

West wide Resource Assessment Team

Consensus Draft

January 15, 2004

Responses to Questions Regarding the Need for Increased Cooperation or Collaboration

I. SITUATION ANALYSIS

Considerable progress has been made on the assessment recommendations WRAT identified in its *First Report to CREPC* (January, '03). Of particular significance is that the WECC's semi-annual assessments of loads and resources for August peak hour capacity (MW) are more realistic and much improved over the 2002 assessment.¹ Working with SSG-WI PWG and PacifiCorp, WRAT has seen remarkable progress in developing a public data base for Western Interconnection (WI) assessment, which the three RTOs have committed to maintain for 3 years.² Along with the data base development, SSG-WI completed its first Framework for regional transmission planning, a truly major undertaking.

This progress is heartening. It has been achieved in part through concrete accomplishments by WECC and SSG-WI, but largely through ad hoc and volunteer personal relationships among key technical staff of state/provincial agencies, utilities, existing regional bodies, and emergent RTOs. In order for regional assessment and resource adequacy process development to take the next steps, it will be necessary to pursue more in-depth and integrated analyses. Redoubled regional coordination efforts are likely to be needed to achieve results capable of deflecting further intervention in the WI by federal entities. These interventions continue to loom, such as those proposals contained in the federal energy legislation and recent statements by the FERC.³

Continued focus and urgency is warranted to address resource adequacy/shortage questions and potential reliability and wholesale price volatility concerns. The basis for our belief that continued attention is needed includes the following current and coming challenges:

- Responsibilities for regional assessment are unclear; probabilistic planning is not yet underway; there is limited integration of transmission and generation planning.
- No energy (kWh) assessment is yet being conducted for the region, despite the importance of hydro resources, gas supply limits and energy limited sub regions.

¹ Unlike the 2002 assessment, the WECC board approved the 2003 assessments.

² An RFP for development and maintenance of the data base will be issued by SSG-WI shortly.

³ Chairman Pat Wood Press Conference, January 7, 2004 Washington D.C. Text included as attachment to CREPC Reliability Working Group January 15 Report.

Consensus Draft

- There is no linkage of regional electricity system analysis with natural gas availability, infrastructure and price as called for in a Sept. 2003 Western Governors' resolution.⁴
- Assessment metrics and adequacy benchmarks are not well understood or agreed to.
- Current market incentives may be insufficient to achieve timely and appropriate levels of resource development, without some form of state/provincial or federal intervention.
- There is limited information on the adequacy of resources for specific load-serving entities (LSEs), (including municipal utilities and retail access providers) and sub-regions of the WI; responsibility for meeting load growth is diffuse or unclear.
- Regional assessment(s) to date use load forecasts with only a 1 in 2 probability of occurrence and do not address severe but likely weather.
- If overall resources are inadequate, reliability and affordability problems are virtually guaranteed.
- Recent FERC orders emphasize the interrelationship of resource adequacy, market power and other market design elements⁵; and, FERC is exploring what it can do in 2004 under existing law to address heightened concern over reliability since the eastern blackout.

This **Draft** Report provides our consensus response to CREPC's request regarding continuing challenges and the need for enhanced regional cooperation. We focus on our primary area of interest to date—resource assessment, but extend the discussion in an introductory way to the topic on which we plan to focus on in 2004-- resource adequacy. Section II addresses whether “interstate cooperation or collaboration is needed” assuming the current WI electricity system structure status quo. Section III discusses “probable changes in industry structure”, and effects those could have on responsibilities for resource adequacy. Section IV presents “ideas on how interstate or state-FERC cooperation or collaboration might occur.” Section V contains our preliminary recommendations to CREPC.

⁴ North American gas production is declining. SSG-WI estimates indicate that in a likely future, gas-fired generation will be at least 40 percent of WI capacity (nominal MW) and 27 percent of generation (MWh) for 2008. Gas shortages, particularly in a cold dry winter, could cause problems for reliability and wholesale prices.

⁵ FERC Supply Margin Assessment Screen and Alternatives, Supplemental Notice of Technical Conference January 9, 2004 Docket No. PL02-8-000

II. IS COOPERATION OR COLLABORATION NEEDED?

As described above, progress has been made in what could be considered a relatively short period of time. WRAT has spearheaded a set of ad hoc changes to traditional regional assessment practices, and introduced the subject of resource adequacy to CREPC members. WECC has improved, and agreed to consider further improvements in, the regional assessments that WECC staff conduct to which WECC members contribute information. Actual commitments to additional improvements related to load forecasts and energy (gWh) assessment for the WI have not been made, so likely success or timeliness of implementation of these initiatives is not entirely certain. No progress has been made in improving access to “confidential” WECC data needed to support a wide range of WI assessments, including resource adequacy. There is no recognized forum or ongoing process for discussing adequacy metrics or benchmarks and no one is responsible for initiating a review of the adequacy of the integrated electricity/natural gas system. There is thus a need for enhanced regional activity in both assessment and adequacy.

A. Improvements in Resource Assessment

The following subsections elaborate on continuing, pressing needs for regional assessment on five subjects: load forecasting, energy load/resource (L/R) assessment, integrated electric/gas system evaluation, generation expansion case development; and western renewable energy generation information tracking and analysis. All of these enhanced assessments are needed to provide a foundation for improved understanding of resource adequacy using approaches such as those summarized in Section B below.

Western Interconnection Load Forecasts. The rigorous and transparent assessment of the WI electricity system must begin with a well-understood, robust, documented set of LSE demand forecasts. These do not exist or are not documented and readily available. At the present time, WECC is the only regional entity gathering data from control areas on electricity loads and forecasts. The FERC requires all entities serving loads > 200 megawatts to file load information and forecasts annually, but this data is not timely, has apparent errors and lacks documentation. The forecasts that WECC reports are summarized at the level of four major WI sub regions. WECC does not receive forecasts of individual LSEs unless these also happen to be control areas. There is virtually no documentation of the forecast assumptions submitted to WECC. The WECC forecasts also do not provide estimates of loads under extreme temperature conditions.

The WRAT led the Load Subgroup of the WECC RS, which reached consensus that revisions to the WECC load and resource data requests were needed. Revisions proposed included: clarification of forecast basis (1 in 2 chance of being exceeded); specification of weather drivers of peak forecast results; and, documentation and of forecasts for years 3-10. Implementation accomplished at the time of this writing includes clarification of requests for 1 in 2 forecasts. The acquisition of weather sensitivity documentation is progressing in a cooperative effort between the WRAT and RS/WECC staff. A data request has been released and responses are requested in mid-February. These are major accomplishments and WECC staff and committees should be commended.

On the documentation/confidentiality front, (in spite of the intensive effort invested in reaching a consensus of RS Load Subgroup members themselves), WECC's committees have not acted on the request for documentation of forecasts. Some utilities are concerned about releasing their forecasts if others do not. However, if most utilities release their detailed forecasts, it will help states/provinces, SSG-WI and all WECC members assess the load-resource balance in the West. The lack of accurate western and sub region assessments before 2000 blindsided the region to the impending crisis. Since the WRAT is not seeking real-time or even near term forecasts, (and forecasts by their very nature are guesses about the future), release of long-term load forecasts should not affect utility efforts acquire resources at competitive prices.

Energy (kWh) Assessment. In its January, '03 report to CREPC, the WRAT urged that an energy (kWh) assessment for the WI. Some sub-regions of the West are energy (not capacity) limited. One contributing cause to the shortages in 2000-01 was multiple state/provinces/entities relying on the same increment of hydro exports, which were unavailable due to low Columbia River Basin flows. WRAT members testified to WECC that an energy assessment should be initiated. While the WECC RS concurred with the WRAT that the benefits and costs of doing an assessment should be evaluated, no effort was made to initiate this evaluation. After further emphasis on the importance of the energy analysis by WRAT to WECC RPIC, an RS subgroup was formed to evaluate the need and benefits of an assessment in December '03. The subgroup is making good progress, but the progression from subgroup to board approval is a long distance through multiple committees.

Potential high prices due to scarcity is the clearest reason for doing an energy assessment for the West, to complement the peak capacity assessment that is aimed primarily at physical reliability (though it has price implications as well). From the WI perspective the primary issues should be uncertain water supply, non-hydro fuel limitations such as air-quality limits or gas-supply constraints on the total annual MWh output of fossil-generation, and unexpected shutdown or retirement of plants (particularly in California). The effects of these supply limitations may be critical when there are extremely hot summers or cold winters. An energy assessment is central to illuminating key resource adequacy and reliability considerations. For example, there are some interesting but complex issues for at least sub-regional (Northwest) peak reliability that are tied to the level of the reservoirs (i.e., water condition) as well as temperature. While it is not known if these are consequential for the West as a whole, particularly because they are winter peak events in a summer peaking system, an analysis is needed.

There are other aspects of resource adequacy that an energy study will reveal. For example, it will show the extent to which actual reliability is threatened for the WI or any of its sub-regions due to inadequate transmission capability or insufficient power supply. Second, it can illustrate the economic consequences of events that do not threaten reliability, but impose large cost increases. A prolonged drought would increase the use of gas-fired generation. This increased use of more expensive fossil generation would be further exacerbated if it took place when natural gas prices were high. If combined with extreme cold or hot weather the effects on total electricity costs could be severe.

The type of analytical approach will affect the usefulness and cost of an energy assessment. A complex hourly WI simulation model could provide answers but would tend to be expensive and time-consuming. Less expensive but useful approaches are possible. Further clarification of the information needs of decision-makers and modeling capabilities of WECC and other institutions will help define the best approach.

Dependent on determinations regarding the energy assessment's value and cost, it is uncertain that the WECC RS will complete an energy assessment in 2004. A lag of 3-6 months could occur between an RS subgroup recommendation, RS and PCC concurring, and obtaining WECC board approval (if given, which is highly uncertain). The implementation schedule if approved is not known until the method is selected. It is hoped that a simple study and methodology could be pursued first, with potentially more complex methods following only if needed. All of this is dependent on adequate WECC staffing resources being available (another uncertainty). There are no other regional entities with resources or responsibility to undertake an assessment at this time.

Integrated Electricity and Natural Gas System Evaluation and Risk Assessment Framework. As recognized in the WGA annual meeting in September '03, there is no assessment of natural gas fuel supply and infrastructure and western gas needs, including power generation. Natural gas prices set wholesale electric prices whenever the most expensive generation unit is gas-fired. This is now about 75 to 90 percent of the hours of the year. Absolute shortages or inability to meet all end-use demands from inadequate gas supplies are also possible. This is a more complex assessment than the energy assessment discussed above. It should include an assessment of the effect of increased gas demand (generation and non-generation) on western gas prices in the short run. It also needs to bound a reasonable range of risks that Governors identify they wish to be informed of.

There is no WI or sub-regional entity that has the responsibility, authority, resources, ability or desire to undertake the assessment requested by the Governors. The integrated risk analysis may be only a one-time study requirement, or it could become a useful periodic exercise. Ongoing need can be determined based on the results of the first study and on gas market developments in the next year or two. Lacking a regional entity that believes itself responsible for "stretch the envelope" integrated assessment activities, there is no plan for approaching this assignment from the Governors. In hopes of moving forward by attracting ad hoc volunteer efforts, a general conceptual approach to risk assessment for the interconnection has been developed by WRAT members and is included as **Attachment 1** to this report. It would, however, be completely infeasible to implement the Framework without dedicated resources from multiple entities, including staffing and coordination.

Generation Expansion Case Development. In the report *Framework for Expansion of the WI Transmission System*, the SSG-WI members emphasize the interrelationships among transmission infrastructure expansion assessment, resource adequacy and diversity. They note that SSG-WI work "...can provide insights into transmission additions that can support resource diversity and thus improve reliability. Conversely, the transmission infrastructure development

Consensus Draft

depends on input from states/provinces, LSEs and developers. Transmission planning must be integrated with utility and developer plans in sub-regional studies *in order to arrive at solutions for transmission and generation infrastructure that fully support the goals of energy policy-makers*” (emphasis added).

Thus one important next step for regional transmission expansion planning is the development of a plausible, region-wide generation expansion scenario. State/provincial policy maker participation is needed to inform a realistic scenario. One approach could combine WI or sub-regional evaluation of resource choices, compilation of state/provincial proceedings on jurisdictional utility resource plans, and monitoring of all LSE plans and outcomes for efficiency, demand response, customer generation or other non-transmission alternatives.

The foundation of what has been approved by states/provinces or is identified for funding by utilities can then be combined with the some “middle of the road”, “likely”, or “preferred” generation addition strategies anticipated by states/provinces and or other stakeholders. It is unclear how the desires of competing generation industries will be reconciled, particularly wind and coal. The end result might be multiple but more realistic scenarios than the 2003 SSG-WI report. A single consensus generation scenario is unlikely because of uncertainties related to gas prices, carbon dioxide regulation and load growth. Still, some parties will seek a single scenario of resource additions that can be used to build out the WI generation picture in future years.

This exercise, which must be done regionally and periodically, requires a commitment of state/provincial and sub-regional efforts. At present there is no process underway to develop such generation expansion scenario(s) and no entity with the authority, responsibility, or staffing to facilitate synthesis of or agreement on a WI planning resource scenario. In the absence of a well-informed generation development case to support regional transmission planning, results of transmission studies will be difficult to support. Since large transmission additions typically take longer than generation additions to build, and transmission is lumpy, sub-optimal investments could result. In any case, better agreement on the generation scenarios would result in improved and coordinated plans for transmission and fuel infrastructures.

Renewable Energy Generation and Information Tracking and Analysis. WGA and California have joined in partnership with other states/provinces to develop and implement a tracking and certificates system for renewable energy generated in the WI. The system is in the early formation stages and is just beginning to address the question of what institution would appropriately house this regional function. As with other assessment and tracking tasks, data availability is a key challenge that will need to be addressed. A particular problem is obtaining timely, good quality data on the gWh generated by renewable projects. At present there is no institution that has the authority, responsibility or resources to perform this regional task. WGA and the California Energy Commission have formed an Institutional Committee to explore alternatives for a regional entity to house the tracking system, which has been named the Western Renewable Energy Information System (WREGIS). Decisions regarding design and implementation of a tracking system will be made in 2004.⁶

B. Overview of Approaches to Resource Adequacy

The West can choose from three alternatives to increase the likelihood that adequate generating and demand response resources will be developed. The choices have different implications for the need for more formal state/provincial and federal cooperation or collaboration, including a formal decision-making body. There is no internal agreement on the WRAT about which alternative to recommend to CREPC; however, WRAT does not support the present status quo. The three alternatives are:

- Develop improved resource assessment information (resource availability and load and resource balances) for the western interconnection, and document/make this information publicly available so that individual LSEs, their regulators, direct access customers and independent resource developers can make informed decisions (“Assessment”);
- Develop informational benchmarks of resource adequacy (possibly different sub regional ones or a single interconnection-wide one) for LSEs and their regulators to use in assessing the LSE’s commitments to meet future loads (“Benchmarks”); and
- Develop an interconnection-wide mechanism for enforcing compliance with benchmark levels on LSEs (“Enforceable Adequacy Standards”).

These alternatives are introduced in the remainder of this subsection. A more detailed discussion of approaches to ensure resource adequacy is being prepared by the WRAT and will be provided shortly as a supplemental draft discussion report.

⁶ Tracking systems have been discussed entirely in the context of facilitating compliance with renewable generation obligations. Those resource adequacy proposals which attempt to match LSE loads and the generation which meets it create the same need for tracking systems that encompass all generation, not just renewables. To further add to this complexity, tracking is also needed on a prospective, planning basis, not an historic, after-the-fact basis as renewable systems are oriented to.

Improvements in Resource Assessments. The simplest alternative is developing improvements in information about the expected load and resource situation in the interconnection, and making this information widely available. As described in subsection A above, this should include information on expected plant construction, load and resource behavior under various risk factors (e.g. different weather conditions that would stress the system along with associated probability levels), and information about potential transmission and fuel supply constraints.

These assessments would aim to develop uniform information to decision-makers, such as resource developers, LSEs, regulators and direct access customers for assessing future investments or contracts. The WECC process undertakes some of these functions already, but not yet at the level of sophistication that WRAT believes is needed. The current WECC process has allowed each reporting entity to interpret reporting requirements broadly and lacks documentation, so it is difficult to know whether information from each reporting entity is comparable. WECC currently prepares and publicizes resource assessments without publicly-tested analyses of power markets.

Reliance upon this kind of assessment assumes that LSEs are able to make their own decisions about their levels of exposure to spot markets (unlike the situation of California LSEs in 2000-01). It also assumes that different actors (LSEs, regulators, direct access customers, developers) may have different tolerances for risk or thresholds for investment.

The resource assessment improvements described in more detail in Section II.A require some central entity to collect, analyze and publish data that adheres to uniform standards responsive to public policy needs. These data needs could potentially be identified by a small review group of state/provincial regulators working closely with a regional stakeholder body.⁷ This alternative would involve the least institutional change, but would depend on WECC to: take up the responsibility; be responsive to state/provincial policy concerns; and, to allocate the appropriate level and type of technical staff. If adequate improvements in regional assessments were not made in a timely way by WECC, or if it proves to be unwilling to take on the additional work, then one of the following options involving greater state/provincial or federal oversight might be required.

Informational Benchmarks. This alternative builds upon the improved assessment effort by also developing an interconnection-wide benchmark to measure the level of resource surplus over load that is “ok” in some sense. Like the previous alternative, this one entails an ongoing process to generate and publish results relative to this benchmark.⁸ This alternative would require some

⁷ An example of additional guidance that is not being provided by states/provinces or WECC is a protocol for guiding how proposed demand side management and demand response programs should be included within load forecasts and resource tabulations. At this time, even though states/provinces increasingly emphasize reliance upon energy efficiency and demand response program impacts, for example to control possible market power abuses, it is unclear how the current WECC process includes or excludes the impacts of such initiatives.

⁸ The Western States/provinces Coordinating Council (WECC’s predecessor organization) once had a requirement that members maintain a planning reserve margin, but this requirement was eliminated when WSCC transformed itself into WECC.

regional consensus on appropriate levels of benchmarks. The purpose would primarily be to provide LSEs and their regulators with a quick test of how well the entire interconnection or its major sub regions were prepared to meet loads in the future.

There would be fundamental issues that would need to be resolved in agreeing on the right benchmarks to use and the metric that is associated with each such benchmark, such as energy requirements vs. capacity requirements. There would be numerous technical issues to resolve, including such things as how renewable resources like wind are measured, or the extent to which programmatic activities like energy efficiency programs and demand response are accounted for, how various risk preferences are measured, and so forth.

Constructing a single assessment using the benchmark on an interconnection-wide basis only may limit the problem posed by different risk preferences. It would, on the other hand, limit its usefulness as a quick test for LSEs and their regulators to use on an individual LSE basis, since it would not address the issue of different risk preferences. Further, a single benchmark may not apply well to different sub regions facing different problems. For example, parts of the Pacific Northwest are winter peaking and face important hydro energy constraints. The Southwest has few hydro resources and is summer peaking. While alternative benchmarks are conceptually appropriate, regional variances should only be allowed if they are more stringent than interconnection-wide ones.

This alternative would require more state/provincial agreement, and potentially coordinated action between the states/provinces and WECC, in obligating WECC members to provide the additional information that even regional resource assessments, let alone individual LSE resource assessments would require.

Enforceable Adequacy Standards. This alternative builds upon the previous two by adding an enforcement mechanism for the chosen benchmark levels of forecast resource surplus. These would be akin to the operating reserve requirements of NERC and WECC⁹, but would be requirements to demonstrate sufficient resource commitments over some planning horizon. The proposed FERC SMD planning reserve requirement is an example of this kind of action and NERC may be contemplating establishing resource adequacy requirements of some kind.¹⁰ Compared to informational benchmarks, an enforceable adequacy standard obligates an LSE to commitment to resources up to the level of the benchmark. Rather than merely imposing additional planning costs, this alternative creates financial consequences for those LSEs who were not already covering future load with resource commitments.

An enforceable standard would have all of the complexities of the benchmark determination, but they would be more consequential, and thus, probably more difficult to resolve. Standards would likely be enforced on all LSEs (either on direct access customers or their suppliers), and

⁹ WECC's operating reserve requirements are currently only enforceable against signers of the RMS agreement in WECC, though they are widely accepted as requirements.

¹⁰ States/provinces may create alternative resource adequacy requirements of their own. California has committed to do so, and in R.01-10-024 the CPUC is poised to do so for its regulated IOUs as this report is written.

would affect independent resource developers by creating a contract market for their projects. Development of an enforceable requirement would be more considerably difficult than an informational benchmark, because affected LSEs would attempt to limit their financial exposure. Implementation would be more difficult because the necessary reporting requirements for an enforceable standard would have to be LSE-specific. Such reporting requirements would most likely be more significantly more extensive than for an informational assessment to be able to support adverse actions, such as financial penalties, should they document failures to comply.

This level of action would require coordinated state/provincial action, and potentially federal coordination. Whether it would need a formal state/provincial decision-making entity is not clear, though it might not.

Issues Discussion. There are several issues of roughly equal significance that could affect whether states/provinces believe that one or another level of these alternatives is better.

- An issue for all three alternatives is the extent of direct access compared to traditional monopoly service. Even for physical assessments, the expansion of the number of load serving entities (LSE) in the form of energy service providers and community aggregators makes preparation of improved assessments more difficult. If there is extensive retail access, then it is more difficult to ensure that service providers have taken responsibility to ensure adequate service to their customers than if most service is provided under monopoly service provisions.
- A second issue is the ability of LSEs to make independent decisions about the composition of their resource portfolios. The extreme case was the problem California LSEs were in when they were mandated by state/provincial law to buy from the short-term spot market and sell resources that they owned into the spot market.
- A third issue is the expectation of, and expected levels of, price caps in the wholesale market. A strong argument can be made that if price caps are inevitable, because of lack of political will, that the markets that are expected to be capped will provide inadequate incentives for investment into those markets.
- A fourth issue is that of free riders. It can be argued that some LSEs, in the absence of enforceable adequacy standards, will make insufficient provision for future load service, counting on both the presence of price caps and the prudent behavior of their neighbors to allow them to get service on the cheap. Whether this is a compelling argument depends on whether price caps are expected to remain in place, how high they might be relative to the cost of avoiding spot purchases.
- Finally, creating explicit requirements that each LSE (and perhaps other entities) must satisfy mostly likely alters the nature of the public reporting requirements for assessment products. At least for those entities under the supervision of state/provincial regulators, explicit requirements would likely influence both what is reported to WECC and whether this information can remain confidential.

In conclusion, the three levels of intervention to address resource adequacy have both increasingly greater change in the activities associated with assessment as it has existed in the

recent past as well as increasingly greater challenges for the institutions currently preparing these assessments. As resource adequacy requirements are increasingly more obligatory, shifting from improved assessments toward enforceable standards, the greater the need for new institutional arrangements among state/provincial regulatory agencies and WECC. The WRAT is leading a project to develop a better understanding of adequacy and reserve margin concepts and will continue to provide information to CREPC this year.

III. PROBABLE CHANGES IN THE INDUSTRY

It is impossible to predict what changes are probable, but two that are possible include continued progress in formation of RTOs and passage of some form of the federal energy legislation containing reliability provisions. These changes are most likely to affect resource adequacy rather than assessment, so those potential effects are examined in the following discussion.

Reliability and resource adequacy has two aspects. For the average citizen, it means not having the lights go out. For state/provincial regulators, federal power agencies and locally-elected utility board it also means avoiding price spikes. While there were limited but politically disastrous blackouts in 2000-2001, the larger problem were the huge cost increases that resulted from price spikes--that most customers are still paying and some will pay for another decade.

There seems little reason for a uniform adequacy standard enforced by the FERC. Regional or state/provincial specific adequacy standards or guidelines, implemented by RTOs, state/provincial regulators and locally-elected utility boards, are probably better at dealing with loss-of-load and price volatility problems than a uniform west-wide standard. In any case it is unlikely that FERC could withstand the political backlash if it tried to impose a west-wide adequacy standard. Absent changes in federal law, a FERC standard would not apply to federal power marketing agencies or publicly-owned utilities.

If RTOs are formed it is possible they could use FERC authority to compel resource development. This could solve some adequacy problems but is not a panacea, particularly if many control areas and LSEs are not subject to RTO rules. The WECC does not have authority to impose adequacy standards and would not gain that authority under proposed federal energy legislation.¹¹ Proposed federal energy legislation allows for a state/provincial Regional Advisory Body (RAB) for WECC. If established, a RAB would be well positioned to evaluate and recommend benchmarks or guidelines, but such recommendations would have to be implemented by the state/provincial regulators, publicly-elected utility boards, RTOs or by the FERC for RTOs



¹¹ HR 6 Section 1211 a subsection 215 I 1-3; see text attached to CREPC Reliability Working Group January 15 Report to CREPC.

WECC could also recommend an adequacy benchmark for regulators, RTOs and LSEs to consider. This could consist of WECC reinstating a planning reserve margin requirement, non-mandatory but historically used by the WSCC, WECC's predecessor.

RTO Development Scenarios. Since the extent of FERC-proposed ISO and RTO formation in the West is highly uncertain, CREPC identified several RTO scenarios in its request to the Working Groups. These scenarios are to provide a basis for characterizing the degree of impact of ISOs and RTOs on functions such as assessment and adequacy. The three scenarios of RTO formation would give increasing authority to FERC to enforce any resource adequacy standards it adopts. However, if the FERC cannot effectively force LSEs and control areas to join RTOs, this increased authority is hollow. FERC nonetheless is looking carefully at its reliability-related authority and is addressing adequacy in the context of market power regulation. [See Supply Margin Assessment Screen and Alternatives, December 19, 2003]. Scenarios identified by CREPC are addressed below.

Scenario 1 – Status Quo. The status quo consists of the California Independent System Operator and sufficiently concrete plans for future formation of RTO West and WestConnect such that SSG-WI continues as an umbrella transmission planning group.

To resolve the reliability assurance issues present in California, it is likely that at least for the CAISO control area that formal resource adequacy requirements will be devised and implemented. These could be implemented either through California's or FERC's requirements.

Scenario 2 – RTO Lite. An RTO lite scenario suggests scattered formation of ISOs or RTOs at a scale and scope less than the RTO West and WestConnect RTO proposals. The lighter versions of RTOs might not consolidate control areas. If so, they probably would not have adequacy standards. Compared to the proposed RTO West and WestConnect scope, fewer states/provinces might be involved.

Scenario 3 – Formation of Proposed RTO West and WestConnect. Development of RTO West and WestConnect at the maximum scope imagined by proponents would result in substantial portions of Western loads within the footprint of these entities. Further, the geographic scale of the participating utilities means that regulators from Washington, Oregon, Idaho, Utah, Arizona and New Mexico would be directly affected by formation of FERC-jurisdictional RTOs gradually undertaking system control and short term planning functions now performed by PacifiCorp and other integrated utilities. Issues discussed above for RTO lite would be present, but at a slightly expanded scope for this scenario. RTO West and West Connect have indicated they will defer to state/provincial decisions on adequacy.

Scenario 4 – Mandatory Participation in RTOs by All Utilities. Mandatory participation in RTOs or ISOs is the desired outcome of the FERC SMD, even as modified by the April 2003 White Paper. Not only would this affect all of the public service commissions (PSC) throughout the West, it would raise jurisdictional issues within the states/provinces concerning municipal and other publicly-owned utilities that are not now regulated by the state/provincial PSCs. It is

unclear how traditional political dynamics in the various states/provinces would respond to possible expansion of control over municipal utilities via resource adequacy requirements, and whether state/provincial legislature controls would be preferable to the universal requirements issued by a west-wide institution. This might cause the formation of numerous additional RTOs organized to preserve traditional municipal versus invest-owned distinctions or other sub-regional stakeholder interests.

Mandatory RTO participation raises numerous state/provincial jurisdictional issues This would likely increase the need for more consistent regional reactions to FERC policy directives or proposals. The SSG-WI's consensus decision-making process among its RTOs would become more difficult with more RTOs, particularly if these RTOs were formed to represent disparate stakeholder interests.

Given FERC's deferral to states/provinces for development of resource adequacy requirements, and slowdown in RTO formation, what is the rationale for a multi-state/provincial or west wide effort? Perhaps a more realistic question is: Can the existing institutions and regulators get better quality information on the load/resource status and desirability of various levels of yet to be determined metrics of adequacy? This question is largely independent of how many more RTOs or RTO-like organization form in the West.

IV. IDEAS ON HOW INTERSTATE, PROVINCIAL OR STATE/FERC COOPERATION OR COLLABORATION MIGHT OCCUR

As stated at the outset, WRAT believes that increased cooperation is needed in both assessment and adequacy. Initial thinking on mechanisms to achieve this is highlighted below.

It is likely that each of the five resource assessment needs highlighted in Section II A above will have somewhat different analytic and institutional solutions. **A consistent theme however should be clear—there are unmet needs for assessment conceptualization, integration, synthesis, presentation and actual analyses in the interconnection.** Some of this is due to the slow evolution of or lack of timely cooperation by existing regional entities. All entities (WECC, SSG-WI, WIEB, WGA, CREPC) have limited resources to undertake additional work. Some needs and alternative study methods have to be clarified before it will be clear how to best pursue the effort. At a conceptual level, six options exist to address evolving needs:

- Muddle along with state/provincial agency volunteer efforts with current levels of staffing.
- Get existing regional entities, such as WIEB, WECC or SSG-WI, to undertake expanded analyses and assessments on a one-time basis with supplemental resources for specific tasks (e.g. USDOE funding for an integrated gas-electric system study).
- Have WECC expand its scope, budget, and staffing for assessments and analyses.

Consensus Draft

- Have WIEB staff do assessments funded by some type of FERC approved regional charge on transmission.
- Create a new analytic arm of WIEB/CREPC with dedicated funding and staffing for analysis and assessments;
- Create a new entity to undertake assessment and possibly a range of other functions such as those identified in other CREPC work group reports.

These options are not necessarily mutually exclusive and could be pursued in concert. Some are more practical as interim approaches while more permanent ones are being developed. Some alternatives have states/provinces dependent on USDOE funding of a putative regional function. This implies that an inability to obtain federal funding would mean a potential failure of regional planning, perhaps not an acceptable solution.

The greatest needs for state/provincial and federal entity cooperation will be:

- **Identification and provision of consistent funding/resources; and,**
- **Timely collection and distribution of high quality data, such as FERC 714 forms.**

These are threshold issues which must be addressed regardless of any change in regional structure.

An initial characteristic of the assessment and tracking function needs suggest they do not appear to require a regional body invested with any advising, decision-making or voting authority, although if one existed it could be well-placed to perform the functions. Without a regional entity dedicated to conducting advanced regional assessments, with the funding to sustain itself, the WI is at a higher risk of experiencing events such as occurred in 2000-2001. Volunteer efforts are unlikely to produce the continuity need for this effort.

The most urgent, near-term need is for good quality information and analyses for existing decision-makers at utilities, states/provinces, CREPC, WIEB, WECC and the FERC.

With respect to load forecasting and energy assessment we reach the following conclusions:

- If WECC upgrades and documents regional load forecasts, the need for additional interstate/provincial cooperation for this purpose will be limited to continued collaboration with WECC in defining the issues and to helping ensure jurisdictional utilities supply data promptly. If WECC does not follow through on this task, some other west wide approach or entity will be needed. WECC's current efforts to reduce its budget and resistance to undertaking new staff assessment activities is not a good sign of WECC's current vision of an entity that evolves as WRAT believes it could.
- If WECC is willing to undertake a timely and robust energy assessment, the major remaining interstate/provincial cooperation needs will be to conceptualize, coordinate and

present results of the study to decision makers. If WECC chooses not to follow through on this task, some other west-wide approach or entity will be needed.

The WRAT has the potential but not the resources to move beyond information sharing to participation in resource adequacy analyses. The NW Power and Conservation Council has made a contribution by doing an assessment with the Aurora model and presented the results at the April 2003 CREPC meeting. WRAT members have coordinated participation in the WECC Reliability Subcommittee peak-hour power supply assessments. The RS peak-hour assessments are improving, and WRAT intends to continue to press WECC to improve them further. The WRAT also is encouraging the RS to do a west-wide energy assessment, which may stretch WECC beyond its traditional reliability base, but which would be necessary for WECC to be the entity that conducts complete resource adequacy assessments.

Clearly, the next steps in improved assessment of resource adequacy require states/provinces to more broadly, if not universally, recognize resource adequacy as an issue, and to pursue common (not necessarily identical) solutions through existing state/provincial authority. For example, if all western states/provinces would adopt resource adequacy requirements that follow the same general principles, then movement in a common direction would reduce resource adequacy concerns. CREPC might be a vehicle for developing and recommending a model resource adequacy approach or benchmark, to which individual states/provinces added embellishments which they considered appropriate.¹² If this track proved to be insufficient, some tighter uniformity and greater compliance might be viewed as appropriate by WGA members. Unfortunately, using this “cheer leading” role by CREPC would require dedicated resources that extend beyond what is reasonable to expect WRAT or other volunteer efforts to accomplish, thus the current CREPC/volunteer model is likely to be insufficient.

V. RECOMMENDATIONS

The WRAT has reached the following consensus conclusions and respectfully urges that CREPC:

- Continue and increase its efforts work with SSG-WI and WECC to enhance the usefulness and effectiveness of regional data collection, modeling and analyses.
- Support formation of a new or evolved existing entity charged to better evaluate, coordinate and encourage improvements in the efforts of existing regional and state/provincial entities. This entity would work under the direction of the Governors, CREPC, WIEB and states/provinces and would rely on existing data bases and analyses to the maximum extent feasible. Action by FERC might be necessary to provide

¹² In March 2003, CREPC conduct a survey of member states/provinces to determine awareness of resource adequacy issues and to discern levels of activity on this and related regulatory topics. A wide range of awareness and activity was found.

Consensus Draft

adequate, consistent funding over a multi-year period. DOE funding might help during a start up period. It is not anticipated that any voting or advising protocols would be required as the entity would have no decision-making authority. It is expected that the funding and activity levels could be greatest at the start-up time and could be reduced over time. If other entities are successful in picking up and continuing the work, the eventual activity of the entity could consist primarily of bird-dogging to ensure work is done adequately and assisting in synthesizing results and highlighting the relevance of results to CREPC, WGA and interested states/provinces.

- Endorse and pursue a consistent funding source for an existing or new entity to undertake critical and urgent assessment and tracking functions for the WI.
- Encourage completion of the WGA/WRAT-LBL Reserve Concepts project in 2004 in order to develop better understanding of reserve requirements and approaches to different adequacy metrics and benchmarks.
- Urge WECC to work with CREPC to evaluate the historical use of planning reserve margins and to consider the appropriateness of WECC reinstating a voluntary reserve margin requirement (power supply criteria).

ATTACHMENT:

1—Risk Assessment Framework for the Western Interconnection

Attachment 1

Risk Assessment Framework for the Western Interconnection

BACKGROUND

This paper provides an overview of the risks to which the WRAT believes the Western Interconnection is vulnerable, and suggests a series of scenarios and assessment techniques that would reveal the extent of these risks. This paper builds upon a series of brief communications from WRAT to CREPC members and from WRAT to WECC PCC and RS members on these same issues. While some initial steps have been taken to encourage WECC to collect vital information from its members about weather assumptions embedded within their load forecast and to document the sensitivity of peak loads to hot summer and cold winter weather, discussions reveal a need for a more complete background document. In these interactions, WRAT members have identified a need to be specific about risks WRAT would like to have assessed in future WECC and SSG-WI studies. This brief paper attempts to enumerate several risk factors, define scenarios that might be used in assessment efforts, and suggests the sort of techniques that might be needed to quantify these risks.

RISK FACTORS AND EXPLORATORY SCENARIOS

There is no doubt that reliability risks are induced by extreme temperature considerations. Hot summer weather is well understood to induce stresses on the system, and these can be exacerbated by various supply-side problems if they occur simultaneously. Similarly, the winter peaking subregions are well aware of cold weather extremes that might induce difficulties. The scope of these difficulties may be increasing as generation shifts more toward gas-fired combined cycle facilities and as domestic space heating becomes more and more dominated by natural gas.

To these clear reliability risks, WRAT adds several additional risks that shift toward energy resource adequacy and cost exposure concerns rather than strict reliability risks. However, as public agency representatives, WRAT believes these additional risks need some form of assessment by a competent technical organization so that policy makers can understand and mitigate problems, if warranted.

Risk Factors

The following factors are WRAT's initial list of primary risks.

- Hot summer weather
- Cold winter weather
- Rainfall patterns inducing adverse hydro generation conditions
- Sudden unforeseen increases in natural gas prices

Consensus Draft

- Precipitous shutdown of nuclear plants resulting from NRC safety concerns
- Sudden, extensive retirement of aging fossil power plants
- Impacts of global climate change

Suggested Scenarios to Perform Reliability and Cost Impact Assessments

The following scenarios are suggested for evaluation in prospective reliability and energy cost risk assessments.

1. Hot summer weather

Intensely hot summer weather over a large part of the WI that would increase total WI peak demand and disrupt normal patterns of transmission loading between regions.

2. Cold winter weather

Intensely cold weather for a week during January along the Pacific coast states/provinces would greatly increase domestic natural gas demand, diminishing natural gas supplies to industrial facilities and generators, possibly creating both natural gas curtailments for generators and threatening electricity reliability.

3. Prolonged drought

Prolonged drought in the Pacific Northwest for two successive years meeting or exceeding historic adverse hydro generation conditions, thus triggering possible energy shortages in the PNW or even threatening firm hydro capacity contracts with loads outside the PNW.

4. Sudden, unexpected, sustained shift in fuel prices

Sudden shift upward in natural gas prices and gas futures as market takes new, tighter supply-demand expectations into account.

5. Shutdown of category of power plants as a result safety concerns

Sudden, long standing shutdown of nuclear power plants as NRC identifies a previously unrevealed safety concern.

6. Sudden, Extensive Retirement of Aging fossil Power Plants

A sudden, extensive shutdown of aging fossil power plants due to air quality concerns would both threaten general reliability as well as induce local reliability problems in local areas with constrained transmission capability.

7. Climate change impacts on generation and load

Change in rainfall amounts, patterns, and timing that affects snowpack and results in reduced hydro-generation both in Pacific Northwest and in California combined with increased summer peak temperatures magnifying summer peak loads.

ASSESSING RELIABILITY VERSUS COST RISKS

Summary of Techniques

The seven scenarios listed previously require varying degrees of alternative methodology. Some are amenable to analysis using modifications to the SAM assessments prepared by WECC staff under RS guidance, while others probably require quite different analytic techniques. The following table summarizes an approach to assess each of the scenarios in two alternative formats. The first explores the scenario from the perspective of its impact on WI or subregion reliability. The second explores the scenario from its impact on energy adequacy, which emphasizes cost impacts on electricity consumers.

Suggested Analysis Techniques

A series of Appendices to this paper provide a more detailed description of the data and analyses that would be required to conduct the assessments WRAT believes are needed for some scenarios. These scenarios are the ones which have received the greatest level of attention in recent discussions. As noted in the summary table, some scenarios are modest stretches from existing data and analysis techniques, while others may require much greater effort and development.

Appendix A describes how the new data about load forecasts and load forecast sensitivity to weather can be used in conjunction with recent embellishment in the SAM model to prepare an improved assessment of WI and subregional reliability under hot weather conditions.

Next Steps

While the full set of seven scenarios address the risks threatening the electricity system some of them are probably beyond the scope of what WECC considers its charter. Previous discussions in the WRAT process suggest that scenarios 1-3 are sufficiently well recognized by WECC and the government agencies represented in CREPC that they should be pursued now. The immediate steps for each of these are slightly different.

Hot Summer Weather

Once WECC control areas provide the supplemental data request data to WECC, WECC staff could use minor variants of the SAM model to undertake this work with relatively little additional delay.

Cold Winter Weather

This scenario requires development of natural gas demand and curtailment impacts on power plants that is quite different from previous work WECC staff might be able to undertake. Formation of a team of cooperative WECC members and WRAT members might be useful to identify unrecognized entities that can contribute to this effort. Such a team might also help to fine tune the proposed analysis methodology and to define the scenario more precisely. Thus the initial next step is an organizational one.

Energy Impacts of Prolonged Pacific Northwest Drought

Appendix C of this paper is currently incomplete, indicative of the as yet undefined analytic method to tackle this risk. The immediate next step is to follow through with the discussions now underway among a team of WECC RS members and WRAT members seeking to devise a sufficiently compelling explanation of this topic that WECC's PCC will endorse doing this analysis over time.

Combination Scenarios

Each of the previous subsection discussions has reviewed a single-variable scenario and how that factor might be assessed. It is possible that combinations of uncertainties actually produce more risk than single scenarios. For example, very cold weather in conjunction with adverse hydro might produce greatest winter impacts on electric reliability. In parallel with the previous scenario assessments, a combination scenario should be developed. Once this combination is developed, it will be more clear what combination of assessment techniques is best suited for the quantitative analysis. The immediate next step is to convene a panel of experts to provide guidance about such a combination scenario.

Summary of Likely Assessment Techniques for Each Risk Scenario

Risk Type	Reliability Approach	Cost Impact Approach
Hot summer weather	Existing SAM with augmented load sensitivity to hot weather; precise definition of scope of hot weather event; and probability assessment of the weather assumptions.	Cost impacts limited to short duration prices spikes in spot market. LSE-specific costs impacts defined by exposure to spot markets, which is poorly known.
Cold winter weather	Existing SAM with augmented load sensitivity to cold weather; precise definition of scope of cold weather event; dependence of generators on gas pipeline deliveries; constraints on pipeline and storage flows; regulations guiding non-domestic curtailments, and probability assessment of the weather assumptions.	Like hot weather scenario, cost impacts limited to short duration prices spikes in spot market. LSE-specific costs impacts defined by exposure to electricity spot markets, which are poorly known, and natural gas fuel price links to NG spot markets which are even more poorly known.
Prolonged drought	Special assessment of impacts of extremely limited water on firm capacity contracts given new realities of fisheries.	[insert WG options]
Sudden, unexpected, sustained shift in fuel prices	Reliability not expected to be stressed under these conditions, but analyses might be of interest to identify whether some differences in the mix of resources serving load at time of peak .	Production cost modeling likely to be used to determine how fuel price increases translate into higher aggregate costs, and how capacity expansion strategies might be modified to ameliorate the impacts.
Shutdown of category of power plants as a result safety concerns	Modified SAM inputs should be able to reveal consequences of this scenario.	Production cost models used to determine how available generation should be dispatched to meet load and minimize consequences.
Shutdown of Aging Fossil Power Plants	Modified SAM inputs should be able to reveal consequences of this scenario.	Production cost models used to determine how available generation should be dispatched to meet load and minimize consequences.
Climate change impacts on generation and load	NA	