

RCR-35
Reliability Coordinator Reliability Plan for the SaskPower
Subregion of the Midwest Reliability Organization

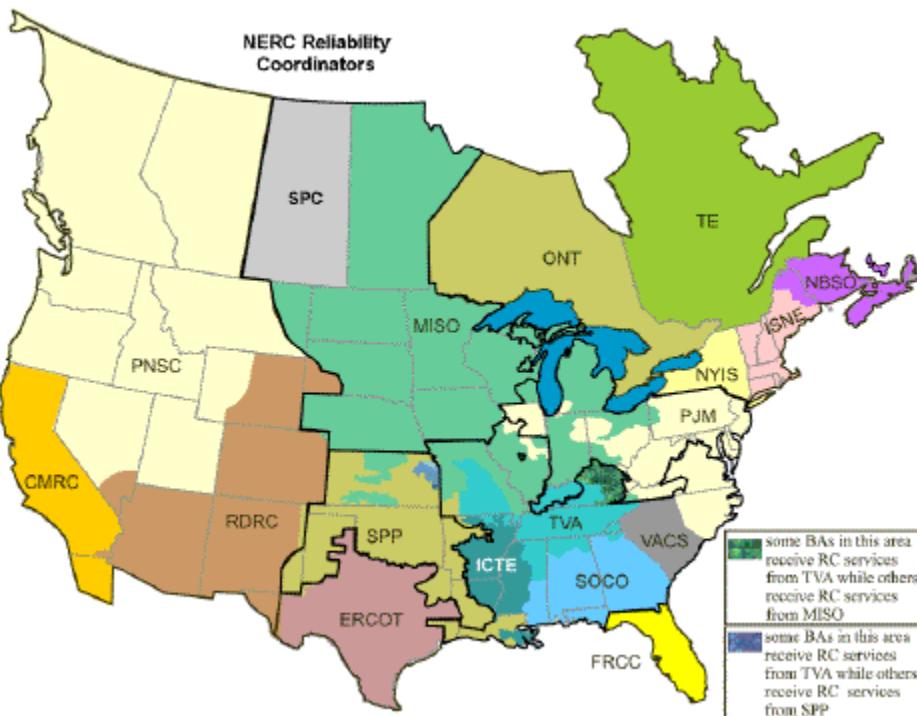
Introduction

The North American Electric Reliability Council (NERC) requires every Region, Subregion, or interregional coordinating group to establish one or more Reliability Coordinators to provide the reliability assessment and emergency operations coordination for the Balancing Authorities and Transmission Operators within the region and across the regional boundaries.

SaskPower is a Subregion within the Midwest Reliability Organization (MRO) Region of NERC. The SaskPower Reliability Coordinator Area consists of the transmission and generation facilities within the boundaries of the Canadian province of Saskatchewan. SaskPower is recognized by the MRO as the Reliability Coordinator for the Balancing Authority and Transmission Operator functions within the metered boundaries of the SaskPower system.

The SaskPower Reliability Coordinator (RC) is responsible for the SaskPower bulk transmission and power supply reliability. The SaskPower RC functions associated with power supply reliability include review and approval of planned transmission facility line outages, planned generation outages, monitoring of real-time loading conditions, loading relief procedures, generation re-dispatch, current day and next day reliability evaluations of the integrated transmission and generation systems and coordination/communication with other Reliability Coordinators. SaskPower RC procedures and policies are consistent with those of NERC.

This document represents the Reliability Plan for the SaskPower Reliability Coordinator.



A. Responsibilities – Authorization

1. Authority to Act

The SaskPower Reliability Coordinator is responsible for the reliable operation of the Bulk Power System within its Reliability Coordinator Area in accordance with NERC standards and Regional policies and standards.

- 1.1 The SaskPower RC has a wide area view of its Reliability Coordination area and neighbouring areas that have an impact on SaskPower's operating area. The SaskPower RC has the operating tools, processes and procedures to prevent or mitigate emergency operation situations in both the next-day and real-time operating periods. SaskPower RC responsibilities and authority are clearly defined in the governing documents listed in Appendix A of this document.
- 1.2 The SaskPower RC has clear decision-making authority to act and direct actions to be taken by the Balancing Authority, Generator Operators and Independent Power Producers, Transmission Operator, Transmission Service Provider, Load Serving Entity and Purchasing-Selling Entity within the SaskPower Subregion to preserve the integrity and reliability of the bulk electric system. SaskPower RC responsibilities and authority are clearly defined in the executed Reliability Coordination Agreements.
- 1.3 The SaskPower RC has not delegated any of its Reliability Coordinator responsibilities.

2. Independence

The SaskPower RC will act in the interests of reliability for its Reliability Coordination area and the Eastern Interconnection before the interests of any other entity. The expectation of independence is clearly identified in the governing documents included in Appendix A.

3. SaskPower RC Directives Compliance

All operating entities under the authority of the SaskPower RC shall comply with SaskPower RC directives including emergency actions such as the shedding of firm load, with the exception of cases involving endangerment to employee or public safety, equipment or regulatory or statutory requirements.

B. Responsibilities – Delegation of Tasks

The SaskPower RC has not delegated any Reliability Coordination tasks or responsibilities.

C. Common Tasks for Next-Day and Current-Day Operations

1. Interconnected Reliability Operating Limit (IROL) Determination

The SaskPower RC performs security studies with regard to System Operating Limits (SOLs) and Interconnection Reliability Operating Limits (IROLs) during the real-time and next-day operating horizons for the SaskPower and wide area region including thermal, voltage and stability related analysis as necessary. The SaskPower RC determines IROLs based on local, regional, and inter-regional studies including seasonal assessments and ad hoc studies. The SaskPower RC identifies IROLs on a daily basis or as warranted by changes in system topology using the daily planning model based on criteria established in the document “Transfer Capability Methodologies”. SaskPower Reliability Coordinator security planning staff and the SaskPower Subregion transmission operator immediately notify the SaskPower Reliability Coordinator and as applicable, adjacent Reliability Coordinators of any possible IROL conditions that may be identified, including any potential IROL violations that may be caused by the outage of multiple normally non-critical facilities. The IROL limits are reviewed each weekday morning during reliability coordination meetings with the SaskPower Subregion transmission. IROLs are also communicated to neighbouring RCs and the SaskPower transmission operator via the next day security analysis report.

2. SOL and IROL Violation Prevention

The SaskPower RC, through joint operating agreements, ensures that the SaskPower subregion operates to prevent the likelihood that a disturbance, action or non-action in the Reliability Subregion will result in a SOL or an IROL violation in another area of the Interconnection. The joint agreements include data exchange, Available Transfer Capability coordination, and Outage Coordination and are listed in section H. The SaskPower subregion is required to operate in accordance with NERC reliability standards and MRO supplements to these standards. The SaskPower RC coordinates maintenance outages with its neighbours to minimize potential impacts on other systems reliability. The SaskPower RC performs a 24x7 real-time, a rolling day-ahead, a week-ahead and a month-ahead N-1 contingency security analysis. In cases where there are differences in derived operating limits, the SaskPower RC utilizes the most conservative limit until the difference is resolved.

3. Operating Under Known and Studied Conditions

The SaskPower RC ensures that its Reliability subregion is continuously operating under known and studied conditions and returns its region to a secure operating state within 30 minutes following contingency events without regard for the number of contingency events or the status of monitoring or analysis tools.

The SaskPower RC, at least once per day, conducts next-day security analysis that incorporates planned equipment outages, forecasted loads, generating unit commitment schedules and anticipated net interchange. The first contingency (n-1) analyses include peak condition contingency analysis, voltage stability and reactive reserve review for key areas. Next-day security analysis results and mitigation strategies are documented and archived on-site. In the event that a potential SOL or IROL violation is observed, SaskPower coordinates with impacted and/or impacting entities to develop mitigation plans. SaskPower updates the Next-Day Security Analysis studies if previously planned system conditions change during the day.

SaskPower also conducts current day security analysis that includes significant generation and line outages, projected critical equipment constraints and daily load projections. The results of current day security analysis is documented in the SaskPower Daily Reliability Coordination Report. The SaskPower Daily Reliability Coordination Report includes significant facility outages, projected constraints, voltage security assessment results, reactive reserve summaries and forecasted weather conditions.

In real-time, through information provided by its Scada system, SaskPower maintains awareness of system conditions in its Reliability region by monitoring, alarming and evaluating the flows on all critical facilities to identify potential IROL and SOL problems. SaskPower also uses a real-time security analysis application to assess post contingent facility loading in response to N-1 contingencies. SaskPower's operating criteria is to ensure that post contingent loading of system facilities does not exceed SOLs. SaskPower's real time contingency analysis is automatically run every 10 minutes or in the event of a change in a critical facility status change.

4. SOL and IROL Communication

SaskPower disseminates and communicates all identified SOLs and IROLs within the SaskPower Subregion through internal postings, coordination meetings and weekday morning reviews.

5. Issuing Directives

SaskPower has implemented a clear, concise, definitive communication protocol for the issuing/receiving of directives and exchange of information within and external to its Reliability Subregion in compliance with the NERC Communication Standards. Proper communication protocols are included in RC operator training provided by SaskPower and are referenced in the document RCR-06 Communication Facilities and Protocol.

D. Next-Day Operations

1. Reliability Analysis and System Studies

The SaskPower RC conducts next-day reliability analyses for its Reliability region to ensure that the Bulk Power System can be reliably operated in normal and post contingency conditions. SDX data is utilized to construct PSS/E load flow cases which reflect expected operating conditions within the internal SaskPower RC area as well as within adjacent reliability coordinator areas that are included in the SaskPower RC wide area view.

On a daily basis, SaskPower conducts next-day security analysis utilizing known equipment outages, forecasted loads, generation commitment schedules and expected net interchange schedules using the study capability of the PSS/E transmission security analysis program. Base case flows on all monitored facilities are compared against the normal rating and post contingent flows are compared to emergency ratings for all contingencies. Voltage stability analysis is conducted as required to determine flow limits. Reactive reserves are reviewed to ensure they meet adequacy criteria and dynamic stability limits are recalculated if key facilities are returning from an outage.

Mitigation plans are formed as needed for potential violations determined in the next day security analysis. Mitigation plans may include unit recommitment, restriction on generator output or as documented in operating guides to be utilized by the SaskPower RC and transmission operators.

The SaskPower RC monitors and takes the appropriate action to ensure that the impact of interconnection flows from its Reliability region does not place an unacceptable or undue burden on an adjacent Reliability Coordinator area. The SaskPower RC will contact the neighbouring RC in the event that the next-day reliability analysis indicates that parallel flows may cause a potential IROL violation on the neighbouring system. After verification of the potential IROL violation, the SaskPower RC will coordinate with the neighbouring RC to develop appropriate mitigation plans. The mitigation plan will establish the actions required to prevent the IROL. Mitigation actions may include recommitment of generating capacity, reconfiguration of the transmission system or another action documented in operating guides to be utilized by the SaskPower RC and transmission operators.

2. Reliability Information Sharing

The SaskPower RC receives the information required to perform reliability analyses from internal departments and work groups that are under obligation to provide SaskPower Subregion reliability data to the SaskPower RC. The reliability data includes transmission and generation facility maintenance schedules, load forecasts, generation resource plans and operating reserve projections. External reliability data from

neighbouring balancing areas, transmission operators and RCs is gathered from other sources such as SDX and ICCP communications. SaskPower provides reliability data to other RCs and operating entities using SDX and ICCP communications.

3. Study Result Dissemination

When conditions warrant or upon request, the SaskPower RC shares the results of its system studies with other Reliability Coordinators either directly by phone or via conference calls. Study results for the SaskPower Reliability Region shall be available no later than 16:00 Eastern Standard Time, unless circumstances warrant otherwise.

4. Communication Initiation

The SaskPower RC initiates conference calls, or other appropriate communications, as necessary when system security conditions revealed by reliability analyses warrant. Conditions that warrant communication with other RCs include, but are not limited to, potential IROL violations and capacity deficiencies that could result in the shedding of firm load. The SaskPower RC also participates in weekly conference calls with other neighbouring RCs.

E. Current-Day Operations

1. Monitoring of the Reliability Coordinator Area

The SaskPower RC monitors all facilities within the SaskPower Subregion and as necessary adjacent RC areas to ensure that, at any time, regardless of prior planned or unplanned events, the SaskPower RC is able to determine potential SOL and IROL violations within the SaskPower Subregion. The Reliability Coordinator Area parameters monitored by SaskPower include, but are not limited to, the following:

- Current status of Bulk Electric System elements and system loading
- Scada alarming of low or high voltages or facility loadings beyond normal or emergency limits
- Pre-contingency and post contingency element conditions (voltage, thermal or stability), including applicable mitigation plans to alleviate SOL or IROL violations.
- System real-time and required real and reactive reserves
- Capacity and energy adequacy conditions
- Current ACE for SaskPower Balancing Authority
- Planned generation dispatches/commitment schedules
- Planned transmission or generation outages
- Contingency events

The SaskPower RC utilizes a state estimator and real-time contingency analysis as a primary tool to monitor facilities. The state estimator model includes all facilities 72 kV and above in the SaskPower Reliability Coordination Area. The model also has extensive

representation of neighbouring facilities in order to provide an effective wide-area view. The SaskPower RC model is updated on a regular schedule and also on demand in response to emergencies.

SaskPower's real-time contingency analysis is performed on approximately 60 contingencies of critical facilities with a minimum execution cycle of every ten minutes. The contingencies analyzed include all SaskPower critical facilities and neighbouring contingencies that would significantly impact SaskPower RC Coordination Area facilities.

SaskPower utilizes a dynamically updated transmission overview display to maintain operator awareness of the wide area view. The current status of all transmission facilities 138 kV and above are displayed on the wide area overview along with indication of facility status and high and low voltage warning and alarming. More detailed monitoring functionality is provided via dynamically updated Balancing Area displays used to view all facilities 72 kV and above that includes line flows, voltages, generator outputs, and facilities currently out of service. Dynamically updated bus level one-line diagrams are utilized for station level information.

1.1 Neighbouring RC Notification

The SaskPower RC notifies neighbouring Reliability Coordinators of operational concerns such as declining voltages, excessive reactive flows, or an IROL violation that it identifies within the neighbouring Reliability Coordination Area via direct phone calls, conference calls, NERC hotline calls and/or RCIS messages. The SaskPower RC has documented coordination agreements with neighbouring Reliability Coordinators listed in Section H. As provided in the coordination agreements, the SaskPower RC directs action to provide emergency assistance to all Reliability Coordinator neighbours during declared emergencies.

2. Maintaining Awareness of Critical Facility Status

The SaskPower RC maintains operational awareness of the status of all critical facilities whose failure, degradation or disconnection could result in a SOL or IROL violation within its Reliability Coordination Area. Operational awareness and system restoration objectives are facilitated through the utilization of a State Estimator, Real-Time Contingency Analysis, Scada alarming, organized documentation systems and an extensive display system covering the SaskPower Reliability Coordination Area and other external neighbouring areas.

3. Awareness of RC Area Conditions

The SaskPower RC is continuously aware of conditions within its Reliability Coordination Area and includes this information in its reliability assessments. These real-time conditions are included as automatic updates to the state estimation system,

contingency analysis tool and the transmission displays. The SaskPower RC monitors its SaskPower Reliability Coordination Area parameters, including the following:

- 3.1 Current status of Bulk Power System elements (transmission or generation) including critical auxiliaries such as Automatic Voltage Regulators and Special Protection Systems and system loading are monitored by state estimator, RTCA, Scada alarming and transmission displays. The SaskPower balancing area and transmission operator is required to report to the SaskPower RC when the status of Special Protection Systems change and Automatic Voltage Regulators are not in-service.
- 3.2 Current pre-contingency element conditions (voltage and thermal) are monitored by state estimator, Scada alarming and transmission displays.
- 3.3 Current post-contingency element conditions (voltage and thermal) are monitored by Real Time Contingency Analysis and transmission displays. Stability limits are studied using off-line PSS/E software and IROLs specified include sufficient margins to ensure that stability limits will not be approached.
- 3.4 System actual and required real reserves are monitored using a reserve monitoring system that incorporates warnings and alarms in the event of impending reserve shortfalls. Actual reactive reserves and reserve surpluses are monitored using a reactive reserve monitoring system that incorporates warnings and alarms in the event of insufficient reactive reserve margins.
- 3.5 Current day capacity and energy adequacy conditions using SaskPower RC capacity management planning procedures provided in RCR-12-0 Day Ahead Capacity Management Planning.
- 3.6 The current ACE for the SaskPower balancing area is continuously displayed, monitored, and alarmed in a trend graph available to SaskPower RC.
- 3.7 Local procedures and TLR procedures that are in effect outside the SaskPower Subregion using the IDC and RCIS.
- 3.8 Generation dispatch plans for the SaskPower Reliability Coordination Area.
- 3.9 Planned transmission and generation outage schedules within the SaskPower Subregion.
- 3.10 Contingency events using EMS alarming applications, state estimator and power system analysis tools and displays.

4. Monitoring of Significant Bulk Power System Parameters

The SaskPower RC monitors Bulk Power System parameters that may have significant impacts upon its Reliability Coordination Area and neighbouring Reliability Coordination areas with respect to:

4.1 The SaskPower RC maintains awareness of all Interchange Transactions that wheel-through, source or sink in its Reliability Coordination Area through NERC E-tags and NERC IDC displays. Interchange Transaction information is made available to all Reliability Coordinators via NERC E-tags.

4.2 SaskPower evaluates and assesses additional Interchange Transactions that could violate SOLs and/or IROLs. SaskPower utilizes tag information in the IDC and real-time data in EMS to make assessments of the impact of additional transactions on flowgate loading.

SaskPower RC operators are authorized to utilize all resources, including load shedding to address potential or actual IROL violations. The RC authorization to utilize resources is provided in the SaskPower RC Authority to Act document.

4.3 The SaskPower RC monitors Balancing Area Operating Reserves to insure that the required amount of Operating Reserves is provided to meet NERC Control Performance Standards and Disturbance Control Standards using the EMS based Operating Reserve Monitoring System. The SaskPower RC is alerted when reserves fall below prescribed levels and will direct the Balancing Area to replenish reserves through internal actions or by obtaining assistance from neighbouring control areas.

4.4 The SaskPower RC identifies the cause of potential or actual SOL or IROL violations through assessment and analysis of security analysis, state estimator results, contingency analysis results or Scada alarming of outages. The SaskPower RC will initiate control actions including transmission switching, generation redispatch or emergency procedures to relieve the potential or actual IROL violation without delay, and no longer than 30 minutes.

The SaskPower RC is authorized to direct utilization of all resources, including load shedding, to address a potential or actual IROL violation.

4.5 The SaskPower RC internally communicates start and end times for time error corrections to its Balancing Area. The SaskPower RC internally communicates Geo-Magnetic Disturbance forecast information to its Balancing Area. The SaskPower RC will assist in development of any required response plans.

4.6 The SaskPower RC participates in NERC Hotline discussions, assists in the assessment of Region reliability and the overall interconnected system, and coordinates actions in anticipated or actual emergency situations.

4.7 SaskPower RC monitors system frequency and the Balancing Authority ACE and Operating Reserves. The SaskPower RC directs any necessary rebalancing required for

the Balancing Authority to return to CPS and DCS compliance. In response to the SaskPower RC, the Balancing Authority shall utilize all resources, including the shedding of firm load to relieve an emergent condition.

4.8 The SaskPower RC coordinates with other Reliability Coordinators and neighbouring Balancing Authorities, as needed, for the development and implementation of action plans to mitigate potential or actual SOL, IROL, CPS or DCS violations. The SaskPower RC coordinates pending real-time and next-day generation and transmission maintenance outages with other Reliability Coordinators through SDX and telephone communications.

4.9 The SaskPower RC will provide internal assistance to the Balancing Authority in arranging for assistance from neighbouring RCs or Balancing Authorities by issuing Emergency Energy Alerts as needed.

4.10 The SaskPower RC monitors ACE in the SaskPower Subregion to identify the sources of large ACEs that may be contributing to substantial frequency deviation, time error or inadvertent interchange. The SaskPower RC will monitor and insure Balancing Authority corrective actions are carried out and provide direction where system facility overloads are experienced.

4.11 The SaskPower RC maintains awareness of the status of all Special Protection Systems including degradation or potential failure to operate. The SaskPower RC includes all SPS status changes in the security analysis system.

5. Issuing of Alerts

The SaskPower RC issues alerts and shares relevant operational information, as appropriate, to all Reliability Coordinators via the Reliability Coordinator Information System and the telephone communications system when it foresees a transmission problem such a SOL or IROL violation or a critical loss of reactive reserve.

6. Confirmation of Reliability Assessment Results

The SaskPower RC confirms reliability assessment results by analyzing state estimator and real-time contingency analysis results and conducting discussion with neighbouring Reliability Coordinators. The SaskPower RC identifies options to mitigate potential or actual SOL or IROL violations by examining existing operating guides, system knowledge, and power flow analysis to identify and implement only those actions as necessary that contribute to the best interests of the interconnection.

F. Emergency Operations

1. The SaskPower RC directs its Balancing Authority and Transmission Operator to return facility loadings on the transmission system to within applicable IROLs as soon as practicable, but no longer than 30 minutes. The SaskPower RC directs the necessary actions such as system reconfiguration, generation redispatch or load shedding until appropriate transmission relief has been achieved.

2. The SaskPower RC utilizes the SaskPower Emergency Operating Procedures when IROL violations are imminent. The SaskPower Emergency Operating Procedures provide the processes and procedures that the SaskPower RC follows to remediate an IROL violation by generation re-dispatch, transmission reconfiguration, Interchange Transaction management, or system load reduction. The SaskPower RC coordinates its alert and emergency procedures with other Reliability Coordinators through coordination agreements, the NERC RCIS and telephone.

3. The SaskPower RC directs action in the event the loading of transmission facilities progresses to or is projected to progress to a SOL or IROL violation.

3.1 The SaskPower RC directs local transmission loading relief procedures or the NERC TLR procedures for resolving a potential or actual SOL or IROL violation on the transmission system within the SaskPower Reliability Subregion. The SaskPower RC maintains internal communication with the Transmission Operators who are responsible for implementing the guides for local area relief to ensure regional reliability is not jeopardized by the implementation of these procedures.

3.2 The SaskPower RC will implement a local transmission loading relief procedure or congestion management procedure simultaneously with NERC TLR procedures when the SaskPower RC deems it necessary. In the circumstance of prevailing local transmission problems, the SaskPower RC will direct the SaskPower transmission operator to implement operating directives as necessary.

3.3 The SaskPower RC will direct transmission reconfiguration, re-dispatch and NERC TLR reductions to relieve facilities as necessary. The SaskPower RC will not rely on NERC TLR as an emergency action.

3.4 Local relief procedures and guides used by the SaskPower RC are applicable to the Transmission Operator within the SaskPower Subregion. In the event that the implementation of these guides is anticipated to impact transmission facilities in neighbouring jurisdictions outside of the SaskPower Subregion, the SaskPower RC will ensure appropriate communications and coordination occurs with the RC of the impacted jurisdiction.

3.5 The SaskPower RC will comply with the provisions of the NERC TLR procedure. In the event that the SaskPower RC receives notification through the IDC that another RC has issued a TLR that calls for curtailment and/or halts transactions within the SaskPower Subregion, the SaskPower RC will use the IDC to acknowledge the curtailment/holds. The SaskPower RC will ensure that the transaction curtailment/holds are properly implemented.

4. The SaskPower RC continuously monitors interconnection frequency and its Balancing Authority ACE. The SaskPower RC directs its Balancing Authority to take

appropriate action to return the SaskPower Subregion within acceptable limits according to NERC criteria.

5. The SaskPower RC will take or direct action as needed, including load shedding, to mitigate an energy emergency within the SaskPower Subregion in compliance with NERC standard EOP-002-0. The SaskPower RC will provide assistance to other RCs experiencing an energy emergency as necessary.
6. In the event that a potential or actual Energy Emergency is experienced within the SaskPower RC area, the SaskPower RC will implement processes and procedures, including NERC standard EOP-002-0, to mitigate the emergency condition. The SaskPower RC will take the necessary actions, including a request for emergency assistance and directing load shedding, if required.

G. System Restoration

1. Restoration Plan Awareness

The SaskPower RC has a written restoration plan for the Saskpower Subregion that is available to Reliability Coordination staff and is reviewed and trained annually. The SaskPower RC directs the restoration process, monitors restoration progress and acts to coordinate additional assistance as needed.

2. SaskPower Restoration Plan

The SaskPower RC utilizes a restoration plan for the SaskPower Subregion that provides for internal coordination between the SaskPower Balancing Authority and the SaskPower Transmission Operator to insure that reliability is maintained during system restoration events.

3. Dissemination of Information

The SaskPower RC is the contact for the dissemination of information regarding restoration plans and procedures to neighbouring Reliability Coordinators. The SaskPower RC approves, communicates and coordinates the re-synchronizing of major system islands or synchronizing points so as not to cause a burden on adjacent Reliability Coordination Areas. Restoration information is primarily provided by direct telephone call or the posting of information on the RCIS and periodic updates on the NERC Hotline.

H. Coordination Agreements and Data Sharing

1. Coordination Agreements

RCR-04-1 SPC - MISO RC Coordination Agreement
RCR-04-6 SPC – WECC RC Coordination Agreement

2. Data Sharing

The SaskPower RC currently has adequate data to support its reliability coordination tasks. The SaskPower RC determines additional data requirements and requests such data from adjacent Reliability Coordinators. The SaskPower RC reciprocally provides data exchange with adjacent Reliability Coordinators via a secure communication network.

I. Facility

SaskPower performs the Reliability Coordinator function at its System Control Centre (SCC) located in Regina, Saskatchewan, Canada. The SCC has the necessary facilities for the SaskPower RC to perform its responsibilities. The SaskPower RC has the necessary voice and data communication links to appropriate entities within and external to the Reliability Coordination Area for the SaskPower RC to perform its responsibilities. The SaskPower RC has a fully redundant, independent back-up control center located in a diverse location that provides backup communications, data and tools required for the SaskPower RC to provided reliability services for the SaskPower Subregion in the event of an evacuation of the main control centre.

1. Communication Facility Adequacy

The SaskPower RC has adequate and reliable voice and data link communications to all Subregion facility locations to facilitate normal operations and remediation of real time emergency conditions. The SaskPower RC has multi-directional voice and data communications with other entities and with neighbouring Reliability Coordinators to facilitate meeting reliability objectives of the Interconnection. The SaskPower RC maintains satellite phones, PSTN phones, dedicated data links, diversely routed telecommunications circuits and a video link between SaskPower's main control centre and its backup control centre.

2. Multi-directional Capabilities

The SaskPower RC has multi-directional communications capabilities within its Subregion and with neighbouring Reliability Coordinators, for both voice and data exchange to meet the reliability objectives of the Interconnection.

3. Real-time Monitoring

The SaskPower RC has detailed real-time monitoring capability of its Reliability Coordination Area and a substantial wide area view of facilities surrounding the SaskPower Reliability Coordination Area to ensure that potential or actual SOL violations are adequately identified. The SaskPower RC has the facilities to monitor key or critical external transmission components that may cause SOL or IROL violation in the SaskPower Reliability Coordination Area.

The SaskPower RC monitors Bulk Power System elements (generators, transmission lines, buses, transformers, breakers etc.) that could results in SOL or IROL violations within its Reliability Coordination Area. The SaskPower RC monitor both real and

reactive power system flows, operating reserves and the status of the Bulk Power System elements that are, or could be, critical to SOLs, IROLs, and system restoration requirements within its Reliability Coordination Area. The SaskPower RC utilizes Transmission Operator and Balancing Authority information to mitigate or prevent problems in the Reliability Coordination Area.

4. Study and Analysis Tools

4.1 The SaskPower RC has adequate wide area view displays and analysis tools, including state estimation, pre and post-contingency analysis capabilities including thermal, stability and voltage assessments. The SaskPower RC has detailed monitoring capability of the SaskPower Reliability Area and sufficient monitoring capability of the surrounding Reliability Areas to ensure potential reliability violations are identified. The SaskPower RC monitors key transmission facilities in its area in conjunction with the Transmission Operator monitoring of local SaskPower facilities.

Some of the monitoring and evaluation systems utilized by the SaskPower RC include state estimator, contingency analysis, generation management systems, voltage monitoring system, operating reserve monitoring system, Var management system, status and analog alarming, overview displays of the SaskPower Subregion and wide area view, and grid health monitoring system.

4.2 The SaskPower Reliability Coordinator has a fully redundant backup facility that is continuously available in the event that all or a portion of the main monitoring system is unavailable. The SaskPower RC has documented procedures for the evacuation of the main control centre.

4.3 The SaskPower RC controls its Reliability Coordinator analysis tools, including approvals for planned maintenance. The SaskPower RC has procedures in place to mitigate the effects of analysis tool outages.

J. Staffing

1. NERC Certification and Training

The SaskPower RC office is staffed around-the-clock with trained NERC certified RC operators. Operations support staff that have primary responsibility for RC inputs or results or are directly responsible for complying with NERC standards are also NERC certified with the Reliability Coordinator designation.

The SaskPower RC requires its Reliability Coordinators to complete a minimum of five days per year of training and drills in addition to other training to maintain operating qualifications. SaskPower has a full time, three person training department that oversees, provides and facilitates operator training and certification.

2. Reliability Coordination Area Comprehension

The SaskPower RC operating personnel have an extensive comprehension and understanding of the SaskPower Balancing Authority and Transmission Operator within the SaskPower Reliability Coordination Area and other neighbouring Reliability Coordinators. This comprehensive understanding includes operating staff, operating practices and procedures, restoration priorities and objectives, outage plans, equipment capabilities, and operational restrictions.

SaskPower RC operating personnel place particular attention on SOLs and IROLs and inter-tie facility limits using the state estimator tool and other real-time monitoring tools. SaskPower ensures that the proper operating procedures such as Blackstart Restoration Plans, Emergency Evacuation Plans, and other procedures are available and utilized when necessary.

3. SaskPower is responsible for the Reliability Coordinator function and is a signatory to the NERC Reliability Coordinator Standards of Conduct. SaskPower will ensure that all RC operations staff are trained in the NERC Reliability Coordinator Standards of Conduct on an annual basis and adhere to the standards at all times. The SaskPower RC is independent of the merchant function and does not share information or data with any wholesale or retail merchant function that is not made available simultaneously to all internal or external wholesale merchant functions.

Appendix A

Authority to Act

- RCR-01 Reliability Coordinator Authority
- RCR-02 Reliability Coordinator Standards of Conduct
- RCR-03 Standards of Conduct Policy for Sask Power

Cory IPP Operating Agreement

Centennial Wind Power IPP Agreement

Meridian IPP Operating Agreement

NorthPoint/SaskPower Service Agreement

Sunbridge Wind Power IPP Operating Agreement

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