

**Annexe Québec de la norme PRC-024-2 en  
suivi des modifications  
(version anglaise)**



## Appendix PRC-024-2-QC-1

### Specific provisions applicable in Québec for standard PRC-024-2 – Generator Frequency and Voltage Protective Relay Settings

This appendix establishes specific provisions for the application of the standard in Québec. Provisions of the standard and of this appendix must be read jointly for comprehension and interpretation purposes. Where the standard and appendix differ, the appendix shall prevail.

#### A. Introduction

1. **Title:** No specific provisions.
2. **Number:** No specific provisions.
3. **Purpose:** No specific provisions.
4. **Applicability:**

##### 4.1. Functional Entities

No specific provisions in regard to applicable entities.

##### 4.2. Facilities

The Facilities subject to this Standard are the Facilities of the Main Transmission System (RTP).

#### 5. Effective date:

- 5.1. Adoption of the standard by the Régie de l'énergie: December 11, 2020
- 5.2. Adoption of this appendix by the Régie de l'énergie: December 11, 2020
- 5.3. Effective date of the standard and of this appendix in Québec: April 1, 2021

For Facilities already subject to PRC-024-1, the requirements will be implemented on the following dates:

Requirements	Applicability	Implementation date in Québec
R1 to R4	At least 40% of its Facilities covered	October 1, 2018
	At least 60% of its Facilities covered	October 1, 2019
	At least 80% of its Facilities covered	October 1, 2020
	100% of its Facilities covered	October 1, 2021

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For Facilities newly subject to PRC-024-2, the requirements will be implemented on the following dates:

Requirements	Applicability	Implementation date in Québec
R1 to R4	At least 40% of its Facilities covered	July 1, 2022
	At least 60% of its Facilities covered	July 1, 2023
	At least 80% of its Facilities covered	July 1, 2024
	100% of its Facilities covered	July 1, 2025

#### B. Requirements

##### Specific provision regarding Requirement R1:

Wind, thermal and photovoltaic generating stations, as well as stations equipped with asynchronous generators, shall adhere to the curves in Appendix 1, as specified by Requirement R1, except that they may be tripped at a frequency of  $\geq 61.7$  Hz.

##### Specific provisions regarding Requirement R2:

For Main Transmission System (RTP) generating facilities (including step-up transformers) connected to the RTP, references to “PRC-024 Attachment 2” are replaced by “Attachment 2 of the Québec Appendix to PRC-024-2”.

For Main Transmission System (RTP) generating facilities (including step-up transformers) not connected to the RTP, references to “PRC-024 Attachment 2” are replaced by “Attachment 3 of the Québec Appendix to PRC-024-2”.

Replace “PRC-024 Attachment 2” with “PRC-024-2-QC-1 Appendix 2” except for Generation facilities for industrial use which can replace “PRC-024 Attachment 2” with “PRC-024-2-QC-1 Appendix 3”.

Replace the first exception to Requirement R2 with the following: “A generating unit may be tripped in accordance with a Remedial Action Scheme (RAS).”

#### C. Measures

No specific provisions.

#### D. Compliance

##### 1. Compliance Monitoring Process

###### 1.1. Compliance Enforcement Authority

In Québec, “Compliance Enforcement Authority” means the Régie de l’énergie in its roles of monitoring and enforcing compliance with respect to the Reliability Standard and to this appendix.

###### 1.2. Data Retention

No specific provisions.

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#### 1.3. Compliance Monitoring and Assessment Processes

The Régie de l'énergie establishes the monitoring processes used to evaluate data or information for the purpose of determining compliance or non-compliance with the Reliability Standard and with this appendix.

#### 1.4. Additional Compliance Information

No specific provisions.

#### 2. Violation Severity Levels

No specific provisions.

#### E. Regional Variances

No specific provisions.

#### F. Associated Documents

No specific provisions.

#### G. References

No specific provisions.

#### PRC-024-2 — Attachment 1

No specific provisions.

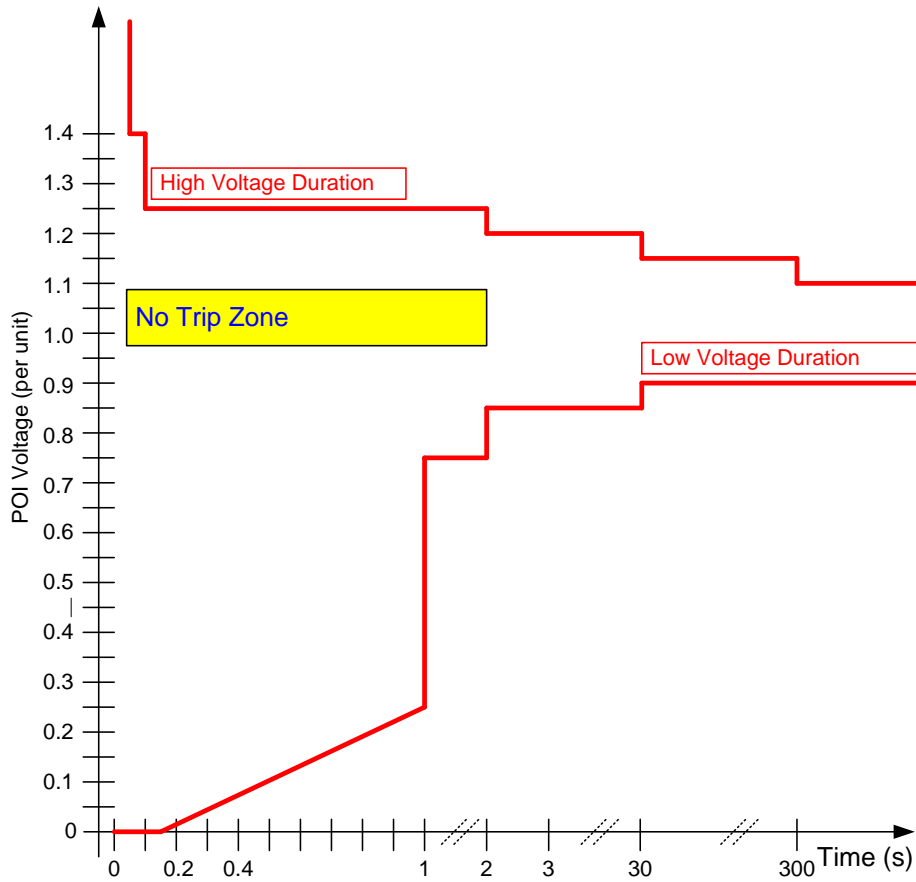
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#### PRC-024-2 — Attachment 2

Replace the curve and table with the following:

Voltage Ride-Through Time Duration Curve at Québec



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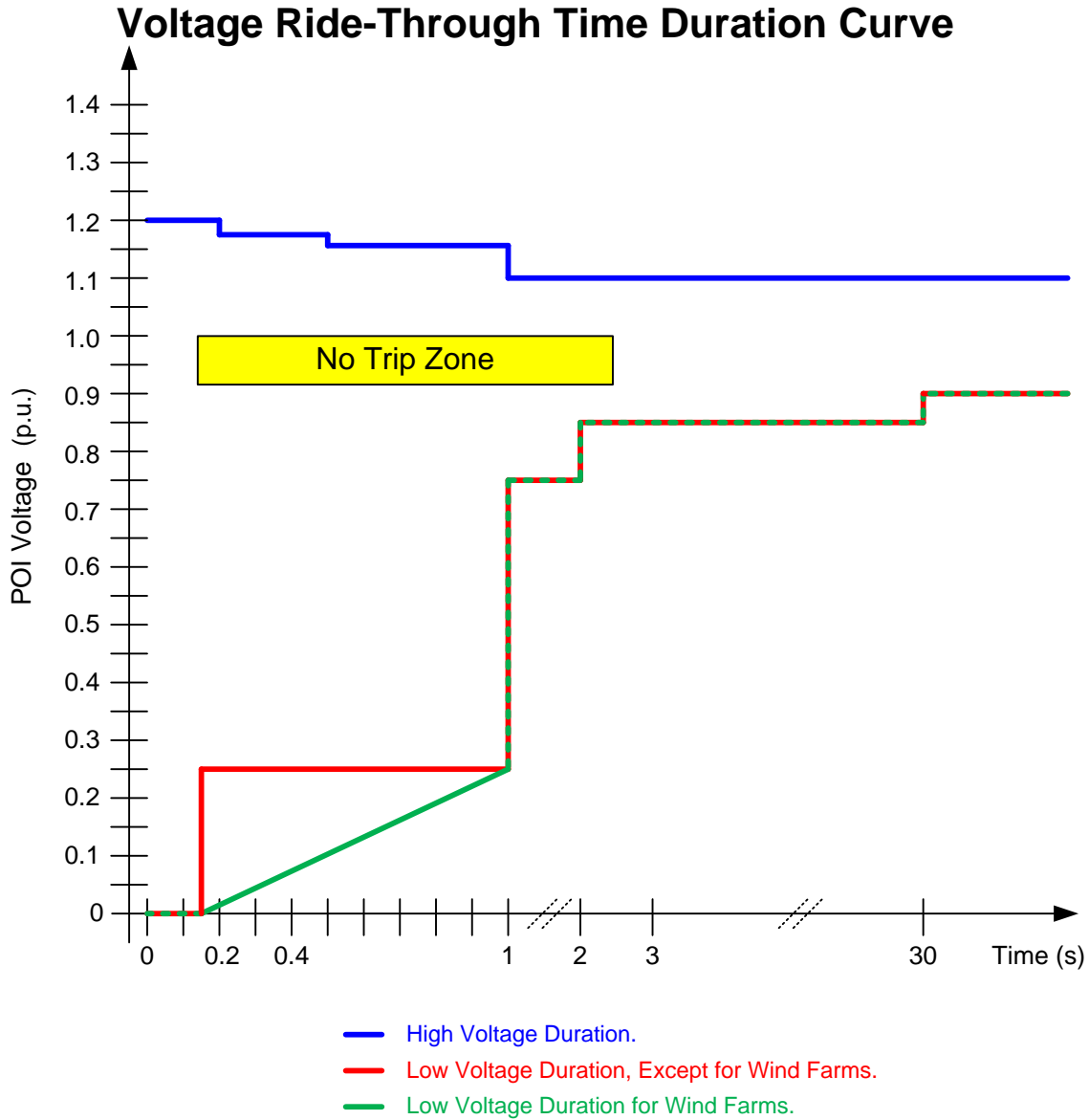
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#### Ride-Through Duration

<u>High Voltage Ride Through Duration</u>		<u>Low Voltage Ride Through Duration</u>	
<u>Voltage (pu)</u>	<u>Duration (sec)</u>	<u>Voltage (pu)</u>	<u>Duration (sec)</u>
<u>&gt;1.4</u>	<u>0.033</u>	<u>.9 &lt; V &lt; 1.10</u>	<u>Permanent</u>
<u>1.25 &lt; V &lt; 1.40 (note 2)</u>	<u>0.10</u>	<u>.85 &lt; V &lt; .9</u>	<u>30</u>
<u>1.20 &lt; V &lt; 1.25</u>	<u>2.0</u>	<u>.75 &lt; V &lt; .85</u>	<u>2.0</u>
<u>1.15 &lt; V &lt; 1.20</u>	<u>30</u>	<u>.25 &lt; V &lt; .75</u>	<u>1.0</u>
<u>1.10 &lt; V &lt; 1.15</u>	<u>300</u>	<u>0 &lt; V &lt; .25 (note 1)</u>	<u>0.15</u>
<p><b>Note 1.</b> For the voltage range between 0 and .25 pu, wind farms should respect the minimal duration calculated as following : <math>D = 3,4V + 0,15</math>, where D is the duration in second and V is the voltage in pu.</p> <p><b>Note 2.</b> Facilities that use power electronics must remain operational throughout the entire voltage range except for voltage level greater than 1.25 pu where temporary blocking is allowed.</p>			
<u>Voltage (pu)</u>	<u>Time (sec)</u>	<u>Voltage (pu)</u>	<u>Time (sec)</u>
<u>&gt;1.4</u>	<u>0.033</u>	<u>0.9 ≤ V ≤ 1.10</u>	<u>permanent</u>
<u>1.25 &lt; V ≤ 1.40 (Note 1)</u>	<u>0.10</u>	<u>0.85 ≤ V &lt; 0.9</u>	<u>30</u>
<u>1.20 &lt; V ≤ 1.25</u>	<u>2.0</u>	<u>0.75 ≤ V &lt; 0.85</u>	<u>2.0</u>
<u>1.15 &lt; V ≤ 1.20</u>	<u>30.0</u>	<u>0.25 ≤ V &lt; 0.75</u>	<u>1.0</u>
<u>1.10 &lt; V ≤ 1.15</u>	<u>300</u>	<u>0 ≤ V &lt; 0.25 (Note 2)</u>	<u>0.15</u>
<p><b>Note 1.</b> Temporary blocking is allowed, after a 0.022 sec delay, when the positive-sequence voltage exceeds 1.25 pu. However, normal operation must resume once the voltage drops back below the 1.25 pu threshold.</p> <p><b>Note 2.</b> For voltage levels between 0 and 0.25 pu, wind farms must observe the minimum duration calculated with the formula <math>D = 3.4 V + 0.15</math>, where D is minimum duration and V is voltage in pu.</p>			

Specific provisions applicable in Québec for standard  
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PRC-024-1.2 — Attachment 3





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#### Ride Through Duration :

High Voltage Ride Through Duration		Low Voltage Ride Through Duration	
Voltage (pu)	Duration (sec)	Voltage (pu)	Duration (sec)
$\geq 1,200$	Instantaneous trip	$.9 \leq V \leq 1.10$	Permanent
$\geq 1,175$	0,2	$.85 \leq V < .9$	30
$\geq 1,15$	0,5	$.75 \leq V < .85$	2.0
$\geq 1,10$	1,00	$.25 \leq V < .75$	1.0
		$0 \leq V < .25$ (note 1)	0.15

**Note 1.** For the voltage range between 0 and .25 pu, wind farms should respect the minimal duration calculated as following:  $D = 3,4V + 0,15$ , where D is the duration in second and V is the voltage in pu.

#### Rationale

No specific provisions.

#### Version history

Version	Date	Action	Change tracking
1	December 11, 2020	New appendix	New
<u>2</u>	<u>March 12, 2021</u>	<u>Curves and tables of appendices 2 and 3 are replaced by the same appendices of PRC-024-1 Québec Appendix.</u>	<u>Modifications per decision D-2021-027</u>