



TECHNICAL INFORMATION

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Airborne Toxic Control Measures for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in California Ports

This technical information was published to provide information on the 2020 At-Berth Regulation, which amends the 2007 At-Berth Regulation and came into force on 1 January 2023.

1. Background

2007 At-Berth Regulation



The California Air Resources Board (CARB) approved the 2007 At-Berth Regulation, the Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in California Ports, on December 2007, and this regulation that actually require the vessel berthing in a California port to mandatorily use shore power or an equally effective compliance strategy (such as a capture and control system) entered into force on

1 January 2014. This Regulation applied only to fleets of container vessels, refrigerated-cargo vessels, and passenger vessels visiting California ports.

2020 At-Berth Regulation

The 2020 At-Berth Regulation, adopted by CARB on 27 August 2020, amends the 2007 At-Berth Regulation and came into force on 1 January 2023. This Regulation expands the scope to include ro-ro vessels and tankers, extends reporting requirements to all vessel types, and introduces new emission reduction requirements for auxiliary boilers on tankers.

2. Purpose (Section 93130.1)

The purpose of this regulation is to reduce oxides of nitrogen (NO_x), reactive organic gases (ROG), particulate matter (PM), diesel particulate matter (DPM) and greenhouse gas (GHG) emissions from the operation of vessel auxiliary engines or tanker auxiliary boiler on any U.S. or foreign

flagged container vessel, passenger vessel, refrigerated-cargo vessel, ro-ro vessel and tanker while berthing at California ports.

3. Applicability (Section 93130.3)

This regulation applies to

- (1) any person who owns, operates, charters, rents, leases any U.S. or foreign-flagged container vessel, passenger vessel, refrigerated-cargo vessel, ro-ro vessel and tanker that visits a California port.*
- (2) any person who owns, operates, or leases a port, terminal or berth located where container vessel, passenger vessel, refrigerated-cargo vessel, ro-ro vessel and tanker visit,
- (3) any person who owns, operates, or leases a CAECS for vessel auxiliary engines or tanker auxiliary boilers.

* The reporting requirements for vessel visits apply to all vessel types

The requirements of this regulation do not apply to: (Section 93130.4)

- Stopping and anchoring only to the extent such stopping and anchoring are required by the USCG
- Rendered necessary by force majeure or distress
- Made for the purpose of rendering assistance to persons, vessels, or aircraft in danger of distress
- Government and military vessels

4. Compliance start (Section 93130.7)

Beginning 1 January 2023, CARB 2020 At-Berth Regulation enter into force as per the timeline shown below:

4.1 Requirements for vessel auxiliary engines

Table 1. Compliance start dates by vessel's type

Compliance Start Date	Vessel's Type
1 January 2023	Container vessels and refrigerated-cargo vessels
	Passenger vessels
1 January 2025	Ro-ro vessels
	Tankers that visit the ports of Los Angeles or Long Beach
1 January 2027	All remaining tankers

4.2 Requirements for tanker auxiliary boilers on tankers with steam driven cargo pumps

Table 2. Compliance start dates for tankers with steam driven cargo pumps


Compliance Start Date	Vessel's Type
1 January 2025	Tankers with steam driven cargo pumps that visit the ports of Los Angeles or Long Beach
1 January 2027	All remaining tankers with steam driven cargo pumps

5. Summary of requirements by vessel type

Consequently, under the 2020 At-Berth Regulation, the ship's owner/operator (vessel operator) should comply with the relevant requirements based on vessel type and year, as specified in Table 3. below.

Table 3. Summary of requirements for vessel operator

Year	Reporting of vessel visit *	Compliance with emission control requirements for vessel auxiliary engines (Including auxiliary boiler for tanker)					
	2023+	2023	2024	2025	2026	2027	2028+
Bulk vessel	O						
General cargo vessel	O						
Container vessel	O	O	O	O	O	O	O
Passenger vessel	O	O	O	O	O	O	O
Refrigerated-cargo vessel	O	O	O	O	O	O	O
Ro-ro vessel	O			O	O	O	O
LA/LB Tanker**	O			O	O	O	O
Other Tanker	O					O	O

* Report Form 

** LA/LB Tanker means Tankers that visit the ports of Los Angeles or Long Beach

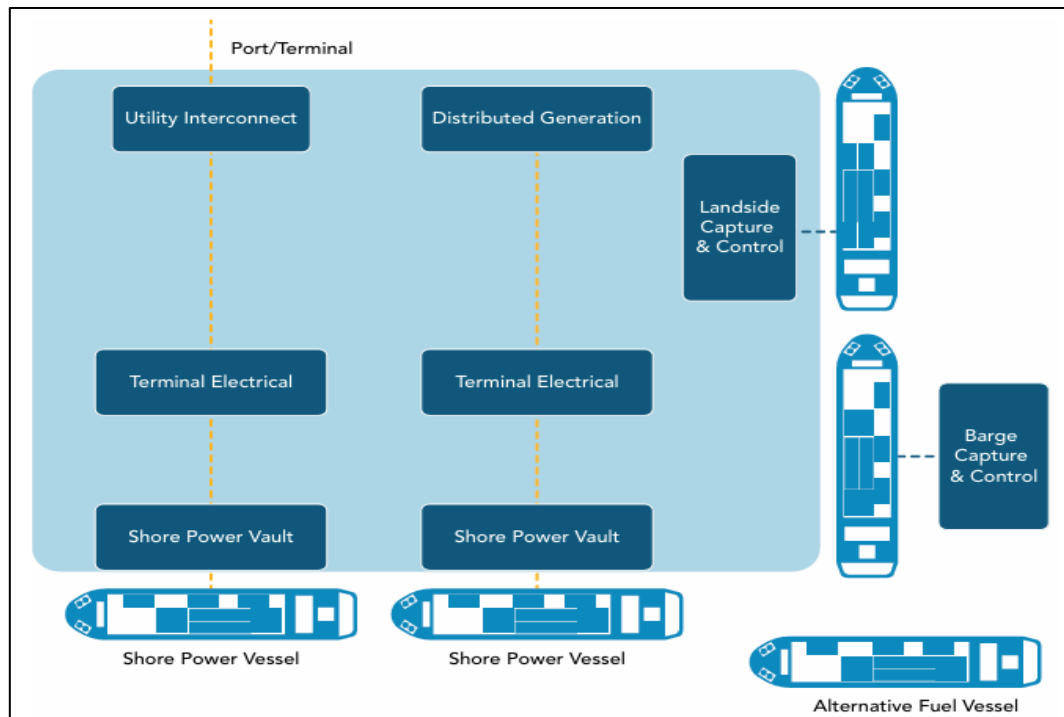


Figure 1. Example of emission control strategies for vessel at berth (Source: CARB)

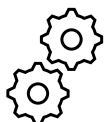
6. Options for Compliance

Vessels and other regulated parties have the following options for compliance:



(1) **Connection to shore power**

Considered the “gold standard” for reducing emissions from ocean-going vessels while at berth.



(2) **Use of a CARB-approved exhaust capture and control system**

Currently, STAX Engineering, Clean Air Engineering Maritime, and AERAS Technologies have developed an approved barge-based exhaust capture solution.



(3) **Alternative fuels** (e.g., LNG, ammonia, hydrogen etc.)

Vessels may use alternative fuels such as LNG, ammonia, hydrogen etc. provided they can demonstrate compliance with 2020 At-Berth Regulation performance standard through testing data.



(4) **Payment into a Remediation Fund**

This option requires eligibility approval and cannot be used solely due to lack of available alternative CAECS.



(5) **An innovative concept solution**


Any alternative emission reduction measures that achieve equivalent results from other sources around the port may also be considered.

7. Requirements for Vessel operator (Section 93130.7)

Vessel operators shall complete all items in the checklist (Table 4.) to ensure compliance under the Control Measure:

Table 4. Vessel operator procedures for compliance with the 2020 At-Berth Regulation

STEP 1	At least 7 (seven) calendar days before arrival, the vessel operator shall communicate in writing with the terminal operator and operator of the CAECS to coordinate the use of a CAECS, and shall do all of the following: <ul style="list-style-type: none">- Request for use of a CAECS- Supply the terminal operator and the operator of the CAECS with information about the compatibility of the vessel with the intended CAECS	CARB Link *
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STEP 2	Ensure the vessel is commissioned as required by the terminal operator or port, where applicable	
STEP 3	<p>Use shore power or another CAECS during the vessel 'visit' **</p> <ul style="list-style-type: none"> - Begin controlling emissions with shore power or another CAECS within 2 (two) hours after 'Ready to Work' *** - Cease controlling emissions with shore power or another CAECS no sooner than 1 (one) hour before 'Pilot on Board' **** 	
STEP 4	<p>Beginning on 1 January 2023, and thereafter, all vessel operators shall report the following visit information to CARB electronically within 30 (thirty) calendar days of each vessel's departure, using local time for all dates and times:</p> <ul style="list-style-type: none"> - Fleet name - Vessel's name - Vessel's IMO number - Vessel's type - IMO NOx tier - Vessel operators contact information, including name, address, email address, and telephone number - Port, terminal, and berth visited - Vessel arrival/departure time - Vessel shift to another berth (shall be reported as a separate visit), where applicable - Type of CAECS used, where applicable - Date and time when vessel declared as "Ready to Work" - Date/time when a CAECS begins reducing emissions, where applicable - Date/time when a CAECS stops reducing emissions, where applicable - Type of fuel used in auxiliary engine(s) and auxiliary boiler(s) - Sulfur content of fuel used in auxiliary engine(s) and auxiliary boiler(s), where applicable - Amount of fuel used in auxiliary engine(s) and boiler(s), during vessel visit, where applicable - Date/time pilot on-board in preparation for departure - Information specified in the approved compliance strategy's Executive Order compliance instructions - Information if a vessel uses an exception, including the type of exception, a detailed description, including dates and times, and any relevant correspondence (e.g., emails) documenting the visit exception - Report if a request for the use of the remediation fund, including 	<p><u>Report</u> <u>Form</u> </p>

	<p>detailed description of the applicable circumstance specified in section 93130.15 of this Control Measure, the start and end times during which applicable specified circumstance took place, and the tier rating of the auxiliary engine.</p> <ul style="list-style-type: none"> - Report if a vessel operator or terminal operator uses a TIE or VIE for the visit including the contact information of the responsible official who authorized the use of the TIE or VIE - Report if a CARB approved innovative concept is used to reduce emissions for the visit in compliance with this Control Measure, as required in the innovative concept's Executive Order. 	
STEP 5	<p>Submissions (Section 93130.19)</p> <p>The vessel operator shall submit information to CARB.</p> <p>(Address)</p> <p>CHIEF, TRANSPORTATION AND TOXICS DIVISION CALIFORNIA AIR RESOURCES BOARD 1001 I STREET SACRAMENTO, CA 95814</p> <p>(Email)</p> <p>shorepower@arb.ca.gov</p>	
STEP 6	<p>Records retention</p> <p>Records should be kept for a minimum of 5 (five) years. This information shall be sent to the Executive Officer within 10 (ten) calendar days of a request from CARB staff.</p>	

* [CARB's link](#) for all terminal plans and CARB's responses to each plan is posted.

For your reference, despite the compliance start dates specified for each vessel type in Section 93130.7, the actual implementation of the regulation remains uncertain due to the limited availability of CARB-approved shore power and CAECS at each terminal. Therefore, it is strongly recommended that vessel operators confirm the implementation of this regulation with their local agents or the relevant terminal prior to arriving at any ports in California.

** 'Visit' means the time period from when the vessel is 'Ready to Work' to 'Pilot on Board' A vessel move from one berth to another berth is considered a new visit at each subsequent berth.

*** 'Ready to Work' means that the vessel is tied to the berth, the gangway has been lowered with netting down, and all government authorities with jurisdiction over the vessel visit have cleared the vessel.

**** 'Pilot on Board' means the vessel's pilot has boarded the vessel to assume navigational control to prepare for vessel departure.

8. Vessel Visit Exceptions (Section 93130.8)

Vessel operators are exempt from the operational requirements in section 93130.7 of this Control Measure if any of the following occurs.

- (1) Vessel safety and emergency event
- (2) Bulk and general cargo vessels (only required to report vessel visit)
- (3) Vessel commissioning (The first vessel commissioning visit made by a vessel to a terminal)
- (4) The purpose of research
- (5) Vessels visiting a low activity terminal
- (6) Vessel incident event (VIE) and terminal incident event (TIE)
- (7) Remediation Fund
- (8) Innovative concept

9. VIE/TIE (Section 93130.11)

Vessel Incident Events (VIE) and Terminal Incident Events (TIE) accommodate a limited number of visits where emissions are not reduced during a regulated visit. The vessel or terminal operator may use a VIE or TIE if they are unable to meet the emissions reduction requirements of the 2020 Regulation.

VIEs are granted as a percentage of visits to a California port from the previous year, and these percentages are listed in Table 5.

Table 5. VIEs and TIEs rates by vessel type

VIEs and TIEs Rates by Vessel Type per Year							
		2023	2024	2025	2026	2027	2028+
TIEs	All Terminals	15%	15%	5%	5%	5%	5%
VIEs	Container/Reefer	5%	5%	5%	5%	5%	5%
	Passenger	5%	5%	5%	5%	5%	5%
	Ro-ro			5%	5%	5%	5%
	LA/LB Tankers*			5%	5%	5%	5%
	Other Tankers					5%	5%

* LA/LB Tankers means Tankers that visit the ports of Los Angeles or Long Beach

A vessel fleet will receive 5% of their annual visits as "VIEs" for the next calendar year. For example, if a vessel fleet makes 100 visits to a regulated terminal in a calendar year, that fleet would have 5 VIEs to use in the next calendar year.

VIEs and TIEs expire on January 31 of the following year. For example, if a vessel fleet or terminal was granted 10 VIEs or TIEs for use in 2023, those VIEs or TIEs would be eligible for use through January 31, 2024.

VIEs and TIEs can only be used at the port for which they are granted and by the fleet for which they are granted. The vessel and terminal operators should report the use of VIEs and TIEs in their visit report, and when a VIE is used, the fleet operator must approve it in writing to CARB.

10. Remediation Fund (Section 93130.15)

Vessel operators, terminal operators, CAECS operators, and ports may request to use the remediation fund option in the following circumstances, if supported by compelling documentation proving eligibility, as determined by CARB.

- Terminal or port equipment repairs
- Vessel equipment repairs
- Delays with operation of existing control strategy
- Terminal or port construction project

Within 30 days of CARB's eligibility determination, the requestor shall transfer the required sum equal number of hours of excess emissions times the applicable hourly payment to the to the CARB-approved fund administrator.

Table 6. Remediation Fund hourly amount by vessel type

Remediation Fund Hourly Amount for 2025-2026		
Vessel Type	Hourly Remediation Payment for 2025-2026	
	Normal Rate	Tier III Rate
Container, Reefer, Ro-ro	\$2,328	\$1,348
Tanker with electric pumps	\$1,960	\$1,225
Tanker with steam driven pumps	\$4,166	\$3,308
Passenger vessels with capacity under 1,500 combined passenger and crew	\$6,494	\$3,921
Passenger vessels with capacity of 1,500 or more combined passenger and crew	\$14,704	\$8,700

Prior to each odd-numbered year, the hourly remediation payments in this section and Table 6. shall be adjusted based on the Consumer Price Index (CPI) relative to 2019 to set rates for that year and the next. CARB shall post updates on its website (Link: <https://ww2.arb.ca.gov/our-work/programs/ocean-going-vessels-berth-regulation/remediation-fund>)

11. Summary of Responsibilities (Section 93130.18)

This Control Measure has shared responsibilities between all parties involved in reducing emissions from ocean-going vessels. Tables 7. and 8. outlines a summary of responsibilities and how the terminal or vessel operator can apply exceptions, VIEs, TIEs, and remediation fund.

Table 7. Summary of responsibilities (Qualify for an Exception, a VIE/TIE or remediation)

Summary of Responsibilities (Circumstances that may qualify for an Exception, a VIE/TIE, or remediation)				
Circumstances	Exception	VIE/TIE	Remediation Fund	Responsible Parties
Safety/emergency, research, vessel commissioning, or innovative concept	O			
Visits without reductions		O	*	Terminal, Vessel
Vessel control equipment repair		O	O	Vessel
Terminal control equipment repair		O	O	Terminal, Port
Terminal upgrades/construction		O	O	Terminal, Port
Delays, but reductions occur		O	O	Terminal, Vessel, CAECS operator
CACES equipment failure, or CAECS failure to perform		O	O	Terminal, Vessel, CAECS operator

* In general, all visits may use a VIE or TIE if available, but not all visits qualify for remediation. See section 93130.15(b) of this Control Measure

Table 8. Summary of responsibilities (Evaluation for non-compliance)

Summary of Responsibilities (Circumstances that will be evaluated for non-compliance)		
Circumstances		Responsible Parties
Berth	Vessel	
Has shore power	Does not have shore power	Vessel
No shore power, but has other CAECS	Has shore power	Terminal, Port
No shore power, but has other CAECS	Does not have shore power	Terminal, Port, Vessel
Has other CAECS	No shore power, but doesn't allow CAECS	Vessel

12. Potential Penalties for Non-Compliance (Section 93130.20)

Any person who fails to comply with any provision, prohibition, limit, standard, criteria, or requirement in this Control Measure is subject to penalties, injunctive relief, and other remedies under California law (Health and Safety Code sections 38580, 39674, 42400 et seq., 43016), with all responsible parties held jointly and severally liable. Each day a vessel operates without using a CAECS or violates recordkeeping/reporting requirements constitutes a separate violation.

Section 43016 of the Health and Safety Code (HSC) states that penalties shall not exceed **\$37,500** per violation for "each action" subject to this part of the code. Also, each calendar day, or portion of, in which violations occur will be considered a separate daily violation.

13. Requirements for CARB approval of an emission control strategy (CAECS) (Section 93130.5)

The following Table 9. outlines the maximum allowable emissions for auxiliary engines on vessels and auxiliary boilers on tankers when using CAECS. CAECS operators must ensure compliance with these emission limits to obtain approval from CARB.

Table 9. The requirements for CARB approval of an emission control strategy

	Auxiliary engines on vessels		Auxiliary boilers on tankers	
	Default emission rate	CAECS achieves emission rate	Default emission rate	CAECS achieves emission rate
NOx	13.8	2.8	2.0	0.1
PM 2.5	0.17	0.03	0.17	0.03
ROG	0.52	0.1	0.11	0.02

[Unit: g/kW-hr]

For your reference, please refer to the document issued by relevant association (OCIMF) regarding the Emission Capture and Control (ECC) system, one of the CAECS.

(Link: <https://www.ocimf.org/publications/information-papers/emission-capture-and-control-at-berth-preliminary-safety-recommendations>)

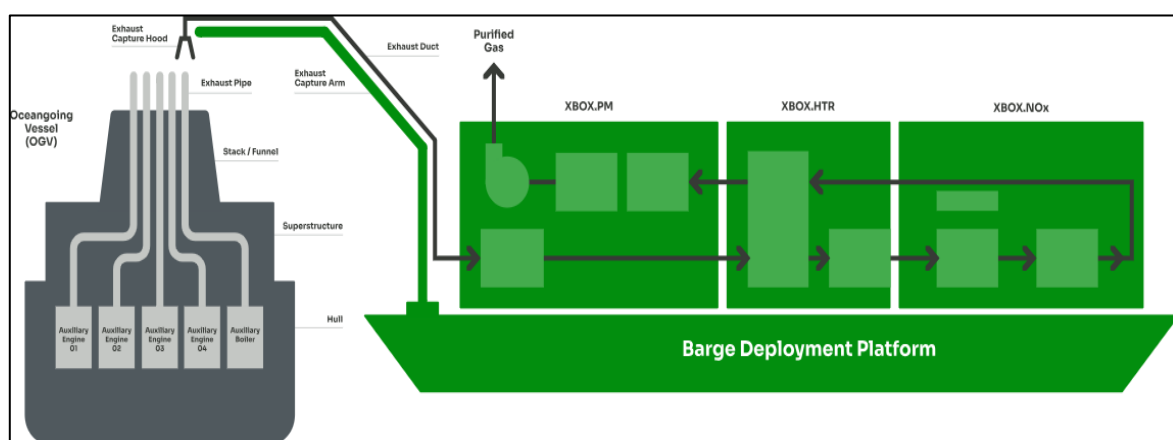


Figure 2. Emissions capture and control system (source: STAX engineering)

※ For more detailed information, please refer to the attached original copy of Regulation published by CARB

Attachment

1. CARB - Final Regulation.pdf
2. CARB - 2020 At Berth Regulation - FAQ Sept 2024.pdf
3. Vessel Operator Visit Report Template.xlsx

Distributions: Ship owners, Other relevant parties

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