

June 23, 1955

Mr. K. E. Fields
General Manager
U. S. Atomic Energy Commission
Washington, D. C.

SUBJECT: GENEVA REACTOR - PROJECT AQUARIUM

References: A--DWL OF 55-3-6 as corrected
B--Addendum to CF 55-3-6

Dear Mr. Fields:

The Geneva reactor was reviewed by a Subcommittee of the Advisory Committee on Reactor Safeguards on June 18, 1955 at Oak Ridge. The Subcommittee is of the opinion that the operation of this reactor at Geneva under the conditions proposed does not incur any appreciable hazard as long as the following limitations are observed. Every member of the Advisory Committee on Reactor Safeguards concurs in the Subcommittee recommendations.

1. Fuel loading and configuration in Geneva shall be identical to that used in the original test at Oak Ridge, that is to say, 5 x 5 lattice with 2 unused holes, 19 full fuel elements (170 gm U-235 each, marked "G"), 3 control rod fuel elements (25 gm U-235 each), and one additional fuel element in the lower right hand corner that will be sufficient to make the reactor critical and give $\Delta k/k$, a maximum value of 0.005. This last (23rd) fuel element may be either (a) 1/3 plates (56 gm U-235), 2/3 plates (113 gm U-235), or a full fuel element, choice to be made in Geneva. Tests at Oak Ridge gave the following:

1/3 fuel element	$\Delta k/k = 1.000 \pm$
2/3 " "	$= 1.0025$
full " "	$= 1.005$

In the improbable event that a full fuel element in the lower right hand corner will not give $\Delta k/k$ of 0.005 and if the actual $\Delta k/k$ so obtained is insufficient for the proposed operation then an additional corner may be used to obtain up to a maximum $\Delta k/k$ of 0.005.

2. The Subcommittee recommends against taking out fuel elements every night, that is to say, once the reactivity has been adjusted to a

F/33

June 23, 1955

maximum of 1.005 the fuel elements will not be disturbed except to replace damaged ones or other necessary maintenance.

3. Extra fuel rods are to be kept in security area under guards reporting to Mr. George G. Manov. No rods are to be issued or exchanged without his OK in writing and in accordance with the procedure specified in Reference B. Strict accountability is to be maintained.
4. For the benefit of VIPs, special tours through the control room will be permitted under escort. VIPs will be allowed to start up the reactor under supervision. The automatic safety controls are such that pressing the wrong buttons shuts down the reactor.

The AEC will control the total number of visitors to be accorded this privilege. (ORNL suggests a maximum of 50.)

No experiments are to be performed excepting the nine described in Reference B.

5. The control system and its operation as presented to the Subcommittee is not to be modified by the incorporation of any additional devices.
6. The reactor will not be loaded with any "dummy" fuel elements.
7. If it is necessary to replace a fuel element the reactor will be recalibrated.
8. If it is found that an excess $\Delta k/k$ of 0.005 is not sufficient for the proposed operation a request to exceed this value will be submitted to Washington.

Sincerely yours,

C. Rogers McCullough
Chairman
Advisory Committee on
Reactor Safeguards

cc: G. Manov
G. Weil, O.I.C.
Dr. C. Larson, ORNL
Dr. A. Weinberg, ORNL
S. Sapiric, Mgr., CROO

*Sent 6/20/55
mym*

*File
6-20-55
mym*