



power system. The IESO-controlled electric power grid is interconnected with grids in two provinces and three states.

The IESO is a member of the ISO/RTO Council (“IRC”) and a signatory to comments submitted by the IRC to this proceeding.

Reactive power issues are critically important to the industry, and the IESO commends the Commission for addressing them at this time. These comments give an Ontario perspective on certain aspects of the Staff Report, supplementing the IRC submission and elaborating on the Staff Report’s description of Ontario practice respecting reactive power procurement.

The IESO’s comments are intended to assist the Commission in its deliberations by documenting and providing rationale for differences between Ontario practice and that of ISOs and RTOs subject to the Commission’s jurisdiction.

## **II. The Ontario Approach to Reactive Power Procurement**

The distinct features of the Ontario approach may be considered to follow from three principles:

1. All Ontario generators are required to be capable of operating within a standard power factor range if they are to participate in the IESO-administered markets for energy and operating reserves.
2. Specific payments to a generator in respect of the **capability** to produce/consume reactive power are warranted only when a generator must make an investment incremental to that required to be a producer of real power within the standard power factor range, and when such an investment requirement is not applied equally to other generators.

3. A generator should not be financially disadvantaged when directed to produce/consume reactive power.

In accordance with principles 1 and 2 above, **no compensation is paid for reactive capacity/capability**, i.e. the ability to produce/consume reactive power, within the standard power factor range. That is, there is no compensation in Ontario for the costs of equipment such as exciters, which in effect are deemed an essential requirement for real power production by all generators within the standard power factor range. This contrasts with the Schedule 2 payments under FERC ISO/RTO tariffs that compensate U.S. generators for reactive power capacity.

Operation beyond the standard power factor range (e.g. the ability of a generator to operate in condense mode) requires specialized equipment and applies to only a sub-set of generators. Accordingly, **generators able and willing to operate in condense mode do receive capacity/capability payments** to compensate for the cost of such specialized equipment. A number of other jurisdictions have comparable approaches.

Generators do incur incremental real power losses when operating with a non-unity power factor, whether within or outside of the standard power factor range. Consistent with principle 3 above, **generators are compensated for real power losses**. Compensation is based on calculated losses (MW.h) and the market clearing energy price (\$/MW.h) for the period in question. As such the compensation represents payment for the opportunity cost of the lost energy. A number of other jurisdictions have comparable approaches.

**Compensation is paid to generators directed to operate outside the standard power factor range and reduce real power output.** In such circumstances generators

incur additional opportunity costs. Compensation is based on the reduction in real power output including calculated losses (MW.h) and the market clearing energy price. A number of other jurisdictions have comparable approaches.

**Transmitters** providing reactive support and voltage control are eligible for compensation via their Ontario Energy Board-approved transmission tariff, for the costs of installing and maintaining the associated equipment (capacitors, static VAR compensators, reactors). The tariff would include a regulated rate of return on the transmitter's associated investment. Ontario practice in this regard is comparable to practice in U.S. jurisdictions.

### **III. Discussion**

The key respect in which Ontario practice differs from that in jurisdictions served by other ISOs/RTOs is therefore the absence of capacity/capability payments with respect to the ability to operate within a standard power factor range.<sup>1</sup> We find the Ontario practice to be eminently reasonable, being based on the principle that a generator should not be compensated separately for reactive power capacity/capability that involves no incremental investment beyond that required for real power production.

In effect, payment for reactive capability to operate within a standard power factor range represents windfall revenue for generators and introduces an economic distortion. Although the payment amounts may be relatively modest and hence the degree of economic distortion may be small, such distortion serves no value and is an unnecessary and inappropriate charge to electricity customers.

We view such capacity payments for reactive supply as reflective of cost-based thinking, from the era of rate-of-return regulation of electricity prices. Today, where

markets for real power exist, all generators make expenditures relating to the costs they must incur to have the necessary equipment ready to participate in those markets.

*In closing*, the IESO commends the Commission for promoting public discussion of reactive power, and appreciates the opportunity to offer comments.

***Respectfully submitted,***

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<sup>1</sup> The province of Alberta similarly does not compensate generators for reactive power capacity/capability.