HECO T-6
DOCKET NO. 03-0XXX

TESTIMONY OF
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HAWAIIAN ELECTRIC COMPANY, INC.

Subject: Description of Alternatives and Schedule

INTRODUCTION

Q. Please state your name and business address.

A. My name is Kerstan J. Wong and my business address is 820 Ward Avenue, Honolulu, Hawaii.

Q. What is your present position with the Hawaiian Electric Company, Inc. ("HECO")?

A. I am a Project Manager in the Project Management Division of the Energy Delivery Process Area. My educational background and experience are provided in HECO-200.

Q. What is the scope of your testimony?

A. My testimony will address the description of the East Oahu Transmission Project alternatives that were presented to the community for public input in 2003, and the permitting and engineering schedules developed for planning purposes for these alternatives. In addition, my testimony will address the permitting and engineering schedule for the 46kV Phased Project selected by the Company following the public input process, and presented to the Public Utilities Commission (PUC) in the Application supported by this testimony.

DESCRIPTION OF ALTERNATIVES

Q. What were the three alternatives that were presented to the community for public input in 2003 to address the East Oahu transmission concerns?

A. The following three alternatives were presented to the community for public input:

(1) Kamoku-Pukele 138kV Underground Alternative (via Palolo);

(2) Kamoku 46kV Underground Alternative; and

(3) Kamoku 46kV Underground Alternative – Expanded.

KAMOKU-PUKELE 138kV UNDERGROUND ALTERNATIVE

Q. Please describe the scope of work associated with the Kamoku-Pukele 138kV Underground Alternative.

A. The Kamoku-Pukele 138kV Underground Alternative via Palolo involves the installation of an underground 138kV transmission line between Kamoku Substation and Pukele Substation. The approximate length of the proposed transmission line is 3.6 miles. Kamoku Substation is located in Moiliili at the intersection of Date Street, Kamoku Street and Kapiolani Boulevard. Pukele Substation is located in Palolo Valley at the end of Myrtle Street. 138kV termination equipment would be needed at Kamoku and Pukele Substations for this alternative. HECO-600 is a set of colored photographs that show the proposed route for the 138kV transmission line alternative in city streets and the location of both substations.

Q. Why is this 138kV transmission line alternative proposed for underground construction?

A. This alternative is proposed for underground construction due to a 1980 legal settlement between HECO and the Palolo community. The legal settlement precludes the construction of new overhead 138kV transmission lines in Palolo Valley, except for certain specific mountainous areas as established in the settlement. The denial of HECO's application for a Conservation District Use Permit by the Board of Land and Natural Resources for the previously proposed Kamoku-Pukele 138kV transmission line alternative over Wa'ahila Ridge essentially eliminated the only practical overhead alignment to Pukele Substation.

The legal settlement does not preclude the construction of new underground 138kV transmission lines.

Q. Please describe the various underground cable technologies considered for this 138kV alternative?

A. There are two technologies that could be utilized for the 138kV underground transmission line: High Pressure Fluid Filled (HPFF) cables or Cross-Linked Polyethylene (XLPE) cables. For the HPFF technology, a pumping facility would be needed in Palolo Valley due to the elevation difference between Kamoku Substation (near mean sea level) and Pukele Substation (~ 600 feet above mean sea level). Typical equipment that would be housed in the pumping facility is shown in HECO-601. The fluid storage tank shown in HECO-601 could be mounted horizontally to lower the height of the building enclosure. For planning purposes, three locations were identified to possibly site the pumping facility: (1) an empty lot owned by the City on Palolo Avenue opposite of Keanu Street, used to access the Palolo stream (HECO-600, page 4); (2) an empty lot owned by HECO on Paalea Street next to the Palolo stream (HECO-600, page 5); and (3) a portion of the parking lot of the City owned Palolo Valley District Park on Palolo Avenue (HECO-600, page 6).

Q. Why are two different technologies proposed for the 138kV underground transmission line?

A. Up until the 1980s, HPFF technology was the most reliable and proven underground cable type used for transmitting bulk power at 138kV or higher voltages for significant distances. XLPE technology was limited at that time to 69kV or lower voltages because of unreliable performance at higher voltages. Since the 1980s, significant improvements in technology and manufacturing of

XLPE cables for 138kV or higher voltages have been made in the utility industry. Today, XLPE technology is considered as reliable as HPFF cables for most applications. Therefore, when a project requires a 138kV or higher voltage transmission line, both HPFF and XLPE are considered for installation.

Q. What are the differences between HPFF and XLPE cables?

A. The main differences between HPFF and XLPE cables are the current-carrying capability, infrastructure, cost, and electromagnetic field ("EMF") levels that emanate from the cables. In general, HPFF cables can carry more current than XLPE cables. However, XLPE cables could be doubled-up to provide the same current-carrying capacity as HPFF cables. This is the case for the Kamoku-Pukele 138kV Underground Alternative. For infrastructure, HPFF cables are installed in a steel pipe, which is encased in a concrete jacket. An Environmental Protection Agency approved mineral oil is circulated in the steel pipe to insulate the cables from electrical faults. To circulate the mineral oil, pumping facilities are needed. For XLPE cables, each phase (three phases comprise a transmission line circuit) is installed in a PVC duct conduit, which is encased in a concrete jacket. No circulating fluid is required for XLPE cables. As for costs, HPFF cables tend to be more expensive than XLPE cables. Ms. Oshiro discusses the costs for this alternative in HECO T-9. For EMF levels, HPFF cables tend to have lower fields than XLPE cables. Mr. Silva discusses the projected EMF levels for the two technologies for this alternative in HECO T-10.

KAMOKU 46kV UNDERGROUND ALTERNATIVE

Q. Please describe the scope of work associated with the Kamoku 46kV Underground Alternative.

A. This alternative involves the installation of the following underground XLPE 46kV circuits in and around the Ala Moana, McCully, Moiliili, and Kapahulu areas:

- Two new 46kV circuits are required between Makaloa Substation and McCully Substation. Makaloa Substation is located at the corner of Amana Street and Makaloa Street. McCully Substation is located at the intersection of Lime Street and Pumehana Street. For planning purposes, it was assumed that the two new 46kV circuits would be installed in a single new underground ductline. The main ductline begins at the Makaloa Substation and ends at a new manhole on Lime Street fronting McCully Substation. The total length of the proposed main ductline is approximately 3,450 feet. From this new manhole on Lime Street, the two circuits branch off into two separate ductlines. The first circuit extends approximately 50 feet and interconnects with an existing underground 46kV circuit in McCully Substation. The second circuit extends approximately 200 feet from the new manhole to an existing pole on Pumehana Street where it interconnects with an existing overhead 46kV line. Mr. Morikami details the planned route of the main ductline in HECO T-7. HECO-202 shows the proposed route for these two 46kV circuits in city streets.
- One new 46kV underground circuit approximately 130 feet long is required in the area of the intersection of Pumehana Street and Date Street near the Lunalilo Elementary School. This circuit would interconnect two existing overhead 46kV circuits. HECO-203 shows the location of this 46kV circuit.
- Two new 46kV underground circuits are required from the Kamoku Substation onto Date Street. One of the proposed 46kV circuits out of

Kamoku Substation is approximately 30 feet long, and the other circuit is approximately 300 feet. Both of these circuits would connect to an existing overhead 46kV circuit located on the mauka side of Date Street. HECO-204 shows the location of these 46kV circuits.

- One new 46kV underground circuit approximately 420 feet long is required on Winam Avenue from Hoolulu Street to Mooheau Avenue in Kapahulu. This circuit would interconnect two existing overhead 46kV circuits. HECO-205 shows the location of this 46kV circuit.

In addition to the new 46kV underground circuits, a new 138kV to 46kV transformer would be installed at Kamoku Substation and the modification of equipment would be required at various distribution substations. The distribution substations are Ena, Waikiki, Kuhio, Kapahulu, Makaloa, McCully and Kewalo. The proposed modifications would be contained within the fence line of these substations and would have very little if any land use impacts at these existing sites.

KAMOKU 46kV UNDERGROUND ALTERNATIVE - EXPANDED

Q. Please describe the scope of work associated with the Kamoku 46kV Underground Alternative - Expanded.

A. The scope of work for this alternative can be separated into two phases. Phase 1 is essentially the Kamoku 46kV Underground Alternative described above. Phase 2 involves the installation of three new XLPE 46kV underground circuits required to connect Archer Substation to existing 46kV overhead circuits in the McCully area originating from Pukele Substation. The three new 46kV circuits are assumed for planning purposes to be installed in one main ductline, which begins

at Archer Substation located on HECO's facility on Ward Avenue. The main ductline would exit Archer Substation onto Cooke Street and then head in the Diamond Head direction on King Street until the area fronting the McCully Times Supermarket. The total length of the proposed main ductline is approximately 8,325 feet. From the area fronting the McCully Times Supermarket, a separate ductline continues in the Diamond Head direction on King Street, then turns mauka onto McCully Street until it crosses Young Street for a distance of approximately 1,450 feet, where the first 46kV circuit would be connected to the existing Pukele 7 overhead 46kV circuit. At the McCully Times Supermarket, separate ductlines for each of the other two 46kV circuits branches off from the main ductline for distances of approximately 40 feet and 50 feet to existing poles in the sidewalk area fronting the McCully Times Supermarket parking lot and the American Savings Bank, respectively. The two new 46kV circuits would each be connected to the existing 46kV circuit on the respective poles. Phase 2 also requires the installation of a new 138kV to 46kV transformer at Archer Substation. Mr. Morikami details the planned route of these ductlines in HECO T-7. HECO-208 shows the proposed route for these three 46kV circuits in city streets.

Q. Why is HPFF technology not proposed for the 46kV alternatives?

A. HPFF technology is only manufactured for cable applications 69kV or higher.

SCHEDULE

Q. What are the difficulties in estimating a project schedule for major utility infrastructure projects?

A. As detailed in HECO-602, uncertainty in the permitting and approval process has

grown dramatically over the years making it substantially more difficult to estimate the permitting and approval time for a major utility infrastructure project that generates public concern and/or controversy. Approval processes have become more politicized, and are not necessarily left to the "expert" agencies. For instance, requirements not imposed by law may be added/changed to deflect criticism. Agencies may be reluctant to act before other agencies have acted. And agencies may not defer to sister agencies that have more expertise. In addition, project opponents that do not prevail on the merits may employ shotgun litigation and/or procedural delay tactics to stop projects. Planning and permitting costs and time have substantially increased as a result. For example, the environmental impact statement (EIS) process adds significant cost and time (detailed analyses of alternatives, even if little or no chance of selection, must be performed; EIS comment process taken to unprecedented lengths; possibility of EIS rejection if requirements are added/changed). The community input process adds cost and time. Yet despite the increased time, it is difficult to start the permitting/approval process sooner as agencies may be reluctant to act until the project need has become urgent.

Q. Out of the three alternatives considered in 2003, which alternative has the most schedule uncertainty and which has the least?

A. Out of the three alternatives considered in 2003, the Kamoku-Pukele 138kV Underground Alternative appears to have the most schedule uncertainty. The Kamoku 46kV Underground Alternative appears to have the least schedule uncertainty. The Kamoku 46kV Underground Alternative – Expanded has slightly more schedule uncertainty than the Kamoku 46kV Underground Alternative, but not nearly the extent of uncertainty as the 138kV alternative.

KAMOKU-PUKELE 138kV UNDERGROUND ALTERNATIVE

Q. What are the major factors that contribute to the schedule uncertainty of the Kamoku-Pukele 138kV Underground Alternative?

A. The major factors that contribute to the schedule uncertainty are certain required permits and approvals, environmental reporting requirements, and the technology to be utilized (HPFF versus XLPE).

Q. What permits and approvals for the Kamoku-Pukele 138kV Underground Alternative appear to contribute to the schedule uncertainty?

A. The permits and approvals that appear to have the most schedule uncertainty are the following:

1) Development Plan Public Facilities Map Amendment (PFMA) – City Department of Planning & Permitting (DPP)/City Planning Commission/City Council; or Revision of the Public Infrastructure Map (PIM) related to the Primary Urban Center Development Plan – DPP/City Council. Both the PFMA and PIM processes involve approval from the City Council. The PFMA also requires mayoral approval. These City processes are where the project could get highly politicized and possibly delayed if public sentiment to this alternative is negative and intense.

2) Public Utilities Commission (PUC) Review and Approval. In general, a project need determination and underground/overhead determination have been made at the same time in a single proceeding. For major transmission line projects, planning and preliminary design work are oftentimes extensive and costly due to routing studies and/or an EIS. In addition, one of the major arguments expressed by project opponents is that the project is not needed. Therefore, it is recommended that a determination of project need be made

first before additional costs are incurred on this alternative for preparation of an EIS and pursuit of other permits and approvals.

Q. What was the assumed environmental reporting requirement for the Kamoku-Pukele 138kV Underground Alternative?

A. It was assumed that an EIS under Chapter 343 of the Hawaii Revised Statutes would be done for this alternative based on the following factors:

- An EIS, entitled the *Kamoku-Pukele 138-kV Transmission Line Project, Revised Final Environmental Impact Statement, September 2000* (September 2000 Final EIS), was prepared for the Waahila Ridge 138kV partial underground/partial overhead alignment.
- The 138kV transmission line alternative utilizing Waahila Ridge generated considerable public interest and debate on the project, resulting in the submission of thousands of public comments during the public comment period for the September 2000 Final EIS.
- Recent meetings to elicit public input on the three proposed alternatives identified a strong continuing interest in the community over the project, including residents along the route alignment and others who wish to learn more about the potential construction and other impacts of an underground 138kV line in their community.
- Preparation of an EIS for the 138kV underground alignment appears to be an expectation of many individuals in the community who have expressed an interest in the project.

Q. How does preparing an EIS contribute to the schedule uncertainty for this 138kV transmission line alternative?

A. In January 2001, a lawsuit was filed (by among others, Life of the Land and The

Outdoor Circle) challenging the acceptance of the September 2000 Final EIS and seeking, among other things, a judicial declaration that the September 2000 Final EIS is inadequate and null and void. Given this history, it is certainly possible that the same or other project opponents would consider appealing an agency acceptance of an EIS prepared for the Kamoku-Pukele 138kV Underground Alternative. Whether such an appeal would delay the project schedule depends on a number of factors, including whether the court grants a motion for stay, whether the accepting agency would in its own discretion stay further processing of a permit or approval pending the appeal, and the ultimate success or failure of the appeal before the courts. If permit processing is stayed pending final resolution of an appeal, significant delay to the project schedule of one to one and one-half years could be anticipated. Furthermore, project opponents are not precluded from initiating a campaign, similar to the September 2000 Final EIS, to generate thousands of comments via pre-printed postcards (each requiring an individualized response letter) during the EIS public comment period. Such a campaign results in a significant increase in the size, cost and time to complete the EIS. Therefore, processing an EIS has a considerable amount of uncertainty in terms of schedule.

Q. How does the type of technology (HPFF versus XLPE) for the Kamoku-Pukele 138kV Underground Alternative contribute to the schedule uncertainty?

A. For the HPFF technology, a pumping facility would be needed in Palolo Valley due to the elevation difference between Kamoku Substation (near mean sea level) and Pukele Substation (~ 600 feet above mean sea level). For planning purposes, three locations were identified to possibly site the pumping facility. Two of the sites would require an easement from the City's Department of Budget & Fiscal

Services, Purchasing Division. The City is not obligated to provide easements to private utilities. If public sentiment is negative and intense toward the alternative, the City will be less inclined to negotiate with HECO for an easement. The XLPE technology does not require a pumping facility. With everything else being equal, the HPFF technology would have a longer permitting and engineering schedule if HECO were required to obtain an easement for the pumping facility.

Q. For planning purposes, what schedule scenarios were developed for the Kamoku-Pukele 138kV Underground Alternative?

A. Three schedule scenarios were developed for the Kamoku-Pukele 138kV Underground Alternative. Common to each schedule scenario was that an EIS would be done and the construction duration is approximately twenty-four months. Mr. Harrington discusses the construction duration estimate in HECO T-8. The first scenario assumed HPFF technology with a bifurcated PUC review and approval process (Figure 2, HECO-602, page 12). This resulted in the permitting and engineering activities being completed in 2008 and construction completed in 2010. The second scenario assumed HPFF technology with a single PUC review and approval process (Figure 3, HECO-602, page 17). This resulted in the permitting and engineering activities being completed in 2008 and construction completed in 2010. The third scenario assumed XLPE technology with a single PUC review and approval process (Figure 4, HECO-602, page 18). This resulted in the permitting and engineering activities being completed in 2007 and construction completed in 2009.

KAMOKU 46kV UNDERGROUND ALTERNATIVE

Q. Why was the Kamoku 46kV Underground Alternative concluded to have the least amount of schedule uncertainty of the three alternatives considered in 2003?

A. The following major factors were considered in concluding that the Kamoku 46kV Underground Alternative has, for planning purposes, the least schedule uncertainty amongst the alternatives considered:

- It has the least major permits and approvals required;
- Only the XLPE technology is used for 46kV cables so no easement is needed for a pumping station (associated with the 138kV HPFF technology); and
- It was assumed that the need for an assessment of environmental impacts under the formalized process of Chapter 343 of the Hawaii Revised Statutes (HRS) was not needed.

Q. What major permits and approvals are required for the Kamoku 46kV Underground Alternative and how does that support the conclusion that this alternative has the least schedule uncertainty?

A. The major permits and approvals that have the most schedule impact on this alternative are the Conditional Use Permit (CUP)-minor from the City Department of Planning and Permitting (DPP), and the PUC Review and Approval. The CUP–minor does not require a public hearing and has statutory time limits for agency decision making. If the DPP does not take action within the statutory time limits, then the CUP–minor application could be deemed approved. For the PUC review and approval, it is assumed that determinations on project need and whether the project should be placed underground or overhead would be completed in the more typical single PUC proceeding, thereby reducing the time for the proceeding. When compared to the permits and approvals required for the

Kamoku-Pukele 138kV Underground Alternative, it is noted that the PFMA and PIM processes are not applicable to this 46kV alternative. Those processes are where a project could get highly politicized and possibly delayed if public sentiment is negative and intense.

Q. How does the XLPE technology used for 46kV cables reduce the schedule uncertainty?

A. The XLPE technology does not need a pumping plant like the HPFF technology, thus eliminating the need to site and potentially acquire land rights for a pumping plant. As previously noted for the 138kV HPFF technology, the potential need to obtain an easement from the City's Department of Budget & Fiscal Services, Purchasing Division, adds uncertainty to the project schedule. The City is not obligated to provide easements to private utilities, and if public sentiment is negative and intense toward the project, the City will be less inclined to negotiate or provide an easement to HECO. Prior experience also indicates that even when the City is willing to provide an easement, it can take an extended and uncertain period of time to secure the easement.

Q. Why was it assumed for planning purposes that the need for a formalized assessment of environmental impacts was not needed for this alternative?

A. It was assumed that an environmental assessment (EA) or environmental impact statement (EIS) would not be required for this alternative, thereby removing significant uncertainty in the schedule, based on the following:

- Past experience that government agencies have not required an EA or EIS as part of their permit and approval process for other underground sub-transmission or distribution lines rated 46kV and below within existing roadways, which we have the right to use under our franchise; and

- For this alternative, there is less than 1 mile of ductlines proposed for construction in existing City roadways and none of the underground circuits are across areas of significant environmental concern. Moreover, all substation improvements are contained within the enclosed substation site structure or fence line and would have little if any land use impact at these existing sites.

Q. For planning purposes, what was the schedule developed for the Kamoku 46kV Underground Alternative?

A. As shown in Figure 6 of HECO-602, page 23, it was estimated that the permitting and engineering activities for the Kamoku 46kV Underground Alternative would be completed in 2005 and construction completed in 2006.

KAMOKU 46kV UNDERGROUND ALTERNATIVE – EXPANDED

Q. What are the factors that make the schedule for the Kamoku 46kV Underground Alternative – Expanded slightly more uncertain than the Kamoku 46kV Underground Alternative?

A. The installation of the three 46kV underground circuits from Archer Substation to McCully Street via King Street adds a certain degree of schedule uncertainty to the Kamoku 46kV Underground Alternative – Expanded. There are existing City-owned drains running down Ward Avenue and Pensacola Street from the mountain to the sea, which cross King Street. Based on the experience of past projects crossing those same drains on Kapiolani Boulevard, there may be potential structural loading and maintenance access issues with routing the proposed ductlines for the 46kV circuits either above or below these drains on King Street. In addition, the proposed 46kV lines would be constructed across

several major intersections on King Street – Ward Avenue, Pensacola Street, Piikoi Street, Keeaumoku Street, Kalakaua Avenue, and McCully Street – which require additional consideration to mitigate potential traffic impacts during construction. Therefore, it is assumed that technical consultations would be required with various City agencies before drawings are submitted for approval. After drawings are submitted, it is anticipated that City agencies will require longer review and approval times to ensure the above issues are addressed adequately.

Q. For planning purposes, what was the schedule developed for the Kamoku 46kV Underground Alternative - Expanded?

A. As shown in Figure 8 of HECO-602, page 30, it was estimated that the permitting and engineering activities would be completed in 2006 and construction completed in 2008.

PROPOSED PROJECT

Q. What is the project proposed in this Application?

A. The proposed project is hereafter referred to in my testimony as the 46kV Phased Project, and is essentially the Kamoku 46kV Underground Alternative – Expanded implemented in two phases, and includes a voluntary environmental assessment (EA) conducted within the PUC review and approval process. The scope of work for Phase 1 is the same as the Kamoku 46kV Underground Alternative previously described. Phase 2 involves the installation of three new 46kV underground circuits from Archer Substation, along King Street, to existing 46kV overhead circuits in the McCully area originating from Pukele Substation. A 138kV to 46kV transformer is also installed at Archer Substation in Phase 2.

Q. What are the schedule impacts of completing the 46kV Phased Project in two phases?

A. PUC review and approval would be sought for both Phases 1 and 2 in a single proceeding. After PUC review and approval, the permitting and engineering activities for Phase 1 (essentially the Kamoku 46kV Underground Alternative) would commence. As shown in Figure 9 of HECO–602, page 33, the permitting and engineering activities for Phase 1 would be completed in 2005. The construction of Phase 1 and the permitting and engineering activities for Phase 2 would concurrently commence thereafter. The construction for Phase 1 would be completed in 2006. The permitting and engineering activities for Phase 2 would be completed in 2007, with construction for Phase 2 completed in 2008. The major benefit of the proposed two-phase project approach is that a significant portion (Phase 1) of the 46kV Phased Project may be completed in 2006, whereas all construction is completed in 2008 in the Kamoku 46kV Underground Alternative – Expanded.

Q. Why is it possible to implement the Kamoku 46kV Underground Alternative – Expanded as a two-phased project?

A. As explained by Ms. Ishikawa in HECO T-4, Phases 1 and 2 are independent of each other because each phase would address specific transmission system concerns. Phase 1 would address the potential overload of the transmission lines providing power to the Koolau Substation, which in turn provides power to the Pukele Substation. In addition, Phase 1 would partially address the Pukele Reliability concern (Waikiki and surrounding areas). Phase 2 would address the remaining areas still vulnerable to the Pukele Reliability concern (outside of Waikiki). Phase 2 also has the potential to provide complete back-up of the

customer load served by the Archer Substation, thereby addressing a significant portion of the future reliability concern for the Downtown Substations.

Q. What is the advantage of implementing the 46kV Phased Project, as compared to the Kamoku 46kV Underground Alternative – Expanded?

A. The major advantage in the two-phase project approach of the 46kV Phased Project is that the schedule uncertainties are reduced for Phase 1 by separating much of the permitting, engineering and construction activities of Phase 1, from those of Phase 2. As detailed in HECO-603, discussions with various City agencies after the schedule was developed for the Kamoku 46kV Underground Alternative – Expanded, identified potential scheduling conflicts with City-initiated projects planned for King Street. The City-initiated projects plan to begin construction as early as 2004 and as far out as 2015. Community concern for numerous construction projects in the same area may influence coordination efforts between the Phase 2 work scope on King Street and the various City projects. This may affect when Phase 2 is actually started and completed. HECO plans to consult with the various City agencies to coordinate the scheduling of Phase 2 and address potential community concerns. Until these consultations occur, the schedule uncertainty for Phase 2 remains. The Phase 1 work scope does not include construction on King Street so is not affected by these various City projects.

Q. Why is it important to reduce the schedule uncertainty for Phase 1 of the 46kV Phased Project?

A. It is important to reduce the schedule uncertainty because the completion of Phase 1 (by 2006) would more timely address the potential overload of the transmission lines (starting in 2005) that directly provide all of the power to the Koolau

Substation, and in turn, to the Pukele Substation. As noted by Mr. Joaquin in HECO T-1 and discussed by Ms. Ishikawa in HECO T-4, if this transmission concern is not addressed, the risk for a catastrophic type power outage increases.

Q. For planning purposes, what is the estimated schedule impact of adding an EA to the PUC review and approval process?

A. As shown in Figure 10 of HECO-602, page 36, it is estimated that approximately three months is added to the overall PUC review and approval process. Therefore, the construction for Phase 1 would be completed at the end of 2006 and Phase 2 at the end of 2008. Mr. Joaquin discussed why a voluntary EA was made a part of the 46kV Phased Project in HECO T-1.

Q. What schedule uncertainties are added to the 46kV Phased Project by conducting an EA?

A. Although the estimated schedule impact of conducting a voluntary EA appears moderate, an EA does add a step and creates some uncertainty to the overall project approval and permitting process. For instance, given the past history of this project, project opponents could readily employ the same comment letter and postcard strategy as in the past to increase the size, cost and time to complete an EA. However, conducting a voluntary EA should proactively mitigate to some extent a risk of greater project uncertainty, delay and cost increase brought on by protracted litigation that is anticipated if an EA is not performed. The need to address in a timely and cost effective manner the existing transmission system concerns for the eastern half of Oahu is a major factor for consideration in selecting amongst the proposed project alternatives.

SUMMARY

Q. Please summarize your testimony.

A. Description of Alternatives:

Following the BLNR denial of the CDUP, the following three alternatives were identified for consideration in 2003: 1) Kamoku-Pukele 138kV Underground Alternative (via Palolo); 2) Kamoku 46kV Underground Alternative; and 3) Kamoku 46kV Underground Alternative – Expanded. The Kamoku-Pukele 138kV Underground Alternative via Palolo involves the installation of an underground 138kV transmission line between the Kamoku and Pukele Substations. The Kamoku 46kV Underground Alternative involves the installation of several underground XLPE 46kV lines in and around the Ala Moana, McCully, Moiliili, and Kapahulu areas. In addition, a 138kV to 46kV transformer installation at Kamoku Substation and minor modifications to various distribution substations are also required. The scope of work for the Kamoku 46kV Underground Alternative – Expanded can be separated into two phases. Phase 1 is essentially the Kamoku 46kV Underground Alternative. Phase 2 involves the installation of three XLPE 46kV lines in a single ductline from Archer Substation on Cooke Street to McCully Street utilizing King Street, and a 138kV to 46kV transformer installation at Archer Substation.

Schedule:

Uncertainty in the permitting and approval process has grown dramatically over the years making it substantially more difficult to estimate the permitting and approval time for a major utility infrastructure project that generates public concern and/or controversy. Approval processes have become more politicized, and are not necessarily left to the "expert" agencies. In addition, project

opponents that do not prevail on the merits may employ shotgun litigation and/or procedural delay tactics to stop projects. Planning and permitting costs and time have substantially increased as a result. Out of the three alternatives considered in 2003, the Kamoku-Pukele 138kV Underground Alternative appears to have the most schedule uncertainty. The Kamoku 46kV Underground Alternative appears to have the least schedule uncertainty. The Kamoku 46kV Underground Alternative – Expanded has slightly more schedule uncertainty than the Kamoku 46kV Underground Alternative, but not nearly the uncertainty of the 138kV alternative.

For the Kamoku-Pukele 138kV Underground Alternative, it is estimated that permitting and engineering activities could be completed in 2007 or 2008 and construction completed in 2009 or 2010.

For the Kamoku 46kV Underground Alternative, it is estimated that the permitting and engineering activities could be completed in 2005 and construction completed in 2006.

For the Kamoku 46kV Underground Alternative – Expanded, it is estimated that the permitting and engineering activities could be completed in 2006 and construction completed in 2008.

The project proposed in this Application is the 46kV Phased Project, which is essentially the Kamoku 46kV Underground Alternative – Expanded implemented in two phases. A two-phase implementation would allow Phase 1 construction to be completed in 2006 instead of 2008. In addition, Phase 1 would be isolated from the schedule uncertainties associated with Phase 2. This is critical because the timely installation of Phase 1 would address the potential overload of the transmission lines providing power to the Koolau Substation

(starting in 2005), which in turn provides all the power to the Pukele Substation, and minimize the risk of a catastrophic type power outage from occurring. In addition, Phase 1 would partially address the Pukele Reliability concern (Waikiki and surrounding areas). It is estimated that Phase 2 construction would be completed in 2008. Phase 2 would address the remaining areas still vulnerable to the Pukele Reliability concern (outside of Waikiki). Phase 2 also has the potential to provide complete back-up of the customer load served by the Archer Substation, thereby addressing a significant portion of the future reliability concern for the Downtown Substations.

Q. Does this conclude your testimony?

A. Yes, it does.