

RTO West Adequacy Standards

1 Introduction

In Stage 1, the Planning Work Group described transmission adequacy as follows:

The ability of the RTO West Controlled Transmission Facilities, irrespective of the cost of energy, to deliver sufficient energy to "keep the lights on." (In other words, is the pipe big enough?)

What the Stage 2 small group discussed at its first meeting is:

"The goal of transmission adequacy standards is to provide a uniform, objective measure of sufficiency of transmission capacity in fulfilling projected load requirements."

There was general apprehension on the meaning of transmission adequacy given the physical requirement that service to load requires generation as well as transmission. This apprehension was sparked by the realization that the responsibility of RTO West is not to provide or even plan for generation since the market is the means of supply. Rather, RTO West's responsibility in the end is to plan for a reliable transmission system that meets customers' power requirements assuming of course that the market provides the required generation, which can be either local or remote from the load. There is also a desire to minimize the monitoring cost of RTO West in determining adequacy. For example, it was felt by many of the participants that monitoring the contractual obligations of generation resources is inappropriate and costly. Therefore, the concept that was proposed by the stage 2 small group was to develop a physical and not a contractual or cost adequacy standard. Simply put, if the load has enough access to generation (local generation and transmission transfer capability of remote generation within RTO West's jurisdictional territory) to serve it during all hours of the year, then it is adequate. If those responsible for contracting for resources fail to do so and load is not served because of these commercial reasons, the system is still transmission adequate from RTO West's Adequacy Standards point of view.

A subgroup¹ of the Stage 2 small group was assigned the task of documenting the RTO West Adequacy Standard. The traditional system planning approach that included both generation and transmission resources were used in developing the following adequacy standard. This documentation is very high level, uses existing NERC and WSCC Planning Standards and is intended to develop discussion on the issues surrounding adequacy standards. Examples illustrating some of the concepts and issues are also included.

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Note that this paper is not intended to define the RTO's standard for action with regard to any reinforcement or backstop role. These are subjects of a separate paper.

2 Definitions

2.1 Customer Demand

This is the firm load demand including firm transmission obligations for the applicable time period for planning and operation of the RTO interconnected transmission system. This should be based on a consistent method and criteria for all zones in the RTO West system. The system is not considered inadequate when the actual load exceeds the given standard load forecast. Any standard criteria can be exceeded under exceptional circumstances and planning to meet these exceptional circumstances is not economical or practical. Remedial measures should be used to meet exceptionally high loads.

2.2 Dependable Generation

This represents the reliable available generation, taking into consideration fuel and water flow constraints and outages for maintenance.

2.3 Load Service Adequacy

Load Service Adequacy is synonymous with the Adequacy Standard described in Section 2. It combines both the requirements of Generation Adequacy and Transmission Adequacy as defined in sections 3.4 and 3.5.

2.4 Generation Adequacy

The system is generation adequate if the total system generation is greater than or equal to the total load plus reserves.

2.5 Transmission Adequacy

A system is Transmission adequate if there is sufficient transfer capability to transmit power to the Customer Demand from generation required to serve the Customer Demand.

3 Adequacy Standard

The RTO West system is adequate if it has the ability to supply the aggregate electrical demand and energy requirements of their customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.²

² This statement is mostly borrowed from NERC's definition of Adequacy.

The RTO West system is adequate if it meets all of the following conditions.

- a) For a region of RTO West, the dependable remote generation capacity and transmission transfer capability plus the dependable local generation capacity is greater than or equal to the projected Customer Demand for all hours of the year.
- b) For the whole RTO West, the dependable generation capacity and related transmission system transfer capability is sufficient to meet the projected Customer Demand for all hours of the year.
- c) The RTO West system complies with the NERC and WSCC Standards.
- d) The system is Generation and Transmission Adequate during maintenance outages, and disturbances as specified in the NERC and WSCC Standards.
- e) New generation or transmission reinforcements can be built in time to meet new load or export obligations.
- f) Generation and transmission elements are physically capable of performing their intended function for reasonably expected periods to be included as resources to supply projected customer demand and contracted firm (non-recallable reserved) transmission services.
- g) Load serving entities and PTOs have certified that they meet the RTO West Adequacy Standard.

4 Examples

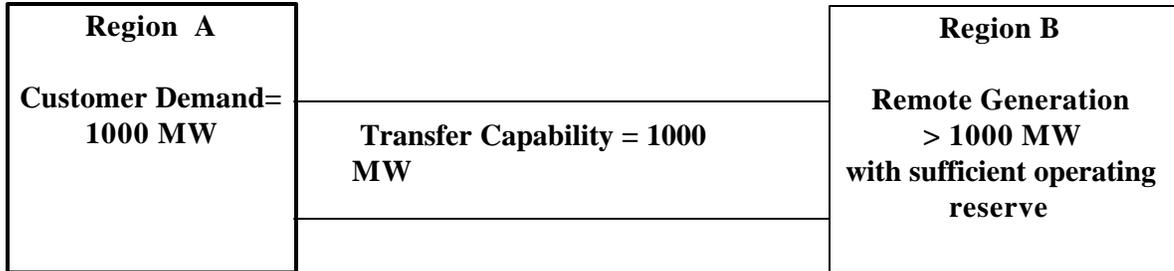
4.1 Collective RTO Adequacy:

Assume that on a regional basis that each region has adequate resources and transfer capability as defined above, and are then individually deemed by the RTO to have adequate supply. Assume also, that on a simultaneous basis, there are simply not enough total resources to supply the load (the present California problem). The system would be determined to be Generation Inadequate. However, if there is enough transmission to access the available dependable generation then the system is Transmission Adequate. Overall, the system does not meet the Adequacy Standard.

4.2 Meeting Applicable Standards:

It is expected that the RTO will meet applicable NERC and WSCC transmission standards, including Planning Standards and MORC requirements. As a result, a system that does not have adequate internal generation and does not meet applicable Standards for importing energy will be found to be inadequate. Note that if an area is defined as a “local area”, adequacy may be met by load shedding after a contingency.

4.3 Generation and Transmission Adequacy

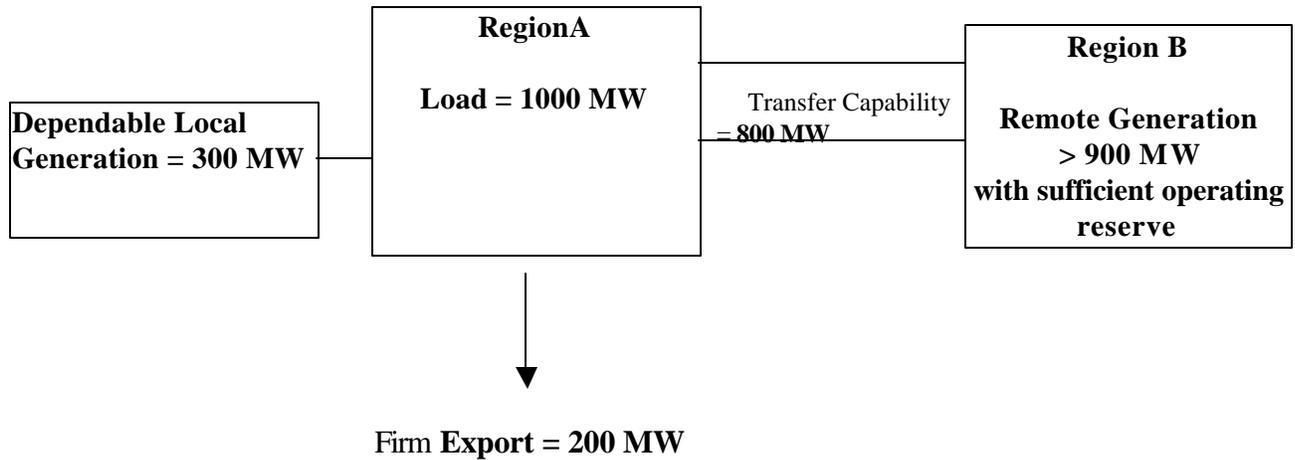


This system is Generation Adequate because the total generation is greater than the Customer Demand and it includes sufficient operating reserves.

The system is Transmission Adequate because the transfer capability is equal to or greater than the Customer Demand of system A.

If the transfer capability is less than 1000 MW, the system is Transmission Inadequate because the remote generation is required to meet the Customer Demand. However, the solution is not limited to transmission reinforcement. If local generation is built to serve the load or if the load itself is decreased, then the system can meet the Adequacy Standard.

4.4 Adequacy Requires Service to Both Local and Firm Exports

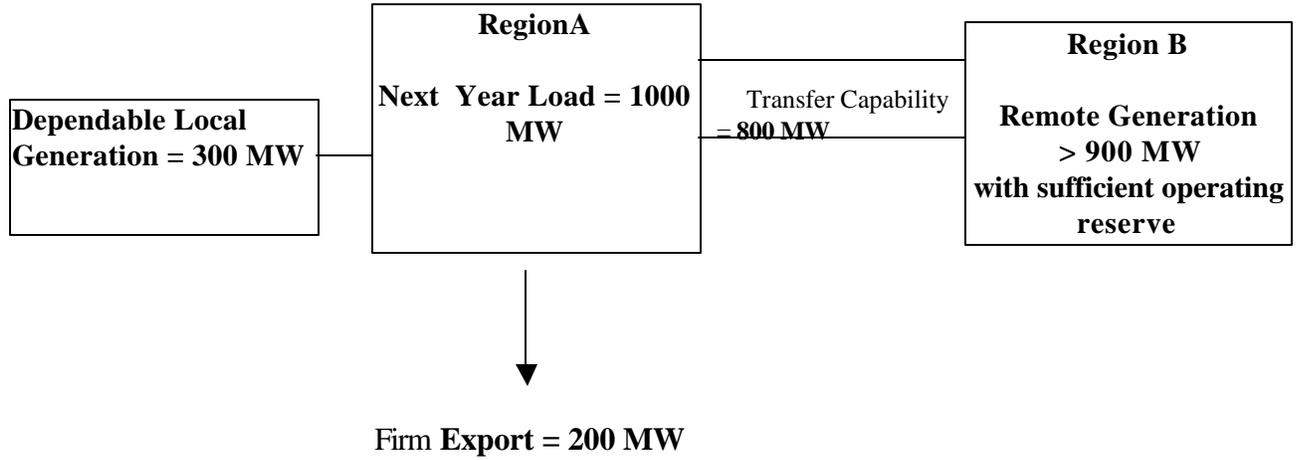


This system is Generation Adequate because the total generation (remote generation plus local generation = 1200 MW) is greater than the Customer Demand (Local load plus firm export = 1200 MW)

This system is Transmission Inadequate because the transfer capability of the system is 100 MW less than the requirement to meet the Customer Demand. The transfer capability is 800 MW and the Customer Demand requires access to 900 MW of remote generation.

The system does not meet the Adequacy Standard because the Customer Demand cannot be met. In this example, the Customer Demand includes both the local load and the firm export. NERC standards considers firm load and firm exports to be served on a non-discriminatory basis. Therefore for the local load to be adequate the firm export must also be adequate.

4.5 Adequacy and Timing



Region A has decided that to make the system adequate next year, the transfer capability of the line will have to be increased. Unfortunately the transfer capability reinforcement will take several years to implement. The system is Transmission Inadequate and does not meet the Adequacy Standard next year because Region A didn't arrange for service in time to meet the load.