

Experience in use of OPS in the U.S.

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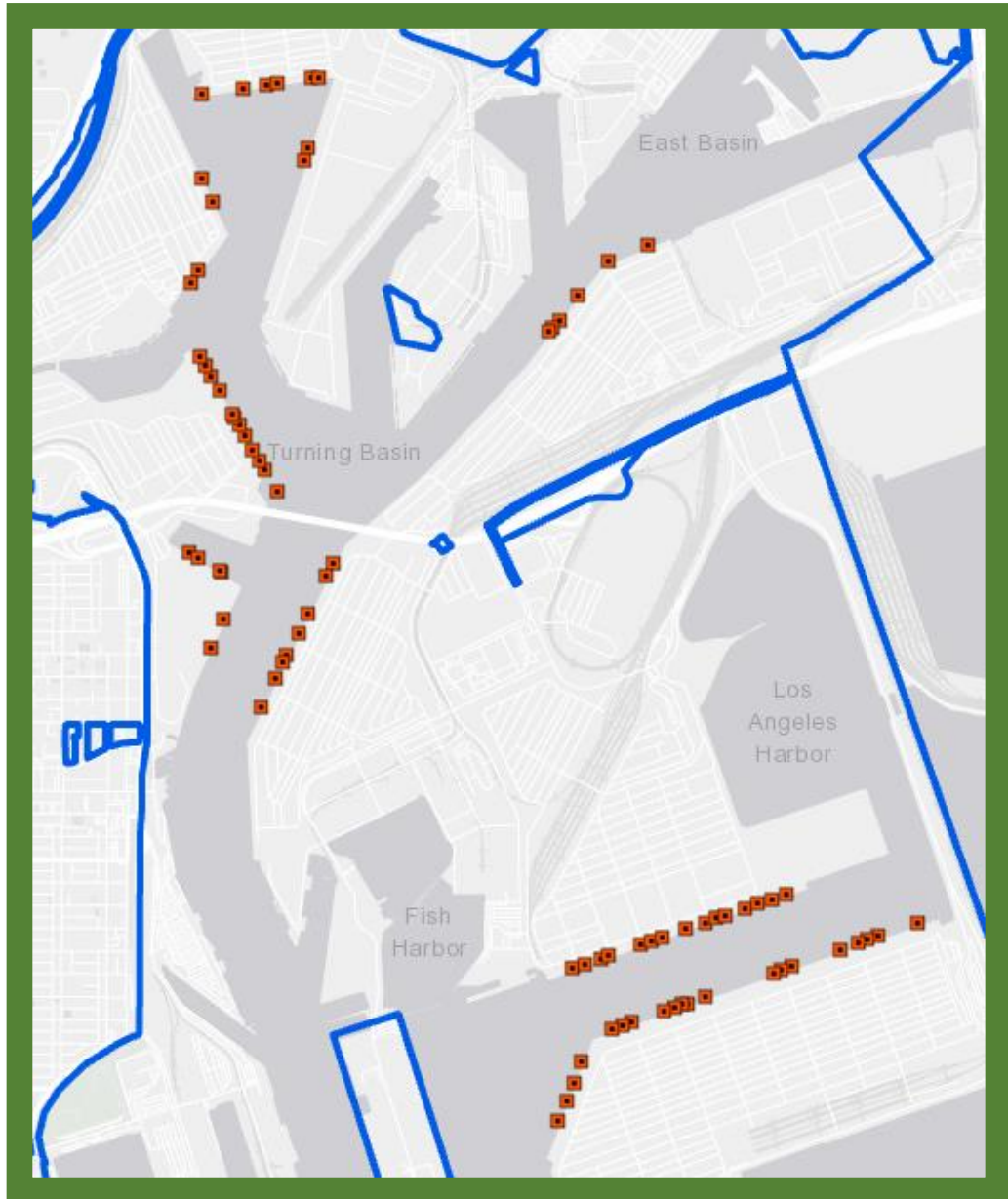


History of OPS at Port of Los Angeles

- Port of Los Angeles (POLA) was the first port to install and use shore power at a container berth in 2004
- Driving force for initial installation of shore power was to reduce health risk to surrounding communities
- POLA was an active participant in the development of IEC/ISO/IEEE 80005-1 standard
 - POLA continues to participate in standard development
- Use of shore power was first regulated for use in 2007 by the state of California with requirements starting in 2014
 - State regulation now requires 100% emissions control for container, reefer, & cruise with limited exceptions starting 2023

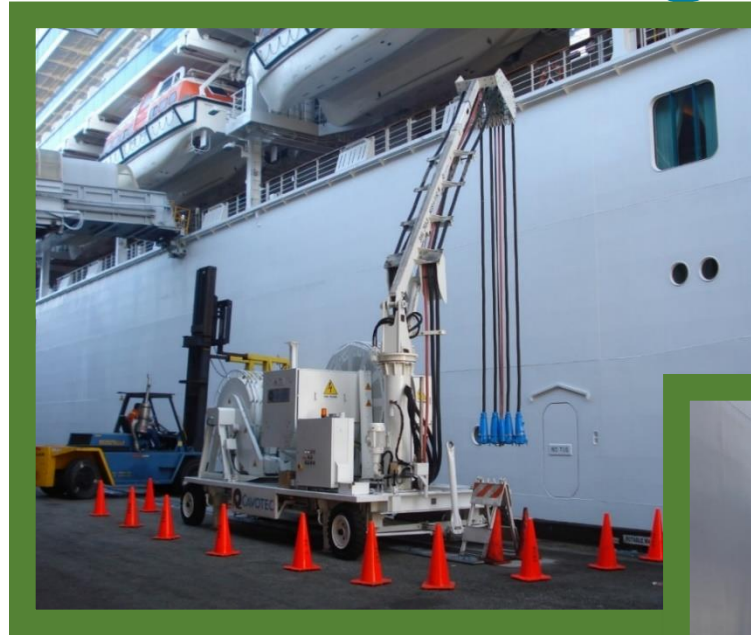


Current Shore Power Infrastructure



- 24 Berths = 79 vaults Completed and Operational (January 2022)
 - 22 Container berths = 73 vaults at 6.6 kV
 - 2 Cruise berths = 6 vaults (4 at 11 kV, 2 at 6.6 kV)
- Project Cost: approx. **\$230 Million USD**
- New Project: 2 vaults at 1 auto carrier berth
 - Estimated cost of \$18 million USD (pre-pandemic)

Moveable Ship Cable Management



Electrical Provider/Billing

- Electrical power is provided by City of Los Angeles Department of Water & Power (LADWP)
- POLA is responsible for the installation & maintenance of facilities up to the high-side of the 34.5 kV Station which services Merchant Ship loads
- LADWP invoices are sent to the POLA
- POLA re-invoices all LADWP invoices received to the terminal tenants that utilize shore power
 - LADWP invoice amount
 - Individual ship power consumption, for reference
 - Port labor cost by ship, for reference
- POLA does not add any service charge to the LADWP invoices



Lessons Learned

- Safety is most important
- Need for moveable connection points rather than fixed connection points
 - AMP containers are limited to crane movement so not always the solution
 - Cable reel systems can be too bulky for some wharves
- Every terminal is unique so every OPS installed will have its own unique design and challenges
- Huge capital investment
- Ship crew will like it because they can do maintenance while connected to shore power
- Better air quality for surrounding area



Thank You

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More information on POLA shore power is located at
[https://www.portoflosangeles.org/environment/air-quality/alternative-maritime-power-\(amp\)](https://www.portoflosangeles.org/environment/air-quality/alternative-maritime-power-(amp))

More information on other POLA air quality programs
<https://www.portoflosangeles.org/environment/air-quality>



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