

Consideration of Comments
Comment Report Form for WECC-0107

Power System Stabilizer (PSS) Design and Performance
WECC Regional Reliability Standard

Posting 1

The WECC-0107 PSS Drafting Team (DT) thanks everyone who submitted comments on the proposed project.

Overview

The proposed standard would be applicable to the Generator Owner and the Generator Operator.

Facility Threshold

The proposed standard adopts the BES applicability threshold.

Requirements and Measures

Within existing NERC and WECC Standards, there are currently Requirements to model¹, plan², and to run³ PSS (98% of operating hours except under twelve specified conditions).⁴

The proposed standard would reframe the operating mandates creating requirements for the Generator Operator (GO) to: 1) provide the Transmission Planner with the GO's Power System Stabilizer (PSS) operating specifications, 2) to have the PSS in service during all hours unless specifically exempted, and 3) tune its PSS so that the PSS provides a specific performance.

The Generator Owner would be required to: 1) install PSS under specified circumstances occurring after the Effective Date of the standard, and 2) repair or replace and existing PSS within 24 months of the PSS becoming non-operational.

¹ MOD-026-1 and MOD-032-1

² TPL-001-4, VAR-002-X

³ VAR-501-WECC-1, Power System Stabilizer

⁴ VAR-501-WECC-1, Power System Stabilizer, Requirement R1.

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The proposed document honors the Ballot Pool results of the WECC-0105 “P81” redraft endeavor (June 25 through July 18, 2014), removing documentation requirements from the Requirements and relocating them into the Measures.

Posting

This document was last posted for a 45-day public comment period from July 1, 2014 through August 15, 2014.

WECC distributed the notice for the posting on June 27, 2014. The Drafting Team asked stakeholders to provide feedback on the proposed document through a standardized electronic template. WECC received comments from four companies representing five of the eight Industry Segments, as shown in the table on the following page.

Location of Comments

All comments received on the document can be viewed in their original format [here](#).

Changes in Response to Comment

The Facilities section was deleted.

Requirement R2 was modified to clarify that the “testing” bullet applies to testing of a BES Element affecting or affected by the PSS. A final bullet was added allowing for non-operation “as agreed upon by the Generator Operator and the Transmission Operator.” The structure of Requirement R2 was changed to mandate a prescribed performance output as opposed to meeting a specified tuning criteria.

Requirement R3, numbered section 3 was changed so that the PSS shall be set to “provide a gain margin of at least 6 Db.” Sections 5 and 6 describing the feature of automatic disability were deleted. The drafting team believes these features should be described in any communication created as a result of Requirement R1.

The direct reference to PSS2A-type equipment was redrafted to describe specified performance as opposed to a PSS2A comparison.

Requirement R4 incorporated the Commercial Operation trigger previously included in the Facilities section.

Requirement R5 was added to ensure that the Generator Owner repairs or replaces an out-of-service PSS within 24 months of that unit becoming non-operational.

The Compliance table was updated.

Minority Comments Summary

A request to expand the Requirement R3 phase performance from 30 degrees to 45 degrees was rejected; however, the team agreed to revisit the matter.

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A request to exempt certain entities was rejected, opting instead to make the document applicable to facilities meeting the Bulk-Electric System (BES) definition. Entities seeking an exemption from the BES may do so through the procedures provided by NERC as approved by FERC.

A request to exempt older units was rejected because drawing a bright line for “older” machines was deemed impractical and inequitable. An accommodation was made by requiring installation of equipment only after reaching Commercial Operation, after the Effective Date of the standard, and after either connecting to the BES or replacing the voltage regulator on an existing excitation system.

No changes were made to the Effective Date noting that existing PSS within WECC should already be meeting the Requirements and any changes or additions to the equipment would not be immediately triggers, allowing up to 24 months to reach compliance.

The twelve “exceptions” and an allowance to be out-of-service two percent of the time for any reason as allowed in the existing standard were not retained but were accommodated by creating the possibility for exemption under Requirement R1 (planning horizon), plus Requirement R2 (operational horizon), and an additional bullet in Requirement R2 that allows for being out-of-service in the event the Generator Operator and the Transmission Operator agreed it was necessary. The drafting team concluded this expanded list of possible exemptions was a reasonable proxy for the two percent.

A request to lower the Violation Severity on Requirement R1, administrative in nature, was not accepted because the language is binary in nature and mandates a “Severe” rating. The drafting team does not have a choice.

Action Plan

The team will continue its discussions on changing the phase requirement in Requirement R3. (SUBSEQUENT ENTRY: This item was addressed by redrafting the requirement. See Posting 3.)

An iterative version of the document will be forwarded to the WEC Standards Committee with a request to post for a 30-day comment period.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact the Manager, WECC Standards Processes, W. Shannon Black, at sblack@wecc.biz. In addition, there is a WECC Reliability Standards Appeals Process.⁵

⁵ The appeals process is described in the Reliability Standards Development Procedures: <http://www.wecc.biz/Standards/Documents/WECC%20Reliability%20Standards%20Development%20Procedures.aspx>

Comment Report Form for WECC-0107

The WECC Standards Voting Sectors are:

- 1 — Transmission Sector
- 2 — Generation Sector
- 3 — Marketers and Brokers Sector
- 4 — Distribution Sector
- 5 — System Coordination Sector
- 6 — End Use Representative Sector
- 7 — State and Provincial Representatives Sector
- 8 — Other Non-Registered WECC Members and Participating Stakeholders Sector

Commenter		Organization	WECC Standards Voting Sectors							
			1	2	3	4	5	6	7	8
1	Janet Smith on behalf of Baj Agrawal	Arizona Public Service Company	X	X	X	X	X			
2	Caitlin Liotiris	Western Power Trading Forum (WPTF)			X					
3	Leland McMillan	PPL Montana, LLC		X	X					
4	Cain Braveheart,	Bonneville Power Administration	X		X	X	X			

Index to Questions, Comments, and Responses

Question

- 1. The WECC-0107 Drafting Team welcomes comments on all aspects of this document.**

1. The WECC-0107 Drafting Team welcomes comments on all aspects of this document.

Summary Consideration:	A summary of proposed changes included in the preamble of this document.		
Commenter	Yes	No	Comment
Arizona Public Service			<p>In reference to Requirement 2, the following comments are provided:</p> <ul style="list-style-type: none"> • R2: The ± 30 degrees criteria should be relaxed to ± 45 degrees and with a comment that it be generally within ± 30 degrees. There are many situations where ± 30 degrees is not attainable. APS Suggests a revision to the language of this requirement, which would read: "PSS shall provide a compensated frequency response of the excitation system and synchronous machine such that through the frequency range from 0.1 Hertz to 1.0 Hertz the phase will generally be within ± 30 degrees but not exceed ± 45 degrees. • R2: It should refer to minimum gain margin only. There should be no limit on higher gain margins. There are many situations where gains are based upon providing adequate damping and actual gain margin is much higher than 10 db. There are other situations where it is not even possible to know what the true gain margin is. • R2: Automatically disconnecting PSS should not be a requirement. It should simply be allowed to be off line at low loads. APS suggests a revision to the language of this requirement with would read: "PSS should be on or should be automatically enabled when the generator power output is above a threshold typically near minimum stable operating load level." <p>In reference to Requirement 3, the following comment is provided:</p> <ul style="list-style-type: none"> • There should be no reference to damping greater than that for PSS2A. It is impossible to measure such effectiveness.

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<p>1) Issue 1 Requirement R2 “Phase”:</p> <p>The WECC Policy Statement on Power System Stabilizers has been in effect since April 18, 2002 and has included the 30 degree threshold since that time. Historical experience indicates the 30 degree has served well to meet the reliability needs of the Interconnection. No changes were made. The drafting team agreed to continue its study in the appropriateness of the numeric value.</p> <p>(SUBSEQUENY ENTRY: The DT addressed APS’s “30 degree” concerns in Posting 3.)</p> <p>2) Issue 2: “Gain” and related ranges:</p> <p>The drafting team has considered your suggestions and made the following changes.</p> <ul style="list-style-type: none"> • The Requirement was restructured to be a performance-based requirement as opposed to merely a requirement to set the equipment at a specified parameter. • In #3, the language was changed to reflect “a gain margin of at least” 6db as opposed to setting a minimum and a maximum. • #5 and #6 (automatically disabled) were eliminated and the concept of planned non-operation, such as through a cavitation range, was incorporated into the new Requirement R1 that allows for a “one time” notice to the Transmission Planner that the Generator Operator intends a planned non-operation for specific purposes. <p>3) Issue 3: PSS2A</p> <p>The drafting team concurs and has changed the Requirement, deleting that phrase, and cross-referenced the Requirement to the performance criteria mandated elsewhere in the document.</p>			
WTFP			<p>The proposed modifications to VAR-501-WECC would add mandatory and enforceable PSS design and performance requirements for generators in the Western Interconnection. The modifications would also require the installation of PSS to synchronous generators that are newly interconnected to the BES or to existing generators that are updated, modernized or renovated. In addition, the proposed modifications would change the current requirements for PSS operation contained in R1 of VAR-501-WECC-1. The comments below ask the Drafting Team</p>

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			<p>to provide clarity as to when PSS installation is required and to consider the impacts of the proposed modifications on older, analog units, which may have significant difficulty complying with the minimum PSS specifications that are proposed. In addition, the following comments ask the Drafting Team to either retain the current PSS operation requirements in R1 of VAR-501-WECC-1 or provide justification for the significant changes that are being proposed.</p> <p>The proposed modification uses the terms “renovates”, “modernizes” and “updates” to indicate when PSS installation would be required on an existing generator. However, these are not defined terms. The use of these undefined terms increases the probability that there would be different interpretations of when renovation, modernization or updates to an excitation system occur and, thus, when PSS installation is required for compliance purposes. Although the use of new regional definitions is typically not encouraged by NERC, the use of these terms may warrant the development of new regional definitions. The Drafting Team should consider developing definitions for the terms “renovates”, “modernizes”, and “updates.” Alternatively, if the Drafting Team feels that regional definitions for these terms are not appropriate, then the standard should be modified to remove the terms and include specific circumstances under which a PSS should be installed. For instance, the installation of a PSS on an existing generator could be required when nameplate capacity is increased, when investment in the excitation system exceeds a threshold value, or when capital investments are made that are intended to extend the life of the plant by a threshold number of years. In either case, the Drafting Team should provide clarity on what activities are considered renovations, upgrades, or modernization to an excitation system so that generators fully understand when installation of a PSS is required for compliance purposes. In addition, the Drafting Team should clarify that PSS installation is only required for existing generation facilities that are connected to the BES. The current language</p>

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			<p>appears to imply that ALL existing generators must install a PSS upon renovation, upgrade or modernization of the excitation system.</p> <p>The PSS specifications contained in the proposed modifications may be excessively difficult for older, analog units to comply with. WPTF urges the Drafting Team to consider how each proposed specification requirement might impact older, analog units. If the requirements are kept in their current form, the Drafting Team should consider adding an exemption for older units. Furthermore, in establishing the effective date of the standard, the Drafting Team should consider that, in order to comply with the specifications, older units may need to order new equipment and take the unit out of service to install that equipment. Therefore, additional time to implement the standard may be required. Although the current effective date would provide about one year until the standard would become effective, 18 months or more may be required for older units that will require PSS upgrades.</p> <p>In addition to adding PSS performance measure to the standard, the proposed modifications would substantially change the current requirements for PSS operation and eliminate potentially important exemptions for PSS operation. Yet, justification for these changes has not been provided. The Drafting Team should provide documentation supporting each proposed change to the requirement for PSS operation or should retain the existing requirements contained in R1 of VAR-501-WECC-1.</p>

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			<p>VAR-501-WECC-1 requires that PSS be in-service for 98% of the time, except under certain conditions. The proposed modifications would change the requirement for PSS operation to 100%, except when the PSS is disabled due to power loss, component failure, testing, or maintenance. An increase to a 100% in-service requirement for PSS operation appears to increase compliance risk without providing substantial reliability benefits beyond the current 98% requirement. Furthermore, the proposed change would remove the exemptions for PSS operation for generators that operate less than 5% of all hours during a quarter, time when the AVR is out of service, units operating in synchronous condenser mode, etc. The Drafting Team should provide justification for increasing the requirement for PSS operation to 100% and also explain why each individual exemption for PSS operation should be removed.</p> <p>The proposed revisions to R1 would eliminate time requirements for putting a PSS back in-service following component failure (currently contained in R1.8, R1.9 and R.10). Removing these requirements could increase the amount of time a PSS is out of service, which may have adverse reliability impacts. The removal of R.12 (which exempts PSS operation during times when the Transmission Operator directs the Generator Operator to operate even though the PSS is unavailable) could also have adverse reliability impacts, which the Drafting Team should evaluate prior to proposing their elimination from the standard.</p> <p>The Drafting Team should consider maintaining the existing language in R1 of VAR-501-WECC-1. If the Drafting Team moves forward with the proposed changes to R1 of VAR-501-WECC-1, substantial justification for each proposed modification should be provided and the potential impacts to reliability should be considered for beach change that is proposed (including justification for each exemption that is removed).</p>

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1) Issue 1: Renovations			
<p>The drafting team agrees that the posted language was ambiguous. To remedy the issue, the Requirement has been redrafted to require action only when:</p>			
<ul style="list-style-type: none"> • The Generator Owner <u>connects</u> a generator to the BES, after achieving Commercial Operation and after the Effective Date of this standard; (or) • The Generator Owner <u>replaces</u> the voltage regulator on its existing excitation system, after achieving Commercial Operation and after the Effective Date of this standard. 			
<p>The Generator Owner is allowed six months to comply.</p>			
<p>The drafting team believes this approach protects existing Generator Owners from a mandate to install a PSS – except under the specified circumstances. The first bullet grandfathers existing units while the second bullet links installation of new PSS to the specific event of replacing the unit’s voltage regulator. The drafting team believes this latter event is a common denominator that would be undertaken by each Generator Owner during a renovation, modernization, update, or upgrade.</p>			
2) Issue 2: BES			
<p>The drafting team has deleted the Facilities section noting that by default, all Standards are applicable only to the BES Facilities, unless otherwise specified.</p>			
3) Issue 3: Older Units			
<p>The drafting team notes that no action is required until the voltage regulator is changed or the unit is connected to the BES. So long as an “older” unit does not require that servicing or is not newly connected to the BES, there is no action required regarding the “older” unit. By contrast, once the unit is identified for servicing, it would be an appropriate time to require the installation of a PSS. Finally, the drafting team opted not to adopt an exception for “older” units noting that no matter what age was specified for an “older” unit, drawing a bright line would always be inequitable for someone.</p>			

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4) Issue 4: Effective Date			<p>The drafting team opted to make no changes to the Effective Date noting that the majority of the PSS systems within WECC should already be set as specified.</p>
5) Issue 5: Retain R1 from the existing standard			<p>The existing VAR-501-WECC-1 requires a Generator Operator's PSS to be in service 98% of all operating hours for synchronous generators equipped with PSS. R1.1-R1.12 gives the Generator Operator 12 specified circumstances during which it does not have to operate. As evidence, quarterly reports are filed.</p> <p>These 12 events in R1 are not exhaustive of all of the actual events that could be addressed; however, as drafted they are the only events specifically considered for exclusion. As proposed Requirements R1 (planning horizon) and R2 (operational horizon) provide the Generator Owner with a broader, non-exhaustive, less restrictive set of events during which operation is not required. The counterbalance to this flexibility is the requirement that the PSS be always in-service unless specifically exempted.</p> <p>It should also be noted that the basic premise of the existing standard is documentation as opposed to the newly proposed standard that is performance based.</p> <p>The drafting team believes proposed Requirement R1 preserves the existing R1.3, R1.4, R1.5, R1.6, R1.7, R1.11, with the added benefit of only requiring a single reporting as opposed to a quarterly reporting. Proposed Requirement R2 preserves the existing R1.2, R1.8, R1.9, and R1.10.</p> <p>Although the existing R1.12 could be covered in either the proposed R1 or R2, depending on the circumstances, the drafting team has opted to add an additional bullet to the proposed R2 to clarify treatment of the exception and to allow the Generator Operator and the Transmission Operator the opportunity to identify unforeseen circumstances in the operational horizon during which the reliability of the grid is best served if the PSS is out-of-service. R2 has been changed as follows:</p> <p>R2. Each Generator Operator shall have its PSS in service during all operational hours, except when the Generator Operator has notified the Transmission Operator that the PSS is removed from service for any of the following circumstances: <i>[Violation Risk Factor: Medium] [Time Horizon: Operating Assessment]</i></p>

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			<ul style="list-style-type: none"> • Power loss, • Component failure, • Testing of a BES Element affecting or affected by the PSS, • Maintenance, (or) • As agreed upon by the Generator Operator and the Transmission Operator. <p>6) Issue 6: Removes exemption (Existing R1.1)</p> <p>The focus of the proposed standard switches from merely counting hours to requiring actual performance. The existing R1.1 counts hours and creates exemptions but does not provide for performance. The purpose of the performance is to add stability to the grid. Requiring the “five percenters” to run adds a margin of stability. Arguably, these few units add only a modicum of additional reliability individually; however, when considered in the aggregate these units bring a viable resource to the stability of the Interconnection. Further, when the grid is stretched to extremes such as in days of peak load, it is the performance of the last few percentages of units that either makes or breaks “performance.” Thus, the drafting team concluded the Requirements should apply to all generators meeting the BES definition.</p> <p>The drafting team has discussed the benefit/burden elements of including the five-percenters and concluded that burden to have a PSS operating at all times is low compared to the benefit of having those units operating and performing when needed. To otherwise exempt them leaves a potentially valuable resource unavailable during times of peak need.</p> <p>That said, the drafting team recognized that the “Section 5 Facilities” qualifier could add confusion as to “which” units the standard applies. To remedy this concern, the Facilities qualifier has been removed and the Commercial Operation feature exported to the Requirements. As a result, by default the standard only applies to those elements meeting the Bulk-Electric System (BES) definition. If a “five percenter” falls outside of the BES definition it will not be required to adhere to the standard.</p> <p>Finally, under the existing R1.1. the five-percent unit is still required to provide quarterly reports. Depending on how that unit is affected by the proposed R1 and R2, the unit may be able to dramatically reduce its reporting burden.</p>

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7) Issue 7: Requirements for putting units back on line			
<p>The existing Requirement R1, sub-parts R1.1.8, 1.9, and 1.10 require that PSS will be in operation unless it meets a listed exception. The specific exception in each of the sub-parts is “due to component failure.” This exception is retained in the proposed Requirement R2.</p> <p>The team notes that in each of the existing sub-parts R1.8, R1.9, and R1.10, the subsequent portion of the sentence does not create a requirement; rather, it creates a permissible condition predicated on submittal of document. The submittal of documentation neither adds nor subtracts from the reliability of the grid.</p> <p>To address the concern that a Generator Owner may unreasonably delay repair or replacement of a non-operational PSS, the team has created a new Requirement stating:</p> <p>R5. Each Generator Owner shall repair or replace a non-operating PSS within 24 months of that unit becoming non-operational. <i>[Violation Risk Factor: Medium] [Time Horizon: Operational Assessment]</i></p> <p>M5. Each Generator Owner will have evidence that it repaired or replaced a non-operational PSS within 24 months of that unit becoming non-operational. Evidence may include, but is not limited to, documentation of: 1) the date the unit became non-operational, and 2) the date the unit was returned to service, the span of the time window between the two events being within 24 months of one another.</p> <p>The rationale for the 24 month window is that it provides the Generator Owner an ample window to either procure a replacement part or to purchase and bring operational and entirely new PSS.</p>			
8) Issue 8: Removal of R.1.12			
Please see response to Issue 5.			
PPL Montana			<p>Summary</p> <p>1) PPL Montana, LLC (PPLM) requests this Power System Stabilizer (PSS) standard only apply to BES plants. Accordingly, Requirement R3 should be re-</p>

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Commenter	Yes	No	Comment
			<p>written and the second part of R3 removed. The drafting team has not shown the benefits of indiscriminately putting PSS equipment on small facilities and ignores the Study Progress Report (April 2014) showing smaller plants have little impact on damping. Requiring the installation of PSSs on all generators (large and small) cannot be justified as a way to enhance electric system reliability.</p> <p>a. There is no justification for including plants too small to be part of the BES in this standard.</p> <p>b. Non-BES plants should be free to “renovate(ing), modernize(ing) or update(ing)” an existing excitation system without installing a PSS.</p> <p>2) PPLM requests that R1 be modified to include language that allows the operator of a PSS-equipped facility to not have the PSS in-service for a small amount of time, such as in the existing PSS standard Requirement 1 which allows for a small percentage of time for the PSS to be off and includes other important exceptions (including those now in Requirement R2-5 and R2-6).</p> <p>Discussion</p> <p>PPLM commends the WECC-0107 PSS standard drafting team (SDT) for recognizing the history of PSS application in the west and the limitations of recent PSS study work. The study report completed in April, 2014 (the “report”) is to be commended for the thoughtful (albeit limited) analysis put forth. Several times in this report, the author states that PSS location and tuning are critical factors for WECC grid stability. Thanks to the efforts of the SDT, the standard now contains tuning information in R2 (items 1-4) that should be helpful to all generator owners. Unfortunately, the issue of location has yet to be addressed and for reasons that are unclear, an “all generators” approach was adopted by the SDT.</p>

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			<p>The report clearly states that PSS location is important. It appears to be possible to identify critical PSS locations because the report shows three Mode Shape Scatter Plots involving location. Unfortunately, the proposed WECC PSS standard does not address where it might be best to install PSSs, opting instead for an “all” policy where all PSSs at all locations are deemed to all be equally as effective at mode dampening. The standard is actually contrary to statements in the report that while more than half of the generators in the WECC study case are less than 75 MVA, there is “negligible” difference when turning off all 50 MVA PSSs vs turning off all 25 MVA PSSs. As the graph for the BC-Alberta outage shows (using the Malin 500 kV voltage) not only is the difference between 25 and 50 MVA “negligible,” the resulting damping is positive (positive damping is good for reliability) when either the 25 or 50 MVA PSSs are turned off. Clearly, having a PSS on all plants does NOT increase reliability in any meaningful way. Thus this standard will most likely result in an over-application of PSSs.</p> <p>Also, please note that the consequences of failing to comply with this standard are extreme because both R1 and R3 only have one Violation Severity Level (VSL) and that is “Severe,” extracting potentially large fines for small infractions whose impact on grid reliability may be inconsequential because as shown in the Malin 500kV voltage plot in the report, when entire groups of many hundreds of machines less than 50 or 25 MVA were turned off, there was “negligible” difference in reliability than when all PSSs were on. There simply is no justification for the “Severe” VSL when one machine has the PSS turned off.</p> <p>The report states that since 1992, the cost of installing and operating a PSS was an important consideration to the WECC and cost was correctly used to justify limiting</p>

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			<p>the application of PSSs to plants over a certain MVA threshold. Today, cost effectiveness cannot look at hardware purchase price alone. There are tuning costs which may actually exceed the hardware costs. There are costs that may come about to maintain compliance with a very strict standard. All of these costs point out how incorrect the statement is in the report that “Now it is not unusual to apply PSS at no additional cost.”</p> <p>Further, PPLM requests removal of the second part of R3 which states “renovate(ing), modernize(ing) or update(ing)” an existing excitation system, no matter what size the machine or plant, will require a PSS. PPLM requests removal of the second part of R3 because as described above, the drafting team has not shown the benefit of indiscriminately putting PSS on small facilities compared to the cost and consequences. Additionally, and possibly a demonstration of the rule of unintended consequences, some GOPs may forego upgrading exciters and AVR’s to avoid the cost of installing and operating (and risking a compliance violation related to) a PSS. This may actually reduce grid reliability because it may discourage the generator owner from renovating, modernizing or updating their excitation system.</p> <p>R1 of the new standard requires perfection in operating a PSS by requiring the PSS be on-line 100% of the time it is working. While this sounds straightforward and simple, it is very complex and results in what might be an inappropriate prioritization of operator duties and at the very least increases the possibility of a GOP compliance violation. Certainly a functional PSS improves WECC grid reliability, but it will in no way jeopardize the reliability of the WECC grid to write a standard to recognize a small tolerance for generator operator imperfection. Indeed, the SDT has noted in Requirement 2 Items 5 and 6 that there are exceptions when the PSS</p>

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			<p>does NOT have to be turned on.</p> <p>In reality, having the operator focus so intently on the PSS might actually be a serious distraction. For example, if the operator is bringing up a machine at a hydro plant, while at the same time reducing spill to keep the river flow constant for the fishery, while also at the same time moving the unit through a rough zone, while meeting the energy scheduling requirements, it may take a minute or two to bring the PSS on-line. As R1 is proposed, the one or two minute delay would appear to be a Severe violation possibly resulting in a fine. Creating this standard with perfection required in R1 is the easy part: GOPs having to live with PSS perfection at the expense of all other actions for 24x7x365 is the hard part.</p> <p>R1 as written is unreasonable and conflicts with R2-5 and R2-6. The SDT should restore the previous 2% exception and accompanying exclusions (see BES Definition Guidance Document II.2 BES Inclusion I2 and VAR-501-WECC-1) for R1. To show how this standard holds generator operators to an unreasonable standard of perfection, examine a comparison between the generator operator requirements and transmission operator or balancing authority requirements. Recall that Balancing Authorities are not held to perfection in the BAL standard for Control Performance Standard CPS-2 where the target is 90%. Further, Transmission operators have a full 30 minutes to get under a System Operating Limit (SOL). Certainly there are reliability consequences of the BA and TOP actions in these two areas, but only the GOP is held to perfection. Please restore the 98% requirement and the 12 exclusions as shown below in the current standard. The SDT has not justified the need for PSS perfection beyond that required of other NERC functional entities that may impact reliability more than a PSS.</p>

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1) Issue 1: BES			
<p>The drafting team concurs that the standard should only apply to the BES. The team has removed “Section 5 Facilities” so that by default the standard only applies to the BES.</p> <p>The concept of applicability by virtue of a “Commercial Operation” date has migrated to the proposed Requirement R4 making that specific Requirement tied to the Commercial Operation date as one of the qualifiers.</p> <p>The proposed Requirement R4 is as follows:</p> <p>R4. Each Generator Owner shall install on its generator a PSS, within 180 days of either of the following events: [Violation Risk Factor: Medium] [Time Horizon: Operational Assessment]</p> <ul style="list-style-type: none"> • The Generator Owner connects a generator to the BES, after achieving Commercial Operation, and after the Effective Date of this standard; (or) • The Generator Owner replaces the voltage regulator on its existing excitation system, after achieving Commercial Operation and after the Effective Date of this standard. 			
2) Issue 2: Justify putting PSS on smaller units.			
<p>The drafting team concurs. The document as proposed would only apply to BES units and would not require either installation or operation of a PSS on any unit not meeting the BES definition. Any unit meeting the PSS but currently excluded under the WECC PSS Policy could petition NERC/FERC for an exemption under the procedures provided.</p>			
3) Issue 3: Should include an allowance to not run (keep the 98% hours)			
<p>The drafting team notes that the focus of the document shifts away from counting hours to requiring performance of the PSS units meeting the BES definition. Rather than specify a period of time during which the PSS could be out-of-service <i>for any reason</i> (the 2% of the current standard), the proposed standard shifts to a requirement that the PSS shall be in service at all times....<i>except when</i></p>			

Summary Consideration:	A summary of proposed changes included in the preamble of this document.		
Commenter	Yes	No	Comment
			<p><i>specifically exempted.</i></p> <p>R1 (planning horizon) allows the GO's PSS to be out-of-service due to forward-looking circumstances foreseen by the Generator Operator. Since the GO takes the initiative to identify those circumstances, and whereas the GO is the entity that best knows the equipment, this places a great deal of flexibility into the hands of the Generator Operator.</p> <p>R2 (operating horizon) allows the GO's PSS to be out-of-service due to: 1) Power loss, 2) Component failure, 3) Testing of BES Elements affecting or affected by the PSS, 4) Maintenance, and 5) (newly added) during any circumstances agreed upon by both the Generator Operator and the Transmission Operator.</p> <p>This final bullet in R2 is added to allow for the unforeseen event, and the extreme (arguably non-existent) unlikelihood that keeping a PSS in service could somehow be deleterious to the grid. This is analogous to NERC EOP-002-3.1, Capacity and Energy Emergencies, Requirement R1, wherein the Balancing Authority and the Reliability Coordinator have the responsibility "to take whatever actions are needed to ensure the reliability of its respective area."</p> <p>The drafting team concluded that counterbalanced against the mandate for 100% operation, the list of exemptions creates a proxy for the 2% cushion allowed by the current standard while closing the door to an indiscriminate set of excluding events.</p> <p>4) Issue 4: "Severe" VSL is too severe.</p> <p>The drafting team notes several observations on this comment. First, the Violation Risk Factor / Violation Severity Level (VRF/VSL) table is not considered part of the standard subject to final determination by the drafting team. Its proposals are subject to change once the document is provided to NERC/FERC.</p> <p>The team believes PPL's comment is more accurately directed to the Violation Risk Factor (VRF) as opposed to the Violation Severity Level (VSL). The VRF identifies the potential <u>reliability impact</u> whereas the VSL defines the <u>degree of compliance</u> not achieved. The drafting team has reviewed the VRF and the VSL for each of the newly proposed Requirements.</p> <p>The drafting team chose "low" as the VRF for Requirement R1 as it affects the planning horizon, is administrative in nature, and if violated, would not be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system.</p>

Summary Consideration:	A summary of proposed changes included in the preamble of this document.		
Commenter	Yes	No	Comment
<p>The drafting team chose a “medium” VRF for the remaining Requirements as they affect the operational horizon, and if violated, these Requirements could directly affect the electrical state or the capability of the BES, or the ability to effectively monitor and control the BES, but are unlikely to lead to BES instability, separation, or cascading failures.</p> <p>In developing the VSLs for each Requirement, the drafting team anticipated the evidence that would be reviewed during an audit, and developed its VSLs based on the noncompliance an auditor may find during a typical audit. The drafting team based its assignment of VSLs on the following NERC criteria:</p> <ul style="list-style-type: none"> • The “Severe” VSL assigned to Requirements R1, R2, R4 and R5 are not optional. A violation of a “binary” type requirement such as these must have a “Severe” VSL as instructed by FERC. • Assignment of the VSLs was comparable to those included in the existing standard. • The VSLs avoid any ambiguity by stating the specific degree of non-compliance as opposed to using ambiguous terms such as minor, major, or significant. • The VSLs are structured so as not to create further requirements not otherwise stated in the Requirement and Measure section of the document. • The VSLs are based on a single violation, the degree of non-compliance being reflected in the increasing VSL as additional components of the Requirement are not met. <p>5) Issue 5: Remove the renovation clause.</p> <p>The drafting team addressed the issue in its response to WPTF. See proposed Requirement R4.</p> <p>6) Issue 6: Retain the 98%.</p> <p>See above at Issue 3 above.</p>			
Bonneville Power Administration (BPA)			BPA agrees with the requirements as written. BPA has no additional comments at this time.
<p>The drafting team thanks BPA for its continued support of the standards development process.</p>			

