

Updated Informative Digest

Proposed Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate

Sections Affected:

Proposed amendments to California Code of Regulations, title 13, sections 2477.1, 2477.2, 2477.3, 2477.4, 2477.5, 2477.7, 2477.8, 2477.9, 2477.10, 2477.11, 2477.12, 2477.13, 2477.14, 2477.15, 2477.16, 2477.17, 2477.18, 2477.19, 2477.20 (Renumbered 2477.23), and 2477.21 (Renumbered 2477.24). Proposed adoption of California Code of Regulations, title 13, section 2477, 2477.6, 2477.20, 2477.21, and 2477.22. Repeal California Code of Regulations, title 13, section 2477.6.

Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3))

- 49 Code of Federal Regulations section 1201, General Instructions 1–1 Classification of carriers (April 5, 2021). Incorporated in 2477.4(a) “Class I Railroad”
- (IPCC, 2007) Intergovernmental Panel on Climate Change’s Fourth Assessment Report. Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Incorporated in 2477.4(a) “Global Warming Potential (GWP)”
- (IPCC, 2013) Intergovernmental Panel on Climate Change’s Fifth Assessment Report. Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) pgs 731-738. Incorporated in 2477.4(a) “Global Warming Potential (GWP)”

Background and Effect of the Proposed Regulatory Action:

The California Air Resources Board (CARB or Board) adopted the Airborne Toxic Control Measure for In-Use Diesel-Fueled TRUs and TRU Generator Sets, and Facilities Where TRUs

Operate (TRU ATCM; title 13, California Code of Regulations, section 2477) in 2004 (and amended it in 2010 and 2011) to reduce diesel particulate matter (PM) emissions and resulting health risk from diesel-powered TRUs used to control the environment of temperature-sensitive products transported in insulated trucks, trailers, shipping containers, or railcars, as well as diesel-powered TRU generator sets that provide electric power to electrically-powered refrigeration units of any kind.

The TRU ATCM requires that TRU engines that operate in California meet specific in-use performance standards that require diesel PM emissions to be reduced in accordance with a phased compliance schedule. The phased compliance schedule is based on the model year (MY) of the TRU engine and requires compliance with the in-use performance standard seven years after the engine MY. The TRU ATCM includes two levels of stringency that were phased-in over time. The first phase, beginning in 2008, is the low emission TRU performance standard. The second phase, beginning in 2010, is the ultra-low emission TRU (ULETRU) performance standard. Ultimately, all TRU engines are required to meet the ULETRU performance standard and have 85 percent PM control (compared to an uncontrolled Tier 0 engine) to be fully compliant with the TRU ATCM.

CARB subsequently amended the TRU ATCM in 2010 and 2011. The 2010 amendments included additional recordkeeping and reporting requirements for TRU original equipment manufacturers that directly or indirectly sell, or offer for sale, TRUs to the California market. The amendments also included more stringent definitions for compliance. The 2011 amendments extended certain TRU performance standard compliance deadlines from those originally contained in the 2004 regulation and included provisions to improve enforceability.

Staff are proposing amendments to the TRU ATCM (Proposed Amendments) to achieve additional emission reductions from diesel-powered TRUs and increase the use of zero-emission technology in the off-road sector. The Proposed Amendments are also needed to address the emergence and growth in the number of trailer TRUs, domestic shipping container (DSC) TRUs, railcar TRUs, and TRU generator sets equipped with engines less than 25 horsepower, which have less stringent emission standards; strengthen the regulation by including requirements for owners and operators of facilities where TRUs operate, expand TRU reporting and labeling to monitor compliance; ensure TRUs operating in California meet and continue to meet emission standards; and collect fees from TRU and applicable facility owners to cover CARB's reasonable costs associated with the certification, audit, and compliance of TRUs operating in California.

A. Summary of the Proposed Amendments

Staff are proposing amendments to the TRU ATCM to require the transition of diesel-powered truck TRUs to zero-emission, a PM emission standard for newly-manufactured non-truck TRU engines, the use of lower global warming potential refrigerant, facility registration and reporting, expanded TRU reporting and labeling, and fees. Key elements of the Proposed Amendments include the following:

By December 31, 2022:

- All newly-manufactured truck TRUs, trailer TRUs, and DSC TRUs that operate in California shall use refrigerant with a GWP less than or equal to 2,200, or no refrigerant at all.
- MY 2023 and newer trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines shall meet a PM emission standard of 0.02 grams per brake horsepower-hour or lower.

- Note: MY 2022 and older trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines would continue to operate under the existing TRU ATCM requirements, in which they shall meet ULETRU by December 31 of the seventh year after the engine MY. For example, a trailer TRU equipped with a MY 2020 engine would have to meet ULETRU by December 31, 2027.

By December 31, 2023:

- Applicable facility owners¹ shall register their facility with CARB, pay registration fees every three years, and report all TRUs that operate at their facility to CARB quarterly, or alternatively attest that only compliant TRUs (i.e., those with a valid CARB compliance label or showing as compliant on CARB's website) operate at their facility.
- TRU owners shall report all TRUs that operate in California, regardless of where they are based.
- TRU owners shall pay TRU operating fees and affix CARB compliance labels to their TRU every three years, for each TRU operated in California.
- TRU owners shall turnover at least 15 percent of their truck TRU fleet (defined as truck TRUs operating in California) to zero-emission technology each year (for 7 years).
- All truck TRUs operating in California shall be zero-emission by December 31, 2029.

Objectives and Benefits of the Proposed Regulatory Action:

The main objectives of the Proposed Amendments are to: (1) achieve fine particulate matter (PM_{2.5}), oxides of nitrogen (NO_x), and greenhouse gas (GHG) emission reductions needed to protect communities from near-source pollution impacts, contribute toward meeting the current health based ambient air quality standards across California, and toward achieving the State's climate goals; (2) transition diesel-powered TRUs to zero-emission technology, as directed by Executive Order N-79-20, which set a goal for 100 percent zero-emission off-road vehicles and equipment by 2035; (3) address the emergence and growth in the number of trailer TRUs, DSC TRUs, railcar TRUs, and TRU generator sets equipped with engines less than 25 horsepower, which have less stringent emission standards; (4) address multiple State policies and plans directing CARB to achieve additional diesel emission reductions; (5) strengthen the regulation by including requirements for owners and operators of facilities where TRUs operate and vehicle owners, as well as expanded TRU reporting and labeling to monitor compliance; and (6) collect fees from TRU and applicable facility owners to cover CARB's reasonable costs associated with the certification, audit, and compliance of TRUs.

The primary benefits of the Proposed Amendments are PM_{2.5}, NO_x, and GHG emission reductions from diesel-powered TRUs that operate in California. Staff estimate that cumulatively, from 2022 to 2034, the Proposed Amendments will reduce statewide TRU emissions by approximately 1,258 tons of PM_{2.5}, 3,515 tons of NO_x, and 1.42 million metric tonnes of GHGs, relative to the baseline. These emission reductions will benefit California residents by reducing cancer risk to individual residents and off-site workers near facilities where TRUs operate, including those located in and near disadvantaged communities; improving air quality and resulting ozone exposure from reductions in NO_x; providing GHG

¹ An applicable facility is defined in the Proposed Amendments as a refrigerated warehouse or distribution center with a building size greater than or equal to 20,000 square feet, a grocery store with a building size greater than or equal to 15,000 square feet, a seaport facility, or an intermodal railyard if one or more TRUs operate within the legal property boundary of the facility.

emission reductions (including the powerful short-lived climate pollutants hydrofluorocarbons and black carbon) needed to combat climate change; and reducing non-cancer health impacts such as premature deaths, hospital visits for cardiovascular and respiratory illnesses, and emergency room visits for asthma, especially in sensitive receptors including children, the elderly, and people with chronic heart or lung disease. The total statewide valuation of avoided adverse health outcomes as a result of the Proposed Amendments from 2022 to 2034 is approximately \$1.75 billion. Emission reductions will also reduce occupational exposure and benefit on-site workers, including, but not limited to TRU operators, drivers, and other individuals who work at facilities where TRUs operate.

The Proposed Amendments will provide an opportunity to increase zero-emission technology in the off-road sector. As more fleets use zero-emission truck TRU technologies as a result of the Proposed Amendments, industry acceptance of advanced technologies will improve. The state of zero-emission TRU technology will progress and expand into extended range applications, as well as other off-road sectors. Purchases of zero-emission truck TRUs will also benefit zero-emission TRU manufacturers, as well as various businesses in the zero-emission TRU supply chain, including those involved in battery, fuel cell, cold plate, and solar photovoltaic technology throughout the State. Supporting infrastructure installations will provide opportunities for design, engineering, construction, and project management firms to design new and expanded infrastructure at approximately 1,000 truck TRU home base facilities statewide, as well as benefit suppliers, equipment installers, and electricians. The expansion of electric charging infrastructure will also increase the amount of electricity supplied by utility providers and help the State's investor-owned utilities meet the goals of Senate Bill 350 (Stats. 2015, ch. 547), which requires the State's investor-owned utilities to develop programs to accelerate widespread transportation electrification with goals to reduce dependence on petroleum, increase the uptake of zero-emission vehicles, help meet air quality standards, and reduce GHGs.

Lastly, the Proposed Amendments will result in noise reduction benefits. Diesel-powered TRUs can produce a substantial amount of noise, which also results in adverse health impacts. This is of concern when TRUs operate in and near places where people live, work, and play. Staff have received several noise complaints regarding TRU activity near schools, hospitals, elder care facilities, and residential neighborhoods. The Proposed Amendments will transition diesel truck TRUs to zero-emission technology, which produces little to no noise. This will eventually eliminate the use of diesel-powered truck TRUs and reduce noise levels statewide, and will be of particular benefit in disadvantaged communities experiencing disproportionate burdens. Based on staff's analysis, approximately 40 percent of the applicable facilities subject to the Proposed Amendments are located in disadvantaged communities as designated by CalEnviroScreen.²

Description of Regulatory Action

On July 27, 2021, CARB released the Notice of Public Hearing (45-Day Notice) and Staff Report: Initial Statement of Reasons for Rulemaking (Staff Report), titled "Public Hearing to Consider Proposed Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate," for public review. The Staff Report contains a description of the rationale for the Proposed Amendments. On July 27, 2021, all references relied upon and

² Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0, June 25, 2018. (web link: <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>)

identified in the Staff Report were made available to the public. CARB received written comments from seven individuals or organizations during the 45-Day Notice comment period.

At the initial September 23, 2021, public hearing, CARB staff presented the Proposed Amendments to the Board, and received written and oral comments from the public. The Board did not take action on the proposal at the September 23, 2021, hearing, but did approve Resolution 21-18.

Resolution 21-18, in accordance with Government Code section 11346.8, directed the Executive Officer to adopt the Proposed Amendments after making any appropriate conforming modifications, as well as any additional supporting documents and information, available to the public for a period of at least 15 days. The Board further provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in consideration of the comments received, and shall present the regulation to the Board for further consideration if warranted.

Subsequent to the hearing, CARB released a Notice of Public Availability of Modified Text and Availability of Additional Documents and Information (15-Day Notice) on December 22, 2021. The 15-day comment period commenced on December 22, 2021, and closed on January 6, 2022. The text of the proposed modified regulatory language, updated economic analysis, and updated fee calculation were posted on [CARB's website](https://ww2.arb.ca.gov/rulemaking/2021/tru2021) (<https://ww2.arb.ca.gov/rulemaking/2021/tru2021>), accessible to all stakeholders and interested parties. The 15-Day Notice proposed modifications that included the following changes to the regulatory text:

- Modifications to the proposed TRU operating and applicable facility registration fee amounts.
- Addition of zero-emission truck TRU assurances to require manufacturers to provide a comprehensive warranty for zero-emission truck TRUs and have an authorized service-and-repair facility located in California to perform warranty repairs.
- Modification to the length of compliance extensions due to private financing, equipment manufacture delays, or installer delays from a maximum of four months to six months.
- Modifications to the requirements for lessees and lessors to allow TRU owners (lessors) to delegate compliance responsibility to the TRU operator (lessee) if the rental or lease agreement is for a period of one year or longer.
- Modifications to the non-compliance and penalty provisions to match other CARB regulations.
- Modifications to the applicable facility reporting requirements to allow applicable facility owners or owner/operators to report alternative information.
- Addition of severability language to fee requirements to ensure that a successful legal challenge to any one particular fee provision will not necessarily void the remaining fee provisions or the remainder of the TRU Regulation.
- Modifications to definitions and clarifications of various elements in the regulation.

The Final Supplemental Environmental Analysis (Final Supplemental EA) and written responses to the Draft Supplemental Environmental Analysis (Draft Supplemental EA) were posted on February 18, 2021, for public review. CARB staff presented the Final Supplemental EA, written responses to the Draft Supplemental EA, Final Regulation Order, and Proposed Resolution 22-5 to the Board at its February 24, 2022, hearing, and received written and oral comments from the public. At the conclusion of the hearing, the Board approved

Resolution 22-5, which approved written responses to the Draft Supplemental EA, certified the Final Supplemental EA, and approved the Proposed Amendments, as originally noticed on July 27, 2021, with the modifications as noticed on December 22, 2021.

Staff subsequently prepared written responses to the comments received during the 45-Day and 15-Day comment periods and Board hearings, as set forth in the Final Statement of Reasons (FSOR).

Updates to the Economic Analysis

The 15-Day Notice, released on December 21, 2022, proposed modifications that collectively resulted in lower costs to TRU and applicable facility owners. The updated total net cost of the Proposed Amendments from 2022 to 2034 (as a result of the 15-day changes) was estimated to be \$850.2 million compared to \$1.04 billion in the Staff Report. The 15-Day Notice proposed modifications that included the following updates to the economic analysis:

- Updates to new sales populations used to calculate the cost to TRU owners to purchase new equipment. In the Staff Report, new sales populations in the Proposed Amendments and the baseline were the same for trailer TRUs, domestic shipping container TRUs, railcar TRUs, and TRU generator sets. The new sales populations in the Proposed Amendments did not reflect that all model year 2023 and newer units would meet the proposed PM standard and no longer need to comply with the in-use performance standard when the unit turns seven years-old. Staff updated the new sales populations to reflect that new sales populations in the Proposed Amendments would be lower than in the baseline. This update lowered staff's estimated cost of the Proposed Amendments for TRU owners.
- Updates to the TRU operating and applicable facility registration fee amounts. Staff updated the fee amounts to reflect changes to new sales populations and postage costs, as well as removal of the additional cost to CARB for indirect labor. In the Staff Report, both direct labor costs to implement and enforce the TRU program and indirect labor costs that include administrative management, legal, and information technology costs to run the program were included in the fee calculation. The indirect labor cost was included as an additional 26 percent of the direct labor cost. Staff removed the additional 26 percent indirect labor cost since the salary amounts used for the direct labor cost already included operating expenses and equipment for each labor classification. This update lowered staff's estimated cost of the Proposed Amendments for TRU and applicable facility owners.
- Addition of zero-emission truck TRU assurances to require zero-emission truck TRU manufacturers to provide a warranty for the zero-emission truck TRUs they produce and have an authorized service-and-repair facility located in California to perform warranty repairs. This update results in a higher capital cost for zero-emission truck TRUs and increased staff's estimated cost of the Proposed Amendments for TRU owners.
- Removal of Low Carbon Fuel Standard (LCFS) credits from the total cost of the Proposed Amendments. Staff originally assumed that all zero-emission truck TRU owners would take advantage of the incentive provided by LCFS. However, based on an analysis of the size of truck TRU fleets registered in CARB's Equipment Registration Program (ARBER), a majority of truck TRU owners are small owner-operators. Over 75 percent of truck TRU fleets registered in ARBER have three or fewer truck TRUs. Thus, to be conservative, staff removed the LCFS cost savings from the total cost of the Proposed Amendments. Generating and selling credits under LCFS is resource

intensive, as it requires owners to register with the LCFS program, track electrical data usage, submit required documentation and reports to CARB, and sell credits. Staff determined it was not reasonable to assume that all zero-emission truck TRU owners would take the time to generate LCFS credit revenue. This update increased staff's estimated cost of the Proposed Amendments for TRU owners.

- Updates to the compliance extension due to private financing, equipment manufacture delays, or installer delays. Staff extended the compliance extension from four months to six months to provide TRU owners or owner/operators additional time to comply with the Proposed Amendments due to delays related to current supply chain issues. This change affects the amount of time TRU owners or owner/operators have to comply with the Proposed Amendments, but not the cost to comply. Therefore, these changes are expected to result in minimal or no impacts to the total estimated cost of the Proposed Amendments.
- Clarification of requirements for lessors and lessees. These changes affect who may be responsible for compliance, but not the cost to comply with the Proposed Amendments. Therefore, these changes are expected to result in minimal or no impacts to the total estimated cost of the Proposed Amendments.
- Updates to the non-compliance and penalty provisions to match other CARB regulations. The economic analysis assumes full compliance with the Proposed Amendments. The total cost does not reflect penalties paid for non-compliance. Therefore, these changes are expected to result in minimal or no impacts to the total estimated cost of the Proposed Amendments.
- Updates to the facility reporting requirements. The proposed changes would allow facility owners or owner/operators to report alternative information to CARB that they collect as part of the normal business practice and would lessen the burden to comply with the facility reporting requirements. The facility reporting requirements are largely administrative in nature. Therefore, these changes are expected to result in minimal or no impacts to the total estimated cost of the Proposed Amendments.
- Addition of severability language to fee requirements. The added language will ensure that a successful legal challenge to any one particular fee provision will not necessarily void the remaining fee provisions or the remainder of the TRU Regulation. Therefore, these changes are expected to result in minimal or no impacts to the total estimated cost of the Proposed Amendments.

Comparable Federal Regulations:

The United States Environmental Protection Agency (U.S. EPA) and CARB regulate TRU engines as mobile non-road (off-road) engines (referred to as off-road throughout this rulemaking). Federal off-road compression-ignition engine emission standards are set forth for new engines in 40 Code of Federal Regulations Part 89. California standards for new off-road compression-ignition engines align with federal requirements and are set forth in California Code of Regulations, title 13, Article 4, sections 2420-2427, under "Heavy Duty Off-road Diesel Cycle Engines." The Proposed Amendments require new TRU engines operating in California to meet emission standards that generally align with the harmonized federal/State off-road compression-ignition engine emission standards.

More specifically, the Proposed Amendments require newly-manufactured (MY 2023 and newer) trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines to meet a PM standard that aligns with the U.S. EPA Tier 4 final PM emission standard for engines greater than 25 horsepower. Engines less than 25 horsepower would be required to meet a PM emission standard more stringent than the harmonized federal/California PM standard. In-use

(MY 2022 and older) trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines would continue to operate under the current TRU ATCM requirements. The more stringent PM standard for newly-manufactured trailer TRU, DSC TRU, railcar TRU, and TRU generator set engines less than 25 horsepower is needed to address the emergence and growth in the number of units equipped with engines less than 25 horsepower. As discussed previously, the 2021 update to the statewide TRU emission inventory indicates growing sales of trailer TRUs with less than 25 horsepower engines, which contrasts with previous inventories where all trailer TRU engines were over 25 horsepower. The federal and California federal PM off-road emission standard for engines less than 25 horsepower is 15 times higher than the standard for engines greater than 25 horsepower. As a result, diesel PM emissions have not been reduced under the TRU ATCM as expected. Similar trends are also expected for DSC TRUs, railcar TRUs, and TRU generator sets. Based on the TRU emission inventory, the number of units equipped with engines less than 25 horsepower will become responsible for the majority of PM emissions from TRUs in the near future, if current trends continue. The Proposed Amendments follow the precedent set by the current TRU ATCM, which already requires more stringent in-use diesel emission standards than federal requirements. CARB adopted the TRU ATCM in 2004, and U.S. EPA authorized California to enforce the regulation in 2009.³ CARB subsequently adopted amendments in 2010 and 2011. U.S. EPA determined those amendments fell within the scope of the original authorization and granted full authorization.^{4,5} In granting CARB authorization, U.S. EPA acknowledged that unique circumstances exist in California necessitating the need for the State's own off-road mobile source pollution program. As discussed in Chapter II of the Staff Report, California has a critical need to reduce exposure to air toxics such as diesel PM, as well as PM, NO_x, and GHG emissions. The benefits of protecting public health and reducing emissions justify the cost of adopting regulations that differ from existing federal regulations.

Currently, no federal regulations establish requirements on the use of zero-emission technologies or lower-GWP refrigerant for TRUs, as would be required by the Proposed Amendments.

Thus, the Proposed Amendments do not conflict with federal regulations.

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded these regulations are neither inconsistent nor incompatible with existing State regulations.

³ United States Environmental Protection Agency, Federal Register, Vol. 74, No. 11, Page 3030, January 16, 2009. (web link: <https://www.govinfo.gov/content/pkg/FR-2009-01-16/pdf/E9-907.pdf>).

⁴ United States Environmental Protection Agency, Federal Register, Vol. 78, No. 125, Page 39870, June 28, 2013. (web link: <https://www.govinfo.gov/content/pkg/FR-2013-06-28/pdf/2013-15437.pdf>).

⁵ United States Environmental Protection Agency, Federal Register, Vol. 82, No. 12, Page 6525, January 19, 2017. (web link: <https://thefederalregister.org/82-FR/6522/2017-01235.pdf>).