

PDMT Panel Project Proposal: Vessel Emissions Mitigation

**John Malone, Consultant
Ron Selvidge, AAA
Dr. Matthew P. Tedesco, Consultant**

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Background

- **International, federal, and local regulations for marine engine emissions are evolving at a rapid rate**
- **U.S. Navy seeks compliance with federal, state, and local regulations, however means of compliance is a technical and programmatic challenge for new programs**
 - OPNAVINST 5090.1C states: 22-4.3 Navy Policy 22-4.3.1 Compliance with Regulations. Navy ships shall comply with applicable Federal, State and local regulations governing air pollution emissions
- **Commercial programs have been faced with increasing costs, delays, and risks resulting from confusion regarding regulatory requirements and alternative approaches to compliance**
- **Marine highways initiative is dependent, in part, on successfully demonstrating net reductions in emissions compared to traditional modes**
- **There is often confusion regarding which local regulations are applicable, and what regulations will be in force at the time of contract award**

Technology Options

- **Alternative fuels**
- **Emerging emissions mitigation technologies**
 - Exhaust gas recirculation (EGR) decreases NO_x emissions by 20-30%, although the lower combustion temperature results in a slightly higher PM count
 - Selective catalytic reduction (SCR) breaks down NO_x, resulting in an estimated 85% to 99% reduction as reported by Munters. PM reductions of up to 40% have been reported with SCR
 - Sea water scrubbers will reduce PM by 80%, as reported by Krystallon
 - Combining technologies technically challenging due to required exhaust gas temperatures
 - Technologies have not yet been applied to large diesel engines
 - Technologies result in modest (1 to 2%) reductions in efficiency
- **Reduction of fuel consumption through improved hullforms and propulsion efficiency**

Proposed Tasks

- **Task 1: Review and document emerging federal, state, and local regulations**
 - Identify key drivers
- **Task 2: Assess emerging emissions mitigation technologies for applicability to emerging Navy programs and large commercial Jones Act vessels**
 - Assess ship system impacts and cost
- **Task 3: Conduct a workshop bringing together stakeholders to solicit lessons learned and feedback for incorporation into final report**
- **Task 4: Final report documenting regulations that drive requirements, applicability of emerging emissions mitigation technology, and recommendations for definition of emissions requirements in specifications**