15.3.3 Radiological Consequences of a Postulated Fuel Handling Accident (Cont'd.)

We have independently evaluated the consequences of a postulated fuel handling accident inside containment.

The Davis-Besse Unit No. 1 containment ventilation design, which will be in operation during refueling operations, consists of a containment recirculation system with intake ducts located in the containment dome which exhausts air across an air gap into a set of fan coolers having a total capacity of 234,000 cfm, and which are located in the upper portions of the containment. The fan coolers blow cooled air to the lower portions of the containment where one-fifth (about 46,000 cfm) is exhausted past the containment purge isolation valves to the atmosphere, while the remainder is returned to the fan coolers for recirculation. Two safety grade radiation monitors are located within the containment and upon receipt of a high radiation signal will close the purge valves, isolating the containment in 15 seconds, assuming a technical specification valve closure time of 10 seconds. Non-safety grade radiation monitors are also located in the containment purge duct downstream of the outboard containment isolation valve. Upon receipt of a high radiation signal, these monitors will also automatically cause containment isolation.

In the event of a fuel handling accident inside containment, we believe it likely that any activity released would be mixed in the containment atmosphere, thereby causing the radiation monitors inside containment to isolate the containment. Because the contaminated air is likely to be significantly diluted and containment isolation will be relatively prompt, we believe the dose consequences are likely to be low. It is possible, however, that any initial release of activity might be directed downward away from the radiation monitors. We have, therefore, conservatively assumed in our analysis that the entire activity release is directed initially into the lower portions of the containment and that one-fifth is released to the environment before containment isolation can occur. In this event, the release would cause the radiation

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monitors located in the purge duct to isolate the containment. In addition, the portion of the activity recirculated to the containment would cause the in-containment monitors to detect and isolate the containment. We conclude, therefore, that a release of one-fifth of the activity to the atmosphere is a conservative estimate of the activity released as a result of a fuel handling accident inside containment. Our other assumptions and dose consequences are listed in Table 15.7. As can be seen from this table, the doses are well within the guideline values of 10 CFR Part 100.

Our independent assessment of a postulated fuel handling accident inside containment has conservatively assumed the operation of existing plant systems. We conclude that these systems will effectively mitigate the consequences of such an event, that the doses are well within the guideline values of 10 CFR Part 100, and are acceptable.

TABLE 15.7

ASSUMPTIONS FOR AND CONSEQUENCES OF A POSTULATED

FUEL HANDLING ACCIDENT INSIDE OF CONTAINMENT

Power Level	2772 MWt
Peaking Factor	1.65
Operating Time	3 years
Number of Rods Failed	208
Number of Rods in Core	38,816
Fraction of Inventory in Gap:	
Noble Gases	10%
Iodines	10%
Effective Iodine Decontamination Factor in Pool	100
Shutdown Time	72 hours
SFAS Response Time for Isolation Valve Closure	15 seconds
Containment Purge Flow	46,666 cfm
Containment Air Cooler Fan Flow (2)	234,000 cfm
Ratio of Purge Flow/Air Cooler Flow	.20
X/Q Relative Concentration Values	
0-2 hours @ 732 meters	2.2×10^{-4} secs/cubic meter
0-2 hours @ 3200 meters	9.6×10^{-6} secs/cubic meter

	Dose, rem	
	Thyroid	Whole Body
Exclusion Area Boundary	10	< 1
Low Population Zone	< 1	< 1