DISTRIBUTION:
Docket File (4)
NRC PDR (4)
L PDR (2)
ORB#2 Rdg
VStello
KRGoller
TJCarter
Attorney, OELD
OI&E (6)
DZiemann
RSilver
PO'Connor
RDiggs
DEisenhut
TBAbernathy
JRBuchanan
ACRS (16)
MFairtile
RPSnaider
MGrotenhuis

Dockets Nos.: 50-254
50-265
~~50-237~~
and 50-249

FEB 2 1977

Commonwealth Edison Company
ATTN: Mr. R. L. Bolger
Assistant Vice President
P. O. Box 767
Chicago, Illinois 60690

Gentlemen:

We are reviewing your submittals for Quad Cities Units Nos. 1 and 2 and Dresden Units Nos. 2 and 3 dated September 26, 1975 and September 9, 1976, regarding exemptions from the requirements of Appendix J 10 CFR Part 50. The additional information requested in the enclosure is necessary to continue our review.

To enable us to maintain our review schedule please submit the requested information within 60 days of the date of this letter.

Sincerely,

Original signed by
Richard D. Silver
for
Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosure:
Request for Additional Information

cc w/enclosure: See next page

OFFICE	ORB#2:DOR	ORB#2:DOR	ORB#4:DOR	~~AD-OT:DOR~~	ORB#2:DOR
SURNAME	RSilver	PO'Connor:rm	MFairtile	~~DEisenhut~~	DLZiemann
DATE	1/31/77	1/31/77	2/2/77	~~1/ /77~~	2/2/77

Form AEC-318 (Rev. 9-53) AECM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166

cc w/enclosure:
Mr. Charles Whitmore
President and Chairman
Iowa-Illinois Gas and
Electric Company
206 East Second Avenue
Davenport, Iowa 52801

Mr. John W. Rowe
Isham, Lincoln & Beale
Counselors at Law
One First National Plaza, 42nd Floor
Chicago, Illinois 60603

Anthony Z. Roisman, Esquire
Roisman, Kessler and Cashdan
1025 15th Street, N. W., 5th Floor
Washington, D. C. 20005

Moline Public Library
504 - 17th Street
Moline, Illinois 61265

Morris Public Library
604 Liberty Street
Morris, Illinois 60451

ENCLOSURE

STAFF POSITIONS AND REQUEST FOR

ADDITIONAL INFORMATION

COMMONWEALTH EDISON COMPANY

QUAD CITIES STATION UNITS NOS. 1 AND 2

DRESDEN UNITS NOS. 2 AND 3

REQUEST FOR EXEMPTIONS TO REQUIREMENTS OF APPENDIX J

TO 10 CFR PART 50

1. Testing of Instrument Lines

You have requested an exemption from the requirements of paragraph II.H.1 of Appendix J as they relate to the Type C tests on the instrument lines.

Provide an evaluation to demonstrate that Quad Cities Nuclear Power Station, Units Nos. 1 and 2 and Dresden Nuclear Power Station Units Nos. 2 and 3 are in accord with the provisions of Regulatory Guide 1.11, "Instrument Lines Penetrating Primary Reactor Containment," and "Supplement to Safety Guide 11, Instrument Lines Penetrating Primary Reactor Containment Backfitting Considerations," February 17, 1972 (Attachment A).

2. Sequence of Local and Integrated Leak Rate Tests

To satisfy paragraphs III.A.1.a and III.A.e.a of Appendix J to 10 CFR 50, you plan to conduct local leak rate tests during the first part of an outage and conduct an integrated leak rate test near the end of the outage.

The requirement of Appendix J, 10 CFR 50 and of ANSI N45.4 with respect to the integrated leak rate test is that it be conducted following the required containment inspection and before any repairs or adjustments are made so as to provide assurance that the containment is tested in as close to the "as is" condition as practical. In regard to your plan to conduct local leak rate tests before the integrated leak rate test, we find that due to design considerations it is not possible to determine what portion of the total measured leakage was into the containment and what portion was out of the containment for many of the local leak rate tests. Consequently, if the local leak rate tests are conducted before the integrated leak rate test, an element of uncertainty would exist as to the method and accuracy when correcting back to establish the "as is" integrated leak rate results. To eliminate any uncertainty in regard to the accuracy and methods utilized in back calculating to the "as is" containment leak rate condition, and thereby concurrently permitting you to perform one rather than two integrated leak rate tests, we find that the above requested exemption can be considered only if the conservative assumption is made that the total measured local leak rate is in a direction out of the containment when establishing the "as is" and final containment leak rate.

Please indicate your intention to abide by the Appendix J, 10 CFR 50 and ANSI N45.4 requirements or to assume that the total measured leak rate is in a direction out of the containment in making the calculations to establish the "as is" integrated leak rate.

3. Airlocks

Your submittal describes the difficulties encountered in meeting the letter of the requirements of paragraph III.D.2, Appendix J regarding the periodic retest schedule of the Type B airlock tests and concludes with the statement "Our experience indicates that testing at each refueling outage will satisfactorily ensure that the integrity of those locks is maintained."

The exemptions proposed by you regarding the testing of the airlocks are unacceptable. To guide you in the preparation of an acceptable response we have prepared a discussion on the requirements of Appendix J as they relate to airlock leakage testing. These are described in Attachment B to this enclosure.

We request that you submit a response within the range of options presented in Attachment B.

4. Test Pressure for the Airlocks

In regard to the airlock seal tests, paragraph II.G.2 specifies they are to be conducted as Type B tests and paragraph III.B.2 requires that the Type B tests be made at a pressure not less than Pa, which is the calculated peak containment internal pressure related to the design basis accident.

Provide a response, within the range of options presented in Attachment B, that utilizes the requested reduced pressure during the tests.

5. Traversing Incore Probe System

Your submittal states: "The traversing incore probe (TIP) system's ball valves are not testable. These valves are normally closed during operation and also go closed, if open, on a Group II isolation signal."

Due to the potentially significant containment leakage path via the TIP system and testing experience, we cannot grant an exemption for this system. We require that these valves be made testable by installing test connections and that an additional valve be installed in series with the present ball valves. Also, we require that the TIP purge line to be made testable by installing a block valve and a test connection. Provide your plans to meet these requirements and a schedule for installing these additional connections and valves.

6. Additional Questions for Dresden Station Only

Additional exemptions are requested to paragraphs II.H.1, II.H.3, and II.H.4 of Appendix J relative to drywell air sample valves (except for the continuous air monitor and sample return valves), isolation condenser vent valves, ECCS injection valves, and reactor building closed cooling water supply and return valves.

We find that the justification provided in your request for exemptions is not sufficiently responsive to our August 5, 1975 letter which requested "If you are not in full compliance, you should identify your planned actions and schedule to attain conformance to the Regulation. Possible courses of action include design modifications, amendments to the Technical Specifications, and requests for exemption pursuant to 10 CFR Part 50, Section 50.12." Further, should an exemption be requested, supporting information should be provided which describes the design features that do not permit conformance.

Provide additional information which supports and justifies the above for exemption for each of the lines penetrating the containment.

ATTACHMENT A

SAFETY GUIDE 11

INSTRUMENT LINES PENETRATING PRIMARY REACTOR CONTAINMENT

A. Introduction

General Design Criteria 55 and 56 require that each line that penetrates primary reactor containment and is part of the reactor coolant pressure boundary or that is connected directly to the containment atmosphere have one automatic valve inside and one automatic valve outside containment "unless it can be demonstrated that the design is acceptable on some other defined basis." This guide describes a suitable basis which may be used to implement General Design Criteria 55 and 56 for demonstrating the acceptability of a particular group of these lines, namely, instrument lines.

B. Discussion

Valving provided for each instrument line penetrating or connected to primary reactor containment must reflect the importance of two safety functions: (1) the function the line performs and (2) the need to maintain containment leaktight integrity. The probability of achieving the first function is enhanced by inclusion of fewer valves (e.g., one rather than two), whereas that of the second function is enhanced by additional valves.

In the event of a rupture of any component in the instrument line outside primary containment, it is important to assure that the integrity and functional performance of secondary containment and its associated filtration systems are maintained. It is also desirable to keep the rate and extent of coolant loss from the ruptured component within the capability of reactor coolant makeup system. The probability of such a rupture is considered to be sufficiently high that the calculated offsite exposures that might result from such a single failure during normal operation should be substantially below the guidelines of 10 CFR 100.

The rate of coolant loss from an instrument line rupture outside containment can be reduced by including flow restrictions, such as orifices, in the instrument line. The flow restrictions should be sized to reduce this rate of coolant loss to the extent practical without adversely affecting the capability of the connected instruments to perform their functions. In particular, it must be assured that the response time of the instruments does not become unacceptably long because of such flow restrictions and that the flow restrictions will not become plugged. It is also desirable that flow restrictions in the instrument line be located as close as practical to where the instrument line connects to the reactor coolant system.

If the conditions of the two preceding paragraphs are satisfied, an acceptable capability for isolating instrument lines penetrating or connected to primary reactor containment can be provided by a single isolation valve capable of automatic operation (no dependence on operator actions) or capable of remote operation by the operator in the control room or another appropriate location. A self actuated excess flow check valve is acceptable as an automatically operated valve if it has the other features needed for this service. It is desirable that the isolation valve be located outside containment for greater accessibility. For power operated valves, which may provide a safety function in either the open or closed position, on balance, greater safety will be afforded by designing this valve to remain "as-is" (usually open) if power is lost.

Elimination of the isolation valve inside containment makes it important that there be a high degree of assurance that the piping from the containment up to and including the outside valve retain its integrity during normal reactor operation and under accident conditions. This assurance can be provided by locating the valve as close to containment as practical, by adopting a conservative approach in the design of this section of piping, by suitable quality assurance provisions, and by suitable visual inservice inspections. Performing inservice inspections should not increase the probability of damaging the instrument lines. In addition, provisions may be needed to protect against accidental damage of lines and to assure that failures of one line will not induce failure of any other line by pipe whip, missiles, or some other mechanism.

Sufficient experience with valves of a similar type should be available to assure a high probability that the valve will not close when the instrument line is intact and its safety function is required, but that it will close if the instrument line is ruptured downstream. In the event of a rupture downstream of the valve, the valve should close automatically or be capable of being closed during normal reactor operation and under accident conditions. In addition, the valve should reopen automatically or be capable of being reopened readily under the conditions that prevail when reopening is appropriate. It should not be necessary to break a line to reopen a closed valve.

It is desirable to have valve status (opened or closed indicated in the control room because without such an indication, a valve may be closed and the effectiveness of the instrument impaired for long periods of time. For remotely operable valves, the operator needs sufficient information regarding the status of the valve and the condition of the line so that he can take proper, timely actions.

Lines connected to instruments that are part of the protection system are extensions of that system and should satisfy the requirements for redundancy, independence, and testability for the protection system, to assure that the protective function will be accomplished.

Lines connected only to instruments that are not part of the protection system need not meet the requirements of the protection system. For these lines, the assurance that isolation can be effected when required is of greater importance to safety than the capability of the connected instrument function; therefore, more extensive valving is acceptable.

C. Regulatory Position

To implement General Design Criteria 55 and for instrument lines penetrating or connected to primary reactor containment:

1. *Sensing lines for instruments that are part of the protection system:*
   a. Should satisfy the requirements for redundancy, independence, and testability of the protection system.
   b. Should be sized or orificed to assure that in the event of a postulated failure of the piping or of any component (including the postulated rupture of any valve body) in the line outside primary reactor containment during normal reactor operation, (1) the leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss are within the capability of the reactor coolant makeup system, (3) the integrity and functional performance of secondary containment, if provided, and associated safety systems (e.g., filters, standby gas treatment system) will be maintained, and (4) the potential offsite exposure will be substantially below the guidelines of 10 CFR 100.
   c. Should be provided with an isolation valve capable of automatic operation[1] or remote operation from the control room or from another appropriate location, and located in the line outside the containment as close to the containment as practical. There should be a high degree of assurance that this valve (1) will not close accidentally during normal reactor operation, (2) will close or be closed if the instrument line integrity outside containment is lost during normal reactor operation or under accident conditions, and (3) will reopen or can be reopened under the conditions that would prevail when valve reopening is appropriate. Power-operated valves should remain as-is upon loss of power. The status (opened or closed) of all such isolation valves should be indicated in the control room. If a remotely operable valve is provided, sufficient information should be available in the control room or other appropriate location

[1] A self-actuated excess flow check valve is acceptable as an automatically operated valve provided it has all other features specified in the guide.

to assure timely and proper actions by the operator.

d. Should be conservatively designed up to and including the isolation valve and of a quality at least equivalent to the containment. These portions of the lines should be located and protected so as to minimize the likelihood of their being damaged accidentally. They should be protected or separated to prevent failure of one line from inducing failure of any other line. Provisions should be included to permit periodic visual inservice inspection, particularly of those portions of the lines outside containment up to and including the isolation valve.

e. Should not be so restricted by components in the lines, such as valves and orifices, that the response time of the connected instrumentation will be increased to an unacceptable degree.

2. *Sensing lines for instruments that are not part of the protection system:*

   a. Should meet the provisions of 1.b., 1.c., 1.d., and 1.e., above, or

   b. Should be provided with one automatic isolation valve inside and one automatic valve outside containment. The valve outside should be located as close to containment as practical.

SUPPLEMENT TO SAFETY GUIDE 11

INSTRUMENT LINES PENETRATING PRIMARY REACTOR CONTAINMENT

BACKFITTING CONSIDERATIONS

D. Introduction

Safety Guide 11 describes the regulatory position concerning instrument lines penetrating primary reactor containment for present and future reactors. The purpose of this supplement is to provide guidance to applicants and licensees concerning possible backfitting with regard to these instrument lines. This supplement does not represent a requirement for backfitting; such requirements will be formulated on an individual case basis pursuant to §50.109, "Backfitting," of 10 CFR Part 50.

E. Regulatory Position

1. Plants for which a notice of hearing on application for construction permit was published on or after January 5, 1970, should conform to the regulatory position in the safety guide.

2. Plants for which a notice of hearing on application for construction permit was published between January 5, 1967, and December 30, 1969, should meet the following criteria as soon as practicable:

   a. Each instrument line connected to the reactor coolant pressure boundary and penetrating containment should be sized or include an orifice such that if a postulated failure of the piping or of any component (including the postulated rupture of any valve body) in the line outside primary reactor containment occurs during normal reactor operation:

(1) the leakage is reduced to the maximum extent practical consistent with other safety requirements,

(2) the rate and extent of coolant loss are within the capability of the reactor coolant makeup system,

(3) the integrity and functional performance of secondary containment, if provided, and associated safety systems (e.g., filters, standby gas treatment system) will be maintained, and

(4) the potential offsite exposure will be substantially below the guidelines of 10 CFR Part 100.

b. For each instrument line penetrating containment, including those connected to the containment atmosphere, some method of verifying during operation the status (open or closed) of each isolation valve should be provided.

3. Licensees of plants for which a notice of hearing on application for construction permit was published on or before December 30, 1966, should furnish to the regulatory staff a suitable analysis of the effects on the secondary containment, if provided, and associated safety systems of a postulated failure of the piping or of any component in an instrument line outside primary reactor containment. With respect to plants for which the integrity and

functional performance of the secondary containment building and associated safety systems cannot be maintained under these postulated conditions, the licensee should provide protection equivalent to that described in 2.a.(3) above as soon as practicable consistent with the reactor shutdown schedule.

ATTACHMENT B

CONTAINMENT AIRLOCKS

Appendix J to 10 CFR 50 requires that reactor containment airlocks be leak tested at the peak calculated accident pressure (Pa) at six month intervals. Further, should the airlocks be opened during such intervals, the airlocks will be leak tested after each opening. Appendix J calls out these specific requirements for airlocks because they represent a potentially large leakage path that is more subject to human error than other isolation barriers.

The staff's interpretation of the objectives of the airlocks leak testing requirements are (1) that the six month test will provide an integrated leakage rate for the entire airlock assembly, including electrical and mechanical penetrations, the airlock cylinder, hinge assemblies, welded connections, and other potential leakage paths; and (2) that the "after each opening" test would provide a means of assuring that the door seals had not been damaged or seated improperly during airlock use.

For those operating facilities that were designed and constructed prior to the issuance of Appendix J, consideration has been given to the alternatives to the specific testing requirements which will meet the provisions of Appendix J. Listed below are a number of guidelines which may be useful when considering or revising current airlock leak testing programs.

1. At six month intervals, the entire airlock assembly shall be leak tested at the peak pressure, Pa. If the test pressure will lift the inner airlock door off its seat a strongback or other mechanical devices should be used so that meaningful test results can be obtained at Pa.
2. Should the airlock be opened during the interval between the six month tests, the airlock door seals shall be leak tested with in 72 hours of the first of a series of openings. This relaxation in the "after each opening" test requirement of Appendix J recognizes that a significant amount of time is required to conduct these intermediate tests in relation to the frequency of use of the airlock. These tests would be conducted whenever containment integrity is required.
3. For those plants which require the use of a strongback or clamps to leak test the door seals at a pressure Pa, a lower pressure (e.g., manufacturer's recommended pressure, which would not require the use of such clamping devices) should be used to conduct the intermediate tests. The results of leakage tests at the lower pressure shall be conservatively extrapolated to a leakage rate at the accident pressure Pa to determine acceptability.

4. In lieu of the intermediate tests, an acceptable alternative would be the use of a continuous leakage monitoring system. As in the case of reduced pressure intermediate tests it must be demonstrated that the leakage rate using a continuous pressurized monitoring system is sufficiently sensitive, and can and will be conservatively extrapolated to the leakage rate that would be experienced under accident conditions (e.g., at a pressure of Pa).