January 2, 2007
Contact – Tony Iavarone

Workgroup Recommendations and Other Potential Control Measures
Non-Automobile Gasoline Engines Workgroup

NA007 – Stage II Vapor Recovery Compatibility for Boat Fuelling and Marina Gasoline Fueling Facilities

Description:	VOC Benefits:
State regulations requiring control of volatile organic compound emissions during retail refueling (N.J.A.C. 7:27-16.3) currently do not effect refueling gasoline–powered watercraft. Boaters who trailer their boats often will purchase fuel at automotive gas stations due to the comparatively lower fuel prices versus marina fuel retailing facilities. Marina refueling operations are also exempt from the regulation. This control measure would prohibit gasoline-powered watercraft refueling at a gas station equipped with a vapor-balance type stage II vapor recovery system unless the boat fuel filler neck is compatible with the fuel pump interface. This control measure would also remove the marina exemption from stage II requirements at N.J.A.C. 7:27-16.3 (f) 1(I) and require use of "active" fan assisted stage II vapor recovery systems. Watercraft Fuel Filler Neck Design and Stage II Watercraft fuel filler necks are not specifically designed to be compatible with "vapor-balance" type stage II systems. Vapor-balance type stage II systems are widely used in New Jersey. This measure would place the burden upon the owner of an incompatible boat to acquire and utilize an adapter on the boat's fuel tank filler neck if they opt to refuel the vessel where a vapor-balance type stage II system is employed. Alternatively, the gasoline retailer could provide an appropriate mechanism such as a rubber donut adapter. The measure is not expected to effect gasoline retail facilities equipped with vacuum assist type stage II systems since this type of stage II does not require a sealed interface between the fuel dispensing nozzle and the receiving fuel filler neck. Therefore, it is believed that active fan assisted stage II systems by design are already compliant with this control measure. The Department believes that ten percent of stage II systems in New Jersey use vacuum assistance. Developing a mechanism to allow for a proper seal between a	0.17 tons/summer weekday Assumptions and Sources – 50% control efficiency – 80% rule effectiveness. – RFG II summer fuel evaporates at 7.6 lbs VOC per 1000 gallons during fuel dispensation. – Fuel consumption for marine vessels powered by spark-ignited engines is 114,713 gallons/day (NONROAD 2005, 2007 summer weekday with RFG II) – All marinas with gasoline pumps exceed the fuel throughput threshold of 10,000 gallons per month, triggering stage II requirements. Costs: $7,000- $18,000 for implementing stage II at a facility with monthly gasoline throughputs of between 10,000 and 200,000 gallons. 1985 dollars. Similar figures were found in EPA guidance documents published in 1991. The actual costs for installing stage II in a marina environment unknown and expected to be higher by an

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vessel fuel filler neck and a vapor-balance stage II system is not expected to be a burdensome task. A few appropriately sized thick flexible o-rings kept at the gas station may be all that is necessary. The variety of fuel filler neck configurations used in marine vessel application is unknown, but is thought to be limited to boats with permanent fuel tanks. Many smaller vessels use portable "red jerry can" type fuel tanks that are believed to be able to seal with the vapor-balance style stage II systems. The greatest burden to implement this control measure is expected to be upon marina facilities due to the investment and construction required to install stage II system. Design issues for marina installations of stage II systems are unknown but may require special features for spill prevention and marine environments.	unknown amount due their specialized operating requirements. Costs for an adapter system to seal between a vessel fuel filler neck and a vapor-balance stage II system is unknown.
2002 Existing Measure: New Program	
Recommendation- Medium priority	
Actions required by DEP : Rule change to N.J.A.C. 7:27-16.3 to eliminate current exemption from stage II for marina refueling operations. Rule change to N.J.A.C. 7:27-16 to require boat owners or gasoline retailers to ensure compatibility of stage II and boat fuel filler neck interface. Information needs to reach marinas, gasoline retailers and boat owners.	

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Considerations:

Compatibility of vapor-balance type stage II systems- An additional consideration in developing this measure will be to ensure the availability of adaptation mechanisms for boaters or automotive gasoline retailers to ensure compatibility between fuel filler necks and vapor-balance type stage II systems. The Non-Automotive Gasoline Engines workgroup is unaware of adapters that are specifically designed to this purpose. It is likewise unclear what boat filler necks are incompatible with the stage II systems. The workgroup did not believe it is technologically prohibitive to develop this mechanism. It may only necessitate maintaining a few appropriately sized thick flexible o-rings at the gas station. Due to the early implementation of stage II vapor recovery in New Jersey, most of the systems are of the vapor-balance type. Most other states with stage II have a predominance of the more modern vacuum assist types, which do not require a seal between the pump and the fuel filler neck. Therefore, it is believed that if New Jersey were to institute this measure, most of the cost of developing adaptation mechanisms would be borne by New Jersey boaters or gasoline retailers as the mechanisms would have less utility in other states.

Boats are required to vent fuel tanks while refueling- United States Coast Guard vessel construction standards require vessels with a fuel tank located in an enclosed space to be constructed with a tank ventilation system designed to evacuate combustible vapors. It must be used while refueling to prevent buildup of fugitive fuel vapors in enclosed spaces within the vessel, circumventing an explosion hazard. The ventilation mechanism is thought to diminish the control efficiency of active and vapor balance stage II systems.

On-Board Refueling Vapor Recovery

EPA and California both anticipate proposing marine evaporative emissions rules in late 2006. The rules are expected to require on-board vapor recovery (ORVR) style emission controls. Phase-in of ORVR would be on an implementation schedule that coincides with the concepts in this white paper. Thus the benefits of this program would diminish shortly after implementation due to introduction of ORVR in the marine fleet.

The USEPA is also in the process of preparing more stringent emission standards for non-road spark-ignited engines. It is widely thought that both sets of standards will necessitate on-board refueling vapor recovery systems. These standards would eventually render obsolete any marina-based stage II installations. Since this control measure is medium priority, a medium–term implementation timeline may render the measure obsolete.

The Weekend Effect- Recreational marine fuel consumption increases eight-fold from 115,000 gallons/weekday to 845,000 gallons/day on summer weekend days compared to summer weekdays. Assuming this correlates to refueling activities and using the same assumptions for control benefits, there is a VOC reduction of 1.3 tons per summer weekend day.

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