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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 Mr. Mike Boyes at (510) 437-5954 or email him at michael.j.boyes@uscg.mil.

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)