



NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## SaskPower Corporation (SPC) Pre-Operational Evaluation for Reliability Coordinator Preparedness

October 22–25, 2007

### Report of Findings

#### SaskPower Participants

Dennis Felgate	Manager, Grid Control Centre
Lynda Gamble	Acting Supervisor, Transmission Services
Ross Wilkinson	Supervisor, Operation and Technical Support
Cordell Wrishko	Engineer II, Technical Support
Al Schindel	Power System Supervisor — Off Shift
Al Schreiner	Training Consultant, SaskPower
Walter Omoth	Supervisor, System Security & Performance
John Smith	Supervisor, Special Practices & Training
Stuart Hughes	Supervisor, Grid Operations
Jim Fischl	Power System Supervisor
Gene Friesen	Power System Supervisor
Tom Trenker	Supervisor, SCADA Engineering & Operations

#### NERC Evaluation Team

Mitch Needham*	NERC
Shel Berg*	Midwestern Reliability Organization (MRO)
Dan Schoenecker	MRO
Leo St. Hilaire	Manitoba Hydro
Randy Pascoe	British Columbia Transmission Corporation
Don Urban	PJM Interconnection
Pierre Paquet	TransÉnergie HQ
Dale Walden	Independent Electricity System Operator

\* Co-leads for the evaluation

# **SaskPower Corporation (SPC) Pre-Operational Evaluation for Reliability Coordinator Preparedness**

## **Introduction and Evaluation Process**

The North American Electric Reliability Corporation (NERC) is committed to the reliability of the North American bulk power system. A NERC-led evaluation team visited SPC to determine its preparedness to begin formally performing reliability functions as a reliability coordinator for the SaskPower balancing authority footprint upon acceptance by the NERC Operating Committee. The pre-operational evaluation team consisted of industry volunteers with considerable expertise selected to provide representation from other interconnections, other regions, and neighboring operating entities. The team also included two representatives from the MRO.

Prior to the evaluation, SPC completed a questionnaire and provided supporting documentation to the evaluation team that discussed how it intends to comply with NERC reliability standards pertaining to the functions of a reliability coordinator. The evaluation team also received completed questionnaires from neighboring reliability coordinators — Pacific Northwest Security Coordinator (PNSC) and Midwest Independent Transmission System Operator (MISO). There was no questionnaire completed by the sole operating entity for which SPC intends to provide reliability coordinator services, the SaskPower balancing authority footprint, because of the integrated nature of the organization.

The pre-operational evaluation team for the SPC evaluation met on-site with SPC representatives on October 22–25, 2007. The evaluation team reviewed the questionnaire responses and supporting documentation, interviewed SPC staff, and examined tools, processes, and procedures to ascertain SPC's preparedness to perform the intended reliability coordinator functions. The evaluation team offers this report of its findings to the NERC Operating Committee for consideration in accepting SPC's proposal to function as a reliability coordinator for the SaskPower footprint.

## **Organizational Profile**

SPC is the principal supplier of electricity in Saskatchewan. Its mission is to deliver power in a safe, reliable, cost-effective, and environmentally responsible manner. SPC serves over 441,000 customers and maintains 154,269 km of power lines (12,159 km transmission and 142,110 km distribution). This extensive network is designed to serve Saskatchewan's large geographic area and widely dispersed population.

SPC's aggregate generating capacity is 3,655 MW. This includes 3,206 MW from SPC's own facilities — three fossil-fired stations, seven hydroelectric facilities, four natural gas facilities, and two wind generation facilities. SPC is the only balancing authority and transmission operator within the province of Saskatchewan.

The SPC reliability coordinator provides reliability coordination services to the SaskPower balancing authority footprint exclusively. The reliability coordinator footprint covers electrical facilities that are located within the province of Saskatchewan. SPC is a member of the Midwest Reliability Organization (MRO).

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As defined in Attachment A of the *MRO Reliability Plan*, dated October 13, 2006, SPC will be responsible for performing the following services:

- Acting as reliability coordinator for SaskPower's transmission system
- Determining interconnected reliability operating limits (IROLs)
- Preventing system operating limit (SOL) and IROL Violations
- Ensuring operation of the SaskPower subregion under known and studied conditions
- Disseminating and SOL and IROL information within the subregion
- Issuing directives within its reliability subregion
- Conducting studies and sharing information for next-day operations
- Monitoring the subregion in real time, including bulk power system parameters that may have significant impacts on the SPC and/or neighboring reliability coordinator areas
- Maintaining awareness of reliability coordinator area conditions and critical facility status
- Issuing alerts
- Confirming reliability assessment results
- Directing emergency operations as appropriate
- Coordinating system restoration activities

SPC uses a staff of six NERC certified reliability operators to staff one around-the-clock reliability coordinator services position in the SPC control center in Regina, Saskatchewan. In addition, the SPC control center operations supervisor is NERC certified. Additional support is provided by four reliability planning engineers, two capacity management planning engineers, two transmission service supervisors, and a network management analyst.

The SaskPower area is synchronously connected to the Eastern Interconnection via four connections and has an asynchronous interconnection with a member utility in the Western Electricity Coordinating Council. SPC is a member of MRO and will adhere to all relevant NERC and MRO standards.

In order to prepare for its role as a reliability coordinator, SPC has completed the following activities:

- Prepared operating agreements with the PNSC and MISO reliability coordinators (awaiting certification for signatures)
- Prepared and obtained approval for the *SPC Reliability Coordinator Reliability Plan* in conjunction with MRO requirements

### **Executive Summary**

The evaluation team finds that SPC is prepared to perform the functions of a reliability coordinator for the SaskPower footprint — SPC has adequate facilities, procedures, processes, tools, and trained personnel. The evaluation team notes that there are certain reliability coordinator tools to which SPC does not yet have full access and asks that NERC complete the process to provide these tools. The evaluation team did not identify any “show-stoppers” that

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should prevent SPC from fully assuming its intended reliability coordinator functions and noted 16 significant positive findings during the process. The evaluation team identified six recommendations and three suggestions that if adopted will enhance SPC's ability to function as a reliability coordinator.

### **Significant Positive Observations**

The evaluation team noted the following positive observations during its evaluation process:

1. SPC has a corporate culture that understands the special needs of shift workers as evidenced by the provision of an "alertness recovery room."
2. SPC has designated an "office of reliability coordination" comprised of the reliability coordinator plus the operations support engineers (over which the reliability coordinator has functional authority).
3. SPC employs psychological profiles in the determination of suitability of applicants for system operator positions.
4. Reliability coordinator operators have status indicators on monitoring displays that indicate the adequacy of voltage and reactive reserves and allow for rapid identification of problem areas.
5. SPC stages major computer system upgrades through its backup control center, including 24-hour operational testing, prior to installing at the primary control facility.
6. At the backup control center, SPC uses an Internet service provider located outside the Eastern Interconnection, providing a higher level of communication redundancy.
7. SPC has produced a circuit "thermal" graph PI (information system) display to show the loading status of each critical element.
8. Information technology and communication support personnel for the operations platforms report to the transmission and distribution organization.
9. SPC uses a versatile training development platform that allows for the production of computer-based training modules.
10. SPC has a dispatcher training simulator used for training and assessment activities.
11. The training program incorporates a systematic approach to training and several training delivery methods.
12. All members of the training staff are required to obtain and hold a certificate in adult education.
13. SPC has moved to a robust document control system with review date monitoring, version control, and change notification capabilities.
14. Operational documents and procedures are available online to operations personnel via an operator "dashboard."
15. SPC operates its reliability coordinator functions from the backup control center on a monthly basis, which provides for good operator familiarity of the facility and regular testing of the system.
16. The generator at the backup control center is programmed to self start on a monthly basis for testing purposes.

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## Recommendations

The evaluation team recommends that SPC take the following actions to further enhance its ability to perform reliability coordination functions for the SaskPower footprint. These issues are listed in priority order with a supporting explanation, if warranted.

1. Continue to improve the Power System Simulator for Operations (PSS/O) model of the external bulk power system for use in system studies and ensure a process exists to keep this model up to date.
  - *The evaluation team understands that the SaskPower system is affected by events external to the system and that SPC uses detailed external neighboring system data to produce IROLs and SOLs. The team urges SPC to continue to work with neighboring reliability coordinators to improve the PSS/O external model.*
2. Conduct periodic evacuation drills to the backup control center to ensure that all reliability coordinator operators take part in such a drill annually.
  - *The team learned that SPC tests the backup control center on a monthly basis, but that actual evacuation scenario drills are conducted less frequently. The team encourages SPC to ensure that all reliability coordinator staff participates in an evacuation yearly.*
3. Develop and implement a script for the issuance of directives by the reliability coordinator operators to ensure consistency and understanding of the language used.
  - *The evaluation team believes that communications within the control facility are good but informal for a reliability coordinator, particularly in the issuance of directives. Development of a script will provide consistency and emphasis to the actual communication.*
4. Add a step in the evacuation procedure to notify adjacent reliability coordinators of the move to the backup control center.
  - *The team understands that SPC is aware of this need and wants to ensure that the appropriate addition takes place.*
5. Develop and implement a robust method to assess and track operator knowledge and understanding of new or revised policies and procedures.
  - *The evaluation team understands that several methods are in use to determine operator understanding, but there is currently no documented expectation or data to support that it is happening consistently.*
6. Ensure all restoration documents have been shared with neighboring reliability coordinators.
  - *Neighboring reliability coordinators indicated that the process of sharing system restoration plans is underway, and the team wants to ensure that the exchange is completed soon.*

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### Suggested Enhancements

The evaluation team offers the following suggestions that SPC should consider to enhance its effectiveness as a reliability coordinator:

1. Pursue external training opportunities for the reliability coordinator system operators, including participation in coordinated regional drills and visits to other reliability coordinator facilities.
  - *Discussions with system operators indicated that they would welcome the opportunity to experience outside training events, which would broaden their understanding of industry advances.*
2. Complete the shift turnover process document by placing it on appropriate procedural letterhead and providing a defined checklist of items to be covered.
  - *The evaluation team is comfortable that knowledge exchange is occurring as needed at shift change, but the procedure that has been documented does not match the actual step-by-step process taking place. The team believes having the process properly documented will lead to consistency during busy times. The procedure document uses the word “recommended” in the Background section, indicating that the operator is not bound by the requirements.*
3. Include a tracking record in revised documents to indicate exactly what has changed from a prior version.
  - *The team understands that this provision is included in the new document control system and suggests that SPC ensure it is used for all future document revisions.*