

DOCKETED

Docket Number:	01-AFC-07C
Project Title:	01-AFC-7C Russell City Energy Company
TN #:	243422
Document Title:	CEC Authorization Letter for Russell City Energy Center to Restart
Description:	Letter to Cameron White and Barbara McBride -Calpine
Filer:	susan fleming
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/3/2022 12:23:21 PM
Docketed Date:	6/3/2022



June 1, 2022

Cameron White
Barbara McBride
Russell City Energy Center - Calpine
3862 Depot Road
Hayward, California 94545

Authorization for Restart of Russell City Energy Center (01-AFC-07C) After
Implementation of Required Corrective Actions

Dear Cameron White and Barbara McBride:

At the April 26, 2022 Business Meeting, the California Energy Commission (CEC) adopted the corrective actions identified in Chapter 4 of [Staff's Root Cause Gap Analysis Report](#). The attached CEC Order (Attachment 1) and Corrective Actions (Attachment 2) authorize the CEC's executive director to verify that all required repairs, testing, and corrective actions are completed before notifying Russell City Energy Center (RCEC) that it may return to combined-cycle operations.

BACKGROUND

The CEC's Siting, Transmission and Environmental Protection Division maintains a comprehensive compliance monitoring, inspection, and enforcement program to ensure that permitted thermal power plants are constructed, operated, and decommissioned in accordance with their conditions of certification and all applicable laws, ordinances, regulations, and standards. The CEC's post-certification monitoring, compliance, and enforcement authority can be found in Public Resources Code sections 25532 to 25534.2 and California Code of Regulations, title 20, sections 1751 to 1770, as well as in conditions of certification within facility licenses.

Order No. 22 0426 3 directed the Joint Agency Investigation Team (JAIT), comprised of CEC and CPUC staff, to verify that the required corrective actions identified in the staff report have been implemented by RCEC. The JAIT met with RCEC on a weekly basis to monitor RCEC's progress implementing the required corrective actions. On May 18 and 19, 2022, the JAIT conducted an onsite audit

and reviewed the mechanical changes RCEC made to the plant to conform with industry-standard ASME TDP-1-2013. The JAIT also reviewed RCEC's updated operating and maintenance procedures and updated training for operators. The required corrective actions were signed off as being complete by the JAIT.

Based on the JAIT's onsite review, I have determined that the proposed corrective actions have been completed. Therefore, RCEC is hereby authorized to restart in combined cycle mode and proceed with normal operations at the RCEC.

If you have any questions or concerns, please contact Shawn Pittard, STEP deputy director, at (916) 661-8213 or at Shawn.Pittard@energy.ca.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Drew Bohan', with a long horizontal stroke extending to the right.

Drew Bohan
Executive Director

ATTACHMENT 1

ORDER NO: 22-0426-3

STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

IN THE MATTER OF:

RUSSELL CITY ENERGY CENTER

Docket No. 01-AFC-07C

**ORDER ADOPTING STAFF RECOMMENDED
CORRECTIVE ACTIONS AND DELEGATING
AUTHORITY TO THE EXECUTIVE
DIRECTOR**

I. BACKGROUND

The Russell City Energy Center (RCEC) is a nominal 600 megawatt (MW) natural gas-fired, wet-cooled, combined-cycle electric generating facility that was initially certified by the California Energy Commission (CEC) in September 2002 and began commercial operation in August 2013.

On May 27, 2021, RCEC experienced a mechanical failure of the steam turbine generator that resulted in an explosion and fire (incident). The steam turbine generator experienced extensive damage. As a result, Russell City Energy Company, LLC (project owner) temporarily shut down RCEC and estimated that the time required for repairs necessary to resume combined-cycle mode operations would be approximately one year.

On June 3, 2021, the project owner filed a post-certification petition with the CEC to modify RCEC's license to allow the facility to temporarily operate in simple-cycle mode.

On July 15, 2021, the CEC voted to approve the project owner's petition for modifications to allow the facility to temporarily operate in simple-cycle mode, subject to certain limitations in the CEC's order. The CEC order found it was appropriate for the CEC to "exercise enhanced scrutiny over the facility" in light of the May 27, 2021 incident and that "it is reasonable for the public to have access to safety audits conducted pertaining to the operation of the facility, including the circumstances that gave rise to the petition."

Additionally, the order directed the project owner to meet with CEC staff and the Hayward City Fire Department within 30 days of the order "to discuss any needed modifications of [RCEC's] standard operating procedures for first responders to implement when responding to incidents on site, including establishing a process for reimbursement of reasonable expenses."

Finally, the CEC's order found that RCEC will "return to combined cycle operations when repairs and testing are completed." The order did not specify a schedule for completion of repairs and testing nor did it set a date by which modifications to the facility must be completed to resume combined-cycle operations. On June 7, 2021, the CEC staff conducted an initial inspection of the explosion and fire site and interviewed RCEC employees, first responders, and witnesses. In collaboration with the California Public Utilities Commission (CPUC), the CEC staff conducted an additional eleven site visits.

On November 24, 2021, the project owner submitted its Root Cause Analysis (RCA) of the May 27, 2021 turbine overspeed incident to the CEC staff and the CPUC. The project owner's RCA, completed by Structural Integrity Associates, found that the systems' inability to detect and drain excess water under pressure and at high temperature within the reheater system was the root cause of the Steam Turbine Generator (STG) drivetrain event at RCEC.

In January 2022, the CEC and the CPUC staff notified the project owner that they would be conducting a Joint Agency Investigation (JAI) and on-site inspection of RCEC on February 7 through 11, 2022. The purpose of the JAI was to investigate questions that were not answered in the project owner's RCA and evaluate the need for additional corrective actions. The on-site inspection was performed as planned, and the project owner provided requested documents prior to the on-site inspection and made employees available to be interviewed by the CEC and the CPUC staff.

On February 18, 2022, the CEC and the CPUC staff transmitted to the project owner a list of preliminary corrective actions necessary for the facility to safely return to combined-cycle operations. The list of corrective actions prepared by the JAI was intended to supplement the corrective actions identified in the project owner's RCA as necessary to resume combined-cycle operations. The project owner acknowledged receipt and provided responses indicating it would implement all of the CEC and the CPUC staffs' preliminary corrective actions before resuming combined-cycle operations.

On April 22, 2022, the CEC staff filed its investigation report, titled *Russell City Energy Center May 2021 Incident: Root Cause Gap Analysis* (Staff's Investigation Report), to the RCEC compliance docket. Staff's Investigation Report lists the activities and safety audits undertaken as part of the JAI since May 27, 2021, presents their independent determination of the root cause of the turbine overspeed event, and presents the nine remaining corrective actions that the JAI team determined must be implemented at RCEC for the facility to safely return to combined-cycle operations with a minimal risk of future turbine overspeed events due to water induction.

II. STAFF RECOMMENDATION

The CEC staff has concluded that, with the CEC's adoption of, and the project owner's completion of, all corrective actions identified in Chapter 4 of Staff's Investigation Report, the project owner can safely resume operating in combined-cycle mode while ensuring that the risk of a similar water induction incident occurring in the future is eliminated to the degree feasible by deploying robust redundant systems of prevention and detection.

Based on the foregoing, CEC staff recommends that the CEC specify that RCEC may return to combined-cycle operations only after all corrective actions identified in Chapter 4 of Staff's Root Cause Gap Analysis Report are completed and verified by CEC staff.

Consistent with the CEC's compliance verification regulations (Cal. Code Regs., tit. 20, § 1770), the CEC staff also recommends that the CEC delegate to the CEC's Executive Director authority to verify completion of all corrective actions identified in Chapter 4 of the CEC staff's Root Cause Gap Analysis Report prior to resuming combined-cycle operations. If this delegation is approved, the CEC's Executive Director will verify that all required repairs, testing, and corrective actions are completed before notifying RCEC that they may return to combined-cycle operations.

At this time, the CEC staff is not recommending changes to any conditions of certification for RCEC, as the facility will be operating within its existing license.

III. ENERGY COMMISSION FINDINGS

Based on the record, including CEC staff's Root Cause Gap Analysis Report and the April 21, 2022 Basis for CEQA Findings Memorandum, all required corrective actions, repairs, and testing must be completed by the project owner to ensure RCEC can safely return to combined-cycle operations. Upon verified completion of the stated corrections, repairs and testing, the temporary modifications to allow for operation in simple-cycle mode will no longer be necessary. As such, the CEC finds that:

- The corrective actions identified in Chapter 4 of Staff's Root Cause Gap Analysis Report are sufficient to enable RCEC to safely return to operations in combined-cycle mode. Implementation of the corrective actions will eliminate risk of recurrence of a similar water induction incident to the degree feasible, by deploying robust redundant systems of prevention and detection.
- The project owner will file status reports documenting implementation of the corrective actions and will provide verification of completion to the Executive Director prior to RCEC restarting combined-cycle commercial operations.
- The facility's operation in combined-cycle mode is within the existing license.

- Adoption of the corrective actions and delegation to the Executive Director are not projects under CEQA because they will not result in a direct or reasonably foreseeable indirect physical change in the environment. (Cal. Code Regs., tit. 14, §§ 15060(c)(2)-(3) and 15378(a) & (b)(5).) In addition, the Class 1, Class 2, and Class 21 exemptions (Cal. Code Regs., tit. 14, §§ 15301, 15302 and 15321; see also 15061(b)(2)), and the common-sense exemption also apply. (Cal. Code Regs., tit. 14, § 15061(b)(3).)

IV. CONCLUSION AND ORDER

The CEC hereby adopts the corrective actions identified in Chapter 4 of CEC Staff's Root Cause Gap Analysis Report and orders their completion by RCEC's project owner prior to returning to combined-cycle operations.

The CEC hereby orders the project owner to file via the CEC docket system, bi-weekly compliance reports outlining the progress made towards completion of the identified corrective actions. Compliance reports shall be filed by close of business starting on Friday, May 6, 2022, and continuing every two weeks thereafter until combined-cycle operations resume.

The CEC hereby delegates the authority and directs the CEC's Executive Director to verify that the corrective actions have been completed at RCEC and to issue notice to RCEC when the facility may resume combined-cycle operations.

IT IS SO ORDERED.

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of an Order duly and regularly adopted at a meeting of the CEC held on April 26, 2022.

AYE: Hochschild, Gunda, McAllister, Monahan, Vaccaro

NAY:

ABSENT:

ABSTAIN:



Liza Lopez
Secretariat

ATTACHMENT 2 CORRECTIVE ACTIONS

In response to the RCEC's May 2021 incident, the focus of this report has been to highlight the JAIT's investigative activities, provide an understanding of what occurred, and determine the appropriate corrective actions necessary to allow RCEC to return to operation safely.

After reviewing SIA's root cause analysis, the JAIT conducted an audit to address some perceived gaps. This gap audit was necessary to determine whether there were contributing factors to the event that were outside the scope of, or not addressed in, SIA's root cause analysis. After completing the gap audit, the JAIT determined that there were three overall casual factors to the water induction event: (1) deficiencies in maintenance for some critical equipment, such as the CRH-1 valve assembly, (2) deficiencies in control room operator interface and training, such as the inability to detect and respond to water accumulation in the offline HRSG, and (3) inadequate protection from water induction, such as reliance on a single valve to prevent accumulation in the offline HRSG. Corrective actions were developed to address these three casual factors.

The corrective actions for the equipment maintenance and monitoring program at the RCEC include:

- For each HRSG, implement a preventative maintenance and monitoring program for the cold reheat (CRH-1) valve, gearbox and actuator assemblies that includes frequency of inspections, services, and lubrication for review and approval.
- For each HRSG, implement an annual preventative maintenance program for the steam attemperators and mixers for review and approval.
- Revise operations procedures needed to accommodate implementation of SIA's restoration recommendations for review and approval.

The corrective actions for the control room operator interface and training include:

- Synchronize the internal clocks that generate the time and date stamps for alerts and alarms for both the Mark VI and the distributed control system. Review and evaluate the alarm and trip points of RCEC's programmable logic controllers making them more sensitive to alarm settings, where appropriate.

- Consolidate the alarms generated by the DCS and Mark VI control systems into a single control system to reduce the need for operations staff to monitor multiple systems simultaneously.
- Reduce the occurrence of nuisance/false alarms by providing “smart alarm” logic in the consolidated DCS and Mark VI control systems and provide an updated operator training that includes water induction events along with evidence of its completion.

The corrective actions for inadequate water induction protection include:

- Provide an ASME TDP-1-2013 conformance analysis for the RCEC.
- Provide the list of design modifications that are being implemented at RCEC based on the ASME TDP-1-2013 conformance analysis along with evidence of their completion.
- Implement the SIA restoration recommendations along with evidence of their completion.

These corrective actions contain a mix of operations and maintenance changes, improvements to operator notification systems to improve situational awareness, and upgrades to hardware and control system integration. These corrective actions would not expand the facility, change the performance of the facility, or require any changes to existing conditions of certification. These corrective actions are required to be implemented prior to the facility restarting combined-cycle operations. Verification that the corrective actions have been completed will be achieved through review of documentation provided by RCEC and by onsite inspection by the DCBO and JAIT staff or retained consultants. In addition to the required corrective actions for the water induction event, the JAIT also conducted an audit of other aspects of the power plant. This included tasking the CEC’s DCBO with reviewing several systems on site that could have potential for offsite consequences to the surrounding community and providing a report that will specify whether the systems are code compliant and will detail any deficiencies needing correction. Such inspections are periodically conducted to help ensure that the normal operation of the plant remains in compliance with applicable regulations and industry standards. Collectively, these nine corrective actions will address the three causal factors that were identified by the JAIT during the investigation. Completion of the above corrective actions by the RCEC would prevent, to the degree feasible, any future turbine overspeed events due to water induction by deploying redundant systems of prevention and detection.