THE AMERICAN SCENE (Continued)

In the ultimate operational device, heat from the reactor will be transferred by a liquid sodium coolant to a boiler containing mercury. The mercury vapour will be fed into a miniature turbo-generator. Such a conversion system has been developed and successfully operated at design conditions with an electrical heat source. The components of the power conversion system were developed by Thompson Ramo Wooldridge, of Cleveland, Ohio.

The SNAP Experimental Reactor takes its name from the Commission programme under which it was developed. Known as the "Auxiliary Power." The objective of this programme is the development of compact source of auxiliary electric power for space vehicle systems. Two basic concepts are being followed. One concept, being developed for the Commission by the Martin Company of Baltimore, Maryland, will use the heat from a radioisotope to operate electrical power conversion equipment. The other concept designated SNAP II, will use the heat from a reactor to operate electrical power conversion equipment. The present experimental reactor follows this concept. The objective of the SNAP reactor programme is to provide devices which will generate many kilowatts of electrical energy for a minimum period of one year in space and which will weigh no more than a few hundred pounds. The device must be capable of withstanding the shocks and vibrations of missile launch, must be capable of unattended, reliable, and automatic operation in a space environment, and must not present a radiation hazard. Such a device would make possible long-lived weather satellites, world-wide television communications, deep-space information transmission and, eventually, inter-planetary travel.

The core of the SNAP II reactor is a hexagonal array of sixty-one cylindrical elements that delivers 50kW (thermal) to a liquid sodium coolant. The fuel elements are Zr H-14M and are 10 m long and 1 in. in diameter. The sodium enters the core at 1000 deg. F., and leaves at 1200 deg. F., carrying the heat to the mercury-vapour turbo-generator. The net electrical output is 3kW, which gives an overall energy-conversion efficiency of 6 per cent.

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