Methodology for Defining Planning Coordinator Areas in the WECC Region

Planning Coordinator Function Task Force (PCFTF)

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WECC

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Executive Summary

The purpose of the Planning Coordinator function is to "coordinate, facilitate, integrate and evaluate (generally one year and beyond) transmission facility and service plans and resource plans within a Planning Coordinator area and coordinate those plans with adjoining Planning Coordinator areas."[1] Currently, there are 31 registered Planning Coordinators in the WECC[2] Region. Within the past few years there has been a growing concern that gaps in reliability could exist because there are entities that are neither registered for the Planning Coordinator function nor identified in another entity's Planning Coordinator area. This concern was elevated following the final assessment of the September 8, 2011 "Southwest Outage" event.

In consideration of this event, WECC acknowledged the potential gap and recognized there could be a reliability risk if Bulk Electric System (BES) Facilities do not fall under the purview of a Planning Coordinator.[3] Subsequently, the WECC Planning Coordination Committee (PCC) established a Planning Coordinator Function Task Force (PCFTF) to consider and, if possible, address identified Planning Coordinator gap issues and to develop an approach to address the issues that is in the interest of all WECC stakeholders.[4]

This report documents the results, conclusions, and recommendation of the PCFTF.

Summary of Conclusions

The Planning Coordinator function is to ensure, through coordination among other functional entities, that reliability concerns are identified, considered and addressed for all entities under its purview. For the Western Interconnection to minimize reliability risk and consistently address compliance obligations within its network, there is an expectation that every BES Facility will be included in a Planning Coordinator area. Based on this understanding, the PCFTF, through its assessment of the Planning Coordinator function within the Western Interconnection, reached the following general conclusions:

1. A Planning Coordinator, as a registered entity, is not required by any NERC Reliability Standard to include within its Planning Coordinator area, adjacent BES Facilities owned and/or operated by other entities (TOs, GOs, GOPs, etc.) connected to its system.
2. The lack of a requirement for a Planning Coordinator to consider adjacent systems within its Planning Coordinator area has led to confusion and uncertainty about the roles and

[1] See NERC Functional Model V5 and NERC Reliability Functional Model Technical Document V5
[2] The number of WECC Planning Coordinators in the NERC Compliance Registry as of June 26, 2015.
[3] WECC Settlement, Docket No. IN14-11-000, Paragraph 32.
[4] PCC Report WECC Board of Directors Meeting March 11, 2015

responsibilities of the Planning Coordinator as they relate to adjacent entities that are connected to a Planning Coordinator's system. In certain cases, adjacent entities believed that a Planning Coordinator they were connected to was performing the Planning Coordinator function on their behalf because they were sharing information through the planning process.

3. In certain situations, Planning Coordinators acknowledge that they are only performing the Planning Coordinator function for their own BES Facilities, even though in many cases they are including assets owned by adjacent entities in their planning activities. Extending the Planning Coordinator compliance function to adjacent entities is in large part, perceived to be a compliance risk and financial burden that a Planning Coordinator may be unwilling to bear on behalf of these adjacent entities.
4. In examining the perceived reliability gap associated with the Planning Coordinator function, it appears that the majority of the Planning Coordinator reliability functions are currently being performed through established planning processes. Entities are providing information to a Planning Coordinator and the Planning Coordinator is including that information in its respective planning processes; even in situations where no formal Planning Coordinator "relationship" exists between the two entities.
5. The role of the Planning Coordinator is defined in both the NERC *Rules of Procedure* and *NERC Functional Model*; however, inconsistencies between the two documents has led to a lack of clarity about the responsibilities of a Planning Coordinator, making it a challenge for Planning Coordinators to effectively and consistently define their Planning Coordinator areas.
6. The majority of NERC Reliability Standards (Standards) applicable to the Planning Coordinator function are *also* applicable to the Transmission Planner function, which leads to additional confusion regarding the Transmission Planner's role and relationship to the Planning Coordinator.
7. Recently approved standards[5] include additional compliance requirements applicable to the Planning Coordinator function, further adding to the importance of the Planning Coordinator function to the reliability of the interconnected network. This, in turn, reinforces the importance of addressing the lack of clarity of the relationship between a Planning Coordinator and those non-Planning Coordinator entities that are adjacent to and connected to a Planning Coordinator.
8. Planning Coordinator responsibilities are intended to overlay a specifically defined area that includes BES Facilities and other certain registered functions as articulated by the Standards. Considering the hesitation to change established practices in the Western Interconnection, developing a voluntary unified approach within the Western Interconnection to define a Planning Coordinator area appears to be infeasible. There are; however, several different methodologies presented in this paper that could be used to provide entities with a range of options of choice to define a Planning Coordinator area.

[5] Standards that necessitate this relationship include, but are not limited to, CIP-002-5, CIP-014, PRC-023, MOD-032

9. The PCFTF believes that no particular methodology that is presented in this paper is superior to the others; however, there are several that offer more compatibility and may be easier to implement within certain areas in the Western Interconnection.
10. Absent regulatory changes, the relationship between a Planning Coordinator and adjacent entities would change very little except on a voluntary basis. PCFTF recognizes that even if a Planning Coordinator area is defined, if parties within that area are unwilling to formalize a relationship, a gap may remain.
11. The PCFTF recognizes that Planning Coordinators may accrue new costs due to the additional work required and liability assumed from acknowledging and accepting new entities and facilities into their Planning Coordinator footprints. Additional work could be required by the Planning Coordinator to document full compliance with all applicable reliability standards. This work may include performing new system studies, reviewing and coordinating methodologies and study results with neighboring registered entities. Depending on the complexity and amount of the additional work required, the Planning Coordinator may request reimbursement for these costs from the registered entities they are acting as the Planning Coordinator for. These costs should be taken into consideration as registered entities and Planning Coordinators enter into formal agreements and create official Planning Coordinator relationships.

Summary of Recommendations

Based on the results and conclusions documented in this report, the PCFTF makes the following recommendations until a final solution can be thoroughly vetted within NERC, the following "short" and "long" term actions are proposed:

Short Term

1. The Planning Coordination Committee should create a task force to work with industry within the Western Interconnection to close Planning Coordinator gaps within existing planning cycles. The task force could consider the methodologies presented in this report as a means to initiate dialog among entities within the Western Interconnection. See Appendix 5: Planning Coordinator (PC) Gap Resolution Team (GRT) – PC- GRT.
2. Planning Coordinators should voluntarily, but formally, agree to include BES Facilities owned by other entities in their Planning Coordinator footprint.
3. Through a coordinated implementation plan, the ERO Enterprise compliance program should provide the Planning Coordinators flexibility and time to establish relationships, and incorporate additional facilities into their Planning Coordinator footprint within their normal planning cycles. The entities would provide a timetable for completing the effort, and provide periodic reports to WECC on the progress. See Appendix 7: Implementation Plan.
4. Initiate an effort to revise the NERC *Rules of Procedure*, *Glossary of Terms*, *Functional Model*, Registration Criteria and applicable standards, as necessary, to more clearly define the role and intent of a Planning Coordinator, and to provide the definition of a Planning Coordinator area.

Long Term

1. The NERC Functional Model lacks the clarity that is needed to effectively implement the Planning Coordinator function. Consideration should be given to initiating a review and revision of the document to ensure that it reflects the role of the Planning Coordinator and the boundaries of a Planning Coordinator's area.
2. To facilitate system reliability and ensure that planning is conducted in a manner commensurate with the NERC Functional Model, a Planning Coordinator must have a mechanism to ensure it can obtain data and work with all entities within its Planning Coordinator purview regardless of registration status. This could be achieved through changes in the NERC Functional Model and/or applicable Standards.
3. New or revised Standards should be written in a way that clearly delineates the roles and responsibilities of the Planning Coordinator and the Transmission Planners. For example, many planning Standards list both the Planning Coordinator and the Transmission Planner under the same requirement. Revisions should clarify the intended hierarchal role and responsibility. See Appendix 8: Roles and Responsibilities of Planning Coordinator and Transmission Planner.

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Introduction

The Planning Coordinator Function Task Force (PCFTF) was established by the WECC Planning Coordination Committee (PCC) to address identified Planning Coordinator gap issues and develop an approach to address the issues that would be in the interest of all WECC stakeholders. In general, the PCFTF focused on:

1. Identifying, reviewing and assessing Planning Coordinator issues within WECC with the intent of developing an approach and methodology to address these issues to arrive at a solution that best serves the interests of all stakeholders in the region;
2. Preparing a white paper for the PCC's consideration and feedback that documents the results, conclusions, and recommendations reached by the PCFTF;
3. Proposing, if possible, an approach and methodology to address the issues and concerns considered by the PCFTF;
4. Working with WECC Registered Entity Oversight staff to consider a framework for helping functional entities meet the intent of the Planning Coordinator function;
5. Working with WECC staff to close Planning Coordinator gaps while mitigating potential compliance concerns.

The PCFTF developed a list of guiding principles that provided guidance to the task force when developing this paper (see Appendix 4: PCFTF Guiding Principles).

Background

The Functional Model framework defines the reliability functions such that any organization involved in ensuring reliability could identify the functions it performs, and register with NERC as one or more of the functional entities. Following the Energy Policy Act of 2005, entities who engaged as owners, operators, or users of the Bulk Electric System (as defined by NERC) were required to register, as applicable, with NERC as one or more of the functions listed in the Functional Model since January 2006. Per the NERC Glossary, Planning Coordinator and Planning Authority are synonymous.

Per the NERC Functional Model, the individual BES asset[6] is the "building block" for defining areas where BES operations and planning functions reside. That is, these building blocks are the individual transmission, generation and other assets that collectively constitute the BES. This allows any given BES asset to be associated with a single organization for reliability and compliance purposes. An asset-specific approach to establishing a functional entity's responsibilities facilitates the clear assignment of responsibility for managing the potential reliability impacts of the asset, and is also helpful in avoiding potential gaps in coverage across functional entities responsible for overlapping or adjacent facilities.

[6]Regardless of asset ownership.

Further, the Functional Model anticipates that organizations involved in ensuring reliability will define the areas over which their functional responsibilities apply. Gaps or areas of overlapping responsibility can be identified and eliminated through coordination with neighboring entities that have also defined their functional responsibilities. It follows that areas should be well-defined to ensure clear responsibilities for compliance with ERO Reliability Standards.

Discussion

Role of the Planning Coordinator

The role of the Planning Coordinator function is to coordinate, facilitate, integrate and evaluate (generally one year and beyond) transmission facility and service plans, and resource plans within a Planning Coordinator area and coordinate those plans with adjoining Planning Coordinator areas. However, the PCFTF learned that both registered and non-registered entities are reluctant to be included in the purview of a Planning Coordinator area because they perceive that doing so would subject them to additional compliance exposure, additional resource costs, and a potential misinterpretation of a Planning Coordinator's authority. As such, many entities have self-registered for the Planning Coordinator function for their BES Facilities while abstaining from formalizing existing relationships built on past planning activities.

Planning Coordinators should work through a variety of mechanisms to conduct facilitated, coordinated, joint, centralized, or regional planning activities so that all network areas, regardless of the extent of their interconnections, are completely coordinated for planning activities.

The PCFTF reviewed the NERC Function Model and the definitions of the Planning Coordinator (PC), Transmission Planner (TP) and Resource Planner (RP). There is an overlap between the roles and responsibilities between the PC and TP that contributes to the lack of clarity of assets included in the PC footprint.

The PCFTF identified four constructs of registration:

1. Planning Coordinator covering a very large area,
2. Planning Coordinator covering a small area with only one Transmission Planner and Resource Planner,
3. A group of Transmission Planners forming a regional analysis group to fulfill the planning reliability function, and
4. A Regional Entity forming a regional analysis group to fulfill the planning reliability function.

Currently, there are approximately 80 entities registered as Planning Coordinators with NERC, 31 of which are in the WECC Region, ranging from municipal utilities to ISOs/RTOs. Given the entities in

WECC that have registered with NERC and the NERC Reliability Standards that are applicable to a Planning Coordinator, the PCFTF observes two points:

First—based on the information available from NERC and/or WECC, there is no way for the PCFTF to ascertain if a registered entity such as a Generator Owner or Distribution Provider, among others, is associated with a Planning Coordinator. The survey conducted by WECC, which is discussed later in this white paper, does provide some insight into where Planning Coordinator gaps may exist, but the results are not conclusive.

Second—there are entities that should either be registered as or associated with a Planning Coordinator, but are neither. This contributes to the observation that reliability gaps exist. If each Planning Coordinator is responsible for *"assessing the longer-term reliability of its Planning Coordinator area,"*[7] the question becomes, "How are Planning Coordinator areas determined?"

The relationships between NERC-defined functional entities are hierarchical in nature. For example:

- All Facilities should be under the purview of a Transmission Planner and a Resource Planner;
- All Resource Planners and Transmission Planners should be affiliated with one or more Planning Coordinator(s).

Some planning requirements apply solely to the Planning Coordinator and, since it has been established that there are areas where no Planning Coordinator exists, a potential reliability gap exists for some reliability standards. In some instances, entities may reside in geographical proximity to one another yet have no existing business relationship among facility owners and Planning Coordinator entities; nor are they required to identify or establish such a hierarchal relationship by the NERC registration process. This leads to a potential gap in both registration and reliability.

Planning Coordinators need the flexibility and time to incrementally add facilities to their Planning Coordinator areas, and incorporate them into existing planning cycles to establish accurate models. It can take anywhere from nine months to two years to fully incorporate the newly identified facilities in the Planning Coordinator's models. Allowing flexible implementation will encourage Planning Coordinators and non-Planning Coordinators to establish a relationship. As such, the PCFTF understands that, to ensure proper planning, a Planning Coordinator should account for and work with all entities within its Planning Coordinator purview regardless of registration status.

Ideal State

In an ideal state, the Planning Coordinator area(s) will be defined such that every BES Facility is included in a Planning Coordinator area. This should also include non-BES Facilities that are critical or that impact reliability and are necessary for planning and/or operational functions. Non-registered

[7] NERC Reliability Functional Model Technical Document – Version 5 (May 2010).

entities would cooperate fully with their designated Planning Coordinator to ensure overall models and planning activities are accurate.

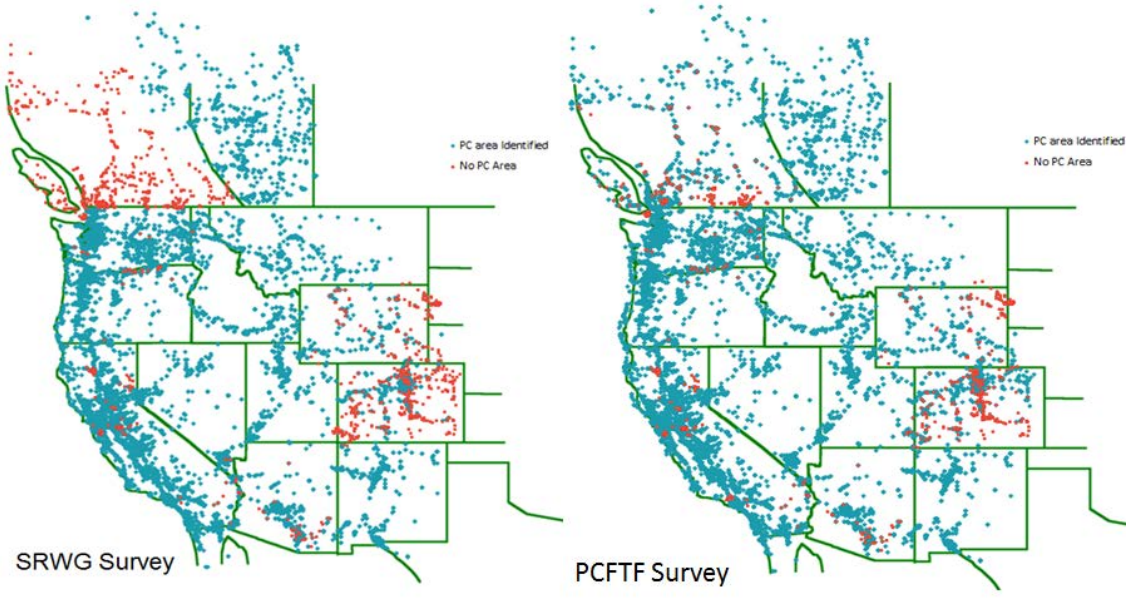
WECC Survey

In November 2013, the WECC System Review Work Group (SRWG) conducted a survey to identify Planning Coordinator coverage within a WECC power flow model. The purpose of the survey was to identify potential modeling gaps resulting from implementation of the MOD-032 Standard, which transfers the obligation for WECC base-case data collection and submission to Planning Coordinators as opposed to the historical WECC Area Coordinator role. SRWG members were asked in the survey to identify which buses in the 14hs4a Operating Case fell under their Planning Coordinator footprint (see figure below SRWG Survey).

Since the survey was conducted, the results have been shared in various forums (e.g., the Compliance User Group) to provide an estimate for Planning Coordinator coverage gaps within the Western Interconnection. Although the primary purpose of the survey was modeling related, the results have been very useful to the Planning Coordinator Function Task Force (PCFTF) and others in illustrating facilities within the Western Interconnection that do not have a designated Planning Coordinator.

Within the forums where the initial survey results were shared, it was noted that several of the SRWG members responding to the survey may have responded without soliciting a collective opinion for their respective organizations. As a result, the survey was reissued to SRWG representatives and issued to contacts from the WECC Registered Entity Oversight Department to make sure that responses better collectively represented entities. The results of the PCFTF survey are illustrated in Figure 1.

Figure 1: WECC Survey Results



Both surveys were based on WECC base-case bus data. In the PCFTF survey, 2278 more buses were claimed by a Planning Coordinator than in the SRWG survey. Because the survey questions focused on buses from a base case, responses for equipment such as transmission lines or generators connected to those buses were not collected and there were some instances where the Planning Coordinator claimed the bus but did not claim any of the equipment associated with that bus. In the 14hs4a Operating Case there were a total of 19,478 buses and approximately 91 percent of the buses were claimed by a Planning Coordinator. The remaining 9 percent of the total buses were unclaimed in the responses. 2 percent of the total were in the British Columbia area, Roughly 1 percent of the unclaimed buses are generator buses, 3 percent of unclaimed buses are in the Colorado area, and the remaining of 3 percent of unclaimed buses are scattered throughout the west.

Inconsistencies Between the NERC Functional Model and NERC Rules of Procedure

There appears to be inconsistency between the NERC Functional Model and the NERC *Rules of Procedure* regarding the Planning Coordinator functional role, and whether there can be more than one Planning Coordinator for a given BES element. The sections below illustrate the areas of inconsistency.

The description of the Planning Coordinator from the NERC Reliability Functional Model Technical Document — Version 5 states:

> ...the Planning Coordinator area must cover at least one Transmission Planner area and one Resource Planner area, or part thereof if either or both of these planner areas are larger than the Planning Coordinator area. On the other hand, there is the possibility that a Planning Coordinator area could be nested inside an even larger Planning Coordinator area provided the smaller Planning Coordinator does in fact perform the appropriate system assessments. In this special case, the larger Planning Coordinator would perform the ultimate planning coordinating function for all the Resource Planners, Transmission Planners and smaller Planning Coordinators in its area. As an example, some ISOs and RTOs perform the Reliability Planning Functions but they are also under the purview of the Regional Entity that also performs the Reliability Planning Functions at a broader scale.
>
> In many areas, there may exist more than one Transmission Planner and Resource Planner, as well as a nested Planning Coordinator, within a Planning Coordinator area, each performing a different role demarcated primarily by their particular function and scale (area-wise) of assessments performed. In these cases, delineation of the role of the various functional entities needs to be clearly defined in the regional reliability plan(s).

Guiding Principle #3 of the NERC Functional Model — Version 5 states:

> The Model is structured to ensure there are no gaps or overlaps in the performance of operation Tasks in the operating timeframe anywhere in the Bulk Electric System. This is achieved in part by associating an "area" of purview for each functional entity. Areas are

> defined in terms of the individual transmission, generator and customer equipment assets that collectively constitute the Bulk Electric System. For example, each Bulk Electric System asset has one Reliability Coordinator, one Balancing Authority, and one Transmission Operator. Regarding overlaps for planning, as described in the Technical Document, it is not always possible to achieve this in the case of planning Functions, where there may be overlapping levels of responsibility for given assets. Questions regarding relationships between the areas of different functional entities, such as whether one type of area must be totally within another type of area, will be defined in Reliability Standards or the *Rules of Procedure*, not the Model.

However, the NERC *Rules of Procedure* seem to indicate that there can only be one Planning Coordinator for each BES element. Section 501 ("Scope of the Organization Registration and Organization Certification Programs") of the *Rules of Procedure* state:

> "1.4.3 Ensure that all transmission Facilities of the Bulk Power System are the responsibility and under the control of one and only one Transmission Planner, Planning Authority, and Transmission Operator."

Current State

A Planning Coordinator area is represented through the individual transmission, generation and customer equipment assets that collectively constitute the entirety of the BES that the Planning Coordinator is coordinating. The Functional Model states: "The boundaries for the Planning Coordinator area are basically defined by the location of the Bulk Electric System (BES) Facilities under the purview of the Planning Coordinator, i.e. those facilities for which the Planning Coordinator coordinates and evaluates and recommends reinforcement and corrective plans resulting from studies and analysis of system performance and interconnection of facilities. The BES Facilities under its purview are generally contiguous and cover in aggregate the same areas as the Transmission Planners it coordinates."

The Rules of Procedures state that all BES facilities must be under the purview of a Planning Coordinator. If all entities were registered as a Planning Coordinator, there would be a profusion of Planning Coordinator areas throughout the Western Interconnection;(e.g., there would be 302 Planning Coordinator Areas based on the NERC Active Compliance Registry Matrix as of May 15, 2015). Considering the expectation that a "Planning Coordinator by its very nature will generally take responsibility over a wider perspective than the Transmission Planners for which its coordinates," the PCFTF concludes that the intent of the Functional Model is to minimize the number of Planning Coordinators within any given Reliability Coordinator's area of purview. Or put another way, defining broader Planning Coordinator areas is recommended.

Summary of Proposed Methodologies

The PCFTF has determined there are several methodologies that can be utilized by Planning Coordinators in order to identify a Planning Coordinator area. While not all methodologies will work

effectively across the entire Western Interconnection, those considered cover a wide spectrum of options and offer flexibility for Planning Coordinators. The PCFTF recognizes that other methodologies not detailed in this paper could also be used. A detailed summary of the proposed methodologies are included in Appendix 1.

1. Balancing Authority Area

   The existing Balancing Authority (BA) area footprints currently contain boundaries and demarcation points where power flows are measured, and areas of responsibilities have been pre-determined and assigned. These BA footprints are non-overlapping, which places each BES facility within a defined BA geographical boundary. Generally, under the BA Area Method, the Planning Coordinator areas would mirror the existing BA areas and would encompass all Resource Planners, Transmission Planners, and all BES elements in the Western Interconnection. WECC has published a map of all of the BAs in the region that illustrates their interlocking and non-overlapping footprints (see Appendix 2).

2. Operational Control

   Using this methodology, the definition of a Planning Coordinator area boundary is determined by the BES transmission network that is under the operational control of a Transmission Operator (TOP). In addition to the facilities that are under a Transmission Operator's operational control, the facilities of Distribution Providers and Generator Owners that connect to the Transmission Operator's transmission network also form a Planning Coordinator area.

3. Requirements Analysis and Mapping

   The Requirement Analysis and Mapping concept starts with a list of the applicable Planning Coordinator requirements, and a larger entity's customer base. It then identifies facilities and facilities' owners as being either in or out of the Planning Coordinator area based on an analysis of which entity currently performs the duties defined in the applicable Standards. Adjacent affected Planning Coordinators would agree to exceptions on a case-by-case basis. Where agreement cannot be reached, the performance of Transmission Service Provider, Balancing Authority, or Transmission Operator functions are taken into consideration to determine the default Planning Coordinator.

4. Area Coordinator

   The Area Coordinator approach has been proposed as an option that aligns with the boundaries currently used for coordinating power flow and stability data in WECC cases. The actual Planning Coordinator boundaries are based on the facilities a Planning Coordinator reports either directly to WECC as the Area Coordinator or to an Area Coordinator that aggregates data across several Planning Coordinator areas. Power flow and stability data coordination encompasses a number of NERC Planning Coordinator requirements. The footprint for any particular Area Coordinator is readily identifiable based on data contained in WECC databases. Planning Coordinators within that footprint will be able to easily identify the subset of facilities they are responsible for coordinating.

5. Western Interconnection Planning Coordinator – Wide Area Planning Coordinator

A "wide area Planning Coordinator" would ensure complete Planning Coordinator coverage of all facilities within the Western Interconnection. The concept of a wide area Planning Coordinator does not require that the wide area Planning Coordinator would take on all Planning Coordinator functions for all entities. However, it would be an option for the wide area Planning Coordinator to perform all Planning Coordinator responsibilities for some entities.

6. Third-Party Service

   Finally, entities with facilities that have not been included in a defined Planning Coordinator area might enter into a contractual agreement with a third party for performance of the Planning Coordinator functions for the area. The third party would register as a Planning Coordinator, and would coordinate with other Planning Coordinators in the Western Interconnection.

Summary of Conclusions

The Planning Coordinator function is to ensure, through coordination among other functional entities, that reliability concerns are identified, considered and addressed for all entities under its purview. For the Western Interconnection to minimize reliability risk and consistently address compliance obligations within its network, there is an expectation that every BES Facility will be included in a Planning Coordinator area. Based on this understanding, the PCFTF, through its assessment of the Planning Coordinator function within the Western Interconnection, reached the following general conclusions:

1. A Planning Coordinator, as a registered entity, is not required by any NERC Reliability Standard to include within its Planning Coordinator area, adjacent BES Facilities owned and/or operated by other entities (TOs, GOs, GOPs, etc.) connected to its system.
2. The lack of a requirement for a Planning Coordinator to consider adjacent systems within its Planning Coordinator area has led to confusion and uncertainty about the roles and responsibilities of the Planning Coordinator as they relate to adjacent entities that are connected to a Planning Coordinator's system. In certain cases, adjacent entities believed that a Planning Coordinator they were connected to was performing the Planning Coordinator function on their behalf because they were sharing information through the planning process.
3. In certain situations, Planning Coordinators acknowledge that they are only performing the Planning Coordinator function for their own BES Facilities, even though in many cases they are including assets owned by adjacent entities in their planning activities. Extending the Planning Coordinator compliance function to adjacent entities is in large part, perceived to be a compliance risk and financial burden that a Planning Coordinator may be unwilling to bear on behalf of these adjacent entities.
4. In examining the perceived reliability gap associated with the Planning Coordinator function, it appears that the majority of the Planning Coordinator reliability functions are currently being performed through established planning processes. Entities are providing information to a

Planning Coordinator and the Planning Coordinator is including that information in its respective planning processes; even in situations where no formal Planning Coordinator "relationship" exists between the two entities.

5. The role of the Planning Coordinator is defined in both the NERC *Rules of Procedure* and *NERC Functional Model*; however, inconsistencies between the two documents has led to a lack of clarity about the responsibilities of a Planning Coordinator, making it a challenge for Planning Coordinators to effectively and consistently define their Planning Coordinator areas.
6. The majority of NERC Reliability Standards (Standards) applicable to the Planning Coordinator function are *also* applicable to the Transmission Planner function, which leads to additional confusion regarding the Transmission Planner's role and relationship to the Planning Coordinator.
7. Recently approved standards[8] include additional compliance requirements applicable to the Planning Coordinator function, further adding to the importance of the Planning Coordinator function to the reliability of the interconnected network. This, in turn, reinforces the importance of addressing the lack of clarity of the relationship between a Planning Coordinator and those non-Planning Coordinator entities that are adjacent to and connected to a Planning Coordinator.
8. Planning Coordinator responsibilities are intended to overlay a specifically defined area that includes BES Facilities and other certain registered functions as articulated by the Standards. Considering the hesitation to change established practices in the Western Interconnection, developing a voluntary unified approach within the Western Interconnection to define a Planning Coordinator area appears to be infeasible. There are; however, several different methodologies presented in this paper that could be used to provide entities with a range of options of choice to define a Planning Coordinator area.
9. The PCFTF believes that no particular methodology that is presented in this paper is superior to the others; however, there are several that offer more compatibility and may be easier to implement within certain areas in the Western Interconnection.
10. Absent regulatory changes, the relationship between a Planning Coordinator and adjacent entities would change very little except on a voluntary basis. PCFTF recognizes that even if a Planning Coordinator area is defined, if parties within that area are unwilling to formalize a relationship, a gap may remain.
11. The PCFTF recognizes that Planning Coordinators may accrue new costs due to the additional work required and liability assumed from acknowledging and accepting new entities and facilities into their Planning Coordinator footprints. Additional work could be required by the Planning Coordinator to document full compliance with all applicable reliability standards. This work may include performing new system studies, reviewing and coordinating methodologies and study results with neighboring registered entities. Depending on the complexity and amount of the additional work required, the Planning Coordinator may request reimbursement

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for these costs from the registered entities they are acting as the Planning Coordinator for. These costs should be taken into consideration as registered entities and Planning Coordinators enter into formal agreements and create official Planning Coordinator relationships.

Summary of Recommendations

Based on the results and conclusions documented in this report, the PCFTF makes the following recommendations until a final solution can be thoroughly vetted within NERC, the following "short" and "long" term actions are proposed:

Short Term

1. The Planning Coordination Committee should create a task force to work with industry within the Western Interconnection to close Planning Coordinator gaps within existing planning cycles. The task force could consider the methodologies presented in this report as a means to initiate dialog among entities within the Western Interconnection. See Appendix 5: Planning Coordinator (PC) Gap Resolution Team (GRT) – PC- GRT.
2. Planning Coordinators should voluntarily, but formally, agree to include BES Facilities owned by other entities in their Planning Coordinator footprint.
3. Through a coordinated implementation plan, the ERO Enterprise compliance program should provide the Planning Coordinators flexibility and time to establish relationships, and incorporate additional facilities into their Planning Coordinator footprint within their normal planning cycles. The entities would provide a timetable for completing the effort, and provide periodic reports to WECC on the progress. See Appendix 7: Implementation Plan.
4. Initiate an effort to revise the NERC *Rules of Procedure*, *Glossary of Terms*, *Functional Model*, Registration Criteria and applicable standards, as necessary, to more clearly define the role and intent of a Planning Coordinator, and to provide the definition of a Planning Coordinator area.

Long Term

1. The NERC Functional Model lacks the clarity that is needed to effectively implement the Planning Coordinator function. Consideration should be given to initiating a review and revision of the document to ensure that it reflects the role of the Planning Coordinator and the boundaries of a Planning Coordinator's area.
2. To facilitate system reliability and ensure that planning is conducted in a manner commensurate with the NERC Functional Model, a Planning Coordinator must have a mechanism to ensure it can obtain data and work with all entities within its Planning Coordinator purview regardless of registration status. This could be achieved through changes in the NERC Functional Model and/or applicable Standards.
3. New or revised Standards should be written in a way that clearly delineates the roles and responsibilities of the Planning Coordinator and the Transmission Planners. For example, many planning Standards list both the Planning Coordinator and the Transmission Planner under the

same requirement. Revisions should clarify the intended hierarchal role and responsibility. See Appendix 8: Roles and Responsibilities of Planning Coordinator and Transmission Planner.

Disclaimer

WECC receives data used in its analyses from a wide variety of sources. WECC strives to source its data from reliable entities and undertakes reasonable efforts to validate the accuracy of the data used. WECC believes the data contained herein and used in its analyses is accurate and reliable. However, WECC disclaims any and all representations, guarantees, warranties, and liability for the information contained herein and any use thereof. Persons who use and rely on the information contained herein do so at their own risk.

Appendix 1: Detailed Description of Proposed Methodology

The following is a detailed description of each of the six proposed methodologies for defining a Planning Coordinator area.

1. Balancing Authority Area

One method for establishing Planning Coordinator areas in the Western Interconnection is to use the footprints of the existing Balancing Authorities. NERC Reliability Standard BAL-005-0.2b Requirement R1 states the following, "All generation, transmission and load operating within an Interconnection must be included within the metered boundaries of a Balancing Authority Area."

Therefore all BES facilities must be associated with and included within a given Balancing Authority Area. For this reason, the BA Area Method is a straightforward process for associating all BES facilities to a Planning Coordinator area.

The BA Area Method has several distinct advantages that allow it to be universally applied throughout the WECC Region, such as:

- Provides readily-identifiable boundaries between neighboring BAs;
- Uses this boundary to identify Planning Coordinators within each BA area;
- Is repeatable for each of the 34 current BAs in the Western Interconnection;
- In most cases, provides a wide-area view of distinct operational areas;
- Ensures every BES element is contained within a Planning Coordinator area; and
- Minimizes the number of NERC-registered Planning Coordinators.

Owing to these advantages, the BA Area Method could be applied throughout the Interconnection as either a single solution to fill the Planning Coordinator gaps in the WECC Region, or could be leveraged in combination with the other identified solutions. Following is a discussion of the primary advantages of the BA Area Method, along with several examples of its application.

Application of the BA Area Method

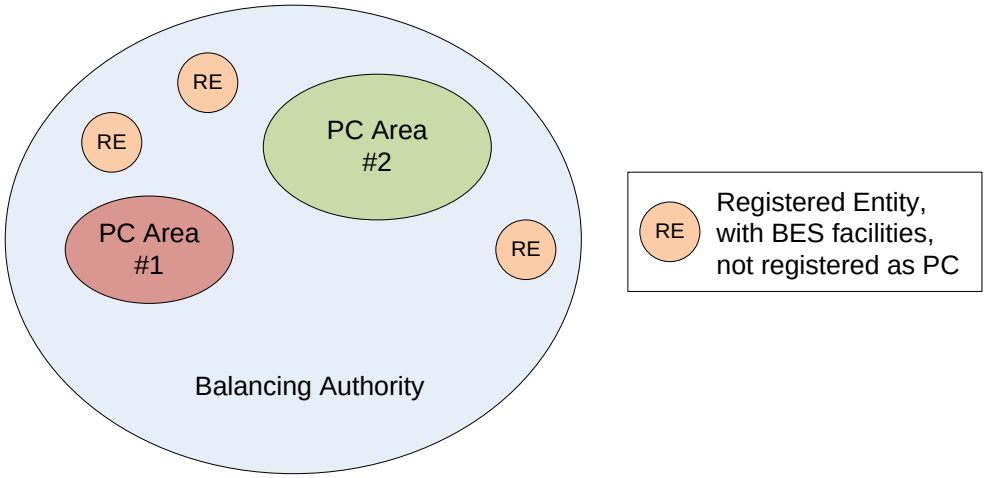
The BA Area Method would work well for the 25 BAs in the WECC Region that are already registered as Planning Coordinators.[9] They would assume the role of the Planning Coordinator for those entities within their BA footprint who have BES facilities, but are not registered as a Planning Coordinator. If a BA that is not already registered as a Planning Coordinator chooses to use this methodology, it would have to either register for the Planning Coordinator function, or find another Planning Coordinator who would be willing to assume the Planning Coordinator responsibilities for their BA area. This latter

[9] The number of BAs that are also registered as Planning Coordinators was obtained from the NERC functional registry dated June 26, 2015. See Appendix 3 for a complete analysis of WECC BA-registered entities.

solution may be applicable to the BAs whose footprint contains only generation assets and are registered as a BA only.

Figure 2 below, illustrates a situation where the BA Area Method could be applied. A BA area is depicted, consisting of two Planning Coordinator Areas and three non-Planning Coordinator entities within the BA footprint, where the BA may or may not be registered as a Planning Coordinator. The BA Area Method would be leveraged to determine a logical scenario that would bring the non-Planning Coordinator entities with BES facilities into the area of purview of a registered Planning Coordinator.

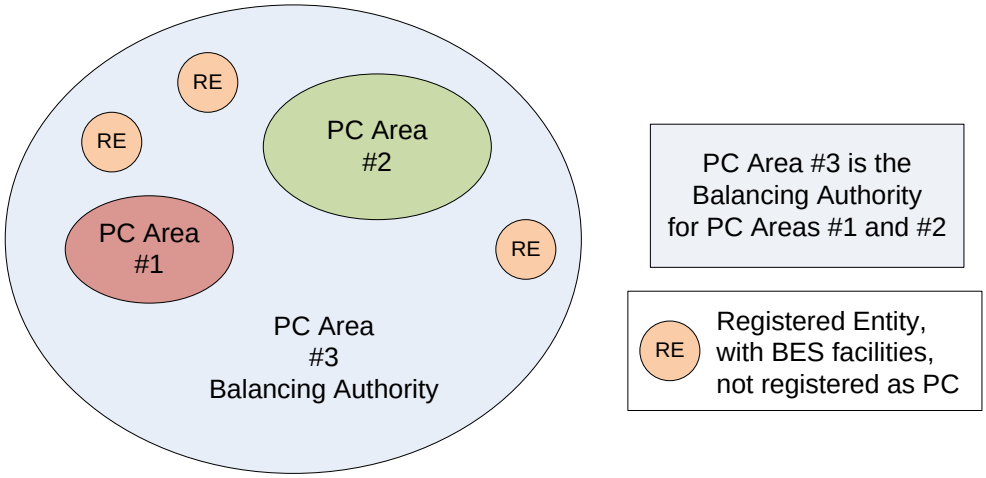
Figure 2: Balancing Authority Method



Under the BA Area Method, non-BA entities that are already registered as Planning Coordinators (Planning Coordinator Area #1 and Planning Coordinator Area #2) could still maintain their Planning Coordinator status, provided that their Planning Coordinator area is contained within that of their BA's Planning Coordinator area of purview. This would create a Planning Coordinator area that is nested inside an even larger Planning Coordinator area, provided the smaller Planning Coordinator does in fact perform the appropriate system assessments for its own area of purview. In this special case, the larger Planning Coordinator (the Balancing Authority) would be responsible for performing the ultimate planning coordinating function for all the Resource Planners, Transmission Planners and smaller Planning Coordinators in its area, including those entities that are not registered as a Planning Coordinator but who own BES facilities.[10] The concept of a Planning Coordinator area within a Planning Coordinator area is described in the NERC Functional Model Technical Reference (p.11). Refer to Figure 3 below for an illustration.

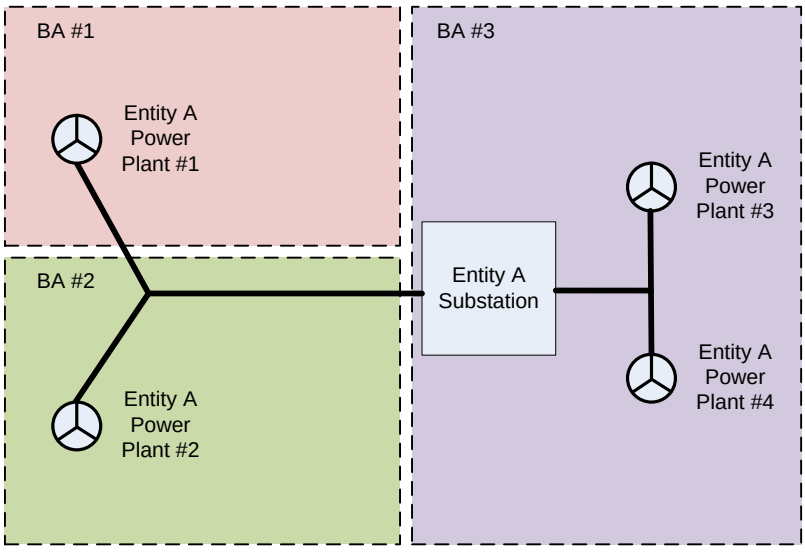
[10] See NERC Functional Model V5 and NERC Reliability Functional Model Technical Document V5.

Figure 3: Planning Coordinator Area with a Planning Coordinator Area



Since transmission ownership may cross state, provincial or regional boundaries, some BES facilities of a single Transmission Owner may be in one Planning Coordinator area whereas the remaining facilities of that Transmission Owner may be in another Planning Coordinator area. Therefore, for an entity with multiple BES facilities that are geographically separated and located in different BA areas (*e.g.*, a single registered entity with multiple dispersed generators) each BES facility would be assigned to its respective BA's Planning Coordinator Area of purview. The following are some examples of how BA assignments could work for these entities.

Figure 4: Geographical Separation of Planning Coordinator Areas



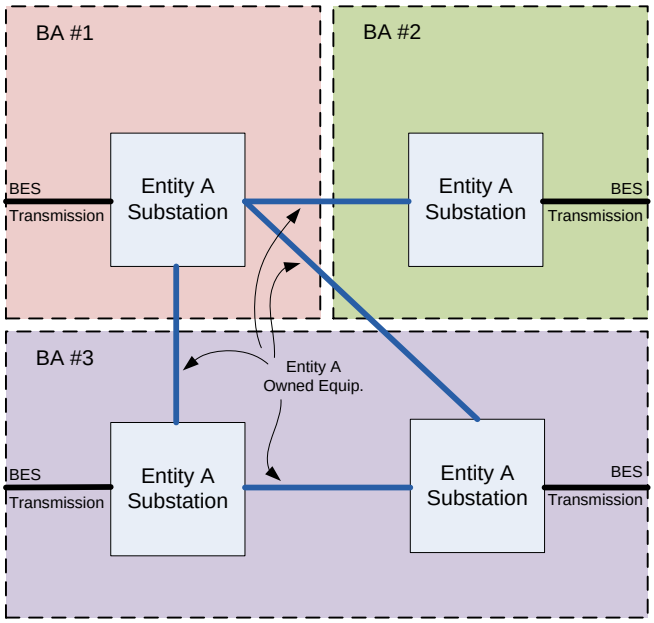
In Figure 4 above, Entity A is a non-Planning Coordinator-registered entity with BES facilities in multiple (3) BA areas. Entity A's generators would fall under the Planning Coordinator area of purview for each of its respective BA areas. Generally, generators that are connected inside a BA footprint

would be assigned to the corresponding BA for that area (*i.e.*, per BAL-005 they must be within the metered boundary of a BA). Consequently, each of the generators would now be included inside a Planning Coordinator area.

As another alternative for smaller entities that are interconnected to multiple BAs, the BA with which they have the most interconnections could be designated as their Planning Coordinator. This decision might be based on the number of interconnections, largest percentage of load, or the largest percentage of generation located in any one of the BA areas. Entities with BES elements that are physically located in multiple states or geographical regions; and, under different BAs, might have more than one Planning Coordinator, depending upon the location of each BES element. The following are some examples of how such BA assignments would work.

In Figure 5 below, Entity A owns BES facilities and is connected to BES transmission located in three different BA Areas. Entity A would choose BA #3 to be its Planning Coordinator due to the amount of load or owned equipment, or power flows to or from BA #3.

Figure 5: Multiple Balancing Authority Areas



Rationale for Selecting the BA Area Method

The BA Area Method works well in assigning the BES facilities of non-Planning Coordinator-registered entities to a particular Planning Coordinator area because the BA areas are already well established, and non-overlapping. Therefore, assigning Planning Coordinator footprints is relatively easy. BAs, by their design, are responsible for the load and generation of a wide area of the BES. The BA's wide-area purview maps nicely with the Planning Coordinator reliability functions such as analyzing loads and resources for large portions of the BES. The BA would register as a Planning Coordinator (if not

currently so-registered), and take on the Planning Coordinator role for those non-Planning Coordinator entities within the BA's area of purview.

The BA Area Method would also help to minimize the total number of Planning Coordinators within the Western Interconnection. There are currently 34 BAs in the WECC Region.[11] Using the BA Area Method throughout the Western Interconnection will help limit the number of Planning Coordinators in the region by eliminating the unnecessary Planning Coordinator registrations on the part of entities that cannot and do not perform the wide-area coordination that is intended in the NERC Functional Model. By minimizing the number of Planning Coordinators, the coordination required between neighboring Planning Coordinators and BAs is greatly improved and simplified. As it stands, Planning Coordinator/BA relationships remain unnecessarily complicated by those entities that register as a Planning Coordinator solely to meet compliance with the ERO Reliability Standards.

Furthermore, given that every generator, transmission facility, and end-use customer (all BES facilities) currently resides within in a BA Area, using the BA Area footprints to define Planning Coordinator areas will not only ensure that every BES element is accounted for by a Planning Coordinator, but will completely eliminate the Planning Coordinator gap as it exists today.

In sum, the BA Area Method provides an appropriate framework for creating Planning Coordinator umbrellas at the BA level, for all of the smaller WECC entities, and these non-Planning Coordinator entities can use this method to accurately identify their Planning Coordinator.

2. Operational Control

This section describes an approach to defining a Planning Coordinator boundary based on BES facilities that are operated by a Transmission Operator. The identification of a Planning Coordinator boundary would be done by Transmission Operators based on their Transmission Operator Areas, who would fulfill the performance of the Planning Coordinator function as set forth in applicable Standards. Determining which facilities reside within a Planning Coordinator area would be based on the nature of the facilities themselves (e.g., transmission facilities, distribution facilities, generator interconnection facilities and generation facilities, or some combination thereof) as described below.

Transmission Operator Operational Control

Under this methodology the framework upon which the definition of a Planning Coordinator area boundary would be based on the BES transmission network that is under the operational control of a Transmission Operator. However, the facilities of Distribution Providers and Generator Owners that are directly connected to the Transmission Operator's network are normally not under the operational control of the Transmission Operator. As such, these facilities would be considered to be outside of the

[11] The number of Planning Coordinators was obtained from the NERC functional registry dated June 26, 2015. See Appendix 3 for a complete analysis of WECC Planning Coordinator-registered entities.

Transmission Operator Area and not within the Transmission Operator's Planning Coordinator boundary. This framework is necessarily defined by the following NERC Glossary terms:

- BES [12]: All Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources connected at 100 kV or higher;
- Elements: Any electrical device with terminals that may be connected to other electrical devices such as a generator, transformer, circuit breaker, bus section, or transmission line. An element may be comprised of one or more components;
- Transmission Operator: The entity responsible for the reliability of its "local" transmission system, and that operates or directs the operations of the transmission facilities; and,
- Transmission Operator Area: The collection of Transmission assets over which the Transmission Operator is responsible for operating.

Taken collectively, these terms define Transmission Operator's areas of responsibility. This methodology would tie this area to the Planning Coordinator Area.

General Definition

As described above, a Planning Coordinator area is represented through the individual transmission, generation and customer equipment assets that collectively constitute the entirety of the BES that the Planning Coordinator is coordinating. In the Transmission Operator's case, this is the transmission network that is considered BES facilities that are under the Transmission Operator's operational control. The Functional Model states: "The boundaries for the Planning Coordinator area are basically defined by the location of the Bulk Electric System (BES) facilities under the purview of the Planning Coordinator, i.e., those facilities for which the Planning Coordinator coordinates and evaluates and recommends reinforcement and corrective plans resulting from studies and analysis of system performance and interconnection of facilities. The BES facilities under its purview are generally contiguous and cover in aggregate the same areas as the Transmission Planners it coordinates."

Under this methodology, the Planning Coordinator area boundary would be defined by transmission facilities that are under the operational control of a Transmission Operator. In other words, the Transmission Operator Area defines the Planning Coordinator boundary.

FERC Order No. 785 Generator Interconnection Facilities

NERC requires owners and operators of BES facilities to register in various categories, such as Generator Owner (GO), Generator Operator (GOP), Transmission Owner (TO), and Transmission Operator (TOP), as applicable. Once registered, the entity must comply with each of the reliability standards applicable to each category in which the entity is registered. For example, a generator would be registered as a GO and GOP because of its ownership and/or operation of generation facilities and

[12] Per the NERC BES definition

would be required to comply with each standard applicable to a GO and GOP. However, virtually all generators also own and/or operate radial transmission facilities called "generator interconnection facilities" which have the sole function of transmitting the electricity from their generating facilities to the transmission grid.

Generators traditionally had viewed their tie-lines as part of their generation facilities. However, in 2007 NERC began to register some generators with tie-lines over 20 miles in length as TO/TOPs solely because of their ownership and operation of those tie-lines. According to NERC and FERC, such registrations were necessary because there would be a reliability gap if the generator did not apply certain TO/TOP reliability standards to its tie-line.[13]

Several generators contested NERC's action to require them to register as a TO/TOP as a result of their "generation interconnection facilities." To address concerns raised by generators in response to NERC's TO/TOP registration action, NERC announced the formation of an Ad Hoc Group for Generator Requirements at the Transmission Interface (Ad Hoc Group) to address concerns about perceived reliability gaps associated with generator interconnection facilities. The Ad Hoc Group issued a report (Ad Hoc Group Report) suggesting a fairly broad approach to address these perceived gaps, including proposed changes to standard applicability and requirement language.[14]

In 2013 FERC issued Order 785[15] which addressed the perceived reliability gap and obviated the need for similar TO/TOP registrations, at least for most generators. In effect, FERC approved Standards FAC-001-1, FAC-003-3, PRC-004-2.1a, and PRC-005-1.1b. However, NERC retains the discretion to decide that a particular generator should be registered as a TO/TOP solely due to its tie-line. The result of FERC Order No. 785 establishes the generator interconnection facilities to be part of the GO assets to the point of interconnection with the BES transmission network. At the same time, the order retains discretion for NERC (and WECC) to require a GO to register as a TO/TOP should their generation interconnection facilities be considered to create a reliability gap.

Order 785 is important in that it clarifies that the generator interconnection facilities are part of the generator assets and therefore, for purposes of this white paper, must have a Planning Coordinator. However, Order 785 also allows for certain GOs to be required to register as a TO/TOP if NERC or WECC determines that their generator interconnection facilities result in a reliability gap and therefore be considered as BES facilities. In such uncommon situations, the GO is required to have a Transmission Planner and a Planning Coordinator.

[13] New Harquahala Generating Co., LLC, 123 FERC ¶ 61,173 (2008) (Harquahala); Cedar Creek Wind Energy, LLC and Milford Wind Corridor Phase I, LLC, 135 FERC ¶ 61,241, reh'g, 137 FERC ¶ 61,141 (2011), order on compliance filing, 139 FERC ¶ 61,214 (2012) (Cedar Creek and Milford).

[14] Final Report of the Ad Hoc Group for Generator Requirements at the Transmission Interface (Nov. 16, 2009), available at: www.nerc.com/files/GOTO_Final_Report_Complete_2009Nov16.pdf.

[15] Generator Requirements at the Transmission Interface, 78 Fed. Reg. 58449 (Sep. 24, 2013) (final rule).

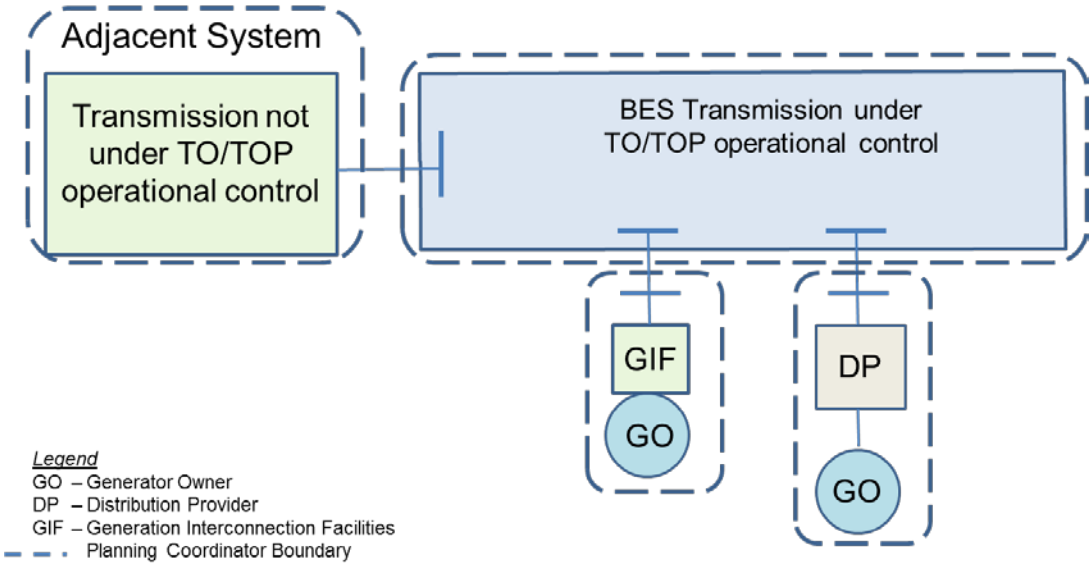
Generator Owner and/or Distribution Provider Facilities Define their Planning Coordinator Boundary

The same methodology would be applicable to Generator Owners and Distribution Providers that are radially connected to a Transmission Operator Area such that the generator and distribution provider areas and their interconnection facilities taken together would define a Planning Coordinator boundary area. The Generator Owner and/or Distribution Provider Planning Coordinator boundary would be immediately adjacent to the Planning Coordinator boundary area that is defined by the Transmission Operator Area at the point of interconnection between the TO/TOP facilities and the Generator Owner and Distribution Provider facilities.

Principles for Defining Planning Coordinator Responsibilities

Certain principles can further elaborate on understanding how a Planning Coordinator area boundary can be defined by the Transmission Operator Area. These principles are illustrated in Figure 6 and listed below.

Figure 6: TOP Planning Coordinator



Principle 1 – Transmission Operator's Planning Coordinator Responsibility

Under the context of this methodology, a Transmission Operator must provide Planning Coordinator services to facilities inside the Transmission Operator's Planning Coordinator area boundary. These may be BES and/or non-BES facilities. In certain instances a single owner may have facilities inside and outside the Transmission Operator's Planning Coordinator area boundary. In such cases and consistent with this principle, only those facilities inside the Transmission Operator's Planning Coordinator area boundary would be considered under the purview of the Transmission Operator for Planning Coordinator responsibility.

Principle 2 – Transmission Operator's Operational Control

For the determination of the Transmission Operator's Planning Coordinator area boundary, consistent with NERC terminology and Standards, operational control means the right of the Transmission Operator to operate its transmission lines and facilities, and other electrical plant equipment affecting the reliability of those lines and facilities, that are within its Transmission Operation Area; i.e., the registered Transmission Operator (TOP) area = Planning Coordinator Area. In certain cases a Transmission Operator may have operational control over scheduling rights on another Transmission Operator's facilities. In this case, the facilities over which the Transmission Operator only has scheduling rights under its operational control would not be included in the Transmission Operator's Planning Coordinator area boundary.

This definitional approach is consistent with the Functional Model's Planning Coordinator definition that *"boundaries for the Planning Coordinator area are basically defined by the location of the Bulk Electric System (BES) facilities under the purview of the Planning Coordinator . . . ."* Therefore, while the Transmission Operator may have operational control of certain rights and entitlements for scheduling purposes on another Transmission Operator's facilities, the Planning Coordinator responsibilities fall to the Transmission Operator in whose Transmission Operator Area those facilities are located.

Principle 3 – Non-Transmission Facilities Connected to Facilities under a Transmission Operator's Operational Control

Numerous types of assets are connected to the transmission network under a Transmission Operator's operational control. These assets may be transmission, generation, or distribution related. In defining the Transmission Operator's Planning Coordinator area, the following non-transmission facilities would not be considered to be within the Transmission Operator's Planning Coordinator area boundary and; therefore, the Transmission Operator is not their Planning Coordinator:

- Generators (and their interconnections) connected directly to facilities under the operational control of a Transmission Operator;
- Generator interconnection facilities (generator asset only);
- Distribution Providers (facilities less than 100 kV) connected directly to facilities under the operational control of a Transmission Operator; and
- Generators or Distribution Providers connected radially to a Distribution Provider who is directly connected to facilities under the operation control of a Transmission Operator.

Principle 4 – Adjacent Systems

There are certain transmission facilities or systems that are connected through BES Facilities, to the transmission facilities that are under the Transmission Operator's operational control. These transmission facilities or systems are referred to as an adjacent system. These adjacent systems may have Generation Owners and Distribution Providers that are connected to them. Adjacent systems are

not considered to be within the Transmission Operator's Planning Coordinator area boundary and; therefore, the Transmission Operator is not their Planning Coordinator. The Functional Model assumes adjacent systems to be represented by a registered Transmission Owner, Transmission Operator and Transmission Planner, and assumes they will also either be registered as, or represented by, a registered Planning Coordinator.

Principle 5 – Generation Interconnection Facilities

A power producing resource's connection to the transmission network that is under the Transmission Operator's operational control can range from simple, single generator tie-lines to complex transmission networks such as those associated with dispersed power producing resources (DPPRs). Some DPPRs are connected through a system that aggregates a total capacity of generation and is designed primarily for delivering the total capacity to a common point of interconnection to the transmission network that is under the Transmission Operator's operational control. Whether simple or complex, the transmission network is defined as a generation interconnection facility unless NERC or WECC has determined that those facilities may impact certain BES facilities. In such cases, the Generator Owner is required to register as a Transmission Owner/Transmission Operator and the generator interconnection facilities are considered BES facilities.

Existing power producing resources and generator interconnection facilities that are connected to the transmission network under the Transmission Operator's operational control are not considered to be within the Transmission Operator's Planning Coordinator area boundary and; therefore, the Transmission Operator is not their Planning Coordinator.

Principle 6 – Distribution Provider Facilities

Distribution Provider facilities are those facilities that are less than 100 kV, cannot be classified as BES, and are connected directly to the transmission network under the Transmission Operator's operational control. Distribution Provider facilities that are connected to the transmission network under the Transmission Operator's operational control are not considered to be within the Transmission Operator's Planning Coordinator area boundary and; therefore, the Transmission Operator is not their Planning Coordinator.

Example of Planning Coordinator Boundaries using this method

A Planning Coordinator area boundary is defined by transmission facilities that are under the operational control of a Transmission Operator. However, applying this approach throughout the Western Interconnection, while clearly defining Planning Coordinator boundaries, will also yield a large number of Planning Coordinator boundaries. Considering the expectation that a "Planning Coordinator by its very nature will generally take responsibility over a wider perspective than the Transmission

Planners for which it coordinates,"[16] the PCFTF concludes that the intent of the Functional Model is to minimize the number of Planning Coordinators within any given Reliability Coordinator's area of purview.

As an example, the California ISO (ISO) recognized this functional responsibility gap as it was developing its own methodology for defining its Planning Coordinator boundary. The California ISO has published a technical bulletin[17] that sets forth its interpretation of its Planning Coordinator area, for purposes of its performance of the Planning Coordinator function established in applicable Standards, consistent with its interpretation of the guidance provided in the Rules of Procedure, the NERC Functional Model Version 5, and the NERC Functional Model Technical Document Version 5. Further, based on the principles presented in its bulletin, the CALIFORNIA ISO identified owners of facilities that are inside its Planning Coordinator area.

The California ISO's determination of certain facilities to be inside its Planning Coordinator area is based on the nature of the facilities themselves. The covered facilities are intended to be consistent with the Functional Model as it describes transmission facilities, distribution facilities, generation interconnection facilities and generation facilities, or some combination thereof. The relationship between the owners of these facilities and the California ISO is also based on the nature of these facilities. At present and consistent with the current approach being used by WECC, the SRWG and PCFTF, the California ISO has identified these facilities at the electrical bus level and not the component level to minimize the voluminous list of components that would be subject to excessively frequent updating. In considering the facilities that made up its electrical network, the California ISO initially considered that as a registered BA, those facilities defined within its BA boundary could be considered to be inside its Planning Coordinator area as well. However, when considering the responsibilities of being a registered TOP, the California ISO concluded that certain facilities, while inside a BA area, were not within its operational control as defined by the TOP function. As such, these facilities should not be included in the California ISO's Planning Coordinator area. However, considering the TOP function, the California ISO concluded that as a TOP, the "Transmission Operator Area" for which it was responsible provided a better alignment with responsibilities associated with the Planning Coordinator function.

Adopting operational control as the premise for defining its Planning Coordinator area, other facilities, while connected to the California ISO's BES network under its operational control, were not considered to be within California ISO's Planning Coordinator area. These facilities, as described earlier, are "Adjacent Systems," Generator Owner Facilities, certain Generation Interconnection Facilities, and Distribution Provider facilities. Nonetheless, in considering the intent of the Planning Coordinator function is to take the "wider perspective" over the area it coordinates, the California ISO concluded

[16] http://www.nerc.com/pa/Stand/Functional%20Model%20Archive%201/FM_Technical_Document_V5_2009Dec1.pdf
[17] http://www.caiso.com/Documents/TechnicalBulletin-CaliforniaISOPlanningCoordinatorAreaDefinition-Aug_4_2014.pdf

that it would be in the best interest of reliability for its system to include generator assets, generation interconnection facilities (where appropriate), and distribution provider assets within its Planning Coordinator area. To ensure the integrity of reliability across its Transmission Operations Area, the California ISO offers, for a fee, to provide Planning Coordinator area services to Adjacent Systems that are embedded within its BES network.

The California ISO has taken specific steps to ensure that the integrity of its Planning Coordinator area is commensurate with the intent of the Planning Coordinator function, even though it is not required to do so by any existing standards. However, the California ISO has chosen to embrace the intent of a Planning Coordinator's intended responsibilities. Clearly, generator owners and their interconnection facilities, distribution providers, and systems with network BES facilities are required to have a Planning Coordinator associated with their facilities. But without some legal mechanism to compel a Planning Coordinator relationship with these facilities, the Functional Model gap will remain unaddressed.

3. Requirements Analysis and Mapping

Some areas in the Western Interconnection have complicated, historical contractual arrangements in place. Strictly following Balancing Authority Area or Operational Control methods to designate the Planning Coordinator may result in Planning Coordinators that lack the institutional knowledge about the facilities or working relationships with the facilities' owners in their Planning Coordinator area. Additionally, application of the Balancing Authority Area or Operational Control methods may result in many new Planning Coordinators that do not meet the Planning Coordinator definition.

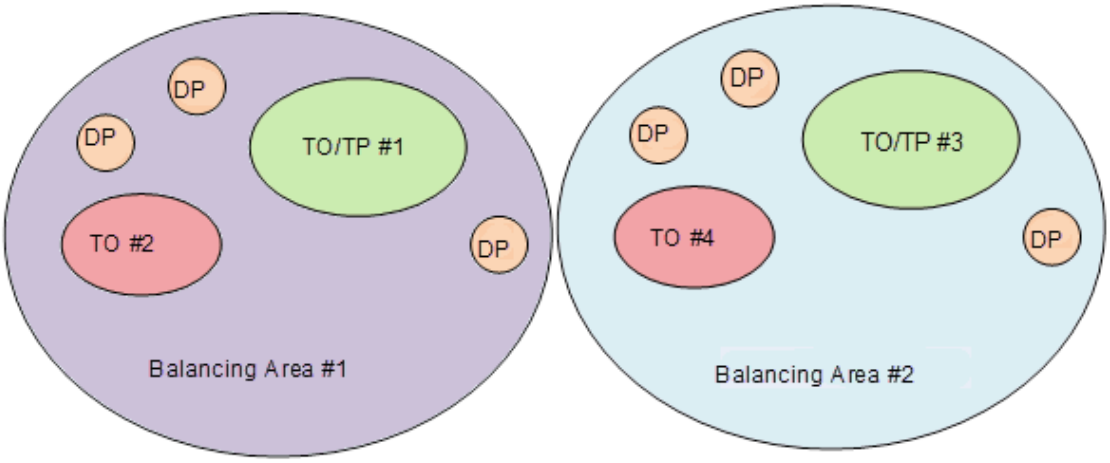
The Requirement Analysis and Mapping methodology would allow for existing relationships to continue in the more formalized realm of NERC Registration. The Requirement Analysis and Mapping method provides for flexibility to address unusual situations and will work best when a larger entity applies the analysis to its customer base. The following discussion highlights the advantages of using the Requirement Analysis and Mapping method and provides several examples of its application.

The general idea behind the Requirement Analysis and Mapping method is that it would start with a listing of the applicable Planning Coordinator requirements, and a larger entity's customer base. Facilities and facility owners are then determined to be in or out of a Planning Coordinator area based on an analysis of which entity currently performs the duties defined in the Standards applicable to Planning Coordinators. Exceptions would be agreed to by adjacent affected Planning Coordinators. Where agreement cannot be reached, the entities can take into consideration who performs the Transmission Service Provider, the BA or Transmission Operator (TOP) functions to determine who is the default Planning Coordinator.

Application of the Requirement Analysis and Mapping Method

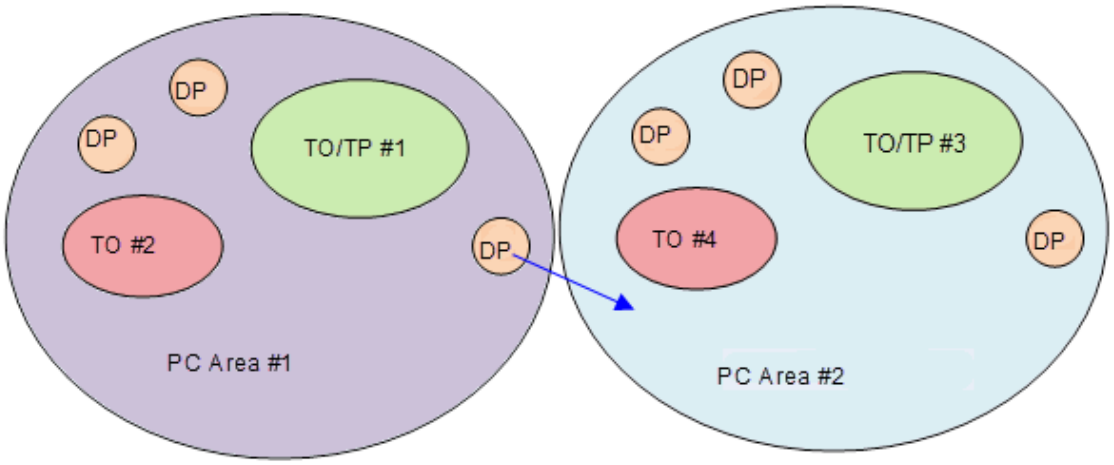
For a discussion of Planning Coordinators within the larger Planning Coordinator of a BA Area, see Methodology 1. For this discussion, the base assumption will be that a single BA Area is equal to a single Planning Coordinator area. BA Area could also be replaced with Operational Control area or TOP area and the examples would still be valid. Figure 7 below shows adjacent BA Areas.

Figure 7: Adjacent Balancing Authority Representation



In this example, Balancing Area #1 has two Transmission Owners and three Distribution Providers (DP) in its area. One of the Transmission Owners is registered as a Transmission Planner. Balancing Area #2 has the same arrangement. Each Balancing Area would register as a Planning Coordinator. However, Balancing Area #2 has historically served the load for one of the DPs in Balancing Area #1. This DP gives its load forecast to Balancing Area #2 and Balancing Area #2 arranges for transmission service from Balancing Area #1 on behalf of the DP. Balancing Area #2 looks up the Standards that apply to Planning Coordinators and sees that for DPs, the main role that a Planning Coordinator performs is collecting load forecasts and making sure the information gets into the base cases (see Standards MOD-017 through MOD-021). Balancing Area #2 coordinates with Balancing Area #1 and they both agree (such agreement to be in writing) that Balancing Area #2 will have the affected DP in its Planning Coordinator area. See Figure 8 below.

Figure 8: Balancing Authority Coordination



In this example, an exception was made based on the analysis of the Standards and requirements to modify the Planning Coordinator areas to be different from the BA Areas to have the party that historically has fulfilled the duties described in the Standards continue to do so. This creates "holes" in Planning Coordinator Area #1 and non-contiguous "bubbles" for Planning Coordinator Area #2, but still ensures that all facilities are covered in a Planning Coordinator area. There are no "air gaps" and the adjacent Planning Coordinators have an agreement in writing.

The example above could be more complicated than just one Planning Coordinator taking responsibility for a customer in an adjacent Planning Coordinator's area. Perhaps after an analysis of the requirements, it is determined that both Planning Coordinator #1 and Planning Coordinator #2 are each performing some of the duties in the requirements. In that case, there are two possible outcomes: assign the party fulfilling the most requirements to be the Planning Coordinator, or assign the respective BA to be the Planning Coordinator. Either outcome will likely require an adjustment in the relationship between the registered entity and the two Planning Coordinators involved.

Another scenario where exceptions to the BA Area Method make sense is dynamically scheduled generation. Generators locate wherever there is a good fuel resource – wind, solar, hydro, coal, etc. They can sell their power to customers a long distance away from their resource. Some generators dynamically schedule their output to customers, leading to the generator being in a BA Area that is remote from the physical interconnection. Other generators form generation-only BA Areas that are comprised of widely scattered facilities. The Planning Coordinator function is focused on the planning of transmission facilities, setting of operational limits, collecting of forecasts, building and validating base-case data sets, coordinating wide area transmission studies, and coordinating proper relay settings. For example: when a wind project in the Pacific Northwest is dynamically scheduling its

output into a BA Area in California, the BA Area is not going to be involved in any of the tasks a Planning Coordinator normally does, at least not in the geographical area where the generator is interconnected. In this case, it makes more sense for the generator to belong to the Planning Coordinator where it is physically located and interconnected. For generator-only BA Areas, the individual generators may end up in several Planning Coordinator areas. Again, the key is making sure that no facilities are left without a Planning Coordinator and making sure that all affected parties have in writing who is assuming which role.

The Requirements Analysis and Mapping method provides for flexibility in dealing with contractual arrangements that do not necessarily line up well with the BA Area Method or the Operational Control Method. This method provides for pragmatic determination of a facilities' Planning Coordinator by simply asking, "Who is doing what today?"

4. Area Coordinator

The "Area Coordinator" approach has been proposed as an option that aligns with the boundaries used today for coordinating powerflow and stability data in WECC cases. The actual Planning Coordinator boundaries would be based on the facilities a Planning Coordinator reports either directly to WECC as the Area Coordinator or to an Area Coordinator that aggregates data across several Planning Coordinator areas. The footprint for any particular Area Coordinator is readily identifiable based on data contained in WECC data bases. Planning Coordinators within that footprint will be able to easily identify the subset of facilities they are responsible for coordinating.

This option focuses on mapping Planning Coordinators based on a subset of the requirements considered in the Requirement Analysis and Mapping option. The subset involves the Standards related to powerflow and stability data collection and reporting. The option also has the advantage of having established definable boundaries based on practices similar to the BA Area Method. This is demonstrated by the information provided in Table 1 below, which lists the existing Area Coordinator entities.

The combined facilities reported by the entities include the entire WECC Region. The table indicates which areas of the WECC data base are coordinated by an Area Coordinator that is an existing Planning Coordinator. It can be seen that the majority of the areas are coordinated by a registered Planning Coordinator entity and, therefore, have an identified Planning Coordinator performing at least a portion of the ERO compliance requirements for Planning Coordinators.

Table 1 – Existing Area Coordinator Entities

Modeling Area	Area Coordinator Entity	Area Number	Area Coordinator Entity is a Planning Coordinator?
NEW MEXICO	Public Service Company of New Mexico	10	Yes
EL PASO	El Paso Electric Company	11	Yes
ARIZONA	Power Engineers	14	No
NEVADA	Nevada Power Company	18	Yes
MEXICO-CFE	Southern California Edison - Transmission & Distribution	20	
IMPERIALCA	Southern California Edison - Transmission & Distribution	21	Yes
SANDIEGO	Southern California Edison - Transmission & Distribution	22	No
SOCALIF	Southern California Edison - Transmission & Distribution	24	No
LADWP	Southern California Edison - Transmission & Distribution	26	Yes
PG AND E	Pacific Gas and Electric Company	30	No
NORTHWEST	ColumbiaGrid	40	No
B.C.HYDRO	BC Hydro	50	
FORTISBC	BC Hydro	52	
ALBERTA	Alberta Electric System Operator	54	
IDAHO	Idaho Power Company	60	Yes
MONTANA	NorthWestern Corporation	62	Yes
WAPA U.M.	Western Area Power Administration - Upper Great Plains Region	63	Yes
SIERRA	Sierra Pacific Power Company	64	Yes
PACE	PacifiCorp	65	Yes
PSCOLORADO	Public Service Company of Colorado	70	Yes
WAPA R.M.	Public Service Company of Colorado	73	Yes

Default Facility Mapping

The default mapping for all facilities with this option is to map the facility to the Planning Coordinator acting as an Area Coordinator, or the Planning Coordinators who coordinate data with an Area Coordinator. This option would work best in an area where the vast majority of BES Facilities are incorporated into WECC data bases either by a Planning Coordinator acting as the Area Coordinator or by Planning Coordinators who submit data to an Area Coordinator. To the extent that a region has a substantial number of facilities that are incorporated into WECC data bases by non-Planning Coordinator entities that report to a non-Planning Coordinator Area Coordinator, another option should may be considered.

In areas where the current Area Coordinator is not a registered Planning Coordinator, registered Planning Coordinators within the Area Coordinator's footprint should assume the Planning Coordinator role for the facilities/entities incorporated in their data submittals.

From the information in Table 1, assuming this option were applied across the entire WECC Region, it can be seen that the default mapping would result in a substantial portion of the facilities in the WECC Region being mapped to an existing registered Planning Coordinator.

In the example in Figure 9 below, an area is shown with an existing Planning Coordinator acting as the Area Coordinator. The area includes other entities that coordinate with the Planning Coordinator for the purpose of establishing the WECC planning data bases. Under the Area Coordinator option, the default Planning Coordinator for the facilities and entities shown in Figure 9 would be the Planning Coordinator acting as the Area Coordinator.

Figure 9: Existing Planning Coordinator Acting as an Area Coordinator

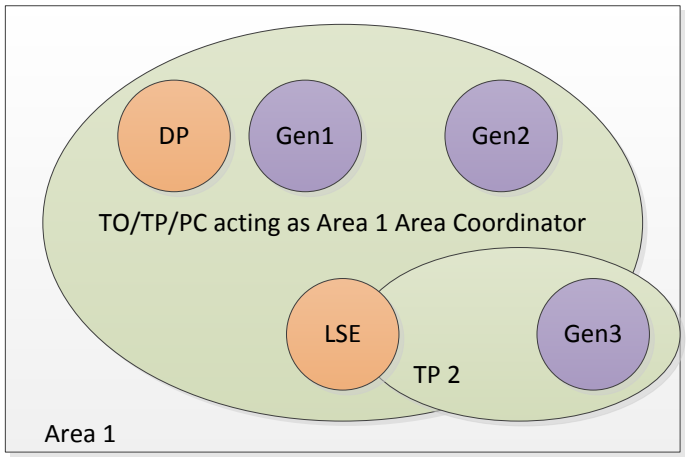


Figure 10 below, provides an example where the Area Coordinator is not a Planning Coordinator. In this example, several entities use a non-Planning Coordinator Area Coordinator to aggregate data across several systems. As a result, the default Planning Coordinator cannot be the Area Coordinator. In this situation, the default Planning Coordinators become the Planning Coordinators reporting to the

Area Coordinator and the footprint is defined by the facilities that Planning Coordinator includes in its data submittals. To the extent that there are other entities with BES Facilities incorporated into the submittal, these facilities would be part of the Planning Coordinator's default footprint. Representative entities are included in Figure 10 by including DP and generator entities within the Planning Coordinator's boundaries.

Figure 10: Representative Entities with BES Facilities

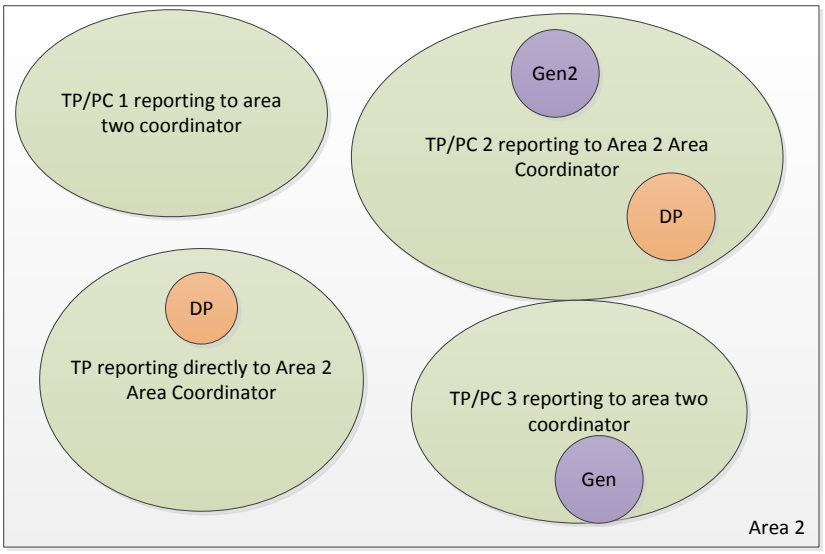


Figure 10 also provides an example where a non-Planning Coordinator Transmission Provider (TP) reports directly to the Area Coordinator. This results in a portion of the facilities that do not include an existing Planning Coordinator in the path of the data reporting process. This would indicate that entities within the area would need to determine the Planning Coordinator or Planning Coordinators that would represent the facilities. Some guidelines for this determination are provided below. If an area has a significant portion of the facilities that do not have an existing Planning Coordinator involved in the coordination of the data, then the Area Coordinator option may not be an appropriate option for mapping facilities to a Planning Coordinator.

Handling of Gaps

If the methodology generally works for a region in WECC, but leaves isolated facilities or pockets, the isolated portions would be included in one of the following:

1. The Planning Coordinator area that surrounds the facilities;
2. Adjacent Planning Coordinators would decide the Planning Coordinator area if the isolated area is adjacent to more than one Planning Coordinator area or
3. A Planning Coordinator already associated with the facility.

5. Western Interconnection Planning Coordinator – Wide Area Planning Coordinator

Background

The Western Interconnection has a large number of Planning Coordinators that vary in size and have a wide range of interpretations of which equipment is required to be within their Planning Coordinator boundary. This has created an environment where not all equipment in the Western Interconnection is included within the collective Planning Coordinator purview. One potential solution to this is to have a wide area Planning Coordinator, which ensures complete Planning Coordinator coverage of all equipment within the Western Interconnection.

FERC has expressed interest in a wide area Planning Coordinator for the Western Interconnection, primarily to achieve consistency with other portions of North America; however, FERC has acknowledged that there is no NERC Standard or other requirement that mandates the existence of a wide area Planning Coordinator.

Problem Definition

The FERC/NERC *Arizona-Southern California Outages on September 8, 2011* report (Report) documented specific concerns over the lack of a wide area view for Planning Coordinators in the Western Interconnection. Specifically, there were two findings and associated recommendations that addressed near- and long-term planning; finding #9 - Gaps in Near- and Long-Term Planning Processes, and finding #10 – Benchmarking WECC Dynamic Models.

Excerpts from "Arizona-Southern California Outages on September 8, 2011" Report

10.5.3 FERC Recommendation 9 – Gaps in Near- and Long-Term Planning Processes:

The Report identifies several issues with existing planning processes, namely in the area wide area coordination. The Report states:

> WECC RE should take actions to mitigate these and any other identified gaps in the procedures for conducting near- and long-term planning studies. The September 8th event and other major events should be used to identify shortcomings when developing valid cases over the planning horizon and to identify flaws in the existing planning structure. WECC RE should then propose changes to improve the performance of planning studies on a subregional- and Interconnection-wide basis and ensure a coordinated review of TPs' and Planning Coordinators' studies. TOPs, TPs and Planning Coordinators should develop study cases that cover critical system conditions over the planning horizon; consider the benefits and potential adverse effects of all protection systems, including RASs, Safety Nets (such as the SONGS separation scheme), and overload protection schemes; study the interaction of RASs and Safety Nets; and consider the impact of elements operated at less than 100 kV on BPS reliability.

Coordination across a wide area like the Western Interconnection is an extremely challenging task but could enhance reliability by identifying critical contingencies that impact multiple Planning Coordinator

areas, identifying and studying necessary sub-100-kV systems, and accounting for RAS actions and impacts.

FERC Recommendation 10 – Benchmarking WECC Dynamic Models:

The Report went on to discuss model accuracy and a need for benchmarking models against actual system events, stating:

> WECC dynamic models should be benchmarked by TPs against actual data from the September 8th event to improve their conformity to actual system performance. In particular, improvements to model performance from validation would be helpful in analysis of under and/or over frequency events in the Western Interconnection and the stability of islanding scenarios in the SDG&E and CFE areas.

In addition to FERC and NERC recommendations following the Pacific Southwest Outage Event, four primary functional gaps exist in the current Planning Coordinator arrangements within the Western Interconnection that could be resolved with a wide area Planning Coordinator for the Western Interconnection.

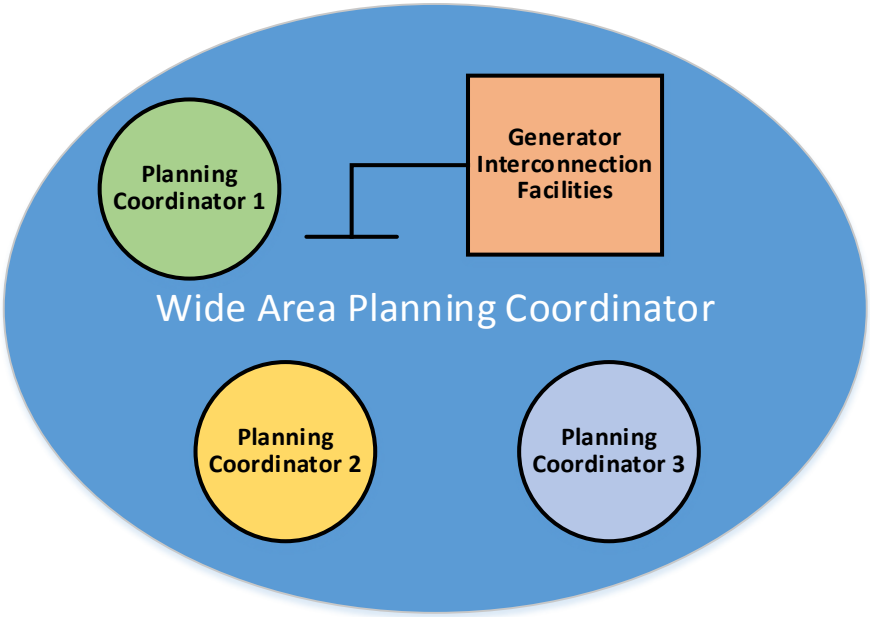
1. Portions of the Western Interconnection that fall under operational control of a traditional TOP do not have a Planning Coordinator. These areas can be reasonably large and do include entire TOP footprints.
2. In some of the current Planning Coordinator arrangements, Generation Interconnection Facilities do not have Planning Coordinator coverage. This situation depends on the existing Planning Coordinator's methodology regarding how it treats these generation interconnection facilities. It is well understood that these generation interconnection facilities do need a Planning Coordinator, but in some cases the existing Planning Coordinator does not claim those facilities as being within its Planning Coordinator area.
3. Some industry stakeholders believe WECC, or its subcommittees, is performing certain data collection and system modeling functions required by Planning Coordinator Standards. WECC has provided clarification that WECC is not a registered Planning Coordinator (see Appendix 9: The Planning Role of WECC in the Western Interconnection).
4. There is no over-arching coordination between Planning Coordinators that occurs in the Western Interconnection, which does result in disagreements between neighboring Planning Coordinators regarding study results and methodologies that cannot be resolved.

Functions and Benefits of a Wide Area Planning Coordinator

The concept of a wide area Planning Coordinator does not require that the wide area Planning Coordinator would take on all Planning Coordinator functions for all entities; however, it would be an option for the wide area Planning Coordinator to perform all Planning Coordinator responsibilities for some entities. In fact, there are many synergies that could exist between smaller Planning Coordinators and an overlapping wide area Planning Coordinator. The postulation is that it is acceptable to have overlapping Planning Coordinators—with specific responsibilities assigned to each of the Planning

Coordinators—ultimately ensuring Planning Coordinator coverage of the entire Planning Coordinator area.[18] The wide area Planning Coordinator concept would not require existing Planning Coordinators to deregister as a Planning Coordinator. See Figure 11 below for an illustration of the wide area Planning Coordinator concept.

Figure 11: Wide Area Planning Coordinator Concept



[18] NERC Functional Model Technical Document V5 provides for circumstances where a Planning Coordinator area can be nested within a larger Planning Coordinator area and for the existence of more than one Planning Coordinator where roles are demarcated based on function and scale of assessments.

Table 2: "All In" Option for Entities under the Wide Area Planning Coordinator

Standard Requirement(s)	Description of Wide Area Planning Coordinator Obligations
FAC-002-1	Perform assessments, or ensure other entities perform assessments, to understand the reliability impacts of new facilities and their connections on the interconnected transmission system.
FAC-010-2.1 (or subsequent standards) and FAC-014-2[19]	Ensure SOL methodology is well defined and documented for the Planning Coordinator area; ensure SOLs and IROLs are established for the Planning Coordinator area per the SOL methodology. Coordinate with Reliability Coordinator to communicate SOLs and IROLs for the Planning Horizon.
FAC-013-2	Create, in conjunction with the reliability entities in the Planning Coordinator area, a Transfer Capability methodology and make available as required per the standard.
MOD-016, 017, 018, and 019	Perform data collection and aggregation as necessary. Develop base cases and/or coordinate development of base cases for Planning Coordinator area. Perform and/or support generator testing.
PRC-006-1	Support and improve UFLS methodology and coordination; perform UFLS studies for entities within the wide area Planning Coordinator footprint.
TPL-001 to 004	Ensure TPL studies are performed for all facilities within the Wide Area Planning Coordinator area. Perform TPL studies for those entities that are part of the Wide Area that do not perform those studies themselves.

The wide area Planning Coordinator would have a set of "umbrella" responsibilities, represented in Table 2, that it would perform for all Planning Coordinators in the Western Interconnection. The primary umbrella responsibilities of a wide area Planning Coordinator include the improved

[19] The FAC standards are currently under a NERC periodic review and may be modified or deleted prior to a Wide Area Planning Coordinator being implemented in the Western Interconnection.

coordination and consistency of Planning Coordinator activities across the Western Interconnection such as study practices, SOL methodologies, and overall communication and information exchange among the Planning Coordinators and RC. The wide area Planning Coordinator would have a role to serve all other Planning Coordinators in the Western Interconnection for the betterment of reliability.

Functions of a wide area Planning Coordinator that benefit the reliability of the Western Interconnection, including all Planning Coordinators, include but are not limited to:

1. Ensuring the consistency of SOL methodologies for the Planning Horizon. It is widely understood that there are differences in SOL methodologies among existing Planning Coordinators, which has resulted in past conflicts. In addition, a wide area Planning Coordinator could support bridging the planning horizon and operations horizon to support the appropriate level of consistency between Planning Coordinator SOL methodologies and RC SOL methodologies.
2. Supporting and improving UFLS methodology and coordination per PRC-006-1. Several requirements require coordination, modeling, and study of UFLS across boundaries of other Planning Coordinators. A wide area view/study is important to ensuring that all system interactions, RAS actions, or wide area impacting contingencies are properly studied.
3. Coordinating and awareness of RAS/SPS (new PRC standard development ongoing that will assign new responsibilities to Planning Coordinator), including performing necessary studies to ensure that RAS are properly studied and their impacts to the Western Interconnection analyzed,
4. Acting as a mediator when disagreements occur between adjacent Planning Coordinators and/or other functions. The wide area Planning Coordinator would have the authority to resolve problems that have not been resolved between conflicted parties.
5. Maintaining a close relationship with the RC to ensure seamless transfer of information to influence operations planning and real-time operations. The information transfer would include, but is not limited to, stability limitations within the wide area Planning Coordinator area, RAS impacts and coordination information, and credible single and multiple contingencies analyzed within the Planning Horizon. With the introduction of new standard IRO-017-1, the RC is responsible for an outage coordination process that spans the entire operations horizon (up to one year out). A smooth, comprehensive handoff between the Planning Coordinator to the RC will significantly improve RC Operations Planning processes.
6. Ensuring proper quality control on base-case development processes. The wide area Planning Coordinator could take on a few different roles related to base-case development and quality, ranging from supporting the process and ensuring appropriate levels of quality, to performing the data collection and base-case development work. Further, a wide area Planning Coordinator would have the ability to work with Peak Reliability (Peak) on the development and use of Peak's West-wide System Model (WSM) for the benefit of both planning and operations functions in the Western Interconnection.

Obstacles to Successfully Implement a Wide Area Planning Coordinator

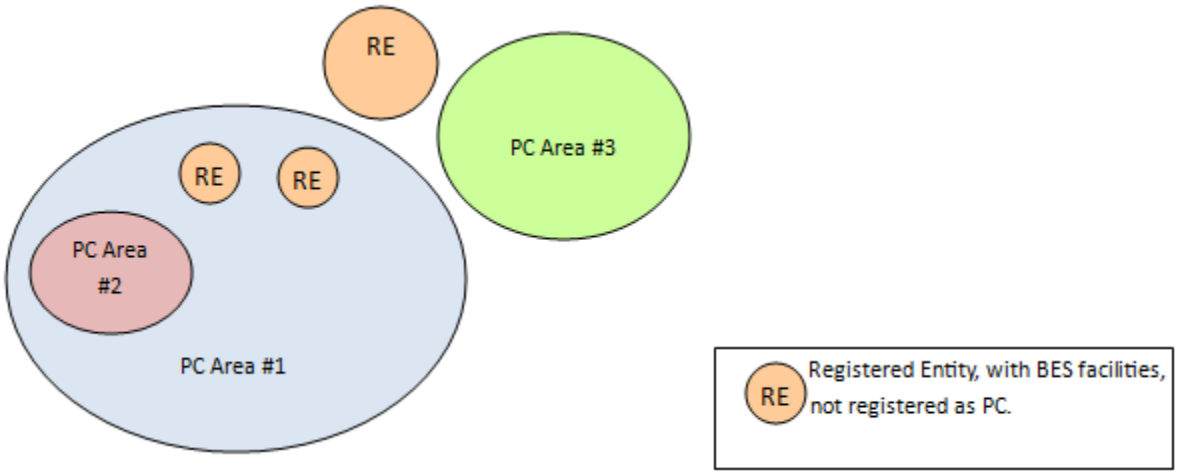
The wide area Planning Coordinator concept can only be successful if the Western Interconnection in its entirety sees value and reliability benefits to the approach and is therefore willing to support a wide area Planning Coordinator. The existing Planning Coordinators would need to be willing to entrust a subset of existing Planning Coordinator responsibilities to the wide area Planning Coordinator. For the Western Interconnection to recognize benefit from a wide area Planning Coordinator, it would require the endorsement and commitment from the majority of entities. The majority of the implementation obstacles are rooted in the issue of how to ensure a wide area Planning Coordinator has the necessary support and authority to perform its functions as a Planning Coordinator for the Western Interconnection.

The implementation of a wide area Planning Coordinator would require Delegation Agreements or Coordinated Functional Agreements between the wide area Planning Coordinator and other entities in the Western Interconnection. It would be very important to clearly identify the responsibilities of the wide area Planning Coordinator, including compliance responsibilities that the wide area Planning Coordinator takes on in behalf of the other entities or Planning Coordinators in the Western Interconnection.

6. Third-Party Service

The final method for establishing Planning Coordinator areas in the Western Interconnection where an entity's facilities have not been included in a defined Planning Coordinator area is for the entity to enter into a contractual agreement with a third party to perform the Planning Coordinator functions for the area and/or its facilities. The parties involved would enter into an agreement in which the third party will perform the services required by a Planning Coordinator on behalf of the entity(ies). The third party would register as a Planning Coordinator and coordinate with other Planning Coordinators in the Western Interconnection.

Figure 12: Three Defined Planning Coordinator Areas



Using Figure 12 above, there are three defined Planning Coordinator areas and three registered entities that are not registered as Planning Coordinators. If the previous methodologies did not identify a Planning Coordinator area inclusive of the registered entities' BES facilities, the registered entities can contract the services with a Third-Party Planning Coordinator. This scenario would allow for defined Planning Coordinator areas and could include embedded Planning Coordinator areas that were already identified using the methodologies above. However, in instances where BES Facilities were still excluded from a Planning Coordinator area, the third party would provide the services and coordinate with the other Planning Coordinators. In this example, the third party could perform the Planning Coordinator services for each of the three registered entities and coordinate with the other three Planning Coordinators.

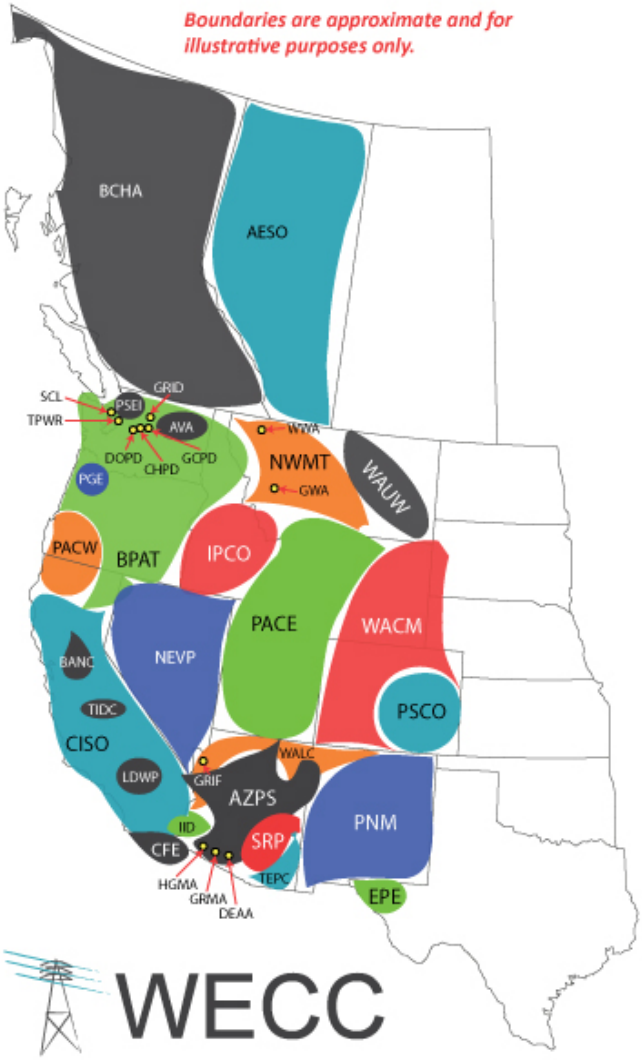
As indicated in Appendix 3, there are 31 Planning Coordinators and 50 Transmission Operators in the Western Interconnection. However, over 200 GO/GOPs exist in WECC that are not registered as a Planning Coordinators. Where BES Facilities are not included in the boundaries of a defined Planning Coordinator area, under this methodology the registered entity has two options – register as a Planning Coordinator or obtain services from a third party. For small entities, it would be difficult to register as a Planning Coordinator and obtain the resources to enable the entity to perform the Planning Coordinator functions. To perform the function, the entity would have to have obtained the necessary tools and resources to perform and coordinate complex studies. This could be a considerable cost to the entity with little recognized benefit.

There are a number of third parties that offer services to the utility industry. The third-party services include everything from full plant operation and maintenance to engineering and technical services. In some instances, it may be more cost effective for the entity to seek third-party services to perform the Planning Coordinator function compared to establishing the necessary tools and resources in-house. In Figure 12 above, where the three registered entities are not included in a Planning Coordinator area, they could recognize cost savings if they used the same third party to perform the Planning Coordinator function. The third party would maintain the tools and applications and use resources already available. Coordination would be accomplished for the registered entities with the other Planning Coordinators.

It is anticipated the third-party option would be the option of last resort. Registered entities would likely attempt to make arrangements to be included in another Planning Coordinator area using one of the other methods above. However, in instances where agreements can't be made, the third-party methodology could be an option for several entities to obtain the services without creating a large number of dispersed small Planning Coordinator areas. There is also concern services could be duplicated where some efforts are being performed by another entity, but not "on behalf of" the entity.

Appendix 2: Map of Balancing Authorities in the WECC Region

This map of Balancing Authorities in WECC provides a general overview of the geographical relationship between neighboring BAs and may not match the official list of NERC-registered BAs.



Western Interconnection Balancing Authorities (38)

AESO - Alberta Electric System Operator
AVA - Avista Corporation
AZPS - Arizona Public Service Company
BANC - Balancing Authority of Northern California
BCHA - British Columbia Hydro Authority
BPAT - Bonneville Power Administration - Transmission
CFE - Comision Federal de Electricidad
CHPD - PUD No. 1 of Chelan County
CISO - California Independent System Operator
DEAA - Arlington Valley, LLC
DOPD - PUD No. 1 of Douglas County
EPE - El Paso Electric Company
GCPD - PUD No. 2 of Grant County
GRID - Gridforce
GRIF - Griffith Energy, LLC
GRMA - Sun Devil Power Holdings, LLC
GWA - NaturEner Power Watch, LLC
HGMA - New Harquahala Generating Company, LLC
IID - Imperial Irrigation District
IPCO - Idaho Power Company
LDWP - Los Angeles Department of Water and Power
NEVP - Nevada Power Company
NWMT - NorthWestern Energy
PACE - PacifiCorp East
PACW - PacifiCorp West
PGE - Portland General Electric Company
PNM - Public Service Company of New Mexico
PSCO - Public Service Company of Colorado
PSEI - Puget Sound Energy
SCL - Seattle City Light
SRP - Salt River Project
TEPC - Tucson Electric Power Company
TIDC - Turlock Irrigation District
TPWR - City of Tacoma, Department of Public Utilities
WACM - Western Area Power Administration, Colorado-Missouri Region
WALC - Western Area Power Administration, Lower Colorado Region
WAUW - Western Area Power Administration, Upper Great Plains West
WWA - NaturEner Wind Watch, LLC

Appendix 3: Analysis of NERC-Registered Entities in the WECC Region

34 Balancing Authorities

31 Planning Coordinators

25 Balancing Authorities that are also Planning Coordinators

50 Transmission Operators

31 Transmission Operators that are also Planning Coordinators

45 Transmission Planners

30 Transmission Planners that are also Planning Coordinators

List of NERC-registered Balancing Authorities in the WECC Region:

NERC Active Compliance Registry Matrix as of 06/26/2015											
Entity Name	BA	DP	GO	GOP	LSE	PA	RP	TO	TOP	TP	TSP
Arizona Public Service Company	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Arlington Valley, LLC - AVBA	BA (06/17/2007)										
Avista Corporation	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Balancing Authority of Northern California	BA (06/17/2007)										
Bonneville Power Administration	BA (06/17/2007)				LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
California Independent System Operator	BA (06/17/2007)					PA (06/17/2007)			TOP		TSP
City of Tacoma, Department of Public Utilities, Light Division	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
El Paso Electric Company	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Gridforce Energy Management, LLC	BA (11/22/2013)										
Griffith Energy, LLC	BA (05/15/2009)										
Idaho Power Company	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Imperial Irrigation District	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Los Angeles Department of Water and Power	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
NaturEner Power Watch, LLC (GWA)	BA (10/14/2008)										
NaturEner Wind Watch, LLC	BA (10/02/2013)										
Nevada Power Company	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
New Harquahala Generating Company, LLC - HGBA	BA (09/12/2007)										
NorthWestern Corporation	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
PacifiCorp	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Portland General Electric Company	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Public Service Company of Colorado	BA (08/23/2007)	DP	GO	GOP	LSE	PA (08/23/2007)	RP	TO	TOP	TP	TSP
Public Service Company of New Mexico	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Public Utility District No. 1 of Chelan County	BA (06/17/2007)	DP	GO	GOP	LSE	PA (01/28/2014)	RP	TO	TOP	TP	
Public Utility District No. 2 of Grant County, Washington	BA (06/17/2007)	DP	GO	GOP	LSE	PA (05/18/2010)	RP	TO	TOP	TP	
PUD No. 1 of Douglas County	BA (06/17/2007)	DP	GO	GOP	LSE		RP	TO	TOP	TP	
Puget Sound Energy, Inc.	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Salt River Project Agricultural Improvement and Power District	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Seattle City Light	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	
Sundevil Power Holdings, LLC	BA (06/17/2007)										
Tucson Electric Power	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Turlock Irrigation District	BA (06/17/2007)	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Western Area Power Administration - Desert Southwest Region	BA (06/17/2007)				LSE	PA (06/17/2007)		TO	TOP	TP	TSP
Western Area Power Administration - Rocky Mountain Region	BA (06/17/2007)				LSE	PA (06/17/2007)		TO	TOP	TP	TSP
Western Area Power Administration - Upper Great Plains Region	BA (06/17/2007)				LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP

Appendix 3 (continued)

List of NERC registered Planning Coordinators in the WECC Region:

Note: Planning Authority (PA) equals Planning Coordinator per the NERC Glossary of Terms.

NERC Active Compliance Registry Matrix as of 06/26/2015											
Entity Name	BA	DP	GO	GOP	LSE	PA	RP	TO	TOP	TP	TSP
Arizona Public Service Company	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Avista Corporation	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Black Hills Corporation		DP	GO	GOP	LSE	PA (01/01/2015)	RP	TO	TOP	TP	TSP
Bonneville Power Administration	BA				LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
California Independent System Operator	BA					PA (06/17/2007)			TOP		TSP
City of Tacoma, Department of Public Utilities, Light Division	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Colorado Springs Utilities		DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
El Paso Electric Company	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Idaho Power Company	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Imperial Irrigation District	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Los Angeles Department of Water and Power	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Nevada Power Company	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
NorthWestern Corporation	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
PacifiCorp	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Platte River Power Authority			GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Portland General Electric Company	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Public Service Company of Colorado	BA	DP	GO	GOP	LSE	PA (08/23/2007)	RP	TO	TOP	TP	TSP
Public Service Company of New Mexico	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Public Utility District No. 1 of Chelan County	BA	DP	GO	GOP	LSE	PA (01/28/2014)	RP	TO	TOP	TP	
Public Utility District No. 2 of Grant County, Washington	BA	DP	GO	GOP	LSE	PA (05/18/2010)	RP	TO	TOP	TP	
Puget Sound Energy, Inc.	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Sacramento Municipal Utility District		DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Salt River Project Agricultural Improvement and Power District	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Seattle City Light	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	
Sierra Pacific Power Company		DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Tucson Electric Power	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Turlock Irrigation District	BA	DP	GO	GOP	LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP
Western Area Power Administration - Desert Southwest Region	BA				LSE	PA (06/17/2007)		TO	TOP	TP	TSP
Western Area Power Administration - Rocky Mountain Region	BA				LSE	PA (06/17/2007)		TO	TOP	TP	TSP
Western Area Power Administration - Sierra Nevada Region						PA (06/17/2007)	RP	TO	TOP	TP	TSP
Western Area Power Administration - Upper Great Plains Region	BA				LSE	PA (06/17/2007)	RP	TO	TOP	TP	TSP

Appendix 4: PCFTF Guiding Principles

The PCFTF developed the following list of guiding principles that it believes are relevant to and provide guidance for the PCFTF to meet its core objectives:

1. Identify, review and assess the recent Planning Coordinator coverage and gaps in WECC and develop a proposed approach and methodology to address these issues that is in the best interest of all WECC stakeholders and reasonably consistent with the NERC Reliability Functional Model and definition of Planning Coordinator;
2. Based on the results of the October 2013 and September 2014 Planning Coordinator bus assessments and in consideration of the proposed approach and methodology; develop, assess, and document processes and procedures that will be recommended to the PCC, as appropriate, that are commensurate with the requirements of the Planning Coordinator function and the needs of WECC members;
3. Outreach will be conducted, as appropriate, with WECC stakeholders throughout the PCFTF's activities;
4. Develop an implementation plan for the proposed processes and procedures.

Based on the definitions included within the NERC Functional Model documentation, and as identified in the Glossary of Terms Used in NERC Reliability Standards, the term Planning Authority is synonymous with Planning Coordinator. As such, for this document and for all of the PCFTF work, the term Planning Coordinator is used. Guiding Principles not yet resolved are identified in a separate section. Further discussion will be required to reach resolution.

Disclaimer on Guiding Principles

The Guiding Principles were documented and approved through the PCFTF and the PCC in August 2014 to help guide the PCFTF through the process. As the PCFTF worked to create the paper, some of the intent of the Guiding Principles may not have direct alignment due to knowledge gained during the process.

Guiding Principles Reached Through Consensus

1. Each Planning Coordinator will define its area of purview and will identify the entities contained within each Planning Coordinator area. The area under the purview of a Planning Coordinator may include as few as one Transmission Planner (TP) and one Resource Planner (RP).
2. Facilities/equipment may have overlapping Planning Coordinator and TP planning responsibilities. It is the responsibility of the Planning Coordinators and TPs to coordinate their specific responsibilities of their covered facilities/equipment.
3. The facilities under Planning Coordinator purview are generally contiguous and cover in aggregate the same areas as the Transmission Planners it coordinates.

4. Almost all Planning Coordinator Tasks and Relationships (includes system modeling data collection) require interaction with TPs, RPs and adjacent Planning Coordinators.
5. In turn, the TP must interact with TOs, GOs, TSPs, LSEs, RPs, and other TPs for almost all of its activities.[20]
6. Planning Coordinator area is not necessarily the same as a Balancing Authority Area.
7. A Planning Coordinator area is defined by "electrical" (asset) boundaries.
8. All planning functions must be assigned based on NERC registration. The NERC Functional Model describes a set of Functions that are performed to ensure reliability of the BES. The Model assigns each Function to a functional entity. To ensure that facilities necessary to BES reliability are adequately modeled and assessed:
    a. Every BES facility shall belong to at least one Planning Coordinator area.
    b. Every BES facility shall belong to at least one TP area.
    c. Non-BES facilities that are critical or that impact the reliability of the BES and are necessary for planning and/or operational functions (e.g., modeling) shall belong to at least one Planning Coordinator and TP area.
9. An entity may have multiple Planning Coordinators. When an entity has assets in multiple Planning Coordinator areas, the Planning Coordinators, in consultation with the entity, will make the final determination on which Planning Coordinator will be responsible for which assets (let the Planning Coordinators coordinate).
10. Planning Coordinators may need to account for the modeling of non-registered entities.
11. Planning Coordinator footprints should not change based on specific requirements of the standards (today a Planning Coordinator may have multiple Planning Coordinator areas depending on specific requirements).
12. The Planning Coordinator assignment doesn't obligate the Planning Coordinator to assume any other NERC registration functions (e.g., TP or RP).
13. Since TP closely follows ownership of facilities and Planning Coordinators are comprised of one or more TPs, then it can be said that the Planning Coordinator function follows ownership.

[20] Non-registered entities complicate this principle.

Appendix 5: Planning Coordinator (PC) Gap Resolution Team (GRT) – PC- GRT

Planning Coordinator (PC) Gap Resolution Team (GRT) – PC- GRT

The PC-GRT will support entities in establishing PC relationships. The PC-GRT will focus on resolving the PC gaps to promote and ensure reliability – data utilized in the PC-GRT process will not be used for compliance monitoring. Entities are encouraged to proactively attempt to establish relationships with a PC for their planning activities. Examples of documents used for formalizing PC relationships are included in Appendix 10. Entities may elect to use the PC-GRT process. The PC-GRT may be used as a facilitator as well. Additionally the PC-GRT may conduct outreach to close any remaining gaps. Any entity within WECC seeking resolution on who its PC or TP is may use the PC-GRT process.

Team make up: Panel of seven to 12 industry experts with knowledge of the NERC Functional Model and NERC planning Standards. In order for the process to be efficient and consistent, to the extent possible, a core team of participants should be used for each review. Should an issue pertain to an individual's utility, the individual must be recused for that specific situation. WECC Planning staff will facilitate the review process.

The technical team will concentrate on the technical solution of closing the gaps, while recognizing that registration and compliance are considerations. At the conclusion of the PC-GRT process, the PC-GRT may provide a recommendation to the Planning Coordination Committee, the WECC Registered Entity Oversight Department, NERC, and FERC.

The technical team will concentrate on the technical solution of closing the gaps, while recognizing that registration and compliance are considerations. The outcome of the PC-GRT review will be a recommendation that will be provided to the Planning Coordination Committee, the WECC Registered Entity Oversight Department, NERC, and FERC.

Process Outline

Entity X is an entity with qualifying transmission assets that are not included in a PC area.

Entity Y(s) is a candidate that may be suitable to perform PC functions based on one or more of the methodologies from the white paper, e.g., *may* be performing some PC functions for Entity X or Entity X is the under the operational control of Entity Y.

1. Entity X fills out the current PC-GRT matrix[21] (see Appendix 6 for an excerpt)
2. Entity X sends completed spreadsheet to:
    a. Planning Coordinator Gap Resolution Team (PC-GRT)
    b. All Entity Y's that are contained within Entity X completed spreadsheet
3. Entity Y has the opportunity to add additional clarification on Entity X's submittal within 30 days

[21] Draft PC-GRT matrix is located in the PCFTF accordion located: https://www.wecc.biz/pcc/Pages/Default.aspx

    a. Entity Y submits additional information to PC-GRT
4. PC-GRT reviews each submitted PC-GRT matrix
5. PC-GRT meets with Entity X and all identified Entity Y representative to review the PC-GRT matrix.
    a. PC-GRT works with Entity X and Entity Y(s) to gain additional information or clarity regarding the completed PC-GRT matrix.
6. Based on the information gathered the PC-GRT may make a recommendation on who the PC should be.
7. Quarterly the PC-GRT will make their recommendations available to the PCC, the WECC Registered Entity Oversight Department, NERC, and FERC.

Appendix 6: Draft PC-GRT Matrix

PC-GRT Matrix - Part 1

Information provided will not be used in the Compliance Monitoring Process

Entity Name:	**NCR #:**
Questions	**Response**
Who's your Balancing Authority	
Who's your Area Coordinator for base case	
Who has Operational Control of your facilities	
Who do you send the following modeling data to:	
*Load Forecast	
*Facility Ratings Methodology	
*Facility Ratings	
*Transfer Capability	
*Interconnection Studies and requirements	
*Relay Coordination	
*Long Term Demand Forecasts	
*Long Term Capacity Purchases and Sale	
*System modeling data	
Have you received any PC like notifcations (PRC-023, modification of plan of service, SOL's designated as IROLs, CIP-014 facility criticality notice, etc.)	
Who is your Transmission Planner	
Who do you think your PC may be	

PC-GRT Matrix - Part 2

Information provided will not be used in the Compliance Monitoring Process

Entity Name:			NCR #:					
NERC Standards Requirements & WECC Criteria applicable to the Planning Authority / Planning Coordinator					As of 8.24.14			
Standard	Req	Text of Requirement	How is this accomplished today	Who does the data go to	Frequency	Function	Importance to Reliability	Applicable Entities
FAC-002-1	R1	The Generator Owner, Transmission Owner, Distribution Provider, and Load-Serving Entity seeking to integrate generation facilities, transmission facilities, and electricity end-user facilities shall each coordinate and cooperate on its assessments with its Transmission Planner and Planning Authority. The assessment shall include:			As needed - probably multiple times per year	Transmission Planning	Medium	GO, TO, DP, LSE, TP, PA
FAC-002-1	R1.1.	Evaluation of the reliability impact of the new facilities and their connections on the interconnected transmission systems.			As needed - probably multiple times per year	Transmission Planning	Medium	PA, TP, GO, TO, LSE, DP
FAC-002-1	R1.2.	Ensurance of compliance with NERC Reliability Standards and applicable Regional, subregional, Power Pool, and individual system planning criteria and facility connection requirements.			As needed - probably multiple times per year	Transmission Planning	Medium	PA, TP, GO, TO, LSE, DP
FAC-002-1	R1.3.	Evidence that the parties involved in the assessment have coordinated and cooperated on the assessment of the reliability impacts of new facilities on the interconnected transmission systems. While these studies may be performed independently, the results shall be jointly evaluated and coordinated by the entities involved.			As needed - probably multiple times per year	Transmission Planning	Medium	PA, TP, GO, TO, LSE, DP
FAC-002-1	R1.4.	Evidence that the assessment included steady-state, short-circuit, and dynamics studies as necessary to evaluate system performance under both normal and contingency conditions in accordance with Reliability Standards TPL-001-0, TPL-002-0, and TPL-003-0.			As needed - probably multiple times per year	Transmission Planning	Medium	PA, TP, GO, TO, LSE, DP
FAC-002-1	R1.5.	Documentation that the assessment included study assumptions, system performance, alternatives considered, and jointly coordinated recommendations.			As needed - probably multiple times per year	Transmission Planning	Medium	PA, TP, GO, TO, LSE, DP

PC-GRT Matrix - Part 2

Information provided will not be used in the Compliance Monitoring Process

Entity Name:			NCR #:					
NERC Standards Requirements & WECC Criteria applicable to the Planning Authority / Planning Coordinator					As of 8.24.14			
Standard	Req	Text of Requirement	How is this accomplished today	Who does the data go to	Frequency	Function	Importance to Reliability	Applicable Entities
FAC-010-2.1	E.1.	The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC
FAC-010-2.1	E.1.1.	As governed by the requirements of R2.5 and R2.6, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC
FAC-010-2.1	E.1.1.1	Simultaneous permanent phase to ground Faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is anacceptable risk and therefore can be excluded.			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC
FAC-010-2.1	E.1.1.2	A permanent phase to ground Fault on any generator, transmission circuit, transformer, or bus section with Delayed Fault Clearing except for bus sectionalizing breakers or bus-tie breakers addressed in E1.1.7			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC
FAC-010-2.1	E.1.1.3	Simultaneous permanent loss of both poles of a direct current bipolar Facility without an alternating current Fault.			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC
FAC-010-2.1	E.1.1.4	The failure of a circuit breaker associated with a Special Protection System to operate when required following: the loss of any element without a Fault; or a permanent phase to ground Fault, with Normal Clearing, on any transmission circuit, transformer or bus section.			Once - then update as needed - maybe annual check?	Transmission Ops - Study Team	High	PA, PC

Appendix 7: Implementation Plan

It is understood when a non-PC entity establishes a relationship with a PC, both parties need time to ensure the data necessary for a PC to perform its obligations is provided and incorporated. WECC Registered Entity Oversight leadership has agreed where a relationship is newly formed; a formal implementation plan must be submitted to WECC for consideration when conducting Compliance Monitoring and Enforcement Program (CMEP) activities.

An implementation plan will provide Entity X and Entity Y strategy to ensure reliability and compliance obligations are understood by both entities such that reasonable assurance of compliance will be established on completion of the plan. During WECC CMEP activities, WECC will consider the implementation plan when developing a risk-based compliance monitoring plan for the entities involved. Upon establishing an implementation plan, WECC Registered Entity Oversight Department will review and either recommend modifications or approve the PC implementation plan. If Entity X and Entity Y are meeting the milestones outlined in the implementation plan, WECC will not find an entity in violation as relates to the standards that are applicable to fully implementing the planning coordinator functions. Implementation plans will vary depending on the complexity and amount of time expected to fully develop and establish a PC relationship and integrate the non-PC facilities within the PC Area. The PCFTF has provided a proposed/example phased in approach outlined below.

1. When Entity Y formalizes the PC relationship with Entity X, sufficient time will be provided to incorporate data within their normal planning cycles.
    a. The timeline can be 18-24 months depending on Entity's Y's normal planning cycle
2. Entity X and Entity Y agree on a timeline to fully implement the PC requirements.
3. Entity Y submits a proposed timeline and action plan to WECC Registered Entity Oversight Department.
4. The implementation plan will need to include Entity Y's detailed phased in approach – see example on the next page provided by PCFTF.
5. Entity Y, in coordination with all Entity Xs, will provide quarterly updates to WECC Registered Entity Oversight Department indicating completion/progress of activities within the action plan.
    a. Revisions/extensions to the implementation plan must be submitted for WECC review and approval.
6. The Registered Entity Oversight Department will have the authority to spot check on reported progress.
7. Upon completion, all Entities will have reasonable assurance that all planning requirements addressed by the implementation plan are being met and applicable facilities are in a Planning Coordinator area.
8. Entity Y will be publicly acknowledged for its efforts to improve reliability.

Below is the suggested phased-in implementation for incorporating a new entity within an existing PC area. This is an intensive data collection, data validation; data integration effort to bring a new entity into the PC's planning cycles to ensure accurate modeling of facilities incorporated. Keeping an entity's system design, configuration, planning cycles and business practices in perspective, PCs should assess and determine the specific priorities and milestones to be included within their PC Implementation Plan.

This example implementation plan can be adopted by:

1. An entity incorporating a new entity within an existing PC area
2. An entity becoming a PC

Phase 1

- FAC-010 – System Operating Limits Methodology for the Planning Horizon
  - Operating limits are needed for planning and operations
- PRC-023 Transmission Relay Loadability
  - Ensure proper relay coordination in real-time operations
- MOD-032 Data for Power System Modeling and Analysis
  - Foundational data for modeling and coordination
- TPL-001-4 Transmission System Planning Performance Requirements
  - Needed to assure load can be reliability served in near and long term
- NUC-001
  - It's important to plan Nukes

Phase 2

- FAC-002 Coordination for New Facilities
  - This should be done upon interconnection, it's important for the new PC to understand what studies were done
- FAC-013 Assessment of Transfer Capability for the Near-Term Transmission Planning Horizon
  - TPL-001-4 covers future needs, FAC-013 augments the TPL-001-4 studies
- FAC-014 Establish and Communicate System Operating Limits
  - TPL-001-4 covers future needs, FAC-014 communicates and augments the TPL-001-4 studies

Phase 3

- PRC-006 Automatic Underfrequency Load Shedding
  - Plan is already developed, it's been implemented, the standard has been moved into the maintenance and validation mode
- TPL-007 Transmission System Planned Performance for Geomagnetic Disturbance Events
  - Data collection could be a time consuming task (not subject to enforcement yet)

An example implementation of each phase is provided below. Please keep in mind that an entity can incorporate more standards into an earlier phase.

Milestone	Responsible Entity	Timeline
Establish relationship	Entity X and Entity Y	Begins
Establish roles and responsibilities	Entity X and Entity Y	TBD
Request facility information from X with specifications	Entity Y	TBD
Provide PC with required information	Entity Y	TBD
Integrate X information in planning processes	Entity Y	TBD
Validate results from PC Studies	Entity X and Entity Y	TBD
Implementation Complete:		
Continued coordination and communication as established in roles and responsibilities	Entity X and Entity Y	TBD

Appendix 8:
Roles and Responsibilities of Planning Coordinator and Transmission Planner

The Planning Coordinator (PC) coordinates and integrates transmission facility and service plans, resource plans, and protection system plans among the Transmission Planners (TP) within its defined area. A PC may have multiple TPs within its defined area. The activities of the PC range from setting common procedures, protocols, modeling and methodology software for consistency, to acting as a central coordinator to review the reinforcement and corrective action plans developed by the TPs within its area. The PC also conducts system performance assessments, in collaboration with other PCs, to coordinate transfer capabilities across multiple TPs that connect the PC areas.

The TP evaluates the facilities that will be needed in response to long-term requests for transmission service, new generation interconnections, new transmission facilities, and end-use customers in the Bulk Electric System (BES) area it is responsible for. The TP provides its transmission plan to its PC for review to ensure impacts on the interconnected systems are duly addressed. In reporting its transmission expansion plans to the PC, the TP is expected to assess whether its plans for new or reinforced facilities meet reliability needs or whether corrective plans are necessary. The TP works with its PC to identify potential alternative solutions, including solutions proposed by stakeholders, to meet interconnected BES reliability requirements.

Appendix 9: The Planning Role of WECC in the Western Interconnection

The Planning Role of WECC in the Western Interconnection

WECC Staff

August 11, 2015

155 North 400 West, Suite 200

Salt Lake City, Utah 84103-1114

Introduction

The Western Electricity Coordinating Council (WECC), by delegated authority from the North American Electric Reliability Corporation (NERC), is the Regional Entity responsible for assuring a reliable Bulk Electric System in the Western Interconnection. WECC also fills a critical role by performing interconnection-wide independent analysis of the Western Interconnection through its Reliability Planning and Performance Analysis activities.

With the evolution of the NERC Functional Model, concerns around Planning Coordinator area gaps have emerged in the Western Interconnection. Because of these concerns, understanding the roles and responsibilities of different planning entities has become critical to minimize duplication of effort and assure that reliability planning functions are being performed across the interconnection. The purpose of this paper is to describe the role WECC plays in reliability planning and highlight the distinction between the role of the Regional Entity and that of a Planning Coordinator.

WECC Reliability Planning

WECC currently has two departments dedicated to understanding the reliability needs of the interconnection in the planning horizon – System Adequacy Planning and System Stability Planning.

The System Adequacy Planning department supports the activities of NERC's reliability assessment work (e.g., the Long-term Reliability Assessment and probabilistic resource adequacy assessment), WECC's reliability assurance role, and the Transmission Expansion Planning Policy Committee (TEPPC). As part of this effort WECC uses a Production Cost Model of the Western Interconnection to analyze study cases based on different load and resource mixes on the Bulk Electric System in the Western Interconnection as it is expected to look in the ten-year timeframe. This model uses dispatch algorithms to assess congestion on the transmission system as well as resource adequacy. The studies that are performed using these models help to inform policy makers, NERC, and other industry stakeholders as they make decisions about reliability and the need for system expansion in the future.

The System Stability Planning department supports the activities of the Planning Coordination Committee and WECC's reliability assurance role. A major function of the System Stability Planning group is the collection and compilation of data used to develop interconnection-wide power flow and dynamics models. These models are used by Transmission Planners, Planning Coordinators, and many other industry stakeholders to evaluate the stability of the near term and future system as required by several WECC processes and Reliability Standards. In addition to model development, the System Stability Planning department facilitates planning processes, such as the WECC Path Rating process, that are used by system planners across the interconnection.

Through its System Adequacy Planning and System Stability Planning departments, WECC is able to perform independent interconnection-wide reliability assessments of the Western Interconnection. This helps to support WECC's mission of promoting and fostering a reliable Bulk Electric System by identifying system performance issues of potential system futures.

The Planning Coordinator Role

A Planning Coordinator is a Registered Entity and is thus subject to mandatory Reliability Standards. The Planning Coordinator has the responsibility of working with Resource Planners and Transmission Planners to develop "alternative solutions for plans that do not meet those reliability needs." Furthermore, Planning Coordinators have the responsibility to develop methodologies and processes to support planning functions, such as the calculation of transfer capability.

WECC's Role in System Planning

As the Functional Model points out, "By its very nature, Bulk Electric System planning involves multiple entities." The perfect example of this concept is the development of power flow models. Planning Coordinators and Transmission Planners work with functional entities (e.g., Transmission Owners) that supply system characteristics data, such as load forecasts and line ratings, and convert that information into a format that can be used by power system simulation programs. Planning Coordinators then validate data and compile information to create models for the Planning Coordinator's footprint. Planning Coordinators then submit data to NERC or its designated model builder for constructing interconnection-wide models.

WECC has been designated by NERC to be the model builder for the Western Interconnection as referenced in MOD-032-1 R4. In this capacity, WECC is responsible for working with Planning Coordinators to receive information needed to compile models representing the entire interconnection and assuring that the models meet high quality standards.

In addition to power flow and dynamics modeling, WECC supports the planning needs of the interconnection by developing Production Cost Models. Although not referenced in Reliability Standards, these models assess transmission congestion and resource adequacy issues, which help policy makers, regional planning groups, and other industry stakeholders make informed decisions about reliability and system expansion in the future. Additionally, Production Cost Models enable system planners to study a wider range of time frames than power flow models (Production Cost Models simulate every hour of a given year, where power flow models represent a snapshot of a specific point in time), thus helping to identify times throughout the year when the system may be stressed.

In addition to system modeling, WECC also has the delegated responsibility to "develop assessments of the reliability of the Bulk-Power System, or ensure that data and information are collected, analyzed and provided to NERC in support of the development of reliability assessments, in accordance with the

NERC Rules of Procedure."[22] This means that WECC will perform reliability assessments of the Western Interconnection, either of its own accord or in conjunction with NERC.

As part of WECC's coordination role, it also provides a forum for stakeholders to meet, develop industry policies and practices, share information, and perform other activities to support planning activities on an interconnection-level.

Why is WECC not a Planning Coordinator?

As outlined above, WECC is the Regional Entity responsible for assuring a reliable Bulk Electric System in the Western Interconnection and not that of a Planning Coordinator. Several factors support this position, such as:

1. As a result of the September 8, 2011 Southwest Outage and subsequent follow up with NERC and FERC, WECC bifurcated its organization to separate its Regional Entity role from its Registered Entity roles (Reliability Coordinator and Interchange Authority). Because of the need to maintain the separation of functions that resulted in bifurcation, WECC is very unlikely to register as a Planning Coordinator.
2. WECC's authority and duties come through its delegation agreement with NERC. This delegation agreement outlines WECC's roles and responsibilities of how it will operate as the Regional Entity. These responsibilities include the development, monitoring and enforcement of, but not the responsibility of compliance with, Reliability Standards. FERC supported this position by not approving fill-in-the-blank standards.
3. On May 22, 2015, NERC designated WECC as the designee for receiving models from the Planning Coordinators as required by Requirement R4 in MOD-032-1. MOD-032-1 outlines a distinct role for WECC (as the NERC designee) apart from Planning Coordinators. As such WECC does not develop steady-state, dynamics, and short circuit modeling data requirements and reporting procedures for the Planning Coordinator's planning area as required by Requirement R1. Additionally WECC does not collect steady-state, dynamic, or short circuit data from the Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider as required by Requirement R2. Rather, WECC receives the models for Planning Coordinator planning areas from the Planning Coordinators as required by Requirement R4.
4. WECC does not have a role in project selection. WECC does not choose winners and losers when it comes to proposed transmission projects. Instead, in accordance with its role as the Regional Entity, WECC only assesses the reliability of the interconnection for specific future scenarios.

[22] http://www.nerc.com/FilingsOrders/us/Regional%20Delegation%20Agreements%20DL/WECC_RDA_Effective_20141223.pdf (see page 11, section 7C).

5. WECC does not conduct a complete Planning Assessment of the entire Western Interconnection or any specific Transmission Planner or Planning Coordinator footprint as required in TPL-001-4.
6. WECC does not develop a Corrective Action Plan when Planning Assessments conducted by Planning Coordinators or Transmission Planners do not meet specified performance requirements.
7. WECC does not coordinate with Generator Owners, Transmission Owners, Distribution Providers, or Load-Serving Entities seeking to integrate generation facilities, transmission facilities, and electricity end-user facilities as required by FAC-002-1.
8. WECC does not develop System Operating Limit Methodologies as required in FAC-010-2.1.
9. WECC does not develop System Operating Limits as required in FAC-014-2.

Planning Function Considerations Going Forward

This paper reflects WECC's current planning role in the Western Interconnection and WECC will continue to engage in discussions around improving processes that support the reliability of the Bulk Electric System. As the evolution of the power industry has been heavily driven by Reliability Standards and the emergence of FERC Order 1000, it is essential that the planning entities within the Western Interconnection identify their roles and responsibilities in various planning processes. WECC, as the Regional Entity for the Western Interconnection, will look forward to working with Planning Coordinators and other planning entities to assure that the reliability of the system is maintained as the power system continues to change into the future.

Appendix 10: Samples of formalizing the PC Relationship

Department of Energy

Bonneville Power Administration

P.O. Box 61409 Vancouver,
WA 98666-1409

TRANSMISSION SERVICES

December 18, 2013

In reply refer to: TPC-TPP-4

«Customer_Name_Long», «Customer_Title»
«Customer»
«Customer_Mailing_Address»

Dear «Customer_Name_Short»:

This notification is to inform «Customer» that as of January 1, 2014, the Bonneville Power Administration (BPA) will serve as the registered Planning Authority/Planning Coordinator (PA), as defined by the North American Electric Reliability Corporation (NERC), for

«Customer».
Attached is additional information, including BPA's Planning Authority Implementation Methodology. Key principles include:

- A PA Area does not equal a Balancing Authority Area.
- A PA implements requirements for the PA function. Other applicable NERC registered functions are responsible for implementing requirements for each standard for their functional perspective.
- Serving as the registered PA does not obligate the PA to assume any other NERC registration functions, such as Transmission Planner, or to identify any gaps in NERC registration.
- There can be no gaps in planning functions—every facility must belong to a PA, and qualifying Transmission Assets must have an identified Transmission Planner.
- Bordering PAs make the final boundary determination when an entity is in multiple PA Areas.

BPA has performed an in-depth, customer specific, requirement by requirement analysis of «Customer» facilities for all current mandatory PA standards and created a spreadsheet to facilitate ongoing tracking of those standards. In addition, BPA has created a highlighted one-line diagram that delineates bulk electric system and non-bulk electric system assets and identifies points of change of ownership where the PA area boundaries occur. BPA has attached the analysis and highlighted one-line diagram depicting ownership boundaries.

If you have any questions, please submit them to the Customer Service Reliability Program Mailbox csreliabilityprogram@bpa.gov and we will provide you with a coordinated response from BPA.

Sincerely,

Lorissa Jones
Customer Service Reliability Program Manager

3 Enclosures:
BPA Planning Authority Implementation Methodology
Standards of Applicability Details
One-Line Diagram

cc:
«Customer_Compliance_Contact_», «Customer»

bcc: NOTE – REORDER BY MAILSTOP/NAME ONCE POPULATED
«P_AE_Name_Short» – «P_AE_Mailstop»
T. Miller – PST-6 IF THIS IS A TRANSFER CUSTOMER
K. Johnson – TPC/TPP-4
L. Jones – TPC-TPP-4
«CSE_Short» – «CSE_Mailstop»
«T_AE_Name_Short» – TSE/TPP-2
«T_Acct_Spec_Name_Short»- TSES/TPP-2
Customer File – TPC-TPP-4 («Customer»)
Official File – TPC-TPP-4

LJJones:vrd:6290:12/17/2013 (RS1F01/T_Asset_Management/Transmission Reliability Program/Customers/INSERT FILE NAME)