

September 29, 2025

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

Dear Michael Walker:

California Air Resources Board (CARB) is issuing the enclosed Executive Order (EO) G-24-054-003 for STAXbox capture and control systems for auxiliary marine diesel engines on auto carriers/roll-on roll-off (ro-ro) vessels under the 2020 At Berth Regulation, California Code of Regulations, title 17, section 93130.5. EO G-24-054-003 identifies the monitoring, reporting, and record-keeping requirements for approved STAXbox systems and stipulates the approved operating conditions for use of the STAXbox systems. EO G-24-054-002 is hereby superseded and is of no further force and effect.

EO G-24-054-003 reflects these changes, which STAX requested:

- Changes to the continuous emission monitoring system (CEMS) parameters
- Removal of STAXbox 2-1 from the approved equipment list
- Approval of the Xcraft-1 (STAXbox 1-1 & STAXbox 1-2) dual train system
- Addition of ten duplicate STAXbox systems to the approved equipment list
 - 1) STAXbox 4-1
 - 2) STAXbox 4-2
 - 3) STAXbox 5-1
 - 4) STAXbox 5-2
 - 5) STAXbox 6-1
 - 6) STAXbox 6-2
 - 7) STAXbox 7-1
 - 8) STAXbox 7-2
 - 9) STAXbox 8-1
 - 10) STAXbox 8-2

Please note that CARB also made additional changes:

- Edits to the in-use compliance testing requirements for duplicate equipment, which reduces the capture efficiency testing requirement to one load point on one visit for each train and no longer specifies the vessel type for durability hours. This is to standardize the requirements for CARB approved emission control strategy (CAECS) equipment approved for use on auxiliary engine emissions between container and ro-ro vessels.
- Increasing the carbon intensity limit from 19.16 to 25.70 grams of carbon dioxide equivalent per megajoule of fuel (g CO₂e/MJ) for the renewable diesel used in the

STAXbox auxiliary generators. This is to address an error CARB staff discovered with the previous calculation.

See below for more details on the changes reflected in EO G-24-054-003.

Changes to the CEMS parameters

STAX is required to submit CEMS data to CARB for each visit to verify that emission reduction levels are maintained. Previously, STAX was required to submit CEMS data following the parameters and measurement methods listed in STAX's Test Plan submitted on February 28, 2023. STAX requested to change their required CEMS parameters on April 20, 2025. Following discussion with CARB staff, STAX submitted an updated parameter list on June 4, 2025. EO G-24-054-003 approves this updated parameter list.

Xcraft-1 genset updates

STAX's February 28, 2023, Test Plan included an outdated make and model of the gensets on the Xcraft-1 barge. The updated make and model of the genset is in the design change Test Plan submitted on May 5, 2025. EO G-24-054-003 requires that all duplicate equipment be identical to the equipment described in the design change Test Plan, which includes the updated make and model of the gensets.

Removal of STAXbox 2-1 from the approved equipment list

STAXbox 2-1 (Xcraft-2) was previously approved for use on ro-ro vessels on September 24, 2024, under EO G-24-054-001; however, STAX cited operational constraints with utilizing STAXbox 2-1 on ro-ro vessels at this time. As requested by STAX on March 16, 2025, STAXbox 2-1 has been removed from the approved equipment list under EO G-24-054-003 and may no longer be used for compliance with the 2020 At Berth Regulation. To use STAXbox 2-1 on ro-ro vessels in the future, STAX will need to reapply and request that this system be added to the Executive Order.

Approval for the Xcraft-1 (STAXbox 1-1 & 1-2) dual train system

On December 22, 2024, STAX submitted a Test Plan requesting a design change to allow operation of two STAXbox systems simultaneously on ro-ro vessels operating two auxiliary engines, where each STAXbox controls one engine exhaust simultaneously ("dual train system"). 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 ro-ro vessel. STAX submitted a revised Test Plan on May 5, 2025, which CARB approved on June 12, 2025. Emissions testing was conducted operating the Xcraft-1 (STAXbox 1-1 & STAXbox 1-2) dual train system, and STAX submitted a test report on May 15, 2025, with additional data submitted on June 6, 2025, and July 7, 2025. STAX also submitted in-use compliance testing data for STAXbox 1-2 on June 24, 2025, which was required per EO G-24-054-002.

We are pleased to inform you that we have approved the results of the emissions measurements and have updated EO G-24-054-003 to reflect the requested design change.

Addition of duplicate systems to the approved equipment list

STAX submitted several requests to add duplicate equipment to the approved equipment list for STAX's EOs for container vessels (EO G-23-294) and ro-ro vessels (EO G-24-054):

- "Request for Amending STAXbox 1-1 EO for ro-ro and container vessels to include STAXbox 4-1, 4-2, 5-1 and 5-2 as duplicates of STAXbox 1-1" submitted December 19, 2024.
- "Request to Amend STAXbox 1-1 EOs with three duplicate designed barges (STAXbox 6-1, 6-2, 7-1, 7-2, 8-1 and 8-2)" submitted April 1, 2025.

This letter addresses STAX's requests as they pertain to ro-ro vessels only. The purpose of STAX's requests was to verify and attest that ten STAXbox individual systems (STAXbox 4-1, 4-2, 5-1, 5-2, 6-1, 6-2, 7-1, 7-2, 8-1, and 8-2) are duplicates of STAXbox 1-1, the system formerly named STAXbox.A-1 which was approved under EO G-24-054 for ro-ro vessels operating one auxiliary engine.

Following discussion with CARB staff on the testing requirements for the dual train system, on April 16, 2025, STAX elected to proceed with the dual train testing process before receiving an updated EO for ro-ro vessels. STAX submitted an additional duplicate equipment request for the dual train systems:

- "Request to Amend STAX 1-1 and 1-2 dual train roro EO with 6 duplicate designed barges (STAX 3, 4, 5, 6, 7, 8)", submitted June 20, 2025.

The purpose of STAX's request was to verify and attest that six STAXbox dual train systems, Xcraft-3 (STAXbox 3-1 & 3-2), Xcraft-4 (STAXbox 4-1 & 4-2), Xcraft-5 (STAXbox 5-1 & 5-2), Xcraft-6 (STAXbox 6-1 & 6-2), Xcraft-7 (STAXbox 7-1 & 7-2), and Xcraft-8 (STAXbox 8-1 & 8-2), are duplicates of the Xcraft-1 (STAXbox 1-1 & 1-2) dual train system.

CARB staff's review of STAX's duplicate equipment requests was based on:

- The requirements in the 2020 At Berth Regulation;
- STAX's Test Plan for ro-ro vessels, submitted on February 28, 2023;
- STAX's "dual train system" design change test plan, submitted on May 5, 2025;

We are pleased to inform you that we have approved the ten STAXbox individual systems specified above to be duplicates of STAXbox 1-1, and we have approved the six STAXbox dual train systems specified above to be duplicates of the Xcraft-1 (STAXbox 1-1 & 1-2) dual train system. Refer to Attachment 1 of EO-24-054-003 for the list of approved STAXbox systems.

Approval Duration

STAX may operate under the terms specified in the EO, for STAXbox 1-1 and any duplicates included in this EO, as a CAECS for five years from the date when the STAXbox 1-1 was approved (March 21, 2024) before needing to apply for an extension, as specified in section 93130.5(i)(1) of the 2020 At Berth Regulation.

STAX must conduct in-use compliance testing on all ten duplicate equipment within 6 months (by March 29, 2026) or 30 vessel visits, whichever comes first.

EO G-24-054-003 specifies the in-use compliance testing requirements.

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. Please refer to previous letters on the submission guidelines for duplicate equipment requests.

The Executive Officer may revoke the EO, or approval of any or all STAXbox system(s) listed as Approved Equipment in Attachment 1 of the EO, if the system fails to demonstrate that the expected emissions reductions are being achieved or if the STAXbox design or approved operating parameters are changed without prior notification and approval by the Executive Officer.

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-24-054-003

cc: Angela Csondes, Section Manager, Marine Strategies Section