

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

Welcome! The INEEL News Wire is designed to deliver regular 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. Published by the INEEL Communications Directorate, the INEEL News Wire delivers each news summary to your desktop with links to the entire article at our website. Soon, the INEEL News Wire will be available at <http://www.inel.gov>, along with an archive of previous editions.

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A 'greener,' cleaner two-stroke engine

Idaho Falls, July 21, 2003 – Few people have ever characterized a two-stroke engine as a clean-burning engine. In fact, if you've ever been in the vicinity of the exhaust system of a running snowmobile, chain saw or gas-powered lawn trimmer, it's likely you came away with a strong scent of exhaust fumes accompanied by a cough.

That may all change if an idea developed by three researchers at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory makes it from conception to market.

The invention is a small separator that will remove unburned oil and gas from the two-cycle engine exhaust without compromising engine performance.

Small gasoline-powered two-stroke engines are used in many applications from recreational motor craft to hand-held power tools, mopeds, street motorcycles, and even low-cost automobiles. The engine is popular because it is lightweight, low cost, powerful and exhibits quick throttle response.

The two-stroke engine, however, is notoriously dirty. An unavoidable feature of the engine is that it requires oil mixed with gas for internal lubrication. During operation, the intake and exhaust ports are momentarily open at the same time, thereby pulling some of the intake stream containing fuel and oil to leak out into the exhaust port. This results in inefficiency and smoky exhaust emissions.

Typically, 25 percent to 35 percent of the fuel that enters the two-stroke engine leaves unburned. The solution to both problems, according to INEEL researcher and lead engineer Terry Turner, is a technology that can be implemented in new vehicles and retrofitted to existing ones.

The separator will take the exhaust gas and spin it at a high rate, thereby centrifugally separating the heavy oil, fuel and particulates from the lighter gaseous combustion products. The heavy constituents will be burned in an afterburner or captured and removed for recycling or disposal in an environmentally acceptable manner. Turner feels confident that a significant hydrocarbon emission reduction for standard engines, and per unit retail cost under \$400, are realistic. The separator also may reduce noise.

The uniqueness of the INEEL technology is the separator and its location. The separator is predicated on an innovative design. The separator will be located in the exhaust system, the muffler exhaust area, or a combination of both.

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DOE Idaho Names John Kotek New Deputy Manager

Idaho Falls, July 16, 2003 – DOE Idaho Manager Beth Sellers announced today that John Kotek, Advanced Reactors Program Manager for Argonne National Laboratory-West, has been selected as the Nuclear Energy Idaho Deputy Manager. Kotek has held important positions at Argonne and DOE Headquarters, as well as serving as a congressional fellow for New Mexico Sen. Jeff Bingaman.

Reporting at the end of July, his focus will be on the future Nuclear Energy mission for the laboratory, particularly in the area of research and development. Currently he directs Argonne-West's participation in the Generation IV program, an international effort focused on developing the next generation of nuclear power reactors. He also manages Argonne's research program on the use of nuclear energy for the production of hydrogen. John has a bachelor's degree in

nuclear engineering from the University of Illinois and a master's degree in business administration from the University of Maryland.

American Nuclear Society honors INEEL researcher

San Diego, June 30, 2003 – Tirelessly sharing his passion for nuclear power with groups and individuals of all ages has netted Eric Loewen of Idaho Falls a prestigious national award.

Loewen is a scientist at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory and a member of the American Nuclear Society. The ANS presented Loewen with its Public Communication Award at the society's annual meeting in San Diego earlier this month for his efforts to raise the public's awareness about nuclear energy.

"The award recognizes and honors an individual for outstanding personal dedication and accomplishment in furthering public understanding of the peaceful applications of nuclear technology," according to the society.

"Most of my technical education has been paid for by the taxpayers," Loewen said. "All I'm trying to do is give a little bit back." Loewen served as an officer in the Navy and completed his doctorate at the University of Wisconsin on a National Science Foundation fellowship. Loewen said he never turns down a request to speak to students.

Loewen has spoken to audiences ranging from kindergarteners to United Nations councils. He said he prefers a simple, straightforward style of speaking to technical jargon because it allows him to use humor. He captures his younger audiences' interest by creating mock crime scenes, and has even been known to put on a wedding dress.

Loewen has worked at the INEEL for four years. He and his wife live in Idaho Falls with their two children. The size of his household often fluctuates as the family welcomes foster children; another way of giving back to society, Loewen said.

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Pollution sleuthing with environmental forensics

Idaho Falls, July 16, 2003 – If there were such things as air pollution detectives, they would likely find few fingerprints and many cold trails. What they would find are air pollutants that are difficult to accurately detect in both their origin and quantity. Yet, a recent scientific approach is offering a different way of managing air quality.

Atmospheric scientist Michael Abbott from the Department of Energy's Idaho National Engineering and Environmental Laboratory is developing a method of analysis that will decipher the complexity of atmospheric contamination, allowing him to connect downwind air pollution to its source, such as a refinery. Even more remarkably, it identifies multiple sources of contamination and how they contribute to the mix.

"Current air dispersion models take a remarkably crude approach to simulating the complex atmospheric interactions going on," said Abbott. "Such models generate predictions for each contaminant separately, and don't adequately account for complex wind flow patterns or atmospheric chemistry that may remove or transform the contaminants. Also, it's impractical to run these models for the myriad of sources within a city or large industrial area to account for all pollutants."

As air quality has deteriorated, controlling and reducing contamination has become a global imperative. "Emissions control is an important issue to regulators, industry and the public. But we need better tools to understand what contamination sources need to be controlled," Abbott said.

Today's standard uses an estimation of air pollutants contributed by something such as an industrial processing plant. These models estimate the amounts of each pollutant coming out of the stacks (chimneys), and then apply historical measurements of winds and turbulence. This model estimates where the pollutants will travel and the amount of dilution that occurs. The very best results of such air dispersion models can be off by a factor of two - meaning they could be predicting anywhere from half as much to twice the level of contamination that really exists. It's more common for predictions to be off by a factor of 10, Abbott explains.

"We've got to look at the bigger picture, at the cumulative, multisource contributions of regional industrial areas and not just individual businesses to be able to understand and control air pollution," said Abbott. The key is more complete information - validated, scientifically defensible data - that would help regulators determine optimum emission control strategies and how best to permit new facilities, help communities plan new growth and help the public to more accurately weigh the relative risks of proposed plans.

Link to complete news story on the INEEL website is:

<http://newsdesk.inel.gov/contextnews.cfm?ID=442>; Abbott's website is at <http://www.inel.gov/env-energyscience/mercury/>

INEEL announces new leadership for science organization

Idaho Falls, July 8 – Richard (Dick) Jacobsen has been named associate laboratory director of Energy and Environmental Sciences at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL). Jacobsen, has worked at the INEEL since Bechtel BWXT Idaho was awarded the contract to manage the site in October 1999.

In his new position, Jacobsen will be responsible for the INEEL's Research & Development activities supporting the Subsurface Science Initiative and the Laboratory's Geosciences, Physical Sciences, Biotechnology, Materials, Chemistry and Analytical Laboratories departments.

"Dick is highly qualified to assume the responsibilities of this important aspect of the laboratory's research and development division," said Paul Kearns, INEEL vice president and deputy laboratory director. "His background in teaching and research and administration experience at the University of Idaho prior to coming to the INEEL, in addition to his management of INEEL programs, will continue to serve him well in this position."

Jacobsen is a fellow of the American Society of Mechanical Engineers (ASME) and has been nominated to be vice president, research, for ASME with a three-year term beginning in June 2004. His specific research expertise is in thermophysical properties of fluids.

Prior to his new position, Jacobsen was responsible for the strategic planning and technical outreach of the INEEL as well as being the Laboratory's chief scientist. He will retain the title of chief scientist.

Link to complete news story on the INEEL website:
<http://newsdesk.inel.gov/contextnews.cfm?ID=440>

INEEL invites public to comment on implementation plan for site-wide long-term stewardship

Idaho Falls, July 10 – The U.S. Department of Energy-Idaho Operations Office is asking for public comment on the plan for implementing a site wide Long-Term Stewardship program at the Idaho National Engineering and Environmental Laboratory. Comments will be taken through Aug. 15.

After the cleanup mission is complete at the INEEL, the Long-Term Stewardship program will continue to ensure cleanup measures remain protective of human health and the environment. The program will also ensure that records and

information about cleanup projects and land use remain available for local, state and federal agency decision-makers now and in the future.

In 2001, the INEEL established its Long-Term Stewardship program. Members of its staff consulted with stakeholders from around the state to establish goals for the program. Those goals were outlined in a strategic plan issued in September 2002. To make sure the Long-Term Stewardship program will meet those goals, the DOE is asking stakeholders to review and comment on its draft implementation plan.

"My hope is that with the input from the public, our stakeholders and the Shoshone-Bannock tribes, we will be able to develop an implementation plan that will best meet the needs of future decision-makers," said Patty Natoni, DOE's Long-Term Stewardship program manager. "By commenting on the plan, interested stakeholders can help us identify program priorities and performance measures that will ensure we meet our strategic objectives."

As the name implies, the Long-Term Stewardship program is responsible for a wide array of activities over a long period of time, including managing the natural environment, protecting historic and cultural resources, enforcing institutional controls, operating long-term groundwater treatment processes, long-term record-keeping, and promoting stakeholder involvement and communication.

More information about the INEEL Long-Term Stewardship Program is available online at <http://www.inel.gov/environment/ineel-lts.shtml>. The implementation plan will be made available for download from a link on this Web site, along with a form so interested stakeholders can provide their comments online.

Link to complete news story and background on the INEEL website:

http://newsdesk.inel.gov/press_releases/2003/06-30Pit9demonstration.htm

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