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MURRAY R. EDELMAN
VICE PRESIDENT
NUCLEAR

February 19, 1985
PY-CEI/NRR-0157 L

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Perry Nuclear Power Plant
Dockets Nos. 50-440; 50-441
Containment Purge System
(Confirmatory Issue 56/
License Condition 24)

Dear Mr. Youngblood:

Perry has committed to three progams to assess the need for use of the containment purge system, and to minimize its use consistent with ALARA guidelines:

1. Containment Purge Operation Data Gathering Program.
2. Containment Access Management Program.
3. Interim Guidelines for Perry Containment Purge Operation.

These programs were previously outlined in Section 6.2.4, Perry SSER 4. Based on the results of these 3 programs, we will propose the purge criteria to be used for the remainder of plant life in accordance with License Condition 24.

Attachment 1 addresses the Perry data gathering program. Attachment 2 summarizes the program for control and evaluation of Perry containment access. Attachment 3 describes interim guidelines for Perry containment purge operation.

We believe that this letter should resolve Confirmatory Issue No. 56 in the next Supplementary Safety Evaluation Report. If you have any questions, please contact us.

Very truly yours,

Murray R. Edelman

Murray R. Edelman
Vice President
Nuclear Group

MRE:njc

Attachments

cc: Jay Silberg, Esq.
John Stefano (2)
J. Grobe

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PERRY CONTAINMENT DATA GATHERING PROGRAM

PURPOSE

The purpose of this program is to determine the benefits of containment purging and the operating time required to obtain those benefits. Appropriate plant operating data will be gathered as defined by Table 1-1. An evaluation of first cycle data will be submitted to the NRC before the plant returns to operation.

BACKGROUND

The Perry design has a significant amount of vital equipment inside containment. This equipment will require routine inspection, maintenance, and surveillance in order to assure its function. Therefore, containment access by operations and maintenance personnel is necessary during a large portion of normal plant operating conditions. In order to ensure that personnel exposure to airborne radioactivity is maintained As Low As is Reasonably Achievable (ALARA), purging of the containment was incorporated into the Perry design. In addition, airborne radioactivity concentrations inside containment must be maintained within the maximum permissible concentrations of 10CFR20. These requirements are intimately related to ALARA and are implemented through compliance with Regulatory Guide 8.8. In addition, containment purging will be performed within the limitations of the Radiological Effluent Technical Specifications.

DATA GATHERING PROGRAM

In order to provide a quantification of the actual containment environmental conditions (related to airborne radioactivity concentrations and overall air quality) that the plant operational and maintenance personnel will experience,

a data collection program will be implemented during the first fuel cycle. The data for this program is listed in Table 1-1. The data to be collected is categorized by six basic sets of information as follows:

1. Containment Access Requirements
2. Containment Mode of Purge Operation
3. Radioactivity Concentrations/Radiation Levels Inside Containment
4. Containment General Air Quality
5. Special Plant Events/Parameters
6. Plant General Status Information

The data set defined will provide information related to radioactivity source terms and the capabilities of the containment purge system to control containment environment. The data will be gathered from instrumentation and various required documents such as plant sample logs, containment access logs, radiation work permits, operator's logs and surveillance logs.

It should be recognized that data gathered during the first fuel cycle may not be indicative of plant conditions after several years of operation. Changes in plant conditions beyond the first cycle, which are important to airborne activity, include fuel and equipment leakage. Allowance for these factors will be considered during subsequent evaluations of operating data.

TABLE 1-1
PERRY CONTAINMENT DATA

Monitored Parameter	Recording/ Sampling Frequency	Parameter Reporting Interval	Data Source(s)	Comments
1. Containment Access (a) Time of Entry (b) Duration of Entry (c) Purpose(s) for Entry (d) Number of personnel	Continuously	Daily	-Containment Access Logs -Radiation Work Permits	
2. Containment purge operation	As needed based upon changing conditions		-Operator's Logs	-Data to be collected will include number of valve cycles and purge time durations.
3. Radioactivity Concentrations & Radiation Levels in Containment			-Radiation Work Permits -Instrumentation -Survey Sheets	
(a) Containment Area Radiation Monitors (Gross Gamma)	Continuously Recorded	Daily*		*Evaluation frequency may increase depending on activity.
(b) Continuous Air Monitors (Iodines, Noble Gases, Particulates)	Continuously Recorded	Daily*		

TABLE 1-1 (Continued)
PERRY CONTAINMENT DATA

Monitored Parameter	Recording/ Sampling Frequency	Parameter Reporting Interval	Data Source(s)	Comments
(c) Atmospheric samples (for isotopics)	Daily	Daily		
(d) Suppression Pool Activity Concentrations	Weekly	Weekly	-Chemistry Sample Logs	Evaluation frequency would increase following an SRV blowdown.
(e) Surface Contamination Survey	Before and after work performed.	As needed.		
4. Containment General Air Quality	Area Specific	Daily	-Plant Instrumentation -Atmospheric Sample Logs	Sampling/Evaluation frequency would be based upon needs during maintenance activities.
(a) Temperature				
(b) Humidity	Weekly	Weekly		
(c) Fumes, Gases & Vapors	As Needed	As Needed		
5. Special Plant Events/ Parameters			-Operator's Logs	
(a) SRV Blowdown	As Needed	As Needed	-Periodic Containment Surveillance Logs	
(b) Suppression Pool Clean-up				

TABLE 1-1 (Continued)
PERRY CONTAINMENT DATA

Monitored Parameter	Recording/ Sampling Frequency	Parameter Reporting Interval	Data Source(s)	Comments
(c) Leakage Rates - Containment & Drywell Sump Levels	Every Shift	Every Shift	-Plant Instrumentation	
6. Plant General Status Information			-Operator's Logs	
(a) Plant Operating Mode	Daily	Daily		
(b) Reactor Power	Every Shift	Every Shift		
(c) Reactor Coolant Activity	Weekly	Weekly	-Chemistry Sample Logs	
(d) Off-gas Activity	Continuously Recorded	Weekly	-Plant Specific Instrumentation	

PERRY CONTAINMENT ACCESS MANAGEMENT PROGRAM

PURPOSE

The primary goal is to evaluate and control containment occupancy based on operating experience. This program will consist of the following three phases:

1. Provide plant procedures to control containment access.
2. Collect containment access data during first fuel cycle.
3. Evaluate data and provide recommendations.

BACKGROUND

A preliminary evaluation of the anticipated containment occupancy levels necessary to conduct routine maintenance, surveillance, and operational checks of vital plant equipment inside the Mark III Containment during normal plant operating modes has been performed by the Licensing Review Group II*. This evaluation was based upon a review of the following:

1. General Electric Mark III Containment Dose Reduction Study; dated December 5, 1977;
2. Plant-specific Technicial Specification required surveillances; and
3. Plant-specific Operational Surveillances not included in Technical Specifications.

Table 2-1 provides preliminary information indicative of activities to be performed during normal plant operations (i.e., plant at power) and requiring containment access. The hours tabulated do not include plant shutdown or refueling tasks. Depending upon the specific scope of activities, the example occupancy levels could vary considerably.

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*Submitted by D. L. Holtzscher, Chairman, Licensing Review Group II on June 29, 1984, to Mr. J. J. Stefano, Project Manager, BWR/LRG I and II Programs.

PERRY CONTAINMENT ACCESS MANAGEMENT PROGRAM DESCRIPTION

PART 1 - PLANT PROCEDURES

Prior to fuel loading, plant procedures will be developed to control containment access by:

A. Establishing access criteria.

B. Identifying the following types of activities:

1. Regularly scheduled maintenance activities in containment.
2. Operational surveillances in containment.
3. Technical Specification requirements requiring containment access.

C. Scheduling, where feasible, the activities in Item B to minimize the number of individuals performing such activities, consistent with ALARA, during entries into the containment.

PART 2 - CONTAINMENT ACCESS DATA

The type of data that to be gathered include the following:

1. When entries are made;
2. The purpose of each entry;
3. The duration of each entry;
4. The number of personnel required by each entry; and
5. Appropriate equipment data related to routine maintenance, surveillance and operational checks.

PART 3 - DATA EVALUATION

Once the above data is collected, Perry will evaluate it to determine if containment access can be reduced by considering the following items:

1. Determine if regularly scheduled data acquisition activities, operational checks and surveillances, and routine maintenance are being consolidated so that the minimum number of individuals can perform such activities during regularly scheduled entries into the containment.
2. Determine if equipment performance indicates that the frequency of operational checks and routine surveillance can be reduced.
3. Determine if operational analyses of recorded performance data and readouts available in the main control room or other monitoring locations can be used in lieu of checks requiring containment entry.
4. Determine if training activities on containment equipment are being scheduled during times when the containment is occupied for other reasons such as maintenance/surveillance activities on unrelated equipment.

Based on data evaluation, recommendations will be made to the plant's ALARA Committee for improvements to plant procedures. The results of the Committee's evaluation will be documented.

Once the review is completed and the existence of a station program to minimize containment access during operation confirmed, the ALARA program will serve as the permanent program for assuring that personnel radiation exposure in the containment, and therefore containment access, remains controlled.

TABLE 2-1

CONTAINMENT NORMAL OCCUPANCY LEVELS

STATION	OCCUPANCY, HR/YR
Sampling	1250
Reactor Water Clean-up	850
Control Rod Drive	1590
Refueling Preparation	240
Standby Liquid Control	500
Sumps	270
Reactor Recirc Flow Control	310
Containment Cooling	620
Traversing Incore Probe	160
Control & Instrument Panels	1010
ECCS/Process Equipment	1090
Contingency	480
	8370 HR/YR

Activities at each station do not consider manhours for plant shutdown or refueling operations and include:

Routine Maintenance
Special/Corrective Maintenance
Routine Operation
Training/Abnormal Events

DW94/P/10/rmk

Interim Guidelines for Perry Containment Purge Operation

Objective

Within the overall limitation of operating less than 3000 hours per year during operational conditions 1, 2 and 3, define guidelines for containment purge system operation to satisfy limitations on airborne activity, maintain personnel exposure ALARA, and maintain overall containment air quality.

Airborne radioactivity level shall be maintained in accordance with 10 CFR 20.103 (a) (1), 20.103 (a) (3), and 20.203 (d):

a. If the airborne radioactivity in work areas is maintained below 1/4 MPC*, the workers occupying these areas will not be required to undergo an assessment of radioactivity intake.

b. Work areas where the airborne radioactivity exceeds 1/4 MPC, will have to be designated as "Airborne Radioactivity Areas."

Interim Guidelines for Purge Operation

The containment purge system will be operated as needed to maintain containment iodine activity below 0.25 MPC or as low as practical and reasonable. This concentration is a function of activity sources and removal by natural decay or purge exhaust.

In terms of operating guidelines, purge system operation is the key variable. Perry technical specifications stipulate that annual cumulative operating time be verified less than 3000 hours on a weekly basis, during operational conditions 1, 2 and 3. Grab samples will be taken in areas of suspected contamination to be occupied more frequently than experience indicates purge operation is required. Purge will be initiated when containment air samples indicate an iodine concentration at or above 0.25 MPG in areas to be occupied. With priority given the 3000 hr annual total, purge time will be extended to minimize exposure to site personnel, to interface with reactor water cleanup operations, and to minimize fatigue, valve seat wear, and other adverse effects of operational cycling.

An analysis confirming the 0.25 MPC limitation on thyroid dose has been performed. Parameters important to operating guidelines are summarized below. If stated assumptions do not envelope operating experience, and activity levels are too high, corrective action appropriate to plant conditions and other technical specifications/bases will be implemented or proposed under provisions of the Perry license.

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* Maximum permissible concentrations per 10CFR20, Appendix "B", Table I, column 1.

Bases for Maintaining Perry Containment Iodine ≤ 0.25 MPC

Leakage	2000 lb/hr SRV's; 1/50 gpd RWCU
Iodine concentration in coolant	GE/BWR Requirements Specification 22A2703T, Rev. 6 (I131 = 0.012 μci/g)
Occupancy	8370 hr/yr

Limiting Purge Operating Cycle: 12 hr off/4 hr on = 2190 hr/yr.

SRV (MSIV Closure) 3 times/year x 60 hrs. * = 180 hr/yr.

* 36 hrs. to reduce levels to MPC values plus 24 hrs. during subsequent access.

Contingency to cover uncertainties = 630 hr/yr

TOTAL PURGE TIME = 3000 hr/yr.

Basis for contingency

1. Uncertainty in purge efficiency for removal of radioisotopes. Varying the mixing efficiency has the following effect:

	100%	90%	70%
I-131 (Conc.)	1.0	1.06	1.21
Whole body dose rate	1.0	1.04	1.14

Therefore, 2370 hr purge x .21 = 500 hr.

2. Purge required for periods of unexpected high leakage rates, e.g. RCIC turbine pump test, allowing approximately 5 days of continuous operation = 130 hr

Total Contingency = 630 hr