



Alternative Maritime Power at the Port of Los Angeles



Faster Freight – Cleaner Air
Oakland, CA. – December 8, 2004

AMP Program Description

Alternative Maritime Power (AMP) is a program whereby a steamship company will partner with the Port of Los Angeles and the Los Angeles Department of Water and Power to develop an engineered solution whereby a container vessel is powered via shore-supplied electrical power in lieu of the container vessel's on-board bunker fueling system during the “hoteling” period. The “hoteling” period is defined as the time when the container vessel is docked alongside the wharf.





Why AMP?

- Ships burn a high sulfur Heavy Fuel Oil (HFO) in both their main and auxiliary engines.

- Ships account for:

	<u>NOx</u>	<u>PM</u>
In Port	27.6%	15.1%
Regionally	36.0%	54.9%

(as a percentage of Port emission sources)

- AMP was introduced as an air quality mitigation measure.





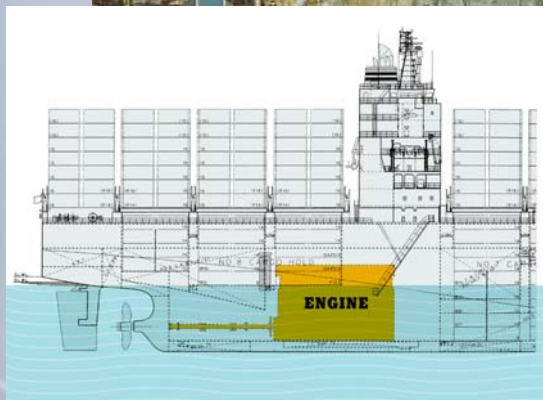
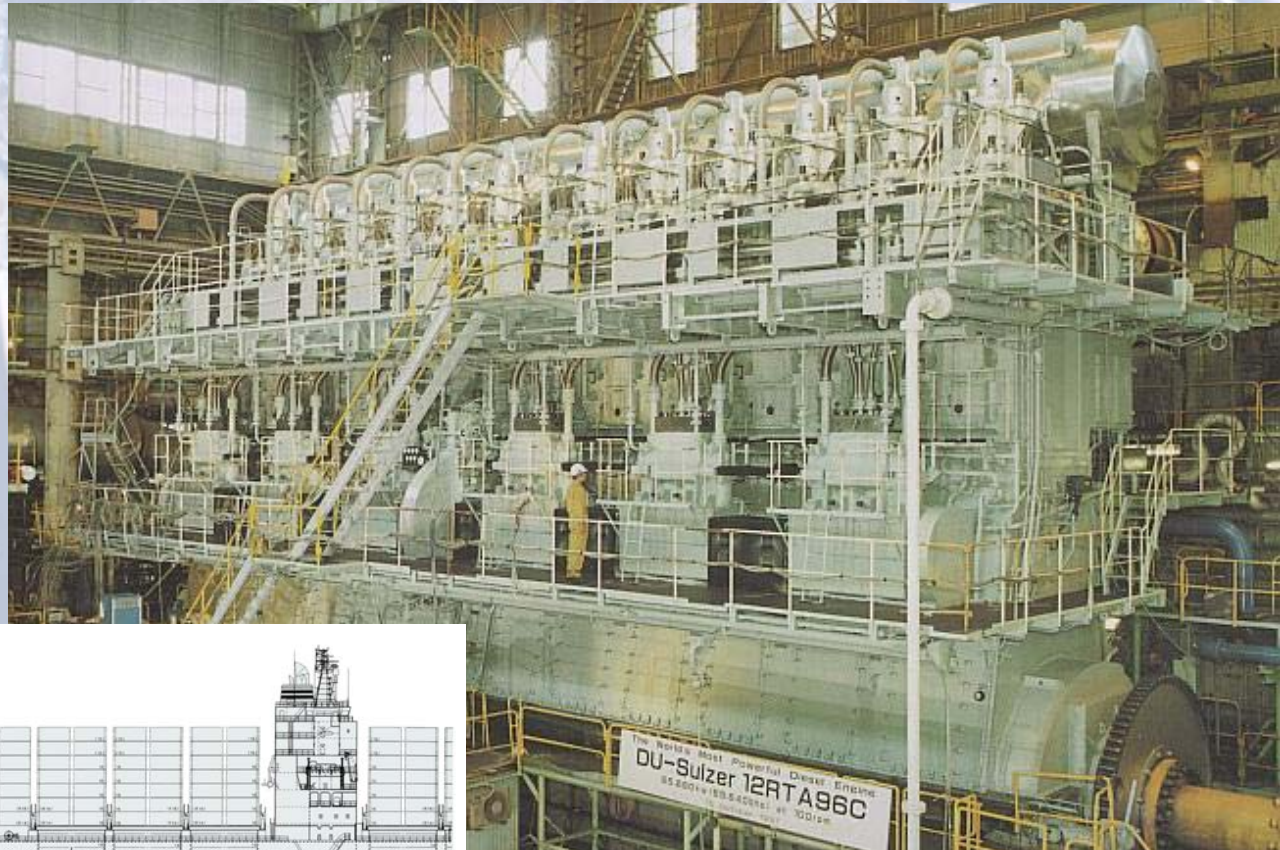
AMP Key Elements

- Mayor James K. Hahn pledged “*No Net Emissions Increase in the Port*”.
- Reliable Clean Power is available through the Los Angeles Department of Water & Power.
- Commitments by the Port, Terminal Operators and Steamship Lines.



AMP Program Description

Ship's Main Engine



AMP Program Description

Auxiliary Engines





AMP Applications

- Military
- Ferries – Baltics
- Princess Cruises (Juneau, Alaska)
- Port of Los Angeles – Berth 100





AMP: *The Challenge*





Container Ship Particulars

On-Board Electrical Systems



- Approx. 10% of current vessels are 6.6 k.v.
- Balance are 440V vessels. 440V Vessels require a 6.6/440 transformer.
- Vessel power demand widely variable
1 – 10 MW (Average 4MW)



Container Ship Particulars

On-Board Electrical Systems

Power Demand Examples

- 2 Megawatt at 6.6 k.v. = 1 cables
- 2 Megawatt at 440 V = 9 cables





Issues and Challenges

- Safety
- Security (U.S.C.G / ISPS)
- Equipment Location
- Cable Routing
- Wharf & Vessel Modifications
- Operational Requirements
- Power / Voltage Emergency Start-up / Back-up Systems





Port of Los Angeles Berth 100





AMP Terminal Design & Construction

- New Facility
- Retrofitting an in-use Terminal
 - Phased Construction
 - Contractor Accessibility
 - Terminal Security & Safety Plans
 - Storage of Materials

