

## Consideration of Comments

<b>Project Name:</b>	Project 2018-01 Canadian-specific Revisions to TPL-007-2
Comment Period Start Date:	10/2/2018
Comment Period End Date:	11/15/2018
Associated Ballots:	

There were 8 sets of responses, including comments from approximately 41 different people from approximately 30 companies representing 10 of the Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the [project page](#).

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Senior Director of Engineering and Standards, [Howard Gugel](#) (via email) or at (404) 446-9693.

## Questions

1. The SDT developed a Canadian Variance to Requirement R7, Part 7.3 to accommodate for required regulatory approvals in different Canadian jurisdictions. For example, Canadian entities may be required to obtain a regulatory approval for investments associated with Corrective Action Plans (CAPs). Such approval may limit the scope or modify the timeline of a CAP. Do you agree that the proposed Variance to Part 7.3 allows for the necessary flexibility to take into account the required regulatory approvals within your jurisdiction? If you do not agree, or if you agree but have comments or suggestions for the Variance, provide your recommendation, explanation, and proposed modification.
2. Do you agree that the language in the introduction section of Attachment 1-CAN adequately describes the Canadian Variance? If you do not agree, or if you agree but have comments or suggestions, provide your recommendation, explanation, and proposed modification.
3. The SDT developed the Attachment 1-CAN, as an alternative to Attachment 1, for defining a 1-in-100 year GMD planning event to be used in the benchmark and supplemental GMD Vulnerability Assessment(s). The proposed alternative approach in Attachment 1-CAN for the GMD planning event is to be based on Canadian-specific data and statistical analyses. Do you agree that the proposed approach to define a 1-in-100 year GMD event is sufficiently clear and flexible for Canadian entities while achieving an equivalent level of reliability of TPL-007-2? If you do not agree, or if you agree but have comments or suggestions for defining a GMD event, provide your recommendation, explanation, and proposed modification.
4. The SDT proposed that the calculation of the geoelectric fields, which is based on geomagnetic field variations and earth transfer function, must be based on technically justified information. Technically justified information includes technical documents produced by governmental entities, technical papers published in peer-reviewed journals, or data sets gathered using sound scientific principles. Do you agree that technical documents, as defined in Attachment 1-CAN, are credible sources of technically justified information? If you do not agree, or if you agree but have comments or suggestions for defining what constitute a technically justified information, provide your recommendation, explanation, and proposed modification.
5. If you have any additional comments regarding the completeness, the adequacy, and the accuracy of the proposed modifications for the SDT to consider, provide them here.

**The Industry Segments are:**

- 1 — Transmission Owners
- 2 — RTOs, ISOs
- 3 — Load-serving Entities
- 4 — Transmission-dependent Utilities
- 5 — Electric Generators
- 6 — Electricity Brokers, Aggregators, and Marketers
- 7 — Large Electricity End Users
- 8 — Small Electricity End Users
- 9 — Federal, State, Provincial Regulatory or other Government Entities
  
- 10 — Regional Reliability Organizations, Regional Entities

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Manitoba Hydro	Mike Smith	1		Manitoba Hydro	Yuguang Xiao	Manitoba Hydro	5	MRO
					Karim Abdel-Hadi	Manitoba Hydro	3	MRO
					Blair Mukanik	Manitoba Hydro	6	MRO
					Mike Smith	Manitoba Hydro	1	MRO
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	RSC no Dominion	Guy V. Zito	Northeast Power Coordinating Council	10	NPCC
					Randy MacDonald	New Brunswick Power	2	NPCC
					Glen Smith	Entergy Services	4	NPCC
					Brian Robinson	Utility Services	5	NPCC
					Alan Adamson	New York State Reliability Council	7	NPCC

David Burke	Orange & Rockland Utilities	3	NPCC
Michele Tondalo	UI	1	NPCC
Helen Lainis	IESO	2	NPCC
Michael Jones	National Grid	3	NPCC
Sean Cavote	PSEG	4	NPCC
Kathleen Goodman	ISO-NE	2	NPCC
Salvatore Spagnolo	New York Power Authority	1	NPCC
Shivaz Chopra	New York Power Authority	6	NPCC
David Kiguel	Independent	NA - Not Applicable	NPCC
Silvia Mitchell	NextEra Energy - Florida Power and Light Co.	6	NPCC
Paul Malozewski	Hydro One Networks, Inc.	3	NPCC

Gregory Campoli	New York Independent System Operator	2	NPCC
Caroline Dupuis	Hydro Quebec	1	NPCC
Chantal Mazza	Hydro Quebec	2	NPCC
Michael Forte	Con Edison	1	NPCC
Laura McLeod	NB Power Corporation	5	NPCC
Nick Kowalczyk		1	NPCC
Dermot Smyth	Con Ed - Consolidated Edison Co. of New York	1	NPCC
John Hastings	National Grid	1	NPCC
Peter Yost	Con Ed - Consolidated Edison Co. of New York	3	NPCC
Sofia Gadea-Omelchenko	Con Edison	5	NPCC
Joel Charlebois	AESI - Acumen Engineered Solutions	5	NPCC

						International Inc.			
						Quintin Lee	Eversource Energy	1	NPCC
						Mike Cooke	Ontario Power Generation, Inc.	4	NPCC

**1. The SDT developed a Canadian Variance to Requirement R7, Part 7.3 to accommodate for required regulatory approvals in different Canadian jurisdictions. For example, Canadian entities may be required to obtain a regulatory approval for investments associated with Corrective Action Plans (CAPs). Such approval may limit the scope or modify the timeline of a CAP. Do you agree that the proposed Variance to Part 7.3 allows for the necessary flexibility to take into account the required regulatory approvals within your jurisdiction? If you do not agree, or if you agree but have comments or suggestions for the Variance, provide your recommendation, explanation, and proposed modification.**

**Leonard Kula - Independent Electricity System Operator - 2**

**Answer** Yes

**Document Name**

**Comment**

The proposed language change provides the flexibility to account for the regulatory approval process in Canada.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

**Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no Dominion**

**Answer** Yes

**Document Name**

**Comment**

The proposed language change provides the flexibility to account for the regulatory approval process in Canada.

Likes 0

Dislikes	0
<b>Response</b>	
The SDT thanks you for your support.	
<b>Nicolas Turcotte - Hydro-Quebec TransEnergie - 1</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Junji Yamaguchi - Hydro-Quebec Production - 5</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>John Pearson - John Pearson On Behalf of: Michael Puscas, ISO New England, Inc., 2; - John Pearson</b>	
Answer	Yes

<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Constantin Chitescu - Ontario Power Generation Inc. - 5</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Payam Farahbakhsh - Hydro One Networks, Inc. - 1</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	

**Response**

**Mike Smith - Manitoba Hydro - 1, Group Name** Manitoba Hydro

**Answer**

**Document Name**

**Comment**

The posted version of “Proposed TPL-007-2 Canadian Variance” has proposed changed to R7 and Part 7.3 as noted above. However, the “Redline to TPL-007-2” version does not have these changes. Please review.

In Manitoba, regulatory approvals are not required for specific capital projects. Therefore the proposed variance is not required in this jurisdiction.

Regulations within Manitoba currently prevent Manitoba Hydro from adopting standards that require construction or enhancement of facilities in Manitoba. Manitoba has no suggestions for a variance that would alleviate this concern. As a result Manitoba Hydro adopted TPL-007 as its own standard (MH-TPL-007-2).

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support. The redline is located in the Variance section of the standard.

The SDT acknowledges the jurisdictional issues mentioned; however, addressing those issues is outside of the scope of this project.

**2. Do you agree that the language in the introduction section of Attachment 1-CAN adequately describes the Canadian Variance? If you do not agree, or if you agree but have comments or suggestions, provide your recommendation, explanation, and proposed modification.**

**Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no Dominion**

**Answer** Yes

**Document Name**

**Comment**

The effective geo-electric field depends on the both geomagnetic latitude and earth conductivity. Both of these factors tend to be larger in Canada compared with most with other places subject to NERC standards so the risk of higher GICs in Canada is higher. The introduction adequately describes the balance the Canadian variance will achieve: preserving an equivalent level of reliability (e.g. 1-in-100 year event) while allowing the flexibility to use an approach that can be demonstrated to better match Canadian circumstances.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

**Leonard Kula - Independent Electricity System Operator - 2**

**Answer** Yes

**Document Name**

**Comment**

**The effective geo-electric field depends on the both geomagnetic latitude and earth conductivity. Both of these factors tend to be larger in Canada compared with most with other places subject to NERC standards so the risk of higher GICs in Canada is higher. The introduction**

adequately describes the balance the Canadian variance will achieve: preserving an equivalent level of reliability (e.g. 1-in-100 year event) while allowing the flexibility to use an approach that can be demonstrated to better match Canadian circumstances.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

**Payam Farahbakhsh - Hydro One Networks, Inc. - 1**

**Answer** Yes

**Document Name**

**Comment**

Likes 0

Dislikes 0

**Response**

**Constantin Chitescu - Ontario Power Generation Inc. - 5**

**Answer** Yes

**Document Name**

**Comment**

Likes 0

Dislikes 0

**Response**

<b>John Pearson - John Pearson On Behalf of: Michael Puscas, ISO New England, Inc., 2; - John Pearson</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Mike Smith - Manitoba Hydro - 1, Group Name Manitoba Hydro</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Junji Yamaguchi - Hydro-Quebec Production - 5</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	

Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Nicolas Turcotte - Hydro-Qu?bec TransEnergie - 1</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	

**3. The SDT developed the Attachment 1-CAN, as an alternative to Attachment 1, for defining a 1-in-100 year GMD planning event to be used in the benchmark and supplemental GMD Vulnerability Assessment(s). The proposed alternative approach in Attachment 1-CAN for the GMD planning event is to be based on Canadian-specific data and statistical analyses. Do you agree that the proposed approach to define a 1-in-100 year GMD event is sufficiently clear and flexible for Canadian entities while achieving an equivalent level of reliability of TPL-007-2? If you do not agree, or if you agree but have comments or suggestions for defining a GMD event, provide your recommendation, explanation, and proposed modification.**

**Leonard Kula - Independent Electricity System Operator - 2**

**Answer** Yes

**Document Name**

**Comment**

**Requiring the methodology and assumptions specified in TPL-007-2 to be used unless the data and sensitivity assessment conditions in the Canadian Variance are both satisfied is sufficiently clear and flexible for Canadian entities while achieving an equivalent level of reliability.**

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

**Mike Smith - Manitoba Hydro - 1, Group Name Manitoba Hydro**

**Answer** Yes

**Document Name**

**Comment**

Manitoba Hydro agrees that Attachment 1-CAN allows for alternative methodologies to be used and supports this approach.

Manitoba Hydro is concerned about the precedence of mandating construction for a 1-in-100 year event. NERC TPL-001-4 does not mandate implementation of a CAP for extreme events, typically defined as 1-in-30 or greater. Manitoba Hydro prefers to set its risk tolerance to be in line with TPL-001-4 and has defined a GMD Planning event at 3 V/km, which corresponds to a 1-in-30 year probability. Manitoba Hydro will determine a CAP for a GMD Planning event. Extreme events of 1-in-50 year (3.5 V/km) and much greater than 1-in-100 years (8 V/km) will be studied in a similar manner as extreme events in TPL-001-4.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support. The mandate of the SDT was to achieve at least an equivalent level of reliability of that in TPL-007-2 (1-in-100-year event); therefore, addressing whether or not mandating construction for a 1-in-100 year event is outside the scope of this project.

**Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no Dominion**

**Answer** Yes

**Document Name**

**Comment**

Requiring the methodology and assumptions specified in TPL-007-2 to be used unless the data and sensitivity assessment conditions in the Canadian Variance are both satisfied is sufficiently clear and flexible for Canadian entities while achieving an equivalent level of reliability.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

<b>Nicolas Turcotte - Hydro-Quebec TransEnergie - 1</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Junji Yamaguchi - Hydro-Quebec Production - 5</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>John Pearson - John Pearson On Behalf of: Michael Puscas, ISO New England, Inc., 2; - John Pearson</b>	
Answer	Yes
Document Name	
<b>Comment</b>	

Likes	0
Dislikes	0
<b>Response</b>	
<b>Constantin Chitescu - Ontario Power Generation Inc. - 5</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Payam Farahbakhsh - Hydro One Networks, Inc. - 1</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	

**4. The SDT proposed that the calculation of the geoelectric fields, which is based on geomagnetic field variations and earth transfer function, must be based on technically justified information. Technically justified information includes technical documents produced by governmental entities, technical papers published in peer-reviewed journals, or data sets gathered using sound scientific principles. Do you agree that technical documents, as defined in Attachment 1-CAN, are credible sources of technically justified information? If you do not agree, or if you agree but have comments or suggestions for defining what constitute a technically justified information, provide your recommendation, explanation, and proposed modification.**

**Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no Dominion**

<b>Answer</b>	Yes
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<b>Document Name</b>	
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**Comment**

The technical documents defined in Attachment 1-CAN are a credible source of technically justified information. Direct measurements (e.g. GIC current, magnetic field) in Canada should be given the highest weighting when assessing technically justified information.

Likes	0
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Dislikes	0
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**Response**

The SDT thanks you for your support. The intent of the proposed Canadian Variance was to allow the use of the best information available.

**Mike Smith - Manitoba Hydro - 1, Group Name Manitoba Hydro**

<b>Answer</b>	Yes
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<b>Document Name</b>	
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**Comment**

This would address one of Manitoba Hydro’s original concerns with the standard and not lock the standard to “old” research but allow the latest research/data to be used in assessments.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support.

**Leonard Kula - Independent Electricity System Operator - 2**

Answer Yes

Document Name

**Comment**

**The technical documents defined in Attachment 1-CAN are a credible source of technically justified information. Direct measurements (e.g. GIC current, magnetic field) in Canada should be given the highest weighting when assessing technically justified information.**

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your support. The intent of the proposed Canadian Variance was to allow the use of the best information available.

**Payam Farahbakhsh - Hydro One Networks, Inc. - 1**

Answer Yes

Document Name

**Comment**

Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Constantin Chitescu - Ontario Power Generation Inc. - 5</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>John Pearson - John Pearson On Behalf of: Michael Puscas, ISO New England, Inc., 2; - John Pearson</b>	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Junji Yamaguchi - Hydro-Quebec Production - 5</b>	

<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Nicolas Turcotte - Hydro-Quebec TransEnergie - 1</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	

5. If you have any additional comments regarding the completeness, the adequacy, and the accuracy of the proposed modifications for the SDT to consider, provide them here.

**Nicolas Turcotte - Hydro-Quebec TransEnergie - 1**

Answer

Document Name

Comment

The SDT should consider the impact of the harmonics generated by the GMD event on the system performance. These were the main cause for the 1989 blackout in Quebec.

Likes 0

Dislikes 0

**Response**

The SDT thanks you for your comment. Addressing the impact of harmonics generated by a GMD event on System performance is not limited to a *Canadian-specific* revision to TPL-007-2; therefore, addressing this concern is outside the current project scope.

**Leonard Kula - Independent Electricity System Operator - 2**

Answer

Document Name

Comment

NA

Likes 0

Dislikes 0

**Response**

**Mike Smith - Manitoba Hydro - 1, Group Name** Manitoba Hydro

**Answer**

**Document Name**

**Comment**

There are portions of Attachment 1-CAN that are not related to the assessment methodology and may fit better within the requirements, such as:

**Modeling assumptions shall also be clearly documented and technically justified. An entity may use sensitivity analysis to identify how the assumptions affect the results.**

**A simplified model may be used to perform a GMD Vulnerability Assessment(s), as long as the model is more conservative than a more detailed model.**

**When interpreting assessment results, the entity shall consider the maturity of the modeling, toolset, and techniques applied.**

Additional comments – made during previous rounds of commenting of TPL-007

Manitoba Hydro does not support the supplemental GMD assessment in R8 and associated additional thermal analysis required in TPL-007-2 R9 and R10. The science is still evolving on localized enhancements.

Manitoba Hydro also notes that R12 serves no obvious purpose in meeting the stated objectives or purpose of the standard; the collection of magnetometer data is performed by NRCAN and several Canadian Universities within Canada.

Manitoba Hydro will not be able to adopt this standard as written due to conflicts with local legislation.

Likes	0
Dislikes	0
<b>Response</b>	
<p>The SDT has considered (i) creating Canadian Variances (requirement-by-requirement) or (ii) developing Attachment 1-CAN. The SDT determined that it would be more efficient to create Attachment 1-CAN.</p> <p>The project scope did not include the modifications to requirements R8 to R10. The Appendix 1-CAN allow Canadian entities to use information collected under R-12 to better define the GMD event or supplemental event. The SDT’s objective was to create a Variance to allow an entity to define its own event(s) to allow the use of data to define or modify the GMD planning.</p> <p>The SDT acknowledges the aforementioned conflicts with local legislation; however, addressing those concerns is outside the scope of the project.</p>	
<b>Payam Farahbakhsh - Hydro One Networks, Inc. - 1</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
<p>The proposed standard could benefit from adding a requirement to review the definition of the alternative benchmark or supplemental GMD events at or prior to the beginning of each standard assessment cycle. This review would allow the future assessments to leverage the results of ongoing research and consider new information that may be discovered in the future from growing data sets.</p>	
Likes	0
Dislikes	0
<b>Response</b>	
<p>The SDT thanks you for your comment and acknowledges that ongoing research and new information should be considered; however, adding a requirement to review the definition of the alternative benchmark or supplemental GMD events is outside the scope of the project.</p>	

The SDT acknowledges the concern of not having a specifically defined “standard assessment cycle.” The SDT recognizes that an entity may benefit from defining parameters around its assessment cycles.