U.S. Department of Homeland Security
United States Coast Guard

Commander
Eleventh Coast Guard District
Prevention Division

Coast Guard Island, Bldg. 50-7
Alameda, CA 94501-5100
Staff Symbol: dp
(b) (6)

16000
6 August 2021

Ms. Bonnie Soriano
Branch Chief, Freight Activity Branch
California Air Resources Board
1001 I Street
Sacramento, California 95814

Ms. Soriano,

I am writing to submit some issues for your consideration as you amend the California Air Resources Board (CARB) Commercial Harbor Craft Regulation. The proposed amendments to the regulation will expand the regulated vessel categories to include, among others, commercial passenger fishing vessels, barges, pilot vessels, research vessels, and workboats. As I understand it, the change is to ensure CARB is capturing as many vessels as possible in order to maximize particulate matter (PM) and nitrogen oxides (NOx) emission reductions.

From my understanding, a vessel has three pathways to compliance. The first option is if a regulated vessel has an engine below 600 kW it can repower to a Tier 3 engine with an added diesel particulate filter (DPF) or a Tier 4 engine with a DPF. However, if the vessel has an engine that is above 600 kW, it has to repower to a Tier 4 engine plus a DPF. The second compliance option is that vessels can use an Alternative Compliance Pathway (ACP) that CARB has approved (such as alternative fuel, hybrid system, exhaust treatment control, engine repower, shore power, etc.). The third option for compliance is that regulated vessels can meet the low-use operational threshold if they operate below a certain number of hours per year.

As indicated in your draft proposal, the EPA has certified 40 unique Tier 4 marine engine families from 600 – 7,458 horsepower. However, the EPA has delayed engine certification requirements for high power density engines until 2022 or 2024 yet you do not expect delays to impact meeting Tier 4 + DPF compliance schedules. Vessels will have a phased-in compliance date depending on the vessel type and model year of the existing engine, which will be from 2023-2031. It was mentioned in the proposed regulation that the engine low-use threshold of 80 – 700 hours per year (depending on engine type) has been adjusted to offer some relief to the regulated vessels and to capture more of the fleet. In addition, if vessels can be repowered and funding is an issue, there is a grant program in place called the Carl Moyer Program, which covers up to 85% of the cost but needs to be completed at least three years before the compliance deadline.

The primary concern with the proposed regulatory changes is the feasibility of vessels being able to repower to a Tier 4 engine. As was discussed in the regulatory proposal, the California State

University Maritime Academy (Cal Maritime) was hired to conduct a feasibility study on 13 different vessel categories to see if Tier 4 engines, DPFs, and selective catalytic reduction (SCR) systems would fit on each vessel. In some cases, repowering to a Tier 4 engine was feasible for some vessel classes such as ferries, tugs, and excursion vessels. However, in other cases it was determined that repowering to a Tier 4 engine or retrofitting the vessel to accommodate a DPF or a DPF plus an SCR would require moderate to substantial reconfiguration of the vessel. Furthermore, in the case of commercial fishing and commercial passenger fishing vessels for example, a repower would not be feasible and a retrofit with DPF and SCR would not fit for the vessels surveyed. If a retrofit and repower is still not feasible then the vessels will have to be replaced.

Concerns have been raised with the proposed changes to the regulation because, from our understanding, there are currently limited options, or no options in some cases, for Tier 4 engines certified for various types of vessels and many vessels may also have space and stability limitations. If the lack of suitable engines continues to be an issue when the compliance dates come to fruition, owners would be required to replace the vessel, which could prove costly for many owners and operators. Many of the Tier 4 engines are significantly bigger than older model engines, which means the current models of approved Tier 4 engines will not fit the vessel and may create stability issues.

Additionally, it is my understanding that DPFs tend to run hot due to the nature of the system, and could pose fire hazards on small passenger vessels, many of which are constructed of wood or fiberglass. For example, the regeneration cycle on a DPF, which requires intense heat to burn off the particulate matter in the filters, can get up to temperatures of nearly 1,500 degrees Fahrenheit in some models. This is a safety issue, and while there are no federal regulations that prohibit using a Tier 4 engine and DPF, practicality has to be considered. Any changes to the regulated vessels will need to be approved by the local Coast Guard Officer in Charge of Marine Inspection (OCMI) and the Coast Guard Marine Safety Center, thus, any conditions that are deemed unfeasible may not be approved.

Another potential issue is the use of a bypass on the DPF as a way to maintain propulsion during a casualty, especially for vessels in close-maneuvering situations. A bypass is not typically part of the DPF design, however it may be prudent to allow for a bypass if an owner/operator requests to use one for their vessel. There are no prescriptive federal regulations that require a bypass, therefore, it would be at the owner/operator's discretion whether or not they want to install one and then it would be on a case-by-case basis for approval. As you may be aware, the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) was instituted in Europe and encouraged the use of bypasses on exhaust gas after-treatment systems used on inland vessels, but it did not go as far as to require it (ES-TRIN, Article 9.09). While we understand that there may be feasibility issues with installing one due to limited space on some vessels, there are other owners/operators that may find it a worthwhile solution for their vessel and we would recommend this at least be considered.

Additionally, there are after-treatment concerns that will need to be addressed by the owners if they are repowering or retrofitting their vessels. These include, but are not limited to, integration into the existing engine electronics, additional equipment that may be required such as air

compressors and tankage, increased maintenance and operational costs, requirements for additional engine room fans to address increased heat load as previously mentioned, and integration with the exhaust system. While repowers and retrofits are common practices within the maritime community, these are substantial undertakings and require a variety of stakeholders to ensure it is done safely.

The following Federal Regulations define the requirements for the inspection and certification of small passenger vessels. These regulations should be taken into account before a repower or retrofit is conducted on a vessel. The regulatory sites are as listed below:

46 CFR Subchapter T
46 CFR 177 Subpart D – Fire Protection
46 CFR 182.425 – Engine Exhaust Cooling
46 CFR 182.430 – Engine Exhaust Pipe Installation

The Coast Guard wants to ensure all vessel operations are conducted safely and adhere to federal requirements. I appreciate the intent and benefits of the proposed changes to the Commercial Harbor Craft Regulation, however, it is highly recommended that the above issues be considered in the final version of the regulation. Should you have further questions or concerns regarding this letter, please contact (b) (6) at (b) (6) or email him at (b) (6)

Sincerely,

G. A. CALLAGHAN
Captain, U.S. Coast Guard
Chief, Prevention Division

Copy: Commandant, Coast Guard (CG-CVC)
Commander, Coast Guard Pacific Area (PAC-54)

CALIFORNIA
AIR RESOURCES BOARD

Gavin Newsom, Governor
Jared Blumenfeld, CalEPA Secretary
Liane M. Randolph, Chair

November 5, 2021

Captain Gregory A. Callaghan
Eleventh Coast Guard District
Coast Guard Island, Building 50-7
Alameda, California 94501-5100
(b) (6)

Dear Captain Callaghan,

This letter is in response to the United States Coast Guard's (Coast Guard) letter, dated August 6, 2021, concerning the Draft Proposed Amendments to the California Air Resources Board's (CARB) Commercial Harbor Craft (CHC) Regulation.

Safety remains the top priority for marine vessel operations, and we are encouraged and appreciative that the Coast Guard has participated since 2018 in the development of the Proposed Amendments to CARB's CHC Regulation. With the input from the Coast Guard and many other stakeholders, we formally released the Proposed Amendments on September 21, 2021, which will be presented to our Board on November 19, 2021. This will be the first of two hearings. The Board will not take final action on the Proposed Amendments until early next year. The Proposed Amendments would significantly reduce toxic diesel particulate matter emissions from vessels by an estimated 89 percent. These reductions, in addition to reductions of smog-forming precursors and greenhouse gases, are critical for protecting the public health, meeting federally mandated air quality standards, and mitigating global climate change.

As indicated your the letter dated August 6, 2021, the proposal includes a few compliance options for vessel owners and operators to meet cleaner combustion or zero-emission performance standards. In some cases, such as for commercial passenger fishing vessels, there is currently low feasibility for repowering with Tier 4 engines and with other retrofit aftertreatment, such as diesel particulate filters (DPF). In these cases, vessel replacement may be a compliance response, which would have increased costs compared to only repowering engines. In our formal proposal, released on September 21, 2021, staff is proposing compliance extensions for vessel owners and operators who need to replace their vessels to comply – up to 8 years in total. This could result in commercial passenger fishing vessel replacement not being required until over 10 years from today. We recognize there would still need to be adjustments to the business models for affected companies; however, CARB staff estimates that just over 10 percent (368 out of 3,159 vessels) of the statewide population would need to be replaced in response to the Proposed Amendments. Additionally, the overall costs of the Proposed Amendments are $2 billion between 2023 and 2038, whereas the monetized health benefits from reduced emissions are more than $5 billion for the same time period. Therefore, the proposal is cost-effective, and it is an overall benefit for the State to require investment into cleaner, health-protecting emissions controls, as opposed to not requiring further action.

We also acknowledge your points regarding the availability, safety, and performance of Tier 4 engines and DPF aftertreatment in marine vessels. The United States Environmental Protection Agency (U.S. EPA) has certified at least 40 engine families covering 22 models of Tier 4 marine engines, and one Tier 3 engine model that is originally equipped with a DPF. We are anticipating that several vessel owners and operators would comply with a retrofit DPF, which would be required to undergo CARB Verification pursuant to Title 13, California Code of Regulations, Sections 2700 et seq. In order to be granted CARB verification, DPF manufacturers must demonstrate safe and durable in-field performance for over one thousand hours. At this moment, one manufacturer has already installed a retrofit DPF onto an existing towing vessel, the *S. Bass*, operating in California. Whether DPFs are included as part of the original marine engine certified by U.S. EPA or as a retrofit, they can be an additional source of heat in the engine room if using an active regeneration strategy. However, the additional heat source is only activated when the engine is operating at lower loads, and the overall exhaust profile is not designed to be hotter than under engine heat alone.

To date, there are millions of DPFs installed and successfully reducing diesel particulate matter from engines in on-road vehicles, off-road equipment, stationary diesel engines, and other equipment – all with no by-pass systems installed. We recognize that in the marine environment there are additional considerations if propulsion equipment fails, as the vessel may not be able to seek emergency assistance as quickly as on-road vehicles. We remain concerned that allowing vessel owners and operators to opt-in to using a by-pass system could result in improper or poor maintenance and fewer emission reductions would be achieved. CARB staff has not received data showing that retrofit DPFs have caused the operation of a diesel engine to shut down. Therefore, at this time, it remains a CARB policy that DPF manufacturers shall not use by-pass systems of any type on their aftertreatment strategies.

We remain open to continuing dialog regarding by-pass systems if the Coast Guard has compelling information and data suggesting that a marine diesel engine has lost power due to aftertreatment or engine designs. We look forward to continued dialog with the Coast Guard regarding the safety and public health protections of CHC operations in California.

Sincerely,

Bonnie Soriano, Branch Chief, Freight Activities Branch