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## Draft QC-2017-02

# Standard PRC-005-6 – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

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### 1. ASSESSMENT OF RELEVANCE

In Decision [D-2016-150](#), the Régie de l'énergie (the Régie) adopted PRC-005 version 2, which came into effect on January 1, 2017. PRC-005 version 6 modifies version 2 by adding new elements that the entities will have to maintain and that broaden the scope to the RTP. This new version includes three important changes as follows:

1. Addition of two new elements subject to a specified maintenance interval: Automatic Reclosing and Sudden Pressure Relaying
2. Clarification regarding the maintenance of Protection Systems for Dispersed Power Producing Resources
3. Replacement of the term Special Protection System (SPS) by the term Remedial Action Scheme (RAS).

Scope (Phase 1): Broadening the scope to the RTP was previously put to public consultation during Phase 1 of this project. The Reliability Coordinator concluded at the end of Phase 1 that broadening the scope of the standard to include the RTP for the maintenance of Protection Systems, Automatic Reclosing and Sudden Pressure was relevant for reliability of the Québec Interconnection.

Content of the standard (Phase 2) – In the second phase of public consultation, the Coordinator asked the entities concerned to comment on the impact and relevance of PRC-005-6, including the following points:

1. Implementation schedule
2. Addition of the new systems (e.g., SPS Type III)

The revision of PRC-005-6 is meant to ensure the maintenance of RTP elements that could impact reliability of the Québec Interconnection in the event of failure or malfunction.

#### **1.1. Automatic Reclosing and Sudden Pressure Relaying**

##### **1.1.1. Automatic Reclosing**

In Order No. 758,<sup>1</sup> FERC followed up on its adoption of PRC-005-1 and asked NERC to add to subsequent versions the maintenance and testing of Automatic Reclosing,<sup>2</sup> which affects BES reliability.

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<sup>1</sup> FERC Order No. 758, accessed on August 8, 2018, on the website:

[https://www.nerc.com/pa/Stand/Project%202007172%20Protection%20System%20Maintenance%20and/Order\\_Interp\\_Protection\\_Sys\\_R\\_S\\_2011\\_2\\_3.pdf](https://www.nerc.com/pa/Stand/Project%202007172%20Protection%20System%20Maintenance%20and/Order_Interp_Protection_Sys_R_S_2011_2_3.pdf)

<sup>2</sup> Automatic Reclosing is used in transmission systems to restore a transmission element after a circuit breaker trip.

Automatic Reclosing can be used in conjunction with Protection Systems to achieve or meet system performance requirements. Such devices can also exacerbate fault conditions if they are not properly maintained and tested. In FERC's view, this makes it essential to add these activities to PRC-005 requirements.

Automatic Reclosing is used mainly to restore a system, not to protect it. It is not designed to meet system performance requirements upon a permanent fault,<sup>3</sup> but only a temporary fault. Noting that Automatic Reclosing can be used for various functions, FERC asked NERC to add this device according to criteria specific to its functionality and impact on BES.

In light of this, NERC tasked two subcommittees, the System Analysis and Modeling Subcommittee (SAMS) and the System Protection and Control Subcommittee (SPCS), with analyzing this device.<sup>4</sup>

The subcommittees reached the following conclusions:

- Regarding Automatic Reclosing that could be used in conjunction with Protection Systems to achieve or meet system performance requirements, the subcommittees could not identify any application in which Automatic Reclosing is used in conjunction with Protection Systems and meets system performance requirements under NERC reliability standards. Nor did they find any application in which this device increases the Interconnection Reliability Operating Limit (IROL). Consequently, they recommend no modification to PRC-005 on this count.
  - Regarding Automatic Reclosing integrated into a Special Protection System (SPS)<sup>5</sup> that factors into meeting the performance requirements of NERC reliability standards or that increase the IROL, the subcommittees recommended detailed specifications for maintenance and testing of Automatic Reclosing. This conclusion corresponds to PRC-005-6 Requirement R4.2.7.3.
- As for potential misoperation of Automatic Reclosing, the subcommittees reached the following conclusions:
  - If Automatic Reclosing sends a circuit breaker close signal with no delay or less than its programmed delay (premature reclosing) and that device is near a generating unit or station, it may create instability. NERC standards ask for consideration of the loss of the largest generating unit in a Balancing Authority Area. Thus, the BES is jeopardized if generation loss exceeds the largest unit in the Balancing Authority Area. By tying the requirements of NERC standards to reclosing relays in the vicinity of generating stations, the subcommittees indicated that reclosing relay maintenance is required under such conditions, i.e., if Automatic Reclosing devices are in the vicinity of generating stations with a capacity exceeding the largest generating unit in the Balancing Authority Area. Requirements 4.2.7.1 and 4.2.7.2 stem from this conclusion.

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<sup>3</sup> Given a permanent fault, reclosing the equipment will trip the circuit breaker again because the fault is still present.

<sup>4</sup> NERC, System Analysis and Modeling Subcommittee / System Protection and Control Subcommittee, *Considerations for Maintenance and Testing of Autoreclosing Schemes*, accessed on August 8, 2018, on the website: [http://www.nerc.com/pa/Stand/Project%202007172%20Protection%20System%20Maintenance%20and/SAMS-PCS Order 758 Autoreclosing Report Final .pdf](http://www.nerc.com/pa/Stand/Project%202007172%20Protection%20System%20Maintenance%20and/SAMS-PCS%20Order%20758%20Autoreclosing%20Report%20Final.pdf)

<sup>5</sup> Since the report, the term Special Protection System (SPS) has been replaced by the term Remedial Action Scheme (RAS).

- The subcommittees' report presents a similar case in which Automatic Reclosing issues a close signal under conditions other than those for which it is designed. The subcommittees saw the same problem as described above, namely, potential instability and damage to generating units. The maintenance conditions described above apply here as well.
- No other analyzed case of misoperation prompted further PRC-005 requirements.

For these reasons, the Coordinator finds that Automatic Reclosing maintenance under the conditions specified in the standard is applicable for the Québec Interconnection area.

#### *1.1.2. Sudden Pressure Relaying*

In Order No. 758,<sup>1</sup> FERC asked NERC to assess for subsequent versions any Component that detects a quantity requiring an action or initiating a control action (e.g., initial tripping, reclosing or locking), and affecting BES reliability. FERC therefore ordered NERC to modify the standard to include any Component or device that is designed to detect a line or equipment fault or any other abnormal or hazardous condition on the power system and that initiates appropriate control circuitry action.

NERC addressed FERC's concerns, including protective relays that do not respond to electrical quantities. It tasked its System Protection and Control Subcommittee with identifying and analyzing all equipment on the IEEE list that responds to non-electrical quantities.<sup>6</sup> The NERC subcommittee classified that equipment into three categories:<sup>7</sup>

1. Protective devices that initiate actions to clear faults or mitigate abnormal system conditions so as to support BES reliability
2. Protective devices that initiate action for an abnormal equipment condition<sup>8</sup> for purposes other than supporting BES reliability, and
3. Protective devices that monitor equipment health and provide advisory information regarding that equipment.

Only the first category addresses BES reliability and must be included in maintenance requirements.

Having analyzing all equipment on the IEEE list, the subcommittee included Sudden Pressure Relaying<sup>9</sup> in PRC-005 when it is used to clear a fault or mitigate abnormal system conditions on a BES element and thus supports reliable BES operation. All other devices were removed from the maintenance requirements because they do not support BES reliability. NERC approved these recommendations by the technical subcommittee.

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<sup>6</sup> NERC, System Protection and Control Subcommittee, SPCS Input for Standard Development in Response to FERC Order No.758, Sudden Pressure Relays and Other Devices that Respond to Non-Electrical Quantities, accessed on August 8, 2018, on the website: [https://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%202020/SPCS\\_Order%20758%20Sudden%20Pressure%20Report\\_Final.pdf#page=13](https://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%202020/SPCS_Order%20758%20Sudden%20Pressure%20Report_Final.pdf#page=13)

<sup>7</sup> Ibid. p. 7.

<sup>8</sup> Device that acts to protect equipment from mechanical or thermal damage.

<sup>9</sup> Sudden Pressure Relaying trips following a change in gas or oil pressure inside such equipment as transformers and reactors and thus responds to a mechanical quantity. The types of faults detected by Sudden Pressure Relaying are not normally seen by conventional protective relays (overcurrent or differential current relays). They may be low-current faults (impossible for overcurrent or differential current relays to detect) or other unusual events such as defective joints, oil loss due to a leak, core hot spots due to short circuits through insulation, etc. Such faults are internal equipment faults that, if left undetected, may lead to considerable damage to the equipment.

All Sudden Pressure Relaying that fits the first category is included in PRC-005-6, regardless of level of protection. It is included even if Sudden Pressure Relaying represents third-level protection and even if the differential relay primary and secondary protections can act and isolate a transformer on a fault.

The NERC technical subcommittee also studied the maintenance interval required for Sudden Pressure Relaying. It studied industry maintenance and testing practices and conducted an informal industry survey. To validate its method and the results, the subcommittee contacted the following organizations: the IEEE<sup>10</sup> Power System Relaying Committee, the NATF<sup>10</sup> System Protection Practices Group and the EPRI<sup>10</sup> Generator Owner/Operator Technical Focus Group. The three organizations indicated that the survey results were consistent with their respective experiences. Based on the survey, the subcommittee recommended a maximum maintenance interval of six years.<sup>11</sup>

The Coordinator considers it relevant to add Sudden Pressure Relaying, which acts to clear a fault on an RTP element. The Coordinator therefore asked the entities concerned to comment on the impact of Sudden Pressure Relaying maintenance, especially regarding the maintenance interval proposed by NERC and adopted by FERC. The Coordinator also solicited comments on the use and function of Sudden Pressure Relaying in their facilities.

### ***1.2. Dispersed Power Producing Resources***

Subsequent to FERC Order No. 743, NERC revised the definition of Bulk Electric System (BES).<sup>12</sup> FERC asked that all facilities necessary for operation of interconnected transmission systems be included and all necessary clarifications be made to preclude ambiguity. NERC therefore added a list of inclusions and exclusions. Inclusion I4 of the BES definition in the NERC Glossary of Terms for Dispersed Power Producing Resources modified the applicability of some standards, including PRC-005. Inclusion I4 makes it possible to specify the Protection Systems and Sudden Pressure Relaying covered in the case of Dispersed Power Producing Resources.<sup>13</sup> The Components covered are those serving to aggregate distributed generation between the point where such generation aggregates to exceed 75 MVA and the common point of connection at 100 kV or higher. For Québec, the Québec Appendix specifies that it is point b) in the proposed definition that applies for maintenance of these elements (see the definition in Section 3.2 below).

The scope broadened to the RTP now encompasses Dispersed Power Producing Resources, previously excluded from PRC-005. The Coordinator asked the entities concerned to comment on the impact and relevance of application of the standard.

### ***1.3. Replacing the term Special Protection System (SPS) by the term Remedial Action Scheme (RAS)***

With FERC's adoption of the term Remedial Action Scheme (RAS), use of the term Special Protection System (SPS) became outdated and had to be revised in the applicable standards. The term SPS was therefore replaced by the term RAS in PRC-005-6. In using the term SPS, NPCC defined three classes: SPS Type I, SPS Type II and SPS Type III. These subclasses no longer exist with the current term RAS.

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<sup>10</sup> IEEE: Institute of Electrical and Electronics Engineers, NATIF: North American Transmission Forum, EPRI: Electric Power Research Institute.

<sup>11</sup> System Protection and Control Subcommittee, op.cit., p. 4.

<sup>12</sup> FERC Order No. 743, accessed on August 9, 2018, on the website: <https://www.ferc.gov/whats-new/comm-meet/2014/032014/E-7.pdf>

<sup>13</sup> NERC Glossary of Terms Used in NERC Reliability Standards, accessed on August 9, 2018 on the website: [https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary\\_of\\_Terms.pdf](https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf)

When applying PRC-005 version 2, the maintenance of Protection Systems installed as SPSS concerned Type I and Type II, meaning that Type III SPSS were excluded. Version 6 of the standard now covers Type III SPSS because they are part of the Protection Systems included in the definition of Remedial Action Scheme (RAS).

This definition has already been adopted by the Régie and is included in the glossary of terms. The Coordinator finds that the term Remedial Action Scheme (RAS) clarifies the protection systems to be included for the reliability of the Québec Interconnection grid and must be implemented in Québec within the applicable standards.

## 2. PREREQUISITES TO ADOPTION

The proposed definition of Dispersed Power Producing Resources and the changes in the terms Bulk Electric System (BES) and Protection System Maintenance Program (PSMP) must be adopted at the same time as the standard.

## 3. MODIFICATIONS TO OTHER STANDARDS OR TO GLOSSARY DEFINITIONS

### 3.1. Standards or requirements to retire on the effective date

PRC-005-2 must be retired the day before PRC-005-6 comes into effect.<sup>14</sup> No standard must be modified upon adoption of version 6 of PRC-005.

### 3.2. New definitions to add to glossary

To make the standard applicable to Dispersed Power Producing Resources, the Coordinator proposes adding this specific term to the glossary. The definition is transposed from *Méthodologie pour la détermination des éléments du réseau de transport principal de l'Interconnexion du Québec* [methodology for determining main transmission system elements of the Québec Interconnection].<sup>15</sup>

Term	Acronym	Definition
<b>Dispersed Power Producing Resources</b>		<p>Dispersed Power Producing Resources are small-scale power generation technologies using a system designed primarily for aggregating capacity providing an alternative to, or an enhancement of, the traditional electric power system. Examples include but are not limited to: solar, geothermal, energy storage, flywheels, wind, micro-turbines, and fuel cells.</p> <p>When a generating facility included in the RTP is made up of Dispersed Power Producing Resources that are connected through a system designed primarily for delivering such capacity to a common point of connection, the facilities designated as being part of the RTP are:</p> <ul style="list-style-type: none"> <li>a) the individual power producing resources, and</li> <li>b) the system designed primarily for delivering such capacity</li> </ul>

<sup>14</sup> NERC, Implementation Plan, accessed on August 9, on the website:

[https://www.nerc.com/pa/Stand/Project%20201505%20PRC005%20Order%20No%20803%20Directives%20DL/PRC-005-6 Implementation Plan Combining 3 4 5 6 2015May27 v2.pdf](https://www.nerc.com/pa/Stand/Project%20201505%20PRC005%20Order%20No%20803%20Directives%20DL/PRC-005-6%20Implementation%20Plan%20Combining%203%204%205%206%202015May27%20v2.pdf)

<sup>15</sup> This methodology was filed as part of [Application R-3952-2015](#).

Term	Acronym	Definition
		<p>from the point where those resources aggregate to greater than 75 MVA to a common point of connection for a generating facility having a nominal capacity above 75 MVA, or</p> <p>the system designed primarily for delivering such capacity from the point where those resources aggregate to reach or exceed 50 MVA to a common point of connection for a generating facility having a nominal capacity of 50 MVA or above and 75 MVA or less.</p> <p><b>(Dispersed Power Producing Resources)</b></p> <p>Source: Méthodologie pour la détermination des éléments du réseau de transport principal de l'Interconnexion du Québec [methodology for determining main transmission system elements of the Québec Interconnection]</p>

### 3.3. Definitions to be modified in the glossary

The definition of BES must be modified to ensure that NERC standards can be interpreted consistently. For example, the definition is needed to understand the reference to Inclusion I4 in the Applicability section of NERC standards.

Modification of the term PSMP is planned through implementation of the NERC standard.

The Coordinator proposes clarifying the English definition of the term Protection System under the third bullet. It is the supply that is DC (direct current), not the substation. Similarly, it is the supply that is associated with protection functions.

Term	Acronym	Definition
<b>Bulk Electric System</b>	<b>BES</b>	<p><u>New definition</u></p> <p>All Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources connected at 100 kV or higher, subject to the inclusions and exclusions below. This does not include facilities used in the local distribution of electric energy.</p> <p><b>Inclusions</b></p> <ul style="list-style-type: none"> <li>• <b>I1:</b> Transformers with the primary terminal and at least one secondary terminal operated at 100 kV or higher unless excluded by application of Exclusion E1 or E3.</li> <li>• <b>I2:</b> One or several generating resource(s), including the generator terminals through the high-side of the step-up transformer(s) connected at a voltage of 100 kV or above, including: <ul style="list-style-type: none"> <li>a) gross individual nameplate rating greater than 20 MVA, or</li> <li>b) gross station nameplate rating greater than 75 MVA.</li> </ul> </li> <li>• <b>I3:</b> Blackstart Resources identified in the Transmission Operator's restoration plan.</li> <li>• <b>I4:</b> Dispersed Power Producing Resources that aggregate a total</li> </ul>

Term	Acronym	Definition
		<p>capacity greater than 75 MVA (gross nameplate rating) and are connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage of 100 kV or above.</p> <p>Consequently, the facilities designated as part of the BES are</p> <p>a) each individual resource, and</p> <p>b) the system designed primarily for delivering capacity from the point where those resources aggregate to greater than 75 MVA to a common point of connection at a voltage of 100 kV or above.</p> <ul style="list-style-type: none"> <li>• <b>I5:</b> Static or dynamic devices (excluding generators) dedicated to supplying or absorbing Reactive Power and connected at 100 kV or higher, through a dedicated transformer with a high-side voltage of 100 kV or higher, or through a transformer that is designated in Inclusion I1, unless excluded by application of Exclusion E4.</li> </ul> <p><b>Exclusions:</b></p> <ul style="list-style-type: none"> <li>• <b>E1:</b> Radial systems: A group of contiguous Transmission Elements that emanates from a single point of connection at a voltage of 100 kV or higher, and <ul style="list-style-type: none"> <li>a) serves only to supply Load, or</li> <li>b) includes only generation resources not covered by Inclusion I2, I3 or I4, with an aggregate capacity less than or equal to 75 MVA (gross nameplate rating), or</li> <li>c) serves to supply Load and includes generation resources not identified in Inclusion I2, I3 or I4, with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).</li> </ul> </li> </ul> <p>Note 1: The presence of a normally open switching device between radial systems, as depicted on plans or single-line diagrams for example, does not affect this exclusion.</p> <p>Note 2: The presence of a contiguous loop, operated at a voltage level of 50 kV or less, between configurations considered as radial systems does not affect this exclusion.</p> <ul style="list-style-type: none"> <li>• <b>E2:</b> A generating unit or multiple generating units connected on the customer's side of the retail meter that serve all or part of the retail Load with electric energy, providing that (i) the net capacity provided to the BES does not exceed 75 MVA, and (ii) standby, back-up and maintenance power services are provided to the generating unit or multiple generating units or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a Generator Owner or Generator Operator, or under terms approved by the applicable regulatory authority.</li> <li>• <b>E3:</b> Local network (LN): a group of contiguous Transmission Elements operated at less than 300 kV that distributes power to Load rather than transfer bulk power across interconnected systems. An LN is supplied from multiple points of connection at 100 kV or higher to improve the quality of service to retail customers, not to accommodate bulk power transfer across interconnected systems.</li> </ul>

Term	Acronym	Definition
		<p>The local network is characterized by all of the following:</p> <ul style="list-style-type: none"> <li>a) limits on connected generation: the local network and its Elements do not include generation resources identified in Inclusion I2, I3, or I4, and its aggregate non-retail generation capacity is not greater than 75 MVA (gross nameplate rating),</li> <li>b) Real Power flows only into the LN, which does not transfer energy originating outside the LN for delivery through the LN, and</li> <li>c) It is not part of a Flowgate or transfer path: the local network does not contain any part of a permanent Flowgate in the Eastern Interconnection, a major transfer path within the Western Interconnection, or a comparable monitored Facility in the ERCOT or Québec Interconnections, and it is not a monitored Facility included in an Interconnection Reliability Operating Limit (IROL).</li> </ul> <ul style="list-style-type: none"> <li>• <b>E4:</b> Reactive power devices installed for the sole benefit of one or more retail customer(s).</li> </ul> <p>Note: Elements may be included or excluded on a case-by-case basis through the Rules of Procedure exception process.</p> <p><u>Former definition</u></p> <p>As defined by the Regional Reliability Organization (RRO), the electrical generation resources, transmission lines, interconnections with neighboring systems and associated equipment, generally operated at 100 kV or higher. Radial transmission facilities serving only load with one transmission source are generally not included in this definition.</p> <p><b>(Bulk Electric System)</b></p> <p>Source: Glossary of Terms Used in NERC Reliability Standards</p>
<b>Protection System Maintenance Program</b>	<b>PSMP</b>	<p><u>New definition</u></p> <p>An ongoing program by which Protection System, Automatic Reclosing, and Sudden Pressure Relaying Components are kept in working order, and proper operation of malfunctioning Components is restored. A maintenance program for a specific Component includes one or more of the following activities:</p> <p>Verify – Determine that the Component is functioning correctly.</p> <p>Monitor – Observe the routine in-service operation of the Component.</p> <p>Test – Apply signals to a Component to observe functional performance or output behavior or to diagnose problems.</p> <p>Inspect – Examine for signs of Component failure, reduced performance or degradation.</p> <p>Calibrate – Adjust the operating threshold or measurement accuracy of a measuring element to meet the intended performance requirement.</p> <p><u>Former definition</u></p>



Term	Acronym	Definition
		<p>An ongoing program by which Protection System Components are kept in working order, and proper operation of malfunctioning Components is restored. A maintenance program for a specific Component includes one or more of the following activities:</p> <p>Verify – Determine that the Component is functioning correctly.</p> <p>Monitor – Observe the routine in-service operation of the Component.</p> <p>Test – Apply signals to a Component to observe functional performance or output behavior or to diagnose problems.</p> <p>Inspect – Examine for signs of Component failure, reduced performance or degradation.</p> <p>Calibrate – Adjust the operating threshold or measurement accuracy of a measuring element to meet the intended performance requirement.</p> <p><b>(Protection System Maintenance Program)</b></p> <p>Source: Glossary of Terms Used in NERC Reliability Standards</p>
Protection System		<p><u>New definition</u></p> <p>Protection System</p> <ul style="list-style-type: none"> <li>• Protective relays that respond to electrical quantities.</li> <li>• Communication systems necessary for proper operation of protective functions.</li> <li>• Voltage and current sensing devices providing inputs to protective relays.</li> <li>• Station DC supply associated with protective functions (including station batteries, battery chargers and non-battery-based DC supply).</li> <li>• Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.</li> </ul> <p><u>Former definition</u></p> <p>Protection System</p> <ul style="list-style-type: none"> <li>• Protective relays that respond to electrical quantities.</li> <li>• Communication systems necessary for proper operation of protective functions.</li> <li>• Voltage and current sensing devices providing inputs to protective relays</li> <li>• Station DC supply associated with protective functions (including station batteries, battery chargers and non-battery-based DC supply).</li> <li>• Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.</li> </ul> <p><b>(Protection System)</b></p> <p>Source: Glossary of Terms Used in NERC Reliability Standards</p>
SPS Type I		<p><u>New definition</u></p>

Term	Acronym	Definition
		<p>See definition of Remedial Action Scheme.</p> <p><u>Former definition</u></p> <p>A Special Protection System that recognizes or anticipates abnormal system conditions resulting from design and operating criteria contingencies, and whose misoperation or failure to operate would have a significant adverse impact outside of the local area. The corrective actions taken by the Special Protection System, along with the actions taken by other protection systems, are intended to return power system parameters to a stable, recoverable state.</p> <p><b>(SPS Type I)</b></p> <p>Source: NPCC Directory D7, Special Protection Systems</p>
SPS Type II		<p><u>New definition</u></p> <p>See definition of Remedial Action Scheme.</p> <p><u>Former definition</u></p> <p>A Special Protection System that recognizes or anticipates abnormal system conditions resulting from extreme contingencies or other extreme causes, and whose misoperation or failure to operate would have a significant adverse impact outside of the local area.</p> <p><b>(SPS Type II)</b></p> <p>Source: NPCC Directory D7, Special Protection Systems</p>

#### 4. APPLICABILITY

Functions covered:

- Transmission Owner (TO)
- Generator Owner (GO)
- Distribution Provider (DP)

#### 5. SPECIFIC PROVISIONS FOR QUÉBEC

PRC-005-6 applies only to the facilities of the Main Transmission System (RTP) and the functions covered as identified in the Register of Entities Subject to Reliability Standards in Québec (the Register).

#### 6. EFFECTIVE AND IMPLEMENTATION DATES OF THE STANDARD

Firstly, regarding maintenance of the Protection Systems adopted by the current PRC-005-2, the Coordinator proposes that the implementation dates remain the same given that the scope of the standard is maintained (*BPS*).

IMPLEMENTATION PLAN FOR STANDARD PRC-005-6<sup>16</sup>

Requirements	Implementation date in the United States	Implementation date in Québec
R1, R2 and R5	April 1, 2015	January 1, 2017
R3 and R4	see table below	see table below

Maximum Maintenance Interval (tables 1 to 3)	Applicability	Implementation date in the United States	Implementation date in Québec
≤1 year	100% maintenance required	October 1, 2015	January 1, 2017
1 year to 2 years	100% maintenance required	April 1, 2017	April 1, 2017
Up to 3 years	30% maintenance required	April 1, 2016	April 1, 2017
	60% maintenance required	April 1, 2017	April 1, 2017
	100% maintenance required	April 1, 2018	April 1, 2018
Up to 6 years	30% maintenance required	April 1, 2017	April 1, 2017
	60% maintenance required	April 1, 2019	April 1, 2019
	100% maintenance required	April 1, 2021	April 1, 2021
Up to 12 years	30% maintenance required	April 1, 2019	April 1, 2019
	60% maintenance required	April 1, 2023	April 1, 2023
	100% maintenance required	April 1, 2027	April 1, 2027

The Coordinator proposes January 1, 2019, as the effective date for PRC-005-6 and its Appendix in Québec.<sup>17</sup>

As concerns the United States, the implementation date for PRC-005-6 Requirements R1, R2 and R5 is January 1, 2016, while the implementation dates for Requirements R3 and R4, dealing with implementation of the maintenance program required for each Component type, vary with the

<sup>16</sup> NERC, Implementation Plan, accessed on August 10, 2018 on the website:

[https://www.nerc.com/pa/Stand/Project%20201505%20PRC005%20Order%20No%20803%20Directives%20DL/PRC-005-6 Implementation Plan Combining 3 4 5 6 2015May27 v2.pdf](https://www.nerc.com/pa/Stand/Project%20201505%20PRC005%20Order%20No%20803%20Directives%20DL/PRC-005-6%20Implementation%20Plan%20Combining%203%204%205%206%202015May27%20v2.pdf)

<sup>17</sup> If the Régie adopts the standard later than the proposed date, the Coordinator requests a minimum of 60 days between the date of adoption and the effective date of those standards, taking into account also the effective date on the first day of one of the four quarters of a calendar year, as authorized by Régie decisions [D-2015-168](#) and [D-2016-011](#).

maximum maintenance interval for each type. The Coordinator notes that this standard is already in effect in neighboring jurisdictions.

In Québec, the Coordinator proposes progressive implementation for the new elements covered by the new version 6, i.e., Automatic Reclosing, Sudden Pressure Relaying and Protection Systems that are installed as a Remedial Action Scheme (RAS), but did not fit the definition of SPS, and Dispersed Power Producing Resources, including equipment now covered owing to the broadened scope of the RTP (including the BPS). The requirements apply to the equipment covered in accordance with the implementation schedule below.

Requirements	Implementation date in the United States	Implementation date in Québec
R1, R2 and R5	January 1, 2016	January 1, 2020
R3 and R4	see table below	see table below

Maximum Maintenance Interval (tables 1 to 5 in Québec and 4 to 5 in the US)	Applicability	Implementation date in the United States	Implementation date in Québec
≤1 year	100% maintenance required	N/A	January 1, 2021
1 year to 2 years	100% maintenance required	N/A	April 1, 2021
Up to 3 years	30% maintenance required	N/A	April 1, 2021
	60% maintenance required	N/A	April 1, 2022
	100% maintenance required	N/A	April 1, 2023
Up to 6 years	30% maintenance required	January 1, 2019	January 1, 2022
	60% maintenance required	January 1, 2021	January 1, 2024
	100% maintenance required	January 1, 2023	January 1, 2026
Up to 12 years	30% maintenance required	January 1, 2021	January 1, 2025
	60% maintenance required	April 1, 2025	January 1, 2028
	100% maintenance required	April 1, 2029	January 1, 2032

There is a four-year difference in implementation dates in the United States and Québec because the broader scope of version 6 in the United States is concerned only with Automatic Reclosing, Sudden Pressure Relaying and Dispersed Power Producing Resources, whereas in Québec the broader scope of version 6 encompasses the RTP as well.

These implementation dates apply only for the time-based maintenance method. Attachment A of the standard sets the objectives for performance-based maintenance.

## 7. PRELIMINARY IMPACT ASSESSMENT

	Low	Moderate	High
Implementation of the standard			X
Enforcement of the standard			X
Compliance monitoring			X

### *Definitions*

**Low:** Normal industry practice that requires only minor adjustments to existing processes or practices.

**Moderate:** Change that requires the allocation of some physical, human or financial resources to implement, enforce and monitor compliance with the proposed standard.

**High:** Change that requires the allocation of significant physical, human or financial resources to plan, implement, enforce and monitor compliance with the proposed standard.

## 8. FINAL IMPACT ASSESSMENT

This section shall be completed upon receipt of the impact assessment forms and at the conclusion of the consultation process prior to filing the reliability standards with the Régie de l'énergie.