

6 July 2007

Laurie Counsell
Electricity Commission
PO Box 10041
Wellington
(by e-mail to Laurie.Counsell@electricitycommission.govt.nz)

Dear Laurie

Application for approval of industrial co-generation station,

The Fonterra/ Todd Joint Venture (FTJV) is an unincorporated joint venture between Whareroa Power limited and Todd Energy Limited.

FTJV would like to make an application for the Whareroa Cogeneration embedded generator connected to GIP HWA1102 to be classified as a "cogeneration plant" in accordance with EGR Schedule G9.

Whareroa Cogeneration Plant Description:

The Whareroa cogeneration plant is located at the single largest dairy factory site in the world. The factory site is made up of several dairy production processes that rely on a cogeneration plant for steam and electricity requirements. The cogeneration plant configuration is:

- 4 x 10.5MW solar turbines and
- 28 MW steam turbine.

The four gas turbines have waste heat boilers (HRSG) attached to them for steam generation.

Two of the HRSGs are IST models that can be run dry to allow the turbines to run without the need to produce steam, although this mode of operation is very inefficient and normally only used during the steam system annual maintenance outage. The other two HRSG's are John Thompson boilers and require steam production/demand for the gas fired turbines to generate electricity.

Host Dairy Factory Description:

Fonterra Whareroa is the largest milk processing site in the world and can process up to 14 million litres of milk per day. Annual milk volume processed at the site is around 1.7 billion litres, giving around 380,000 tonnes of product.

Products manufactured at site include:

- Whole milk powder
- Skim milk powder
- Milk protein concentrate
- Buttermilk powder
- Casein

- Cheese
- Butter
- AMF
- Whey products

The mix of products varies with milk production, market demand, and product mix at Fonterra's other processing sites.

The annual energy consumption for the Fonterra Whareroa site is approximately:

- 700,000 to 750,000 tonnes of steam
- 165 GWh of electricity

Seasonal Information,

During the dairy season (August to May), the factory takes a significant proportion of the electricity generated and steam produced by the cogeneration plant. In the off peak winter months (June – July), the plant is able to operate more like a combined cycle plant with much less electricity and steam being taken by the factory, although there will still be times during the winter when changes in factory loads will force the export electricity outside the +/- 1 MW tolerance for other generation plant.

During the dairy season, steam is supplied directly to the dairy factory. Depending on the mix of steam demand from the site, some electricity is generated through the steam turbine.

Fonterra does not have a resource consent to vent steam to atmosphere and this means that any excess steam not required by the factory processes must pass through the steam turbine. Condensate from the steam turbine is then recycled for steam production again.

Supporting Information,

The Whareroa dairy factory site is made up of several independently operating dairy factories that take steam and electricity from the cogeneration plant. Fluctuations in factory electricity demand affect the net electricity available for export. Fluctuations in factory steam demand can affect steam turbine MW output.

Fluctuations in steam and electricity demand occur due to the independent operation of processes at the factories.

Attached is a line diagram of the cogeneration steam and electricity production process.

Requirements

FTJV makes this application on the grounds that Whareroa meets the requirements set out in Part G Schedule G9

- a) That the plant is connected to the grid or local network

Whareroa has a single point of connection to the GIP HWA1102

- b) That it is reliant on a co-located industrial process

The Whareroa power station is located onsite at Fonterra's factory in Hawera, Taranaki. The primary fuel supply is untreated Kapuni gas /distillate. Natural gas is used to drive four turbine generators equipped with a heat recovery boiler (HSRG), which captures the thermal energy from the turbine's exhaust and uses it to make steam.

Whareroa Cogeneration has a variable steam supply for its steam turbine; steam supply depends mainly on the residual quantity left after dairy factory steam demand.

c) That it is tightly coupled to an industrial process

The Whareroa power station electricity production is a function of the following:

- Gas fired Turbine production
- Steam turbine production which is dependent on steam available for production, and extraction steam load from the factory. Steam available for production is dependent on HRSG production and dairy factory demand for steam
- Electricity load at the dairy factory site.

In addition there are several parameters and constraints for the plant to operate within including:

- cooling capacity constraints;
- minimum running levels for the steam turbine;

Conditions

Previously FTJV applied for and received an exemption from the Commission from certain dispatch instruction requirements, mainly the requirement to remain with +/- 1MW of the dispatch instruction.

The Exemption was approved by the Commission with conditions attached as a result of consultation with the System Operator who had concerns regarding their ability to meet their Principal Performance Obligations under the EGR's if the exemption was granted and the tolerance of +/- 5 MW provided for.

The principal concerns of the System Operator related to system security constraints on the 110KV system that could potentially be breached if the FTJV increased its generation above its dispatched quantity.

The conditions provided FTJV with the tolerance of +/-5MW for 30 minutes while offer revisions were made at which time the revised offers (and therefore dispatched MW's) would accurately reflect the generation profile of the FTJV.

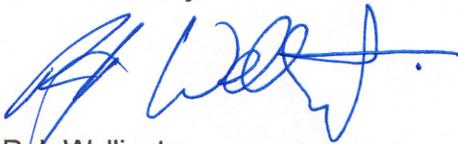
In addition, FTJV undertook to comply with dispatch instructions in the event of an emergency notified by the System Operator in accordance with Part A.

FTJV believes that given the System Operators main concern is with FTJV generating more than dispatched and compromising security constraints, then an appropriate condition to impose would be to limit the tolerance to plus 1 MW.

In the event that FTJV increases its generation by more than the 1MW tolerance provided for, this situation is managed by the process available under the rules to claim a *bona fide* reason for revising offers within the two hour window.

The condition could be expressed as a tolerance of +1/-5MW from the dispatched amount. This would provide the JV with the incentive to revise offers whenever generation increased due to steam being available to put through the steam turbine, or site load reducing, and allow the same level of downwards flexibility as provided for by the EGR's that is provided to other cogenerators.

Yours sincerely



Rob Wellington
Manager Fonterra Todd JV

cc Babu Bahirathan, John Smyth; Doug Watson, Sri Pathmanathan, Charles Teichert.



Single Line diagram of Fonterra Todd JV steam metering points

