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Riverside Energy Resource Center Units 3&4
06-SPPE-1

Data Request 47, 48 & 49

INTRODUCTION

Staff needs to determine the system reliability impacts of the project interconnection and to identify the interconnection facilities including downstream facilities needed to support the reliable interconnection of the proposed project. The interconnection must comply with the Utility Reliability and Planning Criteria, North American Electric Reliability Council (NERC) Planning Standards, NERC/Western Electricity Coordinating Council (WECC) Planning Standards, and California Independent System Operator (CAISO) Planning Standards. In addition the California Environmental Quality Act (CEQA) requires the identification and description of the "direct and indirect significant effects of the project on the environment." For compliance with planning and reliability standards and the identification of indirect or downstream transmission impacts, staff relies on the System Impact Study (SIS) and Facilities Study (FS), as well as review of these studies by the agencies responsible for insuring the adjacent interconnecting grid meets reliability standards, in this case, the Southern California Edison Company (SCE) and/or CAISO. The studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards. When the studies determine that the project will cause the transmission grid or network to violate reliability requirements the potential mitigation or upgrades required to bring the system into compliance are identified. The mitigation measures often include modification and construction of downstream transmission facilities. CEQA requires environmental analysis of any downstream facilities for potential indirect impacts of the proposed project.

BACKGROUND

The description of the RERC switchyard and interconnection facilities between the proposed new generators and the RERC switchyard including major equipment and their ratings are incomplete as provided in the application (section 1.6.6, Page 1-7; sections 2.11 & 2.12, page 2-23; section 2.2, page 2-6; section 5.4.2, page 5-3).

DATA REQUEST

47. Provide a complete electrical one-line diagram of the pre-project RERC 69kV switchyard showing the existing generator units and interconnection equipment to the switchyard, buses with their arrangement, breakers and disconnect switches and their respective ratings, along with existing transmission outlets.

48. Provide a complete electrical one-line diagram of the post-project RERC switchyard showing all equipment for new generators' interconnection with

the switchyard including any bus duct connectors or cables, 13.8/15 kV switchgear and breakers on the low side, generator step-up transformers (GSU), any short overhead line or conductors with its configuration between the GSU and the switchyard, buses and their arrangement, breakers, disconnect switches on the 69 kV side and their respective ratings, along with the existing and proposed transmission outlets.

49. Provide pre and post-project physical layout drawings of the RERC showing existing and new generating units, all major equipment, switchyard and transmission line outlet(s).

RESPONSE

47. A complete electrical one-line diagram of the pre-project 69kV switchyard is attached (Transmission System Engineering Attachment 1).

48. A complete electrical one-line diagram of the post-project 69kV switchyard is attached (Transmission System Engineering Attachment 2).

49. Please see the attached drawing No.ECG0M1101-01, Rev. 0 (Transmission System Engineering Attachment 3). This drawing shows both the existing RERC Units 1&2 equipment (shown in gray tone) and the proposed new RERC Units 3&4 equipment (shown in darker black tone). The existing RERC facility Units 1&2 is also shown without Units 3&4 on attached drawing No.ECG0M1001-02, Rev. A (Transmission System Engineering Attachment 4)

    As shown on the attached RERC Overall One-Line Diagram, Drawing, ECG0E0001-01, Rev. C (Transmission System Engineering Attachment 5), each generator output is connected via underground conduit to the Unit 3&4 common Power Distribution Center (PDC). At the PDC each Generator is connected through a 15 kV output second isolating 15 kV breaker before the between the common Bus and the unit's GSU. A cross connect between the two units allows for the output of either unit to be routed through either GSU. The cross connect is also protected by a 15 kV breaker. Each GSU is rated for 69 kV, 70 MVA at 65 degrees F. The GSU's are connected via 69 kV underground buss duct to the Units 3&4 switchyard.

    At the switchyard there are six 69 kV breakers rated at 2,000 amps continuous and 40 kAIC. Four breakers are required to connect the units to the existing 69 kV transmission lines currently connected to Units1&2. Two of the breakers are for the future addition of two new 69 kV transmission lines.

Riverside Energy Resource Center Units 3&4
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Data Request 50, 51, 52, 53 & 54

BACKGROUND

The application did not include a complete SIS report for interconnection of RERC in 2009 with a mitigation plan for reliability criteria violations and final interconnection approval information. Since the City of Riverside became a new Participating Transmission Owner (PTO) under the Federal Energy Regulatory Commission (FERC) and City Tariff and its high voltage transmission facilities are under California Independent System Operator's (CAISO) operation control, staff believes that the SIS for addition of RERC 3 & 4 and any subsequent studies are required to be coordinated and approved by the CAISO (section 5.5, Pages 5-3 to 5-5).

In view of the Riverside Transmission Reliability Project (RTRP) for the proposed 230/69 kV second point of interconnection with the SCE system in 2012, performing an alternate SIS based on 2012 system conditions may be prudent at this stage (time permitting) to analyze the joint system impacts and to determine a phased (2009 & 2012) mitigation plan due to additions of the RERC and RTRP. The SIS is required to be coordinated by CAISO and SCE and subsequently approved by CAISO (section 2.1.3, page 2-5).

DATA REQUEST

The data requests below provide the choice of filing a SIS for the proposed RERC 3&4, or a coordinated Riverside/SCE SIS which address both the proposed project and the RTRP.

50. Submit a complete SIS report approved by the CAISO for interconnection of the 95 MW RERC based on 2009 summer peak and off-peak system conditions (scheduled on-line date of RERC 3&4). The study should include a power flow, short circuit and transient stability analyses with a mitigation plan for any identified reliability criteria violations inside the City system and in any adjacent system. In the report list all major assumptions in the base cases including major path flows, major generations including queue generation and loads in the area systems. Also identify the reliability and planning criteria utilized to determine the reliability criteria violations.

or,

51. Submit a complete SIS report in coordination with SCE and CAISO and approved by the CAISO for interconnections of the 95 MW RERC 3&4 and addition of RTRP based on 2012 summer peak and off-peak system conditions (scheduled on-line date of the RTRP). The study should include a power flow, short circuit and transient stability analyses with a phased (2009 & 2012) mitigation plan for any identified reliability criteria violations inside

the City system and in any adjacent system. In the report list all major assumptions in the base cases including major path flows, major generations including queue generation and loads in the area systems. Also identify the reliability and planning criteria utilized to determine the reliability criteria violations.

52. Provide power flow diagrams with and without RERC 3&4 or with and without the RERC 3&4 and RTRP for base cases. Power flow diagrams should also be provided for all overloads or voltage criteria violations under normal system (N-0) or contingency (N-1 & N-2) conditions

53. Provide electronic copies of *.sav,*.drw. *.dyd and *.swt GE PSLF files and EPCL contingency files in a CD (if available).

54. Provide the expected date, after contacting the CAISO, when the final interconnection approval letter from the California CAISO would be issued.

RESPONSE

50. Riverside Public Utilities (RPU) contacted the California Independent System Operator (CAISO) with regards to the need for CAISO to perform a System Impact Study. CAISO's opinion was that RPU did not need to interact with CAISO, however they did suggest talking with Southern California Edison, which RPU did.

51. As stated in Data Response 50, the CAISO did not believe they needed to review the interconnection study. RPU spoke with SCE and SCE said they would perform a study. The study can be completed within 90 days of a signed agreement. RPU has sent a letter to SCE to initiate the study process, however an agreement has not yet been signed.

    RPU did assess the impacts to its system from the addition of Units 3&4 as described in our application. RPU knows that SCE performed a study for Units 1&2. However, SCE did not communicate to RPU any impacts from that study. Given that RERC Units 3&4 are identical to Units 1&2 in terms of no power flowing into the SCE system when those units operate, and given their relatively small size of 95 MW total, if there are any impacts to SCE's system, RPU would expect them to be minor. For example, RPU is aware that SCE has recently upgraded much of their switchgear at Vista Substation, decreasing the likelihood of a system impact.

52. As described in our application, the existing RPU system is already subject to overloads and voltage criteria violations for N-1 events. The addition of RERC Units 3&4 reduces the number overloads and violations occurring due to N-1 events as described in the application. The RPU system vulnerabilities cannot be resolved without the completion of the RTRP project. N-2 event system problems are much more numerous N-1 event problems as would be expected.

Consistent with the RPU system planning criteria, RPU does not study N-2 events at peak loads. This is based on historical experience (over 20+ years) of N-2 events having only occurred when system loads are at or below 70%. These events have typically occurred as a result of natural phenomena such as high winds or thunderstorms, which are not associated with peak load conditions. Therefore, RPU's current system planning criteria requires that N-2 events be studied at 80% of system load. Since all four of the RERC units would most likely not be operating at a system load of 80% or less, RPU believes that there is limited value in studying the N-2 contingencies at peak system load.

RPU also discussed with SCE their approach to N-2 contingencies. SCE does not look at unrestricted N-2 outages for 69 kV transmission planning such as a 69 kV network like RPU except for the very isolated case of the loss of the two sole lines to a substation when the lines are on a common wood-pole structure. Their solution is usually to install steel poles for the length of the common-pole portion of the feed to the substation as opposed to adding a third supply line. This is a very restricted application of N-2, and does not directly apply to our situation. RPU would note that the 69 kV transmission lines to RERC are on steel poles.

The interconnect study for RERC 3&4 used ASPEN software as that is what RPU has used to model their system in the past. For the addition of RERC Units 3&4, RPU looked at impacts both prior to the completion of RTRP and with the completion of RTRP. As part of doing the study, the power flow studies that were performed did not include creation the output files for power flow diagrams. As a result, the power flow diagrams are not readily available. RPU is repeating the power flow studies for N-0 and N-1 events and will submit the diagrams prior to the data request workshop scheduled for June 26, 2008.

53. As discussed in the response to DR #52, ASPEN was used for the interconnect study. ASPEN can provide *.epc, *.wmf, and *.seq output files. GE's PSLF software was not used and thus the *.sav, *.drw, *.dyd, and *.swt files that were requested cannot be provided.

54. As stated in Data Response 50, the CAISO did not believe they needed to review the interconnect study.