LA 84-82

Westinghouse Electric Corporation
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August 31, 1984

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Licensing
Washington, D.C. 20555

Attention: Mr. Cecil O. Thomas, Chief
Standardization and Special Projects Branch

Gentlemen:

Subject: Submittal of Additional Information to Application for Renewal of License Number R-119 (Docket 50-87).

The Westinghouse Electric Corporation hereby submits the enclosed additional information to support our application for renewal of License R-119. Attached is a summary of the revisions which have been made to the FSAR and the Technical Specifications which were submitted by letter July 9, 1984.

If you have any questions concerning this submittal, please contact me at the above address or by telephone on (412) 374-4652.

Very truly yours,

A Joseph Nardi

A. J. Nardi, Manager
NES License Administration

AJN/jh

Attachment

Copies Transmitted: 3 notarized & 19 conformed

COMMONWEALTH OF PENNSYLVANIA)
COUNTY OF ALLEGHENY) ss

Sworn and subscribed before me this

31 day of August, 1984

Paulette Slonska
Notary Public

Commission Expires

PAULETTE SLONSKA, NOTARY PUBLIC
MONROEVILLE BORO, ALLEGHENY COUNTY
MY COMMISSION EXPIRES MARCH 10, 1986
Member, Pennsylvania Association of Notaries

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ATTACHMENT TO LETTER LA 84-82

Summary of Changes to FSAR and Technical Specifications for

License R-119

Changes to FSAR

1) Page III-69 - Lower limits were added to the ranges for two types of detectors to clarify their applicability.

2) Page III-131 - Prompt radiation dosages have been corrected to match collected 10KW data which has been extrapolated to the MCA values for maximum power and integrated power to the peak. Values changed are 8 feet from 4 1/2 feet, 0.3 mrem neutron from 60 mrem, 1 mR gamma from 75 mR.

Changes to Technical Specifications

1) Page A-12, Section 3.1.1. -This specification has been changed to include possible effects of experiments or experimental failures in excess reactivity calculations.

2) Page A-23,

Section 5 has been deleted as this was incorporated into Section 3.1.1. Section 6 has been renumbered to Section 5.

3) Page A-24,

Since Section 5 was deleted, reference in the basis was also deleted.

alarm is to alert personnel of a possible danger from the reactor system. It is actuated manually at the north control room door and at the main entrance door of the WTR Facility.

Portable radiation monitoring instruments capable of measuring all expected radiation types and levels are located in the facility. The minimum portable instruments which must be present in the facility are:

Detector	Range
β-γ Detector	0-20 mR/hr
β-γ Detector	0-5 R/hr
γ Detector	1- $\geq$ 100 R/hr
n Detector	0-5 rem/hr
α Detector	0- $\geq$ 100,000 CPM

A small radiation safety laboratory exists in the facility in which routine analysis of air, water, and smear surveys are conducted. Laboratory radiation detector systems are available for measuring α, β, and γ radiation. In addition, analysis of the reactor water for resistivity and pH are conducted in the laboratory.

Each member of the operating staff is issued a neutron and β-γ sensitive thermoluminescent dosimeter (TLD) and a direct readout ion chamber dosimeter which must be worn whenever they are in the facility. The TLD's are worn for no longer than one month and then sent to a commercial processing agency for reading. Visitors in the facility are either issued TLD's or pocket dosimeters, or they are provided with an escort having personnel monitoring devices.

An emergency cabinet is maintained which contains a minimum of two (2) complete sets of anti-contamination clothing, two (2) full face filter-type respirators, and one (1) self-contained breathing apparatus.

Proper storage containers are kept on hand to store suspect radioactive waste materials until they are shipped off for disposal.

4.2 FACILITY AND SUPPORT SYSTEMS

4.2.1 NTR Facility and Controlled Area

The NTR Facility is located in the south wing of the Nuclear Training Center building. The main construction of this building consists of poured concrete, concrete block and steel supports. Figure 4.2.1 describes the Facility layout and also defines the controlled area of the Facility. The Facility building consists of the reactor room, console room, equipment room and other support areas. The Facility building enclosure is approximately 70 feet x 45 feet.

The controlled area which serves as a restricted area, is approximately 90 feet x 100 feet. This area is enclosed either by a

This value for reciprocal period can be used in conjunction with Figure 7.5.2, "Maximum Reactor Power Vs. Maximum Reciprocal Period During Ramp Tests on SPERT-I Core A-17/28" (Ref. 1, p. 504), to arrive at the maximum reactor power level of approximately 70 Mw. Accordingly using Figure 7.5.3, "Energy to Peak of Power Excursion Vs. Reciprocal Period for SPERT-I Core A-17/28" (Ref. 1, p. 501), the energy produced to the peak power was less than 5 Mw-sec. During this power excursion the maximum fuel plate surface temperature would be approximately 160°C as indicated by Figure 7.5.4, "Maximum Fuel Plate Surface Temperature Vs. Reciprocal Period for SPERT-I Core A-17/28" (Ref. 1, p. 503).

As half the thickness of the NTR metalic fuel rings is 0.16 cm, it is expected that the temperature gradient across the fuel plate will be small. After the power burst the reactor chugs at a power level less than 1 Mwt until the reactor is manually tripped.

7.5.2.3 Conclusion

As the estimated maximum fuel plate surface temperature (160°C) is substantially below its melting point (660°C), no damage to the core is expected and consequently no fission products are released. The prompt radiation dosage received outside the NTR reactor room, 8 feet above floor level, would be less than 0.3 mrem for neutron and 1 mR for gamma. This dosage is extrapolated from measured level at 10KW with the normal five foot water height over the core. There is no off-site prompt radiation dose pertinent to restrictions of 10CFR20. As there is no release of fission products to the atmosphere, post excursion radiation doses are controlled by cleanup procedures.

7.5.2.4 References

1. Reactor Physics Contents, ANL-5800, 2nd Edition, Argonne National Laboratory, July, 1963. Pp. 497 - 507.

2. "Safety Considerations for the 24 Element Graphite Reflected Core", December 3, 1980. (Submitted to NTC by letter dated March 19, 1981, A. J. Nardi to James R. Miller).

3. H. L. Witener, et. al., "Reactor Instrumentation and Test Procedures", Report on SPERT-I Destructive Test Results, Transactions of the American Nuclear Society 6, 1, p. 137 (June, 1963).

SUMMARY OF TECHNICAL SPECIFICATIONS CHANGES

	Section	Pages	Content/Reason
1.0	Definitions	3, 4, 5, 6	Rearrange in alphabetical order and add three definitions
1.10	Movable Experiment	4	Definition added
1.14	Reactivity Worth of An Experiment	5	Definition added
1.20	Secured Experiment	6	Definition added
1.21	Unsecured Experiment	6	Definition added
2.1	Safety Limits	8	Correct maximum temperature increase
2.2	Limiting Safety System Settings	9	Clarify basis
3.1.1	Limiting Conditions for Operations	12	Include reactivity due to experiments or their failure for shutdown margin considerations.
4.0	Experiments	21	Redefine experimental limitations in terms of movable experiments and unsecured experiments.
		23	Reword bases to reflect these changes
5.0	Surveillance Requirements		Change wording to reflect accepted industrial format and provide operational flexibility [ANS 15.1-1982, page 6]
	5.1.1	24	
	5.1.2		
	5.1.3	25	
	5.1.5		
	5.1 Bases	26	Add paragraph outlining maximum intervals for surveillance
	5.2.1.A	27	
	5.2.1.B	28	
	5.2.1.C		
	5.3.1	29	Reflect increase interval from 3 months to 6 months well with industrial (ANS standards) and past operating history
	5.3.4	29	WORDING change

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	Section	Pages	Content/Reason
5.3	Surveillance Requirements Bases	30	Reflect change in 5.3.1
6.2	Facility	32	Changes reflect amended controlled access area
6.4.3	Standard Fuel Element	33	Spelling
6.4.6	Graphite Reflector Rods	38	Correct dimensions and clarify language
6.5	Water Handling System	39	Correct flow rates
6.6	Fuel Storage	39	More closely reflect reality
7.3.4.2	Special RSC Reports	44	Correct spelling

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levels in the vicinity of the reactor room will be detected before they become excessive when the reactor is operated at moderator-shield water heights other than the normal level. An approximate value for this setting is estimated to be 500 mR/hr.

3.0 LIMITING CONDITIONS FOR OPERATION

3.1 Reactor Control and Safety Systems

Applicability

These specifications apply to all methods of changing core reactivity available to the reactor operator.

Objective

The purpose of these specifications is to assure that an adequate shutdown method is available and that positive reactivity insertion rates are within those analyzed in the Safety Analysis Report.

Specifications

1. There shall be a minimum of five operable control rods. The maximum excess reactivity that can be loaded into the core including experiments shall be such that the reactor shall be subcritical by a margin greater than 1$ with the control rod having the largest reactivity worth fully withdrawn and with failure of the experiment.

2. The maximum control rod and moderator-shield water reactivity insertion rate shall be less than 0.10$/s when keff is less than 0.99 and less than 0.035$/s when keff is greater than 0.99.

3. The total control rod drop time for each control rod from its full-out position to its full-in position shall be less than or equal to 1.2 seconds. This time shall include a maximum magnet carriage release time of 0.125 second.

4. Negative reactivity shall be available in operable cocked control rods prior to adding the moderator-shield water to the reactor. At least 1$ of negative reactivity shall be available when core loadings, capable of becoming critical, are to be filled with the moderator-shield water.

addition the reactivity worth of all unsecured experiments is limited such that a common mode failure of all such experiments and their associated equipment will not result in a positive reactivity addition greater than 0.80$.

5. Experiments shall not contain explosives or other material which may produce a violent chemical reaction and/or airborne radioactivity.

Bases

The experiments to be performed in the reactor programs are discussed in the Safety Analysis Report (SAR). The present programs are oriented almost exclusively toward fundamental reactor technology training. Other special programs may involve the use of the reactor as an irradiation facility. To assure that experiments are well planned and evaluated prior to being performed, detailed written procedures for all new experiments must be prepared, reviewed by the RSC and approved by the Facility Manager.

Since the control rods enter the core by gravity and are required by other Technical Specifications to be operable, no experiment should be allowed to interfere with their functions. To assure that specified power limits are not exceeded, the nuclear instrumentation must be capable of accurately monitoring core parameters.

All reactor experiments are reviewed and approved prior to their performance to assure that the experimental techniques and procedures are safe and proper, and the hazards from possible accidents are minimal. A maximum reactivity change is established for movable experiments to assure that the reactor controls are readily capable of controlling the reactor.

A positive reactivity addition of 0.80$ due to failure of an unsecured experiment or associated equipment would cause the reactor power to rise on a stable period greater than one second. Thus, the reactor safety systems would be able to trip the reactor before an excessive power level is reached.

Restrictions on irradiations of explosives and highly flammable materials are imposed to minimize the possibility of explosions or fires in the vicinity of the reactor.