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FEDERAL ENERGY REGULATORY COMMISSION

Reliability Technical Conference)

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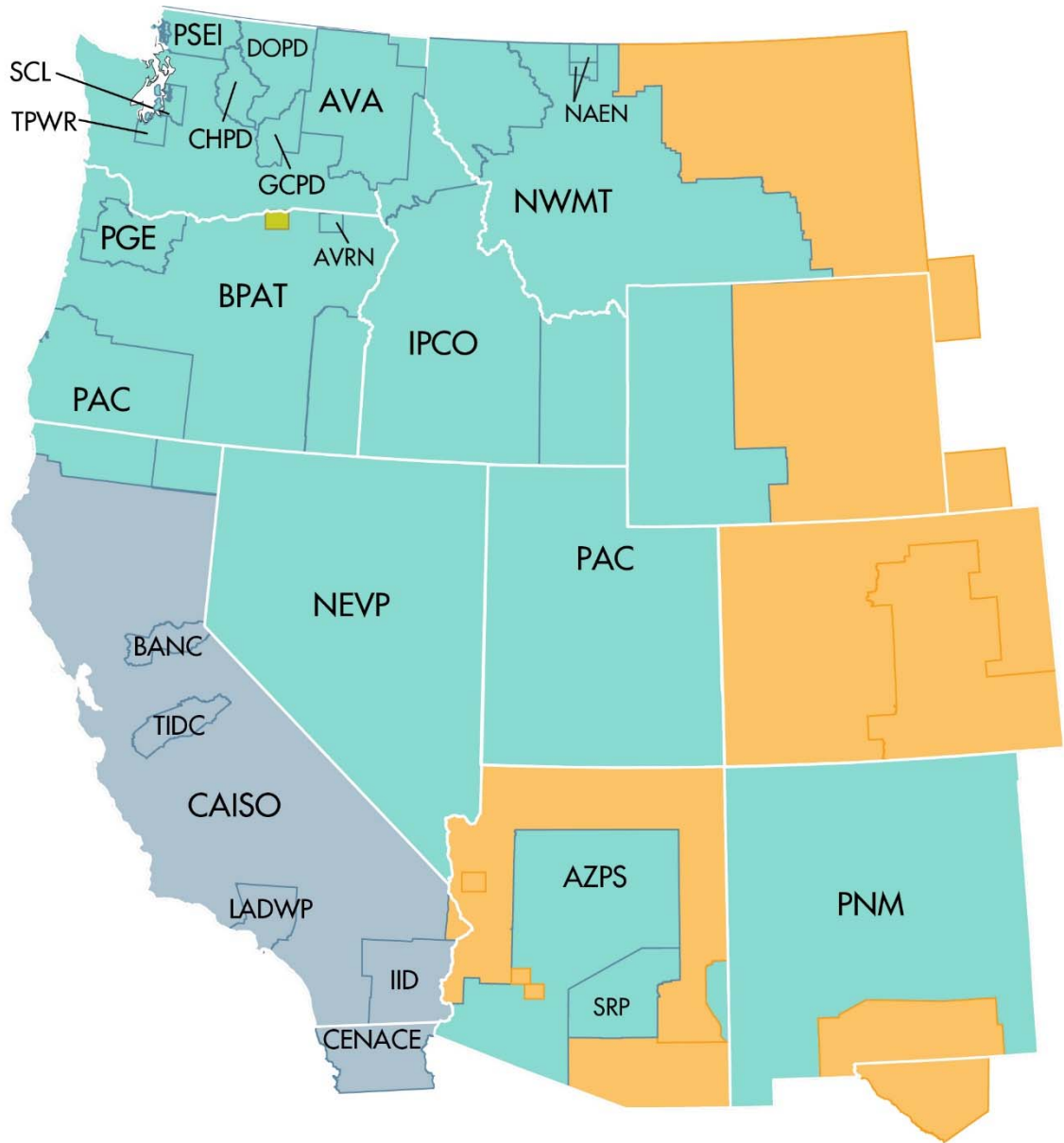
**Prepared Statement of Dede Subakti
on behalf of the California Independent System Operator Corporation**

I. Introduction

My name is Dede Subakti. I serve as Director, Operations Engineering Services at the California ISO (CAISO).¹ In this role, I oversee various functions, including completing resource adequacy assessments, seasonal operating studies, outage coordination studies, day-ahead reliability analysis, real-time operations engineering analysis, as well as developing operating procedures and tools along with other engineering needs to support system operations. In addition, my department supports the CAISO's planned reliability coordinator function for Balancing Authorities and Transmission Operators in the Western Interconnection that have elected to take Reliability Coordinator services from the CAISO. Starting July 1, 2019, the CAISO will commence providing Reliability Coordinator services as RC West to California entities as well as Centro Nacional de Control de Energía (CENACE). RC West will extend its footprint to other Balancing Authorities and Transmission Operators in the Western

¹ Prior to joining the CAISO, I worked with OATI, Inc., managing project development for various transmission system applications for transmission service providers in both the Western and Eastern Interconnections. Prior to my work with OATI, I served as Manager of Regional Operations Engineering at the Midwest ISO (now Midcontinent ISO) where I managed real-time operations engineers providing control room operations support. I have also worked with representatives of both the North American Electric Reliability Corporation (NERC) and the Western Electricity Coordinating Council to develop reliability standards and support operation of the Western Interconnection. I am a licensed Professional Engineer with the State of Minnesota and a certified NERC System Operator. I received a Master of Business Administration from the Carlson School of Management at the University of Minnesota and Master of Electrical Engineering from Iowa State University with an emphasis in power systems. I also earned a Bachelor of Science in Electrical Engineering from Iowa State University.

Interconnection on November 1, 2019. In all, RC West will provide Reliability Coordinator services to 40 Balancing Authorities and Transmission Operators in the Western Interconnection.² The following map reflects the footprint of RC West’s service area as of July 1, 2019 (grey-shaded area) November 1, 2019 (green-shaded area).



² A list of entities that have contracted to take reliability coordinator services from the CAISO is available on the following website: <http://www.caiso.com/Documents/RCWestEntities.pdf>.

My remarks today address Panel IV of this Reliability Technical Conference: *Reliability Issues Associated with Reliability Coordinator Seams*. I describe RC West's plans to provide Reliability Coordinator services at a level that will enhance reliability in the Western Interconnection and the development of new Reliability Coordinator seams in the Western Interconnection. I also describe how RC West will coordinate operations with Reliability Coordinators in the Western Interconnection and the oversight committee mechanism that RC West has put in place to share information with affected stakeholders, foster dialog as well as identify and mitigate risks. I highlight the need to ensure we coordinate implementation of systems and business processes to manage any Reliability Coordinator seams issues. Finally, I discuss some issues on which Reliability Coordinators in the Western Interconnection will need to focus and prepare to address.

II. The Western Interconnection is transiting to multiple Reliability Coordinators

Today, all Balancing Authorities and Transmission Operators in the Western Interconnection, with the exception of the Alberta Electric System Operator (AESO), obtain Reliability Coordinator services from Peak Reliability. Peak Reliability will terminate Reliability Coordinator operations on December 3, 2019 by which time, the CAISO (RC West), the Southwest Power Pool (SPP), and British Columbia Hydro and Power Authority (BCHA) all plan to provide Reliability Coordinator services in the Western Interconnection. The CAISO understands that Gridforce Energy Management also plans to become its own Reliability Coordinator. AESO will also continue to operate as its own Reliability Coordinator.

Under NERC's functional model, a Reliability Coordinator works to enhance the

reliability of the transmission system by identifying threats to reliability and directing coordinated action to mitigate those threats and respond to emergencies. A Reliability Coordinator must also be capable of calculating operating limits for the electricity grid that it serves. NERC defines Reliability Coordinator to mean:

The entity that is the highest level of authority who is responsible for the Reliable Operation of the Bulk Electric System, has the Wide Area view of the Bulk Electric System, and has the operating tools, processes and procedures, including the authority to prevent or mitigate emergency operating situations in both next-day analysis and real-time operations. The Reliability Coordinator has the purview that is broad enough to enable the calculation of Interconnection Reliability Operating Limits, which may be based on the operating parameters of transmission systems beyond any Transmission Operator's vision.

Reliability Coordinators fulfill these requirements through monitoring and awareness, which is supported by outage coordination and day-ahead planning. In addition, Reliability Coordinators must provide coordination or direction to entities when emergencies arise in real-time. RC West's overarching reliability and operating philosophy is to prevent an emergency condition by use of rigorous processes supporting outage planning, day-ahead analysis, as well as proactive monitoring and mitigation. RC West will perform all tasks and functions required of Reliability Coordinators by the applicable reliability standards as well as ensure proper coordination among all affected Reliability Coordinators, Balancing Authorities, and Transmission Operators. RC West intends to deliver Reliability Coordinator services that are enhanced over those that RC West's members receive today.

Until now, the seams between Reliability Coordinators in the Western Interconnection were isolated to coordinated operations between Peak Reliability and

AESO. However, with potentially five Reliability Coordinators operating in the Western Interconnection, more seams will naturally exist. In the operational planning and real-time operating horizons, RC West anticipates the need to exchange information related to reliability coordinator functions with other reliability coordinators that will operate in the Western Interconnection. These exchanges will be essential to ensure reliable operations of the Western Interconnection, but will in no way supplant the functional roles of Balancing Authorities and Transmission Operators in the Western Interconnection nor how these entities provide transmission services, *i.e.*, through an organized market or an open access transmission tariff. In addition, the Western Interconnection will continue to depend upon a set of shared reliability tools for critical functions, regardless of the number of Reliability Coordinators. These shared tools will assist the Reliability Coordinators in managing the seams that will exist.³

III. RC West will coordinate with other Reliability Coordinators in the Western Interconnection pursuant to coordination agreements and established processes for managing reliability

The Commission agenda for this technical conference asks, what are the potential risks for day to day system operations created by Reliability Coordinator seams and how are Reliability Coordinator in the West coordinating in areas such as outage coordination, operation planning, information sharing, wide area monitoring, SOL and IROL exceedance mitigation, and reserve sharing coordination?

³ These tools include the enhanced curtailment calculator for managing unscheduled flow and an interchange tool for managing the check-out process administered by Balancing Authorities. AESO and BCHA have not specifically adopted the unscheduled flow mitigation procedures but follow similar curtailment coordination procedures.

The CAISO is planning to operate with other Reliability Coordinators in the Western Interconnection to ensure it provides effective and reliable service to its customers while also supporting overall reliability of the Western Interconnection. This collaboration will span both the operational planning and real-time operating horizons and will involve discussions related to modeling, outage coordination, day-ahead operations planning analysis, and real-time operations. This coordination should increase reliability awareness due to overlapping monitoring of critical facilities in the Western Interconnection.

To memorialize this arrangement and support reliability coordinator services for California entities and CENACE starting July 1, 2019, RC West has entered into a coordination agreement with Peak Reliability. RC West will also enter into coordination agreements with each of the other entities that will start providing reliability coordinators services in the Western Interconnection in 2019. These agreements will provide a framework for the parties to work cooperatively in their roles as Reliability Coordinators to support the reliability of the interconnected electric systems within their respective reliability areas. Among other activities the parties will continuously share real-time transmission data, forecast data, outage data, network model data, as well as Reliability Coordinator operating plans, processes and procedures. The parties will also coordinate their evaluation of generation and transmission outages as well as joint operations during emergency situations, including events in which there is an exceedance of a system operating limit or interconnection reliability operating limit.

The Commission's agenda for this technical conference also asks whether additional procedures or agreements needed, such as joint operating agreements, to

better coordinate between neighboring Reliability Coordinators during operations. At this time, we do not think additional procedures or agreements are necessary. In addition to coordination agreements, Reliability Coordinators, Balancing Authorities and Transmission Operators in the Western Interconnection will operate their areas consistent with existing procedures such as the Western Interconnection Unscheduled Flow Mitigation Plan, which mitigate flows on Qualified Paths to reliable levels during real-time operations. Entities in the Western interconnection also utilize common tools such as the Enhanced Curtailment Calculator⁴ to ensure reliable system operations. The fact that different Balancing Authorities in the Western Interconnection operate under different electricity market constructs in no way changes these practices. A seam between Reliability Coordinators service areas or even a seam between an organized and bi-lateral market should not require market-to-market seams coordination in the context of Reliability Coordinator services given that we already have common protocols to manage reliability within the Western Interconnection. For example, in the case of the Western Energy Imbalance Market, each participating Balancing Authority and Transmission Operator remains responsible for their own area and can initiate unscheduled flow mitigation on their own accord without intervention by the market operator. Additionally, multiple Reliability Coordinators should not interfere with reserve sharing groups. Balancing Authorities will continue to exercise their functions to secure contingency reserves and dispatch those reserves when needed.

⁴ The Enhanced Curtailment Calculator is a tool used by Reliability Coordinators, Balancing Authorities, and Transmission Operators to gain greater situational awareness in order assess what conditions are contributing to congestion and, if needed, formulate mitigation plans.

In the event that Reliability Coordinator seams issues do arise in the Western Interconnection, RC West will pro-actively raise these issues with its customers and explore means to address them. As part of the effort to offer Reliability Coordinator services, the RC West has developed an Oversight Committee comprised of representatives from Balancing Authorities and Transmission Operators taking Reliability Coordinator services.⁵ The Oversight Committee holds public meetings, provides guidance, and fosters consensus on reliability compliance for RC West. The Oversight Committee includes a regulatory liaison to provide input and feedback from state regulators on general strategic decision-making to RC West and the Oversight Committee. The Oversight Committee's meetings are open to the public and serve as a forum for information sharing and discussion among all affected stakeholders. We anticipate the Oversight Committee can foster discussion and further the resolution of any Reliability Coordinator seams issues that arise for RC West.

IV. A critical step to address Reliability Coordinator seams issues that may arise is for Reliability Coordinators to ensure effective implementation of tools and business processes.

The Commission's agenda for this technical conference asks what reliability challenges with the Reliability Coordinator seams exist in the West? From the perspective of RC West, the most significant step to address issues that may arise with Reliability Coordinator seams is to prepare for coordinated operations across the Western Interconnection. Accordingly, the advance work with the North American Electric Reliability Corporation and Western Electricity Coordinating Council to obtain

⁵ More information about the RC West Oversight Committee, including its Charter as well as meetings agendas, presentations and minutes are available on the following website: <http://www.caiso.com/informed/Pages/RCWest/RCWestOversightCommittee.aspx>.

Reliability Coordinator certification, establishing mechanisms and pathways for coordination among certified Reliability Coordinators, and conducting shadow operations while Peak Reliability remains operational are all steps critical to success. Each Reliability Coordinator will need to make sure its tools and business processes, including operator training, are ready and functioning before Peak Reliability terminates service. The Commission's focus on this effort will help all parties prioritize preparation so that each Reliability Coordinator has systems, tools and communications protocols in place and operational in advance of the transition that will occur.

IV. RC West will support entities in the West as their participation in organized markets increases and resource portfolios change

The Commission's agenda for this technical conference asks, with the establishment of new Reliability Coordinators in the Western Interconnection and the expanding Energy Imbalance Market, what are the key reliability risks that Reliability Coordinators should be focused on and actively managing? RC West believes increased participation in the EIM will in fact enhance reliability in the Western Interconnection, especially as resource portfolios change to include more variable supply and new technologies.

RC West will leverage the operation of this market to more effectively ensure reliable operation of the Western Interconnection. RC West has the ability and infrastructure available to assess transmission reliability issues in advance of real-time. It has the ability to coordinate potential emergency operations among the operating entities within the Western Interconnection. Existing market tools enable more effective forecast and monitoring capability because they can identify potential reliability threats such as transmission line overloads or resource deficiencies hours in advance of

operating hour. This gives affected utilities more time to address these potential threats.

Without advanced forecasting and look-ahead ability, the primary information about reliability threats arrives through telemetry in real-time. RC West will receive this same information within the CAISO Balancing Authority Area as well as the area covered by the EIM ahead of operating hours, thereby allowing RC West to better predict, forecast and avoid potential reliability threats as well as an emergency condition of future operating hours. Visibility cross the CASIO Balancing Authority Area and EIM area will also benefit entities that do not participate in the CAISO markets because those entities could face collateral impacts of reliability issues that the CAISO is able to detect and prevent.

Traditionally, Reliability Coordinators perform operational planning analysis for day-ahead operation by focusing on the ability to serve load reliability by assessing “peak” hour of the coming day, when load is the highest. While the peak hour has historically posed the greatest operating risk to utilities in the Western Interconnection, operating risks during non-peak hours are rising significantly as a result of variation in both load and supply. In any event, there is reliability risk at all times, not just during the peak hour. The information available to RC West, which has had practices to perform operational planning analysis that covers each of the 24 hours of the following day will allow RC West to offer enhanced reliability coordinator services to all customers.

In addition to obtaining advance information about potential reliability threats during each of the 24 hours of the following day, RC West has other tools for analyzing the transmission system in the Western Interconnection. For example, RC West has an

Automated Load Forecasting System (ALFS), which provides a reliable load forecast. Another tool that RC West will use performs transient stability analysis to determine whether an event (e.g., the loss of line or generator) could potentially create an instability. This tool simulates the behavior of the system over time assuming the loss of an element of the system. The tool is useful to assess any number of contingencies, such as a fire approaching a transmission line, so that operators know whether the loss of that line would pose reliability problems. This information will help RC West to identify the need for mitigating steps in advance of the contingency.

As the Commission is aware, there has been significant interest in the western Energy Imbalance Market. The EIM optimizes supply to meet load at least cost every fifteen and five minutes by relying on economical transfers between participating Balancing Authority Areas and creating over \$650 million in benefits since its inception. The EIM emphasizes voluntary participation and local control. The EIM contributes to significant grid reliability by providing situational awareness and enhancing the ability of participating entities to respond to major contingencies.

In concert with entities participating in the EIM, the CAISO is also exploring effort to make day-ahead market functionality available to EIM participants. If sufficient interest exists, the CAISO will initiate a stakeholder process to explore necessary market rule changes. This effort will present an opportunity for EIM participants to expand their market participation into the day-ahead timeframe, which would significantly increase coordination and cost savings.

As utilities look for means to provide reliable electric service at reasonable costs, the EIM and a day-ahead market platform can provide significant economic benefits and

help address reliability issues. For example, fifteen-minute and five-minute transfer capability across a large geographic area helps manage steep ramps utilities now face as they integrate renewables and serve net loads. Combining load curves across the western region in the day-ahead time frame would allow for an even more effective tool to mitigate balancing challenges. RC West will support efforts to improve reliability through greater collaboration among utilities across the Western Interconnection and urges the Commission to support these efforts and allow utilities to pursue solutions that meet their needs.