ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

December 13, 1961

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C.

Subject: REPORT ON PM-2A

Dear Dr. Seaborg:

At its thirty-eighth meeting on December 7-9, 1961, the Advisory Committee on Reactor Safeguards considered the Army pre-packaged nuclear power station PM-2A. The Committee listened to representatives from the Corps of Engineers, Department of the Army, as operators of the station and to representatives of ALCO Products, Inc., as designers and fabricators of the reactor. The Committee also had the benefit of analysis by the staff and the documents listed.

The PM-2A is a 10 MW(th) pressurized water reactor located at Camp Century, on the Greenland Ice Cap, 150 miles east of Thule Air Force Base. The plant has been in operation since March 8, 1961 and has accumulated two megawatt years of operation to date. It should be noted that this is the first time that this project has been referred to the Committee for advice. Accordingly, some of the comments which follow concern design features which may not be capable of being changed in the PM-2A but deserve to be considered for incorporation in future reactors of a similar type.

The information which was presented to the Committee was lacking in detail in some areas. However, in view of the remote location and the very low population density near the reactor site, the deficiencies are not considered to be an important safety factor.

There are several points which are worth mentioning as representing departures from accepted good practice.

A generally accepted criterion for the design of reactors provides that criticality should not be achievable on the removal of any one control rod. It is recognized that this feature alone does not make a reactor safe nor guard against a careless operator. It remains, however, a useful bulwark against the malfunctions which are assignable to human errors. This feature was not included in

the original design with a clean core but will be present in the next modified replacement core. With 20% of design life expended, the first core now almost meets the criterion and because of this, no issue is made of this exception.

A definitive measurement of the integral leak rate of the vapor containment after installation was not reported. It is suggested that periodic experimental verification of the containment integrity would be desirable. Refueling periods would seem appropriate times to make these measurements.

The vapor container which has been designed to provide containment in the event of primary vessel rupture has an internal obstruction which might, under conceivable circumstances, effectively reduce the available volume for expansion of steam. The resulting high pressure which could be attained in a primary system failure might also breach the secondary containment. Relatively simple design modifications could avoid this situation.

Instrumentation used for low range startup is marginally acceptable in that only one channel of counting equipment has been provided for the lowest and intermediate ranges. It is understood that methods of providing desirable duplication of at least the startup channel are under consideration.

The presentation did not clearly describe the emergency procedures which have been established to cope with disasters. In particular, information was lacking on provisions for control of plant ventilation and of access of contaminated air to the balance of the camp in the event of a radioactive release.

It is unfortunate that this first review of the PM-2A reactor and its installation comes after the unit has been constructed and operated. It is recommended that deficiencies be corrected where practicable but, in view of the remote location, it is the opinion of the Committee that the PM-2A can continue to be operated without undue hazard to the health and safety of the public including camp personnel.

Sincerely yours,

Sgd/T. J. THOMPSON

T. J. Thompson
Chairman

References attached

References:

APAE No. 49, Revision 1 - Hazards Summary Report for a Prepackaged Nuclear Power Plant for an Ice Cap Location (PM-2A), Issued July 14, 1961.