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STATEMENT BY

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Thank you. It is a personal pleasure for me to be part of this panel, but more importantly, it's a professional pleasure for me to discuss the pioneering efforts that have been taken here on the Great Lakes to find solutions to the worldwide problem of ballast water transport of non-indigenous species. I don't want to mislead anyone – we've yet to find the answers – but I can say with all confidence that whatever solutions evolve in the years ahead, more than a little of the foundation will have been laid here on the Great Lakes. Equally important, all this effort came long before there was any legislative mandate to address ballast water transport of non-indigenous species.

The Great Lakes effort to deal with ballast water transport of exotics begins in earnest with the discovery of the Eurasian Ruffe in Duluth/Superior Harbor in the late 1980s. This spiny little critter arrived in the ballast water of an ocean-going vessel and found the habitat so inviting that it quickly became the most populous fish in the harbor. Unfortunately, this growth came at the expense of the native perch, so in 1993, the Great Lakes shipping community, under the leadership of Lake Carriers' Association, developed the Voluntary Ballast Water Management Plan for the Control of Ruffe in Lake Superior Ports. The program has been extremely successful. Although there are typically more than 1,000 vessel calls on Duluth/Superior each season, the Ruffe has been found in only two locations outside western Lake Superior – Alpena Harbor on the western shore of Lake Huron in 1997 and now just a couple weeks ago, in Escanaba on the north shore of Lake Michigan.

We are disappointed the Ruffe found its way to Escanaba. We're not sure how it happened. Duluth/Superior or Alpena to Escanaba is not a normal trade pattern, so the Ruffe may have just migrated or been introduced by a recreational boater or sport fisherman.

The Great Lakes are one body of water connected by the St. Marys, Detroit, and St. Clair Rivers, the Straits of Mackinac, and the Welland Canal. As we have long said, in the absence of a natural predator, any non-indigenous species that finds this habitat conducive to reproduction will eventually populate all five Lakes. The only question is how long it will take. Our Voluntary Ballast Water Management Plan for the Control of Ruffe in Lake Superior Ports slowed the spread of the Ruffe, but seeing as Lake Michigan and Lake Huron are connected by the Straits of Mackinac, there is no barrier that will stop the fish from reaching Lake Huron. Once it reaches the southern end of Huron, the Detroit and St. Clair Rivers offer unobstructed access to Lake Erie. From there it's a relatively short swim to the Welland Canal that leads to Lake Ontario.

Therefore, our focus has always been on preventing additional introductions of non-indigenous species. In 1996, we teamed with the Northeast-Midwest Institute to invent systems that could be installed on ocean-going vessels to treat ballast water. I intentionally used the word invent in that last sentence. There was no technology in existence to treat ballast water, not even that much research to draw on. We started from scratch.

Our initial thoughts were that filtration of ballast water offered the most hope for success, so in 1997 we installed a filtration system on a Canadian laker. To increase the frequency of testing, we transferred the filtration system to a barge moored in Duluth/Superior Harbor in 1998. Preliminary results indicated that filtration was effective to a degree, but that a secondary treatment would be necessary. To date, we have invested more than $3 million and tested two separate filtering systems and a hydrocyclone and two different ultraviolet radiation units as the secondary treatment. As far as the mechanical performance of the filters and hydrocyclone, it is clearly evident that filters show good results, but that the hydrocyclone is the wrong approach for reducing particulate and biota in ballast water.

However, it is very important to note that we tested at a flow rate of 1,500 gallons per minute (330 cubic meters per hour) during all our tests, and this was pushing the flow rate envelope for our equipment. Most ships have ballast pumps (at least two, and I know of some ships that have 18) that have flow rates far in excess of that. Cargo ships and tankers have pumps that are up to 10 times that rate, and I know of some ships that can ballast at a total rate of 72,000 gallons per minute using all their pumps. Can you imagine this room being the size of just two ballast tanks, and there are a total of 18 of them on some ships I've operated. Fill this room up 9 times in just 4 hours is what we are talking about — that's moving a lot of water in a hurry. And that's what some ships are currently doing! That's a challenge that treatment systems will eventually have to deal with. Scaling up the equipment that we have tested to those magnitudes is a significant challenge. More challenging is finding a place in the engine room of a ship to install this additional equipment. When someone tells you they have a ballast technology that is ready to go, it is important to ask for what kind of ship and what is the flow rate of the system. There are no systems of significant flow rate in existence today.

Our 2002 project includes testing equipment on a Stolt Nielsen ship that comes to the Great Lakes. We are also working with Fednav to install a filter and UV system on a ship that trades through the Seaway. This test will push the flow rate to 3,000 gallons per minute, double what we have tested to date. We recognize, however, that we must eventually go to even higher flow rates.

Successful treatment of ballast water is only one part of the solution for the Great Lakes. Another problem we must solve is that many ships enter the Great Lakes with no ballast onboard – NOBOB is the term we use. However, even though the ballast tanks are considered empty, there is always some residual ballast water and sediment in those tanks, and they are sufficient to sustain resting cysts. When the vessel discharges cargo, it takes on Great Lakes water as ballast and trim that mixes with the unpumpable water and sediment. When it's pumped out, those reinvigorated cysts have hatched and produced the next generation of an unwanted critter. Solving the problem of NOBOB vessels is going to be an especially challenging project.

One serious ailment in the invasive species arena is the lack of standards for ballast water technology to design to. Lake Carriers' Association recognizes that without standards of performance for ballast treatment systems or ballast exchange procedures, technology will be slow to develop. We strongly encourage the U.S. Coast Guard to issue some Interim Standards that shipowners can try to meet. Also, we strongly encourage the U.S. Coast Guard to allow experimental testing to be done when a shipowner wants to try some technology or technique, providing "good science" is being followed. The U.S. Coast Guard must not make the rigors of the testing and evaluation so difficult that it makes installation and performance testing an economic hardship and burden for the shipowner. Shipowners are not biological scientists and the U.S. Coast Guard should assist in bridging the gap between the two.

In summation, we have made significant progress in identifying systems that have real potential to treat ballast water. However, we face significant challenges in upscaling these systems to meet demands of commercial vessel operations. The problem of NOBOB vessels presents another high hurdle. But what must preface all our efforts is an acceptance of the fact that those non-indigenous species that have taken root in the Great Lakes are here to stay, and, in fact, will spread to inland rivers and lakes. The Lakes are estimated to contain 64 quadrillion gallons of water (that's 64 followed by 15 zeros). There will never be a filtration system that can cleanse that amount of water. The only realistic goal is to prevent future introductions into the Great Lakes. To achieve that goal, systems must be designed that can be installed on vessels trading from the oceans. The fleet of U.S. and Canadian vessels working the Great Lakes never leave the system, so they have never introduced a non-indigenous species and need not be retrofitted with ballast water treatment systems.

Thank you for your attention. I will be happy to answer any questions you may have.

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