
Project QC-2019-01

PRC-026-1 – Relay Performance During Stable Power Swings

1. ASSESSMENT OF RELEVANCE

On August 14, 2003, cascading failures caused a widespread power interruption affecting the northeast of the United States and Canada, resulting in tremendous damage in many regions of northeastern North America.

A few months after that extensive outage, the joint U.S.-Canada Power System Outage Task Force was struck to mitigate the risks of power outages in the future. The report of that commission of inquiry into the causes of the outage states that the blackout could have been prevented and that immediate actions must be taken in the United States and Canada to restore the reliability of the electric power system.¹

The Task Force report explained, among other things, how cascading during the event progressed owing to unwanted tripping of the protective relays.² Those relays failed to distinguish between dynamic but stable power swings and actual faults.

Pursuant to FERC Order No. 733,³ NERC developed PRC-026-1, a standard intended to make load-responsive protective relays unlikely to operate in response to stable power swings. In other words, the objective of PRC-026-1 is to ensure that the protective relay systems used by registered Entities can distinguish between Faults and stable power swings and to further ensure that remedial actions can prevent unwanted cascading of the Elements of the Bulk Electric System (BES) in response to stable power swings.

The Reliability Coordinator filed PRC-026-1 for adoption in Application R-3997-2016, and the Régie adopted PRC-026-1 in Decision D-2017-076.⁴ Although this reliability standard applies only to the Facilities of the Main Transmission System (RTP) connected to the RTP, the Régie suspended application of Requirements R2, R3 and R4 for RTP and non-BPS Facilities connected to the RTP in order to limit their application to BPS Facilities only. In that same Order, the Régie asked the Coordinator to resubmit PRC-026-1 for adoption with fuller justification for its scope of application. The Coordinator notes in this regard that PRC-026-1 Requirement R1 calls for the Planning Coordinator (PC) to designate the Facilities that will be subject to Requirements R2, R3 and R4 and to define the criteria for identifying the covered Facilities, thus ensuring that applicability of R2, R3 and R4 is confined to the relevant Facilities.

In light of the follow-up letter regarding Régie Decision D-2017-076 on PRC-026-1,⁵ the PC had to expand on the identification prescribed by Requirement R1 in order to identify the covered RTP

¹ Final Report on the August 14, 2003 Blackout in the United States and Canada, consulted online on February 8, 2019, at: <https://www3.epa.gov/region1/npdes/merrimackstation/pdfs/ar/AR-1165.pdf>

² Final Report on the Implementation of Task Force Recommendations, consulted online on February 8, 2019, at: <https://www.rncan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/eneene/pdf/outpan-eng.pdf>

³ FERC Order No. 733, consulted online on February 8, 2019, at: <https://www.ferc.gov/whats-new/comm-meet/2010/031810/E-5.pdf?csrt=9836499532932767813>

⁴ Application R-3997-2016, Decision [D-2017-076](#).

⁵ [Lettre de suivi](#) [follow-up letter] re Decision D-2017-076 on PRC-026-1.

facilities connected to the RTP before the start of 2019. After detailed study of the matter, the PC did in fact communicate the identifications of the covered Facilities to the Coordinator, who in turn reviewed them. The Coordinator notes, for one, that the list of identified Facilities includes a significant number of non-BPS RTP Facilities connected to the RTP, i.e., close to 140 generators.

The data provided by the PC must remain confidential given that the study using this methodology and the resulting list of Facilities are owned by the PC, namely HQT, not the Coordinator. Consequently, the Coordinator is not considering any filing that involves this confidential data.

In order for PRC-026-1 Requirements R2, R3 and R4 to be applicable solely to the relevant covered Facilities identified by the PC, as prescribed in Requirement R1, it is the opinion of the Coordinator that the Régie's present suspension of the application of Requirements R2, R3 and R4 to non-BPS RTP Facilities connected to the RTP must be lifted.

2. PREREQUISITES TO ADOPTION

None.

3. MODIFICATIONS TO OTHER STANDARDS OR TO GLOSSARY DEFINITIONS

None.

3.1. Standards or requirements to retire on the effective date

None.

3.2. New definitions to add to the glossary

None.

3.3 Definitions to modify in the glossary

None.

3.4 Definitions to remove from the glossary

None.

4. APPLICABILITY

Requirements	Functions covered		
	Planning Coordinator (PC)	Transmission Owner (TO) ⁶	Generator Owner (GO) ⁷
R1	x		
R2		X	X
R3		X	X
R4		X	X

5. SPECIFIC PROVISIONS FOR QUÉBEC

Although PRC-026-1 is currently in force in Québec, it applies only to RTP Facilities connected to the RTP.⁸ At this point, the Coordinator does not deem it relevant to extend application of this standard to RTP Facilities not connected to the RTP.

6. PROPOSED EFFECTIVE DATES

PRC-026-1 is already in force in Québec. However, the application of Requirements R2, R3 and R4 is suspended for non-BPS RTP Facilities connected to the RTP. In seeking to lift the present suspension, the Coordinator proposes that Requirements R2, R3 and R4 take effect on the date indicated below for non-BPS RTP Facilities connected to the RTP and identified by the PC under PRC-026-1 Requirement R1.

Standard	Requirements	Effective date in the U.S.	Proposed effective date in Québec (non-BPS Facilities connected to the RTP)
PRC-026-1	R2, R3, R4	January 1, 2020	January 1, 2021

7. PRELIMINARY IMPACT ASSESSMENT

The Planning Coordinator has informed the Coordinator that the PC has identified the Facilities as prescribed by PRC-026-1 Requirement R1. In late 2018, the Planning Coordinator informed Transmission Owners and Generator Owners of the Facilities concerned. There are four entities in

⁶ Transmission Owner that applies load-responsive protective relays as defined in PRC-026-1 – Attachment A at the terminals of the Elements listed in Section 4.2, Facilities.

⁷ Generator Owner that applies load-responsive protective relays as defined in PRC-026-1 – Attachment A at the terminals of the Elements listed in Section 4.2, Facilities.

⁸ Application R-3997-2016, Decision [D-2017-076](#).

Québec that own identified RTP Facilities. This preliminary impact assessment considers only the impacts on Entities in the Québec jurisdiction.

	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 and deploy the implementation, enforcement and compliance monitoring of 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.