

**Comments of Michael C. Calviou, Vice President, National Grid USA, prepared for
March 8, 2005 FERC Technical Conference on Reactive Power**

I. Attributes of Reactive Power

Reactive power is fundamental to transmission system operation and for the generation of real power, while reactive power needs are required to be generated locally, there are far reaching interregional consequences when supply is insufficient.

Procurement of reactive power is not conducive to a real time market analogous to the markets for real power for several important reasons:

- Reactive power is a “byproduct” of generation and is not the primary product of a generator therefore it is not realistic to believe that such a market will drive siting decisions.
- The potential size of a reactive power market is orders of magnitude less than real power because the actual incremental costs for providing it from a generator are relatively small. For example the total costs paid for reactive power capacity in New England are approximately \$10-20 million. Last year the total costs of procuring reactive power (including cost to run generators not otherwise running for real power production) under schedule 2 was approximately \$80 million, which is still only approximately 1% of the costs of procuring energy.
- The costs, including adequate reactive power metering, outweigh the benefits.
- Because most generating technologies inherently produce and absorb reactive power, any efficiency gains by procuring the reactive power through a market will be small compared to a compensation system designed to pay generators for what they inherently possess. This is true both for a “typical” level of service and for any incremental costs for providing more than the typical level of reactive power.

II. Recommended Approach

National Grid believes that a simple, pragmatic regulatory model be established to adequately plan, procure, and fairly compensate for reactive power. This recommendation is based on experience in both the UK and the US regions where National Grid operates today. The key elements of National Grid’s recommendations include uniform provision of and compensation for reactive support from all generators, obligations for all compensated units to provide comparable reactive services, and a robust regional planning process that plans for the reactive needs of the system.

A. Compensation

The first element of National Grid’s recommendations is uniform provision of and compensation for reactive support from all generators with such compensation based on “cost reflective” principles applied comparably and non-discriminately to all providers of reactive power.

All generators must possess reactive capability within a specified bandwidth either per FERC’s pro forma Large Generation Interconnection Agreement or an appropriate FERC approved independent entity variation and as a result all generators will be paid for possessing this capability. This requirement is similar to the UK “obligatory” or “default” reactive service requirement.

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Generators should be allowed to recover their costs for the requirement of possessing reactive power capability through capacity payments. Payments should be based on “cost reflective principles”, which establish a proxy payment designed to recover reactive power costs for the average incremental cost without the need to justify specific costs on a case-by-case basis. These costs may vary regionally and may be different for dynamic and static reactive support. In addition, generators should receive compensation for start-up, lost opportunity, and other costs incurred by the unit in the process of providing reactive support.

B. Regional Planning and Real-Time System Operations

Beyond ensuring a certain minimum level of dynamic reactive resources are installed in lockstep with generation additions, our proposed reactive procurement/management program would then assess reactive needs of the system as part an overall robust system planning process. This places the responsibility correctly on the transmission provider to ensure that adequate reactive resources and reserves will be in place to meet anticipated needs.

The Transmission Provider must assess needs based on both reliability considerations as well as economic considerations (e.g., reduction of congestion). If additional reactive resources are required to fulfill needs left unmet through generator capability requirement, the Transmission Provider should and must be allowed to consider a wide range of solutions such as bilateral contracts for “enhanced reactive service” (generator capability outside of the specified bandwidth) and for transmission additions.

C. Obligations of Reactive Resources

The Transmission Provider should have the responsibility to monitor reactive needs/resources for reliability and also utilize reactive resources in real time to relieve transmission constraints that may be contributing to congestion costs.

A necessary feature of being compensated for reactive capability is that all generators should be subject to the same obligations for providing such support. This obligation requires that all compensated units must follow the Transmission Providers instructions, including obligation to start-up if available, and of course these instructions must be given on a non-discriminatory basis. Such a requirement is more consistent with the authority of the system operator in the UK and a departure from Order 2003, under which generators are not obligated to start up even though they have to have a minimum capability.

III. Benefits Of the Model

There are several benefits of the model recommended by National Grid:

- The model is simple, pragmatic, and readily implemented because some of the elements are in existence today or under development in various areas of the country such as minimum reactive capability built into the LGIA, tariff provisions for capacity payments for reactive compensation, and strong regional planning.

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- The model strikes the proper balance between ensuring adequate reactive support within a region (at the right locations) and adequate compensation of reactive resources without paying for significant oversupply of reactive capability.
- The model ensures that reactive resources are utilized both for reliability and economic efficiency needs of the system.
- The model removes incentives for generators to neglect maintenance that affects its reactive capability as a cost savings measure.

IV. Steps Needed To Implement the Model

There are several steps needed to implement National Grid's model, including tariff revisions to compensate generators, better protocols for enforcement of reactive obligations, and improved planning procedures to plan for adequate reactive power resources.

Compensation needs to be provided to ensure that generators will not have the incentive to neglect maintenance of equipment required for reactive support and a general disincentive to assist when needed by the Transmission Provider. Consequently, better protocols for enforcement of reactive obligations including periodic testing of reactive capability and penalties for failure to respond to a Transmission Provider's instructions, should be created.

Planning for reactive power and planning generally demands improvement as there remains resistance to economic planning and as the Staff paper recognizes, no one actively assesses reactive reserves. Reactive power is precisely why economic planning is needed; a generator's natural interest in maximizing real energy revenues often runs counter to the need for that generator to produce reactive power (reactive output backs of real output; reactive power can reduce constraints and take away congestion rents).