

MARAD Port Air Emissions Reduction Program (ERP)

Maritime Industry particularly ports are major contributors to air pollution emissions. Current trend towards containerization has led to larger and faster ships with high power slow speed engines. This has led to increase in NOx emissions due to higher compression pressures. Higher sulfur content in the residual fuel used by these ships leads to higher SOx emissions (Corbett, J. J. 2006). Port is a nodal point in maritime activity. It is also a significant source of air emissions due to the cargo operations in its contiguous area. The primary sources of emissions include vessel operations, cargo handling equipment and truck congestion.

MARAD wants to implement an Emission Reduction Program. We are helping MARAD design a program best suited for its authority and charge with input from the industry. Shipping policy is made and implemented under conditions of multiple objectives and constraints. It is often subject to diverse interests and decision makers each with his own agenda (Frankel, E. G. 1992).

The broad objectives of this project are:

- a) To identify and define clear criteria for evaluating ERP attributes,
- b) To evaluate strategies for marine vessels and for port activity and consider whether a common strategy can be applied to both,
- c) To consider whether a nationally administered strategy can address regional differences in vessel type and activity profiles, pollutants of concern, reduction targets, and economic resources needed to meet regional goals.
- d) To rank strategies in terms of MARAD's role as a national administration responsible for strengthening the US maritime transport system, including improving its environmental performance; and
- e) To estimate planning-level costs to fund and implement highly ranked strategies.

The 1<sup>st</sup> phase was review of various Emission Reduction Program (ERP) policy instruments of relevance to the maritime industry – this has been carried out. In the 2<sup>nd</sup> phase, the industry's perspective is being ascertained using a survey instrument created around the attributes identified. These are: Equity (Polluter Equity & Beneficiary Equity), Cost Effectiveness (Capital Costs & Operating Costs), Technological Development, Administrative Ease (Initiation, Monitoring & Enforcement), Environmental Certainty & Political Popularity. This survey instrument has been forwarded to 13 ports representing diverse size, activity and geographic profiles. The survey responses are to be analyzed by the Analytical Hierarchy Process (AHP) method. AHP is a systematic method for comparing a list of alternatives. It breaks down a complex problem with multiple criteria into easier pair wise comparisons of decision attributes. This also helps eliminate program specific biases. The comparisons can then be used to rank ERP alternatives based on the assigned values of their attributes.



The next phase could include widening of the scope of the survey to include other ports in the USA and then other stake holders for a more balanced insight.