



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 13, 2025

Ms. Paula Gerfen
Senior Vice President, Generation
and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 56, Mail Code 104/6
Avila Beach, CA 93424

SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2 – EXEMPTION
FROM 10 CFR 50.46 TO SUPPORT USE OF OPTIMIZED ZIRLO™ FOR
IMPROVED FUEL ROD CLADDING PERFORMANCE (EPID L-2025-LLE-0012)

Dear Ms. Gerfen:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has approved the enclosed exemption from certain requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," for the Diablo Canyon Nuclear Power Plant, Units 1 and 2 (Diablo Canyon). Specifically, the exemption will support the use of Optimized ZIRLO™ for improved fuel rod cladding performance at Diablo Canyon. This action is in response to the Pacific Gas and Electric Company (PG&E, the licensee) application submitted by letter dated March 26, 2025 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML25085A409). The PG&E letter also included a license amendment request to permit the use of Optimized ZIRLO™ fuel rod cladding at Diablo Canyon. The NRC staff addressed the license amendment request in a separate letter dated August 13, 2025 (ML25174A192).

P. Gerfen

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A copy of the exemption is enclosed. Notice of Issuance for the exemption will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

Samson S. Lee, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure:
Exemption

cc: Listserv

ENCLOSURE

EXEMPTION

NUCLEAR REGULATORY COMMISSION

Docket Nos. 50-275 and 50-323

Pacific Gas and Electric Company

Diablo Canyon Nuclear Power Plant, Units 1 and 2

Exemption

I. Background

Pacific Gas and Electric Company (PG&E, the licensee) is the holder of Facility Operating License Nos. DPR-80 and DPR-82, which authorizes operation of Diablo Canyon Nuclear Power Plant, Units 1 and 2 (Diablo Canyon), respectively. The licenses provide, among other things, that the facilities are subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect. The facilities consist of pressurized-water reactors located in Avila Beach, California.

II. Request/Action

By application dated March 26, 2025 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML25085A409), and pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.12, "Specific exemptions," PG&E requested an exemption from certain requirements of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," to allow the use of fuel rod cladding with Optimized ZIRLO™ for future reload applications. The regulations in 10 CFR 50.46 contain acceptance criteria for the emergency core cooling system (ECCS) for reactors fueled with Zircaloy or ZIRLO™ fuel rod cladding material. The licensee requested the exemption because these regulations do not have provisions for the use of fuel rod cladding material other than Zircaloy or ZIRLO™. Because the material specifications of Optimized ZIRLO™ differ from the specifications for Zircaloy or ZIRLO™, a plant-specific exemption is required to support the reload applications for Diablo Canyon.

This exemption request relates solely to the specific type of cladding material specified in these regulations for use in light-water reactors. As written, the regulations presume use of either Zircaloy or ZIRLO™ fuel rod cladding. The exemption is required because Optimized ZIRLO™ has a slightly different composition than Zircaloy or ZIRLO™. Therefore, PG&E has requested an exemption to consider Optimized ZIRLO™ as an approved fuel rod cladding material. PG&E is not seeking an exemption from the acceptance and analytical criteria of 10 CFR 50.46.

The requirements regarding the acceptance and analytical criteria will be maintained. Along with the exemption request, the submittal from PG&E described above also contains a license amendment request to modify Technical Specifications 4.2.1, "Fuel Assemblies," and 5.6.5, "Core Operating Limits Report (COLR)," to allow the use of Optimized ZIRLO™ as an approved fuel rod cladding material. This exemption and the proposed technical specification changes are subject to a concurrent review that is being documented in the safety evaluation with the license amendments (ML25174A192).

The NRC has previously approved exemption requests that were similar in nature to that requested by PG&E. Precedent exemptions have been approved for other pressurized-water reactor plants, including Beaver Valley Power Station, Unit Nos. 1 and 2 (ML18022B116 and ML17313A550); Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (ML17319A107 and ML17319A214); and Wolf Creek Generating Station, Unit 1 (ML16179A293 and ML16179A440).

III. Discussion

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. Under 10 CFR 50.12(a)(2), special circumstances include, among other things, when application of the specific regulation in the particular circumstance would not

serve, or is not necessary to achieve, the underlying purpose of the rule. The requested exemption to apply the acceptance criteria to Optimized ZIRLO™ fuel rod cladding rather than Zircaloy or ZIRLO™ at Diablo Canyon, satisfies the criteria as described below.

A. The Exemption is Authorized by Law

The NRC has the authority under 10 CFR 50.12 to grant exemptions from the requirements of 10 CFR Part 50 upon showing proper justification. The fuel that will be used at Diablo Canyon contains cladding material that does not conform to the cladding material that is explicitly defined in 10 CFR 50.46. However, the criteria of these sections will continue to be satisfied for the operation of the Diablo Canyon core containing Optimized ZIRLO™ fuel cladding.

B. The Exemption Presents No Undue Risk to Public Health and Safety

The standards for exemption are also satisfied since the exemption will not present an undue risk to public health and safety. The NRC-approved Westinghouse Topical Report WCAP-14342-A and CENPD-404-NP-A, Addendum 1-A, “Optimized ZIRLO™”, July 2006 (ML062080569), has demonstrated that predicted chemical, thermal, and mechanical characteristics of the Optimized ZIRLO™ alloy cladding are bounded by those approved for ZIRLO™ under anticipated operational occurrences and postulated accidents. Reload cores are required to be operated in accordance with the operating limits specified in the technical specifications and COLR. Thus, the granting of this exemption request will not pose an undue risk to public health and safety.

C. The Exemption is Consistent with the Common Defense and Security

The exemption request is to allow the licensee to use an improved fuel rod cladding material. The licensee has documented compliance with the conditions and limitations of the NRC safety evaluation regarding the use of Optimized ZIRLO™ fuel rod cladding at Diablo Canyon and has committed to ensuring compliance for future reloads in the current application.

Use of Optimized ZIRLO™ fuel rod cladding in the Diablo Canyon cores will not affect plant operations and is consistent with common defense and security.

D. Special Circumstances

The special circumstance that necessitates the request for exemption to 10 CFR 50.46 is that the regulations do not explicitly allow the use of Optimized ZIRLO™ fuel rod cladding material. The ultimate objective of 10 CFR 50.46 is to ensure that nuclear power reactors fueled with uranium oxide pellets within Zircaloy or ZIRLO™ cladding must be provided with an ECCS that must be designed to provide core cooling following postulated loss-of-coolant accidents. It has been demonstrated in the NRC-approved Westinghouse Topical Report WCAP-14342-A and CENPD-404-NP-A, Addendum 1-A that the effectiveness of the ECCS will not be affected by a change from Zircaloy or ZIRLO™ clad fuel to Optimized ZIRLO™ clad fuel. Normal reload safety analyses will confirm that there is no adverse impact on ECCS performance.

E. Environmental Considerations

The NRC staff determined that the exemption discussed herein meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9) because it is related to a requirement concerning the installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, and the granting of this exemption involves: (1) no significant hazards consideration, (2) no significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, and (3) no significant increase in individual or cumulative occupational radiation exposure. Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC staff's consideration of this exemption request. The basis for the NRC staff's determination is in the licensee's discussion of the 10 CFR 51.22(c)(9) criteria in the associated license amendment request noticed in the *Federal Register* on June 10, 2025 (90 FR 24421). In addition, because Optimized ZIRLO™ cladding has similar properties and performance characteristics as the currently licensed cladding, the use of Optimized ZIRLO™

will not significantly increase the types or amounts of effluents that may be released offsite, significantly increase individual occupational radiation exposure, or significantly increase cumulative occupational radiation exposure. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the exemption.

IV. Conclusions

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Therefore, the Commission hereby grants PG&E an exemption from the requirements of 10 CFR 50.46 to allow the use of Optimized ZIRLO™ fuel rod cladding material at Diablo Canyon, Units 1 and 2. As stated in this notice, this exemption relates solely to the cladding material specified in the regulation.

Dated at Rockville, Maryland, this August 13, 2025.

For the Nuclear Regulatory Commission.

/RA/

Jamie Pelton, Acting Director,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

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ADAMS Accession Nos.:

ML25171A144 (Package)

ML25171A162 (Letter)

ML25171A164 (FRN – Separate from Package)

ML25171A166 (Exemption)

***via eConcurrence**

NRR-048

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