Vessel Speed Reduction

November 5, 2008

Vessel Speed Reduction

- Speed Reductions for:
  - Environmental Issues
    - Reduce emissions
    - Protect marine mammals
    - Prevent shoreline erosion
  - Lower Fuel Consumption

Air Emissions

- Vessel Air Emissions:
  - Oxides of Nitrogen (NOx)
  - Carbon Dioxide (CO_2)
  - Sulfur Oxides (SOx)
  - Particulate Matter (PM)
- Reduction in NOx

Ports of Los Angeles / Long Beach

- Clean Air Action Plan (CAAP)
  - Goal: Reduce port related emissions by at least 45% by 2011
  - Ocean going vessels = 48% of total port related emissions
- Voluntary Vessel Speed Reduction Program
  - MOU between agencies & Industry in 2001

LA/LB Voluntary Vessel Speed Reduction Program

- Goal
  - Reduce NOx emissions from ocean going vessels
- Method
  - 12 knots
  - 20 nm from harbor entrance
- Program Results
  - Approximate reduction of 100 tons of NOx/quarter
  - Average daily savings of 1.1 tons of NOx
    - *Source: Port of Los Angeles*

APL LA/LB VSR Participation

- Longstanding Partner
  - One of the first companies to sign on
- Our Policy
  - 100% compliance
    - No exceptions policy
    - Maintained even if the vessel is late
- Sound Environmental Stewardship

VSR Program Considerations

- Data Representation
  - One vessel per year @ 12 knots = 100%
  - Frequent callers
    - APL – approximately 350 vessels / year
- Calculation of Speed not Exact
  - Vessel speed over the ground ≠ VTS recorded speed

VSR Program Considerations (continued)

- VSR is Not Free
  - Domino Effect
    - Delays in LA could result in late train arrivals on the East Coast
    - Missed berth windows overseas
  - Idle Gangs
  - Delayed Trains & Availability of Freight
  - Terminal Congestion & Productivity
  - Additional Fuel Burned

VSR Program Considerations (continued)

- Level of Speed Restriction
  - 12 knots – defensible choice?
    - 12 knots on a 26 knot linehaul vessel = slow ahead
    - 12 knots on a 600 TEU/14 knot feeder vessel = full ahead
    - Neither may result in reduced emissions
  - 12 knot calculations do not include:
    - Boiler emissions vs. Shaft generator operation
    - Diesel generator emissions
- Area of Coverage
  - 20 nm from harbor entrance may be appropriate for LA/LB, but not in other systems e.g. Puget Sound

VSR Program Considerations (continued)

- Engineering
  - Modern diesels emit less NOx/SOx at higher speeds vs. lower
    - Liner Vessels @ 8% of Manufacturer's Continuous Rating (MCR) at 12 kts
    - Extended operation = problems e.g. economizer fires
    - Well off the power curve / not operating economically
  - VSR Program Design Criteria
    - Make, Model, BHP, Age, Type of Fuel
- Program Management

Conclusion

- Optimize vs. Flat Reduction Policy
  - Engineering
    - Review and determine optimal reduced speeds for engine types
    - Obtain the greatest reductions in NOx for reduced speeds
  - Flat 12 knots reduces the incentive for new vessels
- Participation – Level the Playing Field
    - Metrics to include number of vessels
- Sound Environmental Stewardship
- Los Angeles/Long Beach
  - Good first step
  - Replicate? Instead, leverage the results for improved programs

Thank You