

News Wire from Idaho National Engineering and Environmental Laboratory – Home of Science and Engineering Solutions

Welcome! This is edition of the **INEEL News Wire**, which delivers news about current advances in research and technology at the multiprogram Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), located in Idaho Falls, Idaho and operated by Bechtel BWXT Idaho for the U.S. Department of Energy.

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Research Institute established

INEEL spin-off company opens in Idaho Falls

Idaho Falls, August 28, 2003 – Recognized by R&D Magazine as one of the most significant technological achievements in 2001, the invention Super-Hard Steel Coatings is being commercialized by The NanoSteel Company (TNC).

The NanoSteel Company, headquartered in Maitland Fla., has established a Nanomaterials Research Institute in Idaho Falls, Idaho. TNC's Chief Executive Officer Joe Buffa noted that 125 companies are pursuing products using TNC materials and that more than 50 already are actively testing coatings on their products.

"During our first year, we have successfully ramped up both our powder and wire products to industrial-scale production (over 100,000-pound capacity per month); established our own research institute, with the cooperation of the INEEL; greatly solidified our intellectual property position; hired a world-class sales team; and

made significant inroads in achieving our sales goals," Buffa said.

Super Hard Steel was originally developed at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL) by Daniel Branagan, a materials scientist who is now the chief technical officer for NanoSteel.

Bill Shipp, INEEL president and Laboratory director, said of the synergy between the private sector and government research programs, "The formation and commercial progress of the NanoSteel Company is a great example of what can happen when national laboratory inventions are put in the hands of an experienced, well-financed team of entrepreneurs. This is exactly what policymakers in Washington want to see happening with their investment in cutting-edge research. The INEEL is proud to be the breeding ground for this remarkable technology."

Super Hard Steel forms a tough, low-cost, wear-and-corrosion-resistant coating that outperforms traditional high-performance materials in applications where combinations of wear, corrosion and impact destroy or damage industrial parts. The application of this coating can vastly extend in-service lifetimes, reduce maintenance costs and allow parts to perform in new and demanding environments and in ways previously not possible.

"There have been very few truly innovative developments in thermal spray or weld overlay protection in the past 20 years," said Michael Breitsameter, TNC vice president of marketing and business development. "This technology, and the highly skilled and motivated team we have put together at TNC, can provide solutions to problems that exist today, and some that are as yet unimagined."

The NanoSteel Company's early focus has been centered on applications involving thermal spray techniques to apply coatings such as HVOF (High Velocity Oxygen Fuel), plasma and wire-arc spraying. TNC has since been actively pursuing the development of variations of Super Hard Steel for the hard-facing (weld overlay) and spray and fuse applications, which result in a protective layer that maintains full metallurgical bonding to the substrate.

Recently, TNC launched a second product line called "NeutraShield™ Coatings" - which combines the revolutionary bond strength, toughness, corrosion and wear resistance of the Super Hard Steel coatings with the ability to absorb thermal neutrons - with an extremely high thermal neutron cross section.

Such material would create containers that better withstand the radiation environments of storage facilities.

Branagan, chief technical officer, said, "We take our focus very seriously - which is taking new materials, developed in-house or anywhere in the world, across the

great technological divide from basic discovery to near-term, large-scale industrial production and commercial utilization much faster than it is currently done. No company in the world either specializes in this area or does this particularly well. This unique capability could truly be considered a national resource, and the development of advanced nanomaterial technologies could make a huge impact on technology and how it affects our everyday lives."

Link to complete news story on the INEEL website is:

http://newsdesk.inel.gov/press_releases/2003/08-28NanoSteel_Company_ramps_up.htm

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Better practices make advances

INEEL's Big Shop receives award for pollution prevention

Idaho Falls, August 28, 2003 – Idaho Gov. Dirk Kempthorne awarded the Big Shop at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory with a coveted membership to the Idaho GEMStars program today.

The Big Shop - a large service facility used for maintaining the INEEL's fleet of buses and small vehicles, became an official member of the Idaho GEMStars program, which was introduced by the governor in 1999 to recognize companies and organizations that voluntarily meet a series of standards to demonstrate leadership in preventing pollution. The program encourages actions to conserve water and energy, and reduce waste and pollution.

"Being named a member of the Idaho GEMStars program is a great achievement for the INEEL and particularly the employees working at the Big Shop," said Bill Shipp, INEEL president and laboratory director. "Many hours of hard work and effort have been given in order for the Big Shop to be positioned to receive this award, which further demonstrates our commitment to pollution prevention, and attention to safety for workers and the environment."

The Big Shop, located at the INEEL's Central Facilities Area, is managed by Bechtel BWXT Idaho. The shop has implemented nearly two dozen pollution prevention practices. Some of the practices include being a solvent-free operation, the elimination of aerosols, mercury free batteries, and alternate fuel conversions.

"As one of the largest employers in the state of Idaho, the INEEL is showcasing its leadership and dedication to pollution prevention, and making the state of

Idaho a cleaner place," said Helen Rigg, Idaho GEMStars director. "To date, the Idaho GEMStars program has been very successful, and adding an organization like the INEEL, with many large and complex operations, emphasizes the versatility of our members and their common goal of improving the environment for future generations."

The Big Shop has also been successful in research and test-bed applications for the conversion of diesel engines to liquefied natural gas. It currently services 135 alternate fueled vehicles and seven transit buses. The Big Shop has participated in numerous work relationships with industry, other federal agencies and international companies to enhance alternate fuels in order to reduce diesel and gasoline emissions - which deplete the earth's natural ozone - and to become less dependent on fossil fuel sources.

Acceptance into the GEMStars program requires members to meet a set of stringent criteria. An organization must complete an application form describing its pollution prevention and waste minimization activities, policy statement, assessments, incentive and training opportunities, and other activities. Each application is reviewed by the GEMStars coordinating committee that includes representatives of the Idaho Department of Environmental Quality. Other GEMStars members include Albertsons, Inc., JR Simplot Co., and the Mountain Home Air Force Base.

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National Parks to get better buses

INEEL helps develop innovative shuttle bus

Yellowstone Park, August 25, 2003 – A modernized version of the traditional Yellowstone National Park tour bus has been developed as a low-emission, cost-effective community and transit shuttle bus of the future.

The U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory is working with automotive industry leaders, the U.S. Department of Transportation's Federal Transit Administration, the National Park Service and private industry in developing the "new" yellow bus. The bus was unveiled in Yellowstone National Park on Aug. 25 as part of the park's centennial celebration of the Roosevelt Arch. This project supports DOE's energy security and environmental missions.

While this modernized version of the traditional yellow bus retains the conventional feel of the older model park vehicles, the new version is a 18- to 32-passenger vehicle that uses alternative fuel, features a low floor and complies with the Americans with Disabilities Act (ADA).

The passenger area of the bus is built low to the ground so steps are not

required for entry. It's entry ramp can be extended to accommodate passengers in wheelchairs. The bus also has a retractable roof to allow passengers greater visibility in the outdoors. Another optional feature is tracks for traveling over snow in winter.

This first bus is a model for Yellowstone National Park, says Kerry Klingler, INEEL project manager. After the Yellowstone unveiling, the bus will travel across the region to assess how it can be adapted to other transportation needs. Eventually, the vehicle is expected to be manufactured using several optional engines, to allow use of alternative fuels like natural gas, propane, ethanol and biodiesel.

Partners in the project with the INEEL include Heart International, Ruby Mountain, Yellowstone National Park/National Park Service, Greater Yellowstone/Teton Clean Cities Coalition, ASG Renaissance and Hadley Products. One purpose of the collaborative effort is protection of the park's pristine environment, combined with a drive to increase national security by reducing dependence on foreign sources of energy.

"While the development of the prototype is the result of a need by the National Park Service for a year-round transit vehicle that could be used for park operations, market analysis indicates the vehicle will have broad application in municipal transit and private-sector transportation as well," says Klingler.

During late August, the vehicle was displayed at the North Entrance of Yellowstone National Park, in Livingston and Bozeman, Mont.; Idaho Falls, Idaho at the Museum of Idaho; Jackson, Wyo.; and Cody, Wyo. Plans are being made to display the bus in Washington, DC during the week of Sep. 15.

Link to complete news story on the INEEL website is:

http://newsdesk.inel.gov/press_releases/2003/08-25yellowstonebus.htm

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PENDING AN UPDATE – Do we have a release or update of this release to reflect that it occurred and was successful?

INEEL to host international seminar on reactor modeling code

West Yellowstone, Mont., August 29, 2003 – The U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory hosted more than 40 engineers from around the world for its annual RELAP5-3D users seminar Aug. 27 - 29.

"The purpose of the meeting is to get people who use the code to come together and share ideas on how to implement it, define problems and discuss

improvements," said Gary Johnsen, the RELAP5 program manager.

RELAP5-3D is a code developed at the INEEL to create computer models of water-cooled nuclear reactors. The code was designed primarily to simulate accidents in order to evaluate the effectiveness of emergency safety systems.

With three-dimensional capabilities recently added, it has been used to improve emergency operating procedures for Russian-designed reactors throughout Eastern Europe, and to enhance the fidelity or accurateness of reactor operator training simulators in the United States.

The original RELAP5 code was developed in 1978. Ongoing improvement and updating-partly an outcome of these annual meetings-have resulted in the current RELAP5-3D program.

Open to the public, the seminar was held in West Yellowstone, Mont. Johnsen said he always tries to hold it near the INEEL to allow a greater number of lab personnel to attend. Visitors will be coming from Europe and Asia, and from across the United States.

At the seminar, users will present papers on innovative ways they have employed the code. Later, the user group's full membership will vote on proposed improvements for the code. Most users of RELAP5-3D are operators and builders of nuclear reactors, for whom the original code was designed, but other industries using water and steam flow systems have found uses for it as well.

The current phase of development for the code is implementing changes needed for modeling the next generation of nuclear reactors, called Generation IV concepts, some of which will use helium, molten lead and other coolants instead of water.

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