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Monticello Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

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Section V

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Emergency Plan Implementing Procedures

Furnished with this letter is a revision to the Monticello Nuclear Generating Plant Emergency Plan Implementing Procedures. The following procedure is revised:

Procedure	Procedure Title	Revision
A.2-208	Core Damage Assessment	5

Please post changes in your copy of the Monticello Nuclear Generating Plant Emergency Plan Implementing Procedures. Superseded procedures should be destroyed. This revision does not reduce the effectiveness of the Monticello Nuclear Generating Plant Emergency Plan.

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EMERGENCY PLAN IMPLEMENTING PROCEDURE - TABLE OF CONTENTS

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1.0 PURPOSE

The purpose of this procedure is to determine the degree of core damage from the measured fission product concentrations in water and gas samples taken from the primary system under accident conditions. The degree of core damage can also be determined from the containment radiation monitor dose rates and containment hydrogen levels under accident conditions.

2.0 APPLICABILITY

2.1 An emergency (Alert or higher classification) has been declared at Monticello Nuclear Generating Plant which involves abnormal or elevated radiological conditions due to possible core damage.

2.2 The REC/CSL has requested sampling and analysis to determine core damage.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 The Radiological Emergency Coordinator (REC) is responsible for:

3.1.1 Overall direction of Radiation Protection and Chemistry Group activities.

3.2 The Chemistry Section Leader (CSL) is responsible for:

3.2.1 Implementation of this procedure when sample analysis is used for core damage assessment.

3.2.2 Overall direction for sampling and analysis.

3.2.3 Overall coordination of Chemistry Group activities.

3.3 The Chemistry Coordinator is responsible for:

3.3.1 Coordination of Chemistry Group activities in the Chemistry Lab.

3.3.2 Coordination of sample logging, identification and documentation.

3.4 The Radiation Protection Specialists (Chem) are responsible for:

3.4.1 Sampling and analysis for core damage assessment.

4.0 DISCUSSION

4.1 Section 6.1 of this procedure is based on the G.E. paper "Procedures for the Determination of the Extent of Core Damage Under Accident Conditions" NEDO 22215. This procedure involves calculations of fission product inventories in the core and the release of inventories into the primary system under postulated loss-of-coolant accident (LOCA) and non-LOCA conditions. The calculations were developed by G.E. for a 3579 MWt rated BWR-6/238 with a Mark III containment reference plant having operated three years at a steady state (3651 MWt) power. Because of this, Monticello isotopic concentrations obtained by sampling and analysis must be normalized prior to determination of core damage using the G.E. prepared calculations. It is the function of the computer program "CORDAM" to normalize the Monticello isotopic concentrations and to estimate the percent metal water reaction based on the percent hydrogen gas in the containment.

4.2 Section 6.2 provides instructions for estimating core damage using the Monticello Containment Radiation Monitor Response Curves (FIGURE 7.1). The curves (developed by Bechtel Power Corporation as calculation M15(1005) under job number 10040-051) are based on TID-14844 model core inventory, Regulatory Guide 1.3, and technical data (physical location, etc.) on the Monticello Containment Radiation Monitors. The curves are intended to indicate the quantity of airborne activity released from the fuel and primary coolant system into containment and estimate core damage based on this airborne concentration.

5.0 PRECAUTIONS

5.1 Both water and gas phase samples should be measured in order to reduce the uncertainty in core damage estimates.

6.0 INSTRUCTIONS

6.1 Core Damage Assessment Using the CORDAM Computer Model

6.1.1 Initiate Form 5790-208-1 (CORE DAMAGE ASSESSMENT REPORT).

6.1.2 Obtain the isotopic analysis results for use in the CORDAM computer program:

A. Reactor coolant I-131 concentration and Torus I-131 concentration, and/or

B. Containment atmosphere Xe-133 concentration and Torus X3-133 concentration.

6.1.3 If core damage based on % metal/water reaction is desired obtain the Containment Hydrogen concentration by analysis or from the Containment Hydrogen Monitor.

6.1.4 Obtain the Reactor power history for the last 50 days prior to shutdown from the Chemistry computer data base.

6.1.5 Determine if the accident is a LOCA or non-LOCA event.

6.1.6 Access the Chemistry computer and run the CORDAM program. Respond to the computer prompts with the data obtained in 6.1.2 through 6.1.5.

6.1.7 Upon completion of the CORDAM program record the results in the applicable space provided on Form 5790-208-1.

6.1.8 If a Reactor coolant isotopic analysis was performed, compare the isotopic analysis results with Reactor isotopic analyses performed during normal operation. During the comparison note the concentrations of Sr, Ba, Cs, La and Ru and record noticeable increases on Form 5790-208-1.

NOTE: If unusually high concentrations of these fission products are found, a fuel melt situation may be assumed.

6.1.9 If a core damage estimate based on Containment Radiation Monitor readings is desired, proceed to Section 6.2 of this procedure. If not, complete Form 5790-208-1 by recording the date, time and signature.

6.2 Core Damage Estimate Using the Containment Radiation Monitor Response Curves.

CAUTION 1

The Containment Radiation Monitor Response Curve (FIGURE 7.1) is valid for core damage estimates which involve primary coolant system leakage into primary containment only. Application of this curve for situations other than primary system release into primary containment is undefined and may result in gross errors in core damage estimates.

CAUTION 2

Due to temperature-induced currents, the Containment Radiation Monitor (high-range radiation monitoring) circuits could initially produce spurious high r/hr signal during extreme temperature heatup transient conditions and indicate a false fail signal during extreme temperature cool down transient conditions. (CR19980453)

6.2.1 Obtain the Containment Radiation Monitor reading in Rem/Hr.

6.2.2 Determine the time (t) after Reactor shutdown (i.e., time since Reactor trip) in hours.

6.2.3 Refer to the Containment Radiation Monitor Response Curve (FIGURE 7.1). Plot the Containment Radiation Monitor reading and time after shutdown on the applicable axis of the curve.

6.2.4 Determine the intersect point and note where the intersect point falls in relation to the % fuel inventory released curve(s) (e.g., 0.001%, 0.01%, etc.).

6.2.5 Using the curve(s) determine the % fuel inventory released into containment based on the Containment Radiation monitor reading and time after shutdown (extrapolate if the intersect point falls between curves).

6.2.6 Using the % fuel inventory released, determined in 6.2.5, refer to the associated source and damage estimated section of the figure (bottom of the figure) to obtain a general description of the core damage estimate.

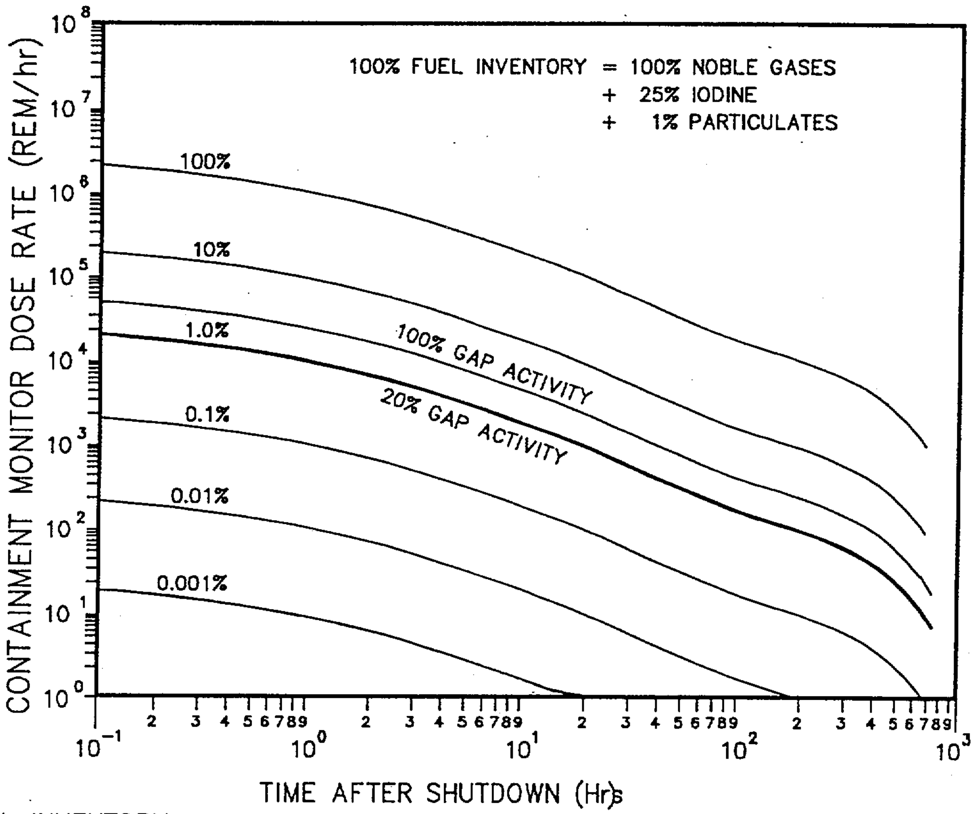
6.2.7 If performing this estimate as part of Form 5790-208-1 (CORE DAMAGE ASSESSMENT REPORT) record the Containment Radiation Monitor reading, % fuel inventory released, and source/damage estimate in the spaces provided on the form.

7.0 FIGURES

FIGURE

7.1 Containment Radiation Monitor Response Curve

PERCENT OF FUEL INVENTORY AIRBORNE IN THE CONTAINMENT



% FUEL INVENTORY RELEASED	APPROXIMATE SOURCE AND DAMAGE ESTIMATE
100.	100% TID-14844, 100% FUEL DAMAGE, POTENTIAL CORE MELT.
50.	50% TID NOBLE GASES, TMI SOURCE
10.	10% TID, TOTAL CLAD FAILURE, PARTIAL CORE UNCOVERED.
3.	3% TID, MAJOR CLAD FAILURE.
1.	1% TID, MAX 10% CLAD FAILURE.
.1	.1% TID, 1% CLAD FAILURE, LOCAL HEATING OF 5-10 FUEL ASSEMBLIES.
.01	.01% TID, CLAD FAILURE OF 3/4 FUEL ELEMENT (36 RODS).
10^{-3}	CLAD FAILURE OF A FEW RODS.
10^{-4}	100% COOLANT RELEASE WITH SPIKING.
5×10^{-6}	100% COOLANT INVENTORY RELEASE.
10^{-6}	UPPER RANGE OF NORMAL AIRBORNE NOBLE GAS ACTIVITY IN CONTAINMENT.

FIGURE

7.2 Forms Utilized in the Procedure

1. 5790-208-1 Core Damage Assessment Report