



Alternative Compliance Plan & Alternative Control of Emissions Implementation Guidance Workshop

**(Cargo Handling Equipment Regulation and
Ocean-going Ship Auxiliary Engine Regulations)**

November 29, 2006

California Environmental Protection Agency



Air Resources Board

Overview

- ◆ Background
- ◆ Draft Implementation Guidance
 - general information
 - application process
 - estimating emissions
 - post-approval
- ◆ Future Activities



Background

- ◆ Cargo Handling Equipment and Ship Auxiliary Engine Regulations approved December 2005
- ◆ ACP and ACE provisions provide flexibility in complying with the regulations and encourage use of emerging technologies to reduce emissions



Draft Implementation Guidance

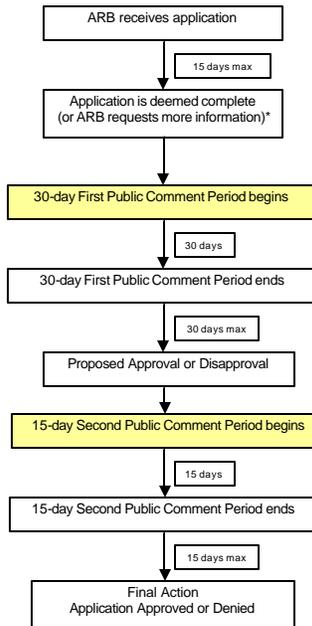
General Information

- ◆ Who can apply?
 - owners/operators in direct control of equipment/vessels
- ◆ What are the alternatives available?
 - engine modifications, exhaust treatment controls, alternative fuels, shore-side power, etc.
- ◆ How long is an approved ACP or ACE valid?
 - calendar year (or continuous 12-month period for ACE)

Application Process

- ◆ How do I apply?
 - submit applications in writing to the Executive Officer (EO) for evaluation
- ◆ What should my application include?
 - contact info; equipment/vessels; emissions data; procedures for compliance; ACE only: ports data
- ◆ What about public availability/confidentiality?
 - Applications will be made available to public for review; state law will be followed in determining confidentiality

ACP/ACE Application Process



* If the application is incomplete, the ARB will notify the applicant, identifying the application's deficiencies. The EO will have an additional 15-day period to review each set of documents or information submitted in response to an incomplete application.

Estimating Emissions: Cargo Handling Equipment

- ◆ How do I determine emissions that would occur under direct compliance with the regulation?
 - assume one of the compliance options specified in the regulation (non-yard truck cargo handling equipment)
 - use acceptable methodology (i.e., emissions testing of the engine(s), methodology included in the Staff Report for the regulation, etc.)
 - estimate emissions of diesel PM and NO_x for the ACP compliance period

Estimating Emissions: Cargo Handling Equipment (cont.)

- ◆ How do I estimate emissions with the use of an alternative emission control strategy (AECS)?
 - use actual engines or test data from manufacturers with AECS in place
 - recommend testing in accordance with ARB, U.S. EPA, or ISO approved methods
 - estimations must assume use of AECS over the applicable calendar year and include diesel PM and NO_x for ACP compliance period
 - documentation, recordkeeping, reporting will depend on specifics of the application

Diesel PM Emissions Summary for ACP Scenario:

Higher level unverified controls used on equipment running more hours in lieu of verified controls on all

Equipment	MY	Rated HP	Load Factor	Annual Hours	PM EF (g/hp-hr)	PM Emissions (lbs)	PM Emissions w/Direct Compliance (lbs)	PM Emissions w/ACP (lbs)
5 Top Picks	2003	250	0.59	1,500	0.12	272	204	272
3 Side Picks	1999	250	0.59	1,900	0.38	704	528	352
Totals:						976	732	624

Note: The calculations above have been simplified for the purposes of illustrating this example scenario and do not reflect deterioration factors or fuel correction factors.

Estimating Emissions: Ship Auxiliary Engines

- ◆ How do I determine emissions that would occur under direct compliance with the regulation?
 - generally assume use of marine gas oil or diesel oil at or below 0.5% sulfur as of 1/1/07; use of marine gas oil at or below 0.1% sulfur as of 1/1/10
 - only emissions occurring within regulated California waters (approx 24 nm offshore) will be counted
 - use acceptable methodology (i.e., emissions testing of the engines using specified fuels, test data from manufacturers, methodology included in the Staff Report for the regulation, etc.)
 - estimate emissions of diesel PM, NO_x, and SO_x for the ACE compliance period

Estimating Emissions: Ship Auxiliary Engines (cont.)

- ◆ How do I estimate emissions with the use of an alternative emission control strategy (ECS)?
 - use actual engines, test data from manufacturers with AECS in place, or other approved methodology
 - recommend testing in accordance with ARB, U.S. EPA, or ISO approved methods
 - documentation, recordkeeping, reporting will depend on specifics of the application

Estimating Emissions: Ship Auxiliary Engines (cont.)

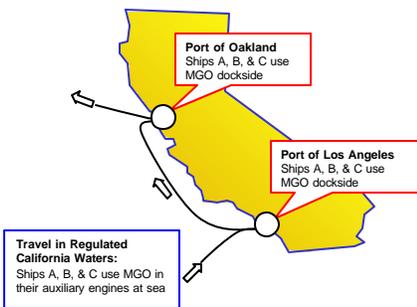
- ◆ What if I comply using shore-side power?
 - turning off all auxiliary engines within an hour of arrival until an hour before departure: ACE application does not require emission calculations, and approved ACE is valid when traveling to and from port where shore-side power is used
 - cannot meet the requirements above: ACE application requires emission calculations



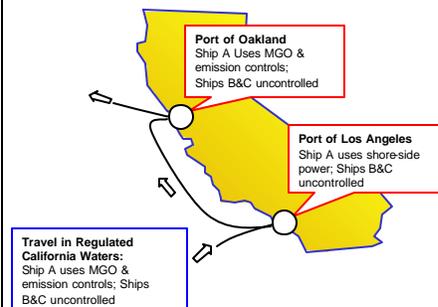
Diesel PM Emissions Summary for ACE Scenario:

Fleet Emissions Averaging Using Emission Controls and Shore-Side Power

Compliance *without* ACE



Compliance *with* ACE



Diesel PM Emissions Summary for ACE Scenario:

Fleet Emissions Averaging Using Emission Controls and Shore-Side Power

Ship "A" Annual Emissions with Marine Gas Oil @ 25 CA visits/50 port calls								
Operating Mode	Time per visit or port call (hrs)	Annual Time in mode (hrs)		Power (kW)	PM EF (g/kW-hr)		PM Emissions (lbs)	
		MGO	ACE		MGO	ACE	MGO	ACE
Transiting	30 hrs/trip	750	750	1,000	0.38	0.20	628	330
Maneuvering	2 hrs/port call	100	100	3,000	0.38	0.20	251	132
Hotelling (aux eng)	50 hrs/port call	2,500	1,250	1,200	0.38	0.20	2,511	661
Hotelling (shore-side power for ACE)	50 hrs/port call (ACE)	NA	1,250	1,200 (grid) (ACE)	NA	0.013	NA	43
Total							3,390	1,166
Ship "B+C" Annual Emissions with Heavy Fuel Oil @ 4 visits/8 total CA port calls								
Operating Mode	Time per visit or port call (hrs)	Annual Time in Mode (hrs)		Power (kW)	PM EF (g/kW-hr)		PM Emissions (lbs)	
		MGO	ACE		MGO	ACE	MGO	ACE
Transiting	30 hrs/trip	120		1,000	0.38	1.5	100	396
Maneuvering	2 hrs/port call	16		3,000	0.38	1.5	40	158
Hotelling	50 hrs/port call	400		1,200	0.38	1.5	402	1,586
Total							542	2,140
Grand Total							3,932	3,306

Post-Approval

- ◆ Is an approved ACP or ACE transferable?
 - no; changes to vehicles/vessels or owners/operators would require new application
- ◆ Can the ARB revoke or modify an approved plan?
 - yes, with 30 days notice
 - multiple violations
 - plan no longer meets the criteria/requirements
 - applicant can no longer comply
- ◆ Can I get credits if the plan reduces more than required?
 - no; regulations do not allow for generation, banking, or trading of emission reduction credits under the ACP/ACE provisions



Future Activities

- ◆ Finalize ACP/ACE implementation guidance by end of the year
- ◆ Regulations expected to become effective January 1, 2007
- ◆ Optional reporting forms and ACP/ACE application forms will be made available as soon as possible

