Bonnet, Bill

From: Bonnet, Bill
Sent: Friday, October 06, 2006 4:04 PM
To: Hamayasu, Toru
Subject: RE: Electrical Service to Rapid Transit

Let us know when the timing would be appropriate for a meeting. What I want is for you guys to look solid when someone chooses to explore the depth of your interest in electrical service.

From: Hamayasu, Toru [mailto:thamayasu@honolulu.gov]
Sent: Fri 10/6/2006 3:59 PM
To: Bonnet, Bill
Subject: RE: Electrical Service to Rapid Transit

Thank you, Bill. That's exactly what we need to state.

Toru

-----Original Message-----
From: Bonnet, Bill [mailto:bill.bonnet@heco.com]
Sent: Friday, October 06, 2006 3:49 PM
To: Miyamoto, Faith
Cc: Hamayasu, Toru; scheibe@pbworld.com
Subject: RE: Electrical Service to Rapid Transit

That's fine, Faith. We're not requesting an immediate meeting either. But at some time, I think it would be good for the City and County to be able to say "not only have we provided information to HECO and received their conceputual confirmation of ability to serve, but we met with them to understand the process by which our needs would be incorporated into their planning process." This gives you a much stronger postion. We'll wait to hear from you. No urgency.

From: Miyamoto, Faith [mailto:fmiyamoulu.gov]
Sent: Fri 10/6/2006 3:12 PM
To: Bonnet, Bill
Cc: Hamayasu, Toru; scheibe@pbworld.com
Subject: RE: Electrical Service to Rapid Transit

Hi Bill -

Thanks for reviewing the information that we sent to you. Based on your response, we can now respond that HECO will be able to provide the electrical service that will be required for the fixed guideway alternative.

I agree that it will be good to meet to discuss the project and our

future coordination. Right now, we are focused on getting the Alternatives Analysis report to the City Council by November 1st. Let's plan on meeting after November 1st. I'll contact you after that date.

Faith Miyamoto
Department of Transportation Services
City & County of Honolulu
(808) 527-6976
fmiyamoto@honolulu.gov

From: Bonnet, Bill [mailto:bill.bonnet@heco.com]
Sent: Wednesday, October 04, 2006 2:57 PM
To: Miyamoto, Faith
Subject: Electrical Service to Rapid Transit

Faith, my apologies for the delay in responding. I was out of town for three weeks. We have reviewed the information you sent on September 8 and believe we will be able to provide electrical service. Obviously it is early in the process, and close coordination will be required during design. It might be good to get together briefly and go over, conceptually, how we would approach this project. If you confirm interest, we'll set up a time to meet.

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Bonnet, Bill

From: Miyamoto, Faith [fmiyamoto@honolulu.gov]
Sent: Friday, September 08, 2006 4:09 PM
To: Bonnet, Bill
Cc: Hamayasu, Toru
Subject: Honolulu High-Capacity Transit Corridor Project
Attachments: HECOresponses.doc

Toru Hamayasu asked that I send you the following responses to the questions you and Dave Waller posed. Attached is the detailed report that is referenced in those responses.

1. Your estimate of annual electricity consumption and peak demand. (+/- 20%) 200,000 MWH per year and peak demand of 60 MW before the year 2030 continues to be reasonable for our operating assumptions. If we shorten our peak-period headway to less than 3 min. then the peak demand would grow proportionally.

2. Voltage levels required for service. 11.5kV or 12.47kV, 3 phase 60Hz. is acceptable; however 21 kV or higher is preferable. (See details in attached)

3. An explanation of how this rail transit system would work

a. Type and number of transit vehicles

60 to 90 electric rail vehicles would be required for the present proposed system. Each vehicle will have collector shoes for power pick-up and will be fully self contained.

b. Where the system would draw power from the grid

The System will require a traction power supply station approximately every 5000 to 6000 feet. Approximately 25 will be needed for the proposed system.

Each supply station will require two independent Utility feeds and adjacent supply stations should not have their "Normal" supply from the same Utility circuit.

The supply to each Traction Supply Station will support the Rating of that station, i.e. a minimum full load of between of 2MW and a maximum full load of 7.5MW (from smallest to largest expected supply station rating).

c. How operations would vary electrically over time

Each Traction Supply Station will support adjacent track area.The electrical requirements (Utility loads) for the system will increase as the level of passenger service increases. Each day, the system is expected to have almost no load between 12 am and 4 am, a base load throughout the day, and higher loads during AM and PM peak periods. Because the system would come online over several years, loads in 2012 are likely to be only about 1/3 of the ultimate load, increasing to the full load by about 2030.

4. Your assumptions about ancillary electricity use

a. What you assume for electric load at transit stations, and where they are located.

For the 1992 system the electric loads at passenger stations were assumed to be 500kVA for each station. Approximately 25 to 30 stations spaced over the length of the corridor.

b. Please isolate your assumptions about system losses...we can do that

-----Original Message-----
From: Hamayasu, Toru [mailto:thamayasu@honolulu.gov]
Sent: Tuesday, August 22, 2006 12:25 PM
To: Bonnet, Bill
Cc: Waller, Dave; Scheibe, Mark; Spurgeon, Lawrence
Subject: RE: Draft Energy Technical Report

Thank you, Bill. I will forward your comments to PB. I think their system consultant can respond to them. Annual consumption of 200,000 MWH +/- 20% and peak demand of 60 MW in the year 2030 were

RESPONSE TO HECO's QUESTIONS – re e-mail from Lawrence dated 8/23/06

Based on the 1992 Heavy Rail System design and level of service I can provide the following answers in the order of the questions:

Preamble:
The 1992 System was a 15.8 mile Heavy Rail System with an initial capacity of 7,500 ppdph and an Ultimate capacity of 17,000 ppdph.
The initial service required 41 vehicles operated as single articulated car trains, and the ultimate service required 97 vehicles operating in a mix of 2 and 3 car trains.
The traction power supply system utilized 15 Supply Stations varying in size from 2MW to 5MW for the initial service (Total installed capacity say 50MW), and 4MW to 7.5MW for the ultimate service (Total installed capacity say 80MW). The increase in rating was to be achieved by adding 2 or 2.5MW transformer/ rectifier units at the 15 Supply Stations.

Answer 1.
If you assume a Supply Station Load Factor of 0.4 for normal operation (off-peak) and 0.8 for normal operation during peak hours the daily power consumption would be:

Initial: 50MW*0.4*16hrs = 320MWH plus 50MW*0.8*4hrs = 160MWH for a Daily Total of 480MWH, and an **Annual Total of 175,200MWH.**

Ultimate: 80MW*0.4*16 = 512MWH plus 80MW*0.8*4 = 256MWH, Daily Total 768MWH, **Annual Total 280,320MWH.**

The **Total peak demand** would be approximately **50MW for the initial service and 80MW for the ultimate service.**

Answer 2.
The 1992 Traction Power Supply System was to be supplied with power from HECO at 11.5kV or 12.47kV, 3 phase 60Hz.
Although the System can be supplied at 11.5 or 12.47kV other Utility Companies have had some problems coordinating their protection Systems when the Supply Station loads are greater than 2MW. Most Utility Companies have resorted to Circuit Breakers at the supply locations rather than Fused Disconnect Switches.
Coordinating "fused" protection is not a problem if the Utility Supply is 21kV or higher.

Answer 3.
For HECO the most important factor regarding the Traction Power Supply System is that the Traction Power Supply Stations are supplied, metered and operated individually.

Each Supply Station requires a "Normal" Utility Supply (3 phase 60Hz.) and a "Back-up" or redundant supply (3 phase 60Hz) from a different Utility Circuit.

The supply to each Traction Supply Station will support the Rating of that station, i.e. a minimum full load of 2MW (smallest initial supply station rating) and a maximum full load of 7.5MW (largest ultimate supply station rating).

The transformer/rectifier units are rated for Heavy Duty with the capacity to provide 150% full load for 2 hours and 300% full load for 5 minutes – but this would be under abnormal conditions.

a) If the system is to be a Heavy Rail System (Operating with a Third Rail for power distribution) we can compare the 1992 System which required 41 vehicles for the initial system and 97 for the ultimate system, with the 60 and 90 required for the present proposed system.
Each vehicle will have collector shoes for power pick-up and will be fully self contained. Vehicles can be connected together to form trains and will have an operator in the lead vehicle.

b) The System will require a traction power supply station approximately every 5000 to 6000 feet. Approximately 25 will be needed for the proposed system.
Each supply station will require two independent Utility feeds and adjacent supply stations should not have their "Normal" supply from the same Utility circuit.

c) The electrical requirements (Utility loads) for the system will increase as the level of passenger service increases. Revenue service is normally increased by running longer trains (say from 1 car trains to 2 or 3 car trains) or by shortening the headway (time interval) between trains say from 10 minutes to 5 minutes).
The rms Utility loads are proportional to the number of vehicles operating on the route – for a given route most supply stations will see the same load as the trains move along the system in a set cycle. The maximum demand at a supply station is dependant on how many vehicles are in the immediate area at any one time and can be influenced by passenger station locations (multiple starting currents).

Supply stations may be sized initially for the Ultimate level of service, or designed in a modular fashion so that added transformer/rectifier units can be installed in the supply stations as the level of service is increased. Obviously space must be allocated for the added equipment and conduits installed for future power cable increases.
It is not normally feasible to add intermediate supply stations to increase the level of traction power supply.

Answer 4.

a) For the 1992 system the electric loads at passenger stations were assumed to be 500kVA for each station.
b) N/A.

Eric A. Scotson.

9/5/06