Consumers Power Company

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November 7, 1975

Regulatory File Cy.

Director of Nuclear Reaction Regulation
Attention: Mr. Roger Boyd, Acting Director
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

MIDLAND PROJECT
DOCKET NUMBERS 50-329, 50-330
REGULATORY GUIDE MEETINGS
FILE: 0505 SERIAL: 1907

We are attaching herewith 10 copies of the Consumers Power Company positions on implementation of Regulatory Guides 1.1, 1.4, 1.7, 1.13, 1.25, 1.42, 1.49, 1.52, 1.54 and 1.70. These Regulatory Guides are on the agenda for discussion in the Miscellaneous Regulatory Guide meeting which has been scheduled for December 19, 1975 by your staff.

R. C. Bauman
Project Engineer

RCB/PLB/gt

Attachments

REGULATORY GUIDE 1.1

NET POSITIVE SUCTION HEAD FOR EMERGENCY CORE COOLING AND CONTAINMENT HEAR REMOVAL SYSTEM PUMPS (11/2/70)

RESPONSE TO REGULATORY POSITION

Adequate NPSH for emergency core cooling and containment heat removal system pumps is provided assuming maximum expected temperature of pump fluids and pump pressures equal to saturation pressure for the fluid temperature. The condition postulated by the Regulatory Guide is physically impractical. That is, that the fluid could be at its maximum expected temperature and yet be at pre-LOCA pressure.

The Applicant has addressed NPSH in its response to DOL question 6.2 in the PSAR. During the injection mode of ECCS operation the Regulatory Guide is met. During recirculation it is assumed that the vapor pressure at the pump is equal to the containment pressure; thus, the available NPSH equals the elevation head minus the head associated with friction loses and is not a function of pressure or temperature.

REGULATORY GUIDE 1.4

ASSUMPTIONS USED FOR EVALUATING THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF A LOSS OF COOLANT ACCIDENT FOR PRESSURIZED WATER REACTORS (Rev. 2 June 1974)

RESPONSE TO REGULATORY POSITION

The potential radiological consequences of the design basis loss of coolant accident are evaluated, using the assumptions of the regulatory position, with the modifications noted below. These modified assumptions are considered within the intent of this Regulatory Guide.

(1) Reference - Paragraph C.1a of the Regulatory Guide. The paragraph requires assumption that 91 percent of the airborne iodine is in the form of elemental iodine, 5 percent in the form of particulate iodine and 4 percent in the form of organic iodides.

In the analysis for the Midland Nuclear Power Plant, the airborne iodine is divided into two fractions: fast reacting and slow reacting.

Ninety-Six percent of the airborne iodine is assumed to be fast reacting and four percent of the airborne iodine is assumed to be slow reacting. The fast reacting fraction contains both elemental and particulate iodines. The slow reacting fraction contains the organic iodides. Particulate iodines are included in the fast reacting fraction because experiments at Battelle Northwest[A] showed that in a steam air atmosphere, iodine aerosols are removed as rapidly as elemental iodine. This is consistent with regulatory position C.1d of the Guide, which states that "The reduction in the amount of radioactive material available for leakage to the environment by containment sprays...may be taken into account...."

(2) Reference - Paragraph C.2.e of the Regulatory Guide. In the calculation of skin dose due to beta radiation, credit will be taken for the inert thickness of the skin, which is approximately 7 mgms/Cm^2.

Due to the limited extent of the effluent plume, the gamma dose conversion factors will be realistically determined using the finite cloud model as proposed in Meteorology and Atomic Energy [B].

(3) Reference - Paragraph C.2.6 of the Regulatory Guide. The atmospheric dispersion factors used in the final analysis will be based on onsite meteorological data. The dispersion factors used in the preliminary analysis are based on the meteorological data collected at Dow Chemical Plant and Tricity (Saginaw) Airport.

(A) Hilliard, R.K., et al, Removal of Iodine and Particles from Containment Atmosphere by Sprays-Containment Systems Experiment Interim Report Battelle Memorial Institute. BNWL-1244, Richland, Washington, February 1970.

(B) Slade D.H., Meteorology and Atomic Energy, 1968, U. S. Atomic Energy Commission, Office of Information Services TID-24190 (1968).

REGULATORY GUIDE 1.7

CONTROL OF COMBUSTIBLE GAS CONCENTRATIONS
IN CONTAINMENT FOLLOWING A LOSS OF COOLANT ACCIDENT
(March 10, 1971)

RESPONSE TO REGULATORY POSITION

The design guidance and assumptions for analysis of the regulatory position of Regulatory Guide 1.7 as supplemented by Standard Review Plan 6.2.5 and Branch Technical Position Paper CSB 6-2 are used without exception for control of combustible gas concentrations in containment following a loss of coolant accident.

REGULATORY GUIDE 1.13

FUEL STORAGE FACILITY DESIGN BASES
(March 10, 1971)

RESPONSE TO REGULATORY POSITION

The Midland Project complies with the requirements of Regulatory Guide 1.13 with the following clarifications:

C.1 The seismic classification of the fuel storage facility ventilation and filteration system is discussed in Consumers Midland Project response to Regulatory Guide 1.29.

C.4 Exception is taken to failure of the cladding of all the fuel rods in one bundle. The 56 peripheral fuel pins are assumed to release their gap activity. See response to Regulatory Guide 1.25 for further discussion of fuel handling accident assumptions.

C.6 Normal makeup to the spent fuel pool is supplied from the chemical addition system in conjunction with the plant water storage and transfer system, both of which are designed as seismic category II. This is interpreted to be consistent with paragraph C.6 of the Regulatory Guide which states that systems utilized for the normal maintenance of water quality and quantity need not meet seismic category I requirements. Should failure or maloperation of this normal makeup system occur, a loss of fuel pool coolant would not occur as required by the Regulatory Guide.

C.8 In addition to the above normal makeup system, an emergency "makeup" system is provided. The emergency system consists of redundant service water connections which are part of the seismic category I service water system. These connections are located in the immediate vicinity of the fuel pool to provide emergency makeup coolant should it be required. This is considered to satisfy the requirements of paragraph C.8 of the Regulatory Guide.

REGULATORY GUIDE 1.25

ASSUMPTIONS USED FOR EVALUATING THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF A FUEL HANDLING ACCIDENT IN THE FUEL HANDLING AND STORAGE FACILITY FOR BOILING AND PRESSURIZED WATER REACTORS
(March 23, 1972)

RESPONSE TO REGULATORY POSITION

The assumptions of the Regulatory Position of Regulatory Guide 1.25 are used in the analysis of the potential radiological consequences of a fuel handling accident with the following exceptions.

(1) Reference: Paragraph C.1.j of the Regulatory Guide. If charcoal filters are employed in the building ventilation system design, the iodine removal efficiencies given in Regulatory Guide 1.25 will not be used in the analysis. Efficiencies will be based on the final ventilation system design with due consideration to the efficiences given in Regulatory Guide 1.52.

(2) Reference: Paragraph C.2 of the Regulatory Guide. The atmospheric dispersion factors used in the final analysis will be based on onsite meteorological data. The atmospheric dispersion factors used in the Preliminary Analysis are based on the meteorological data collected at Dow Chemical Plant and Tricity (Saginaw) Airport.

(3) Reference: Paragraph C.3.b of the Regulatory Guide. In the calculation of skin dose due to beta radiation, credit will be taken for the inert thickness of the skin, which is approximately 7 mgms/Cm^2.

Due to the limited extent of the effluent plume, the gamma dose conversion factors will be realistically determined using the finite cloud model as proposed in Meteorology and Atomic Energy(A).

(A) Slade, D.H., Meteorology and Atomic Energy, 1968, U. S. Atomic Energy Commission, Office of Information Services TID-24190 (1968).

REGULATORY GUIDE 1.42

INTERIM LICENSING POLICY ON AS LOW AS PRACTICABLE FOR GASEOUS RADIOIODINE RELEASES FROM LIGHT-WATER COOLED NUCLEAR POWER REACTORS

(Revision 1, March 1974)

RESPONSE TO REGULATORY POSITION

New Appendix I was adopted into the Code of Federal Regulations on June 4, 1975. Numerical guides provided in this appendix supersede the requirements of the regulatory position of this Guide. It is stated in the introductory paragraphs of Regulatory Guide 1.42, that at some time following the adoption of Appendix I, the commission will issue five Regulatory Guides which provide models and parameters acceptable to the regulatory staff, for calculating expected radiation releases and corresponding radiation doses, and Regulatory Guide 1.42 will be withdrawn. These new Regulatory Guides are not yet issued.

Because new Appendix I was adopted, we conclude that Regulatory Guide 1.42 is not applicable. Compliance with the new Guides will be discussed as they are issued.

REGULATORY GUIDE 1.49

POWER LEVELS OF NUCLEAR POWER PLANTS

RESPONSE TO REGULATORY POSITION

1. The proposed licensed power level for the Midland Plant application is 2452 MWt, well within the maximum set by this guide.

2. Analysis and evaluation in support of this application is made at an assumed initial power level of 1.02 percent full power, where the initial power level or stored energy are important.

   For most analyses, the major concern is the change in core parameters and the associated feedback phenomenon during the event. By increasing the assumed power level trip setpoint value used in the analysis and maintaining the assumed initial power level constant, an increase in the time to reactor trip occurs and the greatest possible change is produced. More energy is added to the system by starting an accident at 100 percent rated core power and assuming a reactor trip at 112 percent than starting the transient at 102 percent rated core power and triping the reactor at 110 percent. Most analyses are, therefore, done with an initial assumption of 100 percent core power and a trip level of 112 percent. To aid in understanding the above discussion, the following is provided:

   Initial power level - 100%

Assumed calorimetric error	2.0% rated power
Tech Spec Trip setpoint	105.5% rated power
Assumed neutron flux measurement error	4.0% rated power
Assumed setpoint error	0.5% rated power
Assumed trip point	112.0% rated power

   Initial power level - 102% (includes calorimetric error)

Tech Spec Trip setpoint	105.5% rated power
Assumed neutron flux measurement error	4.0% rated power
Assumed setpoint error	0.5% rated power
Assumed trip point	110.0% rated power

3. The analyses of possible offsite radiological consequences of postulated design-basis accidents use an assumed core power level of 2452 MWt, which is well within the maximum of 4100 MWt set by this guide, and is greater than 1.02 times the proposed licensed power level. This assumed power level is based on the expected maximum performance of the turbine generator.

REGULATORY GUIDE 1.52

DESIGN, TESTING AND MAINTENANCE CRITERIA FOR ATMOSPHERE CLEANUP SYSTEM AIR FILTRATION AND ADSORPTION UNITS OF LIGHT-WATER-COOLED NUCLEAR POWER PLANTS
(June 1973)

RESPONSE TO REGULATORY POSITION

The Midland project complies with the requirements of Regulatory Guide 1.52 except as described below:

(1) Reference: Paragraph C.2.a
Demisters are used only where moisture impingement is a potential problem.

(2) Reference: Paragraph C.2.c
The seismic classification of the fuel storage facility ventilation and filtration system is discussed in Consumers' Midland project response to Regulatory Guide 1.29.

(3) Reference: Paragraph C.2.g
The pertinent pressure drop which is instrumented to signal, alarm and record in the control room is the pressure drop across the housing. Local differential pressure indication of each component is also provided. The flow rate measurement also indicates proper functioning of the fan.

(4) Reference: Paragraph C.2.j
Overall design consideration includes reduction of radiation exposures during routine maintenance and testing insofar as effectually possible. It is envisioned, however, that workers will not handle filter units immediately after a design basis accident and will thereby avoid exposures associated with immediate post-accident filter handling. Accordingly, no efforts are made toward a unitized atmosphere cleanup train design in the interest of accident exposure reduction.

(5) Reference: Paragraph C.2.m
Non safeguards atmospheric cleanup systems are not designed to retain their contents during a seismic event.

(6) Reference: Paragraph C.3.b
Adsorption units are designed to achieve an efficiency which prevents exposures in excess of the 10 CFR 100 limitations. This efficiency is developed by assessment and appropriate selection of various design parameters such as bed depths and dehumidification.

(7) Reference: Paragraph C.3.d
Since none of the HEPA filter separators are exposed to potential iodine removal spray, the units are not designed for contact with the spray.

(8) Reference: Paragraph C.3.e
To provide added flexibility to the designer and fabricator, filter and adsorber mounting frames should be constructed of corrosion resistant steel (stainless steel) or carbon steel coated with an inorganic nuclear grade paint.

(9) Reference: Paragraph C.3.h
Since inorganic nuclear grade paint on carbon steel weld can effectively withstand possible radiation effects, we feel that mounting frames and internal welds should be corrosion-resistant steel (stainless) or carbon steel coated with an inorganic nuclear grade paint.

(10) Reference: Paragraph C.3.i
The adsorber beds are designed for 2.5 mg of iodine (both stable and radioactive) per gram of activated carbon averaged over the bed depth.

(11) Reference: Paragraph C.3.j
Paragraph C.3.j states, in part "The system design should provide for water sprays to inhibit adsorber fires." Since the use of water could disable a filter unit and also create liquid radioactive wastes, the Midland Project does not intend to use water sprays. However, other alternatives would be considered in design to maintain the charcoal adsorber system below the desorption temperature.

(12) Reference: Paragraph C.4.c
The Regulatory Position is not complied with since we feel that use of vacuum breaker is unnecessary and potentially hazardous. There will be very few, if any, occasions requiring entrance into the housing while the fan is running; such entrance in itself presents safety concerns. The presence of vacuum breakers would increase the probability of leakage resulting from valve leakage or valve failure in the open or partially open position.

(13) Reference: Paragraph C.4.d
The spacing requirement is applicable to systems requiring operator access to remove filters and adsorber trays. This spacing is not provided for systems which do not require this large spacing; e.g., gasketless carbon adsorbers which are filled and emptied externally and for small systems the components of which are removed externally.

(14) Reference: Paragraph C.4.h
The length of piping associated with manifolding would promote plate-out of the constituents of the sampled gas stream and thereby result in erroneous test results. The test probes are located in readily accessible locations and a minimum run of piping is used.

(15) Reference: Paragraph C.5
Filter efficiencies and system testing requirements will be discussed in the FSAR after system design is finalized.

(16) Reference: Paragraph C.5.b
Paragraph C.5.b states, in part, "During the DOP testing the adsorber units should be temporarily bypassed." The Regulatory Position as stated is not complied with, since we feel that the DOP which may be absorbed during testing will have a negligible effect on the charcoal. Furthermore, the bypass system could present a potential for both leakage and accidental bypass of the charcoal during nontest operation.

REGULATORY GUIDE 1.54

QUALITY ASSURANCE REQUIREMENTS FOR PROTECTIVE COATINGS
APPLIED TO WATER-COOLED NUCLEAR POWER PLANTS
(June 1973)

RESPONSE TO REGULATORY POSITION

It is our belief that the Quality Assurance requirement intent of Regulatory Guide 1.54 has been met on the Midland Project as discussed below:

C.1 The painting requirements for the Midland project are specified in four project painting specifications, most of which were developed prior to the issuance of Regulatory Guide 1.54. ANSI 101.4 was used extensively in the development of these specifications and compliance to ANSI N45.2 is required by Consumers Power Company for equipment procured for the Midland project. Although not specifically required in all four specifications, ANSI-N101.4 and ANSI-N101.2 are generally referenced and are used in the evaluation and approval of vendor painting procedures. As discussed as being acceptable in Section 1.2.4 of ANSI-N101.4, in several instances where purchase orders were issued prior to development of the applicable project painting specification or where implementation is impractical due to vendor shop capability, certification shall be provided to Consumers Power that the coating application and acceptance tests were performed in accordance with all such applicable procedures. In instances where

Regulatory Guide 1.54 cont'd

paint not LOCA qualified is used on small components with a limited painted surface, such as valve operators, instrumentation, small accessory components and equipment trim, the FSAR will provide the total surface area painted with these non-LOCA qualified paints to substantiate their limited application and therefore acceptable use.

C.4 Limits are placed by the equipment technical specifications on ppm of halogens in water used during manufacture and for final rinse in preparation for painting.

REGULATORY GUIDE 1.70

STANDARD FORMAT AND CONTENT OF SAFETY
ANALYSIS REPORTS FOR NUCLEAR POWER PLANTS
(Rev. 1, January 1975)

RESPONSE TO REGULATORY POSITION:

It is Consumers Power Company's intent to follow the format requirements of Revision 2 to Regulatory Guide 1.70. The degree of compliance of the Midland Units 1 and 2 FSAR to the analysis content requirements of Revision 2 cannot be determined until evaluation of this revision is complete.

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