

## Western Interconnection Resource Adequacy

### Conceptual Approach and Elements

October 2004

#### I. PURPOSE

The purpose of this paper is to review and explain the conceptual approach and elements the WRAT recommends be used by CREPC and WECC in developing resource adequacy criteria for the Western Interconnection. For each of the seven elements we also identify *illustrative* provisions that could be used to implement the overall approach. We label these elements and their specific provisions as a “**Strawman**”, because we provide them to foster further discussion, not as a recommendation for approval at this time. The WECC Resource Adequacy Work Group (RAWG) process and its submission of recommendations to WECC is now the active forum in which west-wide resource adequacy proposals are under development. Recognizing that the specific provisions of individual elements are complex and can be controversial, we anticipate the need for continuing, thoughtful dialogue and outreach to states, WECC’s Board, staff and members, and other stakeholders. Based on further refinement through the WECC RAWG, WRAT and WECC board members/staff dialogue, we hope that a consensus RA Proposal can be provided for review and continued dialogue at the Spring 2005 CREPC meeting.

#### II. CONCEPTUAL APPROACH to WI RESOURCE ADEQUACY

The WRAT Briefing Paper on Resource Adequacy dated April 2004 included four conceptual approaches:

- transparent information;
- enhanced assessment and consistent metrics;
- voluntary targets; and
- enforceable standards.

The approaches are described in detail in the Briefing Paper and are summarized below.

##### **Transparent Information**

*Develop and maintain transparent information regarding load forecasts, generation, demand resource commitments, transmission, and fuel availability; review this information in a public forum; and, maintain the information in a portable, accessible data base that provides a basis for consistent analyses. (“transparent information and consistent analyses”).*

### **Enhanced Assessment with Explicit Metrics**

*Identify, quantify and review explicit metrics of supply and demand balance for the regional and sub-regional levels considering appropriate timeframes and including elements of risk associated with weather and fuel supplies (“assessment with explicit metrics”);*

### **Voluntary Adequacy Targets**

*Select regional/sub-regional metrics and agree on voluntary adequacy targets for each metric; quantify system performance relative to selected metrics using consistent, transparent information; and, convene periodic summits of regional and state entities to review region and sub-region success in meeting targets (“voluntary targets”);*

### **Enforceable Standards**

*Establish standards on an interconnection-wide basis that reflect intra-regional diversity and provide for sanctions, such as monetary penalties; require LSEs to meet appropriate regional/sub-regional standards (“enforceable standards”).*

The WRAT believes that the third conceptual approach, **Voluntary Targets**, is the approach most likely to be workable given the institutional structure and hybrid market currently in place in the West. Our specific goals in choosing this approach include: building on the existing WECC load and resource assessment process; recognizing that WECC lacks authority to impose mandatory requirements; acknowledging that states have a central interest in generation adequacy as well as authority to impose requirements on LSEs but may have somewhat different evaluations among themselves of the tradeoff between cost and reliability; and, fashioning an explicit partnership between WECC and the states that can result in effective implementation of effective, workable adequacy provisions.

The metrics and targets that form the foundation of this approach would not be “enforceable standards” in the conventional sense described in the fourth approach above, but they would represent the region’s decision makers’ and stakeholders’ best judgment of acceptable system performance requirements-- a reasonable level of adequacy. We believe it will be necessary to utilize at least two metrics (capacity and energy) to reflect WI system diversity and specific subregional uncertainties.

A critical challenge for this approach is establishing a robust process to propose and reach consensus on targets. The WECC Reliability Subcommittee Resource Adequacy Work Group (RAWG) is a forum established to develop a target using the reliability perspective alone. However, from the state/provincial regulatory perspective, establishing such a target requires evaluation of the tradeoff between cost and reliability. Ideally, each consumer could make their own choice how much they are willing to pay for different levels of reliability through the institution of dynamic, market-based rates. However, since it is likely to be a long time before such rates that allow consumers to choose their desired level of reliability are in place throughout the WI, the choice of an aggregate level of reliability for their LSEs will remain a key decision that regulators must make. The WECC RAWG has not yet initiated any activities to evaluate these tradeoffs and may never be in a position to do this analysis. As a part of this public policy decision, questions regarding timeframes, target levels and to whom the targets would apply would be debated, and perhaps resolved by each state/province. Thus, it is possible that WECC

will establish a target that ensures physical reliability at some minimum level, but that some states/provinces will decide that a higher level is justified on the basis of cost versus reliability tradeoffs.<sup>1</sup>

Successful application of this approach would require that the targets be applied and evaluated at a meaningful level of WI geography. “Meaningful” refers to a level of granularity within the Interconnection that allows regional, state and local regulators to focus attention on entities that are capable of taking actions to affect adequacy.

Finally, regional entities and states would agree to a common, public forum to annually review success in meeting the targets, relying on an improved WECC staff annual Power Supply Assessment (PSA). By building upon the current WECC assessment processes, both improving the technical analyses and releasing results at greater level of detail, states/provinces would have the information they need to understand how their own regulated entities fit into the west-wide and subregional electricity system. While WECC has no existing authority to enforce planning targets at this time, the knowledge acquired through the annual review would allow individual states/provinces, control areas and LSEs to achieve outcomes through their existing market roles, authorities and mandates. It is not unreasonable to believe that the precise tradeoff each jurisdiction might make could be different, which would be acceptable if each jurisdiction were able to limit the impacts of individual decisions to their own geographic region.<sup>2</sup>

Since the April 2004 CREPC meeting, the WRAT and members of the RAWG have identified seven elements that need be specifically included within any proposal to implement the “voluntary target” approach. These are:

- Data/information standards
- Level of geographic detail
- Submission of information
- Assessment metrics
- Adequacy targets/benchmarks
- Time horizon, and
- Oversight and uses for resource adequacy evaluation.

We believe that all of these elements must be included for resource adequacy criteria to be applied. In the following sub-sections we offer illustrative provisions that could be used to define each element. As stated at the outset, text or proposed specifics under each element (below) are offered for discussion purposes only.

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<sup>1</sup> Individual customers willing to have lower reliability in exchange for reduced costs can participate in demand response programs and/or market-based tariffs on a voluntary basis.

<sup>2</sup> The California Public Utilities Commission in D.04-01-050 adopted the basic framework of an enforceable standards version of resource adequacy requirements. Subsequently, a stakeholder workshop process has been developing the detailed requirements. A draft decision establishing key details for some elements (e.g. load forecasting protocols and resource counting conventions) has been issued for adoption.

### III. STRAWMAN ELEMENTS FOR WI RESOURCE ADEQUACY

#### 1. Data/Information Standards

- a) Each entity submitting information to WECC for analysis should agree to a common set of load forecasting protocols, resource counting conventions, deliverability screens and other reporting requirements:
  - o Load forecasting protocols standardize the inclusion of energy efficiency, distributed generation, demand response, losses and other considerations affecting load forecasts. An example of a protocol as envisioned here is a clear definition of “Commitment” that would determine whether or not to count the impacts of energy efficiency and other public policy programs in load forecasts.
  - o Resource counting conventions standardize the inclusion of resources, the capacity and energy values to be derived from them in assessments, and any limits that certain types of resources can constitute as part of a portfolio of resources. An example of a convention as referenced here would be a specific method for using historic performance data to de-rate wind nameplate capacity to that level reliably available under summer peak demand conditions.
  - o Deliverability screens ensure that resources identified can actually serve load in light of transmission limitations and other constraints. An example of a deliverability screen as proposed for RA purposes would constrain transmission imports into a resource deficit transmission bubble from adjoining bubbles based on the aggregate path rating of the relevant transmission lines under summer peak demand conditions.
- b) A strong WECC role in obtaining compliance with these reporting requirements should be expected. WECC staff will need to be vigilant in pursuing timely submittals and ensuring adequate tracking of certain data entries, etc.
- c) All of the relevant entities necessary to prepare comprehensive and accurate load forecasts and resource tabulations for the WI need to be included within an expanded reporting process.

#### 2. Level of Geographic Detail

Analysis would be performed at the level of geographic disaggregation within which there are no significant power transfer distinctions for resource adequacy purposes at least with respect to external areas. While this is frequently the control area, there are several large control areas in WECC that have internal transmission limitations that would be treated as separate units for analysis. In current WECC analyses this concept is embodied in the term “transmission bubble.” This could entail creation of some limited number of additional bubbles, for example, splitting the northwest control area as the CAISO control area is now split into zones based on transmission constraints.

### **3. Submission of Information**

- a) In establishing filing requirements, implementation of the resource adequacy approach will build on existing submittals, such as the annual WECC Loads and Resources requirements to minimize new data requests on control area operators.
- b) The control area operator is the primary entity that provides all required information to WECC and that is expected to adhere to the data standards developed as part of the resource adequacy requirements and reflected in the Load and Resource Instructions. The control area operator must be familiar with the plans of the LSEs within its control area and include all relevant information within its submissions to WECC, e.g., load forecasts that reflect the impacts of committed energy efficiency programs or resource tabulations that reflect the authorized subsidy programs that encourage the development of distributed generation.

### **4. Metrics**

Two metrics should be assessed (1) for WECC as a whole and (2) for each of the transmission bubbles, which are the initial geographic level analyzed. It is expected that in any single WECC region or transmission bubble that one of these two metrics provides the limiting constraint.

- a) Capacity margin over August peak loads, using 1:2 weather (expected weather patterns from 50 years of recorded peak events and any consensus on the impacts of climate change) and average economic/demographic projections.
- b) Monthly energy for the winter season months of December – February using a standardized set of adverse weather conditions that describe both likely loads and energy production.

### **5. Benchmarks**

Each of the two metrics described above should have a specific benchmark that is used to judge adequacy. Assessments for a transmission bubble that fall below a given benchmark are candidates for being identified as potentially inadequate within the constraints of the analysis and data used in the assessment. A bubble or other sub-unit of the region could have a lower planning margin if approved by a state or local governing body and they are able to ensure the consequences of shortfalls will not affect their neighbors or the rest of the Interconnection. In reality, this would mean some sort of demand response program or a higher degree of involuntary outages than would otherwise occur.

While sophisticated analytic techniques such as LOLP, LOLE, and expected un-served energy may be the basis for defining specific benchmarks, in the end any benchmark is the result of a tradeoff between reliability and cost that must be made by policy-makers if electricity consumers are not allowed to make their own choices in response to market prices.

- a) *Target/Benchmark for summer peak capacity metric: XX% planning reserve margin.*
- b) *Target/Benchmark for winter monthly/seasonal energy metric: XX% excess generation capability after establishing a cold/dry weather standard that increases loads and decreases hydro-generation compared to average winter conditions. Alternatively, the benchmark could be load and resource balance, but measured against a more constraining weather standard.*

## **6. Time Horizon**

Assessments of resource availability and review of adequacy should be conducted each year for years one through ten out to the future.

## **7. Oversight and Uses for Resource Adequacy Evaluation**

- a) WECC staff would prepare a single multi-year Western Power Supply Assessment for review by the Board and CREPC in an annual meeting.<sup>3</sup> The adequacy evaluation would apply two metrics and associated targets/benchmarks and would be conducted at a meaningful level of geographic granularity (transmission bubbles).<sup>4</sup>
- b) The WECC Board would approve the power supply assessment and forward it to NERC, and would direct WECC staff to ensure any other assessments provided to NERC are consistent with the approved Western Power Supply Assessment.
- c) State/provincial regulators would require LSEs under their jurisdiction to compare and contrast and justify any differences between IRP analyses required by states and submissions to control areas or to WECC.
- d) Regional LSEs and regulators would be expected to apply the voluntary targets as basic thresholds for their IRP analyses, with the expectation that linkage between these analyses and LSE-specific resource procurement would take place in jurisdictions where LSEs and their regulators believed action was appropriate.
- e) State regulators could potentially impose greater resource procurement standards on LSEs under their jurisdiction if they believe higher levels of reliability were appropriate or alternative portfolios of resources were desired.
- f) CREPC and WECC would periodically review the basis for the resource adequacy metrics and targets and makes adjustments in light of experience, new regional developments, and public policy tradeoffs.

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<sup>3</sup> The current short term summer and winter seasonal assessments need not conform to this process.

<sup>4</sup> The metrics would be capacity related and energy related, but with the expectation that one would dominate the other in any particular WECC subregion.

#### **IV. NEXT STEPS**

CREPC should support:

- An RA proposal using the “Voluntary Targets” conceptual approach;
- Inclusion of the seven elements described in this paper in any RA proposal;
- WRAT presentation of the seven strawman elements and associated implementation provisions within the WECC RA process; and
- Work to achieve a consensus WRAT/RAWG RA proposal for CREPC by April 2005.

WGA should:

- Continue development of independent capability to evaluate assessment results of resource adequacy evaluation;
- Support efforts to build state/provincial regulatory staff understanding of assessment and resource adequacy challenges; and
- Provide resources for outreach to state/provincial regulators and local boards regarding adequacy.

WECC should:

- Support renovation of existing assessment processes to ensure consistency among all reports addressing adequacy topics;
- Refrain from drawing conclusions of adequacy w/o formally established resource adequacy metrics and associated targets;
- Institute Board review of all supply adequacy submissions to NERC;
- Undertake efforts to ensure that within the WECC Board and state commissions there are consistent expectations for analysis needed to inform the selection of adequacy benchmarks;
- Initiate necessary coordination efforts to create a process for the WECC Board and states to select mutually acceptable benchmarks for resource adequacy metrics; and
- Modify L & R Instructions to implement the Board-approved RA requirements.

#### **V. ANTICIPATED MILESTONES IN RA DEVELOPMENT PROCESS**

- CREPC presentation (10/21/04)
- WECC/CREPC RA Seminar (10/21/04)
- Presentation of Strawman at RAWG meeting (10/28/04)
- RAWG Phase 1 Progress Report to RS (December 2004)
- Identify funding for/initiate technical analysis of benchmarks/targets (January 2005)
- RS Meeting (January 2005)
- PCC Meeting (March 2005)
- CREPC Spring Meeting (Spring 2005)
- RAWG Phase 2 report to RS (Summer 2005)
- CREPC Fall Meeting to review RA targets (October 2005)
- Second WECC/CREPC RA Seminar (October 2005)
- WECC Board meeting to adopt RA Criteria (December 2005)
- Joint CREPC/WECC meeting to review RA assessments (Fall 2006)