; HECO Companies' Final Statement of Position, at 31; and IREC's Final Statement of Position, at 14-15.

Generating systems that utilize inverter technology must be compliant with *Institute of Electrical and Electronics Engineers IEEE Std 1547* and *Underwriters Laboratories UL 1741* in effect at the time this Agreement is executed. Generating systems that use a rotating machine must be compliant with applicable National Electrical Code, Underwriters Laboratories, and Institute of Electrical and Electronics Engineers standards and rules and orders of the Hawaii Public Utilities Commission in effect at the time this Agreement is executed. **By signing below, the Applicant certifies that the installed generating equipment meets the appropriate preceding requirement(s) and can supply documentation that confirms compliance.**

Settlement Agreement, Attachment 2, Appendix II, Exhibit A, at A-2 and A-3 (boldface in original).

Likewise, pursuant to the second proposed simplified interconnection application, an applicant must certify that:

Generating systems that utilize inverter technology must be compliant with *Institute of Electrical and Electronics Engineers IEEE Std 1547* and *Underwriters Laboratories UL 1741* in effect at the time this Agreement is executed. Generating systems that use a rotating machine must be compliant with applicable National Electrical Code, Underwriters Laboratories, and Institute of Electrical and Electronics Engineers standards and rules and orders of the Hawaii Public Utilities Commission in effect at the time this Agreement is executed. **By signing below, the Applicant certifies that the installed generating equipment meets the appropriate preceding requirement(s) and can supply documentation that confirms compliance.**

Settlement Agreement, Attachment 2, Appendix II-A, Exhibit A, at A-2 and A-3 (boldface in original).

IREC, in support of the proposed simplified interconnection applications, states:

Presently, there is a single Interconnection Application that is an exhibit to Appendices II and II-A, which are the Companies' "Standard Interconnection Agreement" and "Standard Three Party Interconnection Agreement." These agreements only apply to non-exporting generators and it is the intent of the Parties for proposed modifications to allow for its use by feed-in tariff generating facilities.

IREC's Final Statement of Position, at 14-15.

The proposed simplified interconnection applications are designed to facilitate the Simplified Interconnection process set forth in Appendix III. The commission finds reasonable the stipulated revisions to Appendix II, Exhibit A, and Appendix II-A, Exhibit A.

C.

Appendix I

Appendix I, entitled Distributed Generating Facility Interconnection Standards/Technical Requirements, sets forth "interconnection standards [that] are intended to provide general technical guidelines and procedures to facilitate the interconnection and parallel operation of distributed generating

facilities" with the electric utility's electrical distribution system.¹⁷

1.

Definitions

The Parties and IREC propose to amend Appendix I, Section 1, Definitions, to "include additional definitions to provide consistency with [their] proposed amendments [to] Appendices I and III."¹⁸ Such defined terms include Initial Technical Review, Simplified Interconnection, and Supplemental Review.¹⁹ The commission finds reasonable the stipulated revisions to Appendix I, Section 1.

2.

General Interconnection Guidelines

The Parties and IREC propose to revise Appendix I, Section 2, General Interconnection Guidelines, "to include clarification language and to provide consistency with [the] proposed amendments [to] Appendices I and III."²⁰ The commission

¹⁷Settlement Agreement, Attachment 2, Appendix I, at 34B-1.

¹⁸Settlement Agreement, Attachment 1, Appendix I, at 1.

¹⁹Settlement Agreement, Attachment 2, Appendix I, at 34B-5 to 34B-8.

²⁰Settlement Agreement, Attachment 1, Appendix I, at 1.

finds reasonable the stipulated revisions to Appendix I, Sections 2b, c, d, and f.

The Parties and IREC also propose to amend Section 2e, governing Short Circuit Contribution Ratio ("SCCR"), as follows:²¹

Short Circuit Contribution Ratio (SCCR):
A generating facility's short circuit current contribution to the utility distribution feeder can affect operation of existing utility protective devices. A good indicator of the potential impact of a generating facility's short circuit contribution is the Short Circuit Contribution Ratio[, which is the ratio of the aggregate short circuit contribution of the generating facility to the short circuit contribution of the utility system (including all other generating facility sources), for a three-phase fault at the high side of the customer or utility distribution transformer.].
To ensure the operation of existing utility protective devices are not compromised, [additional technical study may be required for generating facilities with an SCCR greater than 5%.] Supplemental Review will be required if the sum of the SCCR of all Generating Facilities on the Distribution System circuit exceeds 10% when measured at the primary side of a dedicated distribution transformer, or the short circuit contribution of the proposed generating facility is grater than 2.5% of the interrupting rating of the Producer's Service Equipment when measured at secondary side of a shared distribution transformer. Analyses such as Short Circuit and Relay Coordination may need to be performed. The need for such [study] analysis will be identified by the Company[.] during Supplemental Review.

Settlement Agreement, Attachment 2, Appendix I, at 34B-10.

²¹Proposed deletions are bracketed, proposed additions are underscored.

The Parties and IREC, in support of their proposed revisions to Appendix I, Section 2e, explain:

This section is proposed to be amended to increase the percentage of when a supplemental review may be required from 5% to 10%. This proposed amendment is consistent with California's Rule 21 and the energy industry rule-of-thumb currently being used to determine whether a proposed distributed generation will have any impact associated with the interconnection. This proposed amendment raises the SCCR limit; thus, accepting more distributed renewable generation onto a circuit before supplemental review is required, and in turn will encourage more renewable generation interconnections.

Settlement Agreement, Attachment 1, Appendix I, at 1.

The stipulated revisions to Appendix I, Section 2e, incorporate the Supplemental Review process, increases the percentage for when additional technical review will be required (i.e., Supplemental Review) from five to ten percent (i.e., the SCCR limit), and is designed to encourage more renewable generation interconnections. The commission finds reasonable the stipulated revisions to Appendix I, Section 2e.

3.

Design Requirements

The Parties and IREC propose to revise Appendix I, Section 3, Design Requirements, to: (1) provide consistency with their proposed revisions to Appendix III; and (2) correct a

grammatical error.²² The commission finds reasonable the stipulated revisions to Appendix I, Sections 3b, e, and h.

With respect to the stipulated revisions to Appendix I, Section 3c, the HECO Companies explain:

The purpose of the proposed modification is to clarify what can be considered an acceptable isolation device. The isolation device must have a visible break, capable of being locked in the open position, and accessible to utility personnel. This is critical to the safety of both utility personnel and customers.

HECO Companies' Final Statement of Position, at 12; see also Blue Planet's Final Statement of Position, at 15 (Blue Planet's reference to the isolation device requirement); and Renewable Parties' Final Statement of Position, at 34 (the clarifying stipulated revisions to the isolation device requirement are reasonable).

The purpose of the stipulated revisions to Appendix I, Section 3c, is to provide clarification with respect to an acceptable isolation device. The commission finds reasonable the stipulated revisions to Appendix I, Section 3c.

The Parties and IREC also propose to amend the first sentence of Section 3f, governing supervisory controls, as follows:²³

²²Settlement Agreement, Attachment 1, Appendix I, at 1.

²³Proposed deletions are bracketed, proposed additions are underscored.

For HELCO

Supervisory Control: For generating facilities with an aggregate capacity greater than [1 MW,] 250 kW, computerized supervisory control [may] shall be required to ensure the safety of working personnel and prompt response to system abnormalities in case of islanding of the generating facility. Based upon the results of the initial technical screening or additional technical study, the Company shall determine whether supervisory control is necessary. In accordance with Section 2.c of Appendix III, the Company shall provide the customer with final results of all technical screenings and studies in writing, and shall notify the customer of such determination and the reasons for such determination as part of the written results.

Supervisory control shall include monitoring of:
(a) gross generation by the generating facility;
(b) feedback of Watts, Vars, Watthours, current and voltage; (c) Vars furnished by the utility; and (d) status of the interrupting device. In addition, the supervisory control will allow the utility to trip the interrupting device during emergency conditions. Monitoring will be performed by system dispatchers or operators at the Company's control center.

See Settlement Agreement, Attachment 2, Appendix I, at 34B-12

(footnote 5 and text therein omitted (HELCO)).

For HECO

Supervisory Control: For generating facilities with an aggregate capacity greater than 1 MW, computerized supervisory control [may] shall be required to ensure the safety of working personnel and prompt response to system abnormalities in case of islanding of the generating facility. Based upon the results of the initial technical screening or additional technical study, the Company shall determine whether supervisory control is necessary. In accordance with Section 2.c of Appendix III, the

Company shall provide the customer with final results of all technical screenings and studies in writing, and shall notify the customer of such determination and the reasons for such determination as part of the written results.

Supervisory control shall include monitoring of:
(a) gross generation by the generating facility;
(b) feedback of Watts, Vars, Watthours, current and voltage; (c) Vars furnished by the utility; and (d) status of the interrupting device. In addition, the supervisory control will allow the utility to trip the interrupting device during emergency conditions. Monitoring will be performed by system dispatchers or operators at the Company's control center.

See Settlement Agreement, Attachment 2, Appendix I, at 34B-12
(footnote 5 and text therein omitted (HECO)).

For MECO

Supervisory Control: For generating facilities with an aggregate capacity greater than 250 kW, computerized supervisory control [may] **shall** be required to ensure the safety of working personnel and prompt response to system abnormalities in case of islanding of the generating facility. Based upon the results of the initial technical screening or additional technical study, the Company shall determine whether supervisory control is necessary. In accordance with Section 2.c of Appendix III, the Company shall provide the customer with final results of all technical screenings and studies in writing, and shall notify the customer of such determination and the reasons for such determination as part of the written results.

Supervisory control shall include monitoring of:
(a) gross generation by the generating facility;
(b) feedback of Watts, Vars, Watthours, current and voltage; (c) Vars furnished by the utility; and (d) status of the interrupting device. In addition, the supervisory control will allow the utility to trip the interrupting device during

emergency conditions. Monitoring will be performed by system dispatchers or operators at the Company's control center.

See Settlement Agreement, Attachment 2, Appendix I, at 34B-12 (footnote 5 and text therein omitted (MECO)).

Based on the commission's review of the Settlement Agreement and the final position statements, it is clear that the Parties and IREC have reached consensus on the proposed revisions to only the first sentence of Appendix I, Section 3f.²⁴ In effect, as noted by the Consumer Advocate, "the Parties and Participant agree with the threshold for requiring supervisory control, 1 MW for HECO and 250 kW for HELCO and MECO."²⁵

Generally speaking, the HECO Companies propose: (1) to revise the existing second and third sentences for HECO's Section 3f; and (2) new, replacement language in place of the existing second, third, and fourth sentences for HELCO's and MECO's respective Section 3f.²⁶ Conversely, Blue Planet, IREC, and the Renewable Parties appear to recommend that the existing second and third sentences of the HECO Companies' Section 3f be

²⁴See Settlement Agreement, Attachment 1, Appendix I, at 1; and Attachment 2, Appendix I, Section 3f, at 34B-12 (HECO), 38B-12 (HELCO), and 38B-12 (MECO).

²⁵Consumer Advocate's Final Statement of Position, at 9 (footnotes and citations therein omitted); see also HECO Companies' Final Statement of Position, at 17-24; and Renewable Parties' Final Statement of Position, at 20 and 35.

²⁶See HECO Companies' Final Statement of Position, at 17-24; and Consumer Advocate's Final Statement of Position, at 9-11.

deleted in their entirety.²⁷ The Consumer Advocate, meanwhile, concurs in part and opposes in part with the HECO Companies' proposed revisions to Section 3f,²⁸ while DBEDT's concurrence with the stipulated revisions to the first sentence of HECO's Section 3f is conditional.²⁹

The commission takes no action in this Decision and Order on the proposed revisions to Appendix I, Section 3f. Instead, the commission defers its review and decision-making of the proposed revisions to Appendix I, Section 3f, to its forthcoming Decision and Order, which is intended to address the disputed issues in this proceeding.

4.

Operating Requirements

The Parties and IREC propose to revise Appendix I, Section 4, Operating Requirements, to: (1) provide consistency with their proposed revisions to Appendices I and III; and (2)

²⁷See HECO Companies' Final Statement of Position, at 18; Consumer Advocate's Final Statement of Position, at 11; Blue Planet's Final Statement of Position, at 18-25; IREC's Final Statement of Position, at 6; and Renewable Parties' Final Statement of Position, at 20-22 and 35.

²⁸Consumer Advocate's Final Statement of Position, at 9-12.

²⁹DBEDT's Final Statement of Position, at 6-7 (DBEDT does not object to revising the first sentence of Appendix I, Section 3f, by changing "may" to "shall," subject to its stated condition).

reference clarifying language.³⁰ The commission finds reasonable the stipulated revisions to Appendix I, Sections 4a, e, and i.

The Parties and IREC also propose to revise Appendix I, Section 4h, as follows:³¹

Frequency Disturbances: The generating facility shall be equipped with protective equipment designed to automatically disconnect the generating facility from the utility distribution system when the frequency at the Point of Interconnection deviates outside the [normal] utility specified operating range [of 59.3 - 60.5 Hz,] set forth below, and remain disconnected until the voltage and frequency have stabilized (see Section 4j). [The frequency settings and time delay can be selected by the utility to provide system security.]

[For generating facilities less than 30 kW, the protective equipment shall disconnect the generating facility within 10 cycles. For generating facilities greater than or equal to 30 kW, the protective equipment shall (1) disconnect the generating facility within 10 cycles if the frequency exceeds 60.5 Hz, (2) be capable of time delayed disconnection with adjustable under-frequency settings in the range of 57.0 - 59.3 Hz, and (3) disconnect the generating facility within 10 cycles if the frequency is less than 57.0 Hz.]

All generating facilities, including those with an aggregate capacity less than 30 kW, shall have frequency setpoints and clearing times selected by the utility and provided below, to coordinate with the utility's system relay settings.

The generating facilities shall set protective equipment to (1) disconnect the generating

³⁰Settlement Agreement, Attachment 1, Appendix I, at 1-2.

³¹Proposed deletions are bracketed, proposed additions are underscored.

facility within 10 cycles if the frequency exceeds 60.5 Hz, (2) be capable of time delayed disconnection of 300 seconds with the adjustable underfrequency setting set to 57.0 Hz, and (3) disconnect the generating facility within 10 cycles if the frequency is less than 57.0 Hz.

Settlement Agreement, Attachment 2, Appendix I, at 34B-16 to 34B-17.

The Parties and IREC, in support of their proposed revisions to Appendix I, Section 4h, state:

This section is being proposed to clearly state the frequency settings which shall be implemented at the generating facility so the settings can be shipped from the manufacturer with the desired settings.

The proposed frequency and time delay trip setting will allow for ride-through of lower frequencies than the typical default setting of 59.3 Hz. The default frequency settings of 59.3 hertz results in nuisance trips and reducing nuisance tripping of distributed generation is of critical importance to the system reliability and stability of the island systems which are more sensitive to power imbalance than mainland interconnections, and because of the high (or potentially high) penetration levels of [distributed generation] on the systems. This modification is also being proposed based on anticipated operational issues facing the Companies due to the potential high level of intermittent generation connected to the system.

Settlement Agreement, Attachment 1, Appendix I, at 2; see also Blue Planet's Final Statement of Position, at 17-18 (the stipulated revisions are not expected to adversely impact electric system safety or reliability and may support the achievement of the State's clean energy objectives).

The HECO Companies, in support of the proposed revisions to Appendix I, Section 4h, also state:

The purpose of the proposed modification is to require that all distributed generation resources, including those less than 30 kW in size, have frequency set points and clearing times appropriate to allow each of the [HECO] Companies to provide required grid security for each autonomous power system. The proposed modifications are necessary to address anticipated operational issues facing each of the utilities due to the large aggregate amount of distributed generation being interconnected to the Companies' systems. At anticipated (and existing, for some of the systems) levels the distributed generation resources comprise a significant amount of online energy and their behavior during off-normal conditions has a significant impact on the power system performance through faults and contingencies. The proposed parameters provide for the ability to coordinate with the utility's protection system settings and remain connected throughout reasonably anticipated faults and contingencies and thereby maintain grid security. The frequency and clearing times will not be randomly selected but will be based on studies or standards intended to maintain grid reliability.

HECO Companies' Final Statement of Position, at 16-17.

The Renewable Parties, in support of the proposed revisions to Appendix I, Section 4h, jointly state:

The Renewable Parties support the Joint Proposal's specification of revised frequency and clearing times set points under Appendix I, § 4(h). The purpose of these revised set points is to prevent a mass tripping of DG systems during grid underfrequency events caused by independent factors such as a sudden loss of centralized generation, and instead to allow DG systems to support the grid during such events. The Joint Proposal essentially adopts as

the unified standard for all of the HECO Companies the underfrequency trip settings of 57 Hz and 300 seconds that HELCO currently employs. This HELCO standard provides the lowest common denominator among all the HECO Companies, allowing renewable DG to stay online [and] support grid reliability across the greatest frequency range for the longest ride-through period. The Renewable Parties have long advocated the standardization of these settings as a constructive solution to facilitate grid integration of renewable DG by addressing the HECO Companies' reliability concerns, while providing a clear and workable standard for renewable energy systems consistent with UL and IEEE requirements.

Renewable Parties' Final Statement of Position, at 29-30 (footnote and citation therein omitted); see also id., at 34 (the stipulated revisions constitute a reasonable advancement that will facilitate renewable energy development by providing clear, workable standards for integrating renewable energy to the HECO Companies' grids).

The underlying purpose of the stipulated revisions to Appendix I, Section 4h, is to require that all distributed generation resources, including those less than 30 kW in size, have frequency set points and clearing times appropriate to allow HECO, HELCO, and MECO to provide required grid security for each autonomous power system. The commission finds reasonable the stipulated revisions to Appendix I, Section 4h.

5.

Technology Specific Requirements and
Protection, Synchronization, and Control Requirements

The Parties and IREC propose to revise Appendix I, Section 5, Technology Specific Requirements, and Section 6, Protection, Synchronization, and Control Requirements, to provide consistency with their proposed revisions to Appendix III.³² The commission finds reasonable the stipulated revisions to Appendix III, Section 5c, and Sections 6a and b.

D.

Stipulated Revisions to Rule 14H

The stipulated revisions to Rule 14H: (1) are intended to facilitate the higher penetration and interconnection of renewable distributed generating facilities that operate in parallel with the electric utility's distribution system; and (2) represent best practices in the area of interconnection and result from a fair and consensus-based, collaborative process between the Parties and IREC.³³ The commission approves as just

³²Settlement Agreement, Attachment 1, Appendix I, at 2.

³³IREC's Final Statement of Position, at 24; see also Blue Planet's Final Statement of Position, at 41-42 (the incorporation of Supplemental Review into the Appendix III interconnection process may greatly improve the current version of Rule 14H with a best practices approach that facilitates greater renewable penetration in the State's electric system); and Renewable Parties' Final Statement of Position, at 2 (the

and reasonable the Parties' and IREC's stipulated revisions to Rule 14H, with the exception of their agreed-upon revisions to the first sentence of Appendix I, Section 3f. The commission defers until its forthcoming Decision and Order its review and decision-making of the proposed revisions to Appendix I, Section 3f.

III.

Orders

THE COMMISSION ORDERS:

1. The stipulated revisions to the HECO Companies' Tariff Rule 14H, as reflected in the Partial Settlement Agreement Regarding Proposed Modifications to Rule 14H, filed on October 14, 2011, are approved, effective from December 3, 2011, with the exception of the proposed revisions to Appendix I, Section 3f, governing supervisory controls.

2. By December 2, 2011, HECO, HELCO, and MECO shall file in this docket their respective revised tariff sheets for Rule 14H, with the applicable issued and effective dates.

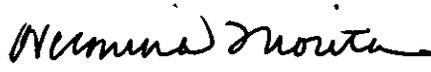
3. The failure to comply with the requirement noted in Ordering Paragraph No. 2, above, may constitute cause to void

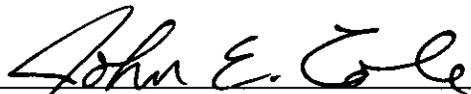
stipulated revisions to Appendix III streamline the interconnection process and make it much more transparent and accessible in line with best practices).

this Decision and Order, and may result in further regulatory action as authorized by State law.

DONE at Honolulu, Hawaii NOV 29 2011.

PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

By 
Hermina Morita, Chair

By 
John E. Cole, Commissioner

By (RECUSED)
Michael E. Champley, Commissioner

APPROVED AS TO FORM:


Michael Azama
Commission Counsel

2010-0015.ps

CERTIFICATE OF SERVICE

The foregoing order was served on the date of filing by mail, postage prepaid, and properly addressed to the following parties:

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