



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

COOPER NUCLEAR STATION

DOCKET NO. 50-298

MULTI-PLANT ACTION ITEM B-24:

RADIOLOGICAL CONSEQUENCES OF A LOCA DURING CONTAINMENT PURGING

1.0 Introduction

The staff has reviewed the radiological consequences of a hypothetical LOCA while purging the containment at power for Cooper Station. This evaluation was conducted under Multi-Plant Action Item B-24 and in accordance with the guidance of Branch Technical Position CSB 6-4, Standard Review Plan Sections 6.2.4 and 15.6.5 and Regulatory Guide 1.3.

2.0 Evaluation

Our evaluation is based on the release of 4800 pounds mass (1bm) of steam prior to the post-LOCA closure of purge valves at the maximum Technical Specification primary coolant concentration of 314 Ci/gm, dose equivalent I-131. It was assumed that the containment isolation would be achieved before the onset of fuel failure resulting from the accident. The five percent X/Q values at the EAB and LPZ consistent with a ground level release were used in the dose calculations. A list of applicable assumptions is given in Table 1.

The staff estimates that the steam released through the purge line would result in an incremental dose of 18 Rem to the thyroid at the Exclusion Area Boundary (EAB) and 10 Rem to the thyroid at the Low Population Zone Boundary (LPZ). These doses when added to the staff Safety Evaluation Report LOCA doses (See Table 2) of 12 Rem to the thyroid at the EAB and 103 Rem to the thyroid at the LPZ, meet the applicable guidelines of 10 CFR Part 100.

3.0 Conclusion

Based on our evaluation, we conclude that the radiological consequences of a LOCA during purging at the Cooper Station would be acceptable.

Principal Contributor: Kenneth Dempsey

Dated: May 18, 1984

8406060180 840518
PDR ADDOCK 05000298
P PDR

TABLE 1

ASSUMPTIONS USED TO EVALUATE THE CONTAINMENT PURGE CONTRIBUTION TO THE
LOCA DOSE

X/Q value (0-2 hour, EAB, ground level release), sec/m^3	5.3×10^{-4}
(0-8 hour, LPZ, ground level release), sec/m^3	2.9×10^{-4}
Purge valve closure time, sec	10
Amount of steam released through the purge valves prior to post-LOCA closure, lbm	4800
Maximum technical specification primary coolant limit, dose-equivalent I-131, $\mu\text{Ci}/\text{gm}$	31

TABLE 2

RADIOLOGICAL CONSEQUENCES

	THYROID DOSES	
	EAB, 0-2 HOUR	LPZ, 30 DAYS
Containment purge contribution	18 Rem	10 Rem
SER LOCA dose	12 Rem	103 Rem
Effective LOCA dose	30 Rem	113 Rem

NOTES:

1. The X/Q values and the SER LOCA doses were taken from the NRC Plant Data File, updated 5/12/83.
2. The whole body doses are not listed because they would be negligible when compared to the guideline values.