Evolving Noise Reduction Requirements in the Marine Environment

Marine Mammal Commission

Briefing on Ocean Noise

Joseph J. Cox
Chamber of Shipping of America

September 25, 2014

Chamber of Shipping of America

- 35 US based companies
- Own, operate or charter vessels
- Trading in coastwise and international trades
- US and non-US flag registries
- Variety of vessel types including tankers, bulk carriers, containerships, ro-ro's and others

CSA Historical Involvement

- Industry advisor on US delegation to IMO
- Involvement in marine ecosystem issues associated with normal operating scenarios
- Sole marine industry representative on US federal advisory committee on Acoustic Impacts on Marine Mammals
- Steering Committee and presenter at both NOAA conferences (2004, 2007)

Marine Industry Caucus Report (FACA Committee)

- Refusal to engage in “finger pointing exercises” among sound producers
- Recognition of precautionary approach
- Recognition of need for future work but…
- Belief that current state of knowledge is sufficient to pursue possible solutions
- Need for international focus e.g. IMO
- Need for education of industry stakeholders

Recent Developments

- DE 57 finalized guidelines – March 2013
- MEPC 66 approved guidelines – April 2014
- IMO issued MEPC.1/Circ.833 – April 2014
- ISO Working Group also working on this issue (measurement protocols)

MEPC Expectations

- minimize the introduction of incidental noise from commercial shipping
- reduce potential adverse impacts on marine life
- emphasis on practical, effective solutions
- **develop non-mandatory technical guidelines on potential design and construction technologies**
- also look at potential navigation and operational practices

IMO Guidelines – What They Include

- Prediction of underwater noise levels (modeling at design stage)
- Design considerations (propellers, hull design, onboard machinery)
- Other technologies
- Ops/Maintenance issues (hull surface, speed, rerouting)

IMO Guidelines – What They Do Not Include (need for future work in appropriate international fora)

- Specific noise reduction target
- Multiple point source contributors assessment to determine contribution
- Quantification of relationship between individual ship as point source and as contributor to regional ambient noise
- Operating guidelines for special areas
- Noise profiles for multiple ship types
- Baseline ambient noise levels

Key Considerations

- Mariners are not marine biologists
- Mariners are not acoustical engineers
- Mariners generally are not aware of negative impacts of sound
- Mariners do want to operate in an environmentally responsible manner
- Progressive approach to assess alternative vessel designs

Ship Design and Construction

- Large customized vessels based on owner specifications (but note smaller vessels engaged in coastwise and offshore applications)
- Design criteria including propulsion systems, cargo capacity, operating equipment and economics
- Water borne noise generation is NOT yet a design criteria in new ship construction
- Reduced cavitation = increased fuel savings?
- Reduced GHG/CO2?
- Win/Win situation?

Sound Producing Activities

- Propeller cavitation
- Propulsion machinery including engines and power train
- Auxiliary machinery including generators, pumps, fans, blowers
- Cargo equipment
- Hydrodynamic flow over hull
- Depth finders

Ship Generated Noise Characteristics

- **Ships as point source and collective contributors to background noise**
- **85% of ship radiated noise due to excessive cavitation**
- **Geographic patterns depend on transoceanic and coastal routing**
- **Other variations due speed, load and onboard operations**
- **Sound respects no legal boundaries**

Policy and Legal Challenges

- Variations in vessel and engine design
- **Shipbuilding industry practices**
  - **Few “custom” ships built for owners**
  - **Shipyards build for marketplace expectations**
  - **Build multiple vessels in class (one design)**
  - **Some opportunity for customization but little relevance to underwater noise mitigation**
- Existing international and national treaty, legislative and regulatory frameworks
- Legal jurisdictions e.g. high seas, EEZ, territorial sea

What's Next?

- Continue to quantify impacts
- Assess technological feasibility of possible solutions
- Assess economics associated with alterative design processes
- Integrate solutions into normal ship operating and design scenarios

Presenter's Contact Information

Joseph J. Cox
President and CEO
Chamber of Shipping of America
1730 Rhode Island Avenue, NW
Suite 702
Washington, DC 20036
202.775.4399
jcox@knowships.org