

Changes made in response to comments received in Open Process

Appendix B

Procedure for the Review of a Special Protection System (SPS)

1.0 Introduction

- 1.1. This Appendix provides the procedure to obtain concurrence from NPCC if an entity proposes a new SPS, or the modification ~~to~~ or the retirement of a ~~Special Protection System (SPS)~~ SPS.
- 1.2. The proposing entity should allow sufficient lead time in order to accomplish all the steps in the process outlined here in. These processes are shown in the attached flow charts.
- 1.3. The following NPCC groups are involved in the review and approval process of the **SPS**:
 - Task Force on Coordination of Planning - TFCP
 - Task Force on System Protection - TFSP
 - Task Force on System Studies - TFSS
 - Task Force on Coordination of Operations – TFCO
 - Reliability Coordinating Committee – RCC

2.0 NPCC Review and Concurrence of a Proposed New or the Modification to an Existing **SPS**

- 2.1. The proposing entity shall notify the TFCP Chairman and Secretary of its intention to install a new **SPS** or to modify an existing **SPS**.

The notification shall include statements and analysis which describes:

- the proposed **SPS** Type (I, II, III) and rationale for classification,
- the need and location for the **SPS**,
- when the **SPS** is planned for service,
- how long the **SPS** is expected to be in service,
- the specific contingency(s) for which the **SPS** is designed to operate,
- the possible failure modes and the consequences of misoperation, unintended operation or failure of the **SPS**,
- for modification of an existing **SPS**, a descriptive statement of the modification, the current **SPS** type and the reason for the change, and
- a statement that the **SPS** is designed according to the existing NPCC Criteria listed in this document and Standards.

For the purpose of this Appendix, a modification that involves the re-classification of the “Type” for an existing **SPS** is a change to its original functionality such that the results of previous analysis or the study which was used for the classification of that **SPS**, is no longer representative of the consequences of the **SPS**’s proper operation, its failure to operate, or the misoperation of

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that SPS.

2.2. TFCP shall forward the documentation from the proposing entity to TFSS to ~~determine~~review and confirm the proposed SPS Type.

TFSS shall ~~review~~confirm the proposed SPS Type by reviewing the analysis that the proposing entity has performed to determine the consequences of either a failure of the **SPS** to operate when and how it is required, or an inadvertent or unintended operation of the **SPS**. If necessary, TFSS shall request that the proposing entity conduct additional studies.

TFSS shall forward a summary of their findings ~~to~~confirming the Type of the SPS to TFCP ~~Chairman and Secretary~~.

2.3 The review shall proceed as follows:

- ~~—~~Type I or II **SPS** ~~—~~as described in paragraph 2.4
- ~~—, or if a~~ Type III **SPS** ~~—~~as described in paragraph 2.5.

2.4 Approval of a New or the Modification of a Type I or II **SPS**

~~2.3.1-~~2.4.1. TFCP shall forward the documentation from the proposing entity and the TFSS findings to TFSP and TFCO.

~~2.3.2-~~2.4.2. TFSP shall confirm the failure modes of the **SPS** including actions of back-up protection, and whether or not the **SPS** complies with NPCC system **protection** standards. TFSP shall review whether the new or modified **SPS** is in conformance with the NPCC Regional Reliability Reference Directory #4 “*Bulk Power System Protection Criteria*”; and the NPCC Regional Reliability Reference Directory #7 “*Special Protection System Criteria*”.

TFSP shall forward a summary of its findings to TFCP.

~~2.3.3-~~2.4.3. TFCO shall review the operability of the **SPS** and shall assess its impact to operations if the **SPS** were to operate incorrectly or fail to operate, and any potential for unintended interaction with other special protection systems. TFCO shall provide a summary of its conclusions together with a statement accepting or rejecting the proposed installation of the new **SPS** or the modification of the existing **SPS**. TFCO shall include a statement that the new **SPS** or the modification of an existing **SPS** conforms to NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”.

TFCO shall forward a summary of its findings to TFCP.

~~2.3.4-~~2.4.4. TFCP shall review the **SPS proposal** for conformance with NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”. TFCP may return the application to the proposing entity for further clarification. ~~(Add some more description of what TFCP is reviewing.)~~ or for additional information.

~~2.3.5.2.4.5.~~ TFCP shall prepare a combined summary report including the proposing entity notification and the task force recommendations for evaluation by RCC.

~~2.3.6.2.4.6.~~ RCC shall review the summary report and act on the proposal. RCC may approve ~~or reject~~ the proposal, ~~reject~~, or remand the review of the **SPS proposal** back to TFCP with a recommendation of further action or the need for clarification.

~~2.3.7.2.4.7.~~ TFCP shall notify all the task forces and the proposing entity of the outcome of the review.

~~2.3.8.2.4.8.~~ Upon RCC approval the **SPS** may be deployed.

~~2.3.9.2.4.9.~~ TFSS shall update the NPCC **Special Protection System** list/database.

~~2.4.2.5.~~ Approval of a New or Modification Type III SPS

~~2.4.1.2.5.1.~~ After review of the **SPS proposal** for conformance with NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”, TFCP shall approve or reject the proposal~~-, or remand the SPS back to the proposing entity with a recommendation of further action or the need for clarification or for additional information.~~

~~2.4.2.2.5.2.~~ TFCP shall prepare a summary report including the proposing entity notification informing RCC of their conclusion.

~~2.4.3.2.5.3.~~ TFCP shall notify all the task forces and the proposing entity of the outcome of the review.

~~2.4.4.2.5.4.~~ Upon TFCP approval the **SPS** may be deployed.

~~2.4.5.2.5.5.~~ TFSS shall update the NPCC **Special Protection System** list/database.

3.0 NPCC Review and Concurrence for the Retirement of an Existing SPS

3.1. The proposing entity shall notify the TFCP Chairman and Secretary of its intention to retire an existing **SPS**.

The notification shall include statements that describe:

- the identification and type of **SPS** being retired,
- the specific changes which have eliminated the need for the **SPS**, and
- for a Type I or II **SPS**, the proposing entity will provide evidence that the **SPS** retirement does not have a **significant adverse impact** on the reliability of the **bulk power system**.

3.2. The review shall proceed as follows:

Type I or II SPS —as described in paragraph 3.3
—or if a Type III SPS —as described in paragraph 3.4.

3.3. Approval to Retire a Type I or II SPS

3.3.1. TFCP shall forward the documentation from the proposing entity to TFSS.

TFSS shall review the analysis that the proposing entity has performed to determine the consequences of the removal of the ~~SPS shall.~~

TFSS shall forward a summary of their findings or concerns to ~~the TFCP Chairman and Secretary.~~

TFCP.

~~3.3.1.~~3.3.2. TFCP may return the application to the proposing entity for further clarification.

~~3.3.2.~~3.3.3. TFCP shall prepare a combined summary report including the proposing entity notification and TFSS recommendation for evaluation by RCC.

~~3.3.3.~~3.3.4. RCC shall review the summary report and act on the proposal. RCC may approve ~~or reject~~ the ~~proposal~~retirement of the SPS, or remand the ~~review of the SPS proposal~~ back to TFCP with a recommendation of further action or the need for clarification.

~~3.3.4.~~3.3.5. TFCP shall notify in a formal letter to all the task ~~forces~~force groups and the proposing entity of the outcome of the review.

~~3.3.5.~~3.3.6. Upon RCC approval the SPS may be retired.

~~3.3.6.~~3.3.7. The TFSS shall update the NPCC **Special Protection System** list/database.

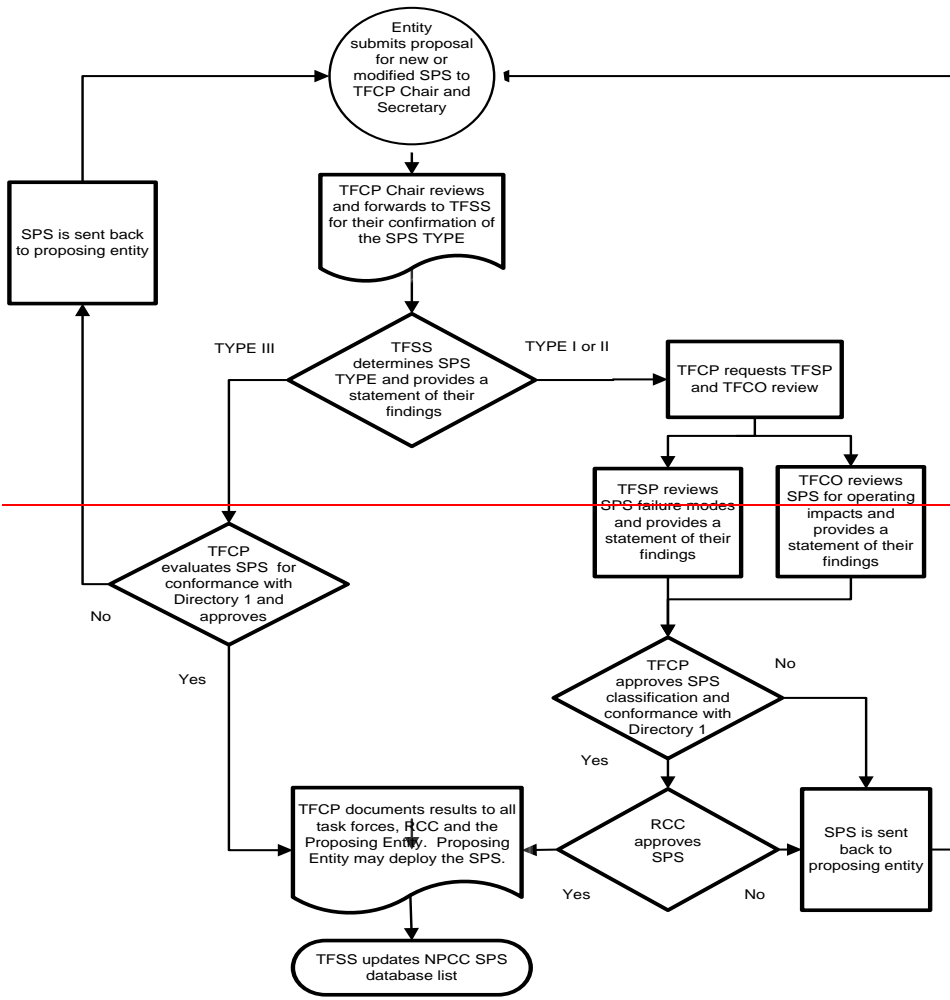
3.4. Retiring a Type III SPS

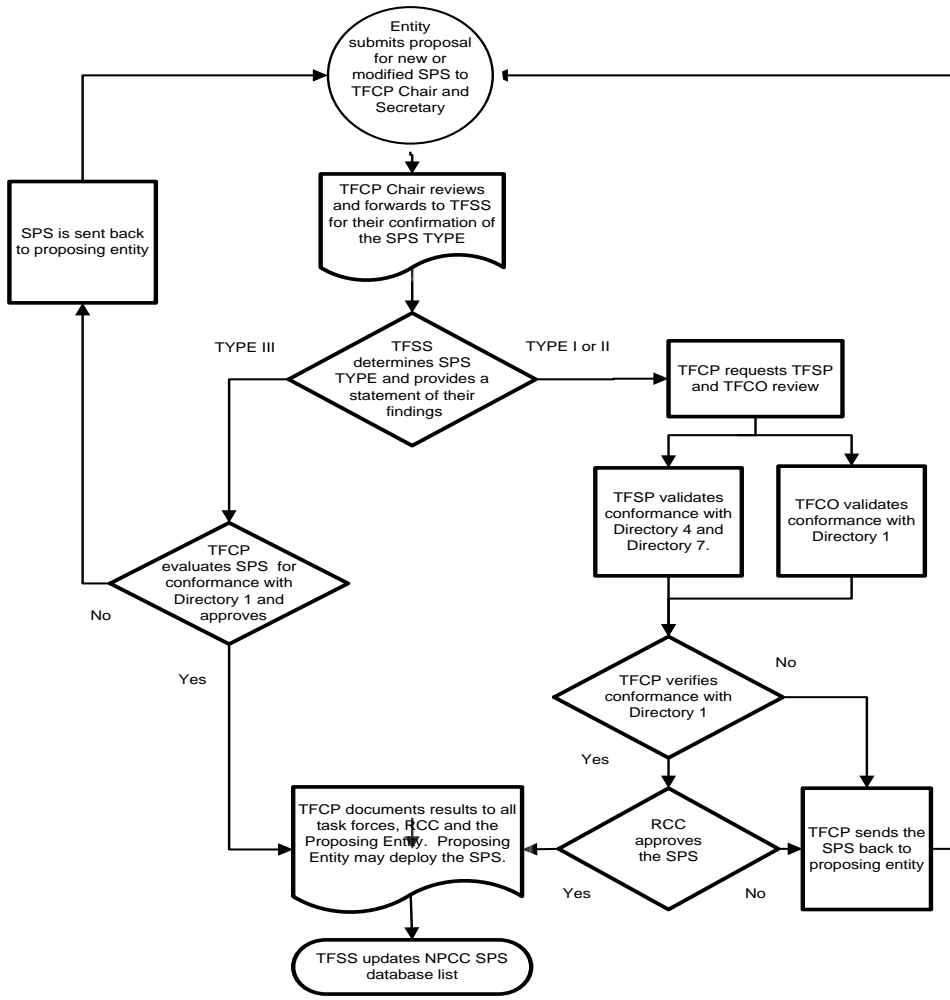
3.4.1. A formal approval to retire a Type III SPS is not required. ~~TFCP~~The proposing entity shall ~~notify~~inform TFCP of the retirement. TFCP shall inform all the task forces and the ~~proposing entity~~RCC of the SPS retirement.

3.4.2. The SPS may be retired.

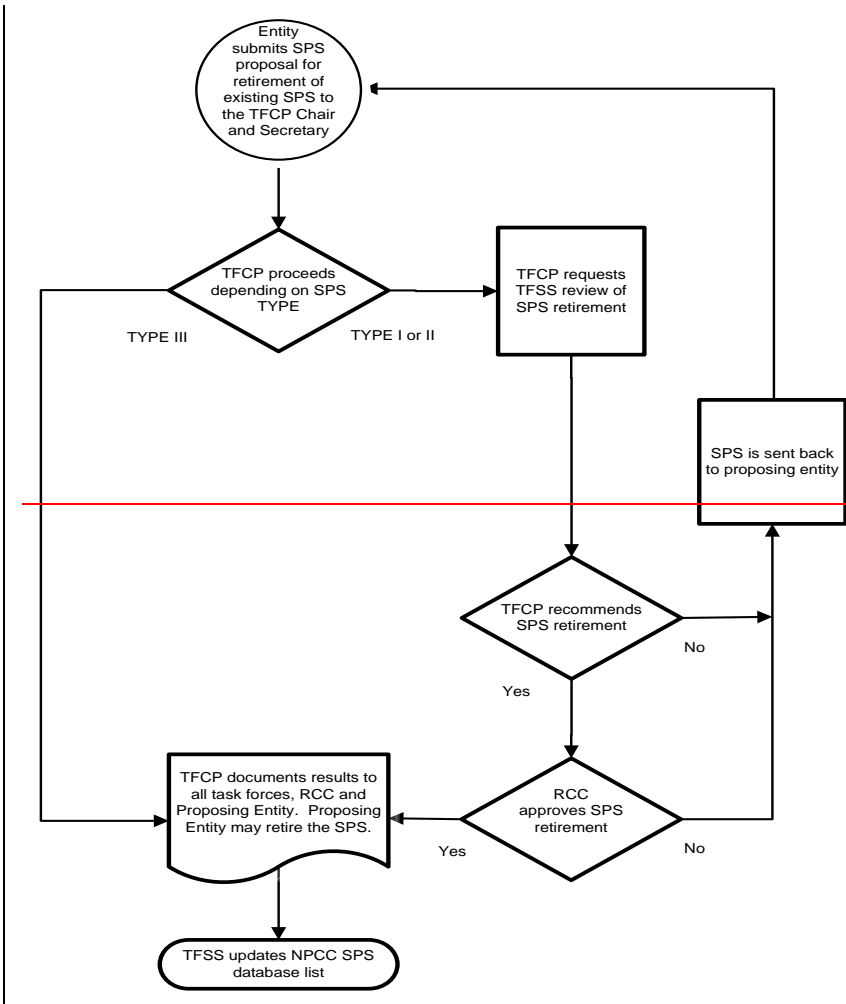
3.4.3. TFSS shall update the NPCC **Special Protection System** list/database.

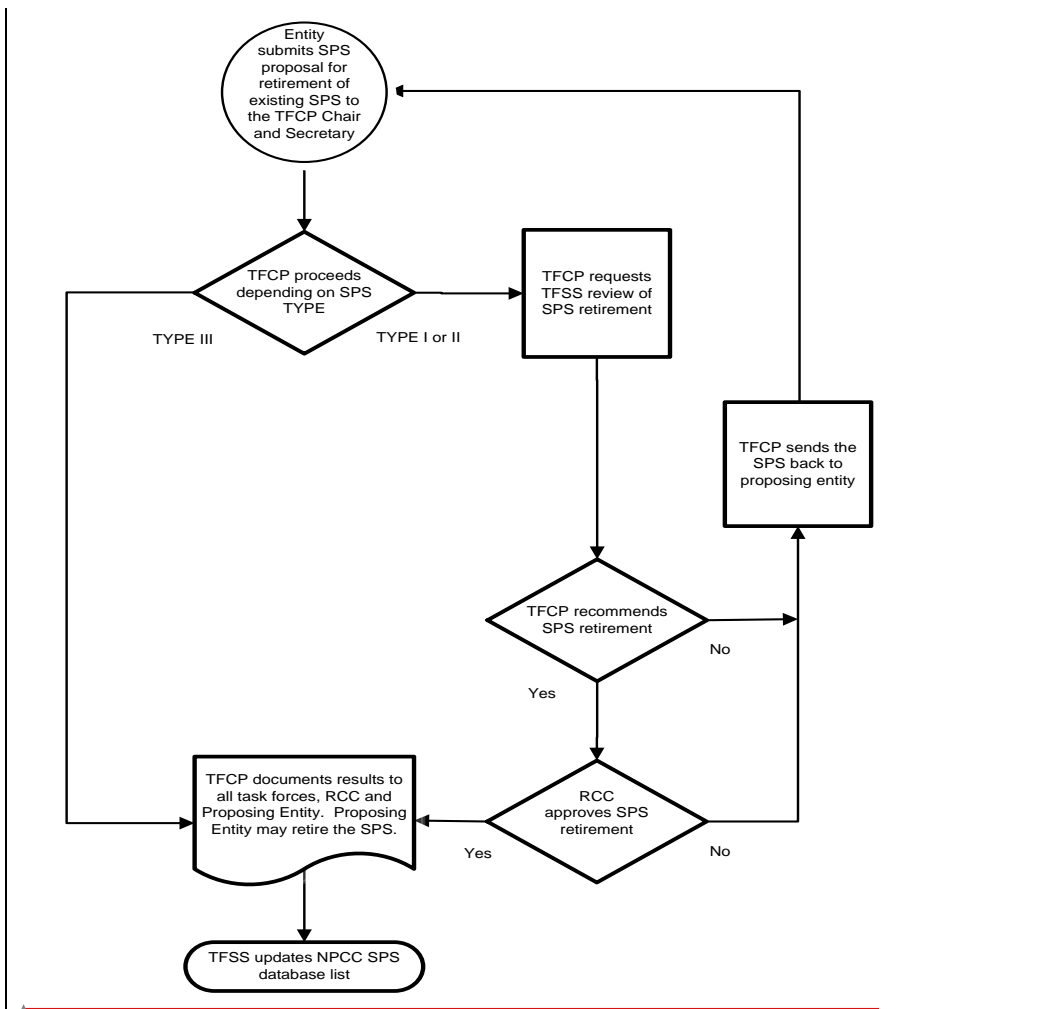
FLOW CHART FOR THE REVIEW OF NEW ~~OR MODIFIED~~
SPECIAL PROTECTION SYSTEMS (SPS) OR THE MODIFICATION OF AN
EXISTING SPS





FLOW CHART FOR THE RETIREMENT OF SPECIAL PROTECTION SYSTEMS (SPS)





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October 16, 2012

These are the comments of The United Illuminating Company:

1. The entity owning an SPS is referred to by various titles throughout the document. The terms "Owner of SPS", "Responsible Entity", "TO, GO, or DP", "proposing entity" and "entity".

TFSP Response: We agree. Each term is used depending on the context of the sentence.

2. In the Directory, references are made to substation physical perimeter, or substation grid. This is a transmission centric a term. SPS components may be located within a Generation Facility.

TFSP Response: Agreed. In section 5.11.1.2 and 5.13, we will add "/plant" to "substation" to also cover generation facility.

3. Section 1.5: remove bolded word "protection". D7 establishes the design criteria for an SPS in conjunction with D4. Protection is defined as "The provisions for detecting power system faults or abnormal conditions and taking appropriate automatic corrective action." D7 does not define the appropriate automatic corrective actions.

TFSP response: We agree that the context of the bold word for "protection" is inconsistent.

TFSP proposed to unbold the word and change it to "protection system design"

4. Section 1.6.2.1 Change "The standard requirements and criteria" to "The criteria". I believe that NPCC standardized on the term criteria for obligations contained within a Directory so as not to utilize NERC terms. Please review the entire document for the use of the word "requirement" or "Requirement".

TFSP Response: Agreed.

5. Section 1.6.2.1 Please include an explicit statement that Directory 7 does not apply to Type III SPS.

TFSP Response: TFSP proposed additional clarification in the Objective, Section 1.3.

6. Section 1.6.2.1 The phrase "It is recommended that this reporting be in accordance with the procedure stipulated in Appendix C of this Directory using the appropriate portion of the "Protection System Review Form" (formerly C-22 forms), for review and disposition by the TFSP, or in a form consistent with the intent of the procedure." Should be modified to "It is recommended that this reporting be in accordance with the procedure stipulated in Appendix C of this Directory using the appropriate portion of the "Protection System Review Form" (formerly C-22 forms)(located in Directory #4 Appendix A), for review and disposition by the TFSP, or in a form consistent with the intent of the procedure in Appendix C of this Directory." This is used in multiple places in the Directory.

TFSP Response: Staff will update posting and links to make sure they are clear.

7. Section 1.6.2.2.1 Please utilize the term "does not comply with all" in place of "do not meet all".

TFSP Response: comment accepted.

8. Section 1.6.2.2.1 Change sentence "The result of this assessment shall be reported." To "The result of this assessment shall be reported to TFSP".

TFSP Response: comment accepted.

9. Section 1.6.2.2.2 requires a mitigation plan to bring an SPS into compliance with these criteria when re-classified. There is no further reference in Directory 7 concerning who receives the mitigation plan, and who follows up on the completion of the plan.
TFSP Response: agreed. TFSP proposed additional language to clarify.
10. Section 1.6.2.2.3 is missing. Probably 1.6.2.2.4 is misnumbered.
TFSP Response: TFSP added section number left blank to maintain link with D4.
11. Section 1.6.3 Responsibility: First it is a subsection under 1.6 Applicability which seems inappropriate; consider numbering as 1.6.2.2.5. Second this section is not a listing of Responsibility rather it seems to assign an action to Generator Owners and Transmission Owners for a particular case. Third, should not this action be performed by entities owning SPS or is it the drafting teams intent that all GO and TO review SPS applications throughout NPCC. I suggest the following 1.6.2.2.5 Change of Operating Design Assumptions – The Transmission Planner or Planning Coordinator will inform an owner of an SPS when BPS design changes are anticipated or the functionality of the SPS is required to be modified. The owner of an SPS shall review modifications to the required characteristics of an SPS, or facility design changes that can impact the SPS application or the SPS compliance to these criteria.
TFSP Response: TFSP proposed change the title of this section and move it to Appendix A, Section 2.1.
12. Section 5.2.1 applies to Type I only. Why does 5.2.2 apply to both Type 1 and Type 2? Is there a redundancy criteria for Type 2?
TFSP Response: Agreed. 5.22 combined with 5.21.
13. Does section 5.3 apply to Type 1 as well as Type 2? The fact that 5.3.1 starts off with Type 2 eliminates type 1. There should be a criteria for Security for Type 1.
TFSP Response: Type I SPS are designed with dependability being paramount while Type II SPSs are designed with security being paramount. Hence there is no Security criterion for Type I in Section 5.3.
14. I don't understand the title of section 5.4. 5.2 is Dependability, 5.3 is security, and 5.4 is both. Shouldn't 5.4.1 be in 5.2. Properly designing component impacts dependability. I can understand 5.4.2 impacting both, but it is more of a monitoring criteria of the SPS. Suggest moving 5.4.1 to 5.2; retitling 5.4 to Criteria for Monitoring and leaving 5.4.2.
TFSP Response: Both 5.41. and 5.42 have the potential to affect both dependability and security.
15. In section 5.5, move 5.5.2 after 5.5.3. Logically it makes better sense that first a means to arm and verify arming is established and then annunciation.
TFSP Response: comment accepted.
16. Section 5.7.1 the phrase "relay accuracy" should be changed to "accuracy". The word "relay" is bolded meaning to reference the Glossary. The glossary definition of relay is "An electrical device designed to respond to input conditions in a prescribed manner and after specified conditions are met to cause contact operation or similar abrupt change in associated electric control circuits." The phrase "relay accuracy" lacks meaning.

TFSP Response: TFSP proposed to change “relay accuracy” to “rated accuracy”

17. Section 5.9 – Is this supposed to apply to Type 2? Other redundancy requirements exclude Type 2.

TFSP Response: TFSP accepted comment withdrawn.

18. Section 5.10 – the term “overarm” is defined in Appendix A section 2.2. The term is not universally recognized as defined in Appendix A. Please include a reference to Appendix A section 2.2 after the use of the term, or just include the meaning in the sentence itself.

TFSP Response: comment accepted.

19. Section 5.12.1 – the introductory phrase “In addition to the physical separation as referenced in Section 5.2.2” is not needed for the criteria.

TFSP Response: comment accepted.

20. Section 7.0 – R2 requires TFSP to issue a letter of acceptance. In Appendix B or Appendix C, I do not find a step requiring TFSP to issue this letter.

TFSP Response: TFSP proposed added step for TFSP and TFCP to issue formal letter for each review.

21. Appendix A 2.2.1 – This section starts off with Redundancy. The paragraph begs the question that Redundancy provides Dependability,. It should be stated clearly. For example, “Dependability of a SPS can be provided by designing with redundancy. Redundancy is normally provided by designing duplicate protection groups but may be achieved by other methods, such as overarming, defined as,”

TFSP Response: comment accepted.

22. Appendix A 2.2.1 – The last sentence limits redundancy to the response to the conditions required to detect. That is not completely true for dependability since redundancy should apply to the Protection System as defined in the Glossary. The word “response” could be interpreted to limit redundancy to everything after the relay output contacts, although reading the criteria it applies to the Protection System components (that is batteries, sensing device, wiring, relay, breaker trip coils).

TFSP Response: The word response in the context of 2.2.1 indicates that the SPS must produce the designed system response for the conditions it was intended to detect.

23. Appendix B – TFCP receives the request for a SPS, but in Main Document Section 7 TFSP issues the letter of acceptance. I suggest that a step is added after 2.4.8 that TFSP issue the letter of acceptance .

TFSP Response: TFSP proposed added step for TFSP and TFCP to issue formal letter for each review.

24. Appendix C – Section 5.6 requires TFSP to generate a position statement and issue a letter of non-conformance. There needs to be step that a letter of acceptance will be issued. This needs to flow with Appendix B.

TFSP Response: TFSP proposed added step for TFSP and TFCP to issue formal letter for each review.

Jonathan Appelbaum
The United Illuminating Company



**NPCC Reliability Reference Directory #7
Special Protection Systems
Draft Sept 27, 2012**

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ISO-NE Comments and TFSP Responses

**NPCC
Regional Reliability Reference Directory # 7
Special Protection Systems**

Task Force on System Protection Revision Review Record
December 27, 2007
Draft Sept 27, 2012
For Open Process Review

Adopted by the Members of the Northeast Power Coordinating Council Inc., this December 27, 2007, based on recommendation by the Reliability Coordinating Committee, in accordance with Section VIII of the NPCC Amended and Restated Bylaws dated July 24, 2007 and as amended to date.

Revision History

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**NPCC Reliability Reference Directory #7
Special Protection Systems
Draft Sept 27, 2012**

Version	Date	Action	Change Tracking (New, Errata or Revisions)
0	12/27/07		New

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1.0 Introduction

1.1 Title Special Protection Systems

1.2 Directory Number 7

1.3 Objective

This directory provides the basic criteria for **Special Protection Systems (SPSs)** such that the **Bulk Power System** in NPCC Inc. member **Areas** is operated reliably. It is not a design specification. (consistent with language in D4, 1.3)

1.4 Effective Date Immediately upon Approval by the NPCC Full Members

Compliance Guidance Statement- Protection system designs submitted to the TFSP prior to the date of this revision are not subject to the ~~TFSP-submittal documentation~~ requirements described in Section 7, **Compliance Requirements R1, R2, and R3.**

1.5 Background

This directory establishes the basic **protection** criteria for **SPSs**.

Guidance for consideration in the implementation of these criteria is provided in Appendix A, and the procedure for reviewing new and revised **SPSs** is provided in Appendix B and Appendix C.

1.6 Applicability

1.6.1 Functional Entities

Transmission Owners

Generator Owners

Distribution Providers

1.6.2 Facilities

Comment [OBERLIN1]: How can you have Requirements and no Measures?
TFSP Response: Compliance Process Section added as recommended by Standard Staff.

Also, R1 is not a TFSP requirement, yet here it states that Section 7, R1, has a TFSP documentation requirement.
TFSP: redlined change made.

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1.6.2.1 New Facilities

The standard requirements and criteria stipulated in this Directory apply to all new Type I and Type II SPSs as defined below. In the application of Type II SPSs, security is the prime concern (see Section 3.3.1 of this document [where is 3.3.1?](#)). As such, Sections 5.2.1, 5.6.3, 5.7.2, 5.10 and 5.12 in this document do not apply to Type II. Each new Type I or Type II **Special Protection System SPS** shall be reported to the Task Force on System Protection. It is recommended that this reporting be in accordance with the procedure stipulated in Appendix C of this Directory using the appropriate portion of the "Protection System Review Form" (formerly C-22 forms), for review and disposition by the TFSP, or in a form consistent with the intent of the procedure. [\(proposed additional language consistent with D4, 1.6.2.2.2\)](#)

1.6.2.2 Existing Facilities

It is the responsibility of individual companies to assess their existing SPSs and to make modifications which are required to meet the intent of these criteria as follows:

1.6.2.2.1 Planned Renewal or Upgrade to Existing Facilities

It is recognized that there may be SPSs, which existed prior to each TO's, GO's, and DP's adoption of the *Special Protection System Criteria*, that do not meet these criteria. If any SPSs or sub-systems of these facilities are replaced as part of a planned renewal or upgrade to the facility and do not meet all of these criteria, then an assessment shall be conducted for those criteria that are not met. The result of this assessment shall be reported. It is recommended that this reporting be in accordance with the procedure stipulated in Section 4.0 of Appendix C of this Directory using the appropriate portion of the "Protection System Review Form" (formerly C-22 forms), for review and disposition by the TFSP, or in a form consistent with the intent of the procedure. [\(proposed additional language consistent with D4, 1.6.2.2.2\)](#)

Comment [OBERLIN2]: This section seems to have several procedural problems. Who is the assessment reported to? Who makes decisions? When does this have to be done? etc.
TFSP: change made to R1.

1.6.2.2.2 SPS Re-classified to Type I or Type II

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These requirements apply to all existing **SPSs** which are reclassified as Type I or Type II due to system changes. A mitigation plan shall be required to bring such an **SPS** into compliance with these criteria.

For Type I **SPS**, where the owner of the **SPS** has determined that the cost and risks involved to implement physical separation, as per Section 5.12, cannot be justified, the reason for this determination and an assessment shall be reported to the TFSP. It is recommended this reporting be in accordance with the procedure stipulated in Appendix C of this Directory using the appropriate portion of the "Protection System Review forms" (formerly C-22 forms), for review and disposition by the TFSP, or in a form consistent with the intent of the procedure. (proposed additional language consistent with D4, 1.6.2.2.2)

1.6.2.2.4 In-kind Replacement of SPS Equipment

If a component of an **SPS** is replaced "in-kind" as a result of an un-planned event, then it is not required to upgrade the associated **protection system** to comply with these criteria.

Comment [OBERLIN3]: If I have a program to replace my fuses every 5 years, this says that since it is a "planned" event, I have to upgrade the whole thing?
TFSP: the intent is that this section is for failure replacement only. Planned replacement doesn't apply in this section.

1.6.3 Responsibility

Whenever changes are anticipated in generating sources, transmission facilities, or operating conditions, Generator Owners and Transmission Owners shall review those **SPS** applications (i.e., settings, ac, and dc supplies) which can reasonably be expected to be impacted by those changes. (proposed additional language consistent with D4, 1.6.3)

1.6.4 Classification of **Special Protection Systems**

SPSs are sub-divided into three types. Reference can be made to the NPCC *Design and Operation of the Bulk Power System* (Directory #1) and ~~NERC TPL Standards~~, where design criteria contingencies, operating criteria contingencies, and extreme contingencies are described.

Comment [OBERLIN4]: The NERC TPL testing is different than NPCC Directory 1, so it is unclear as to what is meant when the NERC TPLs are pointed to right here.
TFSP: reference to NERC standard deleted.

Type I An **SPS** which recognizes or anticipates abnormal

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system conditions resulting from design and operating criteria **contingencies**, and whose misoperation or failure to operate would have a **significant adverse impact** outside of the **local area**. The corrective actions taken by an **SPS** along with the actions taken by other **protection systems** are intended to return power system parameters to a stable and recoverable state.

- Type II An **SPS** which recognizes or anticipates abnormal system conditions resulting from extreme **contingencies** or other extreme causes, and whose misoperation or failure to operate would have a **significant adverse impact** outside of the **local area**.
- Type III An **SPS** whose misoperation or failure to operate results in no **significant adverse impact** outside the **local area**. The practices contained in this document for a Type I **SPS** should be considered but are not required for a Type III **SPS**. It should be recognized that a Type III **SPS** may, due to system changes, become Type I or Type II.

2.0 Terms Defined in this Directory

The definitions of terms found in this Directory appearing in bold typeface, can be found in *NPCC Glossary of Terms*.

3.0 NERC ERO Reliability Standard Requirements

The NERC ERO Reliability Standards containing Requirements that are associated with this Directory include, but may not be limited to:

- 3.1 [PRC-012-0 — Special Protection System Review Procedure](#)
- 3.2 [PRC-013-0 Special Protection System Database](#)
- 3.3 [PRC-014-0 — Special Protection System Assessment](#)
- 3.4 [PRC-015-0 — Special Protection System Data and Documentation](#)
- 3.5 [PRC-016-0 — Special Protection System Misoperations](#)

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3.6 [PRC-017-0 - Special Protection System Maintenance and Testing](#)

4.0 NPCC Regional Reliability Standard Requirements

None at this time. To be developed.

5.0 NPCC “Full Member”, More Stringent Criteria

These Criteria are in addition to, more stringent than, or more specific than NERC or any Regional Reliability standard requirements. (proposed additional language consistent with D4, 5.0)

5.1 General Criteria

An **SPS** shall be designed to recognize the specific power system conditions associated with its intended function.

Due consideration shall be given to dependability and security. The relative effect on the **bulk power system** due to a failure of an **SPS** to operate when desired versus an unintended operation shall be weighed carefully in selecting design parameters as follows in Sections 5.2, 5.3, and 5.4:

5.2 Criteria for Dependability (added section label consistent with D4, 5.2)

5.2.1 To enhance dependability, an **SPS** shall be designed with redundancy such that the **SPS** is capable of performing its intended function while itself experiencing a single failure. (This requirement does not apply to Type II **SPSs**.)

5.2.2 Multiple **protection groups** that are used to obtain redundancy within an **SPS** shall not share any of the same components.

5.3 Criteria for Security (added section label consistent with D4, 5.3)

5.3.1 A Type II **SPS** shall be designed to avoid false operation while itself experiencing a single component failure.

5.4 Criteria for Dependability and Security (added section label consistent with D4, 5.4)

5.4.1 The thermal capability of all **SPS** components shall be ~~rated adequate~~ to

Comment [OBERLIN5]: Why does this apply to a Type II and not a Type I?
TFSP: The possibility of a false operation, due to single component failure, is inherent in Type I SPS.

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withstand the ~~rated~~ maximum short time and continuous loading of the associated **protected elements**.

Comment [OBERLIN6]: The word "rated" is new here and it is not correct. You may be putting in an SPS to take action based on severe overload of a facility. Therefore, the SPS actually needs to be able to withstand currents being over the facility rating for the period of time until the SPS takes action.
TFSP: the word "rated" removed.

5.4.2 Communication link availability, critical control switch, test switch positions, and trip circuit integrity shall be annunciated to a 24-hour Operations center so that operating personnel can be notified and can initiate appropriate actions.

5.5 Criteria for Operating Time and Arming (added section label consistent with D4, 5.5)

5.5.1 An **SPS** shall be designed to take corrective action(s) within times determined by studies with due regard to security, dependability, and selectivity.

5.5.2 Status of **SPS** arming shall be annunciated to a 24-hour Operations center so that operating personnel can respond and can initiate appropriate actions.

5.5.3 An **SPS** shall be equipped with means to enable its arming and to independently verify its arming.

5.6 Current Transformer Criteria

Current transformers (CTs) associated with **an SPS** shall have adequate steady-state and transient characteristics for their intended function as follows:

5.6.1 The output of each current transformer secondary winding shall be designed to remain within acceptable limits for the connected burdens under all anticipated currents, including **fault** currents, to ensure correct operation of the **SPS**.

5.6.2 The thermal and mechanical capabilities of the CT at the operating tap shall be adequate to prevent damage under maximum **fault** conditions and normal or **emergency** system loading conditions.

5.6.3 For **protection groups** to be independent, they shall be supplied from separate current transformer secondary windings. (This requirement does not apply to Type II **SPSs**.)

5.6.4 Interconnected current transformer secondary wiring shall be grounded at only one point.

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5.7 Voltage Transformer and Potential Device Criteria

Voltage transformers and potential devices associated with **an SPS** shall have adequate steady-state and transient characteristics for their intended function as follows:

- 5.7.1 Voltage transformers and potential devices shall have adequate volt-ampere capacity to supply the connected burden while maintaining their **relay** accuracy over their specified primary voltage range.
- 5.7.2 If an **SPS** is designed to have multiple **protection groups** at a single location for redundancy, each of the **protection groups** shall be supplied from separate voltage sources.

The **protection groups** may be supplied from separate secondary windings on one transformer or potential device, provided all of the following requirements are met: (This Section does not apply to Type II **SPS**.)

- 5.7.2.1 Complete loss of that voltage transformer or potential device does not prevent **both protection groups** from performing the intended function;
- 5.7.2.2 Each secondary winding has sufficient capacity to permit fuse **protection** of the circuit;
- 5.7.2.3 Each secondary winding circuit is adequately fuse protected.

- 5.7.3 The wiring from each voltage transformer secondary winding shall not be grounded at more than one point.

5.8 Battery and Direct Current (dc) Supply Criteria

DC supplies associated with an **SPS** shall be designed to have a high degree of dependability as follows:

- 5.8.1 If an **SPS** is designed to have multiple **protection groups** at a single location for redundancy, no single battery or dc power supply failure shall prevent the independent **protection groups** from performing the intended function. Each battery shall be provided with its own charger. Physical separation shall be maintained between the two station batteries or dc power supplies used to supply the independent **protection groups**. (This section does not apply to Type II **SPS**.) (proposed additional language consistent with D4, 5.8.1)

Comment [OBERLIN7]: The paragraph above says that everything may be fed from one transformer, yet here it says that complete loss of the transformer cannot prevent both protection groups from failing. How can they both be fed from the same failed device and still work? The old version talked about using different phases, which seemed to make more sense.
TFSP: This is acceptable so long as upon loss of complete potential input, some other means of performing the intended function must be provided.

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- 5.8.2 Each battery shall have sufficient capacity to permit operation of an **SPS**, in the event of a loss of its battery charger or the ac supply source, for the period of time necessary to transfer the load to the other battery or re-establish the supply source. Each station battery and its associated charger shall have sufficient capacity to supply the total dc load of the station. **(proposed additional language consistent with D4, 5.8.2)**
- 5.8.3 A transfer arrangement shall be provided to permit connecting the total dc load to either station battery without creating areas where, prior to failure of either a station battery or a charger, a single event can disable both dc supplies. **(proposed additional language consistent with D4, 5.8.3)**
I understand but hard to read. Could it be split in 2 sentences like:
1- A transfer arrangement shall be provided to permit connecting the total dc load to either station battery.
2- The transfer arrangement equipment itself shall not disable both dc supplies following a single event.
- 5.8.4 The battery chargers and all dc circuits shall be protected against short circuits.
- 5.8.5 DC battery systems shall be continuously monitored to detect abnormal voltage levels (both high and low), dc grounds, and loss of ac to the battery chargers. These conditions shall be annunciated to a 24-hour Operations center so that operating personnel can respond and can initiate appropriate actions. **(proposed additional language consistent with D4, 5.8.5)**
- 5.8.6 DC supply to the **SPS component** shall be continuously monitored to detect loss of voltage and be annunciated to a 24-hour Operations center so that operating personnel can respond and can initiate appropriate actions. **(proposed additional language consistent with D4, 5.8.6)**

5.9 Station Service ac Supply Criteria

If an **SPS** is designed to have multiple **protection groups** at a single location for redundancy, there shall be two sources of station service ac supply, each capable of carrying at least all the battery chargers associated with the **SPS**.

5.10 Circuit Breakers Criteria

Where **SPS** redundancy is achieved by the use of independent **protection groups** tripping the same circuit breakers without overarming, each circuit breaker shall be equipped with two independent trip coils. (This dual trip coil requirement does not apply to Type II **SPS**.)

Comment [OBERLIN8]: This seems to be a BPS station design requirement rather than an SPS design requirement. Should it be in Directory 7?
TFSP: the redundancy requirement was intentional.

Comment [OBERLIN9]: Same question as above, seem to have crept into BPS station design rather than SPS design.
TFSP: the redundancy requirement was intentional.

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The design of a breaker with two trip coils shall be such that the breaker will operate if both trip coils are energized simultaneously. The relative polarity between the voltage applied to the two trip coils shall not affect proper breaker operation. The correct operation of this design shall be verified by tests and documented. (proposed additional language consistent with D4, 5.10)

5.11 Teleprotection Criteria

5.11.1 Communication facilities required for **teleprotection** shall be designed to have a level of performance consistent with that required of the **SPS**, and shall meet the following:

5.11.1.1 Where the design of an **SPS** is composed of multiple **protection groups** for redundancy and each group requires a communication channel:

5.11.1.1.1 The equipment for each group shall be separated physically on non-adjacent panels and designed to minimize the risk of more than one **protection group** being disabled simultaneously by a single event or condition.

5.11.1.1.2 The communication medium outside the substation physical perimeter for each **protection group** shall be designed to minimize the risk of both **protection groups** being disabled simultaneously by a single event or condition. In addition, physical separation of the communication media outside the substation fence shall be three feet at a minimum. (Also, see Appendix A, Section 2.9.)

5.11.1.2 **Teleprotection** equipment shall be monitored to detect loss of equipment and/or channel and be annunciated to a 24-hour Operations center so that operating personnel can respond and can initiate appropriate actions.

5.11.1.3 **Teleprotection** equipment shall be provided with means to test for proper signal adequacy.

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- 5.11.1.4 **Teleprotection** equipment shall be powered by the substation batteries or other sources independent from the power system. See Section 5.8, Battery and dc Supply Criteria.
- 5.11.1.5 Except as identified otherwise in these criteria, the two **teleprotection** groups shall not share the same component.
 - 5.11.1.5.1 The use of a single communication tower for radio communication systems used by the two **protection groups** of an **SPS** is permitted as long as diversity **what is a diversity?** of the communication signals is achieved.
 - 5.11.1.5.2 Where telecommunication route diversity cannot be achieved, overarming of the appropriate **SPS** trip outputs is an acceptable mitigation.

5.12 Environment (This Section does not apply to Type II **SPS**.)

- 5.12.1 In addition to the physical separation as referenced in Section 5.2.2, if an **SPS** is designed to have multiple **protection groups** at a single location for redundancy, each individual **protection group** and **teleprotection** of the **SPS** shall be on non-adjacent vertical mounting assemblies or enclosures.
- 5.12.2 If an **SPS** is designed to have multiple **protection groups** at a single location for redundancy, wiring for each individual **protection group** and **teleprotection** of the **SPS** shall not be in the same cable. **(proposed additional language consistent with D4, 5.12.2)**
- 5.12.3 If an **SPS** is designed to have multiple **protection groups** at a single location for redundancy:
 - Cabling for individual **protection groups** and **teleprotection** of the **SPS** shall be physically separated. This can be accomplished via different raceways, trays, trenches, etc. **(proposed additional language consistent with D4, 5.12.3)**
 - Cable separation shall be achieved up to the breaker control cabinet. **(new clarified separation requirement)**
 - Cable separation shall be achieved up to the equipment

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control cabinet. (new clarified separation requirement)_

5.12.5 In the event a common raceway is used, cabling for individual **protection groups** of an **SPS** shall be separated by a fire barrier.

5.13 Grounding Criteria

Each TO, GO or DP shall have established as part of its substation design procedures or specifications, a mandatory method of designing the substation ground grid, which:

5.13.1 Can be traced to a recognized calculation methodology

5.13.2 Considers cable shielding

5.13.3 Considers equipment grounding

5.15 Provision for Breaker Failure Criteria

Type I **SPS** shall include breaker failure **protection** for each circuit breaker whose operation is critical to the adequacy of the action taken by the **SPS** the following seems not to be required with due regard to the power system conditions this SPS is required to detect. The following are options for breaker failure **protection**:

5.15.1 A design which recognizes that the breaker has not achieved or will not achieve the intended function required by the **SPS** and which takes independent action to achieve that function. This provision needs not be duplicated and can be combined with conventional breaker failure schemes if appropriate.

5.15.2 Overarming the **SPS** such that adequate action is taken even if a single breaker fails.

5.15.3 The redundancy afforded by actions taken by other independent schemes or devices.

5.16 Design to Facilitate Testing and Maintenance

5.16.1 The design of an **SPS** both in terms of circuitry and physical arrangement shall facilitate periodic testing and maintenance.

5.16.2 Test facilities or test procedures shall be designed such that they do not compromise the independence of the redundant design aspects of an **SPS**.

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5.16.3 If a segmented testing approach is used, test procedures and test facilities shall be designed to ensure that related tests properly overlap. Proper overlap is ensured if each portion of circuitry is seen to perform its intended function, such as operating a relay from either a real or test stimulus, while observing some common reliable downstream indicator.

5.17 Design to Facilitate Analysis of SPS Performance

5.17.1 Event recording capability shall be provided to permit analysis of the SPS's performance.

5.18 Commissioning Testing

An SPS shall be functionally tested when initially placed in service and when modifications are made.

6.0 Measures and Assessments

None developed at this time.

Comment [OBERLIN10]: Measures? TFSP: included in compliance process.

7.0 Compliance Requirements

R1. An entity, proposing to install a new **special protection system** or a modification to an existing **special protection system**, shall submit documentation to TFSP. It is recommended that the form of this documentation is as per Sections 1.6.2.1 or 1.6.2.2, respectively.

M1. Will be developed.

R2. An entity, proposing to install a new **special protection system** or a modification to an existing **special protection system**, shall obtain a letter of acceptance by TFSP of the compliance statement accompanying the submittal in R1 prior to placing the **special protection system** in service.

M2. Will be developed.

R3. The entity shall provide within 30 days, upon request from the Regional Entity (Criteria Compliance Enforcement Program) documented evidence of the submittal and acceptance by TFSP, of any new or modified **special protection system**.

M3. Will be developed.

Comment [OBERLIN11]: There is no action by TFSP for a Type III, so everyone who puts in a Type III will be non-compliant with this requirement. TFSP: Directory 7 requirements do not apply to Type III SPS.

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Prepared by:	Lead Task Force- Task Force on System Protection
Review and Approval:	<p>Revision to any portion of this Directory will be posted by the lead Task Force in the NPCC Open Process for a 45 day review and comment period. Upon satisfactorily addressing all the comments in this forum, the Directory document will be sent to the remaining Task Forces for their recommendation to seek RCC approval.</p> <p>Upon approval of the RCC, this Directory will be sent to the Full Member Representatives for their final approval if sections pertaining to the Requirements and Criteria portion have been revised. All voting and approvals will be conducted according to the most current "NPCC Inc. Bylaws" in effect at the time the ballots are cast.</p> <p>Revisions pertaining to the Appendices or any other portion of the document such as Links, Glossary Terms, etc., will only require RCC Member approval of the document. Errata may be corrected by the Lead Task Force at any time and provide the appropriate notifications to the NPCC Inc. membership.</p> <p>This Directory will be updated at least once every three years and as often as necessary to keep it current and consistent with NERC Regional Reliability Standards and other NPCC documents.</p>
References:	<p>NPCC RRS PRC-XXX-X (Future NPCC Regional Standard)</p> <p>Design and Operation of the Bulk Power System (Directory #1)</p> <p>Emergency Operation (Directory #2)</p> <p>Maintenance Criteria for Bulk Power System Protection (Directory #3)</p> <p>NPCC Glossary of Terms (Document A-7)</p>

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Appendix A Guidance for Consideration in SPS Design

1.0 Introduction

This Appendix provides the guidance for consideration in the implementation of the **Special Protection System (SPS)** design criteria stipulated in Section 5 of this Directory.

2.0 Design Considerations

2.1 General Considerations

The general objective for any **SPS** is to perform its intended function (generator rejection, load rejection, etc.) in a dependable and secure manner. In this context, dependability relates to the degree of certainty that the **SPS** will operate correctly when required to operate. Security relates to the degree of certainty that the **SPS** will not operate when not required to operate.

The relative effects on the **bulk power system** of a failure to operate when desired versus an unintended operation should be weighed carefully in selecting design parameters. For example, the choice of duplication as a means of providing redundancy improves the dependability of the **SPS** but can also jeopardize security in that it may increase the probability of an unintended operation. This general objective can be met only if the **SPS** can dependably respond to the specific conditions for which it is intended to operate and differentiate these from other conditions for which action must not take place.

Close coordination should be maintained among system planning, design, operating, maintenance, and **protection** functions, since both initially and throughout their life cycle, **SPSs** are a multi-discipline concern.

2.2 Issues Affecting Dependability

2.2.1 Redundancy is normally provided by duplication. Some aspects of duplication may be achieved by overarming, which is defined as providing for more corrective action than would be necessary if no failures are considered. The redundancy requirements for an SPS apply only with respect to its response to the conditions it is required to detect. **It does not say much. Could it be more precise?**

2.2.2 For an **SPS** that is composed of multiple **protection groups**, the risk of

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simultaneous failure of more than one **protection group** because of design deficiencies or equipment failure should be considered, particularly if identical equipment is used in each **protection group**. The extent and nature of these failures should be recognized in the design and operation of the **SPS**.

- 2.2.3 In addition to the separation requirements **which one?** in the criteria **which one?**, area of common exposure should be kept to a minimum to reduce the possibility of all groups being disabled by a single event such as fire, evacuation, water leakage, and other such incidents.
- 2.3 Issues Affecting Security
- 2.3.1 An **SPS** should be designed to operate only for conditions which require its specific protective or control actions.
- 2.4 Issues Affecting Dependability and Security
- 2.4.1 **SPSs** should be no more complex than required **it does not say much** for any given application.
- 2.4.2 The components and software used in **SPSs** should be of proven quality, as demonstrated either by actual experience or by stringent tests under simulated operating conditions.
- 2.4.3 **SPSs** should be designed to minimize the possibility of component failure or malfunction due to electrical transients and interference or external effects such as vibration, shock and temperature.
- 2.4.4 **SPSs**, including intelligent electronic devices (IEDs) and communication systems used for **protection**, should comply with applicable industry standards for utility grade **protection** service. Utility Grade **Protection System Equipment** are equipment that are suitable for protecting transmission power system **elements**, that are required to operate reliably, under harsh environments normally found at substations. Utility grade equipment should meet the applicable sections of all or some of the following types of industry standards, to ensure their suitability for such applications:
- IEEE C37.90.1 (oscillatory surge and fast transient)
 - IEEE C37.90.1 (service conditions)
 - IEC 60255-22-1 (1 MHz burst, i.e. oscillatory)
 - IEC 61000-4-12 (oscillatory surge)
 - IEC 61000-4-4 (EFT)

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- IEC 60255-22-4 (EFT)
 - IEEE C37.90.2 (narrow-band radiation)
 - IEC 60255-22-3 (narrow-band radiation)
 - IEC 61000-4-3 (narrow-band radiation)
 - IEEE 1613 (communications networking devices in Electric power Substations)
- 2.4.4 **SPS** circuitry and physical arrangements should be carefully designed so as to minimize the possibility of incorrect operations due to personnel error.
- 2.4.5 **SPS** automatic self-checking facilities should be designed so as to not degrade the performance of the **SPS**.
- 2.4.6 Consideration should be given to the consequences of loss of instrument transformer voltage inputs to **SPSs**.
- 2.4.7 Consideration should be given to the effect of the means of arming on overall security and dependability of an **SPS**. Arming should have a level of security and dependability commensurate with the requirements of an **SPS**.

2.5 Issues Affecting Performance

2.5.1 Control Cable, Wiring and Ancillary Control Device

Control cables and wiring and ancillary control devices should be highly dependable and secure. Due consideration should be given to published codes and standards, fire hazards, current-carrying capacity, voltage drop, insulation level, mechanical strength, routing, shielding, grounding, and environment.

2.5.1 **2.5.2** Environment

2.5.1.1 **2.5.2.1** Means should be employed to maintain environmental conditions that are favorable to the correct performance of an **SPS**.

2.5.1.2. **2.5.2.2** Fire barrier used to separate the cabling of the two **protection groups** of an **SPS** in common raceway should be sufficiently rated to allow enough time to isolate the affected facility while maintaining operation of one **protection group**.

2.6 Operating Time of an **SPS**

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Adequate time margin should be provided taking into account study inaccuracies, differences in equipment, and **protection** operating times.

2.7 Arming of an **SPS**

Arming is the selection, which may be external to the **SPS**, of desired output action based on power system conditions and recognized contingencies. Arming requirements of an **SPS** are normally based upon the results of system studies, which take into account recognized contingencies, operating policies/procedures, and current power system load/generation conditions. For a simple **SPS**, arming may be an on/off function. An **SPS** can be armed either automatically or manually.

2.7.1 Automatic arming is implemented without human intervention.

2.7.2 Manual arming requires human intervention. Sufficient time, with adequate margin for recognition, analysis, and the taking of corrective action, should be allowed.

2.8 Voltage Transformer and Potential Device

Voltage transformer installations should be designed with due regard to ferroresonance. (added language consistent with D4, Appendix A, 2.7)

2.9 Communication Medium for **Teleprotection**

In cases where constraints do not allow three feet separation, this distance may be reduced if a proposed alternative design can achieve comparable physical protection of the communication medium. If an alternative design cannot be met, then an alternative communication path or protection scheme should be proposed. (additional guidance associated with new requirement in 5.11.1.1.2)

2.10 Maintenance Considerations

2.10.1 As an **SPS** may be complex and may interface with other **protection systems** or control systems, special attention should be placed on ensuring that test devices and test interfaces properly support a clearly defined maintenance strategy.

2.10.2 Proper overlap is ensured if each portion of circuitry is seen to perform its intended function, such as operating a relay, from either a real or test stimulus, while observing some common reliable downstream indicator.

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2.11 Grounding

Station grounding is critical to the correct operation of an **SPS**. The design of the ground grid directly impacts proper **SPS** operation and probability of false operation from **fault** currents or transient voltages,

2.12 Battery and Direct Current (dc) Supply

Protective devices protecting battery chargers and dc circuits should be coordinated to minimize the number of dc circuits interrupted.

Appendix B Procedure for the Review of a Special Protection System

1.0 Introduction

- 1.1. This Appendix provides the procedure to obtain concurrence from NPCC if an entity proposes a new, modification to or retirement of a **Special Protection System (SPS)**.
- 1.2. The proposing entity should allow sufficient lead time in order to accomplish all the steps in the process outlined here in. These processes are shown in the attached flow charts.
- 1.3. The following are involved in the review and approval process of the **SPS**:
 - Task Force on Coordination of Planning - TFCP
 - Task Force on System Protection - TFSP
 - Task Force on System Studies - TFSS
 - Task Force on Coordination of Operations – TFCO
 - Reliability Coordinating Committee – RCC

2.0 NPCC Review and Concurrence of a Proposed New or Modification to an Existing **SPS**

- 2.1. The proposing entity shall notify the TFCP Chairman and Secretary of its intention to install a new **SPS** or modify an existing **SPS**.

The notification shall include statements and analysis which describes:

- the proposed **SPS** Type (I, II, III) and rationale for classification,
- the need and location for the **SPS**,
- when the **SPS** is planned for service,
- how long the **SPS** is expected to be in service,
- the specific contingency(s) for which the **SPS** is designed to operate,
- the possible failure modes and the consequences of misoperation, unintended operation or failure of the **SPS**,
- for modification of an existing **SPS**, a descriptive statement of the modification, the current **SPS** type and the reason for the change, and
- a statement that the **SPS** is designed according to the Criteria and Standards requirements listed in this document.

- 2.2. TFCP shall forward the documentation from the proposing entity to TFSS to ~~determine~~ review and confirm the proposed ~~the~~ **SPS** Type.

Comment [r12]: Please clarify what constitutes a "modification"

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TFSS shall confirm the proposed SPS type by reviewing the analysis that the proposing entity has performed to determine the consequences of either a failure of the SPS to operate when and how it is required, or an inadvertent or unintended operation of the SPS. If necessary, TFSS shall request that the proposing entity conduct additional studies.

TFSS shall forward a summary of their findings ~~Should it be a kind of approval instead of findings-~~ confirming the type of the SPS to the TFCP Chairman and Secretary.

2.3. The review shall proceed as follows:

Type I or II SPS as described in 2.4
Type III SPS as described in 2.5

2.4. Approval of a New or Modification Type I or II SPS

Comment [OBERLIN13]: Fix phrasing

2.4.1. TFCP shall forward the documentation from the proposing entity and the TFSS findings to TFSP and TFCO.

2.4.2. TFSP shall confirm the failure modes of the SPS including actions of back-up protection, and whether or not the SPS complies with NPCC system **protection** standards. TFSP shall review whether the new or modified SPS is in conformance with the NPCC Regional Reliability Reference Directory #4 “*Bulk Power System Protection Criteria*”; and the NPCC Regional Reliability Reference Directory #7 “*Special Protection System Criteria*”.

TFSP shall forward a summary of its findings to TFCP.

2.4.3. TFCO shall review the operability of the SPS and shall assess its impact to operations if the SPS were to operate incorrectly or fail to operate, and any potential for unintended interaction with other special protection systems. TFCO shall provide a summary of its conclusions together with a statement accepting or rejecting the proposed installation of the new SPS or the modification of the existing SPS. TFCO shall include a statement that the new SPS or the modification of an existing SPS conforms to NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”.

TFCO shall forward a summary of its findings to TFCP.

2.4.4. TFCP shall review the SPS for conformance with NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”. TFCP

Comment [r14]: Please clarify what this means

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may return the application to the proposing entity for further clarification. (Add some more description of what TFCP is reviewing.)

Comment [r15]: This needs to be removed, and clarified

2.4.5. TFCP shall prepare a combined summary report including the proposing entity notification and the task force recommendations for evaluation by RCC.

2.4.6. RCC shall review the summary report and act on the proposal. RCC may approve or reject the proposal, or remand the review of the SPS back to TFCP.

Comment [r16]: Suggest deleting this text – it is not clear under which grounds a rejection could take place. Please edit chart to match this wording – the remand of the SPS goes to the TFCP

2.4.7. TFCP shall notify all the task forces and the proposing entity of the outcome of the review.

2.4.8. Upon RCC approval the SPS may be deployed.

2.4.9. TFSS shall update the NPCC Special Protection System list/database.

2.5. Approval of a New or Modification Type III SPS

Comment [OBERLIN17]: Fix phrasing

2.5.1. After review of the SPS for conformance with NPCC Regional Reliability Reference Directory #1 “*Design and Operation of the Bulk Power System*”, TFCP shall approve or reject the proposal- or remand the review of the SPS back to the proponent.

Comment [r18]: Suggest deleting this text – it is not clear under which grounds a rejection could take place

2.5.2. TFCP shall prepare a summary report including the proposing entity notification informing RCC of their conclusion.

2.5.3. TFCP shall notify all the task forces and the proposing entity of the outcome of the review.

2.5.4. Upon TFCP approval the SPS may be deployed.

2.5.5. TFSS shall update the NPCC Special Protection System list/database.

3.0 NPCC Review and Concurrence for the Retirement of an Existing SPS

3.1. The proposing entity shall notify the TFCP Chairman and Secretary of its intention to retire an existing SPS.

The notification shall include statements that describe:

- the identification and type of SPS being retired,
- the specific changes which have eliminated the need for the SPS, and

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- for a Type I or II **SPS**, the proposing entity will provide evidence that the **SPS** retirement does not have a **significant adverse impact** on the reliability of the **bulk power system**.

3.2. The review shall proceed as follows:

Type I or II SPS as described in 3.3
Type III SPS as described in 3.4

3.3. Approval to Retire a Type I or II **SPS**

3.3.1. TFCP shall forward the documentation from the proposing entity to TFSS.

TFSS shall review the analysis that the proposing entity has performed to determine the consequences of the removal of the **SPS** shall

Comment [r19]: This word needs to be deleted

TFSS shall forward a summary of their findings or concerns to the **TFCP Chairman and Secretary**.

Comment [r20]: TFSS is not clear on the role of TFCP after the TFSS review described in 3.3.1 is completed.

TFCP may return the application to the proposing entity for further clarification.

3.3.2. TFCP shall prepare a combined summary report including the proposing entity notification and TFSS recommendation for evaluation by RCC.

3.3.3. RCC shall review the summary report and act on the proposal. RCC may approve or reject the proposal, or remand the review of the **SPS** back to TFCP.

3.3.4. TFCP shall notify all the task forces and the proposing entity of the outcome of the review.

3.3.5. Upon RCC approval the **SPS** may be retired.

3.3.6. The TFSS shall update the NPCC **Special Protection System** list/database.

3.4. Retiring a Type III **SPS**

3.4.1. A formal approval to retire a Type III **SPS** is not required. TFCP shall notify all the task forces and the proposing entity of the retirement.

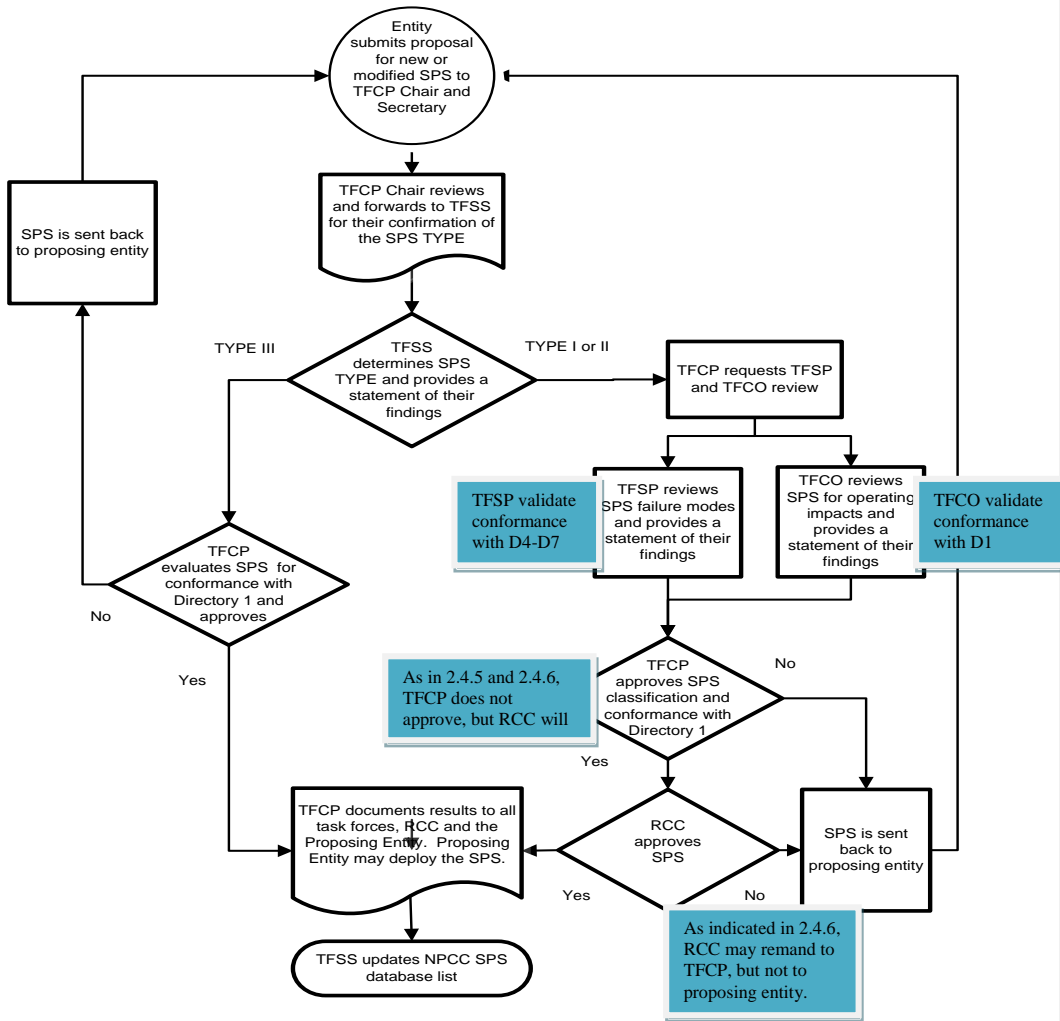
3.4.2. The **SPS** may be retired.

3.4.3. TFSS shall update the NPCC **Special Protection System** list/database.

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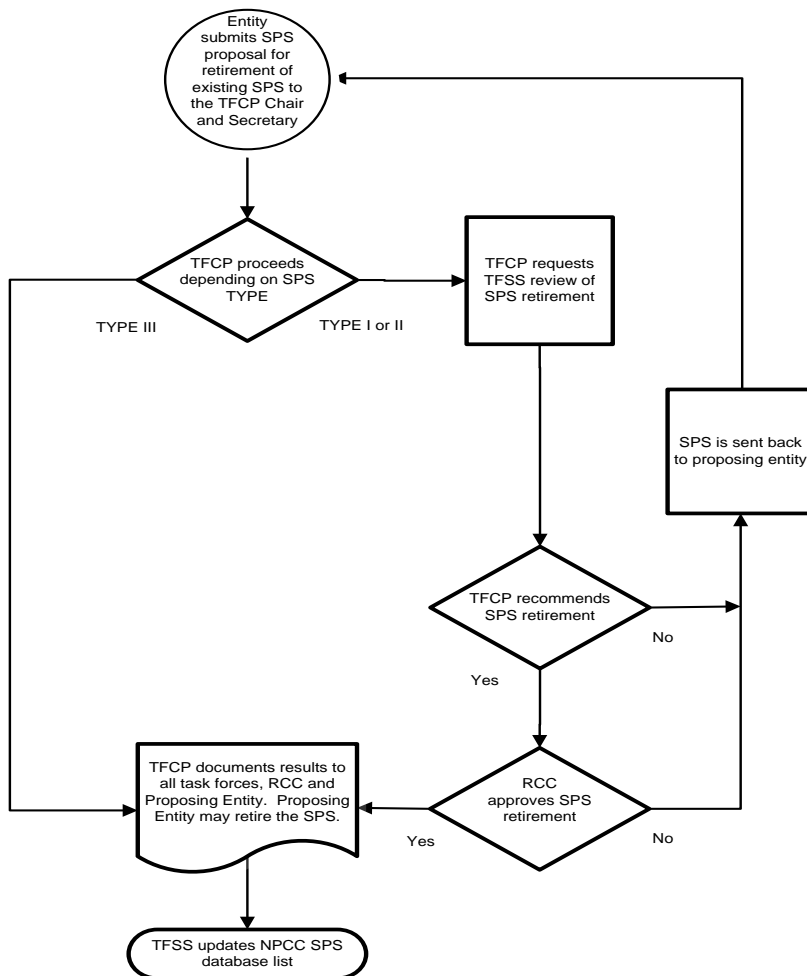
**FLOW CHART FOR REVIEW OF NEW OR MODIFIED
 SPECIAL PROTECTION SYSTEMS (SPS)**

Comment [r21]: Please update charts to match wording



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**FLOW CHART FOR RETIREMENT OF
SPECIAL PROTECTION SYSTEMS (SPS)**



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Appendix C

Procedure for Reporting to TFSP New and Modified Special Protection Systems

1.0 Introduction

In accordance with the applicable facilities described in Section 1.6.2 of this Directory (D7), Responsible Entity should provide the Task Force on System Protection (TFSP) with advance notification of any of its new **SPS** facilities, or significant changes in its existing **SPS** facilities. Notification should be made to the TFSP early in the engineering design stage.

2.0 Presentation and Review of SPSs

Each new or modified Type I or Type II **SPS** shall be reported to the Task Force on System Protection in accordance with the following presentation and review procedure.

- 2.1 A presentation will be made to the TFSP on new facilities or a modification to an existing facility when requested by an NPCC Member or the TFSP.
- 2.2 A presentation will be made to the TFSP when the design of the SPS facility deviates from the D7 Requirement(s).
- 2.3 A presentation will be made to the TFSP when an NPCC Member is in doubt as to whether a design meets the D7 Requirements.

3.0 Data Required for Presentation and Review:

- 3.1 The Responsible Entity will advise the TFSP of the basic design of the proposed system. The data will be supplied on the Protection System Review Form, accompanied by a geographical map, a one-line diagram of all affected areas, and the associated **protection** and control function diagrams. A physical layout of the **protection** panels and batteries for the purpose of illustrating physical separation will also be included.
- 3.2 The proposed **protection** system will be explained with due emphasis on any special conditions or design restrictions existing on the particular power system:

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4.0 Procedure for Presentation:

- 4.1 The Responsible Entity will arrange to have a technical presentation made to the TFSP.
- 4.2 To facilitate scheduling, the chairman of the TFSP will be notified approximately four months prior to the desired date of presentation.
- 4.3 Copies of materials to be presented will be distributed to TFSP members 30 days prior to the date of the presentation.

5.0 Review by TFSP

The TFSP will review the material presented and develop a position statement concerning the proposed **SPS**. This statement will indicate one of the following:

- 5.1 The need for additional information to enable the TFSP to reach a decision.
- 5.2 Acceptance of the Responsible Entity's statement of conformance to the D7 Requirements.
- 5.3 Acceptance of the submitted proposal.
- 5.4 *Conditional acceptance of the submitted proposal.
- 5.5 *Rejection of the submitted proposal

* Position Statements to include an indication of areas of departure from the intent of the D7 Requirements and suggestions for modifications to bring the **SPS** into conformance with the NPCC criteria.

- 5.6 The results of the TFSP review will be documented in the following manner.
 - A position statement will be included in the minutes of the meeting at which the proposed **SPS** was reviewed. The Chair of TFSP will be notified of the position statement.
 - If necessary, a letter outlining areas of non-conformance with the NPCC D7 Requirements and recommendations for correction will be submitted to the Responsible Entity.
 - The Task Force will maintain a record of all the reviews it has conducted.

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