



TransourceSM Energy, LLC

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Steven R. Herling
Vice President, Planning

Craig Glazer
Vice President, Federal Government Policy

PJM Interconnection
2750 Monroe Boulevard
Audubon, PA 19403

Dear Mr. Herling and Mr. Glazer:

We commend PJM for the thorough analysis that has been completed regarding Artificial Island. The supplemental information provided by the finalists, individual meetings and stakeholder discussions provided PJM a robust set of information to guide this critical decision. This complicated situation demands careful deliberation resulting in a proven, constructible, reliable and commercially viable solution. Achieving this result will require critical assessment of the project risks to insure the solution meets these requirements. In this case, the risks are particularly important to consider because the selected project will impact the long-term stability of a 3,800 MW nuclear generation complex that directly serves major eastern U.S. population centers; the negative consequences of a misstep are likely massive. PJM must analyze the risks using factual information, experience, proven technologies and verifiable commitments to properly assess their impact. PJM should be cautious of flashy headlines, unproven technologies and vague commitments that could have an adverse impact and, ultimately, significantly raise the cost of the project to the developer, PJM and customers.

We believe the Transource proposal offers the “no regrets” selection for PJM with the least technical, commercial and execution risks. Transource has invested significant resources to ensure that our proposal is solid on all fronts. Our proposal is based upon a detailed analysis by AEP and Pepco, with experienced industry experts, using proven designs and construction



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techniques coupled with extensive knowledge of the area. In addition, Pepco brings local resources to provide operation and maintenance for the project.

The key benefits presented by the Transource proposal are:

- *An ideal team:* AEP and Pepco are deeply experienced and have extensive resources in all aspects of development, construction and ownership of similar transmission assets (submarine cable, directional drilling, interconnections to nuclear generating facilities, etc.) and in the same geographic area. In addition, our technical advisors, Burns & McDonnell, ABB and Caldwell Marine, bring direct experience in executing very similar projects
- *Thoroughly analyzed project scope and cost estimate:* Transource has invested significant resources in identifying the superior performing¹ submarine cable solution based upon a rigorous due diligence process, including gathering extensive information from subject matter experts with direct experience on similar projects. As a result, PJM can have a high degree of confidence in our project scope, schedule and cost
- *A more permissible option than a new overhead crossing:* our project will not impact the shipping channel and does not cross wildlife refuge lands
- *Use of proven technology and construction techniques:* the combination of directional drilling, in-water cofferdams and jet plow cable burial is the most feasible way to execute the submarine crossing and has proven successful in other projects, like the Bayonne Energy Center Project
- *Fair and rational cost containment framework:* clear financial incentive to achieve cost targets that are not contingent upon changes in the project scope

¹ November 7, 2013, TEAC Reliability Analysis Update, Slide 64



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In contrast, we believe the information provided during the supplemental period concerning each of the alternate proposals exposes PJM and its stakeholders to key risks that could dramatically impact the operation, execution and commercial viability of the project. A brief discussion of the alternative proposals is contained below.

Dominion Proposal

At first glance, Dominion's SVC/TCSC proposal offers benefits: potentially the lowest cost project without the permitting concerns of crossing the Delaware Bay. However, it would be the first application of these technologies under the proposed operating parameters and *we do not believe this approach works in a practical application*. AEP is the largest owner and operator of FACTS devices in the U.S. and we are not aware of any application of TCSC in the world that utilizes series compensation beyond 60%, much less up to 90%. Based on our experience, we believe that 90% series compensation will put the nuclear generation complex and the surrounding PJM grid at a significant risk of interruption. We believe good utility practice would be to only implement this new technological approach after several years of study within a suitable test environment. In this case, Dominion proposes to use Artificial Island as the test environment, where a failure, malfunction or unintended consequence could have massive negative impacts. We challenge PJM to consider if Dominion, the technology vendor, or any other party would agree to absorb the negative financial impact caused by such an unexpected event.

To further the technical point: we urge PJM to recognize that some functionalities and vulnerabilities of FACTS devices *are incalculable* because of limitations in the available modeling analysis that assumes a balanced three-phase system. In reality, due to the variable nature of load, the Extra High Voltage network in PJM remains an unbalanced system. In other words, we believe it is not possible to fully predict the actual performance of the Dominion proposal with analysis alone; it must be observed and tested in a real world environment. AEP experienced



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this issue first hand at its Rockport plant. In this case, AEP engineers performed extensive analysis to perfect the operation of a single phase switching scheme and subsequent curtailment of the plant to ensure stability. However, the unbalanced nature of the grid masked vulnerabilities that, unfortunately, only became known through actual plant tripping events. In 2007, the Rockport plant tripped due to the failure of the protection system and subsequently tripped two additional units in PJM and MISO. This resulted in loss of approximately 4,400 MW of generation that triggered frequency excursions on the Eastern Interconnection. PJM cannot afford to make a similar mistake at Artificial Island and, therefore, should not select the Dominion proposal.

LS Power Proposal²

The LS Power proposal is positioned to grab headlines: guaranteed savings versus other proposals. However, this headline does not recognize several key issues that could combine to result in negative consequences for PJM and its customers. First, LS Power has no direct experience in developing, constructing and owning similar submarine transmission assets and, to our knowledge, no other experienced subject matter experts directly participated in their ongoing due diligence process. This point was highlighted at the December 9th TEAC meeting where LS Power cited Dominion's Yorktown to Hayes project as supporting their project scope and cost estimate. We have confirmed with Dominion that this project was very different in scope, and therefore less costly, than the submarine installation that will be required for Artificial Island³. Both the technology and construction techniques used in the Yorktown to Hayes project are not feasible for the Artificial Island and, therefore, are not applicable. Second,

² For this discussion we will focus on the submarine option proposed by LS Power. We do not believe that constructing a new overhead crossing is a permissible option.

³ Some of the key differences for Artificial Island that drive the cost significantly higher include: installation of seven cables (versus two pipes for Hayes to Yorktown), construction of 14 in-water cofferdams (versus none), jet plowing installation (versus all directional drilling) and installation of XLPE cables (versus high pressure fluid filled cables). More information is available upon request.



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and perhaps as a result, we believe that LS Power underestimates the cost of their project by approximately \$50 to \$100 million⁴. This assertion is based on the detailed analysis performed by Transource and supported by our experienced industry experts. Finally, if the cost cap proposed by LS Power is truly binding, then LS Power would be taking on this massive commercial risk while only posting the limited collateral requirement under the Designated Entity Agreement.

We believe the combination of these factors exposes PJM and its customers to significant risks that could jeopardize the project and PJM must consider if Artificial Island is the appropriate setting for it to sponsor such a venture. Several worrisome scenarios could play out, including LS Power walking away from the project or compromising quality to prevent financial losses, and correcting these issues would greatly increase the overall cost to customers. PJM should clearly identify all of the information it would need to ensure the scope proposed by LS Power is appropriate. Key considerations in this effort include scope definition, design standards, team experience, and investment in due diligence.

PSEG Proposal

In the case of PSEG, we believe PJM cannot make an accurate assessment given the changing information contained in the various proposals. At the December 9th TEAC it was clarified that PSEG does not plan to use any right of way owned by the LDV and, as a result, PSEG will need to acquire significant new right of way along the 8.5 mile route from Hope Creek to the proposed river crossing location. This came as a revelation because PJM specifically cited access to LDV right of way as *the driving factor* for originally designating the project to PSEG⁵. We urge PJM to either dismiss the PSEG proposal as materially changed in scope or recognize

⁴ In the December 9, 2014 TEAC meeting PJM committed to provide to stakeholders more details regarding the scope of LS Power's project that is subject to the proposed cost cap. This information will allow a more detailed assessment of the viability of this cost estimate.

⁵ June 16, 2014, TEAC Artificial Island Recommendation, Slide 31



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the significant new risk to the project caused by the need to acquire this new right of way. The December 9th TEAC meeting also revealed inconsistencies in the “allowable changes” under the PSEG “cost cap” with the explanation offered at the meeting sounding much broader than inferred in PSEG’s supplemental proposal. The likelihood of externally driven changes should raise significant concerns for PJM given the significant challenges of this project: new overhead crossing of the Delaware River, crossing the Supawna Meadows National Wildlife Refuge, and new right of way needed.

Conclusion

In summary, the Transource proposal stands out as the best option for Artificial Island and its many dependent electric customers. We believe it is the best “no regrets” selection for PJM with the fewest technical, commercial and execution risks. We also look forward to receiving the follow up information from the December 9, 2014 TEAC meeting, including specifics of the project scope under the cost caps offered in the LS Power and PSEG proposals. Again, we appreciate the rigor of PJM’s evaluation process and we look forward to working with PJM on future competitive projects.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Rajarajan".

Raja Sundararajan
Vice President, Strategy & Grid Development
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