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AUTH. NAME AUTHOR AFFILIATION
HAYNES, J. G. Arizona Nuclear Power Project (formerly Arizona Public Serv
RECIP. NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards rev to FSAR compliance w/Reg Guide 1.45. FSAR revised to reflect use of gaseous & airborne monitor detection procedures in place for quantifying RCS leakages.

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U.S. Nuclear Regulatory Commmission
ATTN: Document Control Desk
Washington, D.C. 20555

July 2, 1987
161-00344-JGH/JKR

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528 (License NPF-41)
STN 50-529 (License NPF-51)
STN 50-530 (License NPF-65)
Change to the FSAR Concerning Regulatory Guide 1.45
File: 87-A-005-419.05; 87-A-056-026; 87-006-216

Dear Sir:

Attached, please find changes to the FSAR to document our compliance with Regulatory Guide 1.45.

The FSAR has been revised to reflect the fact that a gaseous and airborne monitor is used for detection, however, procedures are in place to use other means for quantifying RCS leakage.

A safety review and evaluation was performed in accordance with 10 CFR 50.59. It was found that no unreviewed safety question was introduced. Due to the uncertainties involved with gaseous and airborne particulate monitoring, any quantification using those methods would prove inaccurate. By directing the operators to quantify the leakage by another more reliable method, the results would be more accurate. The intent of the Regulatory Guide is still being met. There are still various detection methods and means for quickly quantifying the leakage.

Should you have any further questions regarding this matter, please contact Mr. W. F. Quinn of my staff.

Very truly yours,

J. G. Haynes
Vice President
Nuclear Production

JGH/JKR/rw
Attachment

cc: O. M. De Michele
E. E. Van Brunt, Jr.
A. C. Gehr
E. A. Licitra
R. P. Zimmerman
M. Davis
G. W. Knighton

A001
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Since severe sensitization is avoided, testing to determine susceptibility to intergranular attack is not performed.

REGULATORY GUIDE 1.45: Reactor Coolant Pressure Boundary Leakage Detection Systems (Revision 0, May 1973)

RESPONSE

The position of Regulatory Guide 1.45 is accepted, ~~(refer to section 5.2.5)~~ see insert a. Also see CESSAR Section 1.8.

REGULATORY GUIDE 1.46: Protection Against Pipe Whip Inside Containment (Revision 0, May, 1973)

RESPONSE

Except as discussed below, protection against pipe whip inside the containment complies with Regulatory Guide 1.46.

A. Position C.1.b of the Regulatory Guide:

Intermediate break locations between terminal ends are postulated to occur at weld joints where the piping incorporates a fitting, valve, or welded attachment where the following are met (as specified in NRC Branch Technical Position MEB 3-1):

5 (1) the stress range S_n exceeds 2.4 S_m, where S_m is the design stress intensity as defined in Section III of the ASME Code, or

(2) the stress range S_n as calculated by equation (10) of Paragraph NB-3653 exceeds 2.4 S_m and the stresses computed by equations (12) and (13) of Paragraph NB-3653 are greater than 2.4 S_m, or

5 (3) If fatigue analysis is performed, any intermediate location between terminal ends where the cumulative

Insert a:

Position C.5 states that each method of detection should have the capability of detecting leak rates of 1 gpm within one hour. The airborne particulate and airborne gaseous monitoring methods are capable of identifying leakage conditions, but are not used for quantifying that leakage. Procedures are available that instruct operators to perform a water inventory balance upon alarm of increasing trend of activity. (Refer to section 5.2.5)

5.2.3.4.2 Control of Welding

5.2.3.4.2.1 Avoidance of Hot Cracking.

A. Components in C-E Scope of Supply

Refer to CESSAR Section 5.2.3.4.2.1-A.

B. Components Not in C-E Scope of Supply

In order to preclude microfissuring in austenitic stainless steel, PVNGS design is consistent with the recommendations of Regulatory Guide 1.31 except as noted in section 1.8.

5.2.4 INSERVICE INSPECTION AND TESTING OF REACTOR COOLANT PRESSURE BOUNDARY

2 Details of the inservice inspection program are included in
15 section 6.6, and Section 3/4.0 of the Technical Specifications.
Accessibility of inspection areas is discussed in CESSAR
2 Section 5.2.4.1.

5.2.4.1 DELETED

5.2.5 REACTOR COOLANT PRESSURE BOUNDARY LEAKAGE DETECTION SYSTEMS

Means for the detection of leakage from the reactor coolant pressure boundary are provided to alert operators to the existence of leakage above acceptable limits, which may indicate an unsafe condition for the facility. The leakage detection systems are sufficiently diverse and sensitive to meet the criteria of Regulatory Guide 1.45 for leaks from identified and unidentified sources. except as noted in section 1.8

5.2.5.1 Leakage Detection Methods

5.2.5.1.1 Unidentified Leakage

The four methods employed to detect unidentified leakage are presented in the following sections.

- Safety injection line pressure
- High-pressure safety injection header pressure
- Low-pressure safety injection header pressure

5.2.5.2.3 Leakage Detection Conversion to Leakage Equivalent

The procedures necessary for each leak detection method to be converted to a common leakage equivalent are indicated below.

5.2.5.2.3.1 Containment Radioactive Gas and Air Particulate Monitoring. Upon actuation of a high activity alarm, see insert b ~~the operator follows these steps:~~

A. Records particulate and gaseous activity measurements at equal time intervals.

B. Determines the activity increases during these intervals.

C. Estimates RCS activity level based on previous operating history.

D. Estimates the coolant leakage rate from the radioactivity increases. This is accomplished by comparing the measured increases to a curve showing abnormal primary coolant leakage as a function of particulate and gaseous activity variation.

Estimated leakage and measured particulate and gaseous activities then are plotted to test the consistency of the data and to estimate the time elapsed since the beginning of the leak.

Nonconstant activity increases mean either:

- Containment atmosphere activity is approaching steady state
- The abnormal leakage flow is not constant.

Insert b: ... or indication of an increasing activity trend, the operator conducts a water inventory balance to determine coolant leakage rate.

B. Provide for early detection of radioactive leakage into normally nonradioactive systems, including primary-to-secondary leakage, primary-to-atmosphere leakage, and process system leakage into normally nonradioactive systems. ~~Specifically~~ included is the capability of both the containment building gaseous channel and the containment building particulate channel each to detect independently an increase in the reactor coolant system-to-containment atmosphere leak rate, ~~of 1 gal/min within 1 hour~~, as two of the methods of leak detection required to follow the recommendation of NRC Regulatory Guide 1.45. except as noted in section 9.8

C. Provide continuous remote indication and recording of airborne radioactive contamination in the form of particulates and iodines in areas where personnel normally have access, except in areas where the potential for airborne activity releases is negligible, in order to follow the recommendations of NRC Regulatory Guide 8.8 for control of occupational exposure to radiation.

11.5.1.1.2 Effluent Monitoring System

The effluent monitoring system is designed to perform the following functions in order to meet the requirements of 10CFR20, 10CFR50, and follow the recommendations of Regulatory Guide 1.21 during normal operations, including anticipated operational occurrences:

A. Provide continuous representative sampling, monitoring, recording, and indication of gaseous radioactivity levels, and, as a minimum, continuous representative sampling of particulate and iodine radioactivity levels along principal effluent discharge paths.

11.5.2.1.3.13 Containment Building Atmosphere Monitor, (CBB) Channel "B" (XJ-SQB-RU-01). The containment building atmosphere is continuously monitored for particulate, iodine, and gaseous activity. The sample is drawn from the containment building in a closed system, is monitored outside the containment, and then is returned to the containment building atmosphere after it passes through the samplers. The particulate and gaseous channels serve as two methods of RCPB leak detection in accordance with Regulatory Guide 1.45. except as noted in section 1.8. This monitor is designated seismic Category I. 12

In addition to the three radiation channels a hygrometer which measures dewpoint temperature is provided for the CB-B monitor. The hygrometer is microcomputer-controlled and is configured to be an extra channel of the monitor. The hygrometer channel measures dewpoint temperature over the range of 0-200F. Indicated dewpoint is accurate to within ±.4F with respect to actual dewpoint of the sampled air at a rate of change of dewpoint up to ±3F/sec. This channel can be used as a method of RCPB leak detection. 12

In order to obtain a representative sample of containment air, the sample line inlet is located on the operating level between two of the normal cooling units intakes. see insert C This location also facilitates RCPB leak detection by these monitors.

Available monitor sensitivities allow the particulate and I-131 channels of the monitor to detect maximum permissible concentrations allowed by 10CFR20 in the containment building within one hour for Cs-137 and within eight hours for I-131. 12

The CB-B monitor is located just outside the containment building. It samples the containment atmosphere through piping penetrations. Isolation valves at the monitor automatically 2

Insert c: While shown on the 100'-0" elevation in Figure 11.5-3, the sample point is actually on the 93' elevation.