SOUTHERN CALIFORNIA EDISON
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SUBJECT: Proposed Amendments to Rule 1135 - Emissions of Oxides of Nitrogen from Electricity Generating Facilities

Dear Mr. Krause:

Thank you for holding the Rule 1135 Working Group meeting on May 5, 2022. Southern California Edison (SCE) appreciates the South Coast Air Quality Management District's (SCAQMD) efforts to reopen Rule 1135 to address issues relating to SCE's Pebbly Beach Generating Station (PBGS) on Santa Catalina Island (Catalina).

A. Introduction

SCE appreciates SCAQMD's consideration of the unique spatial constraints and operational challenges at PBGS. Unless revised, certain aspects of the current rule will impede SCE's ability to provide reliable and affordable electric utility service to Catalina residents and tourists while maintaining environmental stewardship. SCE's analysis to date indicates that fully transitioning to zero-emissions technologies is not technically viable in the near term within the current PBGS footprint. SCE continues to evaluate the integration of alternative technologies with the cleaner diesel solution at Catalina over the longer term.

As discussed, SCE has modified the Catalina Island Repower project to replace up to three existing generators (instead of six) with new, emissions-compliant diesel generators for reliability. These engines are certified to meet the U.S. Environmental Protection Agency (U.S. EPA) Tier 4 Final (T4F) standard. For the balance of generation needs, SCE is working with outside experts to evaluate clean alternative technologies and conduct outreach to numerous vendors. SCE continues to evaluate our long-term clean energy strategy, including launching the future Catalina Clean Energy All-Source Request for Offers (RFO) for eligible renewable resources, renewable energy generators, demand response, and energy efficiency by year-end.

SCE supports SCAQMD's continued evaluation of alternative technologies and looks forward to collaboratively developing a plan that can be accomplished in a practicable timeframe. This letter provides SCE's perspective on key issues addressed during the Working Group meeting on May 5, 2022:

- T4F-certified engines remain the appropriate Best Available Retrofit Control Technology (BARCT), Best Available Control Technology (BACT), and Lowest Achievable Emissions Rate (LAER) for Catalina.
- The prohibition on new diesel engine installation after 1/1/2024 must be relaxed to accommodate operational reliability and facilitate facility-wide emissions reduction within a realistic timeframe.
- Mass emissions limits and implementation deadlines must be adjusted due to the permitting timeline, current global supply chain issues, and construction constraints.
- The BARCT cost-effectiveness analysis must include all applicable capital and annual operating costs and reflect appropriate equipment useful life.
- Fuel storage is a limiting factor due to the facility's fuel reserve requirements and limited space.

B. T4F Generators are Currently Considered BARCT, BACT, and LAER for the Unique Power Generating Operation at PBGS

SCE is committed to providing uninterrupted electricity to Catalina's 4,000 residents and more than one million annual visitors while complying with the emission limits in Table 2 of Rule 1135. Based on a rigorous assessment of the current state of technology, T4F-certified diesel engines are considered BACT, BARCT, and LAER. Nevertheless, SCE remains actively engaged with agency and industry partners to thoroughly consider all technological options capable of safely producing power in a spatially constrained footprint.

As indicated in the 2018[1] and 2021[2] Rule 1135 Staff Reports, T4F diesel engines meet the requirements of BARCT. BACT and LAER are assessed for all technologies in the context

[1] SCAQMD. Draft Staff Report. Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (October 2018). Available at www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1135/par-1135---dsr---final.pdf?sfvrsn=12.

[2] SCAQMD. Preliminary Draft Staff Report. Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities. Proposed Rule 429.2 – Startup and Shutdown Exemption Provisions for Oxides of Nitrogen from Electricity Generating Facilities (December 2021). Available at

of reliably producing primary power within the current PBGS footprint while maintaining operational flexibility and safety. SCE estimated that NOx emissions would be reduced by more than 63% if all six existing diesel generators are replaced with T4F-certified units.

SCE has reviewed SCAQMD's BACT Guidelines Part A: Policy and Procedures for Major Polluting Facilities, including a thorough review of the California Air Pollution Control Officers Association (CAPCOA) BACT Clearinghouse, U.S. EPA Reasonable Available Control Technology (RACT)/BACT/LAER Clearinghouse, several air districts' and California's BACT Guidelines, and BACT/LAER requirements in New Source Review permits issued by SCAQMD and other air quality agencies. In each database, BACT/LAER is met with T4F-certified diesel engines when considering the need to produce prime power at both current and future forecasted Island load.

Until a new analysis concludes otherwise, T4F-certified diesel engines remain BARCT, BACT, and LAER in replacing the existing diesel generators.

C. The Prohibition on New Diesel Engine Installation Should Be Revised

Rule 1135 (d)(2)(B) prohibits the installation of any new diesel internal combustion engines on Catalina after January 1, 2024. SCE understands and supports the need to accelerate the development of zero- and near-zero technology but believes this prohibition will not help to achieve that goal and will instead impair SCE's ability to reduce NOx emissions from PBGS while maintaining operational reliability.

Even after SCE replaces two old diesel engines with lower-emissions T4F engines, the remaining four old engines will still be needed to ensure reliability and safety, at least until any projects resulting from the RFO are operational which is likely to take several years[3]. As explained above, T4F engines are still considered BARCT, so SCE should be allowed to install them unless and until a new BARCT standard has been established. Without a mechanism to replace the remaining aging engines, it will be difficult to reduce the facility's NOx emissions significantly after the first two engines are replaced.

SCE meets the island's electrical demand by balancing the operation of six engines. The two new engines will need to be removed from service periodically for repair and maintenance. While these units are out of service, SCE will have to rely on the other aging units with much higher emissions to generate power. When the two new units are fully operational, SCE expects they will account for about half of total PBGS annual generation.

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www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1135/par-1135-and-pr-429-2-preliminary-draft-staff-report---10-21-22.pdf?sfvrsn=14.

[3] The projected timeline is: December 2022/RFO launch; March 2023/Offers due; April 2023 to October 2023/Offers reviewed and shortlisted; April 2024/Negotiations complete; June 2024/Contracts executed; July 2024 to December 2024/ CPUC application filed for contract approval; July 2026/ Anticipated approval of CPUC application (18 months after filing); September 2027. Project commences operation.

The other half will be provided by the older units (until, as mentioned above, any RFO projects are operational). Table 1 illustrates historical NOx average emissions from each engine in comparison to the T4F standard. Unless it becomes clear that SCE will be able to fully satisfy future demand with renewable projects from the RFO, allowing SCE to replace the remaining aging units with new T4F engines would reduce the facility's NOx emissions reliably and quickly.

Table 1. NOx Emissions Rates

Engine	Average NOx Emissions Rate (g/kWh)	Expected NOx Emissions Reduction If Replaced by T4F Engine
Tier 4 Final Standard	0.67	--
Unit 7	2.36	72%
Unit 8	5.00	87%
Unit 10	3.90	83%
Unit 12	3.57	81%
Unit 14	2.43	72%

Unit 15 provides an excellent illustration of the difficulties posed by the January 1, 2024 deadline for installing diesel units. As the SCAQMD knows, Unit 15 was recently found to be in violation of Rule 1470's particulate matter (PM) emissions limit (0.01 g/bhp-hr). Because Unit 15 meets the T4F standard and has the lowest NOx emissions rate of all PBGS units, it is both SCE's and SCAQMD's preference to keep Unit 15 in operation. However, Unit 15 cannot be easily retrofitted with a conventional diesel particulate filter (DPF) due to the lack of allowable back pressure and other operational constraints. After several discussions and a permit application with SCAQMD, SCE received a Rule 441 permit to replace Unit 15's current CO catalyst with a new version. SCE is hopeful based on discussions with the manufacturer that this project will bring Unit 15 into compliance with the Rule 1470 PM emissions limit.

This effort requires a coordinated installation and testing plan that is slated for completion in Q4 of 2022. The permit will expire on March 31, 2023. If the catalyst does not perform as expected, the contingency plan is to replace Unit 15 with a T4F diesel generator. However, the current rule prohibits the installation of new diesel engines after January 1, 2024, which leaves only nine months for SCE to procure and construct a T4F engine while the construction for the replacement of Unit 8 and Unit 10 will be underway. To ensure reliability and safety, SCE intends to stagger the new unit installations instead of replacing them simultaneously, to ensure that the first new generator will be in operation while the second is being installed. SCE estimates that at least 18-24 months following the conclusion of the catalyst project would be needed to replace Unit 15 with a T4F engine given current global supply chain issues and construction timelines. Therefore, the need

to allow new engine installation beyond January 1, 2024 remains. SCE proposes extending the deadline for the installation of new engines to July 1, 2025. An alternative option would be to revise the prohibition to allow the installation of a Unit 15 replacement after January 1, 2024 if the catalyst project fails to bring Unit 15 into compliance with Rule 1470.

D. Mass Emissions Limits and Implementation Deadlines Must be Adjusted to Practicable Timeframes

1. The annual NOx emissions limits for 2024 and 2025 must be adjusted to align with realistic permitting and construction and timeframes.

The current emission targets must be adjusted to align with practicable permitting and construction timelines. As described in the 2021 Rule 1135 Staff Report, SCAQMD intended the annual mass NOx emission limits of 50 and 45 tons per year (for 2024 and 2025, respectively) as interim limits that allow PBGS to achieve emission reductions via near-term solutions, i.e., replacement with T4F engines. At the time the mass emission limits were established, SCE assumed it would be able to start construction in 2022 and start operating the two T4F new engines in 2024. That timeline has since been altered due to permitting complexity, global supply chain issues, and facility construction constraints.

Due to the length of the permit review process, SCE may not receive the permit to construct (PTC) in time to install the first two T4F diesel engines by January 1, 2024, which is required by Rule 1135. SCE applied for the PTCs on April 30, 2021, followed by a revision to reduce the number of generators from six to three units on January 21, 2022. SCE has been working diligently with SCAQMD to supply additional information as requested. SCE appreciates SCAQMD's attention to this very important project and understands the level of detailed evaluation it must perform to ensure public health. Because of the length of time this evaluation requires, it is unclear whether SCE will receive the PTCs in time to comply with the January 1, 2024 deadline.

SCE has been working with the vendor to procure and conduct detailed engineering designs for the first two units. Unfortunately, in dealing with global supply chain issues and space limitation constraints, there have been significant delays in the procurement and construction process. Due to these circumstances, which are beyond SCE's control, it may not be possible for SCE to install and operate the new generators in time to reduce emissions to a level compliant with the 2024-2026 NOx limits.

SCE believes that the deadlines for the mass emissions limits should be adjusted once the permitting timeline is settled.

2. Additional analysis must be conducted to confirm whether an annual NOx limit of 13 tons/year is possible.

The rule's NOx emissions limit of 13 tons/year (effective January 1, 2026) rests on the assumption that SCE could replace fossil generation completely with zero-emissions and near zero-emissions technologies. This assumption is unrealistic and the 13 tons/year emissions limit may not be achievable by the proposed deadline even if the available three-year extension is granted. The 13 tons/year cap also assumes the Island's load demand will remain the same in the future. Certain significant load increases are difficult to predict, such as transportation electrification and cruise ship electrification, which would be significant and outside SCE's control.

SCE remains opposed to a facility emissions cap because it effectively disallows future load growth. Further, SCE opposes the inclusion of a mass emissions cap in addition to concentration-based limits given that the stated goal of the RECLAIM transition was to move away from facility emission caps in favor of command-and-control limits. Imposing both requirements simultaneously add unnecessary operational (i.e., hourly) restrictions that go beyond a command-and-control approach and may impede SCE's ability to reliably serve load and meet compliance requirements.

E. The BARCT Cost-Effectiveness Analysis Must Include All Applicable Capital and Annual Operating Costs and Reflect Appropriate Equipment Useful Life

SCE appreciates the SCAQMD's continued evaluation of cost effectiveness. SCE welcomes opportunities to collaborate on this endeavor. Each technology option presents a unique set of engineering challenges with commensurate costs. SCE appreciates the SCAQMD's use of the discounted cash flow (DCF) method to make informed decisions in setting BARCT and BACT. SCE requests that SCAQMD consider all applicable capital and annual operating costs when evaluating viable technological options, including but not limited to:

- Capital costs
    - Purchase costs: primary equipment, ancillary equipment (including additional emissions monitoring system if required by the new equipment), shipping, and delivery;
    - Direct installation costs: foundation and supports, electrical and utilities, plans and permitting, construction & demolition, and labor for equipment installation, includes auxiliary components such as fuel storage and delivery system, fire suppression system, and other equipment;
    - Indirect installation costs: engineering design, field expenses, emissions and performance tests, and contingencies;

- Annual Operating Costs:
  - Annual maintenance;
  - Replacement parts;
  - Insurance and permitting;
  - Fuel costs (including shipping);
  - Hazardous material handling and waste treatment/disposal; and
  - Emissions and performance testing.

In addition to the complete cost profile, the equipment's useful life expectancy must also be considered. SCAQMD based its cost-effectiveness analysis on 25 useful years. PBGS's unique location (on the coast, with considerable marine corrosion) has shortened the life expectancy of the propane-fired microturbines to three to five years (significantly less than the manufacturer's estimation of five to nine years). According to the U.S. Department of Energy, a fuel cell for distributed power system has life expectancy target of 80,000 hours (about nine years). To ensure an accurate and equitable result, SCAQMD should include the appropriate equipment life expectancy in its calculation.

F. Fuel Storage is a Limiting Factor for PBGS Expansion

1. The Roaring Canyon site is not a preferred option to expand power generation.

Although SCE remains open to procuring additional space if available, any replacement technology considered under this rule amendment must be technically feasible within PBGS' existing footprint. Expanding the PBGS operational footprint would be a lengthy and complex process and may not be possible given that 88% of the Island is reserved for conservation purposes. SCE does not have rights to use the Roaring Canyon site, which was identified in the Working Group presentation and in SCE's 2020 Feasibility Study. This undeveloped property is preserved as public open space for Catalina residents and tourists. To construct a new fuel storage facility as SCAQMD proposed in the Working Group meeting, SCE would have to acquire the land from the Island Company and then attempt to satisfy approval requirements from various agencies, including the Public Utilities Commission, Coastal Commission, and L.A. County Fire Department.

G. Conclusion

Thank you for your consideration of SCE's comments. We look forward to continuing to collaborate with you and your staff on finding the best approach to maximize NOx emissions reductions while appropriately balancing reliability, commercial feasibility, cost, compliance deadlines, and environmental stewardship. If you have any questions or would like to discuss these issues, please contact Joy Brooks, Senior Air Quality Manager at (626) 302-8850 or joy.s.brooks@sce.com.

Sincerely,

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