

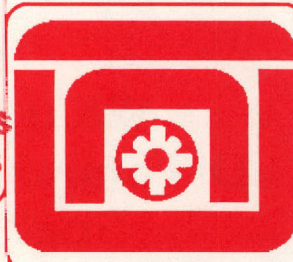
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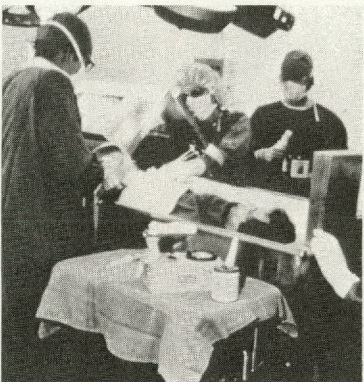
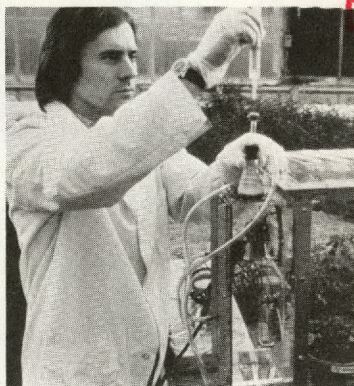
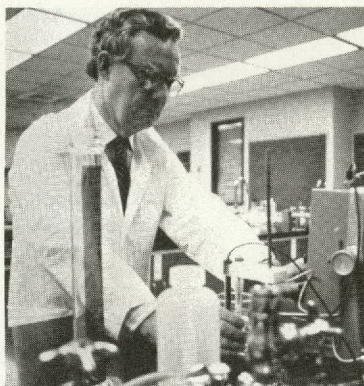
# Rad Waste Review

Government Publications  
March 1990  
Texas State Documents



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*Energy from nuclear power plants and medical, industrial, and agricultural research are just a few of the modern uses for nuclear power. Examples of these uses are illustrated above.*

## Nuclear Power has Many Modern Uses

The plutonium-238 batteries used aboard the Voyager 2 and Galileo spaceships (and on 22 previous space missions, including the moon landings) represent one of the great variety of applications of nuclear materials in today's scientific, industrial, and medical fields.

Some of the other uses of nuclear materials in modern society include the following:

- Nuclear energy plants generated 17 percent of the world's total electricity, without contributing to the accumulation of greenhouse gases in the atmosphere.
- One hospital patient in four in the Western world undergoes a nuclear medicine procedure as part of the diagnostic or treatment processes. Approximately 24,000 nuclear scanners or cameras are used today in hospitals worldwide, avoiding the need for exploratory surgery that patients once dreaded.

*(continued on pg 2)*

Dallas Public Library

## Nuclear Plants Unaffected by California Earthquake

There was no damage to any of California's five operable nuclear power plants as a result of the massive earthquake on October 17 which measured 7.1 on the Richter scale.

The two units at Diablo Canyon, 145 miles from the epicenter at Santa Cruz, were the closest of the five to the center of the earthquake. Ground motion at the site was measured at .01 g's prompting the operator, Pacific Gas & Electric Co., to declare an "unusual event" (the lowest of four alert classifications). However, the motion was far below what the plant was built to withstand. The earthquake was not felt in the control room.

Unit 2 at the Diablo Canyon station continued to operate at 100 percent during the quake, generating power badly needed in California because of damage to other non-nuclear plants and substations. Unit 1 at Diablo Canyon was out of service for maintenance and refueling at the time of the earthquake.

*(continued on pg 4)*

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## What is Decommission- ing?

According to Webster's Dictionary, decommissioning is defined as "to remove something from service". The low-level radioactive waste disposal site built for Texas will be decommissioned at the end of its operating life, approximately 30 years after operations begin.

When decommissioning the disposal site, the Authority will regrade the entire area used for waste disposal to smooth out irregularities. This will promote drainage away from the disposal units. The Authority will also drain and fill in the catch basin area used for holding runoff during site operations.

The buildings at the facility will be surveyed to ensure they are not contaminated. If, as we expect, the buildings show no sign of contamination, the Authority will dismantle and ship them to a sanitary landfill for disposal. The buildings could also be moved to another location for further use or sold for scrap.

The construction equipment used at the site will be cleaned up, surveyed for contamination, and sold for further use or scrapped. At the end of the decommissioning period, the only evidence of disposal operations will be a fence

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## Modern Uses

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- Approximately 5 million cancer patients around the world receive radiation treatments every year from 18,000 radiotherapy machines.
  - Hospitals use gamma radiation to sterilize items like surgical gloves and syringes, lowering the risk that infections will be transmitted.
  - Scientists use nuclear techniques to study the radiation content of water in the Amazon basin. This helps learn more about water cycles and contributes to studies of the problems of deforestation.
  - Industry uses radiation to harden materials, to sterilize products, to make cosmetics, and to make precise measurements. One example: radiation is used to control the thickness and moisture content of paper, enabling the manufacture of thinner paper. This saves material and energy, increases profitability, and lowers environmental impacts.
  - Radiation has been used to breed more than 1,300 varieties of new seeds which enables higher yields, improves quality, and improves resistance to diseases and pests. In the People's Republic of China, 10 percent of the cultivated land surface is planted with seed strains developed by radiation-induced mutation. Benefits to the Chinese run into billions of dollars annually.
  - Gamma sterilization has helped destroy harmful insects like the screw-worm, Mediterranean fruit fly, and the tsetse fly. In the technique, scientists use radiation to sterilize millions of male insects, which are then released to mate—unsuccessfully. This technique has saved billions of dollars annually in crop and livestock losses, while leaving no pesticide residue.
  - Food irradiation is permitted in 35 countries to reduce the risk of food poisoning, to treat food for some hospital patients with very severe illnesses, and to avoid using pesticides. In the United States, for example, gamma radiation is used to disinfect spices.
- Among those uses listed above are many other little-known uses of nuclear technology. Examples include the nuclear-powered icebreakers used by the Soviet Union to keep Arctic waterways open, atomic clocks used to measure time precisely, and self-luminating airport runway lights used by the U.S. Air Force.
- (This article was taken from information contained in Hans Blix's address before The Uranium Institute in London entitled "The Peaceful Applications of Nuclear Energy". Mr. Blix is Director-General of the United Nations' International Atomic Energy Agency in Vienna, Austria.)

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## Court Case Scheduled for April

In return for securing a definite trial date on a pending lawsuit, the Authority has entered into an agreed order with El Paso County to postpone completing technical site studies, filing a license application with the Texas Department of Health, and holding a public hearing in Sierra Blanca until trial begins on April 16, 1989. This order allows the Authority to continue all technical studies that

are underway or that may begin in the next few months.

The agreement stems from a motion filed by El Paso and Hudspeth counties in December requesting a temporary injunction to block further study of the proposed area. "We are tired of the lengthy appeals and delays caused by the lawsuit. We want to try the case on its merits and get it over with once and for all," stated Rick

Jacobi, the Authority's General Manager.

In order to comply with the agreed order, the Authority also amended all contracts to extend their termination dates until August 31, 1990. Final reports under the contracts may not be submitted until after the lawsuit has gone to trial.

## Authority Makes Changes to Proposed Facility Design

The Authority's Board of Directors approved several facility design changes at their quarterly board meeting on February 15, 1989. The Board approved the changes based on staff recommendations made in order to simplify the design and to strengthen the structures for better response to possible earthquakes. The changes made include: (1) the elimination of concrete vaults for disposal of Class B/C waste, (2) the use of concrete canisters for disposal of Class B/C waste, and (3) an increase in the trench depth to allow 5 meters of cover over all waste.

The changes were made in response to recommendations made by Dr. Jose Roesset, a structural engineer and Professor at the University of Texas at Austin. Approval of the design changes enables the Authority to use the revised preliminary facility design in the license application. It also allows the Authority to receive comments on the design from the Bureau of Radiation Control, the Texas Department of Health division responsible for licensing the disposal facility.

The Authority made other changes that did not require Board of Directors' approval. Those changes include the elimination of the waste processing building and off-loading waste directly from trucks into the disposal units. Canisters will be spaced farther apart (approximately one foot) and granular material will be placed between disposal canisters to provide better cushion and drainage. Finally, the cap over the closed disposal units will be covered with soil rather than rip rap to promote natural vegetation growth.



*Christine Pollard, the Authority's Health Physicist, received a Special Recognition award in the third annual Outstanding Women in Texas Government Awards. Christine received her award for her work in the radiological health field.*

## Christine Pollard Earns Outstanding Woman Recognition

Christine Pollard, Certified Health Physicist for the Authority, was selected as one of the special recognition finalists by participating judges in the Outstanding Professional Development category of the third annual Outstanding Women in Texas Government Awards. She was nominated for her work in the field of radiological health.

The Outstanding Women in Texas Government Awards are a project of the State Agency Liaison Group to the Governor's Commission for Women. These awards honor women who have helped shape Texas by contributing their special talents and skills to state service. The awards give Texas an opportunity to recognize the accomplishments of women whose considerable contributions to the state might otherwise go unacknowledged.

Nominations were submitted by agency executive directors and winners were chosen by a panel of distinguished judges from the private sector. In addition to the winners, the judges identified their own category of recognition for several women they felt deserved further acknowledgement. A nomination alone honors the skills women like Christine bring to state government and to the people of Texas.

Christine is a frequent speaker on radiation safety and radioactive waste management. She is one of less than 30 women certified by the American Board of Health Physics.

One of Christine's most recent achievements includes designing and implementing the first-of-its-kind environmental monitoring program for the development of the Texas low-level radioactive waste disposal site. Her program has been reviewed by a number of other states who are just getting started on their own programs.

Christine was manager of the project to develop a technical basis for formulating alternative disposal methods for institutional waste produced in Texas. Her achievement in this area has brought her national recognition. She also developed a database for Texas-produced radioactive waste. She worked with a wide variety of industry and government groups in order to compile the necessary data. Once the data was collected, she analyzed and categorized it into a usable format.

Ms. Pollard has a degree in Biochemistry from the University of Texas at Austin. She will soon be completing her Master's degree in biological sciences. She has over 10 years experience with state government in radiological health and safety.

We are very proud of Christine.

## Decommissioning

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around the property, signs telling people what the area was used for, and markers at the corner of each disposal trench. The trench markers will tell how many cubic feet, how many total curies, and what type of low-level radioactive waste was disposed of in each trench.

The decommissioning period is expected to last three to five years, and the Authority will accomplish most of the work within the first 18 months. The remaining time will be used to maintain the trench caps and to regrade them as settlement occurs. The monitoring systems will continue to monitor the site using a schedule for sampling and analysis similar to that used when the site was operating.

The site will be transferred to the Texas Department of Health after decommissioning is completed. They will monitor the site for at least 100 years under a custodial care program.

## Earthquake

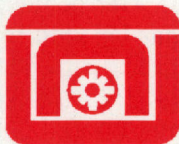
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The three-unit San Onofre nuclear power station in southern California also reported no damage from the quake, as did the Rancho Seco nuclear plant near Sacramento, which has been shut down since June.

Engineered barriers performed well during the earthquake, despite high levels of ground shaking, demonstrating that adverse conditions can be overcome with proper engineering. The proposed Texas low-level radioactive waste disposal site will be designed using massive underground concrete canisters.

## Definitions

1. Background (Natural) Radiation - the radiation that is always present in the environment and is produced by natural sources such as cosmic rays, radioactive elements in the ground, building materials, and the human body.
2. Decommissioning - the process of closing down and putting into a safe state a nuclear reactor or a radioactive waste disposal site after its useful life has come to an end.
3. Half-Life - the time required for half the atoms of a radioactive substance to disintegrate or to decay to another nuclear form; hence the time to halve its radioactive strength.
4. Radiation - the process in which atoms and molecules undergo internal change, resulting in giving off energy.



### Texas Low-Level Radioactive Waste Disposal Authority

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**Please inform us!**