GENERATOR INTERCONNECTION
MATERIAL MODIFICATION ASSESSMENT

for integration of the proposed

330 MW [redacted] PROJECT
(IDAHO POWER QUEUE #590)

to the

IDAHO POWER COMPANY ELECTRICAL SYSTEM

in

ELMORE COUNTY, IDAHO

for

[redacted]

Report v1.0

March 14, 2025

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1.0 INTRODUCTION

On February 13, 2025, [redacted] requested a material modification evaluation from Idaho Power Company (Transmission Provider), which consisted of a proposal to change their 330 MW [redacted] project's (the Project) inverter specifications.

The Project is Generation Interconnect (GI) queue number 590 (GI #590) located in Elmore County, ID at approximately [redacted]. The specific Point of Interconnection (POI) is on Idaho Power's [redacted] 230kV line.

This report describes the results of an assessment that was conducted to evaluate the potential impacts of the proposed modification in accordance with the Idaho Power Tariff and executed Large Generator Interconnection Agreement (LGIA) for the Project.

2.0 SUMMARY

An assessment was conducted which determined that the proposed changes do not result in any new steady-state reliability or transient stability concerns. However, a Sub-Synchronous Control Interaction (SSCI) risk assessment restudy will be required to determine if the modification request will be considered a material modification. The SSCI study requirement will be incorporated in the Project's LGIA milestones as an amendment.

3.0 DESCRIPTION OF PROPOSED TECHNOLOGICAL CHANGE

The original system as described in the LGIA consisted of a wind system with [redacted] inverters, a photovoltaic system with [redacted] inverters, and a BESS system with [redacted] inverters.

The new configuration requests to substitute the wind inverters with [redacted] inverters, the solar inverters with [redacted] inverters, and the BESS inverters with [redacted] inverters.

The main step-up transformers will also change from two (2) [redacted] MVA, 230kV/34.5kV wye-grounded/wye-grounded, 3-phase with 13.8 kV delta tertiary transformers to three (3) 230kV/34.5kV wye-grounded/wye-grounded, 3-phase with 13.8 kV delta tertiary transformers with the following ratings: [redacted] MVA, [redacted] MVA, and [redacted] MVA.

4.0 ASSESSMENT RESULTS

4.1 Power Flow Results (Thermal and Voltage Analysis)

Because there are no changes to the Project's maximum real power output at the POI, the modifications will have no impact on the power flow results already performed in the System Impact Study (SIS).

4.2 Reactive Power Requirements

The Project will be required to operate at 0.95 leading/lagging measured at the high side of the main power transformer to maintain voltage within limits at the POI over the range of real power output.

Power flow analysis indicates that with the modification of the inverter equipment, the Project has sufficient reactive power capability to provide a 0.95 leading/lagging power factor at the POI over the range of real power output based on the data provided by the customer.

4.3 Transient Stability Results

Transient stability data provided by the customer for the changes to the Project was reviewed and deemed usable. A transient stability analysis was performed with the new provided data and the results were acceptable.

4.4 Post-Transient Voltage Stability (Reactive Margin) Results

Because there are no changes to the Project's maximum real power output at the POI, and the reactive power requirements are not changed at the POI, the modification of the inverter equipment will have no impact on the voltage stability analysis results already performed in the SIS.

4.5 Short Circuit Results

The proposed changes do not necessitate any changes to the required protection system identified in the SIS.

4.6 Sub-Synchronous Control Interaction (SSCI)

The Project's POI is on the [redacted] 230kV line which includes series compensation. Due to possible negative interaction between inverter control systems and series compensation, an SSCI study was performed using original inverter specifications, and a report titled Sub-Synchronous Control Interaction Study prepared by Power Engineers was issued on January 18, 2023.

Since this request is proposing to change the Project's inverter models and specifications, an SSCI restudy will be required to determine if this request will be considered a material modification.

4.7 Other Operating Requirements

The Project will be required to control voltage in accordance with a voltage schedule as provided by Idaho Power Load Serving Operations. The Project will be required to install a plant controller for managing the real power output at the Project's POI.

The Project is required to comply with the applicable Voltage and Current Distortion Limits found in IEEE Standard 519-2014 *IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems*.

The Project will be required to reduce output to levels directed by IPC Load Serving Operations during transmission system contingencies and other reliability events. This will be accomplished with a Generator Output Limit Control (GOLC) setpoint sent from IPC to the Project.

5.0 CONCLUSIONS

An assessment was conducted which determined that the proposed changes do not result in any new steady-state reliability or transient stability concerns. However, a Sub-Synchronous Control Interaction (SSCI) risk assessment restudy will be required to determine if the modification request will be considered a material modification. The proposed changes may be incorporated in the Project's LGIA as an amendment with the SSCI study requirement incorporated in the Project's LGIA milestones.