California Independent System Operator

And

San Diego Gas & Electric

Joint Transmission Planning Base Case Preparation Process

For Compliance with

NERC Reliability Standard MOD-032-1

and

WECC's Anchor Data Set Process

Version 3.1

October 2024

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CAISO and SDG&E Transmission Planning Base Case

Preparation Process

I. Introduction

I.1. Purpose

The purpose of this document is to establish consistent modeling data requirements and reporting procedures for development of planning horizon cases necessary to support analysis of the reliability of the interconnected transmission system. This document is a joint effort between the California Independent System Operator (CAISO) south regional transmission group and the San Diego Gas & Electric Transmission Planning Department, in order to support their compliance with NERC Standard MOD-032-1 R1, R2, R3, and R4 and to support WECC's Anchor Data Set (ADS) process.

The distribution of this document will be made initially to applicable NERC registered entities who are required to submit data, including Generator Owners within SDG&E's service area, and upon any change to the document by SDG&E's Transmission Planning group. The document will also be posted to the CAISO website by CAISO Representatives at www.CAISO.com → Planning → Transmission Planning → Transmission planning documents → Submittal Requirements – Data for Power System Modeling and Analysis MOD-032-1 → ISO-SDGE MOD-032-1 Requirements.

I.2. Types of Base Cases

The following base case development processes are covered in this document:

- SDG&E Grid Assessment (GA) Base Cases
- CAISO Transmission Planning Process (TPP) base cases
- WECC base cases

II. SDG&E Grid Assessment Annual Base Case Process

SDG&E transmission planners, in consultation with the California ISO (CAISO) planners, use the following process to develop the study models used in the annual grid assessment studies. SDG&E's transmission model is updated annually and more often as needed, to account for on-going changes in the transmission topology, load forecasts, and resource plans. To ensure accuracy with outside entities, the annual grid assessment study models, known as "base cases", are reviewed by the CAISO planners and other interested parties through the CAISO transmission planning process. In development of the "base cases", SDG&E follows the WECC Data Preparation Manual as a guideline to meet the WECC data requirements and reporting procedures. Detailed system modeling requirements and reporting procedure to be used by applicable registered entities are identified in Section 4 of this document and within the WECC Data Preparation Manual.

The WECC Data Preparation Manual identifies the set of complete data that is needed to be supplied to both the CAISO and SDG&E in development of the "base cases" by applicable registered entities, including generators.

The detailed system models, both steady-state and dynamic, will be built using the PSLF program from General Electric. Any data submitted to SDG&E or the CAISO should be in the PSLF data format, or if the data is from outside these two organizations it can be submitted to the CAISO or SDG&E in the form of a text file in case the submitter does not have the use of the PSLF program.

II.1. Study Plan Development

The ISO initiates the annual process by posting a Draft Study Plan and schedule. Upon agreement with SDG&E and other Participating Transmission Owners (PTOs), the final Study Plan is posted on the ISO's website.

II.2. Starting Transmission Planning Process

The CAISO Transmission Planning Process Unified Planning Assumptions and Study Plan determines which WECC approved system models would be appropriate for the CAISO transmission planning study purposes. These approved system models (e.g., generators, conductors, capacitors, reactors) consist of steady state and dynamic data and are available to the WECC members on the WECC secure website. The system models and matching dynamic data[1] have already been submitted and reviewed by SDG&E and other participating members of the WECC.

[1] Note that some entities create dynamic files that are unique to each case. This is not SDG&E's practice. SDG&E updates WECC's MDF on an on-going basis and uses this file for all of the cases developed by SDG&E.

II.3. GA Base Case Scenarios (Case Scenario Matrix)

The CAISO Study Plan describes the Base Case Scenarios. Generally, the annual study includes:

- Near-term (1 – 5 years)
- Long term (10th year or beyond)

The following loads are included for most years:

- Summer Peak Load for a one-year-in-ten weather condition
- Spring Off Peak Load (~75% of peak)
- Spring Off Peak Light Load (~10-15% of peak)
- Winter Peak Load (~85% of peak)
- Summer Off-Peak Load (~80% of peak)

Sensitivity Cases:

- Maintenance-low load
- Stressed South and North of San Onofre flows
- Energy storage charging in the load pockets
- Heavy renewable output and minimum gas generation commitment

The above scenarios are included to capture as many operating conditions as possible. This list may change based on need and will be specified in the respective TPP Study Plan.

II.4. Base Case Development

The base cases are developed consistent with the ISO Study Plan and involve updating SDG&E's system representation in currently-posted WECC base cases to reflect the most recent information. The following assumptions are generally considered in the studies:

- Load forecast
- Resources
- Transmission topology, rating, and impedance updates
- Power factor
- Base case checks per SDG&E Grid Operations standards and Operating Documentation

II.5. Load Forecast

The load forecast used in the power flow cases include a combination of SDG&E's 90/10 adverse weather Distribution Load Forecast[2] and the California's Energy Commission's (CEC) Demand Forecast; and as listed in the CAISO's study plan. Typically, the forecast used is the CEC's 1-in-10 using the Mid Demand – Additional Achievable Energy Efficiency (AAEE) Scenario 2, Additional Achievable Fuel Substitution (AAFS) Scenario 4 and Additional Achievable Transport Electrification (AATE) Scenario 3.

SDG&E's Distribution Load Forecast (marked as "Pk" in the PSLF base case load table) is loaded into the power flow case, then the aggregate San Diego area load plus transmission losses are scaled down accordingly to match the CEC's 1/10 Demand Forecast (marked as "10" in the load table)[3]. The peak ("Pk") loads are used to carry out local area peaking studies, where a high degree of coincidence can be expected (e.g. Poway load pocket, South Orange County, etc.)

The system load forecast includes the net effect of the following:

- Total customer load **(+)**
- System losses **(+)**
- Imports **(-)**
- Generation **(-)**

II.6. Resource Assumptions

Resources should be modeled according to the California Public Utilities Commission (CPUC) Integrated Resource Planning (IRP) process resource portfolio, which is the key input to the CAISO TPP base case studies. The grid assessment study examines plausible generation dispatch and import scenarios. Generator characteristic data (dynamic stability data) is provided to SDG&E through CAISO and PTO generator data review process and the developer who has built or will be building the new facility. However, given data availability, generic dynamic data may be used for this future generation. Local Resource Adequacy (RA) data is used in the study cases according to CAISO Operating Procedure 7820, "San Diego Area Generation Requirements".

Distributed energy resources (DER) should be modelled in steady-state and dynamic data per the WECC Solar Photovoltaic Power Plant Modeling and Validation Guideline either as an aggregated generator for

[2] Distribution Load Forecast - a 10% probability that system peak load will exceed the adverse forecast.

[3] Note, certain loads are not scaled up or down because the load history shows that they do not change from year to year. These loads are kept static in the PSLF cases by marking them with a "1" in the non-conforming load column in the PSLF edit table for loads. The Power Factor/VAR loading will also stay the same.

in-front-of-the-meter distributed energy resources or as DG component in the composite load model for self-generation including behind-the-meter solar PV.

II.7. Generator Owner Procedures

Any Generator Owner within the SDG&E service area will provide modeling data in accordance with NERC Reliability Standards(MODs 025, 026, & 027 & PRCs 19 & 24), the WECC Data Preparation Manual, and the WECC Generating Unit Model Validation Policy. This modeling data will be provided to SDG&E representatives at basecase@semprautilities.com, and to the CAISO at GridModelingData@caiso.com. The document "WECC Generating Facility Data, Testing, and Model Validation Requirements" lists in detail the specific data that Generator Owners are required to provide to SDG&E as the Transmission Planner. This data is normally obtained during on-site testing and there are a number of firms which can be contracted to perform this testing. When this data is received from Generator Owners and/or the WECC, these models will be modeled in both the power flow base cases and WECC's master dynamic data file (MDF). The new data will be promptly forwarded to the WECC and the CAISO and a log is kept showing when the data was sent, and then acknowledged, by the receiver.

The CAISO Business Practice Manual (BPM) for the Transmission Planning Process (TPP) includes a multi-year phased approach to request data from generating units in the CAISO BA. Section 10 of the BPM[4] for the TPP establishes: (1) what generator information and generator data must be submitted; and (2) the schedule, procedures, and format for submitting that information and data. Once the CAISO has accepted the submitted data as per section 10.4.3 of the TPP BPM, the PTOs and CAISO will work together to submit the validated generating unit data to WECC and include them in transmission planning process power flow and reliability studies as specified in Section 4.3. Generating units that achieve commercial operation after September 1, 2018, will be subject to section 10.4.6 of the TPP BPM. Notwithstanding this process, the CAISO may periodically request generator data, to meet requirements under NERC reliability standards. These requests will be due by deadlines set by the CAISO, under those specific requests and will not be subject to the process outlined in section 10 of the TPP BPM.

MOD-032 explicitly requires the submission of data at least once every 13 calendar months. Therefore, at minimum, modeling data shall be submitted by the end of each calendar year, but not to exceed 13 calendar months between each submission. For data that has not changed since the last submission, a written confirmation that the data has not changed is sufficient. As a reminder, section 25.5 of the CAISO Tariff requires that the CAISO and SDG&E are notified at least 90 calendar days in advance of making modifications to generating facilities. Please refer to that section of the Tariff and the Generator Management BPM on the CAISO website for more details.

[4] https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Transmission%20Planning%20Process

II.8. Transmission Topology & Ratings Updates

Transmission system upgrade projects such as reconductors, new lines, or substations, are contained in the SDG&E "TPP Project Matrix" document and are listed with the year they are scheduled to be completed. This document serves as a guide to the Grid Assessment personnel who are building the cases in order to ensure accuracy and timeliness of the models. Updates to the WECC and GA cases are dependent on the expected timing of transmission additions (which can be affected, for example, by permitting processes). Therefore the in-service data is commonly subject to change. To ensure that GA is modeling the most current topology and that the "TPP Project Matrix" document is up-to-date, monthly project and outage coordination meetings are held to update the status on planned, in construction, or completed projects. In addition, a report, known as a long-term outage plan, is sent out by the SDG&E Grid Operations department every two weeks to Transmission Planning and many others. This is a list of all outages that will be needed in order to complete future projects such as a reconductor or a new substation. The report gives Transmission Planning the most current status of these projects and any project changes that might be needed. This ensures that project data in the base cases is up-to-date. The new information is then input into a change file where it is used to easily update the WECC and GA cases.

Conductor updates, contained in SDG&E's Grid Operations Standard Operating Procedures document TMC1015a (Transmission Line Ratings), are generated by the Grid Operations department and are then updated into the GA cases via a change file. GA cases is then used as a base case to create WECC base cases. Whenever there are changes to the TMC1015a, a revised copy of this confidential document is sent to the ISO.

Any impedance changes are provided as they occur, from the Protection Engineering section of SDG&E. Changes affecting dynamic stability data are entered into the MDF (Master Dynamic File) as the changes occur and the revised MDF is then sent to the WECC.

II.9. Power Factor

Below are the power factor assumptions for each year:

- Near-term, 2nd year – Actual Power Factor[5]
- For all other cases, the power factor is set to whatever is appropriate for that year, load, and particular season (summer, winter, etc.). This value is derived from the estimated summer preparedness study done by the Grid Operation. Power factor data is considered to be confidential.

[5] Actual Power Factor – Actual substation power factor from last year's peak day. This data is provided by Grid Operations Control.

II.10. Base Case Checks – Grid Operations Standards

* The slack machine (swing generator) for each control area represented in the power flow should be within its limits (generator output (Pgen) should be greater than minimum loading and equal to or less than the maximum rated output, (Pmax).

* Line loading must be within the criteria listed in SDG&E's current Grid Operations Standard Operating Procedures document TMC1015a.

* The WECC and GA cases employ voltage criteria set forth in SDG&E's current Grid Operations Standard Operating Procedures document TMC1005 (Transmission System Voltage and VAR Control). Transmission Planning is notified by Grid Operations when any changes (though infrequent) occur, and a revised copy is provided to the ISO.

* Interchanges should be at desired values that were determined through discussions with neighboring utilities. Alternatively, interchange can be set to "free flow" and the power flow program will determine the interchange among neighboring utilities.

* Transformer overloads should not be present, based on the loading criteria set forth in SDG&E's current Grid Operations Standard Operating Procedures document TMC1105a (Transmission Transformer Ratings). Again, when changes occur to this operating document, a revised version is provided to the ISO

* Other overloads should not be present, if so, they will be corrected.

* The base cases should include the generation projects as described in section III.3.b.

* The base cases should incorporate the transmission projects as described in section III.3.d.

* When all the cases are complete, they are compared using the 'PSLF Comparison Function' to ensure completeness and accuracy.

II.11. Contingency and Dynamic Data

The dynamic data used for stability studies is initially obtained from the WECC (Master Dynamic File, "MDF") and updated as necessary. The contingency files are updated as well on an annual basis to include all valid contingencies. The finalized contingency and dynamic files are then sent to the CAISO. Any changes to the MDF are also sent to the WECC.

II.12. Base Case Completion

When the CAISO receives the completed base cases, contingency list and dynamic files, the CAISO then has the opportunity to review and comment on the base cases. The CAISO will communicate any concerns with

SDG&E. Once all concerns are addressed, SDG&E and the CAISO begin the analyses portion of the study. For some base case assumptions, SDG&E may deviate from the CAISO Study Plan for the base cases that SDG&E will study. SDG&E will notify the CAISO which assumptions in the SDG&E base cases are not aligned with the CAISO Study Plan and will work with the CAISO to create a complete set of base case cases that are aligned with the CAISO Study Plan. SDG&E shall maintain a log file of all changes to the base cases and provide it to the ISO when requested.

II.13. Process Diagram

Chart 1 is a process diagram provided at the end of this document as a visual representation of the SDG&E Grid Assessment Base Case development process.

III. CAISO TPP Base Case Development

III.1. Overview of the CAISO TPP Base Cases Development

Every year CAISO posts the CAISO Transmission Planning Process Study Plan which is developed along with the stakeholders. CAISO planners review the study plan with SDG&E and then kicks off the Transmission Planning Process. The reliability assessment is performed on the bulk system and the local areas for a short, medium and long term planning horizons to ensure that the performance of the system under the CAISO controlled grid will meet or exceed the applicable reliability standards.

As shown in Chart 4: the CAISO Transmission Planning Process (TPP) Base Case Development Process Map, TPP base case data for the SDG&E power flow study area should start from the latest SDG&E base cases. The SDG&E case should include up-to-date information of the existing facilities, future generation, and transmission projects in the planning horizon.

SDG&E will provide a list of generation projects that are either under construction, or recently went in service, to the CAISO Planners, which should be consistent with the CPUC In-development portfolio. SDG&E will provide a list of all additions and retirements of generation, transmission, and other projects that will be modeled in the short and medium term planning cases. For the long term planning cases, the CPUC provides the CAISO with the incremental generic resource portfolio to be used in the TPP annually. CAISO Planners will compare the SDG&E and CPUC list and identify the additional projects which need to be modeled in order to meet the applicable CPUC IRP base portfolio. CAISO Planners will provide to SDG&E the list of additional generation that needs to be modeled in the SDG&E base case and a list of generation retirements, as per CAISO study plan, that need to be modeled by SDG&E.

The CEC posts a 1-in-10 demand forecast and provides the allocation of AAEE, AAFS and AATE/TE to bus-bar locations. SDG&E will update the SDG&E base cases according to the Study Plan incorporating topology changes, CEC load forecast, CEC allocation of AAEE, AAFS and AATE/TE, path flows, and new

resources as reflected in the CAISO's annual TPP. SDG&E will create dynamic model files, steady and transient state contingency files, substation load and behind-the-meter (BTM-PV) forecast tables, Remedial Action Scheme (RAS) model files, and switch deck files for transient simulation, and will then provide this information to the CAISO.

CAISO Planners will review the provided information and communicate back any concerns identified in the base case to SDG&E via written comments. SDG&E will update the TPP base case, and as needed the SDG&E Grid Assessment Annual base case to address the CAISO's written comments. Once any concerns are resolved, CAISO will work with SDG&E to merge the SCE base case with the SDG&E base case and will build the full loop base case as specified in the CAISO study plan. CAISO will work with SCE to obtain their TPP base case that is to be merged with SDG&E.

SDG&E will provide to the CAISO the base cases for the years specified in the study plan.

III.2. Evidence Retention

The ISO and SDG&E will keep data or evidence for at least four years, to show compliance with MOD 032 Requirements R1 through R4, and Measures M1 through M4.

III.3. The TPP Base Case Data Requirement

III.3.a. Demand Forecast

The ISO collaboratively works with the CPUC and the California Energy Commission (CEC) to align the transmission planning assumptions between the ISO's Transmission Planning Process and the CPUC's Long-term Procurement Process (LTPP), as well as the demand forecast assumptions contained in the base cases.

The base cases will utilize the latest demand forecast adopted by CEC, which includes self-generation serving customer load. Most of the increase in self-generation over the forecast period come from BTM-PV.

In general, the following are guidelines on how load forecasts are used for each study area.

Since load forecasts from the CEC are generally provided for a larger area, these load forecasts may not contain bus-level load and BTM-PV forecasts, which are necessary for reliability assessment. Consequently, the augmented local area load and BTM-PV forecasts developed by the PTOs will also be used where the forecast from the CEC does not provide detailed load and BTM-PV forecasts. Appendix A of this document

presents descriptions of the methodologies used by SDG&E to derive bus-level load forecasts using CEC data as a starting point.

III.3.b. Generation Projects

Existing, approved/planned future generation resources, and retirement plans are modeled and dispatched to reliably operate the system under stressed system conditions. Details of generation modeling is provided in Study Plan.

A list of ISO market resource identifiers for all ISO Participating Generators in the SDG&E service territory should be populated into the generator data Long ID field in the GE PSLF model data and maintained by SDG&E in coordination with CAISO.

In addition to generators that are already in-service, new resources will be modeled in the studies as generally described below. Depending on the status of each resource, new resources will be assigned to one of the three levels below:

- Level 1: Resource projects that have become operational
- Level 2:
    - Resource projects on the CPUC's in-development resource list; or
    - Resource projects, if any, that are not on the CPUC in-development resource list but are known to have commenced construction or have a power purchase agreement (PPA) with a load serving entity (LSE). For clarity, simply having executed generation interconnection agreement (GIA) is not sufficient to meet the resource inclusion criteria.
- Level 3: Generic resources that are included in the CPUC IRP base portfolio for use in the ISO's current transmission planning cycle to meet long term greenhouse gas emission and reliability

(resource adequacy) targets Based on this classification, the following guidelines will be used to model new generators in the base cases for each study.

Based on levels above, the following guidelines will be used to model new generators in the base cases for each study.

Year 1 Operating Cases:

- Level 1 resources
- Level 2 resources that have commenced construction and have planned in-service dates within the time frame of the study.

Year 2-5 Planning Cases:

- Level 1 resources
- Level 2 resources with planned in-service dates within the 2-5 year time frame of the study.

Year 6 and beyond Planning Cases:

- Level 1 resources.
- Level 2 resources with planned in-service dates within the time frame of the study.
- Level 3 resources with a planned in-service date within the time frame of the study.

In particular, CAISO Planners will work with SDG&E Planners to ensure that the resource additions in the CAISO TPP study plan are modeled in the WECC ten-year out heavy summer ADS case. CAISO Planners will also work with SDG&E Planners to ensure that forecasted BTM-PV additions, AAEE, AAFS, AATE/TE, and demand response are appropriately modeled in the WECC 10 year out heavy summer ADS power flow.

The resources, and transmission topology in the long term Planning Case should be submitted to WECC in response to WECC's base case compilation process for development of WECC's ten-year out heavy summer power flow case. WECC's ten-year out heavy summer power flow case will be the power flow case included

in the Anchor Data Set and will also be used to populate the Anchor Data Set production cost model with resource and transmission topology data.

Generation Retirements: Existing generators that have been identified as retiring will be modeled. In addition to the identified generators the following assumptions will be made for the retirement of generation facilities:

- OTC replacement local capacity amounts in southern California that were authorized by the CPUC under the LTTP decisions will be considered along with the procurement activities to date from the utilities
- Renewable and Hydro Retirements – Assumes these resource types stay online unless there is an announced retirement date
- Other Retirements – Other thermal generators will be assumed to be retired in the long term base cases based on the list provided by CPUC based on age.

The retiring generators along with their step-up transformer banks will be modeled as out of service starting in the year they are assumed to be retired. Their models are to be removed from base cases only when they have been removed from the site. Exception: models can be removed prior to physical removal only when approved plans exist to use the site for other reasons.

OTC replacement local capacity amounts in southern California that were authorized by the CPUC under the LTTP decisions will be considered, along with the procurement activities to date from the utilities.

III.3.c. Renewable generation projects and dispatch

CAISO will work with SDG&E Planners to ensure that CAISO TPP base cases include renewable generation modeling and dispatch that is consistent with the CAISO TPP study plan. SDG&E will model renewable generation and dispatch these renewable generators pursuant to the ISO Study Plan.

III.3.d. Transmission Projects

The transmission projects that the ISO has previously approved will be modeled in the base cases, according to their respective in-service date. This includes existing transmission projects that have been in service and planned future transmission projects that have received CAISO approval in earlier ISO transmission plans. Other network changes or upgrades that are officially driven by different program, such as SDG&E's Wood-

To-Steel program, maintenance, and/or distribution development, will be documented and modeled in the base case development.

III.3.e. Facility Ratings

Requirement R6 of FAC-014-3 directs each transmission planning entity to use facility ratings and criteria that are not less limiting than those described in RC West's SOL methodology unless the entity provides a technical rationale to the entities identified in the standard. To that end, SDG&E as a Transmission Owner shall ensure that the facility ratings including the applicable time duration it provides for its facilities to California ISO PC in planning models and the Transmission Register are consistent with the facility ratings data they provide to their Transmission Operator and/or RC West per the RC's SOL Methodology and the facility ratings criteria in the ISO Planning Standards and/or the ISO TPP Study Plan.

III.3.f. Documentation

If needed for support of the compliance with the MOD-032 standard, the following can be created and furnished to the CAISO:

- Bus-level load spreadsheet, including coincident peak and non-coincident peak load forecast, and CEC projected AAEE, AAFS and AATE/TE, and Demand Response. Approved/planned resources spreadsheet, including retirements, preferred resources, energy storage, and conventional resources. Any approved/planned generation projects in the distribution system which directly affect the transmission system will be included

- Approved/planned transmission projects spreadsheet, listing the project name, scope of work, construction status, facility rating, and the latest in-service date

- Power flow change files of the approved/planned generation and transmission projects that have been applied in the base cases

- Contingency files, conforming to current NERC/WECC/CAISO standards

- Existing and planned RAS files

- Switch deck files for post-transient and transient simulations

- DYD files including additional dynamic models of any approved/planned resources or automatic protection schemes, such as UFLS (Under Frequency Load Shed) and UVLS (Under Voltage Load

Shed). If any errors or misrepresentations are identified during and after the base cases development process, SDG&E will provide the ISO with change files to correct them

- In case SDG&E engineering needs to modify the original scope of a project that has been approved by the ISO, an application for the modification will be submitted to the ISO for review and concurrence. The application will indicate project name, scope of work, construction feasibility, status, and updated in-service date, along with the power flow change file. The material modification that has been approved by the ISO will be included in the approved/planned transmission projects spreadsheet

- Long-term scheduled outages (e.g. more than 6 months) in the 10-year planning horizon

- The existing facilities' normal and emergency ratings in the base cases will be consistent with the normal and emergency facilities ratings registered in the ISO Transmission Register database, or will otherwise be reported to the ISO

- Current SDG&E Standard Operating Practices associated to transmission planning, such as the Spare Substation Power Transformer Policy, etc.

- Current documents of SDG&E's Transmission Monitoring and Control that are related to transmission planning, such as, methodology on transmission facility rating, TMC1505 (Protection Schemes), TMC1015a (TL Rating Spreadsheet), TMC1110 (Transmission Scheduling Reliability Criteria), TMC1105 (Transformer Loading), TMC1015 (TL Loading-Overhead and Underground), TMC1005c (Transmission Reactor Setting Table), etc. However, the ISO will normally have copies of these documents.

- The SDG&E Transmission Planning Department periodically receives new updates from respective departments and update the WECC base cases. During the year, Transmission planning personnel saves changes to line ratings, transformer ratings, and line impedances in the "WECC base Matrix" document. The changes to line ratings and transformer ratings are normally from the SDG&E Grid Operations Department and line impedance changes are sent out by the SDG&E Protection Engineering Department. This matrix is used to create a "TPP Project Matrix" which is used to build TPP cases.

To keep the base cases up-to-date, SDG&E will update the spreadsheets of approved/planned generation and transmission projects and share with the ISO the updated spreadsheets on a seasonal or as needed basis, during the ISO TPP.

IV. WECC Base Case Development Process[6]

Charts 2 and 3 demonstrate the SDG&E's initial WECC base case development and review process diagrams.

IV.1. SDG&E's Role on the WECC Base Case Preparation and Review

SDG&E, as Transmission Planner and Transmission Owner, is responsible for submitting WECC base cases and review comments for Area 22 to the Area Coordinator in accordance with the WECC's Annual Study Program Base Case Compilation Schedule or revised schedule/dates as communicated by WECC, and will send a screenshot of the uploaded files to WECC's site to CAISO at GridModelingData@caiso.com. The WECC Data Preparation Manual for Interconnection-wide Cases is available on the WECC's website.

The SDG&E Grid Assessment Annual Base Cases not only serve as original input into the CAISO TPP base cases development but also can be used as starting cases for WECC base case development. The SDG&E Transmission Planning Department complies with the requirements in WECC's Data Preparation Manual. SDG&E builds and maintains the WECC cases and its own Grid Assessment (GA) power flow base cases by working together with the ISO during the base case development.

SDG&E will review the WECC base cases after WECC sends out the base case data review request letter. SDG&E will provide updates to the base cases and submit them to the Southern California Area Coordinator. In addition, SDG&E will send a screenshot of the uploaded files to WECC's site to CAISO at GridModelingData@caiso.com. The CAISO conducts their own review of the base cases and sends a list of any changes that are necessary to SDG&E, which will input the needed changes. The revised case or change files are sent back to the CAISO to show that these changes have been made.

The SDG&E Transmission Planning Department periodically receives new updates from respective departments and update the WECC base cases. During the year, Transmission planning personnel saves changes to line ratings, transformer ratings, and line impedances in the "WECC Cases Matrix" document. The changes to line ratings and transformer ratings are normally from the SDG&E Grid Operations Department and line impedance changes are sent out by the SDG&E Protection Engineering Department.

In addition, there might be changes to generator data that is contained in test reports. This new data is extracted from the test reports and updated in the WECC base cases and master dynamic files. The actual,

[6] See Appendix C for additional details on the WECC base case preparation procedure and retention requirements.

complete test reports are also forwarded to the WECC and to the CAISO. The "**Dynamic Data Submissions to WECC, 2016-20xx.xlsx**", is created and maintained to list all changes to generator data.

WECC does not currently create interconnection-wide cases for the use of short circuit analysis. However, MOD-032-1 requires that short circuit data should be shared openly between applicable NERC functional entities. This data will be provided upon request by SDG&E in the data owners preferred software format (ASPEN).

IV.2. PTO and CAISO's responsibilities in reporting generator data to WECC

The CAISO and PTO established a joint generator data review process in 2019 to implement Section 10 of the CAISO BPM for TPP to comply with the MOD-032-1 standard, which provides consistency in generator modelling data submission from generator owners and ensures the data be fully validated by the PTO and CAISO. The purpose of this section is to specify roles and responsibilities for submitting generator data to WECC through its base case development process.

Once the CAISO and PTO have validated the generator data and determined that compliance requirements are met by the GO, the CAISO will upload the final data and documents for each generator and share the information with PTO within 60 calendar days after the CAISO sends out a compliance letter to the GO, unless a longer time period is agreed upon by the CAISO and PTO. A complete package of the following validated data and documents will be posted in a special folder for each generator in the Market Participant Portal, and CAISO will send a notice to PTO representatives, and basecase@semprautilities.com for them to access the folder.

- equipment data including short circuit data
- steady-state power flow model in GE PSLF .epc format
- dynamic model in GE PSLF .dyd format
- single-line diagram
- test report for generator real and reactive power capability
- test report for dynamic model
- electromagnetic transient model for sub-synchronous resonance study if applicable

The PTO will submit the generator data in GE PSLF format to WECC (via the Area Coordinator) in response to the first WECC base case data request letter received from WECC after the validated generator data has

been received from the CAISO, unless a longer time period is agreed upon by the CAISO and PTO[7]. However, if the only remaining data that has not been received and validated is the electromagnetic transient model (EMT) data, then the PTO should provide the validated GE-PSLF power flow and dynamic data to WECC without waiting for receipt of the EMT data. If the only remaining data that has not been validated is the electromagnetic transient model data, then the PTO and CAISO should discuss providing the validated GE-PSLF powerflow and dynamic data to WECC to avoid unreasonable delay. To provide consistency in data submittals, PTO will submit the generator data to the Area Coordinator per the guidelines outlined below.

- PTO is responsible for generating units that are located in Area 22
- The latest steady-state power flow model up to generator's POI should be included in the generation representation. The Generator data should meet the WECC base case development requirements. Steady-state and dynamic models shall be consistent (i.e., Bus Number, Bus Name, Unit Id)
- In addition, a list of ISO market resource identifiers for all ISO Participating Generators in the SDG&E service territory should be populated into the generator data Long ID field in the GE PSLF model data and maintained by SDG&E in coordination with CAISO
- The latest validated dynamic model shall be submitted per the dynamic data requirements of WECC Data Preparation Manual, WECC Data Preparation Manual for Interconnection-wide Cases, and WECC Solar Photovoltaic Power Plant Modeling and Validation Guideline
- The latest short circuit data should be used in PTO's short circuit analysis
- SDG&E as Transmission Planner of Merchant substation will coordinate with SCE so the latest generation models are modeled in the WECC base cases, as described in the previous bullet points.

The CAISO and PTO need to review the generator data in the WECC case sent out for review and provide comments to the Area Coordinator during the WECC base case review process. Roles and responsibilities summary

[7] If the due date for the submitting the data for the "first" base case to WECC is less than 60 days from the date of receiving the validated generator data from the CAISO then the PTO can submit the generator data in response to the second WECC base case data request letter received.

Tasks	CAISO	PTO
Save validated generator data as a complete package in the MPP site and send a notice to PTO for them to access the data within 60 CD of compliance letter sent to GO	X	
Submit generator data to WECC (via the Area Coordinator) in response to the next WECC base case data request letter received from WECC		X
Review the generator data in WECC base case review process (CAISO to provide comments to PTO)	X	X
Provide updated information in the WECC base case and master dynamic file and provide a screenshot that the files have been uploaded to WECC site to CAISO		X

IV.3. The ISO's responsibility on the WECC Base Case Review

As shown in Charts 2 and 3, SDG&E's WECC Base Case Preparation in Appendix A, the CAISO will review SDG&E's WECC Base Case Data submittal and will provide comments to SDG&E during the Base Case Review Process[8]. In addition, the CAISO will keep documentation of SDG&E's Base Case Data that was submitted to the Southern California Area Coordinator and of the Southern California Area Coordinator providing this Base Case Data to the WECC staff. SDG&E will provide written response to CAISO, using the case review sign-off sheet in Appendix D, confirming that the WECC Base Case has been updated to address CAISO's review comments or provide an explanation for maintaining the current data. Below are critical actions and procedures that are necessary to review the WECC base cases effectively and accurately.

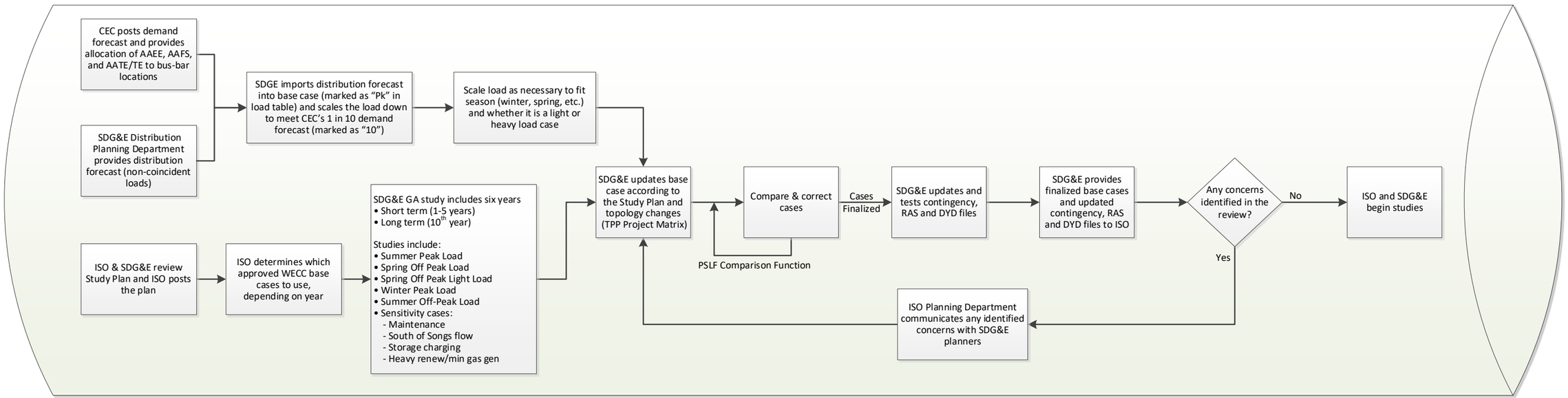
[8] The ISO, in agreement with SDG&E, has developed a case review sign-off sheet for providing WECC Base Case Review comments to SDG&E (Appendix D)

Data Category	Check
Transmission	Approved transmission projects are modeled in accordance to the most recent expected in-service date.
	Canceled projects are removed from the base case.
	Known outages, as per the ISO TPP Study Plan, of transmission facilities with a duration of at least six months are modeled appropriately.
	Line rating (MVA1 and MVA2) are greater than zero.
	Check for branches loading above 100% of RATE1 or RATE2
Generation	Generator (new and to be retired) are modeled in accordance with assumptions in the study plan.
	Check- Pmin < Pmax & Qmin < Qmax
	Reactive resources output are at appropriate level based on their types.
	Known outages, as per ISO TPP Study Plan, of generation facilities with a duration of at least six months are modeled
	Check the accuracy of each generators representation and ensure that all data validated through the CAISO and PTO TPP BPM Section 10 generator data review process has been included. Make sure that interconnection facilities are modelled up to its POI
Load	Area loads are consistent with CEC load forecast.
	Load modeling generator station service shall have Load ID set to 'SS.'
	Load power factor at major load buses is reasonable.
Dynamic Data	Read and initialize dyd file for errors
	Check for any missing generator models
	Check the accuracy of each generators representation and ensure that all data validated through the CAISO and PTO TPP BPM Section 10 generator data review process has been included.

General	Make sure the base case has representation of entire WECC system (full loop).
	Check and report 'dchk' in PSLF for NERC Quality Metrics violations
	Check the interties are modeled as appropriate facilities and not as a fictitious generator or a very-high impedance line.
	Area swing is within the Pmax/Pmin limits and is located outside of the local area of study.
	Generator zone numbers are accurate.
	Major path flows are set consistent with assumption in study plan.
	The sum of net Area Interchange Schedules in the PSLF Area Table is equal to zero
	Path definitions are accurate
	Voltages at critical substations are reasonable.
	Modeling of Imperial Valley phase-shifting transformer's angles

V. Process Flow Charts

Charts 1: SDG&E's Grid Assessment Base Case Development Process



Charts 2 and 3: SDG&E's WECC Base Case Development and Review Processes

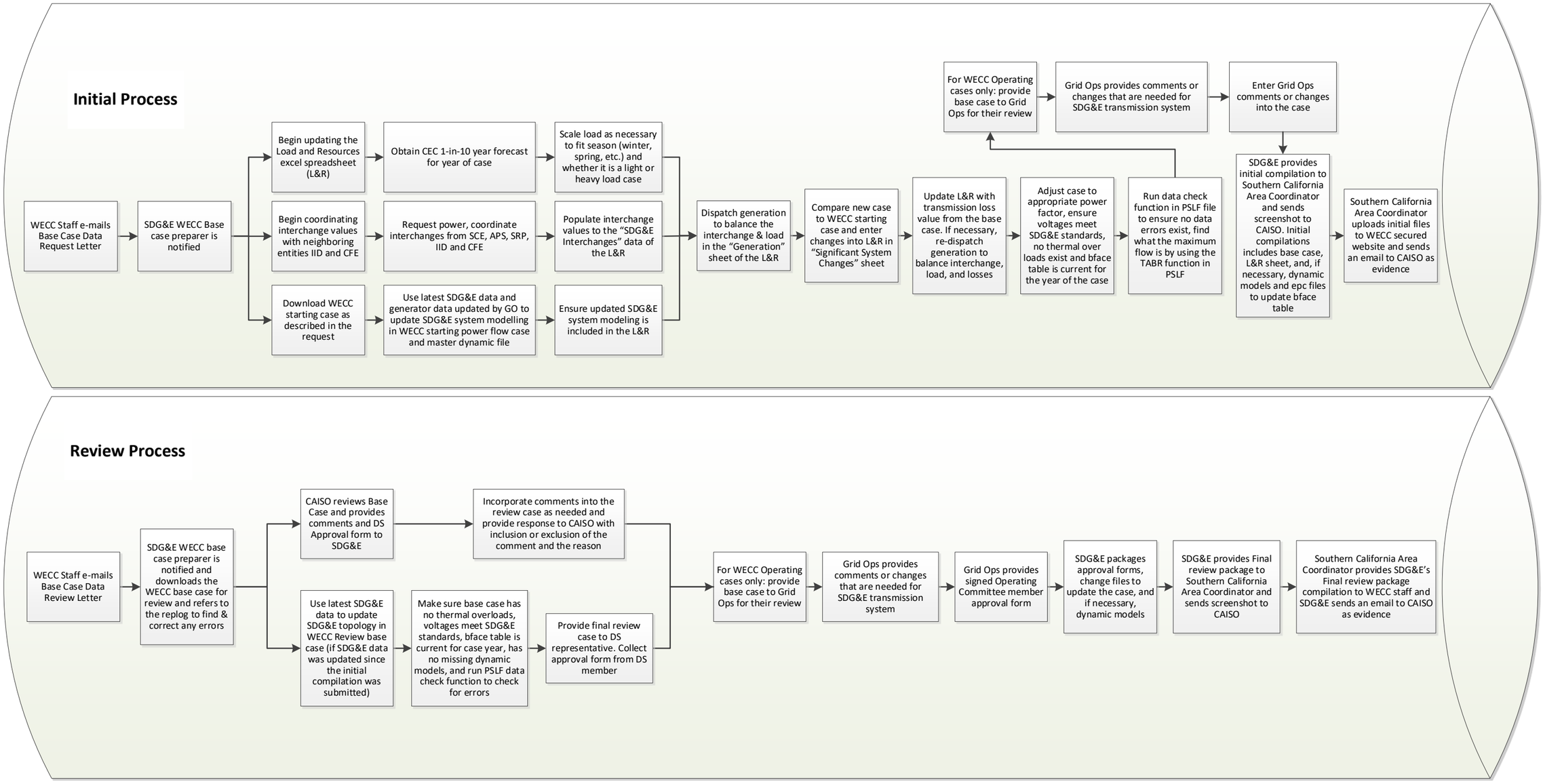
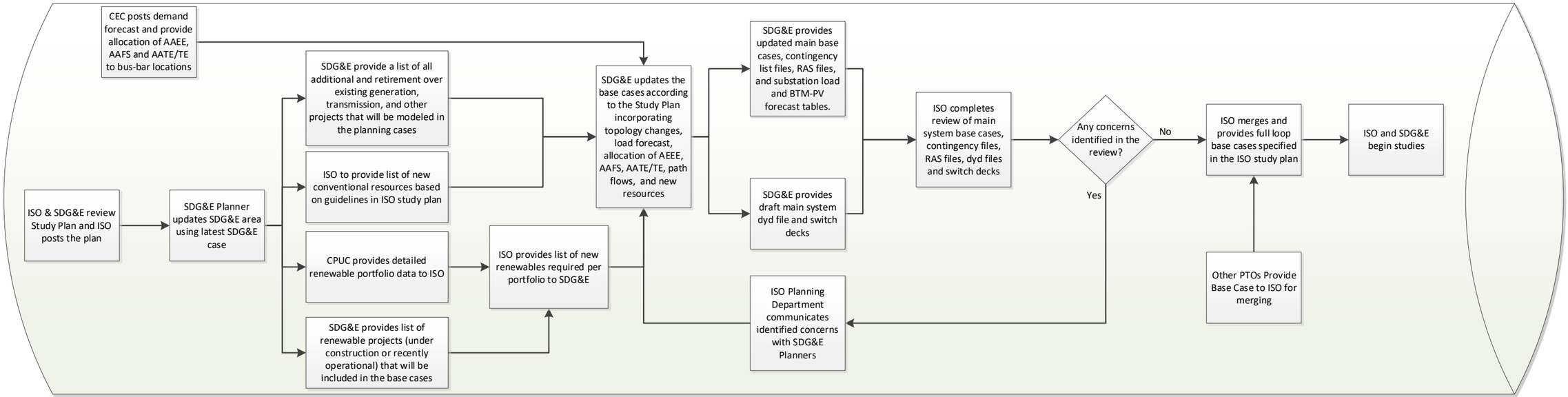


Chart 4: CAISO TPP Base Case Development Process for SDG&E Area



VI. Document Ownership

	Name	Date
Reviewed By: SDG&E Transmission Planning Manager	Original signed by Mehrdad Majidi	09/26/2024
Reviewed By: CAISO Regional Transmission – South Manager	Original signed by Robert Sparks	10/2/2024

Version History

Version	Issue Date	Description of Change
Version 3.1	October 2024	Addition of requirement R6 of FAC-014-3 related to facility ratings and coordination with SCE regarding Merchant substation connected resources
Version 3.0	March 2024	Major edits that consider the latest scenarios studied in the TPP process, load forecast model including AAFS, AATE/TE and BTM-PV, current generation resource modeling in base cases, inclusion of RAS files in the information submitted by SDG&E, addition of CAISO market resource ID in the WECC base cases, and update to CAISO TPP Base Case Checklists
Version 2.1	December 2020	Minor edits to provide the validated power flow and dynamic data to WECC without waiting for the EMT data
Version 2.0	October 2020	Major edits to specify roles and responsibilities for submitting generator data to WECC through its base case development process
Version 1.9	4/23/2019	Replace R. Ayass with D. Tekeste as SDG&E Rep, other minor edits
Version 1.8	9/24/2018	Minor edits to Generator Owner Procedures and ADS data submittal

Version 1.7	12/1/2017	Minor edits for generator survey to be conducted
Version 1.6	9/8/2017	Minor edits to ensure compliance obligations and to accommodate the WECC 10 year Heavy Summer Anchor Data Set requirements
Version 1.5	4/8/2017	Replace F. Castro with H. Maiga as SDG&E Rep
Version 1.4	7/1/2016	Minor edits to clarify and ensure compliance obligations
Version 1.0	7/1/2015	Initial Publication

Appendix A: SDG&E's Methodologies on bus-level load forecasts

SDG&E derives its coincident substation-level forecasts by adjusting its distribution non-coincident substation-level load forecast values so that the sum of all coincident loads, load bus modifiers, and transmission losses equals to the California Energy Commission (CEC's) 1-in-10 system load forecast for the SDG&E area. Consequently, every load bus in the SDG&E area includes five load components that are modeled explicitly in its TPP power flow model: SDG&E's non-coincident substation-level load forecast, SDG&E's coincident load forecast adjusted to the CEC forecast, and the three load modifiers including Additional Achievable Energy Efficiency (AAEE), Additional Achievable Transportation Electrification (AATE), and Additional Achievable Fuel Substitution (AAFS).

With the load components mentioned above, SDG&E utilizes coincident load forecast adjusted to the CEC demand forecast to perform reliability assessments as part of the TPP process. In some instances, the non-coincident substation-level load forecast is utilized in special scenarios such as reliability assessment of a local load pocket area. The use of the non-coincident load level, which may contribute to an aggregated load higher than the CEC demand forecast for the overall San Diego area, will be reviewed on a case-by-case basis for specific load interconnection requests. For this scenario where loads modeled are not accounted for in the CEC Integrated Energy Policy Report (IEPR) forecast, SDG&E will work with the ISO for further validation and concurrence of the load interconnection input assumptions prior to performing applicable planning studies.

Development of the non-coincident distribution substation-load forecast begins with assessing the historical peak loads for the distribution substations to establish a reference point for future forecast projections. The historical substation peak loads are obtained through either historical Supervisory Control and Data Acquisition (SCADA) data, or monthly-recorded substation metering data, or cumulative advanced metering infrastructure (AMI) data. Once the actual peak loads and time-stamps have been determined for the distribution substations, the historical peak demand is evaluated considering factors such as anticipated new load additions, load transfers, loss of a generator connected to the distribution circuits, weather conditions at the time of the historical peak, etc. These factors may result in adjustments to the historical loads to produce the reference points for developing the substation load forecast. Concurrently, various system information is captured as necessary to assist in disaggregation of the CEC's system-level projections of load and DER additions to the bus bar level.

Behind-the-meter PV (BTM-PV)

BTM-PV will be modeled as a component of the load model. Using the DG field on the GE PSLF power flow program load model, the total nameplate capacity of the DG will be represented under PDGmax field, and the production output will be based on the base case scenarios from the ISO TPP Study Plan. The total nameplate capacity is provided by the CEC and used to do a bus-level allocation of the BTM-PV.

Appendix B: CAISO TPP Base Case Checklist

The ISO TPP Study Plan related to base case preparation should be followed. Below are key actions and procedures that are necessary to developing the CAISO TPP base cases accurately and on a timely basis. Please make sure that you follow this checklist and indicate that you have completed the critical tasks outlined below for each Intertie Planning study for which you are responsible. The base case should be reviewed based on the checklist by the CAISO and SDG&E area planners prior to being used for the TPP studies. Following tables are an example checklist based on the 2023~2024 TPP base cases.

2023~2024 TPP Base Cases Checklist -- for the SDG&E Study Area

	Checklist Item	PTO Response	PTO Comment	ISO Review Comment
1	The WECC seed cases specified in the TPP Study Plan and applicable dynamics data files are used as starting bases by PTO	Yes/No		
2	The PTO's portion of the base cases uses models based on data provided in accordance with the MOD-032 standard and are supplemented by data and sources identified in the current CAISO TPP Study Plan. It is highly recommended to perform NERC case quality metrics check for each case in PowerWorld SADD Auxiliary file or PSLF steady-state and dynamic data check tool	Yes/No		
3	Net load (Pload–Pdgen/PdgenMax) in summer peak cases is consistent with the CEC 2022 California Energy Demand Forecast Update, CED 2022 Managed Forecast LSE and BA Tables-Mid Demand- AAEE Scenario 2, Form 1.5d: 1-in-10 Peak Demand. Load allocation to substations is based on the PTO's methodology as outlined in the Study Plan	Yes/No		
4	Net load (Pload–Pdgen/PdgenMax) in the off-peak cases is consistent with the values in Table 2.11-2 of the Study Plan	Yes/No		
5	BTM PV installed capacity is modeled based on the table entitled **Mid demand baseline PV self-generation installed capacity by PTO** and	Yes/No		

	dispatched based on Table 2.11-2 keeping the net load unchanged as specified above			
6	In the Year 2 and Year 5 base cases, in addition to existing resources, only Level 1 and Level 2 resource projects with the appropriate ISD that are under construction, or are identified as CPUC Baseline Portfolio contracted resources are modeled. In the Year 12 base cases, future generic resources (Level 3), and retirements identified in the CPUC Base Portfolio are also modeled. Retired resources have gen-tie and step-up transformer disconnected. Any discrepancies between the generation and storage project models and CPUC base portfolio need to be clarified with appropriate ISD, construction status, and procurement contract. Aged unit retirements identified in the CPUC Base Portfolio are also modeled. Any discrepancies between the generation and storage project models and CPUC base portfolio need to be clarified with appropriate ISD, construction status, and procurement contract	Yes/No		
7	Resources retired, to be retired, and the aged unit retirements identified in CPUC Base Portfolio have gen-tie and step-up transformer disconnected	Yes/No		
8	DR is molded as offline negative load. Fast response RDRR (≤ 20 min response time) and all PDR are modeled with ID of “D1”, Slow response RDRR (≥30 min. response time) is modeled with a load id of “D2”	Yes/No		
9	Renewable generation is dispatched in accordance with Table 2.11-2 of the Study Plan**.** Battery storage and Demand response are dispatched offline in the summer peak and Year 2 off peak cases and in the charging mode in the Year 5 and Year 12 off peak cases	Yes/No		

10	Excel work books used in allocating CEC forecast load to substations and adding and dispatching new resources are provided, if available	Yes/No		
11	The codes provided below are used to identify the type of each resource (i.e. wind, solar, thermal, hybrid, etc.), the status of the resource (existing, contracted, CPUC portfolio, etc.), and transmission zone	Yes/No		
12	Voltages are within limits and no system facilities are overloaded for P0 and P1. Overloaded generation interconnection facilities are reviewed to confirm the ratings used are consistent with actual data provided by the owner. (Note: generation interconnection facility overloads distort production simulation study results)	Yes/No		
13	The PTO's portion of the tuned dynamics data file (dyd file) uses models based on data provided in accordance with the MOD-032 standard for existing facilities and known projects. Appropriate generic models are used for generic CPUC portfolio resources. Latest composite load model that includes BTM PV is used to represent load	Yes/No		
14	Dyd file results in successful base case initialization and no-disturbance flat run.	Yes/No		
15	Steady state and transient stability contingency list is provided based on the selection criteria for P1 to P7 planning contingencies and extreme events. P1 and P7 steady state contingencies are separately provided	Yes/No		
16	RAS files updated to reflect the current topology of the base cases is provided in "aux" format. The RAS models can be used in both steady state and transient simulations	Yes/No		

17	Spreadsheets used for bus allocation of load, AATE, AAEE, AAFS, DR, BTM PV, etc., and renewable generation dispatch for the base cases are provided	Yes/No		
18	Name of PTO/TP/CAISO Representative	SDG&E		
19	Date			

No	Equipment	Checks
1	**Bus**	1. Bus voltages follow planning criteria (0.95<V<1.05)
		2. Check for type 2 buses without machines and multiple type 0 buses
		3. Check to ensure Owner and Zone numbers are set appropriately (not 0, 1, or 999)
2	**Generator**	1. In-service date for generators should be appropriately reflected in the generator modelling
		2. Out-of-service units (retired, planned outage, mothball, not-in-use, etc.) should have status set to zero (Pgen =0, should have status =0).
		3. Offline generators with associated Aux load should have aux load status off.
		4. If Status = 1: check for Pmin ≤ Pgen ≤ Pmax1 (nameplate capacity)
		5. Check for Qmin ≤ Qmax
		6. All swing buses are in generation mode and fall within their respective Pmin and Pmax values.
		7. Transmission connected renewables are modelled consistent with assumptions in study plan
		8. Check the accuracy on generator representation validated through the generator data review process- CAISO and PTO procedure V1, and make sure generator interconnection facilities accurately modelled up to its POI

3	**Branches (for ISO BES)**	1. Rating MVA 1 > 0 and MVA 2 > 0
		2. Following parameters are appropriately modeled: a. Rating 1 & 2 with respect to ISO Transmission Registry and previous year base case
		3. Following parameters are appropriately modeled: a. R, X, B as compared to previous year base case
		4. Check branches loading above 100% of RATE1 or RATE2
		5. Check tie line flows to be within rating
4	**Transformer (for ISO BES)**	1. Variable V Tap or Variable Angle shall be at or within Max VAR Tap and Min VAR Tap for Transformers that are in-service.
		2. Rating MVA 1 > 0
		3. Rating MVA 2 > 0
		4. Maximum voltage (power) at controlled bus (pu or MW) > Min Cont V. Minimum voltage control range shall be 0.02 p.u.
5	**Shunts**	1. The minimum dead band shall be 0.02
		2. Represent shunts at the same bus as being in the same area and zone as the bus
6	**Loads**	1. Represent loads at the same bus as being in the same area and zone as the bus
		2. Load modeling generator station service shall have Load ID set to 'SS.'
7	**DER**	1. Behind-the-meter PV are modelled consistent with assumptions in study plan
		2. LSE procured energy storage facilities are modeled consistent with size and location provided by CPUC, are modeled offline and to be used as potential mitigation for reliability concerns.
		3. Demand Response, if any that meet ISO criteria, are modeled offline and to be used as potential mitigation for reliability concerns.

8	**Dyd check**	1. Behind-the-meter PV is modeled as a discrete element using CMPLDWG model consistent with assumption in study plan.
		2. Turbine Type shall be used to identify solar and wind generators
		3. Unit Base MVA shall be equal to the MVA Base parameter of the unit's Dynamic machine model.
		4. Generator representation should be consistent between steady state and dynamic data (i.e., Bus Number, Bus Name, Unit Id, Bus Voltage)
		5. Pmax ≤ Governor Max
		6. Check for any missing generator models
		7. Check the accuracy of generator model validated through the generator data review process- CAISO and PTO procedure V1
	Other	1. Path definitions are correct (latest WECC Path Rating Catalog)

Appendix C: WECC BASE CASE PREPARATION

A. WECC Initial Base Case Compilation

1. WECC Data Request Letter is emailed to WECC Members
2. Begin sub-coordination process and confirm interchange schedules by the sub-coordination deadline
3. Download the WECC starting base case and associate materials (zip file) as required in the WECC Data Request Letter from the WECC website
    a. Starting base case will only be used to be able to create the "Significant Changes" list in the L & R table.
    b. Starting base case is compared to the new base case and the changes are what will appear in this L & R section.
4. Base case is created from the latest and most appropriate case that is already existing
    a. Example, if a light winter case needs to be developed the recently built heavy winter case is used as a starting point and only the load, generation, and interchange would need to be adjusted.
5. Use the latest Load & Resources (L&R) information to populate generation, load, interchange flows, and loss data in accordance with the WECC Base Case Data Request Letter
6. Dynamic Data Check
    a. Obtain latest WECC Master Dynamic File (MDF) and read into the solved base case
        i. Check for any missing generator models in the dynamic data file when the MDF is loading
        ii. Initialize the base case with the dynamic data file
        iii. Resolve any errors that were identified on the screen
        iv. Run a non-disturbance transient stability analysis for 10 seconds.
            1. If it did not result in a flat line, determine the cause of not obtaining a flat line, for example but not limited to:
                a. Ensure that no Pgen amount exceeds a Pmax amount
                b. Ensure there are no overloads
                c. Check the models of the latest generators added to the MDF.
                d. Check the spread of the generator angles and, if necessary, turn off any non-SDG&E generators that have a large spread and then re-run a non-disturbance evaluation that should produce a flat line.
            2. Note, SDG&E does not create or submit separate DYD files for each case. The MDF is kept up to date by SDG&E and this is what contains the correct data for each SDG&E case.
7. Power Flow Base Case Data Check:

a. Re-open solved base case
b. Solve the base case again and run the EPCLs or PSLF routines that will check the following:
    i. Check maximum and/or minimum 230 kV and 500 kV substation voltages in SDG&E area (Area 22)
    ii. Check for Area 22 errors (i.e. zone, owner, overloads)

Submit the following to the Southern California Area Coordinator/CAISO by the deadline:

- Solved power flow base case
- L&R Spreadsheet
- EPC files to update data as necessary

B. WECC Final Base Case Review

8. WECC's Review Request Letter is emailed to WECC Members
9. Download the WECC base case to be reviewed and its associated materials (zip file) from the WECC website
10. Repeat power flow base case data check, as stated above
11. Incorporate any changes/corrections that are necessary because of being listed in the " Steadystate_And_Dynamics_Dashboard" (error list) downloaded for that case from the WECC
12. Incorporate any changes/corrections from the CAISO. These changes will be sent to SDG&E by the time the WECC sends the case out for a final review.
13. Ensure the base case meets the following:
    a. Voltage requirements
    b. Thermal loadings are not exceeding normal ratings identified in the CAISO Registry
    c. Iface/bface tables are correct
    d. Use the most recent MDF to ensure a flat line is achieved with a non-disturbance run.
14. If changes were made to the base case, create a change file using the extract EPCL file provided by the WECC for the PSLF program
15. Obtain the following signed approval forms
    a. SDG&E DS member form and, for operating base cases, OC member form
16. Submit the following to the Southern California Area Coordinator by the deadline
    a. Signed approval forms
    b. If necessary, a change file (*.p)
    c. EPC files to update transmission projects in the case
    d. DYD files for any missing dynamic models
17. File all documentation, including change files, approval forms, and evidence of submittals on the shared server (WECC base case submittals)
18. Submit all documentation to CAISO, WECC or Southern California Area Coordinator, and save for NERC Compliance evidence.
19. This documentation is already being done by SDG&E and the data is on a secure shared server.

C. SDG&E Base Case Retention Requirements

For each base case the following will be retained and provided as NERC compliance evidence:

1. WECC Base case data request
2. Email correspondence or coordination with entities for interchanges
3. Email correspondence for an entity's system representation
4. Email of submitting base case to the Southern California Area Coordinator, or if SDG&E is the Southern California Area Coordinator, email of submitting base case to WECC and copying the CAISO.

D. Additional Base Case Preparation Guidelines – As Applicable

Below are additional items SDG&E incorporates into WECC Bases Cases as needed:

- ☐ All transmission projects approved by the ISO are modeled.
- ☐ All generation projects and related POS are modeled per DPM criteria for developing WECC base cases (Refer to Appendix A) or study scope as applicable.
- ☐ The load is modeled with the appropriate power factor.
- ☐ All voltage profiles are within limits
- ☐ The VAR flows between SDG&E and other utilities are within operating limits.
- ☐ All thermal, voltage and stability results meet the appropriate performance standards (NERC/WECC/ISO/SDG&E/ criteria).
- ☐ Any replog items have been corrected
- ☐ Owner and Zone numbers are not 0, ,1 or 999, etc.
- ☐ The dyd data file matches the power flow base case and a non-disturbance run results in a "flat line."
- ☐ DS Signature Form has been signed (If it is not an Operating case)
- ☐ Grid Operations have reviewed the case (Review of Operating Case Only)
- ☐ OC Signature Form has been signed (Review of Operating Case Only)

Appendix D: CAISO sign-off sheet for WECC Base Case review

Case Name

POWER FLOW CASE

DATA COMMENT AND SYSTEM REVIEW

PROCEDURE FOR SUBMITTAL

ISO to PTO (current form)

1) PTO to AREA COORDINATOR
2) AREA COORDINATOR TO WECC TECHNICAL STAFF

DATA COMMENT

CAISO Planning Engineers have reviewed the WECC Base Case 'Case Name' for 'PTO name' area. Please find below the identified deficiencies and the recommended changes:

S. No	Deficiency	Recommended Change/s	PTO's comment
1			
2			
3			
4			
5			
6			

ISO Engineer Name: Name

Review being submitted for PTO: PTO name

Date: date

Appendix E: Anchor Data Set (ADS)

For many years, WECC has been aware that data used in its various reliability assessment models (e.g., Power Flow-PF; Production Cost Model-PCM) has varying degrees of consistency and, to some extent, redundancy in terms of the data's development and collection. The concept of an Anchor Data Set (ADS) has been created with the goal of providing a common starting point for WECC's long-term reliability assessments, as well as other planning studies undertaken by WECC stakeholders. The process for developing the ADS is designed to eliminate redundant data development and collection while providing a mechanism for ensuring the accuracy, consistency and completeness of the data.

The Anchor Data Set (ADS) is a 10 year out Heavy Summer compilation of load, resource and transmission topology information used by the Western Planning Regions (WPRs) in their regional transmission plans as well as by other stakeholders in various planning analyses. This data is compatible with Production Cost Models (PCM) and power flow (PF) models, including dynamic data and associated assumptions. The ADS is comprised of data developed by NERC Registered Entities in the U.S. and international entities in the Western Interconnection (Balancing Authorities (BAs'), Transmission Planners (TPs') and/or Planning Coordinators (PCs')) and used by FERC Registered Entities in the U.S. that may be affiliated to the WPR whether or not they have FERC planning obligations as well as Transmission Owners (TO), Generation Owners (GO) or Load Serving Entities (LSE) not represented by the WPR or IPR.

The data included in the ADS must reflect applicable state and federal statutory public policy requirements such as Renewable Portfolio Standards (RPS). Resource and Transmission representation must be aligned with the most recent regional plan of the Planning Region. To achieve the goals of the ADS it is essential that the data submitted for the CAISO's annual 10 year out TPP case and for the WECC's 10 year out Powerflow case (which may be used for MOD-032 compliance purposes), is coordinated with the planning regions, and reflects the most recent regional planning case of the planning region (i.e., is consistent with the CAISO's 10 year Planning Case used in the TPP).

Please refer to WECC ADS Webpage[9] for further information.

[9] https://www.wecc.biz/SystemStabilityPlanning/Pages/AnchorDataSet.aspx