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

May 20, 1961

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

Subject: REPORT ON VALLECITOS EXPERIMENTAL SUPERHEAT REACTOR (VESR)

Dear Dr. Seaborg:

At its thirty-fourth meeting on May 18-20, 1961, in Cambridge, Massachusetts, the Advisory Committee on Reactor Safeguards considered the Vallecitos Experimental Superheat Reactor (VESR), on the basis of the documents referenced below and discussion with representatives of the General Electric Company and the staff of the Atomic Energy Commission. Prior to this meeting, the VESR had been considered by the Advisory Committee on Reactor Safeguards at its thirty-third meeting on April 6-8, 1961; at the ACRS subcommittee meeting on March 14, 1961 at San Jose, California and at the Vallecitos Site; and at the ACRS subcommittee meeting on April 25, 1961 in Washington, D. C.

The Committee notes three points of interest to reactor safety:

1. The VESR is an experimental reactor. Tests will include operation with purposely defected fuel elements and, generally, operation outside previously established experience.

2. Because the VESR is an all-superheater reactor, the positive reactivity effects connected with unintended flooding or unflooding of steam passages are relatively great.

3. The main control system of the VESR inserts nuclear poison rods against the forces of gravity and of reactor pressure, and the main control system fulfills the functions of shim, regulation, and scram. It is consequently somewhat complex.

The applicant has stated that he intends to provide safety rods which move in the direction of gravity and not against reactor pressure while inserting poison. These rods will be designed solely for the scram function. The reactivity worth of these rods -- approximately $2\%\Delta k$ -- if added to the prompt (negative) reactivity change available prior to destructive fuel melting, should override the maximum positive reactivity effect of flooding or unflooding of the steam passages.

The following items are among those which are not intimately connected with the construction of the main part of the plant and which the Committee would like to consider at a later time:

1. Operation at a power level above 12.5 MW(t).

2. Operation with steam supplied by the Vallecitos Boiling Water Reactor and operation in connection with the VBWR turbine.

3. The shutdown margin.

4. Containment of the steam line to the condenser, and of the condenser itself.

5. Specifications and measurement of the containment leakage rate.

6. Control of routine radioactivity release to the atmosphere, on-site environmental radioactivity monitoring, and interaction in these respects of the VESR with other plants on the Vallecitos site.

The Advisory Committee on Reactor Safeguards believes that, with the addition of the safety rods discussed above, a reactor of the type proposed can be constructed at the Vallecitos site with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely yours,

/s/

T. J. Thompson
Chairman

References:

1. GEAP-3643, Preliminary Hazards Summary Report for the Vallecitos Superheat Reactor, dated February 1, 1961.
2. Amendment #1 to License Application, dated March 14, 1961.
3. Amendment #2 to License Application, dated March 24, 1961.
4. Amendment #3 to License Application, dated April 14, 1961.
5. Amendment #4 to License Application, dated May 1, 1961.