Nuclear Notes

Gathered at the Chicago sessions of the American Nuclear Society and Atomic Industrial Forum

REACTORS

Peachbottom Exceeds Expectations

The high-temperature thorium reactor at Peachbottom, Pa., has done better than expected since it went into commercial operation in June.

According to V. S. Boyer of the Philadelphia Electric Co., the experimental reactor, first of its kind to be used commercially in the U.S., operates at higher temperatures with less contamination and longer fuel life than had been estimated.

The Peachbottom reactor uses a mixture of uranium 235 and thorium as fuel. The thorium, much more common than the scarce U-235, changes into uranium 233 when bombarded by neutrons. U-233 then fissions, giving off heat.

The reactor also differs from conventional water-cooled power plants by taking off the fission heat with helium, which can be heated to higher temperatures than water.

Boyer said Peachbottom has had no major difficulties using the helium.

Crucial to the success of the reactor is an improved kind of fuel particle, in which the uranium and thorium are enclosed in a carbon coating that keeps fission products from escaping.

Because of the improved particle, which has a soft inner coating and a hard outer coating, extensive purification systems included at Peachbottom won't be necessary in later models.

ECONOMICS

Small Nuclear Plants Proposed

The nuclear power industry is booming because utilities are convinced large power reactors can compete economically with other fuels.

But John J. Flaherty of Atomics International thinks small plants may be a good idea, particularly for underseas operation and in remote areas where fuel is hard to come by.

Flaherty says large central stations don't take advantage of nuclear power's two main attributes: compactness and long fuel life.

Small, remote plants haven't caught on because they've been built one at a time, with low reliability and needing large operating and maintenance staffs.

But small, reliable, unmanned reactors could be very economical, not only in remote sites, but also in more populated areas, he suggests, because utilities now spend more for transmission and distribution than for generating power.

IRRADIATION

Partial Solution to Food Problems

Processing with radioactive materials may be a partial solution to the food problem in the 21st century, an industry enthusiast declares.

And, says Carl B. Wootten of Isotopes Inc., we're going to need all the partial solutions we can find to lick the problem, the way population trends are moving.

Isotopes Inc., is involved in a joint venture with three other companies to design a food irradiator that will sterilize meat. The Atomic Energy Commission has asked for proposals to build such a plant.

Wootten said although the AEC has asked only for a pilot plant capable of processing one million pounds a year, plans are for a design that could be expanded to full commercial scale of 30 million to 50 million pounds per year.

Five levels of irradiation produce different effects: at the lowest level, growth of wheat and potatoes can be stimulated; then, increasing amounts of radiation will inhibit sprouting of root crops, kill flour weevils, pasteurize products such as strawberries and fish for longer refrigerator life and finally sterilize meat products for unrefrigerated storage.

Wootten says 15 years of research have shown no hazards in irradiated foods.

REACTORS

Leak Detection Problems

Experience with a leaky fuel element in the Idaho Experimental Breeder Reactor II shows that locating the particular culprit can be difficult.

By luck the fuel element that leaked radio-active gas last May was one of three easily identified experimental units rather than one of the hundreds of standard fuel elements used to keep the reactor going, reports R. R. Smith of Argonne National Laboratory. Finding one out of three possibilities was easy—they hit it on the first try.

But, said L. J. Koch, also of Argonne, if any fuel failures occur in the near future at EBR II, locating them will be considerably more time-consuming.

GOVERNMENT RESEARCH

Other Agencies Urged to Use AEC Labs

The national laboratories operated by private industry for the Atomic Energy Commission are a national resource and should be exploited by other Government agencies, the nuclear meetings were told.

Dean Chauncey Starr of the University of California at Los Angeles suggested that new agencies such as the Departments of Transportation and Housing and Urban Development could well use the expertise developed over the years by the various national laboratories supported up to now by AEC funds.

Dr. Starr says the AEC is unique in its fostering of development of a new technology—nuclear power—to be used primarily by private industry.

Now that nuclear power is coming of age, he says, the AEC's role is changing to more of a regulatory function.

As the AEC shifts from its development role, he believes the laboratories should use their great versatility to solve other Government problems.

Dr. Starr says one obstacle to wider use of AEC-supported laboratories by other agencies is that Government bureaucracies don't like to contract with any laboratory they don't dominate. Another is that Congress has its own internal rivalries, which inhibit spending one agency's money in another's bailiwick.