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return to  
Dr. Price  
Criteria Standards

Dr. C. Rogers McCullough, Chairman  
Advisory Committee on Reactor Safeguards  
U. S. Atomic Energy Commission  
Washington 25, D. C.

1/2/59

Dear Dr. McCullough:

We attach hereto for members of the Advisory Committee and for discussion at the January meeting rough drafts of criteria relating to selection of sites for reactors and other safety problems.

These drafts will require a great deal of further study before they are in a form which would be considered acceptable. We believe it would be premature for the Committee to offer formal comments at this stage on these rough drafts but we would welcome any discussions of these criteria, comments and suggestions, during the forthcoming meeting which might assist us in the further development of these criteria.

It is our hope that perhaps by the March meeting we may have this material in a more definitive form.

Sincerely yours,

Harold L. Price, Director  
Division of Licensing and Regulation

Enclosure:  
Criteria-site selection (16)

BCC: E. R. Price

HEB:DL&R

DLR

Beck:cse  
12/31/58

H.L.Price  
12/ /58

A/34

Draft  
/Beck/cse  
12/29/58

## CONTROL SYSTEMS

1. There must be instruments, equipped with automatic level and rate of rise trips, capable of responding to the neutron flux in the start-up range.
2. There must never be less than 2, preferably 3, independent flux monitoring channels.
3. If normal instruments at any range are all similar, it is desirable that these be backed up by a scrambling mechanism of another type.
4. On reactors having power levels of 1 Mw or less, both flux level and period scram protection must be employed at all times.
5. On reactors above 1 Mw, flux level scram protection must be employed at all levels. Period scram is not mandatory in the operating range.
6. Arrangement for a scram only on trip coincidence from 2 channels may only be employed if there are at least three independent channels from which the coincidence trips can originate.
7. During start-up or operation at levels substantially below nominal maximum power, at least one level scram (neutron, gamma, temperature) must ride down in the near vicinity of actual level at any time, and be advanced as necessary as the power increases.
8. There must be periodic check by appropriate signal input or mock up source of the actual response of each safety channel over the whole response range, including activation of the alarm, trip or scram device.
9. Insofar as possible all safety channels must be so constructed that their failure will cause shutdown.

*9/29/58*

## CONTROL SYSTEMS

Continued.

10. In any flux detector there must be an interlock which will cause reactor scram if the high voltage supply to the chamber deviates substantially from the proper value.

11. Interlocks of all sorts should be chosen with great care. It is essential that the necessary ones be provided, but it is hazardous to provide more than are needed. Once chosen, a safety interlock must never be by-passed or deactivated by the operating staff.

12. Safety interlocks must be so arranged that range changes of indicators do not deactivate or move the position of the alarm, trip, or scram point.

13. After any maintenance or alteration of a safety channel, a complete recheck of response must be made, including interlock activation by an appropriate impressed signal.

14. An automatic power level control system may not have capability of both a rapid delta k insertion and a large delta k insertion. In any case, the excess reactivity which may be inserted automatically may not exceed the equivalent value of  $\beta$  (beta) except in special circumstances.

15. When an automatically operated control rod of appropriate value reaches its limit of travel it may not automatically invoke shim withdrawal.