**Bell Bend Nuclear Power Plant**
**PPL Bell Bend, LLC**
**Docket No. 52-039**

**ISSUES for Geosciences and Geotechnical Engineering Branch (RGS)**
**Standard Review Plan (NUREG-0800) Section: 02.05.02 – Vibratory Ground Motion**
**Application Section: SRP 2.5.2**

There is substantial contribution to the seismic hazard for the Bell Bend Nuclear Power Plant (BBNPP) from several seismically active source zones in the New England, New York, Ontario and Quebec regions. Recent studies have been performed for several of these regions. The applicant has not adequately assessed this new information to determine if the seismic source models from the 1986 Electric Power Research Institute's Seismicity Owners' Group (EPRI/SOG) report need to be updated. The staff is concerned that the EPRI/SOG seismic source models for the region may not adequately characterize the seismic hazard.

Sensitivity Analyses:

The applicant provided a supplement to its application on November 24, 2008, which describes a sensitivity study performed for the updated USGS seismicity catalog as well as the Charlevoix seismic source zone. However, adequate descriptions of both sensitivity studies were not provided. The supplement describes a sensitivity study which was performed to understand the effects of the 2002-2007 seismicity in an area broader than the 200 mi (322 km) region. The results of the sensitivity study showed that the 2002-2007 update did not have a significant effect on the probabilistic seismic hazard analysis (PSHA) study at BBNPP site (i.e., the result is a marginal reduction of ground motion levels, between one and two percent, when compared to the United States Geological Service (USGS) 2002 catalog). However, specific details of the sensitivity study were not provided. For example, descriptions of the specific source geometries in which seismicity rates were assessed were not provided. Conclusions regarding the adequacy of the seismicity rates were also not provided.

The sensitivity study performed for the Charlevoix seismic source involved 1) defining a broader Charlevoix seismic zone to cover the epicentral area of the 1988 earthquake and 2) increasing the maximum magnitude of the current source zones that contain the epicenter of the 1988 earthquake. However, specific details of the sensitivity study, including results in the form of hazard curves were not provided.

In addition, the sensitivity study did not take into consideration some of the more recent research since the time of the EPRI-SOG evaluations, or evaluate all of the parameters critical to the PSHA. While the supplement does provide some discussion of the St. Lawrence source zone and the possible occurrence of a magnitude 7 earthquake beneath Lake Ontario (Wallach, 2002), the Ramapo seismic zone (Sykes et al. 2008), and the potential New England seismic source zones as described in Ebel (1996, 2002), the description of the sensitivity study did not include a discussion of the adequacy of the parameters of the EPRI-SOG source zones (i.e., Mmax distribution, geometry, seismicity rate, and probability of activity) to support conclusions made regarding the insignificance of these source zones at the BBNPP site. Furthermore, the discussion in the supplement did not provide any quantitative comparisons between the postulated source models and the existing EPRI/SOG model parameters (i.e., geometry, Mmax distribution, probability of activity) with respect to this new information.