# Posting 3

## Posting

This project was posted for comment from February 24 through March 28, 2022.

WECC distributed notice for the posting on February 17, 2022. The drafting team (DT) asked stakeholders to provide feedback on the proposed document(s) through a standardized electronic template.

Four comments were received on the project.

## Location of Comments

Comments can be viewed in their original format on the WECC-0146 project page under the “Submit and Review Comments” accordion.

## Changes in Response to Comment

* At WR3, “instability” was changed to “stability” to align the Requirement and the Measure.
* Additional reference documents were added to the Attachments or Other Reference Material section.
* The diagram in the Rationale—General Application section was updated. Special note: version designations will be updated in the final review for this project.
* Clarification was added to the Rationale – Requirement WR1 stating, “An entity has the option to specify its nominal voltage different from 525 kV for the 500-kV system.”
* Clarification was added to the Rationale—Requirement WR1.3 and WR1.4 stating, “WR1.4 is intended to describe normal voltage recovery and is not designed to address FIDVR (see Illustration WR1.4).” For more information, please see WECC-0146 Posting 3, TPL-001-WECC-CRT-3 Response to Comments—Additional Guidance posted on the WECC-0141 Submit and Review Comments accordion.
* Clarification was added to the Rationale—Requirement WR1.4 stating, “An entity has the option to specify its nominal voltage different from 525 kV for the 500-kV system.”

## Minority View

The DT opted not to further expand Rationale—Requirement WR4. Rather, the DT concluded the following existing language was sufficient, “WR4 does not change the WR1, WR2, and WR3 defaults; rather, WR4 allows for a different approach without changing the defaults.”

## Proposed Effective Date

The proposed effective date is the first day of the second quarter following approval by the WECC Board of Directors (Board).

## Justification

Some entities may be using planning criteria other than the specified default of WR1. Setting the effective date as the first day of the second quarter should allow sufficient time to implement default criteria.

**Impact on Other WECC Criteria**

None.

## Action Plan

On May 6, 2022, the DT agreed by a majority vote via an email ballot to post Posting 4 for a 30-day comment period. Once the comment period opens, comments can be submitted by selecting the Submit and Review Comments accordion on the WECC-0146 homepage. Then, click **Submit Responses to Posting 4**.

The posting period will open May 11, 2022, and close June 10, 2022.

The DT will meet as follows to address comments received:

* June 16, 2022, 10:00 a.m. to 12:00 p.m. Webinar
* June 30, 2022, 10:00 a.m. to 12:00 p.m. Webinar

## Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant, at (503) 307-5782. In addition, there is a WECC Reliability Standards appeals process.

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| Commenter | Organization |
| Linda Henrickson  | Arizona Public Service (AZPS) |
| ​Jenny Malon | Black Hills Corporation |
| Adrian Andreoiu | BC Hydro |
| Cain Braveheart | Bonneville Power Administration (BPA)  |

# Index to Questions, Comments, and Responses

**Question**

1. **The Drafting Team welcomes comments on all aspects of the document.**

| Summary Consideration: | See summary in the preamble. |
| --- | --- |
| Commenter/Comment | Response |
| APS | AZPS is supportive of the proposed changes in TPL-001-WECC-CRT-4 Posting 3.  |
| The WECC-0141 Drafting Team (DT) appreciates APS’s continued participation in the Standards development process.  |
| Black Hills | ​Black Hills Corporation has reviewed the draft. Commentary previously provided to the drafting team has been satisfactorily incorporated. No further comments to provide! |
| The WECC-0141 Drafting Team (DT) appreciates APS’s continued participation in the Standards development process. |
| BC Hydro | BC Hydro is supportive of the Posting 3 of TPL-001-WECC-CRT-4 and offers the following comments and suggestions.1. The Requirement R1 Part WR1.4 is revised to identify the performance criteria applicable to Single Line to Ground Fault for P1 to P7. BC Hydro recommends that an explanation be included in the Rationale section. Please confirm that there are no voltage performance criteria in WR1.4 for P1 through P7 Three-Phase Fault events.
2. The Illustrations in the Rationale section reference the Version 3 of the Transmission System Planning Performance Criterion. These should be updated to reference TPL-001-WECC-CRT-4.
3. The criteria set out in Requirement WR3 Parts 1.3 through 1.4 [sic – 3.1 through 3.4] are to determine voltage stability, rather than instability. The wording in Requirement WR3 references “instability” while the Measure WM3 references “stability”. BC Hydro recommends that WR3 be consistent with WM3 identifying voltage stability.
4. The Rationale example diagram of bus serving load indicates bus 6 as BES bus serving load. However, Bus 6 is part of a 69-kV network which does not appear to be part of BES. Please confirm.
5. The Requirement WR1 Rationale section includes the following statement:

“If an entity does not specify what is nominal, the default use of the term nominal defaults to the kilo-volt class that is specified in the WECC Base Case, except the 500-kilovolt class, in which case the default nominal would be specified as 525 kilovolts.”Please confirm that an entity has the option to specify its nominal voltage different from 525 kV for the 500-kV system.TPL-001-4 Events Nominal 500kV Nominal 525kVP0 (95% to 105%) 475 kV to 525 kV 498.75 kV to 551.25 kVP1 to P7 (90% to 110%) 450 kV to 550 kV 472.5 kV to 577.5 kV |
| **Requirement R1 Part WR1.4—Add a Rationale Section**BC is correct. There are no voltage performance criteria in WR1.4 for P1 through P7, Three-Phase Fault events. That statement has been added to the Rationale section. See also WECC-0146 Posting 3, TPL-001-WECC-CRT-3 Response to Comments—Additional Guidance posted on the WECC-0141 Submit and Review Comments accordion. **Update Reference Numbers**The DT appreciates BC’s observation. Updating illustration references will be completed by the WECC technical editor as the project nears completion.**Requirement WR3 Parts 1.3 through 1.4—Align the Requirement with the Measure “Stability/Instability?”**The DT appreciates BC’s observation. The two pieces have been aligned adopting the word “stability” in the requirement as well as the measure. **Bus 6 at 69-kV—Included in the BES**The DT appreciates the observation. The diagram is updated as follows: **Requirement WR1 Rationale—Confirm the Option to Specify Voltage**The following has been added to the Rationale section: “An entity has the option to specify its nominal voltage different from 525 kV for the 500-kV system.” |
| BPA | Rationale from DT's Posting 2 - Response to Comments:BPA appreciates the DT’s response regarding the potential to place an undue responsibility on a transmission entities’ system based on criteria in another entities’ system that is more stringent than the WECC base criteria. The addition of the suggested language in the 'General Applicability' section in the DT’s Rationale alleviates BPA’s concern.Suggested Change to the Requirement WR1.4 Rationale SectionBPA recommends the voltage dip criteria specified in Requirement WR1.4 be applied to all Contingency Events in Table 1 of the NERC TPL-001-4 Standard. Limiting application of voltage dip criteria to only events P1 through P7 Single-Line to Ground fault Events in Table 1 appears to be a relaxation of the NERC TPL-001-4 Standard. This would now exclude contingencies where a 3-phase fault is required which include 1) Category P1 - Single Contingency 2) Category P3 - loss of a generator, followed by system adjustment, followed by the next Category P1 contingency and 3) Category P6 – outage of a single transmission element, followed by system adjustment, followed by the next single transmission element contingency.Also, the intent of Requirement WR1.3 is to allow for delayed voltage recovery due to fault induced delayed voltage recovery (FIDVR) load behavior. The intent of Requirement WR1.4 is to specify a [sic] voltage dip criteria after fault clearing and voltage recovery regardless of whether there is FIDVR or not. FIDVR may be expected in systems that predominantly serve loads, but may not always be expected in systems that predominantly transfer power across the system parallel to a load area.In addition, using the composite load model, studies often show load reduction during a fault. This is followed by an instantaneous voltage spike after the fault is cleared due to load tripping during the fault. The voltage spike then causes load reconnection which is then followed by delayed voltage recovery due to FIDVR. With that in mind, BPA recommends that a 0.1 second time delay for measuring the initiation of FIDVR following fault clearing should also be added to Requirement WR1.4. The following is suggested language for WR1.4 with changes marked:"Following fault clearing and voltage recovery above 80 percent for more than 0.1 seconds, voltage at each applicable BES bus serving load shall neither dip below 70 percent of pre-contingency voltage for more than 30 cycles nor remain below 80 percent of pre-contingency voltage for more than two seconds, for all P1 through P7 Single-Line to Ground fault events."Study Origins: Requirement WR1 and WR2 Study QuestionsRegarding questions in the response to comments about studies supporting the criteria in WR1 and WR2.1) Requirements WR1.3 and WR1.4 – During Project WECC-0100, justification for the voltage recovery and voltage dip criteria were documented in the White Paper “WECC-0100 TPL-001-WECC-CRT-3 (CRT) Transmission System Planning Performance Proposed Transient Voltage Response Rationale for CRT Requirements R1.3 and R1.4” dated July 24, 2015. The voltage dip specifically is based on expected impact to end use equipment and was informed by IEEE Standard 1668, not based on agreed to voltage dips based on transmission studies, with the idea that the purpose of the criteria is to reasonably protect non-consequential end use load.2) Requirement WR3 – For reference, the voltage stability criteria recommendation that is the basis for Requirement WR3 was developed under the Reactive Reserve Work Group (RRWG) and was documented in the report “Voltage Stability Criteria, Undervoltage Load Shedding Strategy, and Reactive Power Reserve Monitoring Methodology” dated May 1998. |
| **Requirement WR1.3/1.4 Suggested Addition to the Rationale Section** The DT concluded that the existing language sufficiently covered the issue without requiring the addition of the proposed verbiage. **Study Origins: Requirement WR1 and WR2 Study Questions**The DT greatly appreciates the corporate memory provided by BPA as well as its continued engagement in the standard development process. |