



## CALIFORNIA AT-BERTH REQUIREMENTS

The new California At-Berth Regulation (“2020 Regulation”) reporting requirements will begin, and emissions controls will start phasing in on January 1, 2023.

### CALIFORNIA 2007 AT-BERTH REGULATION

In December 2007, the California Air Resource Board (CARB) approved the At-Berth Regulation with a starting date of January 1, 2010, aimed to reduce emissions from diesel auxiliary engines on container, passenger and refrigerated cargo (reefer) vessels while berthing at a California port under the following provisions:

- Container/reefer fleets  $\geq$  25 annual visits
- Passenger fleets  $\geq$  5 annual visits

California ports include the Ports of Los Angeles, Long Beach, Oakland, San Diego, San Francisco, and Hueneme.

Under the provisions of the 2007 At-Berth Regulation vessels are allowed to run their auxiliary engines for up to 3 hours (or 5 hours for non-synchronous power transfer process) while at berth to connect/disconnect from shore power. Emission/power reduction percentages were phased in from 10 percent in 2010 to 80 percent in 2020.

The 2007 At-Berth Regulation provides two options to reduce at-berth emissions:

1. Turn off auxiliary engines and connect the vessel to some other source of power
2. Use alternative control technique(s) that achieve equivalent emission reductions

Barge-based exhaust scrubber systems are currently available in commercial operation at Ports of Los Angeles and Long Beach. Requirements of the 2007 Regulation will remain in effect until January 1, 2023.

### KEY NOTES

- Applicable Vessel Types: Container, passenger, refrigerated cargo (reefer), tanker and roll on-roll off (“ro-ro”) vessels
- Required Actions: Ocean-going vessels shall use a CARB Approved Emission Control Strategy (CAECS) while docked at berth at California ports.
- References: Sections 93130 through 93130.22 of Title 17, California Code of Regulations

## CALIFORNIA 2020 AT-BERTH REGULATION



The 2020 amendments of the At-Berth Regulation expand the 2007 version by:

- Including two new vessel categories: tanker and roll on-roll off (“ro-ro”) vessels
- Including new ports and terminals that serve these added vessel types
- Transitioning from a 25 visit fleet-based threshold to 20 visit terminal-based threshold of already-regulated vessel types (container, refrigerated cargo (“reefer”), and cruise vessels)
- Imposing an obligation to regulated ships to meet the emissions reduction requirements on every single visit to any regulated terminal

“**Tanker vessel**” means a self-propelled vessel constructed or adapted primarily to carry liquid bulk cargo and according to CARB, the definition includes all liquid bulk vessels (e.g. oil/chemical tankers, LNG carriers, LPG carriers, CO2 carriers).



## IMPLEMENTATION AND REQUIREMENTS

The 2020 Regulation took effect on January 1, 2021, but emissions controls will not phase in until the following dates for vessels visiting a regulated terminal:

Compliance Start Dates	Vessel Type
January 1, 2023	Container and refrigerated cargo vessels
January 1, 2023	Cruise (passenger) vessels
January 1, 2025	Roll-on roll-off vessels
January 1, 2025	Tanker vessels that visit the Ports of Los Angeles or Long Beach
January 1, 2027	All remaining tanker vessels

Emissions controls will not apply for vessels visiting a low activity terminal, meaning that the terminal does not receive 20 or more visits from a regulated vessel type per calendar year. Opacity and visit reporting requirements will apply to all vessel visits.

Regulated entities can comply with the 2020 Regulation using any CARB-Approved Emission Control Strategy (CAECS). This includes:

1. Shore power
2. one of the capture and control systems currently approved for use with the 2007 Regulation
3. a future CARB-approved shore- or vessel-based solution (including alternative fuels, etc.)

If a vessel wishes to utilize a strategy for compliance with the 2020 Regulation that is not already approved, CARB approval of that strategy as a CAECS should be requested.

## CARB APPROVAL OF AN EMISSION CONTROL STRATEGY

To receive CARB approval, the emission control strategy (ECS) must demonstrate that it achieves emission rates below the limit indicated in the table below:

Applicable Limit (g/kW)	Emission rates of aux. engines			Emission rates of aux. boilers		
	NOx	PM 2.5	ROG	NOx	PM 2.5	ROG
	2.8	0.03	0.1	0.4	0.03	0.02

Already approved strategies can operate under their executive order until 2025 before a person needs to apply for an extension. If a vessel intends to run on LNG and can provide testing data showing emissions meet or exceed the standards, then they could be approved as a CAECS and LNG could then be used. ECS utilizing Selective Catalyst Reduction (SCR) shall have ammonia slip no greater than five parts per million on a dry volume basis (ppmdv) and shall continuously test ammonia slip and NOx with a continuous emission monitor.

## REQUIRED ACTIONS BY REGULATED VESSEL OPERATORS

Any visiting vessel must:

1. Reduce emissions using a CAECS while at berth in a regulated terminal on or after the compliance start date for their vessel type by:
  - Controlling emissions within two hours of the vessel being “ready to work” and arriving at the berth

- Continuing to control emissions until no sooner than one hour before the pilot boards the vessel for departure from the berth
- Report the following information set forth in section 93130.7(e)(4) to CARB within 30 calendar days of each vessel’s departure, including any visits without emissions reduction obligations beginning January 1, 2023:

Required information	
(A) Fleet name	(B) Vessel name
(C) Vessel IMO number	(D) Vessel type
(E) IMO NOx tier	(F) Vessel operator contact information, including name, address, email address, and telephone number
(G) Port, terminal, and berth visited	(H) Vessel arrival time and vessel departure time
(I) Vessel shift to another berth (must be reported as a separate visit), where applicable	(J) Type of CAECS used, where applicable
(K) Date and time when vessel declared as “ready to work”	(L) Date and time when a CAECS begins reducing emissions and date and time when a CAECS stops reducing emissions, where applicable
(M) Type of fuel used in auxiliary engine(s) and auxiliary boiler(s)	(N) Sulfur content of fuel used in auxiliary engine(s) and auxiliary boiler(s), where applicable
(O) Amount of fuel used in auxiliary engine(s) and boiler(s), during vessel visit, where applicable	(P) Date and time pilot on-board in preparation for departure
(Q) Information specified in the approved compliance strategy’s Executive Order compliance instructions	(R) 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
(S) Report if a request for the use of the remediation fund, including detailed description of the applicable circumstance specified in section 93130.15 of this Control Measure, the start and end times during which applicable	(T) 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
(U) 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.	

All dates and times are to be reported using California local time

2. Meet opacity limits as specified below:

(a) No person shall discharge or cause the discharge from any ocean-going vessel at berth and at anchor, into the atmosphere, any visible emissions of any air pollutant, for a period of periods aggregating three minutes in any one hour from any operation on the vessel that is:

1. As dark as the Ringelmann 2, as published by the United States Bureau of Mines (May 1967) or



2. Of such opacity as to obscure an observer's view to a degree equal to or greater than the Ringelmann 2
- (b) CARB will use the California time aggregate method and the United States Environmental Protection Agency Opacity Test Method 9 (40 CFR Pt. 60, App. A-4, December 23, 1971) to analyze the readings and determine compliance. Alternative test methods may be used upon written approval from the Executive Officer.

## IF A REGULATED VESSEL CANNOT CONNECT TO SHORE POWER



Apart from shore power, a vessel can use:

1. A CARB Approved Emission Control Strategy (CAECS) either:
  - One of the capture and control systems currently approved for use with the 2007 Regulation, or
  - A future CARB-approved shore- or vessel-based solution (including alternative fuels, etc.)
2. Vessel Visit Exceptions allow vessel operators an exemption from the operational requirements if any of the following occurs:
  - a. **A “safety and emergency event”**: This means an event where a responsible official reasonably determines that compliance with a Control Measure would endanger the safety of the vessel, crew, cargo, passengers, terminal, or terminal staff because of severe weather conditions, a utility event, or other extraordinary reasons beyond the control of the terminal operator or vessel operator
  - b. **A Vessel Incident Event (VIE)**: VIEs are exceptions provided to vessel fleets to allow for a limited number of incidents where a vessel operator does not reduce emissions as required during a vessel visit.

A vessel fleet means a group of vessels of the same vessel type, agreed to utilize their combined VIEs and are registered with CARB by the fleet's representative. A vessel fleet will receive 5 % of their annual visits as “VIEs” for the next calendar year.

Fleet operators that have not previously participated in California recordkeeping requirements, may request VIEs by December, 1 of the preceding year by providing an estimate of fleet visits. Similarly, if a fleet anticipates additional visits in an upcoming year, an estimated number of visits may be provided to CARB when requesting the fleets VIEs. However, if more VIEs are used than warranted by the number of actual visits, those visits will be violations of the regulation.

- c. **A Terminal Incident Event (TIE)**: TIEs are similar to VIEs but provided to terminals.

- d. **Use the remediation fund:** This is an account established by a CARB approved fund administrator under the terms of a Memorandum of Understanding with CARB to provide incentive monies to activities that achieve emission reductions, in communities impacted by excess emissions from vessels at berth.
- e. **Vessel commissioning:** The first vessel commissioning visit made by a vessel to a terminal may be an exception as long as the vessel was able to successfully connect to shore power during that visit. Documentation of a successful vessel commissioning must be submitted with the vessel visit reporting requirements and may qualify for exception if approved by CARB where the vessel operator demonstrates:
1. The commissioning process could not be accomplished in a single visit; or
  2. The terminal requires that the vessel be recommissioned.
  3. Upon successful completion of commissioning, the CAECS provider will issue documentation that the vessel completed commissioning for that berth at the terminal.
- f. **Research:** Vessel visits that participate in research may be an exception provided that the vessel operator:
1. Receives a CARB approved test plan for the research prior to the vessel's arrival.
  2. Participates in testing in accordance with the approved test plan.
  3. Keeps a copy of the approved test plan on the vessel at all times.
  4. Provides a copy of the approved test plan to CARB staff upon request; and
  5. Reports all information including the use of the research exception pursuant to section 93130.7(e)(4).
- g. **Innovative concept:** The at berth emission reduction requirements of section 93130.7 and section 93130.9 do not apply during a visit where the vessel or terminal operator elects to comply using an approved innovative concept.

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	X			
Visits without reductions		X	*	Terminal, Vessel
Vessel control equipment repair		X	X	Vessel
Terminal control equipment repair		X	X	Terminal, Port
Terminal upgrades/construction		X	X	Terminal, Port
Delays, but reductions occur		X	X	Terminal, Vessel, CAECS operator
CAECS equipment failure, or CAECS failure to perform		X	X	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).				

If a vessel operator does not comply with the 2020 Regulation through the CAECS or the use of an exception, or remediation fund, an enforcement action may be taken.

## EXCEPTIONS AND REMEDIATION

The 2020 At-Berth Regulation defines a safety and emergency event as:

- Any situation where complying with the 2020 Regulation would endanger the safety of the vessel, crew, cargo, passengers, terminal, or terminal staff
- Because of severe weather conditions, a utility event, or other extraordinary reasons beyond the control of the terminal operator or vessel operator

Vessel Incident Events provide:

- Vessel fleets a limited number of visits in which emissions are not reduced during a regulated vessel visit
- Limited amount of flexibility, while ensuring that emissions reductions from vessels at berth remain high

Vessel operators may request to use the remediation fund option in the following circumstances, if the request is supported by compelling documentation that demonstrates the eligibility of the request:

- Vessel equipment repairs -- a vessel operator has invested in shore power or other on-board control equipment, but that equipment needs maintenance, needs commissioning, has failed and is being repaired, or new or replacement equipment has been ordered in a timely manner, but has not been received.
- Delays with operation of existing control strategy – a vessel visits a berth, but the visit fails to achieve the full emission reductions required due to a delay or interruption in controlling emissions or a failure of the CAECS operator under contract to perform.

Request must be sent to CARB within 30 calendar days after the affected vessel visit. Remediation fund hourly amount is shown in the table below:

Remediation Fund Hourly Amount		
Vessel Type	Hourly Remediation Payment Beginning in 2023*	
	Normal Rate	Tier III Rate
Container, Reefer, Ro-ro	\$1,900	\$1,100
Tanker with electric pumps	\$1,600	\$1,000
Tanker with steam driven pumps	\$3,400	\$2,700
Passenger vessels with capacity under 1,500 combined passengers and crew	\$5,300	\$3,200
Passenger vessels with capacity of 1,500 or more combined passengers and crew	\$12,000	\$7,100

\*Remediation payments used by vessel operators shall be reduced by 20 percent for IMO Tier III tanker vessels with steam driven pumps, and 40 percent for all other IMO Tier III vessels.



## REQUIREMENTS FOR AUXILIARY BOILERS OF TANKERS



Auxiliary boilers on ocean-going vessels designed primarily to provide steam for uses other than propulsion or pumping cargo do not fall under the scope of At-Berth Regulation. However, the Regulation defines “Tanker auxiliary boiler” as a steam generator on a tanker vessel used to offload liquid product and vessel operators of tanker vessels with steam driven pumps are required to reduce auxiliary boiler emissions through a CAECS during each visit to a terminal unless:

- The tanker is using shore power to reduce emissions from auxiliary engines
- The visit qualifies for an exception

Alternatively, the ship may apply for approval as a CAECS for using any solution that can meet the emissions standards for “tanker auxiliary boiler” as below:

- 0.4 g/kW-hr for NO<sub>x</sub>
- 0.03 g/kW-hr for PM 2.5
- 0.02 g/kW-hr for ROG

## SHIPS FITTED WITH CAECS

The 2020 Regulation has been designed in such a way that vessel-based solutions could be used. Any solution that can meet the emissions standards for auxiliary engines as below may apply for approval as a CAECS.

- 2.8 g/kW-hr for NO<sub>x</sub>
- 0.03 g/kW-hr for PM 2.5
- 0.1 g/kW-hr for ROG

For example, if a vessel intends to run on liquified natural gas (LNG) and can provide testing data showing the vessel’s emissions meet or exceed the standards, then that could potentially be approved as a CAECS, and LNG could then be used as a compliance pathway for vessels with the same engine class.

## SPECIFICATIONS FOR ONSHORE POWER SUPPLY (OPS) SYSTEMS

Currently there is no specific standard specified by CARB. Technical design, installation and testing requirements for the OPS system are provided by the following international standards:

1. IEC/IEEE 80005-1:2019: Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements



## 2. IEC 62613-1:2019: Plugs, socket-outlets and ship couplers for high-voltage shore connection (HVSC) systems – Part 1: General requirements

The ABS Guide for *High Voltage Shore Connection* provides requirements for the design, installation and survey of high voltage shore connection installations and in particular addressing:

- The safety of shipboard and, where applicable, shoreside personnel during the deployment and retrieval of the cable and when making the HV connection.
- The safety of shipboard personnel during the period in which the vessel is operating using the established HV shoreside connection.
- The safety of the shipboard personnel should the HV connection malfunction.
- The safety of shipboard personnel and shoreside staff as applicable at the time the HV connection between the vessel and the shoreside supply is disconnected.
- Requirements for the safe storage of the HV equipment and associated connections when the vessel is on voyage or in ports where no HV connection is established

It is always important to verify that any ship using shore power is compatible with the shore power of the terminal beforehand. A compatibility assessment (for high voltage) or technical analysis (for low voltage) of the OPS system should be available to verify the possibility of connecting the ship electrical system to the shore's installations.

Both shore- and ship-sides should specify responsibilities and assignments, including the person in charge (PIC) of the operation and complete a pre-connection checklist prior to the ship's arrival and connection at a shore supply point

## TERMINAL AND PORT PLANS

Terminals and Ports are required to submit plans to CARB addressing their compliance scheme. The Terminal and Port Plans may be found at <https://ww2.arb.ca.gov/terminal-and-port-plan-submissions>. These plans may include specific information regarding the standard of the shore power equipment/connections. The plans do contain contact information for the terminal/port which may be used to obtain additional information.

## REQUIREMENTS FOR ALL VESSELS INCLUDING BULK CARRIERS AND GENERAL CARGO VESSELS

Vessels that do not have emissions control requirements, still from January 1, 2023 must comply with:

- The visit reporting requirements as described above (see section 93130.7(e)(4) of the 2020 Regulation)
- The opacity requirements as described above (see section 93130.6 of the 2020 Regulation)

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