July 29, 2025

Michael Walker, CEO
STAX Engineering, Inc.
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Santa Barbara, California 90802
m.walker@staxengineering.com

Dear Michael Walker:

California Air Resources Board (CARB) staff has reviewed STAX Engineering's "Emissions Measurement from Tanker Vessels Using STAX Engineering's Barge Based Capture and Control Emissions Control System", dated January 2025, and request for Executive Order (EO) for the Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) barge-based capture and control system to treat emissions from auxiliary marine diesel engines on tanker vessels as a CARB Approved Emission Control Strategy (CAECS) in accordance with CARB's Control Measure for Ocean-Going Vessels At Berth, title 17, California Code of Regulations 93130 et seq (2020 At Berth Regulation).

The Test Report was submitted on January 7, 2025 with supplemental data submitted on March 13, 2025, May 22, 2025, June 6, 2025, and July 9, 2025. The purpose of the Test Report was to provide emission measurements and associated information to support the development of approved operation conditions for the Xcraft-1 for use as a CAECS by tanker vessels. The Xcraft-1 barge contains two control units, or trains, individually referred to as a STAXbox (STAXbox 1-1 and Staxbox 1-2). The Xcraft barge can operate one auxiliary engine per STAXbox, operating one STAXbox individually or operating in dual-train mode with two STAXboxes operating on the same tanker vessel. CARB staff's review of STAX Engineering's Test Report was based on the requirements in the 2020 At Berth Regulation, the guidelines provided in CARB's "Revised Performance and Testing Guidelines for Emissions Control Strategies on Ocean-Going Vessels," and the STAX Engineering Test Plan dated December 18, 2024 (Version 7), and approved on March 19, 2025.

We are pleased to inform you that we have confirmed the results of the emissions measurements, which demonstrate that the Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) meets all of the requirements of section 93130.5, including being grid neutral, and are issuing the attached EO G-25-200. EO G-25-200 identifies the monitoring, reporting, and recordkeeping requirements for the Xcraft-1, and stipulates the approved operating conditions for the use of the Xcraft-1 as a CAECS. Under EO G-25-200, STAX is approved to operate one auxiliary engine per STAXbox, operating one STAXbox individually or operating in dual-train mode with two STAXboxes operating on the same tanker vessel.

The Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) has been granted EO G-25-200 under the 2020 At Berth Regulation, California Code of Regulations, title 17, section 93130.5(e)(3), and

may operate under the terms specified in the EO for five years as a CAECS before needing to apply for an extension, as specified in section 93130.5(i)(1).

Request for Duplicate Equipment Approval

The CAECS operator may request that duplicate systems that are identical to the original base unit (Xcraft-1 (STAXbox 1-1 and STAXbox 1-2)) be added to the EO's approved equipment list. Once an EO is issued with the duplicate equipment listed in the approved equipment list which is attached to the EO, it may operate as a CAECS to comply with CARB's Control Measure for Ocean-Going Vessels At Berth, title 17, California Code of Regulations 93130 *et seq* (2020 At Berth Regulation).

On June 20, 2025, STAX submitted a request to CARB to approve three Xcraft barges as duplicates of the Xcraft-1 and add them to EO G-25-200, approved above. STAX's request for approval is for three Xcraft barges– Xcraft-5 (STAXbox 5-1 and STAXbox 5-2), Xcraft-7 (STAXbox 7-1 and STAXbox 7-2), and Xcraft-8 (STAXbox 8-1 and STAXbox 8-2) - for controlling emissions from auxiliary marine diesel engines on tanker vessels. STAX request verified and attested that the three Xcraft barges, each with two STAXboxes, are duplicates of the Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) dual train system.

CARB staff reviewed STAX's request to add duplicates based on the requirements in the 2020 At Berth Regulation and the conditions provided in STAX's Test Plan for tanker vessels, dated December 18, 2024 (Version 7).

We are pleased to inform you that we have approved Xcraft-5 (STAXbox 5-1 and STAXbox 5-2), Xcraft-7 (STAXbox 7-1 and STAXbox 7-2), and Xcraft-8 (STAXbox 8-1 and STAXbox 8-2) to be duplicates of Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) and are issuing approval under the enclosed EO G-25-200. Under EO G-25-200, STAX is approved to operate one auxiliary engine per STAXbox, operating one STAXbox individually or operating in dual-train mode with two STAXboxes operating on the same tanker vessel. STAX may operate under the terms specified in the EO, for Xcraft-1 and any duplicates included in this EO, as a CAECS for five years from the date when Xcraft-1 (STAXbox 1-1 and STAXbox 1-2) was approved (July 29, 2025) before needing to apply for an extension, as specified in section 93130.5(i)(1).

STAX must conduct the below in-use compliance testing on the duplicate equipment (Xcraft-5 (STAXbox 5-1 and STAXbox 5-2), Xcraft-7 (STAXbox 7-1 and STAXbox 7-2), Xcraft-8 (STAXbox 8-1 and STAXbox 8-2).

Each duplicate system is required to complete in-use compliance testing, confirming the performance of the duplicate equipment per section 93130.5(j) of the 2020 At Berth Regulation. If the CAECS operator fails to submit test results for the new system within the specified timeframe, or if the new system fails to achieve emissions reductions required by the 2020 At Berth Regulation while performing with the same design, conditions, and

requirements approved for the original approved system, the Executive Officer may revoke the approval of the duplicate system and remove it from the EO.

The following in-use compliance tests must be conducted on each duplicate equipment within 6 months (by January 29, 2026) or 30 vessel visits, whichever comes first after the duplicate equipment is approved and added to the EO. For these duplicate Xcraft barges, both STAXboxes (trains) must complete all of the in-use compliance testing outlined below.

1. Third-party source testing for all pollutants listed in section 93130.5 (g) at one load point following the requirements and test methods listed in section 93130.5(g) with Relative Accuracy Test Audit (RATA) testing.
2. Third-party capture efficiency testing at one load point.
3. Durability testing on a minimum of 5 vessels and a minimum of 200 hours.

Executive Order G-25-200 identifies the monitoring, reporting, and recordkeeping requirements for the approved STAXbox systems, Xcraft-1 (STAXbox 1-1 and STAXbox1-2), Xcraft-5 (STAXbox 5-1 and STAXbox 5-2), Xcraft-7 (STAXbox 7-1 and STAXbox 7-2) and Xcraft-8 (STAXbox 8-1 and STAXbox 8-2) and stipulates the approved operating conditions for the use of the STAXbox systems.

Executive Order G-25-200 identifies the approved STAXbox systems and the vessel and engine types for which the STAXbox systems are approved to control in the approved equipment list (Attachment 1 of EO G-25-200).

For a future duplicate system(s) to be added as approved equipment on an EO, STAX will again need to submit information confirming that there are no modifications to design or operation for a future system(s) as compared to the existing approved equipment. When requesting approval for a future duplicate system(s), please submit the following information in writing to assist CARB in verifying that there are no modifications (as described in section 93130.5(i)(2)):

- ID number for this new piece of equipment
- Brief description of the control strategy's operation, confirm no changes
- Brief description of the monitoring and notification system, confirm no changes
- List of all components (provide spec sheets as applicable), confirm no changes
- Confirm no changes requested to any portion of the EO approval
- Refer to previously approved test plan, agree to abide by test procedures (to be used for in-use compliance testing, as applicable) and maintenance procedures
    - Option to include test plan as an attachment, or submit a truncated version applicable to this new request

Per section 93130.19, this information may be submitted via email to shorepower@arb.ca.gov, and shall include an attestation that the information is true, accurate, and complete, signed under penalty of perjury.

In closing, we appreciate the opportunity to work with STAX Engineering in its efforts to implement barge-based capture and control to treat tanker vessel auxiliary engine emissions while at berth.

If you have any questions, please contact Angela Csondes, Manager, Marine Strategies Section, at *angela.csondes@arb.ca.gov*.

Sincerely,

Bonnie Soriano, Chief, Freight Activity Branch, Transportation and Toxics Division

Attachment: EO G-25-200

cc: Angela Csondes, Section Manager, Marine Strategies Section