

Reliability Center Strategic Initiative White Paper

Introduction

This white paper is intended to provide background on the Reliability Center Strategic Initiative, describe the actions taken and explain how the task force arrived at their recommendations. In accordance with the WECC Board Guidelines adopted in April 2004, this papers will review the underlying problems identified by the task force, alternative solutions considered, the level of member participation achieved thus far, and impacts of recommendations made.

The paper has three appendices – a list of questions and answer arising out of early public discussions of the recommendations, a list of NERC and WECC requirements for Reliability Coordinators and, the results of past Reliability Center audits.

Background

The WECC Board of Directors has expressed a three-fold concern regarding the Western Interconnection Reliability Centers:

1. Are the Reliability Centers safeguarding the Reliability of the Interconnection as well as possible?
2. Are the Reliability Centers fulfilling all requirements imposed by NERC, as well the unique reliability needs of our interconnection?
3. Are the Reliability Centers meeting their obligations in a cost-effective and consistent manner for the entire interconnection?

The Board directed that a single five-year strategic plan be developed for all three centers. This directive eventually fell to the Reliability Policy Issues Committee, which created a task force consisting of one director from each class, a Non-Affiliated Director, the chairs of the Operating Committee and Reliability Coordination Subcommittee and a member of the WECC staff.¹

The task force decided that the best way to address this directive was to start with a clean sheet of paper, no constraints, and ask the following four questions:

1. What function should our Reliability Centers be performing in 2010?
2. What tools will they need to perform these functions?
3. What staffing/configuration will they need to do these functions properly?
4. What will it cost?

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The task force visited each of the Reliability Centers, interviewed the coordinators, reviewed the NERC requirements (Appendix B of this paper) and past Reliability Center Audits (Appendix C of this paper), discussed prices and looked at potential Reliability Center hosts and conducted interviews with personnel at the Midwest Independent System Operator, which is comparable to the Western Interconnection in the size of the load and the number of buses. From those efforts, the task force was able to identify the functions that the Reliability Centers need to perform, the tools required to perform those functions, and the policy issues that need to be addressed to enable efficient and effective Reliability Centers.

These recommendations are now being presented to Western Interconnection stakeholders for comment and review. Comments can be made on [the WECC website](#).

Current Status of Reliability Centers

In 1995, NERC adopted a policy requiring all reliability councils to have Transmission Security Centers (later renamed Reliability Centers). To minimize cost the Western Interconnection decided to use Area Coordinators hosted at member control areas. This led to today's three Reliability Centers hosted at BPA, CalISO and WAPA.

Because of a need to have independence for the Reliability Centers, the Reliability Coordinators work at a desk separate from the other control room operators. Reliability Coordinators at WAPA and CalISO are employees of those entities, but their costs are paid for by WECC. Reliability Coordinators at BPA are employed by the Pacific Northwest Security Center, which is funded by WECC. The Reliability Centers use tools based on their host's tools, thus the Reliability Centers have three different tools. The empowerment agreements between the Centers and the users of the Bulk Power System have been created according to the Reliability Center footprint and are not uniform. There are generally one or two coordinators on each Reliability Center shift.

The Reliability Centers form the largest line item in the WECC budget at a little over \$7 million per year. That number will grow significantly as Reliability Center responsibilities expand with implementation of recommendations coming out of the 2003 Northeast blackout.

Identified Functions

Reliability Center functions are numerous but fall into three basic categories:

1. Provide early warning for risks to the stability and security of the Interconnection on a consistent, interconnection-wide basis.
2. Issue directives when reliability violations are not corrected in a timely fashion.
3. Provide restoration guidance following major reliability events.

Identified Problems To Be Addressed

1. The WECC Reliability Centers are not meeting the requirements set forth in NERC standards. With the implementation of mandatory standards compliance, WECC must

either meet the Reliability Coordination requirements or present a justification for changing the requirements.

2. The WECC Reliability Centers need advanced tools to perform their function. Each Center is developing different tools based on their host's infrastructure. Three different sets of tools are inefficient, hinder backup coverage by other Reliability Centers and hurt reliability.
3. There are concerns that the Reliability Coordinators are not independent enough of their hosts.
4. There are concerns that other policies (such as the current empowerment agreements) are not sufficiently clear to support reliability.

Task Force Recommendations

Task force recommendations fall into two categories – policy recommendations and tool recommendations.

Policy Recommendations

The task force recommends that real or perceived problems with the Reliability Center empowerment agreements be addressed through a common enabling agreement or by use of (a) standard(s) having the following characteristics:

- Should be applicable to all control areas, balancing authorities, generation operators, transmission operators, and other entities identified by NERC/ERO
- Should specify the authority of the RC's to take all actions necessary to resolve a reliability concern, including redispatch of Generation, when reliability violations are not corrected in a timely fashion
- Should clearly specify the responsibilities and authorities of the parties including required communications and data exchanges, delegation of authority, and accountability

In addition, the task force recommends that:

- The RC functions should be carried out by two separate Reliability Center teams located at two sites. The number of RC teams and/or sites should be increased if appropriate cost/benefit justification is demonstrated.
- Each team should have primary focus for a specific geographic subregion of the Interconnection, but should perform reliability analysis using network topology and input data for the entire Interconnection.
- Each RC team must have the training and tools to provide immediate backup for another RC team.

- Each RC team member should receive training in the use of all of the application programs provided to the RC, receive annual rotational training at other RC sites, and receive annual restoration training, in conjunction with WECC member personnel, utilizing the Dispatcher Training Simulation Tool.
- The two RC sites should be geographically separate so as to minimize the risk of a single event causing the loss of functionality of both centers.
- Site hosts must provide physically separate work areas for the RC team, must not have administrative or financial oversight of the individuals comprising the RC teams, and must not be provided with any information through the RC which is not normally distributed to other WECC members.
- RC team members should be WECC employees. As an alternate arrangement, RC functions may be provided by independent contractors under contract to WECC where such arrangements can be demonstrated to provide the best qualified individuals for performing RC functions.
- The RCs should report to a WECC staff Director who is accountable for all administrative, budgeting, performance measurement, and customer service measurements related to the RCs. This Director should be hired at the earliest practical opportunity to ensure participation in the implementation of the Reliability Center Strategic Vision.
- Each RC team should consist of at least one Manager, one Lead Coordinator, two 7 x 24 shift positions, two study analysts and one trainer. Additional staffing should be provided where appropriate cost/benefit justification is provided.
- The two 7x24 shift positions should be filled by individuals with complementary skills ... one with strong operations skills and one with strong analytic skills.

Tools Recommendations

To address the need to provide early warning for risks to the stability and security of the Interconnection on a consistent, interconnection-wide basis, the Task Force recommends:

- Each team should be equipped with the same set of application tools, and each team should rely of the West-wide System Model as the source of input data for those applications.
- Each RC team should be provided with, and trained in the use of, the following application tools for performing day ahead/real-time analysis and training:
 - Load Flow Contingency Analysis Tool/State Estimator with RAS modeling
 - Solution Prioritization Tool
 - Voltage Stability Analysis Tool
 - Dynamic Stability Analysis Tool
 - Transmission outage Scheduling Tool

- Interchange Schedule Tool
- Dispatcher Training Simulator
- The application tools, information technology, and communications facilities, used by the RCs; as well as the WSM database, should be provided by a single infrastructure host which can provide facilities in accordance with all applicable ERO/WECC standards, including physical security, cyber-security, backup facility and 24x7 technical support.
- The RC sites should be linked together with full time video/audio links provided and maintained by the IT/communications infrastructure host.

The task force recommends differentiating between Reliability Coordination Teams and Reliability Center sites. Research suggests that the largest cost of a Reliability Coordination Team is not the facility cost, but the personnel and tools costs. Two teams could occupy one site or each team could have its own site, but least two Reliability Center sites should be provided, geographically separated to reduce the risk of an event affecting both. All sites should be linked with full time audio/video communication and must meet NERC and WECC physical and cyber security requirements. Possibilities for Reliability Center sites are WECC member facilities, IT/communications host facilities, or stand-alone sites. The IT/communications infrastructure functions should be outsourced to a single Host Entity who would be responsible to the Reliability Center management for providing primary and backup IT/communications facilities, 24/7 response to equipment, software, and communications malfunctions, and accurate and timely updates/modifications to the application software, databases, and displays.

Alternative Solutions Considered

The developing the current suite of recommendations, the task force has considered a number of solutions as well as a variety of implementation methods. The task force has looked at the variety of tasks that may be required of the Reliability Centers, how many of those need to be performed by the RCs and how many can be performed by others; the number of Reliability Center sites; the number and composition of Reliability Center teams; hosting arrangements; needed software, needed business practices, and policy changes, etc. The task force has also considered the fundamental question of whether to recommend changes or go with the status quo.

The recommendations presented above appear to the task force to provide the best combination of value and functionality, and proposes that the Board adopt the general recommendations and direct the membership, through the Standing Committees, to develop plans to implement them.

The Task Force Does Not Recommend

Extensive revision to the way Reliability Coordination is handled in the Western Interconnection warrants clarification of what the task force is **not** recommending, including:

- That RC's evolve into westwide RTO's or ISO's

- That RC's would take over the grid reliability functions and responsibilities currently performed by grid operators
- That RC's would issue directives prior to real time
- That RC's would use generation redispatch other than as a last resort after grid operators fail to resolve a reliability violation in a timely fashion
- That RC's would use economics as a decision factor in determining generation redispatch solutions

Costs of Implementing Task Force Recommendations

As noted above, the task force was charged with making recommendations that would provide the best reliability and the best use of the resources of the Western Interconnection. The largest portion of the expense of implementing these recommendations would come from staffing requirements; many of the tools required are already under development and requests for information received indicate that the hard costs of physical RC sites are small by comparison.

The task force estimates that the cost of staffing two Reliability Coordination Teams (38 people) would be \$6.7 million. Three Reliability Teams (55 people) would have an annual cost of \$9.6 million. The total annual costs would be between \$11 and \$17 million. In 2006, the cost of the RC program was somewhat more than \$5 million. The current projected WECC budget puts the cost of Reliability Centers in 2010 at more than \$12 million.

What Happens Next

John Stout, chair of the task force will be presenting the task force's report and revised recommendations at the WECC Joint Standing Committee meeting on June 15. RPIC may request Board approval of a *Reliability Center Strategic Vision* comprising its recommendations in July or October of 2006. If approved by the Board, the strategic vision will go to the WECC Operating Committee for implementation.