

***PJM Generator Interconnection  
U3-001 Barbadoes 1 MW  
Feasibility / Impact Study***

**October 2008**

*DMS #505965*

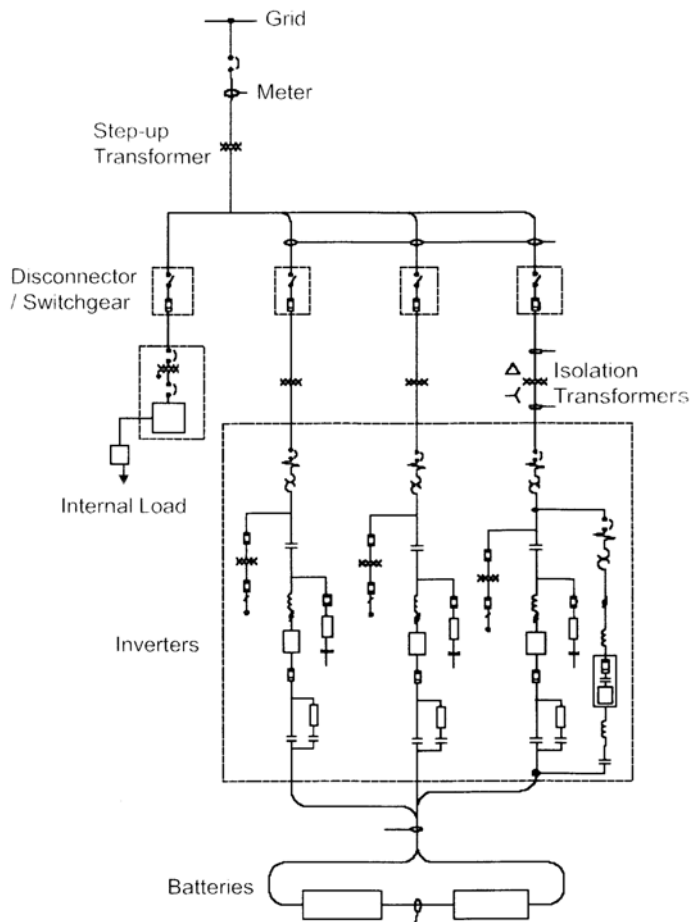
## General

Queue U3-001 is an AES Energy Storage, LLC 1 MW generating facility located in the PJM Service Center Parking Lot at 975 Jefferson Avenue, Norristown, Pennsylvania. Queue U3-001 proposed an in-service date of October, 2008.

Queue U3-001 is an Ancillary Services Unit based on an advanced energy storage system, capable of providing 1 MW of regulation service. This advanced energy storage system has been designed in such a way that it can either respond to control signal from PJM or directly to Area Control Error (ACE) data if available. Responding to a dispatch signal or a pro-rated dispatch based ACE value the unit charges when it receives a negative dispatch and discharges when it receives a positive dispatch. In either response mode the unit is capable of providing a very rapid response, reaching full capacity in less than one second.

## Direct Connection

The U3-001 generation project can be interconnected to the Barbadoes 34 kV circuit #2000 as shown on the one line diagram below. Also see Figure 2 in Attachment A.



**Interconnection Customer (AES) Scope of Direct Connection Work**

AES is responsible for construction of all facilities on its side of the POI (Point of Interconnection). AES proposes to build the interconnection facilities as shown on the one line diagram above.

**Note:** PECO Energy will install metering on the 480 volt side of the PECO transformer to capture retail energy sales to the Interconnection Customer.

**Interconnected Transmission Owner (PECO Energy) Scope of Direct Connection Work**

PECO Energy will perform the following work:

- 1) Provide 1000 kVA Transformer for GS service
- 2) Construct 34 kV Tap fused at 50k
- 3) Connect Interconnection Customer provided 3-1x #1/0 35 kV Al cable on terminal pole

**Cost estimate for PECO Energy Direct Connection work:**

<u>Work</u>	<u>Cost</u>
PECO Labor	\$4151.26
Transformer and cable	\$1373.90
Metering	\$710.
<b>Total</b>	<b>\$6235.16</b>

**Construction time estimate: (Installation of PECO facilities has already been completed)**

**Notes:**

- Metering / telemetering: PECO does not require instantaneous (real time) telemetering for generation less than 5 MW. PJM will require instantaneous (real time) KW and KVAR data for generation that is a Capacity Resource. PJM also requires Interval Revenue Metering (Hourly KW & KVAR) provided daily. See PJM Manuals M-01 and M-14D available at <http://www.pjm.com>
- For additional PJM metering / telemetering information contact Kevin Komara at 610-666-4751 or [komarak@pjm.com](mailto:komarak@pjm.com)

## ***Network Impacts***

The U3-001 project was studied as a 1 MW Energy-only injection into a tap on the Barbadoes 34.5 kV circuit #2000. Project U3-001 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

### NETWORK IMPACTS

#### **Generator Deliverability**

*(Normal system, all facilities in-service ,and Single or N-1 contingencies for the Capacity portion of the interconnection only)*

Not required for an Energy-only unit.

#### **Multiple Facility Contingency**

*(Double circuit towerline, stuck breaker and bus fault contingencies for the energy portion of the interconnection)*

No problems were identified.

#### **Short Circuit Analysis**

No problems were identified.

#### **Stability Analysis**

Not required.

#### **Contribution to Previously Identified Overloads**

*(Queue U3-001 contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)*

No problems identified.

### NETWORK UPGRADE REQUIREMENTS

#### **New System Reinforcements**

*(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts", initially caused by the addition of Queue R53 generation)*

None identified

#### **Contribution to Previously Identified System Reinforcements**

*(Overloads initially caused by prior Queue positions with additional contribution to overloading by Queue U3-001)*

None required.

**ATTACHMENT 1**  
(Site Plan)

