PJM Generator Interconnection
Queue #Q69
Shackleford 34.5 kV (12 MW)

Feasibility / Impact Study

March 2007

DOCS#: 410074

General

Industrial Power Generating Company, L.L.C. (INGENCO) is requesting to interconnect, as a capacity resource, a new landfill gas generating facility located in Little Plymouth, King and Queen County, Virginia. The proposed in service date for this new generating facility is 3/7/07.

Direct Connection Requirements

The generation facilities are proposed to be connected to Dominion's 34.5 kV Circuit 302 from Shacklefords Substation as detailed in the Dominion Assessment Results below, and as depicted in the attached Figure 1. In addition to the modifications to the Dominion facilities detailed below, the Interconnection Customer is responsible for ensuring that metering equipment is in conformance with PJM Manuals 01 and 14D for a Capacity Resource.

Dominion Assessment Results

Industrial Power Generating Company, L.L.C. (INGENCO), the Interconnection Customer (IC), has requested a 12 MW interconnection for its proposed King and Queen County Landfill facility onto Dominion Virginia Power's, the Interconnected Transmission Owner (ITO), 34.5 kV Circuit 302 from Shacklefords Substation. Dominion Virginia Power's Circuit 302 terminates where Dominion provides the delivery of wholesale power to Rappahannock Electric Co-Operative's (REC) Clancie Substation. INGENCO has contracted with REC to provide a 34.5 kV circuit from its generation facility to a point ahead of the Dominion Clancie Delivery Point meter. This will require the rearrangement of the existing primary meter location to accommodate the provision of the REC owned 34.5 kV circuit to the INGENCO facility. As an alternative to the 12 MW request, INGENCO asked for the maximum MW interconnection that would not require distribution line reconductoring upgrades. A 10 MW interconnection can be provided from existing conductors without reconductoring. Reconductoring 1.3 miles of distribution line conductors would allow a 12 MW interconnection. These two options are presented below.

Option one - 10 MW

Modifications required to Dominion Virginia Power's distribution system to accommodate 10 MW of generation capacity injected into Dominion Virginia Power's 3-phase 34.5 kV Circuit 302 from Shacklefords Substation include the following construction requirements:

1. Replacement of a 3-phase hydraulic recloser (302 R120) with a 3-phase electronic recloser with transfer trip capability.
2. Installation of transfer trip capability on the Circuit 302 circuit breaker in Shacklefords Substation.

3. Rearrangement of Dominion's existing Clancie Delivery point primary voltage metering.

The estimated cost for rearranging existing Dominion Virginia Power facilities to accommodate the interconnection request is $150,000.

Installation of new facilities to provide the interconnection will include installation of pole mounted bi-directional metering beyond the Point of Interconnection.

The estimated cost for the installation of new facilities to provide the interconnection is $50,000.

In addition to the Dominion Virginia Power facilities indicated above, the customer will be responsible for providing direct transfer trip equipment at the generator site, and providing and maintaining telephone communication lines to Dominion Virginia Power's metering equipment, and from the customer's main generator breaker to Dominion Virginia Power's up line recloser 302R120 and Dominion Virginia Power's Circuit 302 circuit breaker in Shacklefords Substation to provide a transfer trip circuit protection scheme.

The estimated time for engineering, material acquisition and construction of this option is approximately 6 months.

Option two - 12 MW

Modifications required to Dominion Virginia Power's distribution system to accommodate 12 MW of generation capacity injected into Dominion Virginia Power's 3-phase 34.5 kV Circuit 302 from Shacklefords Substation include the following construction requirements:

1. Replacement of a 3-phase hydraulic recloser (302 R120) with a 3-phase electronic recloser with transfer trip capability.
2. Installation of transfer trip capability on the Circuit 302 circuit breaker in Shacklefords Substation.
3. Reconductoring of 0.38 circuit miles of an existing 3-phase distribution circuit from #2 aluminum conductor to 1/0 aluminum conductor.
4. Reconductoring of 0.9 circuit miles of an existing 3-phase distribution circuit from #2 copper conductor to 1/0 aluminum conductor.
5. Rearrangement of Dominion's existing Clancie Delivery point primary voltage metering.

The estimated cost for rearranging existing Dominion Virginia Power's facilities to accommodate the interconnection request is $550,000.

Installation of new facilities to provide the interconnection will include installation of pole mounted bi-directional metering beyond the Point of Interconnection.

The estimated cost for the installation of new facilities to provide the interconnection is $50,000.

In addition to the Dominion Virginia Power facilities indicated above, the customer will be responsible for providing direct transfer trip equipment at the generator site, and providing and maintaining telephone communication lines to Dominion Virginia Power's metering equipment, and from the customer's main generator breaker to Dominion Virginia Power's up line recloser 302R120 and Dominion Virginia Power's Circuit 302 circuit breaker in Shacklefords Substation to provide a transfer trip circuit protection scheme.

The estimated time for engineering, material acquisition and construction of this option is approximately 8 months.

Network Impacts

Network Impacts
The **#Q69 project was studied as an injection of 12 MW (capacity) into the Shacklefords Substation.** Project #Q69 was evaluated for compliance with reliability criteria for summer peak conditions in 2011. Potential network impacts were as follows:

Generator Deliverability
No problem identified.

Multiple Facility Contingency
No problem identified.

Contribution to Previously Identified Overloads
None

New System Reinforcements
No problem identified

Contribution to Previously Identified System Reinforcements
None

Short Circuit
No problem identified

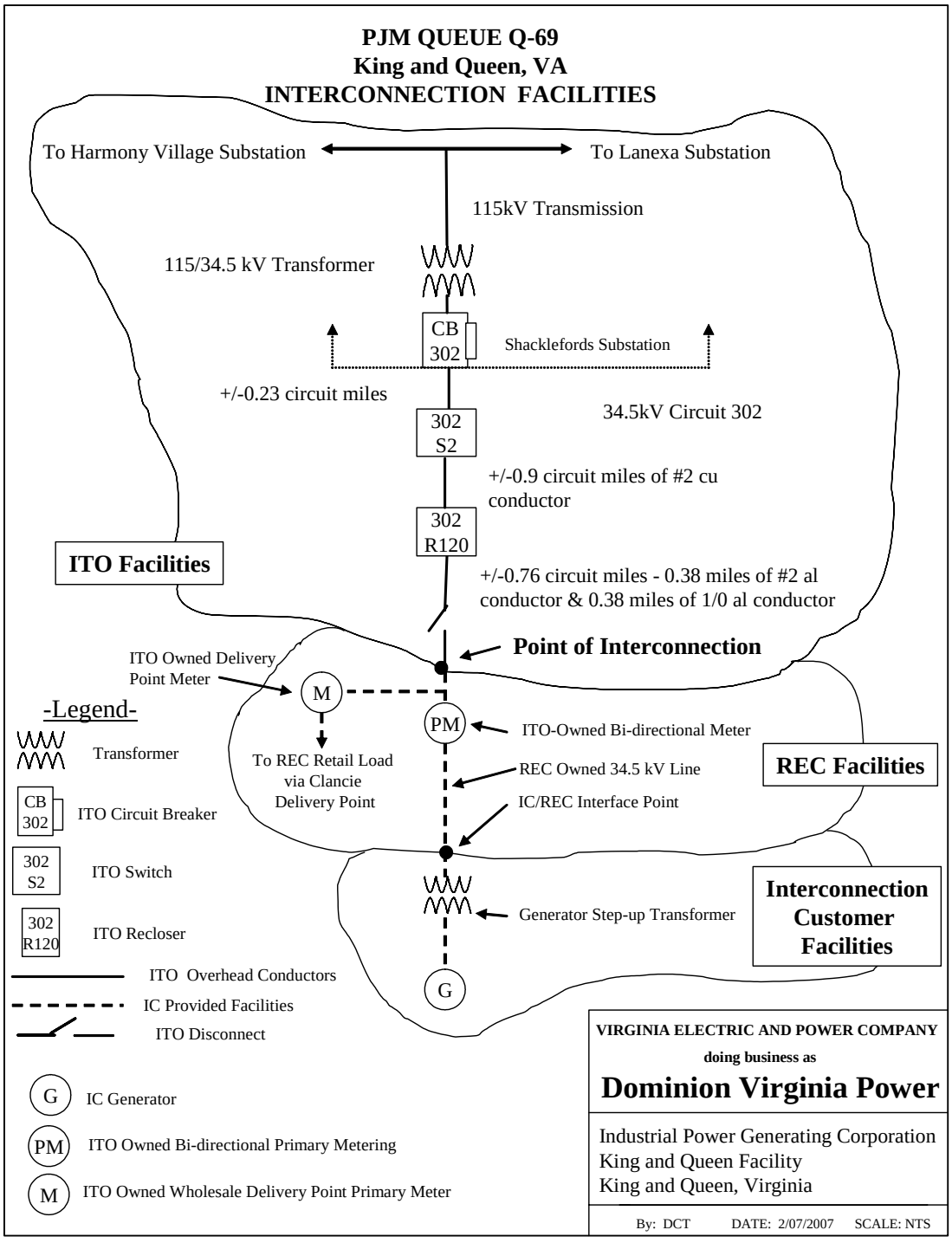

Figure 1