LOUISIANA POWER & LIGHT / 317 BARONNE STREET • P. O. BOX 60340
NEW ORLEANS, LOUISIANA 70160 • (504) 595-3100
MIDDLE SOUTH UTILITIES SYSTEM

October 14, 1988

W3P88-1918
A4.05
QA

Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

SUBJECT: **Waterford SES Unit 3**
Docket No. 50-382
Reply and Answer to Notice of Violation
Enforcement Action 88-144
Inspection Report 50-382/88-16

Gentlemen:

Enclosed please find the reply and answer to the Notice of Violation and Proposed Imposition of Civil Penalty transmitted by Inspection Report 88-16.

Should we be able to provide additional information to assist in your resolution of this issue, please do not hesitate to contact our Nuclear Licensing & Regulatory Affairs Manager, Mike Meisner, at (504) 595-2832.

Yours very truly,

R.F. Burski
Manager
Nuclear Safety & Regulatory Affairs

RFB/MJM/plm

Enclosures: Affidavit
Response to NOV

cc: E.L. Blake, W.M. Stevenson, J.A. Calvo, D.L. Wigginton, R.D. Martin,
NRC Resident Inspector's Office (W3)

IE14

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of	)	
	)	
Louisiana Power & Light Company	)	Docket No. 50-382
Waterford 3 Steam Electric Station	)	

AFFIDAVIT

R.F. Burski, being duly sworn, hereby deposes and says that he is Manager, Nuclear Safety & Regulatory Affairs of Louisiana Power & Light Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached Notice of Violation and Proposed Imposition of Civil Penalty; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

R.F. Burski

R.F. Burski
Manager
Nuclear Safety & Regulatory Affairs

STATE OF LOUISIANA)
) ss
PARISH OF ORLEANS)

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this 14th day of October, 1988.

Mary Hall Fowler

Notary Public

My Commission expires life.

LP&L REPLY
TO
NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY
(INSPECTION REPORT 50-382/88-16, EA 88-144)

Inspection Report 50-382/88-16 transmitted the Notice of Violation and Proposed Imposition of Civil Penalty (NOV) concerning the May 12, 1988 event at Waterford 3 during which a shutdown cooling pump was twice cavitated while draining the reactor coolant system in preparation for part-loop operation.

In accordance with 10CFR2.201 and 2.205 Louisiana Power & Light Company hereby responds to the NOV.

Introduction

The NOV covers a portion of a broad technical and operational area - part-loop operation - which has received a great deal of industry and regulatory attention over the last couple of years. Knowledgeable technical personnel within both the NRC and industry are justifiably concerned to reduce the potential for a serious nuclear event and/or its consequences when the reactor coolant system is drained. At LP&L, we have enhanced sensitivity to the potential for such events because of the July, 1986 event at Waterford 3 in which shutdown cooling flow was lost for an extended period of time. Although that event did not pose a threat to the health and safety of the public or plant personnel, it resulted in such a deep impression on management and operations personnel that it is described to this day in terms as if the event had occurred only recently. LP&L personnel will not lightly or knowingly place themselves or Waterford 3 in a position to allow re-creation of a loss of shutdown cooling event.

LP&L is in somewhat of a quandary as to how to respond to the NOV. We value highly our continued good relationship with the NRC and have considered that a broad admission to the particulars of the NOV may go some ways to furthering that relationship. After all, LP&L agrees that there were deficiencies which led to the LPSI pump cavitation, as discussed with the NRC in the June enforcement conference. On the other hand, as responsible managers, LP&L management must take meticulous care in ensuring that all transactions, particularly with regulators, are accurate even though such an approach may superficially suggest the appearance that the matters at issue are not being given the consideration they deserve.

LP&L has decided to admit to portions of the violations described in the NOV. We are not in agreement with other portions because of what we believe are inaccuracies in the NOV. Specifically, LP&L contests Violation A. LP&L does not agree that the May, 1988 event was a repetition of a significant condition adverse to quality - i.e., the July, 1986 loss

of shutdown cooling event. On the contrary, LP&L is convinced that corrective actions implemented following the July, 1986 event ensured that the event did not recur and, in conjunction with changes implemented in response to Generic Letter 87-12, were a prime contributor to the prompt, professional resolution to the LPSI pump cavitation on the part of the Waterford 3 operations personnel in May, 1988. LP&L admits to Violation B, although certain mistakes are clarified.

LP&L believes that, due to the inapplicability of Violation A, the NOV severity level should be revised to a Level IV violation and the Civil Penalty rescinded. However, LP&L intends to accept and pay the proposed Civil Penalty, or some part thereof, if the NRC after reviewing this response still deems it appropriate.

LP&L management, from the CEO down, is adamant in their support and pursuit of safety in the area of part-loop operation as well as other areas of safe plant operation. We are concerned that contesting the NOV may be misinterpreted as a lack of safety commitment and are concerned that our approach to investigation and resolution of the May, 1988 event may have been similarly misinterpreted. For these reasons, before responding to the specific items contained in the NOV, we would like to discuss our general approach to part-loop operations since implementing corrective actions after the July, 1986 event.

Because of the July, 1986 event and our heightened awareness of the potential for part-loop operation mishaps, LP&L has been in the industry forefront on this issue. Well before Generic Letter 87-12 was issued LP&L management and personnel were working behind the scenes to improve the Waterford 3 and industry approach to part-loop operation.

The Diablo Canyon loss of shutdown cooling event in April, 1987 precipitated a series of regulatory actions which eventually resulted in Generic Letter 87-12. Almost immediately following the Diablo Canyon event, LP&L participated in reviews and examinations of part-loop operations with NRC technical staff through our position on the Steering Committee of the CE Owners Group (CEOG). Due in part to our efforts, the CEOG quickly recognized the significance of problems in the area of part-loop operation and agreed to initiate analyses although the Generic Letter on this issue was not published until sometime later. It was generally recognized at that time that the CEOG was more responsive and well ahead of other vendor Owners Groups.

Concurrently, LP&L represented Waterford 3 and the CEOG on the newly formed NUMARC Subcommittee on Decay Heat Removal. We presented our concern that the issue of part-loop operation be taken seriously and that corrective actions be implemented on an industry basis. In fact, it was at an EPRI Decay Heat Removal Requirements Workshop on June 9-10, 1987, that the LP&L NUMARC Subcommittee representative first publicly presented the NRC's postulated core damage scenario during part-loop operation, which was to form a major technical basis for Generic Letter 87-12.

As the initial industry activities were occurring in May/June, 1987, Waterford 3 senior management began taking a new look at how Waterford 3 conducted part-loop operations, even though the corrective actions from the July, 1986 event had been completed and the NRC had just closed the LER associated with the event. Management quickly endorsed the CEOG approach to prepare as yet undefined analyses of the postulated core damage scenario. Preparatory steps were taken to implement a thorough, in-depth review of all aspects of Waterford 3 part-loop operation.

When Generic Letter 87-12 was issued in early July, 1987, the Waterford 3 Senior Vice-President - Nuclear Operations immediately created a multi-disciplinary task force to investigate and respond. The Vice-President - Nuclear sponsored the task force and senior managers periodically performed a critical review in group meetings on the progress of the task force. At the same time, LP&L's President and Chief Executive Officer was briefed on progress monthly.

The Waterford 3 response to Generic Letter 87-12 reflects the care and thoroughness exhibited by the task force. The quality and detail of the reporting, and the comprehensive nature of corrective actions, has earned this effort a relatively high rating compared to similar industry responses.

Waterford 3 did not hesitate to immediately implement corrective actions from the Generic Letter response. Very shortly after completing and submitting the effort, it was necessary to drain the RCS to replace reactor coolant pump seals. Temporary changes to applicable procedures were implemented to ensure smooth operation.

By the time Waterford 3 entered its second refueling outage in April 1988 the majority of Generic Letter 87-12 improvements were in hand. Additional care was taken for any item which could affect shutdown cooling regardless of whether it had been mentioned in the Generic Letter response. For instance, Steam Generator manway covers were specially fabricated for the outage to facilitate quick installation to accommodate a rapid fill of the RCS should it be necessary.

The initial part-loop operation during the outage (which was not affected by the construction of the new water level indicator) went smoothly. However, near the end of the outage it was necessary to again drain the RCS. At this time (as is described in more detail later), construction was complete on the refueling water level indication system (RWLIS) - a hard-piped RCS level monitoring system intended to augment the rubber hose level system as committed to in the response to Generic Letter 87-12. Inattention to detail in implementing procedures for proper filling and venting resulted in inaccurate level measurements during the final draindown and the subsequent cavitations of the operating shutdown cooling pump.

The response to this event was immediate. LP&L attributes the prompt, professional response on the part of the operators to the extensive training, procedure changes and increased sensitivity to part-loop operations generated during the previous two years as the result of the

July, 1986 event and Generic Letter 87-12. Management response was also timely - directions were given to the Event Analysis Group to conduct an in-depth investigation to determine the particulars of the event and its root causes. All applicable management personnel including the CEO were briefed on the occurrence and its significance. Over the next month a number of contacts with the NRC were made from the CEO and EDO level down.

In retrospect, after the event we spent too much time discussing whether or not shutdown cooling was actually lost, and not enough time talking about what needed to be done to maintain a defense in depth condition, which of necessity must avoid near misses such as pump cavitation. Our corrective action needs to be the same in either case. If procedures in place had been followed, cavitation should not have occurred. The thrust of our corrective action is to improve procedural implementation in such situations to prevent cavitation or loss of shutdown cooling in the future.

Violation A

A. Inadequate Corrective Actions

Criterion XVI of Appendix B to 10 CFR Part 50, requires, in part, that for significant conditions adverse to quality, measures shall be established to assure that the cause of the condition is determined and corrective action is taken to preclude repetition.

In July 1986, a loss of both shutdown cooling pumps occurred at Waterford 3, an event constituting a "significant condition adverse to quality." The licensee's measures established to preclude repetition of this event included specific commitments made in a September 21, 1987 response to Generic Letter 87-12, "Loss of Residual Heat Removal (RHR) While The Reactor Coolant System is Partially Filled." These measures as set forth in the September 21, 1987 response, included:

1. During part-loop operations, operators will utilize two independent and diverse RCS level measurement systems - the heated junction thermocouple (HJTC) system and the refueling level indication system (RLIS), and that the HJTC system level indication shall be monitored continuously while draining, and frequently while the RCS is partially drained.

2. ".... when the reactor vessel head is not in place (or when preparing for head removal or replacement) the RCS water level is maintained several feet above the hot leg centerline. This precludes the possibility of losing SDC [shutdown cooling] flow due to vortexing."

3. "During installation, the tubing length of the RLIS was maintained to a minimum."

Contrary to the above, the licensee failed to take adequate corrective actions to preclude repetition of a significant condition adverse to quality in that, on May 12, 1988 at approximately 6:15 a.m. and again at 9:35 a.m., inaccurate reactor vessel water level indication resulted in vortexing, cavitation, and subsequent loss of the operational shutdown cooling pump. These events are repetitious of the occurrence in July 1986 (reported in LER 86-15) where a series of events, including inaccurate water level indication resulting from improper installation and care of the tygon tube instrument, resulted in vortexing, cavitation, and loss of both shutdown cooling pumps. The licensee's measures to prevent a recurrence of that condition, including the licensee's commitments in response to Generic Letter 87-12, were not fully implemented on May 12, 1988, in that the two independent means of level indication (HJTC and RLIS) were not both used when draining during part-loop operation, the RCS water level was not maintained several feet above the hot leg centerline when the reactor vessel head was not in place, and the RLIS tubing length was not maintained to a minimum when installed. Therefore, the measures were not adequate to prevent a similar condition from occurring.

Response to Violation A

To assist in following LP&L's position on Violation A it is helpful to set out our understanding of the major elements of the violation. In essence the violation states:

- o LP&L made specific commitments in response to Generic Letter 87-12 which were not implemented.
- o Those commitments are a continuation of the corrective action committed to by LP&L following the July, 1986 loss of shutdown cooling. Therefore the corrective action for the July, 1986 event was inadequate.
- o The May, 1988 event is a repetition of the July, 1986 event.
- o Because the July, 1986 event was a significant condition adverse to quality, and was repeated in May, 1988 due to inadequate corrective action, a violation of 10CFR50 Appendix B Criterion XVI exists.

For a civil penalty, 10CFR2.205 allows the response to deny the violation, demonstrate extenuating circumstances or demonstrate error in the notice of violation. As will be discussed in detail below, in this case LP&L contests Violation A, as written, based on the following errors:

I. The May, 1988 event at Waterford 3 is not a repetition of the July, 1986 event in the sense of Criterion XVI of 10CFR50 Appendix B.

II. Commitments made by Waterford 3 in response to Generic Letter 87-12 are not a continuation of the corrective action for the July, 1986 event.

III. LP&L did not make, and fail to implement, the commitments as cited in the NOV.

I. THE MAY, 1988 EVENT IS NOT A REPETITION OF THE JULY, 1986 EVENT

The July, 1986 event at Waterford 3 involved an extended loss of shutdown cooling capability for approximately 220 minutes.

As the event initiated, two separate drain paths were being used to lower RCS level. RCS pressure was to be maintained at approximately atmospheric by nitrogen supplied from the quench tank through the pressurizer vent. However, nitrogen could not be added rapidly enough to compensate for the drain rate, thus creating a slight vacuum in the RCS.

RCS level was periodically monitored by an operator observing a local tygon tube standpipe. The vacuum in the RCS had collapsed the tygon tube causing an inaccurate high level indication.

Recognizing a problem with the level measurement, operators isolated one of the drain paths, overlooking the second path. The operators then vented the RCS to correct the problem with the tygon tube level indication, resulting in indicated level dropping below the hot leg centerline. As a precaution, water flow was added through the charging pumps. However, the second drain path, which had been overlooked, continued to drain the RCS.

Shutdown cooling was lost when the operating shutdown cooling pump eventually began to cavitate due to the continued draindown. In response to the cavitation, the operators secured the pump. At this time operators recognized that the second drain path existed and secured the draindown, but several attempts to restore shutdown cooling were unsuccessful apparently because of a steam bubble formed by localized boiling trapped between the shutdown cooling line loop seal and the shutdown cooling pump suction. Since the RCS water was at saturation, the steam could not be easily condensed. Eventually, cooler water was introduced into the RCS, condensing the steam and allowing restoration of shutdown cooling.

There are a couple of key elements to this event:

- o Two drain paths allowed one to be overlooked.
- o The tygon tube portion of the level measurement system did not have sufficient strength to withstand the RCS vacuum without collapsing.

Along with other corrective action for the July, 1986 event, these items were corrected by a procedure change to prohibit more than one RCS drain path, and by replacing the tygon tube sight glass with one that could withstand a negative pressure without collapse.

In contrast, the major elements of the May, 1988 event were quite different.

Due to commitments made in response to GL 87-12, a new hard-piped refueling water level indication system (RWLIS) with control room indication was being installed during the second refueling outage. The RWLIS was intended to be used in the future as the primary level measurement system rather than the existing tygon tube refueling level indication system (RLIS). The design of the RWLIS called for tying the new system into the RCS at the existing tap-off for the RLIS (tygon tube). The RLIS connection

was then to be relocated to a point within the RWLIS piping network. By relocating the RLIS tap-off, the RLIS hosing (which in the original design had been maintained to a minimum length) in the new design had approximately 30 excess feet of hosing. The significance of the design change was not recognized until late in the May, 1988 event.

On May 7, the Shift Supervisor was informed that construction on the RWLIS and the reconnected RLIS was complete and the systems could be put in service from a fluid system standpoint. At this time the controlling procedure (OP-1-003, Reactor Coolant System Drain Down) was in Revision 5 which did not acknowledge or incorporate the design changes associated with the RWLIS. Revision 6 to OP-1-003, which did include the RWLIS design and associated instructions, was not placed in the control room until May 9 - i.e. after RWLIS/RLIS had effectively been placed in service.

Revision 6 to OP-1-003 requires, prior to draindown, the completion of two attachments dealing with RWLIS and RLIS installation to ensure proper operation. On May 12 operations personnel believed that, since installation of the RWLIS and RLIS was already complete and the systems were in service, the RWLIS/RLIS installation steps of OP-1-003 had already been completed. They failed to recognize that Revision 6 to OP-1-003 was new and had been issued subsequent to the systems being placed in service. Therefore, steps which would have ensured that the RWLIS had a dry reference leg, had been back-filled and vented, ecc., were not implemented and/or confirmed.

On May 12, the reactor head had just been placed on the reactor vessel. In-core instrumentation, including the heated junction thermocouple (HJTC) system had not yet been connected.

Early in the RCS draindown process on May 12, discrepancies in the RWLIS and RLIS measurements caused the draining to be halted until it was discovered that the RWLIS reference leg contained water contrary to design. The leg was drained, the RWLIS measurement was again in agreement with the RLIS, and RCS draining was resumed. The problem with the RWLIS reference leg coupled with the fact that the RWLIS was a new system not yet proof tested caused the operators to le more credence to the RLIS measurement thereafter, although cross checks between the level systems continued to be made.

As the draindown proceeded with the RWLIS/RLIS measurements in approximate agreement, an operator noticed a slight oscillation in LPSI Pump A flow which shortly gave indication of some amount of cavitation as indicated by pump suction pressure beginning to fluctuate in addition to flow. Draining was immediately secured.

A HPSI pump was started to inject water to the RCS and LPSI pump A was vented, releasing some air. Shutdown cooling loop B was aligned for operation and LPSI Pump B was vented and started with no problems occurring. At this point, operator logs indicated RLIS level well above the hot leg centerline.

Extensive investigation and walkdowns were conducted to determine the source of the problem. At the time, operators felt that as a result of maintenance or improper valve line-ups, some air intrusion in the RCS was the cause of the LPSI pump cavitation rather than a low RCS level.

When no indication of air intrusion was found and the valve line-ups were confirmed correct, operators placed shutdown cooling loop A back in service and maintained the B loop on recirculation as a precaution. Because the cause of the cavitation had not been firmly identified, the Operations Superintendent remained in the control room throughout the second draindown.

The RCS draindown was again attempted, with careful attention to important parameters. Draining was again secured, this time due to inconsistencies between the RWLIS and RLIS indications, even though, due to earlier events, the operators had more confidence in the RLIS indication. Within several minutes of securing the draindown, LPSI Pump A again began to exhibit signs of cavitation. Similar to the first cavitation, operators started a SI pump to inject water into the RCS, shutdown cooling was shifted to the B loop and RCS level was restored and shutdown cooling maintained.

Upon walking down the RLIS again, the design engineer investigated the RLIS tubing. He shook it, producing erratic level indications in the control room, eventually clearing the entrapped air which resulted in a drop in RLIS level consistent with the RWLIS indication.

The key elements in this event include:

- o The significance of RLIS design changes which allowed excess RLIS tubing and subsequent air entrainment were not recognized.

- o Procedure changes (Revision 6 to OP-1-003) were not coordinated with construction completion to ensure that RWLIS/RLIS were properly placed in service.

The July, 1986 event concerned an extended loss of shutdown cooling properly characterized by the NRC as "a significant condition adverse to quality". The May, 1988 event concerned brief cavitations of a LPSI pump which did not result in a loss of shutdown cooling due to correct operator actions and procedures.

The level measurement problem in July, 1986 revolved around a collapsed section of tygon tubing which had been replaced and tested with higher strength material to ensure such an event was not repeated. In May, 1988, deficiencies in level measurement concerned entrained air which, had procedures been implemented in a timely manner, should have been identified and resolved.

Most importantly, in July, 1986 operators failed to recover in a timely manner from the inaccurate level indication. In May, 1988, due to the extensive, detailed training, procedure changes, etc. which had been implemented as a result of both the July, 1986 event and Generic Letter 87-12, operators quickly and professionally restored level and maintained shutdown cooling. Rather than being repetitious of the July, 1986 event, LP&L feels that the corrective actions implemented in response to that event, as well as the changes initiated in response to Generic Letter 87-12, were effective in ensuring that the May, 1988 event was not a repetition of July, 1986.

The basis for Violation A rests squarely on the repetition of the July, 1986 event. The violation notes that ".... the licensee failed to take adequate corrective actions to preclude repetition of a significant condition adverse to quality....".

Repetition of a significant condition adverse to quality must logically include a repeat of the significant condition adverse to quality. The July, 1986 event was a "significant condition adverse to quality" because it resulted in a loss of shutdown cooling. The May, 1988 event did not. Repetition of an event must involve more than similarity. For instance, a reactor trip can occur in a number of diverse, unrelated ways. The fact that the same circuitry is involved in tripping the reactor (and the same end result is reached) is not a sufficient basis to label one reactor trip as being repetitive of a previous trip. By the same token, problems with shutdown cooling, level measurement, etc., can occur in many diverse, unrelated ways. Finally, the plant procedures and operator response were quite different. Operator actions and procedures as of July, 1986 were insufficient to prevent a loss of shutdown cooling, while in May, 1988 the LPSI pump cavitation was promptly handled in accordance with revised procedures and training to minimize the safety impact of the event.

Consequently, LP&L feels that the basis for Violation A - a violation of 10CFR50 Appendix B Criterion XVI which characterizes the May 1988 event as a repetition of a significant condition adverse to quality - is in error.

II. COMMITMENTS MADE IN RESPONSE TO GENERIC LETTER 87-12 ARE NOT A CONTINUATION OF CORRECTIVE ACTION FOR THE JULY, 1986 EVENT

In referring to the July, 1986 event, Violation A notes that "The licensee's measures established to preclude repetition of this event included specific commitments made in a September 21, 1987 response to Generic Letter 87-12...".

As previously noted, corrective actions to preclude repetition were implemented for the July, 1986 event. For instance, the tygon tubing which had collapsed was replaced with higher strength tubing and tested under negative pressure, and procedures were changed to not allow draining the RCS through more than one pathway. These problems have not repeated, nor has a loss of shutdown cooling repeated due to these problems.

The corrective actions for the July, 1986 event, of which the above are prime examples, stand on their own. They have been internally reviewed and determined adequate. The NRC, which identified no violations, deviations or open items associated with the event, reviewed various specifics of the event in Inspection Reports 86-15 (8/20/86), 86-16 (10/16/86) and 86-.. (10/24/86). In Inspection Report 86-33 (2/16/87) the NRC closed the event LER (86-015) noting that "reporting requirements had been met, that causes had been identified, [and] that corrective actions appeared adequate...".

The logical basis for Violation A rests, in part, on alleged failures to implement commitments from Generic Letter 87-12, and consequent failure to implement corrective action for the July, 1986 event, resulting in a violation of the corrective action implementation requirements of 10CFR50 Appendix B Criterion XVI. For the purposes of a violation of Criterion XVI, commitments to Generic Letter 87-12 are immaterial because such commitments are not a continuation of corrective action from the July, 1986 event. Consequently, Violation A is in error.

III. LP&L DID NOT MAKE, AND FAIL TO IMPLEMENT, THE COMMITMENTS AS CITED IN THE NOV

LP&L feels that the specific Generic Letter 87-12 statements identified in Violation A are not commitments and, to that extent, Violation A is in error.

Before discussing the specific Violation A items labelled as commitments it is worthwhile to briefly review what the Generic Letter was requesting and the context and organization of the response. Overall, Generic Letter 87-12 requested "a description of the operation of your plant during the approach to a partially filled RCS condition and during operation with a partially filled RCS to ensure that you meet the licensing basis." The particular question applicable to the Violation A areas requested "Reference to and a summary description of procedures in the control room of your plant which describe operation while the RCS is partially filled. . . . We are particularly interested in your treatment of drain-down. . .".

In preparing the Generic Letter 87-12 response, the same general approach was followed for each section: applicable existing procedures were summarized, potential changes were discussed and specific commitments (i.e. future changes) were identified. When

discussing applicable procedures, the response preparers took to heart the Generic Letter direction to summarize. There was not an attempt to provide exhaustive detail for each procedure step. Nor was there an attempt to discuss all potential situations to which the procedures could apply - only duplication of the entire procedure could adequately characterize all situations. In addition, in many cases procedural descriptions described existing procedures - i.e., the past, not future activities.

For these reasons, there was never the intent or belief that a summary description could logically constitute a commitment. Whenever there was an intent to make a commitment in the Generic Letter response it was clearly labelled as a future action and usually restated at the end of each applicable section of the document, in accordance with the Generic Letter request to identify such changes.

The first Generic Letter response statement cited as a commitment by Violation A has two elements:

1) The HJTC and RLIS (two independent and diverse level measurement systems) will be used by operators.

2) The HJTC system shall be continuously monitored while draining and at part-loop conditions.

These elements summarize the applicable Waterford 3 procedures, in a general fashion, that existed at the time the Generic Letter response was written. All details concerning the use of the HJTC/RLIS systems are not included, nor intended to be included, in the sections of the response from which these statements were taken. If summary descriptions are requested, as was done by the Generic Letter, it seems inappropriate to find fault when the descriptions are later found not to be all-encompassing. For instance:

1) With regard to element 1, above - as a commitment, this statement requires operators to use the HJTC and RLIS during draindown, making no allowance for any substitution. However, the Generic Letter had shed doubt on the accuracy and reliability of flexible hose level measurement systems with local indication, such as the RLIS. Being responsive to the Generic Letter concerns, LP&L committed to installing a hard-piped level measurement system with control room indication (the RWLIS), during the second refueling outage as its primary means of RCS level indication in the future. Procedures were changed to allow operations personnel to dispense with the RLIS thereafter, if desired. Taking the NRC's interpretation of the Generic Letter statement as a commitment would prohibit the replacement of the RLIS by the RWLIS in the future because the statement is explicit in requiring the

RLIS. Yet it is quite clear from the Generic Letter response that the true commitment was to RWLIS indication. The inconsistency in this case is treating a summary description of then extant procedures as a continuing commitment for the future.

2) Elements 1 and 2, above, on their face, appear to require the HJTC system always to be available during draindown and part-loop operation. As with the first example, a summary description of extant procedures does not cover all possible instances of applicability. It is clear, for example, that there have been and will be situations where either the reactor head is not in place, or has recently been replaced and HJTC instrumentation has not yet been hooked up. This possibility was recognized in the Generic Letter response. For instance, in Section 6.2.1 of the response which discusses level measurement during a loss of shutdown cooling event, the statement is made (emphasis added): "....the HJTC System is available as a reliable cross check for other RCS level indications when the reactor head is in place." By taking a single statement and labelling it a commitment, Violation A changed the intent of the Generic Letter response. The intention, although it is not explicitly stated in the Generic Letter response, is for operators to cross check RCS level between two systems. The inconsistency is in taking a general summary statement as a commitment and doing so without reference to other qualifying statements.

Similar arguments can be made for the second Generic Letter response statement cited by Violation A that water level be maintained above the hot leg centerline.

The final statement cited by Violation A says (emphasis added): "During installation, the tubing length of the RLIS was maintained to a minimum." From the context of the statement and the tense of the verb it is clear that this statement was intended as a description of the RLIS when first installed. The RLIS rubber hosing is re-used at each installation and its length was never intended to change. At the time the Generic Letter response was written, the design of the RWLIS was incomplete - it was not anticipated that the RLIS tap-off location would be changed as a result. Although LP&L agrees that a deficiency existed in not identifying the excess RLIS tubing as a potential for inaccurate level measurement, this is adequately covered as a procedure violation in Violation B. The statement extracted from the Generic Letter response is not a commitment.

Violation B

B. Failure to Follow Procedures

10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings. The activities shall be accomplished in accordance with these instructions, procedures, or drawings.

Pursuant to this requirement, Waterford 3 operating procedure OP-1-003, Revision 6, "Reactor Coolant System Drain Down", establishes, in part, the requirements for draining down the reactor coolant system (RCS) to the refueling water storage pool (RWSP):

1. Step 6.4.8 of Procedure OP-1-003, Revision 6, states that the plant staff will, "Perform frequent cross checks of the RWLIS, RLIS (Tygon Tubing), if in service, and the HJTC level indication on QSPDS, during RCS drain down."

2. Step 8.4.6 of Attachment 8.4 of Procedure OP-1-003, Revision 6, requires the blowdown of water from the pressurizer reference leg.

3. Attachment 8.4 of Procedure OP-1-003, Revision 6, requires, in part, a backfill and venting of the tubing in the refueling water level indicator system (RWLIS) to ensure that air is removed from the system.

4. Step 8.6.6.5 of Attachment 8.6 of Procedure OP-1-003, Revision 6, requires that the refueling level indicator of the refueling level indication system (RLIS) be inspected for any condition which could cause the refueling level indicator to give false indication.

Contrary to the above, on May 12, 1988, Procedure OP-1-003, Revision 6, was not followed in that:

1.a. During a drain-down of the RCS to the RWSP, no cross checks of reactor vessel water level were performed between the RWLIS indicators and the heated junction thermocouple (HJTC) water level indicator system indicators as required by Step 6.4.8 of Procedure OP-1-003, Revision 6. Further, at the time of the RCS drain-down, the HJTC water level indicator system was not operable.

1.b. During a second RCS drain-down of May 12, 1988, plant operators relied solely on reactor vessel water level indication provided by the RLIS, even though Step 6.4.8 of Procedure OP-1-003, Revision 6, requires that cross checks of the RLIS indications be made with the RWLIS indications.

2. The RWLIS level detector reference leg was apparently not blown down as required by Step 8.4.6 of Attachment 8.4 of Procedure OP-1-003, Revision 6, in that licensee personnel detected water in the reference leg subsequent to the commencement of the RCS drain down. The discovery of water in the RWLIS detector reference leg contributed to the licensee's decision to rely solely on the RLIS for reactor vessel water level indication.

3. RCS drain-down to part-loop was performed even though the RWLIS backfill and venting had not been performed as required by Attachment 8.4 of Procedure OP-1-003, Revision 6. Performance of the RWLIS backfill would have removed entrapped air which can cause false water level indication.

4. Even though the RLIS tubing was inspected prior to and during the RCS drain-down of May 12, 1988, it was not performed in accordance with Step 8.6.6.5 of Attachment 8.6 of Procedure OP-1-003, Revision 6, in that several licensee personnel, initially, failed to detect upon inspection, that approximately 30 feet of excess RLIS hose contained entrapped air and consequently caused erroneously high RLIS reactor vessel water level indication.

Violation B Response

LP&L agrees that prior to, and during, the May 12, 1988 event procedure violations contributed to the LPSI pump cavitation. We therefore admit to Violation B. However, we wish to take issue with two of the violation statements.

The first statement LP&L questions is Violation Statement 1.a. It notes that the HJTC system was inoperable and that cross checks between the RWLIS and HJTC were not performed as required by Procedure OP-1-003, Revision 6, Step 6.4.8. Step 6.4.8 states, in part:

> Perform frequent cross checks of the RWLIS, RLIS (Tygon Tubing), if in service, and the HJTC level indication on QSPDS, during the RCS draindown.

We expect the NRC is reading Step 6.4.8 above not to allow draindown of the RCS with the HJTC inoperable particularly since the modifier "if in service" is not included for the HJTC System as it is for the RLIS. The difference is the "Prerequisites" Section of Procedure OP-1-003, Revision 6, already allowed draindown with the HJTC System inoperable. Prerequisite Step 3.3 of OP-1-003 states:

> QSPDS HJTC level indications. . .are in service when the reactor vessel head is in place, except when preparing for head removal or replacement.

The HJTC System was inoperable because the reactor vessel head had just been put back on the vessel and the lengthy process of instrumentation connection (including the HJTC System) was not complete when the draindown commenced - in other words, Waterford 3 was preparing for head replacement.

In operating procedures, "Prerequisites" and "Precautions and Limitations" apply throughout the course of the procedure. It is unnecessary to restate any item in the procedure steps if it has been already included in the "Prerequisites" Section. For instance, one prerequisite to draindown is that an HPSI pump be available. Operators are trained to know that if they began a draindown with an operable HPSI pump which became inoperable during the draindown, they may not continue draindown until an HPSI pump is restored to operable condition. Similarly, Prerequisite Step 3.3 explicitly allows drain down without an operable HJTC System by providing exceptions to its operability requirements. It is not necessary, therefore, to restate the Prerequisite exception in Step 6.4.8.

The second statement questioned is Violation Statement 1.b (and the last sentence of Violation Statement 2), which note that the operators relied solely on the RLIS indication following the initial LPSI pump cavitation. This is incorrect. In fact, the second draindown was halted due to discrepancies between the RWLIS and the RLIS noted by operator crosschecks. It was only several minutes after securing the draindown that the LPSI pump cavitated the second time.

Violation Severity Level

Appendix C to 10CFR2 contains the NRC policy concerning enforcement actions. In categorizing severity levels, Section III of Appendix C provides general guidance:

> Severity Level I and II violations are of very significant regulatory concern. In general, violations that are included in these severity categories involve actual or high potential impact on the public. Severity Level III violations are cause for significant concern. Severity Level IV violations are less serious but are of more than minor concern, i.e., if left uncorrected, they could lead to a more serious concern.

In Supplement I to Appendix C, specific examples of Severity Level I-V violations are given for the category of reactor operations. While the examples are not all-inclusive to the point of directly matching the NOV, they tend to provide additional clarification for the general classification guidance above. Only one Severity Level III example for reactor operations could be considered similar to the subjects discussed in the NOV:

> 2. A system designed to prevent or mitigate a serious safety event not being able to perform its intended function under certain conditions (e.g., safety system not operable unless offsite power is available; materials or components not environmentally qualified);

Similarly, only one Severity Level IV example could be construed to be similar to the NOV:

> 3. Failure to meet regulatory requirements that have more than minor safety or environmental significance;

The May 12, 1988 event involved the cavitation of LPSI pump A. Operators conservatively switched over to shutdown cooling loop B, which operated successfully. The Severity Level III violation example cited above refers to the loss of a required safety system. The May 12 conditions would not meet the threshhold for a Severity Level III violation because at least one train was always operable as required. As noted in the cover letter to the NOV, a loss of shutdown cooling (i.e. losing both trains of shutdown cooling) did not occur on May 12, nor is it at issue in the NOV. From the standpoint of the Severity Level III examples, it would appear that the May 12 event should not be categorized as a Level III violation.

The Severity Level IV violation example is a fairly close match to the May 12 event. Regulatory requirements exist concerning compliance with procedures. On and prior to May 12, procedure violations clearly occurred which led to the LPSI pump cavitations. Characterizing the May 12 event as Severity Level IV is also consistent with the general Appendix C guidance in that the procedure violations were of more than

minor concern and could lead to the more serious concern if uncorrected.

Viewing the May, 1988 event, LP&L feels that it qualifies as a Severity Level IV violation, consistent with the guidance of 10CFR2 Appendix C. Consequently LP&L requests that the NOV be reassigned a Severity Level of IV and the Civil Penalty be rescinded as not generally applicable to a Severity Level IV violation.

Corrective Action

Following the NRC's feedback from the June, 1988 enforcement conference, LP&L reevaluated the corrective action planned in response to the May, 1988 event. Emphasis has been placed primarily on correcting procedural violations and deficiencies, and secondarily on deficiencies in the station modification turnover process. To prevent recurrence of the May 12, 1988 event the following corrective action has been identified:

1. To prevent recurrence of operating procedure compliance problems:

   - Plant and Operations management have been counselled,
   - The operator shifts involved in the event have been counselled, and
   - The engineering staff who noted (or should have noted) the excess RLIS tubing length have been counselled.

   To emphasize that plant modification turnover and startup procedures are no less important than operating procedures, Plant and Engineering management and staff have also been counselled on the necessity to follow such procedures.

2. The May 12, 1988 event will be included in initial and requalification operator training. The current initial training class will review the event by the end of January, 1989. Subsequent initial training classes will include the May 12 event as part of their standard training. Requalification training through required reading will be complete by September 30, 1989. Subsequent requalification training will include the May 12 event lessons learned prior to each refueling outage.

3. During draindown an operator will be dedicated to monitoring the draindown process.

4. The RCS draindown procedure will be revised by November 15, 1988 to: 1) specifically address minimizing the RLIS tubing length during installation and subsequent inspections, and 2) specify RCS volumes for draindown from refueling (including intact steam generators and steam generators with nozzle dams installed).

5. As discussed with Region IV personnel during the September 1, 1988 SALP briefing, the station modification (SM) process for Waterford 3 has been upgraded. The SM program enhancements included improvements directed at areas of weakness identified following the May, 1988 event:

   Pre-implementation interfaces - discussions are held amongst involved departments to review the work plan, safety concerns, operations boundaries and support requirements, and testing.

   Testing - system engineers are involved in modification testing.

Operations interface at supervisory level - Operations management reviews operability requirements prior to turnover.

6. Overall LP&L feels that detailed, timely followup of corrective action determination and implementation needs to be more thorough. Because the corrective action program at Waterford 3 involves many different activities, procedures and work groups, improvement in this area will, by necessity, require diverse solutions. For instance, one aspect of a successful corrective action program is a strong process for dealing with and reducing human errors. Our Improving Human Performance (IHP) Program elements are directed at this need. Some of these key elements are:

   1. Counseling IHP seminars

   2. Required documentation of counseling, to be reviewed by Senior Management

   3. Zero Deviation Program, which provides positive reinforcement of procedure compliance and error avoidance

   We are also presently upgrading efforts to prioritize, determine corrective action for, and close out nonconformance items which could reflect on equipment and system operability.

   While these efforts appear to have great potential for success, we feel that, in general, the corrective action programs for Waterford 3 would benefit from further coordination and stronger management oversight. Consequently, Waterford 3 management is directing that a task force review the processes by which quality deficiencies are identified, corrected and confirmed as adequate. The task force will be composed of representatives from major Nuclear Operations departments and charged with making recommendations to management necessary to prepare an integrated corrective action program that is timely and responsive. We anticipate the task force effort to be complete by the end of the year. Because of the importance of this issue and the extensive scope of corrective action programs at Waterford 3, there is a need to proceed in a careful, thoughtful manner when changing quality-related administrative systems. It is expected that some time will be necessary to ultimately produce a high quality program. Management review and implementation of the task force recommendations will be completed in a timely manner. However, the final implementation schedule will depend on the nature and scope of the recommendations, the need for further research or pilot programs, etc. Therefore, we will supplement this response no later than January 31, 1989 with a description of the proposed changes to the corrective action program and a schedule for implementation.

Items 1, 3 and 5 are complete. The remaining items will be complete by the schedules indicated above.