Remarks of David Garman, Assistant Secretary
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U.S. Department of Energy

Workshop on Maritime Energy and Clean Emissions
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I wish to begin by thanking all of you for committing your valuable time and efforts to this very important workshop on marine transportation and energy issues, and to commend MARAD for launching this initiative.

Prior to holding this current job I was Chief of Staff to a Senator from Alaska a State that is probably more dependent on marine transportation in support of commerce, tourism, transportation and recreation than any other state.

Alaska is a state whose capital, Juneau, can only be accessed by boat or airplane a state without a railroad link to the lower-48 a state whose bulk commerce arrives almost exclusively via barge and container ship a state whose tourist trade is mainly dependent on cruise ships.

And of course, Alaska is a state with a pristine environment that everyone wants to protect.

In my past job I sometimes found myself in the middle of some very "lively" meetings focused on marine vessel emissions meetings that included environmental activists, freighter and cruise ship companies, Stevedoring companies, and State and local officials. I expect that many of you have participated in similar meetings. So I came to my current job with an appreciation of the challenges we face, and an intense interest in collaborating with MARAD and others in meeting them.

The President’s National Energy Plan directs us to enhance our energy security by advancing energy efficiency and increasing domestic resources while protecting and improving the environment. To this end, we are undertaking performance-based, cost shared R&D programs, in partnership with the private sector and our sister agencies.

This workshop is designed, in accordance with the President’s plan, to bring together the appropriate representatives from the States, local communities, industry, and various federal agencies, to collaborate on R&D planning. Again, I commend MARAD and the Department of Transportation for their initiative and approach.

Transportation now accounts for two-thirds of our petroleum production, and uses four million more barrels per day than we produce domestically. Our imported petroleum bill is now $2 billion a week.

Anything we can do to increase the efficiency of our cars, trucks, locomotives, ships and tugs is obviously valuable. And if energy efficiency were our only goal, our job would not

be so difficult. But emissions are obviously also a concern. Quite often, efforts to enhance efficiency sometimes run counter to efforts to reduce emissions of criteria pollutants, just as efforts to reduce emissions sometimes run counter to efforts to enhance efficiency. The diesel engine is a case in point.

Diesel engines emit levels of NOx and PM that are far higher than we would like, and higher than future EPA regulations will allow. But diesel engines are also comparably energy efficient, some X%-Y% more efficient than comparable gasoline engines.

The energy efficiency of diesel engines compared to comparable gasoline engines are driving a dramatic increase in the use of diesels in Europe, particularly in automotive applications. In the inherent conflict between emissions and efficiency, it would seem that, in Europe at least, efficiency is winning out.

Of course in the U.S. we, as usual, want it all--high efficiency and low emissions. That is why my office is investing in technologies to clean up diesel.

We are also investing in heavy-duty natural gas engines and more esoteric technologies such as fuel cells that may one day have marine application. You may have heard that we have launched a new initiative called FreedomCAR that is aimed at petroleum free, emissions free transportation through the use of fuel cells. But until the business case for hydrogen fuel cell powered transportation can be made, diesel remains highly entrenched, highly efficient, economical, and durable.

Today over 99% of America's freight moves by heavy-duty trucks, locomotives, and inland marine vessels, virtually all of which are powered by diesel engines. Essentially all of the goods and freight that are moved from one point to another have been, at some point in the supply chain, on a vehicle powered by a diesel engine.

So for the moment at least, we are all on the same boat and our boat is powered by a diesel engine.

Of course, heavy-duty diesel is much cleaner than it used to be. Between 1978 and today, heavy-duty diesel PM emissions have been reduced 90% and NOx has been reduced 80%. But EPA is requiring another 90% NOx and PM reduction to be phased in between 2007 and 2010. So what are we doing to make diesel cleaner until alternative technologies such as fuel cells are ready?

- First, we must continue to understand how to better understand the diesel engine combustion process to minimize engine-out emissions;

- Second, we will continue our work on after treatment technologies to minimize tailpipe emissions and/or turn them into benign substances;

- Third, we will work toward lowering the quality of currently used fuels (by lowering the sulfur content; and

- Fourth, we will continue our work to expand the use of alternative fuels such as biodiesel and natural gas.

Let me elaborate a bit on some of these areas in more detail:

Our Combustion Research Facility at Sandia-Livermore National Lab has advanced our understanding of the combustion process by developing world-class laser diagnostics to precisely analyze combustion in the cylinder of production engines. Heavy-duty diesel engine manufacturers have been bringing engines to Sandia for this analysis for more than a decade.

(When you see black plumes of smoke coming out of a bus or truck, you are probably looking at a pre-1991 engine that does not have a microprocessor controlled fuel injection equipment with rate shaping that was developed, in large part, with the help of the Sandia's laser diagnostics.)

We have also developed after treatment systems to treat the exhaust gas between the exhaust manifold and the tailpipe. Urea systems, NOx adsorber catalyst, non-thermal plasma devices, and various kinds of particulate traps are being explored. Some combinations of these technologies in the lab suggest that compliance with 2007 EPA standards is technically feasible; we are working cooperatively with engine and emissions control device manufacturers on meeting life and durability requirements (such as a life of 530,000 miles for heavy trucks).

We have worked with EPA and shown the benefits of lowering the sulfur content of diesel fuel, in terms of enabling these after treatment technologies to be effective for the life of the emissions control system. Our work has resulted in inclusion of a provision for 15 parts per million sulfur content in diesel fuel in conjunction with the EPA 2007 heavy-duty diesel engine emissions standards.

As guided by the NEP recommendations, DOE is working to increase the supply of all kinds of fuels -- but particularly clean, domestic ones, such as natural gas and biodiesel. Clean-burning natural gas engines have been developed and refined well beyond the capabilities of earlier generations of engines. We also have a major effort in biodiesel fuel, as well as on developing sulfur-less lubricating oils.

There are several people from my office here at this workshop who can delve into these technologies with you in greater detail. John Fairbanks, who manages our light truck clean diesel engine program, will be presenting an overview of these emissions reductions technologies tomorrow morning.

We also have Mike Gurevich who manages our health effects work and Nohemi Zerbi who manages our biodiesel activities on hand.

They are here, as am I, to see what elements of our work might be adapted to marine applications, and we look forward to working with MARAD and many of you in this regard.

Thank you very much for the opportunity to speak with you. And if you have questions, I am more than happy to take them.