

**COMMENTS OF TRANSOURCE ENERGY SUBMITTED TO PJM ON DECEMBER 5, 2014
REGARDING PJM EVALUATION OF SUPPLEMENTAL PROPOSALS FOR ARTIFICIAL ISLAND**

Comments Regarding Additional Violations Addressed by Transource Project

PJM has identified the Red Lion – Cedar Creek 230 kV line as a thermal constraint in the ongoing 2014/2015 RTEP long-term proposal window. The Transource proposal significantly reduces the loading on the Red Lion – Cedar Creek 230 kV circuit and eliminates this criteria violation. PJM should consider this additional benefit in the Artificial Island decision making process.

Comments Regarding Optimized SVC Requirement for Transource

Transource has conducted analysis that confirms that the SVC size at New Freedom for the Transource proposal can be reduced to +250 MVAR. Transource further determined that under-excitation capability is not required to meet the PJM stability criteria that were used to assess Artificial Island proposals. Based on our experience, the cost of this SVC requirement (+250 MVAR) will be comparable to the cost of the optimized SVC requirement under other proposals. Transource would be happy to share this analysis of the SVC requirement with PJM upon request.

Comments Regarding Additional Benefits of Transource Proposal

Transource would like to note that our proposal will provide the following benefits, in addition to resolving the reliability and stability issues at Artificial Island:

- Market efficiency benefits
- Route diversity (rather than using an existing corridor)
- Black start benefits
- Avoids outages of the 5015 (Hope Creek – Red Lion) 500 kV line
- Does not cross the crossing of the Supawna Meadows National Wildlife Refuge
- Addresses thermal constraint on Red Lion – Cedar Creek 230 kV line

Comments Regarding CH2M Hill Report

Transource, working in collaboration with Pepco Holdings Inc. (PHI), potential joint participant in the development of the project, and Burns & McDonnell, lead technical advisor, disagrees with two key assumptions used in the CH2M Hill report that drive the report's conclusions regarding permanent

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wetlands impacts, and the associated mitigation costs, and the expected timeframe for permitting. CH2M Hill relies on these faulty assumptions on page 7-2 of their report to conclude that the Southern Delaware Crossings submarine projects “could be the most difficult scenario of the three to permit.” Transource disagrees with this conclusion.

First, CH2M Hill overstates the permanent wetlands impacts and associated mitigation costs for the Transource proposal by assuming a permanent access road is required in Delaware. The report states in section 3.2.2.2:

“Permanent impacts associated with new permanent access roads were calculated based on the assumption that a new, 24-foot wide permanent access road would be required over the entire length of new ROW (2.5 to 3.5 miles) in Delaware. This results in additional permanent impacts between 8 and 11 acres.”

Transource does not propose to install a permanent access road in Delaware and the project will not result in these 8 to 11 acres of permanent impacts to wetlands. Rather, temporary access will be used for construction (composite mats, geotextile fabric & fill, etc.) and maintenance; as such no permanent impacts from roadways are anticipated. This approach will limit the permanent impacts to the overhead transmission foundations, estimated at 0.15 acres by CH2M Hill. This will eliminate the estimated \$770,000 in mitigation costs contained in the report.

The use of temporary access is consistent with AEP and Burns & McDonnell’s extensive experience with building in environmentally sensitive areas. Most significantly, this approach is also consistent with the experience of PHI and its Delaware utility subsidiary Delmarva Power with transmission projects in this geographic region. Due to the coastal nature of its service territory, PHI routinely constructs major projects through sensitive resources, such as wetlands and waterways, using various techniques to eliminate or minimize permanent impacts. The techniques to provide temporary access to construction areas include the use of low ground pressure vehicles, composite mats, barges, temporary bridging, and helicopter installation (see attached photographs in appendix). In addition, PHI uses avoidance and minimization techniques, such as mapping sensitive resource locations in order to route around them or bypass them through the use of horizontal directional drilling. The elimination or minimization of permanent impacts serves to both streamline the licensing and permitting process and reduce associated mitigation costs.

The second assumption involves the likelihood that an Environmental Impact Statement (EIS) would be required under the National Environmental Policy Act (NEPA) review process, resulting in a permitting timeframe of 36-56 months. Based on the collective experience of Transource (American Electric Power), PHI and Burns & McDonnell, these timeframes are overly conservative and the 27 months anticipated in the Transource proposal is much more reasonable.

The CH2M Hill report, section 4.1.1.3, cites four projects as comparison and states that EIS is likely. Transource disagrees with this assertion:

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- The two projects that required an EIS are the Champlain Hudson Power Express (300 miles of subsea installation) and the Dominion James River Crossing (17 overhead structures installed within the James River)
- The two projects that were approved without an EIS are the Hudson Transmission Project (3 mile river crossing) and the Bayonne Energy Center Cables (6.5 miles of submarine cable)

The two projects approved without EIS are more representative of the scope and scale of the project proposed by Transource.

Comments Regarding Classification and Technical Performance of Dominion's TCSC Proposal

Transource urges PJM to carefully consider the classification and all technical performance aspects of the Thyristor Controlled Series Compensation (TCSC) proposed by Dominion. Transource has several concerns with this proposal. First, we do not believe the proposal achieves the objectives of the Artificial Island problem statement. We believe that the TCSC will be considered a Special Protection Scheme (SPS) by ReliabilityFirst. As such, the selection of the TCSC proposal by PJM would go against established PJM practice of only implementing SPS projects as temporary solutions until more permanent RTEP solutions are placed into service. In addition, the TCSC proposal, with its SPS characteristics, would be similar in complexity as the Operating Guideline that is in place today. The goal of the Artificial Island proposal window was to eliminate or at the least simplify this existing Operating Guideline. Considering the complexity introduced by the TCSC, Transource does not believe that this TCSC proposal meets the objectives of the Artificial Island problem statement.

We are also concerned that the potential for Subsynchronous Resonance (SSR) is very high and has not been adequately studied. Many details concerning the operation of the TCSC during fault conditions have not been shared with the stakeholders to assess the potential impact of SSR. In fact, Transource believes that the detailed turbine-generator shaft modeling data necessary to run detailed studies of the risk of SSR were not available in the proposal window and, therefore, such needed studies have not been completed for the proposal.

To elaborate on the SSR issue: it is possible to control TCSCs to mitigate SSR conditions, but the manner in which Dominion proposes to operate the TCSC is concerning. Dominion is proposing to install 40 and 45 percent fixed series compensation on Salem – New Freedom and Hope Creek – New Freedom lines near New Freedom (pages 13, 26-27). Dominion also proposes to insert the TCSC during post-disturbance power swings bringing the total series compensation to 90 percent on both lines for a period of 2.5 seconds and then removing the TCSC. The TCSC might well need to be inserted and active at all times in order to continually regulate against SSR, particularly during outages of the Hope Creek – Red Lion and Salem – Orchard lines, in which case the Artificial Island generators would be operating

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radially into the fixed series caps. Transource expects the 90 percent compensation level to introduce an extreme risk of SSR; a comparable situation does not exist currently in the Eastern Interconnection. It is difficult to predict how quickly resonance conditions might build up to dangerous levels. Further, there may be a continual reliance on the thyristor controllers given the presence of the fixed series caps, which in turn introduces additional risk of failure.

Finally, Transource is also concerned about the unintended consequences of the TCSC on the surrounding grid; impacts that may not be initially calculable. In addition, the impact of the TCSC operation on existing protection and control systems and the changes in fault currents and short-circuit levels in the vicinity of Artificial Island must also be taken into consideration. Transource requests that a thorough and transparent analysis be conducted by PJM to determine the full system impacts of the TCSC proposal.

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Appendix - Photos of Representative Pepco Holdings Inc. Transmission Projects

Composite Matting through Marshland



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Waterway and Marshland Composite Mat
Crossing



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Temporary Bridge Waterway Crossing



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Composite Mat Stream Crossing



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Use of Barge to Transport Supplies



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Use of Barge Crane for Transmission Tower Erection



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Transmission Tower Foundation Construction via Land and Barge



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Helicopter Installation of Transmission Pole



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Helicopter Installation of Transmission Line within a Wetland

