Guterl-5 D1-2 26

Top News Headlines

Environment News Message Board

Personalize Your News

Environment Websites

News Web Guide

Current Events Chat

Science News

E-Wire Instant Updates

Environment News Index

Environment Events Calendar

ENS Features
EcoTravel
EDF Scorecard
Shopping Green
Cartoons

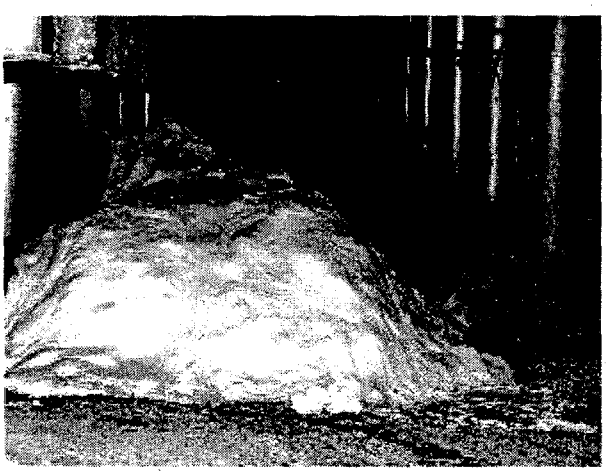
Environment

ENVIRONMENT NEWS SERVICE

New Polymer Coating Immobilizes Chernobyl Radioactive Waste

WASHINGTON, DC, September 18, 2000 (ENS) - A newly developed white silicon polymer coating known as EKOR can completely encapsulate nuclear waste and prevent radioactive contaminants from dusting or seeping into the environment. The substance which is now being demonstrated at the damaged Chernobyl nuclear reactor could solve problems of nuclear waste management anywhere in the world, its developers say.

In March, the EKOR coating was applied in a successful demonstration that contained radiation from the destroyed nuclear reactor at Chernobyl near Kiev, Ukraine. Robots applied the polymer to cover the largest fuel containing mass under the failed Reactor 4 at Chernobyl, the most radioactive spot on the planet.



EKOR coating covers a pile of a molten nuclear fuel located under the Chernobyl reactor. It was dusting and leaching before it was covered by EKOR. This photo was taken after about four months after the coverage and demonstrates no changes in EKOR. (Photos courtesy Eurotech)

Another, more extensive application, is planned for October to develop and fine tune the methods and equipment for applying EKOR coatings to nuclear waste.

When Reactor 4 was destroyed by an explosion and fire in April 1986, molten nuclear fuel collected beneath the ruined reactor where it has been emitting deadly radiation ever since. Many substances have been applied in attempts to contain radiation from the fuel masses and surrounding radioactive dust at Chernobyl, but

all have disintegrated within three or four months from the effects of the radiation.

The ruined reactor and the nuclear fuel masses on the ground floor below are not really protected by the concrete structure that now partially covers the mess. Rainwater enters the building and carries the radioactivity into the soil and groundwater. Birds fly through and become contaminated.

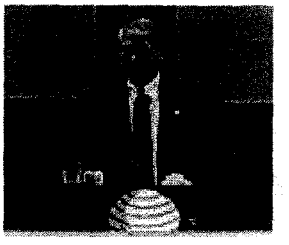
International donors have collected millions of dollars to build a new concrete structure over the reactor, but construction has not yet begun.

EKOR was certified for use by the Ukrainian government in August after an initial application of the composite at Reactor 4 proved that EKOR is radiation resistant, does not degrade even after long term exposure to radiation, and can withstand extreme physical, chemical and biological assaults on its structural integrity.

The substance was developed by Russian scientists at the Kurchatov Institute in Moscow. Some of these scientists went to Chernobyl shortly after the explosion and realized that a way of containing the deadly radiation must be found. The Institute covered the costs of research and development of the polymer.

Kurchatov Institute scientists also developed advanced robots to apply the EKOR coating in the dangerous working conditions under the failed Reactor 4 where humans would suffer the lethal effects of the radiation.

Don Hahnfeldt is president of Eurotech



Once created in the laboratory, the rights to produce and market EKOR were acquired by Eurotech, a publicly traded international technology holding and marketing company based in Washington, DC. Eurotech provided the funds to take the polymer from the laboratory stage to testing and demonstration in the field.

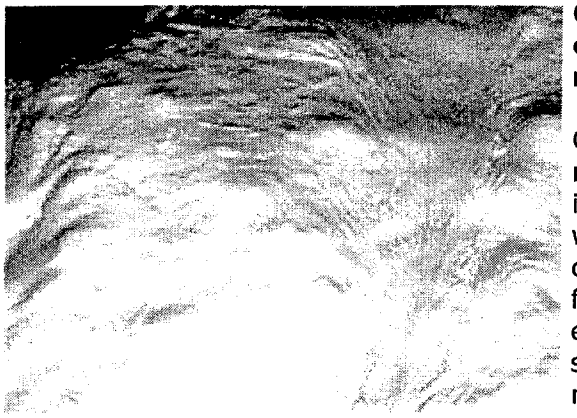
Eurotech president Don Hahnfeldt estimates the total development cost of EKOR to date is approximately $3 million.

Eurotech is currently working with NuSil Technology in Santa Barbara, California to test and prepare EKOR for commercial production in North America where hundreds of nuclear waste sites are emitting radiation.

EKOR is non-toxic, highly fire and heat resistant and can be applied wherever the radioactive material is located, on all surfaces, wet, dry, clean or dirty, according to Peter Gulko, a major shareholder and former director and president of Eurotech. Originally from Kiev himself, Gulko provides liaison between Eurotech and its affiliates in Russia and Ukraine.

To prevent radioactive waste and contaminants from spreading, the ideal encapsulating material must not degrade or decay over

centuries of prolonged exposure to radiation and environmental corrosion.

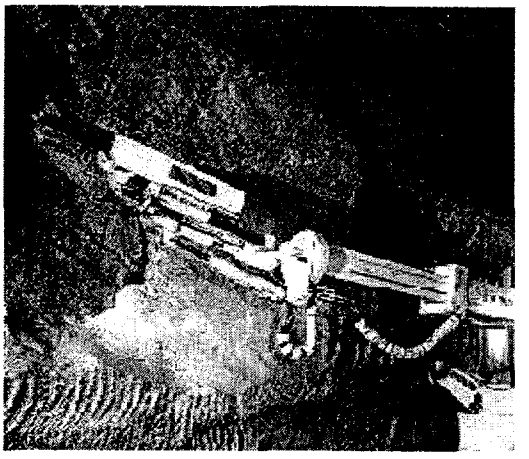


Closeup of EKOR coating in Chernobyl reactor 4

Once applied, the material must form an impervious barrier to water and prevent contaminated materials from leaching into the environment. The substance must be nonflammable and non-toxic, causing no harmful effects to the environment. After exposure to radiation, the material must be disposable as environmentally safe non-radioactive waste if necessary. Gulko says EKOR meets all these criteria.

Recent fires near the Hanford Nuclear Reservation in Washington State, the Los Alamos National Laboratory in New Mexico and at the Idaho National Engineering and Environmental Laboratory illustrate the potential for future nuclear accidents.

At power plants across the United States and in other countries, thousands of tons of spent nuclear fuel are waiting for safe disposal. Radioactive wastes left from Cold War plutonium production for nuclear weapons at Department of Energy facilities across the United States, at the Mayak nuclear complex in Russia, and elsewhere around the world. All of these materials are emitting radiation.



An underground scaling machine removes loose rock from walls and ceilings in the WIPP underground to create a storage area for transuranic waste. (Photo courtesy WIPP)

Only one facility in the world, the Waste Isolation Pilot Plant (WIPP) in the state of New Mexico, USA, is an operating geological repository designed for permanent disposal of long lived radioactive wastes. It accepts transuranic, but not high-level nuclear wastes for storage in salt caverns half a mile below the surface of the Earth.

Scientific evaluation of Yucca Mountain, Nevada for the permanent disposal of high-level nuclear waste has found that even in this arid environment, water might come in contact with the containers in which the waste would be held, eventually eroding the containers and allowing radioactivity to escape.

The greatest problem in nuclear waste management is that many of the facilities designed to store and dispose of these wastes have failed to prevent the leakage into the environment, leaving the groundwater, surface water, soil and air at risk of contamination.

If the EKOR coating continues to perform as it has in the first demonstrations, some of the most dangerous nuclear waste in the world might be more manageable.

Click Here for Related Stories

Environmental Press Releases

Free ENS Daily News Feed by Email

Add Me

Email the Environment Editor

Get your personalized news here.