

The following table lists the Violation Risk Factors (VRFs) for the Version 0 Transmission Operations and Voltage Control standards requirements. These VRFs are the weighted average of the stakeholder VRF selections from the second posting of the VRF survey.

VIOLATION RISK FACTORS – VERSION 0 STANDARDS PRE-BALLOT MATRIX

| Standard Number | Requirement Number | Requirement | Violation Risk Factor |
|------------------------|---------------------------|--|------------------------------|
| TOP-001-0 | R1. | Each Transmission Operator shall have the responsibility and clear decision-making authority to take whatever actions are needed to ensure the reliability of its area and shall exercise specific authority to alleviate operating emergencies. | HIGH |
| TOP-001-0 | R2. | Each Transmission Operator shall take immediate actions to alleviate operating emergencies including curtailing transmission service or energy schedules, operating equipment (e.g., generators, phase shifters, breakers), shedding firm load, etc. | HIGH |
| TOP-001-0 | R3. | Each Transmission Operator, Balancing Authority, and Generator Operator shall comply with reliability directives issued by the Reliability Coordinator, and each Balancing Authority and Generator Operator shall comply with reliability directives issued by the Transmission Operator, unless such actions would violate safety, equipment, regulatory or statutory requirements. Under these circumstances the Transmission Operator, Balancing Authority or Generator Operator shall immediately inform the Reliability Coordinator or Transmission Operator of the inability to perform the directive so that the Reliability Coordinator or Transmission Operator can implement alternate remedial actions. | HIGH |
| TOP-001-0 | R4. | Each Distribution Provider and Load Serving Entity shall comply with all reliability directives issued by the Transmission Operator, including shedding firm load, unless such actions would violate safety, equipment, regulatory or statutory requirements. Under these circumstances, the Distribution Provider or Load Serving Entity shall immediately inform the Transmission Operator of the inability to perform the directive so that the Transmission Operator can implement alternate remedial actions. | HIGH |
| TOP-001-0 | R5. | Each Transmission Operator shall inform its Reliability Coordinator and any other potentially affected Transmission Operators of real time or anticipated emergency conditions, and take actions to avoid, when possible, or mitigate the emergency. | HIGH |
| TOP-001-0 | R6. | Each Transmission Operator, Balancing Authority, and Generator Operator shall render all available emergency assistance to others as requested, provided that the requesting entity has implemented its comparable emergency procedures, unless such actions would violate safety, equipment, or regulatory or statutory requirements. | HIGH |
| TOP-001-0 | R7. | Each Transmission Operator and Generator Operator shall not remove Bulk Electric System facilities from service if removing those facilities would burden neighboring systems unless: | HIGH |

| Standard Number | Requirement Number | Requirement | Violation Risk Factor |
|-----------------|--------------------|--|-----------------------|
| TOP-001-0 | R7.1. | For a generator outage, the Generator Operator shall notify and coordinate with the Transmission Operator. The Transmission Operator shall notify the Reliability Coordinator and other affected Transmission Operators, and coordinate the impact of removing the Bulk Electric System facility. | HIGH |
| TOP-001-0 | R7.2. | For a transmission facility, the Transmission Operator shall notify and coordinate with its Reliability Coordinator. The Transmission Operator shall notify other affected Transmission Operators, and coordinate the impact of removing the Bulk Electric System facility. | HIGH |
| TOP-001-0 | R7.3. | When time does not permit such notifications and coordination, or when immediate action is required to prevent a hazard to the public, lengthy customer service interruption, or damage to facilities, the Generator Operator shall notify the Transmission Operator, and the Transmission Operator shall notify its Reliability Coordinator and adjacent Transmission Operators, at the earliest possible time. | HIGH |
| TOP-001-0 | R8. | During a system emergency, the Balancing Authority and Transmission Operator shall immediately take action to restore the Real and Reactive Power Balance. If the Balancing Authority or Transmission Operator is unable to restore Real and Reactive Power Balance it shall request emergency assistance from the Reliability Coordinator. If corrective action or emergency assistance is not adequate to mitigate the Real and Reactive Power Balance, then the Reliability Coordinator, Balancing Authority, and Transmission Operator shall implement firm load shedding. | HIGH |
| TOP-002-0 | R1. | Each Balancing Authority and Transmission Operator shall maintain a set of current plans that are designed to evaluate options and set procedures for reliable operation through a reasonable future time period. In addition, each Balancing Authority and Transmission Operator shall be responsible for using available personnel and system equipment to implement these plans to ensure that interconnected system reliability will be maintained. | MEDIUM |
| TOP-002-0 | R2. | Each Balancing Authority and Transmission Operator shall ensure its operating personnel participate in the system planning and design study processes, so that these studies contain the operating personnel perspective and system operating personnel are aware of the planning purpose. | MEDIUM |
| TOP-002-0 | R3. | Each Load Serving Entity and Generator Operator shall coordinate (where confidentiality agreements allow) its current-day, next-day, and seasonal operations with its Host Balancing Authority and Transmission Service Provider. Each Balancing Authority and Transmission Service Provider shall coordinate its current-day, next-day, and seasonal operations with its Transmission Operator. | MEDIUM |

| Standard Number | Requirement Number | Requirement | Violation Risk Factor |
|------------------------|---------------------------|---|------------------------------|
| TOP-002-0 | R4. | Each Balancing Authority and Transmission Operator shall coordinate (where confidentiality agreements allow) its current-day, next-day, and seasonal planning and operations with neighboring Balancing Authorities and Transmission Operators and with its Reliability Coordinator, so that normal Interconnection operation will proceed in an orderly and consistent manner. | MEDIUM |
| TOP-002-0 | R5. | Each Balancing Authority and Transmission Operator shall plan to meet scheduled system configuration, generation dispatch, interchange scheduling and demand patterns. | MEDIUM |
| TOP-002-0 | R6. | Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements. | MEDIUM |
| TOP-002-0 | R7. | Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for any single Contingency. | MEDIUM |
| TOP-002-0 | R8. | Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for any single contingency. | MEDIUM |
| TOP-002-0 | R9. | Each Balancing Authority shall plan to meet Interchange Schedules and Ramps. | LOWER |
| TOP-002-0 | R10. | Each Balancing Authority and Transmission Operator shall plan to meet all System Operating Limits (SOLs) and Interconnection Reliability Operating Limits (IROLs). | MEDIUM |
| TOP-002-0 | R11. | The Transmission Operator shall perform seasonal, next-day, and current-day Bulk Electric System studies to determine SOLs. Neighboring Transmission Operators shall utilize identical SOLs for common facilities. The Transmission Operator shall update these Bulk Electric System studies as necessary to reflect current system conditions; and shall make the results of Bulk Electric System studies available to the Transmission Operators, Balancing Authorities (subject confidentiality requirements), and to its Reliability Coordinator. | MEDIUM |
| TOP-002-0 | R12. | The Transmission Service Provider shall include known SOLs or IROLs within its area and neighboring areas in the determination of transfer capabilities, in accordance with filed tariffs and/or regional Total Transfer Capability and Available Transfer Capability calculation processes. | MEDIUM |
| TOP-002-0 | R13. | At the request of the Balancing Authority or Transmission Operator, a Generator Operator shall perform generating real and reactive capability verification that shall include, among other variables, weather, ambient air and water conditions, and fuel quality and quantity, and provide the results to the Balancing Authority or Transmission Operator operating personnel as requested. | MEDIUM |
| TOP-002-0 | R14. | Generator Operators shall, without any intentional time delay, notify their Balancing Authority and Transmission Operator of changes in capabilities and characteristics including but not limited to: | MEDIUM |
| TOP-002-0 | R14.1. | Changes in real and reactive output capabilities. | HIGH |
| TOP-002-0 | R14.2. | Automatic Voltage Regulator status and mode setting. | LOWER |

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| TOP-002-0 | R15. | Generation Operators shall, at the request of the Balancing Authority or Transmission Operator, provide a forecast of expected real power output to assist in operations planning (e.g., a seven-day forecast of real output). | LOWER |
| TOP-002-0 | R16. | Subject to standards of conduct and confidentiality agreements, Transmission Operators shall, without any intentional time delay, notify their Reliability Coordinator and Balancing Authority of changes in capabilities and characteristics including but not limited to: | MEDIUM |
| TOP-002-0 | R16.1. | Changes in transmission facility status. | HIGH |
| TOP-002-0 | R16.2. | Changes in transmission facility rating. | HIGH |
| TOP-002-0 | R17. | Balancing Authorities and Transmission Operators shall, without any intentional time delay, communicate the information described in the requirements R1 to R16 above to their Reliability Coordinator. | HIGH |
| TOP-002-0 | R18. | Neighboring Balancing Authorities, Transmission Operators, Generator Operators, Transmission Service Providers and Load Serving Entities shall use uniform line identifiers when referring to transmission facilities of an interconnected network. | MEDIUM |
| TOP-002-0 | R19. | Each Balancing Authority and Transmission Operator shall maintain accurate computer models utilized for analyzing and planning system operations. | MEDIUM |
| TOP-003-0 | R1. | Generator Operators and Transmission Operators shall provide planned outage information. | MEDIUM |
| TOP-003-0 | R1.1. | Each Generator Operator shall provide outage information daily to its Transmission Operator for scheduled generator outages planned for the next day (any foreseen outage of a generator greater than 50 MW). The Transmission Operator shall establish the outage reporting requirements. | MEDIUM |
| TOP-003-0 | R1.2. | Each Transmission Operator shall provide outage information daily to its Reliability Coordinator, and to affected Balancing Authorities and Transmission Operators for scheduled generator and bulk transmission outages planned for the next day (any foreseen outage of a transmission line or transformer greater than 100 kV or generator greater than 50 MW) that may collectively cause or contribute to an SOL or IROL violation or a regional operating area limitation. The Reliability Coordinator shall establish the outage reporting requirements. | MEDIUM |
| TOP-003-0 | R1.3. | Such information shall be available by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection. | MEDIUM |
| TOP-003-0 | R2. | Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., among affected Balancing Authorities and Transmission Operators as required. | MEDIUM |
| TOP-003-0 | R3. | Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of telemetering and control equipment and associated communication channels between the affected areas. | MEDIUM |

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| TOP-003-0 | R4. | Each Reliability Coordinator shall resolve any scheduling of potential reliability conflicts. | MEDIUM |
| TOP-004-0 | R1. | Each Transmission Operator shall operate within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs). | HIGH |
| TOP-004-0 | R2. | Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency. | HIGH |
| TOP-004-0 | R3. | Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy. | HIGH |
| TOP-004-0 | R4. | If a Transmission Operator enters an unknown operating state (i.e. any state for which valid operating limits have not been determined), it will be considered to be in an emergency and shall restore operations to respect proven reliable power system limits within 30 minutes. | HIGH |
| TOP-004-0 | R5. | Each Transmission Operator shall make every effort to remain connected to the Interconnection. If the Transmission Operator determines that by remaining interconnected, it is in imminent danger of violating an IROL or SOL, the Transmission Operator may take such actions, as it deems necessary, to protect its area. | HIGH |
| TOP-004-0 | R6. | Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including: | MEDIUM |
| TOP-004-0 | R6.1. | Equipment ratings. | MEDIUM |
| TOP-004-0 | R6.2. | Monitoring and controlling voltage levels and real and reactive power flows. | MEDIUM |
| TOP-004-0 | R6.3. | Switching transmission elements. | MEDIUM |
| TOP-004-0 | R6.4. | Planned outages of transmission elements. | MEDIUM |
| TOP-004-0 | R6.5. | Development of IROLs and SOLs. | MEDIUM |
| TOP-004-0 | R6.6. | Responding to IROL and SOL violations. | MEDIUM |
| TOP-005-0 | R1. | Each Transmission Operator and Balancing Authority shall provide its Reliability Coordinator with the operating data that the Reliability Coordinator requires to perform operational reliability assessments and to coordinate reliable operations within the Reliability Coordinator Area. | MEDIUM |
| TOP-005-0 | R1.1. | Each Reliability Coordinator shall identify the data requirements from the list in Attachment 1-TOP-005-0 "Electric System Reliability Data" and any additional operating information requirements relating to operation of the bulk power system within the Reliability Coordinator Area. | MEDIUM |
| TOP-005-0 | R2. | As a condition of receiving data from the Interregional Security Network (ISN), each ISN data recipient shall sign the NERC Confidentiality Agreement for "Electric System Reliability Data." | LOWER |

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| TOP-005-0 | R3. | Upon request, each Reliability Coordinator shall, via the ISN or equivalent system, exchange with other Reliability Coordinators operating data that are necessary to allow the Reliability Coordinators to perform operational reliability assessments and coordinate reliable operations. Reliability Coordinators shall share with each other the types of data listed in Attachment 1-TOP-005-0 "Electric System Reliability Data," unless otherwise agreed to. | MEDIUM |
| TOP-005-0 | R4. | Upon request, each Balancing Authority and Transmission Operator shall provide to other Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability, the operating data that are necessary to allow these Balancing Authorities and Transmission Operators to perform operational reliability assessments and to coordinate reliable operations. Balancing Authorities and Transmission Operators shall provide the types of data as listed in Attachment 1-TOP-005-0 "Electric System Reliability Data," unless otherwise agreed to by the Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability. | MEDIUM |
| TOP-005-0 | R5. | Each Purchasing-Selling Entity shall provide information as requested by its Host Balancing Authorities and Transmission Operators to enable them to conduct operational reliability assessments and coordinate reliable operations. | MEDIUM |
| TOP-006-0 | R1. | Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use. | MEDIUM |
| TOP-006-0 | R1.1. | Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use. | MEDIUM |
| TOP-006-0 | R1.2. | Each Transmission Operator and Balancing Authority shall inform the Reliability Coordinator and other affected Balancing Authorities and Transmission Operators of all generation and transmission resources available for use. | MEDIUM |
| TOP-006-0 | R2. | Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources. | HIGH |
| TOP-006-0 | R3. | Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall provide appropriate technical information concerning protective relays to their operating personnel. | LOWER |
| TOP-006-0 | R4. | Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have information, including weather forecasts and past load patterns, available to predict the system's near-term load pattern. | LOWER |
| TOP-006-0 | R5. | Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall use monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions and to indicate, if appropriate, the need for corrective action. | MEDIUM |
| TOP-006-0 | R6. | Each Balancing Authority and Transmission Operator shall use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations. | HIGH |

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| TOP-006-0 | R7. | Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor system frequency. | HIGH |
| TOP-007-0 | R1. | A Transmission Operator shall inform its Reliability Coordinator when an IROL or SOL has been exceeded and the actions being taken to return the system to within limits. | HIGH |
| TOP-007-0 | R2. | Following a Contingency or other event that results in an IROL violation, the Transmission Operator shall return its transmission system to within IROL as soon as possible, but not longer than 30 minutes. | HIGH |
| TOP-007-0 | R3. | A Transmission Operator shall take all appropriate actions up to and including shedding firm load, or directing the shedding of firm load, in order to comply with Requirement R 2. | HIGH |
| TOP-007-0 | R4. | The Reliability Coordinator shall evaluate actions taken to address an IROL or SOL violation and, if the actions taken are not appropriate or sufficient, direct actions required to return the system to within limits. | HIGH |
| TOP-008-0 | R1. | The Transmission Operator experiencing or contributing to an IROL or SOL violation shall take immediate steps to relieve the condition, which may include shedding firm load. | HIGH |
| TOP-008-0 | R2. | Each Transmission Operator shall operate to prevent the likelihood that a disturbance, action, or inaction will result in an IROL or SOL violation in its area or another area of the Interconnection. In instances where there is a difference in derived operating limits, the Transmission Operator shall always operate the Bulk Electric System to the most limiting parameter. | HIGH |
| TOP-008-0 | R3. | The Transmission Operator shall disconnect the affected facility if the overload on a transmission facility or abnormal voltage or reactive condition persists and equipment is endangered. In doing so, the Transmission Operator shall notify its Reliability Coordinator and all neighboring Transmission Operators impacted by the disconnection prior to switching, if time permits, otherwise, immediately thereafter. | HIGH |
| TOP-008-0 | R4. | The Transmission Operator shall have sufficient information and analysis tools to determine the cause(s) of SOL violations. This analysis shall be conducted in all operating timeframes. The Transmission Operator shall use the results of these analyses to immediately mitigate the SOL violation. | MEDIUM |
| VAR-001-0 | R1. | Each Transmission Operator, individually and jointly with other Transmission Operators, shall ensure that formal policies and procedures are developed, maintained, and implemented for monitoring and controlling voltage levels and MVAR flows within their individual areas and with the areas of neighboring Transmission Operators. | HIGH |
| VAR-001-0 | R2. | Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits. | HIGH |
| VAR-001-0 | R3. | Each Purchasing-Selling Entity shall arrange for (self-provide or purchase) reactive resources to satisfy its reactive requirements identified by its Transmission Service Provider. | HIGH |

| Standard Number | Requirement Number | Requirement | Violation Risk Factor |
|-----------------|--------------------|--|-----------------------|
| VAR-001-0 | R4. | The Transmission Operator shall know the status of all transmission reactive power resources, including the status of voltage regulators and power system stabilizers. | MEDIUM |
| VAR-001-0 | R5. | The Transmission Operator shall be able to operate or direct the operation of devices necessary to regulate transmission voltage and reactive flow. | HIGH |
| VAR-001-0 | R6. | Each Transmission Operator shall operate or direct the operation of capacitive and inductive reactive resources within its area – including reactive generation scheduling; transmission line and reactive resource switching; and, if necessary, load shedding – to maintain system and Interconnection voltages within established limits. | HIGH |
| VAR-001-0 | R7. | Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions. | HIGH |
| VAR-001-0 | R7.1. | Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur. | HIGH |
| VAR-001-0 | R8. | Each Transmission Operator shall correct IROL or SOL violations resulting from reactive resource deficiencies (IROL violations must be corrected within 30 minutes) and complete the required IROL or SOL violation reporting. | HIGH |
| VAR-001-0 | R9. | Each Generator Operator shall provide information to its Transmission Operator on the status of all generation reactive power resources, including the status of voltage regulators and power system stabilizers. | HIGH |
| VAR-001-0 | R9.1. | When a generator's voltage regulator is out of service, the Generator Operator shall maintain the generator field excitation at a level to maintain Interconnection and generator stability. | HIGH |
| VAR-001-0 | R10. | The Transmission Operator shall direct corrective action, including load reduction, necessary to prevent voltage collapse when reactive resources are insufficient. | HIGH |