

A&M explores use of tritium

Fusion process student's goal

By PAT DAVIDSON
Battalion Reporter

Mankind has progressed from wood to coal to oil and gas for energy, and a Texas A&M University student may have a hand in the next transition.

Brent Rice, a senior nuclear engineering major, is looking into the properties of tritium barriers for fusion reactors. Tritium is a radioactive isotope of hydrogen, an element found in profusion throughout the world. The research project is part of the Undergraduate Fellows program.

Fusion refers to energy derived from the bonding of atoms. The fusion process cannot yet be used be-

cause of problems with three things— density, containment and temperature of the fuel. Experiments have been conducted that have attained the required density and containment of highly ionized gas (plasma) at the heart of the fusion process, but never in the presence of the proper temperature. No single experiment has met all three requirements.

Rice is hoping that the three problems can be solved with the use of tritium.

In a recent experiment at Princeton University, scientists attained a plasma at a sun-like temperature of 60 million degrees centigrade. While meeting the temperature

standard for the first time, the scientists encountered problems of containing the tritium.

Rice is working on the project with Dr. R.A. Causey, a professor of nuclear engineering at Texas A&M, and is attempting to solve that problem.

Rice explained that tritium and deuterium are the fuels used in fusion reactors. They are found in plasma, a completely ionized substance which can be compressed with magnets. As it is compressed, the plasma heats. When it gets to a temperature of about 70 million degrees, the atoms fuse and energy is released, Rice said.

During the fusion reaction, tritium is burned, so that more must be made or bred, Rice said.

Tritium is bred in the walls around the reactor called the blanket, Rice said.

He said when the plasma is heated, it gives the atoms energy to go through the walls of the reactor by diffusion.

"We want to keep the tritium inside the reactor," Rice said. He explained that tritium is very expensive, costing about \$2,000 per gram to make.

"Since the blanket where you're breeding it is where most of the tritium is, that is where you want to contain it," Rice said. So he and Causey are developing an idea of breeding tritium in balls with lithium centers and pyrolytic carbon outer portion.

He said the neutrons coming off the reactions would hit the balls and the lithium would absorb the neutrons and make tritium. The neutrons would go through the balls, but the tritium would not, Rice said.

"So you've got this ball where you've made the tritium coming out," he said.

Rice pointed out that if the tritium stays in the reactor, energy

is produced in exchange for the money. If it gets out, you are not getting anything for your money, he said.

Tritium appears to be an expensive source of energy, Rice said, but he added that energy costs are steadily increasing. He predicts it will be at least 30 or 40 years before a transition to fusion reactors occurs. By that time, he said, it might compete economically with other fuel sources.

He said that there is an unlimited supply of tritium and deuterium, whereas oil and gas are running out and there is not a limitless supply of uranium, the fuel for fission reactors.

Rice said deuterium is found in high concentration in the ocean.

Rice, an Honors Program student, said he got the idea for his research from Causey. Rice said Texas A&M just offers one course in fusion, and that it is not required.

"I didn't know any more about fusion than the next person when I started," Rice said. "But once I got into it, I could understand fusion because of my background in nuclear engineering."

"I really enjoy what I'm doing and think I'm doing pretty well," Rice, a member of the American Nuclear Society and president of Sigma Nu Epsilon, nuclear engineering honor society, said.

U.S and Mexico energy amigos

United Press International

WASHINGTON — Mexico's ambassador to the United States says although the two nations are "amigo (friendly) countries," two problems hamper good relations: natural gas trade and what to do about illegal aliens.

Ambassador Hugo Margain said Tuesday he hopes the two countries can work out energy agreements more successfully than in the past, particularly in view of Mexico's new-found oil and natural gas reserves.

Margain spoke at the luncheon meeting of the National Energy Resources Organization, an association of people interested in energy topics.

His speech was significant because of Monday's announcement that Mexico's oil wealth may total in the hundreds of billions of barrels, even more than Saudi Arabia's.

Margain said the gas problem will be solved by Mexico using its own gas, because of the failure of the two nations to come to an agreement on financing and marketing.

The problem of the workers needs a bilateral agreement, he said. Mexico will use much of its new-found natural gas to generate electricity, replacing oil that could be sold to other nations, he said.

Mexico hopes to increase its oil production to 2.2 million barrels a day by 1980, Margain said, and to 5 million barrels a day by 1983.

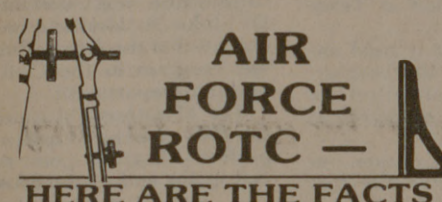
The ambassador said Mexico enjoys friendly relations with the United States, but he added, "It is very vulnerable for Mexico to have only one client—a good friend, but only one client. It is good to have many clients."

Margain said the problem of illegal workers who cross from Mexico into the United States has both a "pull factor" and a "push factor." Mexico hopes that in five or 10 years, "there will be no more push factor."

As for the "pull factor" of attractive wages in the United States, Margain said he hopes the United States can eventually remove that as well. "You know, you have a need for them (Mexican workers) or they would not be here."

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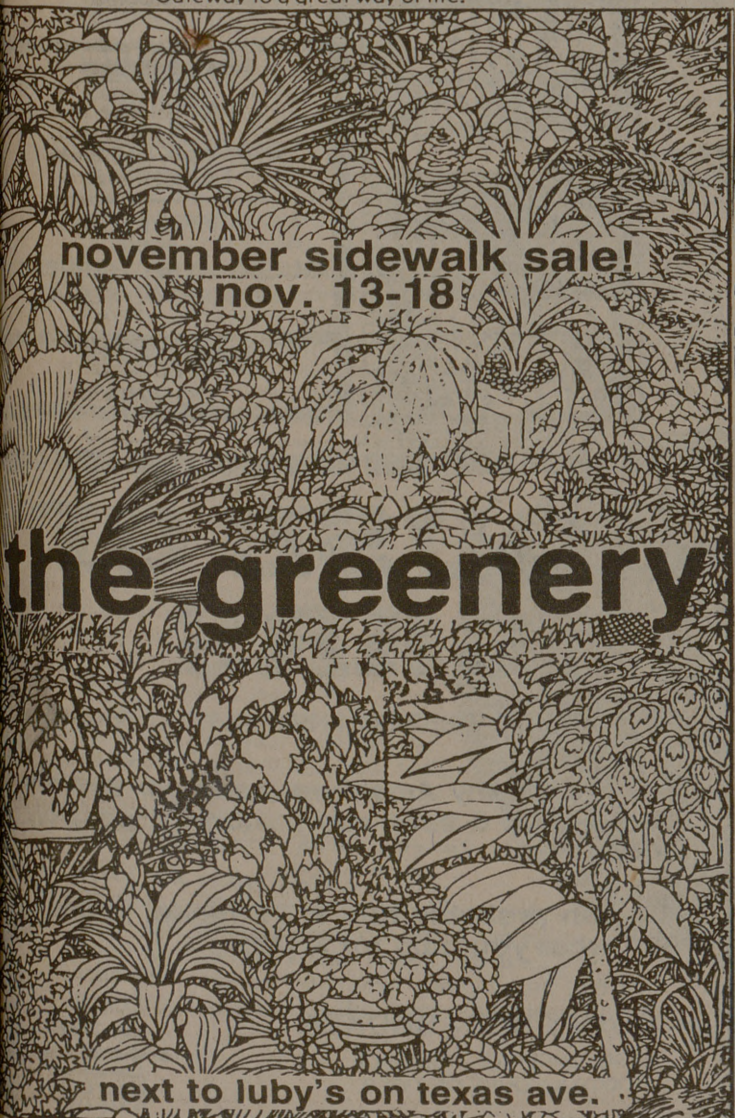
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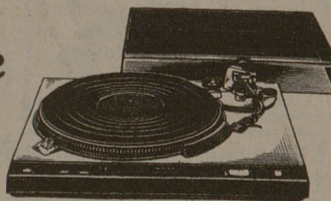
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