

**TESTIMONY OF NABIL NASR
DIRECTOR, NATIONAL CENTER FOR REMANUFACTURING AND
RESOURCE RECOVERY, ROCHESTER INSTITUTE OF TECHNOLOGY
TO THE SUBCOMMITTEE ON DEFENSE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE**

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Chairman Stevens, Ranking Member Inouye and members of the Subcommittee, on behalf of the Rochester Institute of Technology in Rochester, New York, I would like to express our great appreciation for the support that the Subcommittee has provided to RIT over the past four years. Your Subcommittee has provided a total of \$8 million over the past four fiscal years in support of our remanufacturing research program with the Office of Naval Research. We have used these funds to undertake a series of projects to develop, demonstrate and implement new and innovative concepts that the Navy can use for the design of new systems and the remanufacturing of existing ones.

I would also like to acknowledge and recognize the support that Senator Charles Schumer has demonstrated for our work with ONR. The Senator has requested these funds on our behalf in each of the past two years, since his election to the U.S. Senate. We have discussed with Senator Schumer the proposal and request that we are making to you with this testimony, and he has indicated to us that he will again be making a request to the Subcommittee to continue its support of this program.

This past fall, we were honored to have Senator Inouye visit our Center for a brief tour of our facility. I would like to take this opportunity to thank Senator Inouye once again for taking the time to visit our Center, and for his interest and support of our research and demonstration project in remanufacturing.

Four years ago, we came to you with a funding request for promising and innovative technologies with great potential for our defense systems. These technologies lead to remanufacturing of certain legacy systems, providing significant savings and improving the readiness of our armed forces. I'm glad to report to you that, working closely with the Office of Naval Research, not only did we develop and demonstrate significant processes and technologies in this area, but also we successfully implemented them in variety of projects.

Conventional refurbishment and upgrade strategies of military systems can only achieve incremental improvements over original specifications. Remanufacturing, on the other hand, can achieve generational technological upgrades of legacy systems meeting current day standards. Remanufactured systems are typically comparable to new systems in technology, performance and reliability at significantly less cost and lead-time.

More importantly, we believe that significant improvements are possible when one designs a system with an eye on life-cycle technology upgrades and remanufacturing. Through our Innovation Based Design approach, we are proposing the expansion of our work to integrate our technologies into new systems design reducing total cost of ownership and enhancing the readiness of our defense systems during their life cycles.

As you may recall, our initial project with the Office of Naval Research was to investigate the feasibility and conduct a comprehensive engineering analysis for converting a Surface Effect Ship (SES) to a ship with a more advanced hull form known as SLICE. We completed that project within 18 months. We determined that it is feasible to remanufacture the existing fleet of mothballed SES ships, and that each ship can be remanufactured at about 20 percent of the cost of a new SLICE ship. A decision support system that was developed during this project is already being used by a number of leading defense contractors, and has proven to be a particularly useful tool that can be easily updated to frequently revisit maintenance, modernization, remanufacturing and operating costs to optimize return on investment.

As a result of the success of this project, the Navy will be using the modified SES platform as a testbed for other Navy programs including the Advanced Hull Form, All-Electric Ship, and other programs.

Building on the success of these programs, and the enormous potential that remanufacturing represents for leveraging and optimizing investments, we are proposing the establishment of a Center for Excellence for Defense Modernization and Readiness within the National Center for Remanufacturing and Resource Recovery (NCR³) at RIT. This Center would enable us to continue our work with the Office of Naval Research, and to expand the scope of our work to other defense systems. We are requesting an FY2002 appropriation of \$4 million to support this expanded program. The facilities that the Center would require are already in place at RIT. NCR³ is housed within RIT's Center for Integrated Manufacturing Studies, a 157,000 square foot facility that includes several manufacturing bays and state of the art laboratories.

We strongly believe that this Center can assist the Department of Defense in addressing several difficult, interrelated and costly issues. For example, modernization efforts have traditionally focused on designing new systems and replacing existing weapons systems with wholly new ones. We believe that modernizing legacy systems is a feasible and very important part of the solution to this challenge. NCR³ can bring its proven technology and engineering tools to bear on this issue.

For the design of new systems, we believe that we can also contribute to the improvement of system design and increase the value of systems near the end of their useful life through remanufacturing and recovery processes. We believe that significant improvements are possible when one designs a system with an eye on life-cycle upgrades and remanufacturing.

Attached is a more detailed description of the work that we have done with the Office of Naval Research, and the proposed expansion of this research program that will be possible with the additional funding that we are requesting this year.

Thank you again for the support that you have provided to us over the past four years. Our partnership with ONR has been extremely important to us, and we believe that ONR is equally pleased with the outcome of our work with them. We hope that you will continue to support our work in this area, and specifically our request for \$4 million in FY2002.