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MIDDLE SOUTH UTILITIES SYSTEM

April 30, 1984

W3P84-1094
3-A1.01.04
Q-3-A29.02

Director of Nuclear Reactor Regulation
Attention: Mr. G.W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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

Reference 1: LP&L Letter W3P84-0278 dated 2/7/84
Reference 2: LP&L Letter W3P83-3270 dated 9/29/83

Dear Sir:

Reference 1 noted that LP&L has been conducting a toxic chemical survey of the industries surrounding Waterford 3; this survey has essentially been completed. All responses have been received and evaluated with the exception of that of Missouri-Pacific Railroad (response now under legal review at Missouri-Pacific). However, we do not expect to discover any problems from Missouri-Pacific's response as the chemical industries surveyed have already identified the material they receive or ship by rail.

As a result of this survey, we have identified 2 chemicals, hydrogen chloride and sulfur dioxide, which would not be automatically detected by the control room toxic chemical detection system as described in FSAR Section 6.4. Discussion of existing provisions which mitigate such a lack of automatic detection is included in the attached.

Reference 2 noted that LP&L would confirm that no toxic chemicals, other than small quantities, existed at the oil and gas wells near Waterford 3. LP&L therefore identified those companies that at some time owned or operated wells within 5 miles of Waterford 3. Of the 44 surveys sent out (covering 101 wells), 17 were returned, of which 5 were returned as undeliverable. These 17 surveys covered 30 wells of which 18 are no longer owned or operated; two of those still operating were identified as having only small amounts of propane, methyl alcohol, and demethanized plant liquids; none of these chemicals present a toxic hazard for Waterford 3. Although we were unable to contact the remaining companies, the responses we have received confirmed our original tenet that the oil and gas fields do not have any significant quantities of toxic chemicals.

We also wish to take this opportunity to note that, as discussed with your Mr. K. Campe, we have recently determined that problems we have encountered

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with the Broad Range Toxic Gas Detectors (BRTGD) cannot be resolved prior to fuel load. Our current plan for resolving these problems is discussed in the attached Justification for Interim Operation. We believe that the BRTGD can be made operable in accordance with our plan prior to our first refueling. Because the current version of our draft Technical Specifications requires these detectors to be operable at fuel load, we request your timely review of the attached so as to allow the Technical Specification to be revised.

Very truly yours,

K.W. Cook
Nuclear Support & Licensing Manager

KWC/RMF/pco

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield,
J. Wilson, G.L. Constable, K. Campe

JUSTIFICATION FOR INTERIM OPERATION OF WATERFORD 3 WITHOUT THE BROAD RANGE TOXIC GAS DETECTORS

INTRODUCTION

The Broad Range Toxic Gas Detectors, (BRTGD), installed as part of the toxic chemical protective features of the Waterford 3 control room, and discussed in FSAR Section 6.4.4.2c, are as of this date not operating satisfactorily. Since it is not likely that either the present detectors will be functional or replacement detectors installed by fuel load, LP&L is herein submitting justification for Interim Operation (JIO) to outline how Waterford 3 will be operated until broad range detectors are operable.

BACKGROUND

Waterford 3 is located in a highly industrialized area. Within five miles there are 16 industrial facilities of which 14 are concerned with the production or storage of chemical products. The plant is approximately 1000 feet from the Mississippi River, which is a major shipping route. Materials, including toxic chemicals, are transported on nearby railroads and in pipelines.

The storage and transportation of toxic chemicals in the vicinity of Waterford 3 presents a potential threat to the safe operation of the plant. This is due to the possibility that, if a large release of a toxic gas were to occur near the plant, the gas could be drawn into the plant's control room and incapacitate the control room operators. To prevent this from occurring, as required by NRC regulations, accidents involving the release of toxic chemicals have been considered in the design of the control room and a number of protective measures have been provided to protect the operators.

Selection of protective measures for the Waterford 3 control room followed a stepwise approach. First, nearby industries and transportation facilities were surveyed to determine the types and quantities of toxic chemicals which were stored or transported within five miles of the site (this distance is specified in NRC regulatory guidance). The results of the survey revealed that there were many sources of toxic chemicals which have a potential for adversely affecting control room habitability.

Next, a detailed analysis was performed to determine which chemicals could build up to toxic levels in the control room atmosphere and, thus, require protective measures. The method of analysis is described in FSAR Subsection 2.2.3.3. It is very conservative and is likely to overestimate the consequences of the postulated release accidents.

The results of the analysis showed that nearby sources of chlorine and ammonia represent a potentially severe threat to control room habitability. Thus, LP&L decided to provide the control room with

BACKGROUND (Continued)

quick-acting chlorine and ammonia detectors which would isolate the control room outside air intake prior to any significant buildup or these gases in the control room atmosphere.

While these detectors would isolate the control room, NRC regulatory guidance requires one to assume that, following isolation, there is some infiltration of outside air into the control room atmosphere. This is especially significant for accident scenarios in which the release is postulated to occur over a long period of time. To deal with this situation, the control room was provided with self-contained breathing apparatus which the operators could put on and safely "ride out" the emergency. Subsequently, due to the increase in control room staffing mandated by post-TMI requirements, the supply system which is designed to provide breathing air for a minimum of six hours for control room and security personnel was installed to provide capacity for up to seventeen individuals.

In addition to chlorine and ammonia, a number of other chemicals were also found to present a lesser threat to control room operators. This result was due in large part to the conservative nature of the method of analysis. For these chemicals LP&L considered it reasonable to rely on operator action to manually isolate the control room. Reliance on operator action was contingent on the assumption that the operators would have sufficient warning to take timely protective action. LP&L considered this assumption to be justified because most of the chemicals in question are detectable by odor and analysis showed that, following odor detection, the operators would have sufficient time to use the breathing air supply. More importantly, LP&L is a participant in the St. Charles Parish Emergency Preparedness/Industrial Hotline by which it could be notified in case of a release of toxic material.

While the above approach was considered adequate for dealing with chemicals which were known to be in the vicinity of the plant, the NRC reviewer pointed out that it did not address the possibility that new chemicals could be introduced at nearby industrial or transportation facilities which could either pose a severe threat, similar to that of chlorine and ammonia, or which couldn't be detected by odor. When it became clear that the NRC would not accept this approach, LP&L agreed (in 1981) to provide the control room with additional detectors which would be capable of detecting a broad range of toxic gaseous compounds. LP&L felt that the addition of these detectors would provide that additional level of protection sought by the NRC and, therefore, alleviate their concern about the operators' safety and resolve the toxic chemical problem from a licensing viewpoint. Furthermore, LP&L committed to repeat the chemical survey on a periodic basis* to determine if additional protective features are warranted. In addition, LP&L committed to execute letters of agreement with nearby industrial facilities which would provide that LP&L be notified of any significant changes in their hazardous material inventories.

* One survey was taken in 1981 and another is being taken now (1984). LP&L has committed to repeat the survey every four years.

BACKGROUND (Continued)

To summarize, the protective measures which were to be provided to assure the safety of control room operators included:

- o An initial survey of industrial and transportation facilities
- o A conservative method of analysis to identify chemicals of concern
- o Redundant chlorine and ammonia detectors
- o Broad Range Toxic Chemical Detectors
- o Industry emergency hotline
- o Odor detection
- o Letters of Agreement
- o Periodic survey update

The BRTGD procured by LP&L to meet this commitment (FSAR Subsection 6.4.4.2c) were declared inoperable during start-up and calibration testing. These are the detectors that are the subject of this JIO.

STATUS

We have recently discovered that the photoionization process used by our BRTGD has a wide range of sensitivities to the compounds which can be detected. As a result, calibrating the detectors to alarm on, for example, 10 ppm of chemical A may cause the detector to alarm on 20 ppm of chemical B, depending on its ionization efficiency. An additional problem in finalizing the detector setpoints is raised by the fluctuating and diverse background levels. The detectors could potentially alarm due to a combination of toxic chemicals each of which are present in concentrations below their respective desired alarm points. LP&L's plan for dealing with these problems is as follows:

(1) Use the detectors to record background levels for one full year.

(2) Determine the ionization efficiency for the toxic chemicals of interest.

(3) Using the data obtained from (1) and (2), optimize the calibration of the detectors so as to alarm prior to an IDLH level being reached in the control room for as many toxic chemicals as possible.

BACKGROUND (Continued)

In addition to these alarm calibration-type problems, we are also experiencing difficulties in getting the detectors to consistently provide accurate toxic gas concentrations even under controlled test conditions using a single test gas. We were able to get one train of the BRTGD system partially operable, but are now unable to duplicate those previous results. In order to address these problems, several engineers/technicians have been assigned to work on the detector system full time. In addition, LP&L has taken steps to purchase an additional photoionization-based toxic chemical detector system to replace the existing one should our repair efforts prove unsatisfactory. (Note that the calibration problems described above will also exist in this new system.)

In summary, LP&L is expending every effort to place in service a fully operable BRTGD system as soon as possible.

JUSTIFICATION AND SCHEDULE

Using the results of the recently completed survey, we have identified the toxic chemicals which, in the absence of the BRTGD, have the potential for a release concentration in the control room greater than the IDLH (Immediately Dangerous to Life or Health; concentration which can be withstood for up to one-half hour without incapacitation). Eight chemicals may exceed their IDLH in the control room within one-half hour of reaching the odor threshold (or within about one hour of release). One chemical (HCl) will cease production this year; of the remaining 7, all except sulfur dioxide will be detectable by the BRTGD when operable.

It has always been recognized by LP&L that no single attribute of our defense against toxic chemicals, including the BRTGD, would adequately protect the control room operators against all occurrences. This was implicitly recognized by the NRC in SSER 1 where it is emphasized that their acceptance is based on an "aggregate of measures", consisting of detectors, surveys, letters of agreement, and operator training. We believe therefore that although there are a small number of chemicals which will not cause automatic isolation of the control room (by the first refueling, once the detectors are operable, only sulfur dioxide will not cause automatic isolation), the other existing measures provide adequate protection against toxic chemical accidents.

In conclusion, LP&L feels that the aggregate of measures taken to protect the control room operators are adequate in spite of the temporary unavailability of the BRTGD. We feel confident that the action plan outlined above to resolve the problems with the detectors will allow the detectors to be made operable prior to the first refueling. Furthermore, we believe that, once the BRTGD are operable, the overall toxic chemical protection provisions can still adequately protect the control room operators even when a chemical may not cause automatic isolation of the control room.