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W3P85-3154

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Mr. George W. Knighton, Director
PWR Project Directorate No. 7
Division of PWR Licensing-B
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Toxic Chemicals

REFERENCE: LP&L Letter W3P85-0592, dated March 6, 1985

Dear Sir:

Pursuant to the referenced letter, provided as attachment one (1) is the re-evaluation of a postulated toxic chemical release. The re-evaluation confirms no adverse impact from a postulated toxic chemical release based on an infiltration rate of 0.06 volume changes per hour.

The NRC also requested LP&L to incorporate an allowable air make-up flow rate in Technical Specification 3/4.7.6, see the referenced letter. Presently, Waterford 3 procedure PE-5-004 requires that the emergency outside air flow not exceed 200 CFM when verifying the pressure criterion of 0.125 INWG. The allowable air make-up flow rate is thus adequately controlled, administratively. The control of the allowable air make-up flow rate by administrative means is in compliance with NRC regulations and guidelines. The present requirement in Technical Specification 3/4.7.6, that the Control Room Air Conditioning System maintain the control room at a positive pressure greater than or equal to 0.125 INWG, adequately addresses the guidance in Standard Review Plan 6.4, section II.3.c, which simply states that periodic verification of the control room pressurization should be specified every 18 months. The control of the allowable air make-up rate is a specificity relating to test control similar, for example, to the basis for calculating flow rate. Such specificity is appropriately addressed by procedure. Accordingly, based on the foregoing justification, LP&L plans to continue to control the allowable air make-up flow rate when verifying the control room pressure by procedure without instituting a change to Technical Specification 3/4.7.6.

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Please feel free to call me or Robert J. Murillo if you have any questions.

Yours very truly,

A handwritten signature in cursive script, appearing to read "K.W. Cook".

K.W. Cook
Nuclear Support & Licensing Manager

KWC/RJM/plm

cc: B.W. Churchill, W.M. Stevenson, R.D. Martin, J. Wilson,
NRC Resident Inspector's Office (W-3)

ATTACHMENT 1

TOXIC CHEMICAL EVALUATION

BACKGROUND AND SUMMARY

The toxic chemical evaluation in Section 2.2.3.3 of the Waterford 3 FSAR was based on a control room infiltration rate of 0.012 volume changes per hour following isolation. The same infiltration rate was assumed in the analysis of chemicals identified in the 1984 survey, see reference two (2). However, when the Waterford 3 control room was leak-rate tested, an exfiltration rate of about 0.054 volumes per hour was established. LP&L committed to the NRC to provide the results of an analysis which will confirm habitability of the control room from toxic chemicals based on the actual air exfiltration rate, see reference one (1).

LP&L has performed a habitability analysis based on an infiltration rate of 0.06 volume changes per hour and determined that the toxic gas protective measures will still be adequate to protect the control room operators. The evaluation is herein documented.

ANALYSIS AND RESULTS

Dedicated toxic gas detectors have been provided for ammonia, chlorine, and a broad range of other chemicals. Evaluations of the impacts of the postulated releases of toxic chemicals on control room habitability are discussed separately for each of the three detector types.

AMMONIA

Potential hazards posed by stationary sources of ammonia were evaluated using the methodology described in Section 2.2.3.3 of the FSAR. The six sources posing the greatest potential hazards to control room habitability were selected from the 1984 toxic chemical survey of toxic chemicals stored or transported near WSES-3. The four sources that are kept under refrigeration were modeled accordingly.

Table 1 presents the calculated concentration of ammonia in the control room atmosphere at two minutes after its detection, when the operators are assumed to have donned their self-contained breathing apparatus. The listed concentration is the peak value for the meteorological conditions considered. The peak concentrations for all sources except the river source (ship) are below the Immediately Dangerous to Life or Health (IDLH) value of 500 ppm. While the peak concentration for the river source was calculated to exceed the IDLH value, the corresponding probability of this occurring was calculated to be less than 10^{-8} per year. This is an order of magnitude below the 10^{-7} per year probability criterion in Section 2.2.3 of Regulatory Guide 1.70 and Section 2.2.3 of the Standard Review Plan, and thus, it is concluded that the control room operators are adequately protected.

CHLORINE

Stationary Sources:

Potential hazards posed by stationary sources of chlorine were evaluated by comparing such sources to the allowable quantities listed in Table 1 of Regulatory Guide 1.95. For the purpose of applying this Guide, WSES-3 was assumed to have a Type II control room. WSES-3 control room has local detectors, a normal air exchange rate of 0.6 vol/hr, (vs. 1 vol/hr in the Guide), and an assumed leak rate of 0.06 vol/hr (measured rate is 0.054 vol/hr). The response time of the chlorine detectors is a function of the instantaneous chlorine concentration. A study of the concentration build-up following a postulated release indicates that the average isolation time is conservatively estimated to be about 4 seconds, which is the isolation time stipulated by R.G. 1.95 for a Type II control room.

The stationary source of chlorine posing the greatest potential hazard is a tank on the site of the Occidental Chemical Co., which contains 500 tons and is located 1490 meters from the WSES-3 control room. (This information is based on the 1983-84 survey of toxic chemical stored or transported near WSES-3, updated with supplementary information furnished by Occidental Chemical.) At this distance, the maximum allowable quantity calculated by log-log interpolation, in accordance with the guidance of R.G. 1.95, is 662 tons. The WSES-3 control room therefore satisfies the guidance of R.G. 1.95.

Mobile Sources:

The only other potentially hazardous sources of chlorine are tank cars transported on the Missouri-Pacific Railroad tracks, which pass within 724 meters of the control room. This hazard was evaluated by performing a probabilistic risk assessment, utilizing the release and transport models described in R.G. 1.78 and 1.95. This analysis showed that the probability that an accident involving the total loss of Lading of a chlorine tank car could produce chlorine concentrations in the control room in excess of the IDLH level before the operators could don their breathing apparatus is less than 4×10^{-8} per year. Since this is less than 10^{-7} per year, such an accident need not be considered a design basis event, according to Section 2.2.3 of Reg. Guide 1.70

OTHER CHEMICALS

Analysis of chemicals other than ammonia and chlorine is documented in reference two (2). This analysis was performed without taking credit for the broad range toxic gas detectors, that is no automatic control room isolation or alarm was assumed in the analysis. The analysis results were found to be acceptable without taking credit for control room isolation, and therefore a revised infiltration leak-rate of 0.06 volumes per hour does not change the analysis of chemicals other than ammonia and chlorine.

REFERENCES:

1. LP&L Letter W3P85-0592, dated March 6, 1985
2. LP&L Letter W3P84-2152, dated August 9, 1984

Table 1

Results of Ammonia Analysis

<u>Source Type</u>	<u>Distance (meters)</u>	<u>Direction</u>	<u>Mass (grams)</u>	<u>Peak Conc. in Control Room 2 Min. After Alarm (ppm)</u>
Stationary ⁽¹⁾	1530	SE	4.5(10)	220
Rail	724	S	7.3(7)	180
Stationary ⁽¹⁾	805	ESE	1.0(10)	190
River ⁽¹⁾⁽²⁾	306	NNE	1.4(10)	810
Truck	160	NE	1.8(7)	450
Stationary	152	Onsite	2.3(6)	180

(1) Maintained under cryogenic conditions

(2) Probability of exceeding IDLH: 10^{-8} per year