LOUISIANA POWER & LIGHT / 142 DELARONDE STREET
P. O. BOX 6008 • NEW ORLEANS, LOUISIANA 70174 • (504) 366-2345
MIDDLE SOUTH UTILITIES SYSTEM

February 9, 1984

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

SUBJECT: Waterford SES Unit 3
Docket No. 50-382
Control of Heavy Loads - Special Lifting Devices

REFERENCE: A) Letter dated August 18, 1983 from G. W. Knighton to R. S. Leddick, Control of Heavy Loads - Phase I - NUREG 0612
B) Letter dated January 27, 1983 from L. V. Maurin to G. W. Knighton, Control of Heavy Loads
C) IE Information Notice No. 83-71: "Defects in Load-Bearing Welds on Lifting Devices for Vessel Head and Internals", dated October 27, 1983

Dear Sir:

Reference (A) forwarded EG&G's final draft Technical Evaluation Report (TER) of LP&L's conformance to the general load-handling guidelines in Section 5.1.1 of NUREG-0612,"Control of Heavy Loads at Nuclear Power Plants". This report concluded that the load-handling policy and procedures at Waterford Generating Station No. 3 were in compliance with these general guidelines with the exception of General Guideline 4-Special Lifting Devices. The purpose of this letter is to provide clarifying information on our special lifting devices. We will demonstrate that any exceptions to verbatim compliance take an approach that is consistent with the NRC's interpretation of Guideline 4 as stated in the "Synopsis of Issues Associated with NUREG-0612," enclosure to Reference (A).

The synopsis requires the licensee to prepare a stress report and determine that margins to material yield and ultimate strength are comparable to those specified in ANSI N14.6. Reference (B) provided a stress summary and comparison to ANSI N14.6. Although the reactor internals upper guide structure (UGS) and core support barrel (CSB) lift rigs were not designed to ANSI N14.6, (in fact, they were manufactured prior to the issuance of the standard) they were designed to approved standards and fabricated to stringent quality control and quality assurance procedures. As indicated in our stress summary, the stress resulting from a design load of twice the normal operating load will not exceed the code allowable stress for the material of each load carrying member. The code stress is the tensile or compressive stress allowed by the ASME Boiler and Pressure Vessel Code, Section III NB-3000 tables. This stress is always less than the minimum yield strength corresponding to a member's material specification (e.g. forged 304SS has a code [allowable] stress about 1/3 less than minimum yield).

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As discussed with our vendor engineers this design criteria will result in a material yield to normal operating stress ratio (i.e. safety factor) of greater than 3 for most members of the subject lift rigs. For the remainder, the safety factor will be between 2.0 and 3.0 with most of these cases being closer to 3.0. The ANSI N14.6 standard essentially requires a safety factor of 3.0 for operating loads. It is our opinion therefore that the margins to material yield and ultimate strength for the "low usage" CSB and UGS lifting rigs is comparable to the ANSI N14.6 margins for "high usage" lifting devices for nuclear material shipping containers. However, since verbatim compliance is not achievable in this case, appropriate non-destructive examination (as discussed further) will be incorporated into our inservice inspection program.

Our exception for the 150% overload test was previously [illegible]d in Reference B. In remaining consistent with the NRC synopsis, the UGS a[illegible] lift rigs have been subjected to a manufacturer's recommended overload test of 125% as proof of workmanship prior to shipment to site. The use of the detailed vendor provided Reactor Internals Lift Rig Manual, assures that error is highly unlikely in any required assembly or disassembly. The lift devices are relatively uncomplicated and the number of weld joints have been minimized by the use of pin and bolt connectors to couple the tie rod, spreader and lift column assemblies.

In addition to the design considerations above our maintenance, repair and testing procedures will also insure a continued level of substantial safety margin throughout the useful lifetimes of the rigs. Control Identification and Work Authorization (CIWA) procedures establish the control condition which assure that any repair work or replacement part orders will meet or exceed the original design criteria. A list of critical components need not be specially made up for these rigs as bills of material showing the required minimum material specifications are available for use on certified construction drawings. Also, in keeping with the synopsis approach, we are committing to examination of all load bearing welds over a normal inservice inspection interval in a manner similar to that specified in the ASME B&PV Code for Class 2 component supports.

Another concern of special lifting devices which needs to be addressed is the reactor vessel (RV) head lift rig. Reference (B) committed to an item by item comparison of the RV head lift rig to the ANSI N14.6 standard. In Reference (A), EG&G duly noted the absence of this comparison in their review of Reference (B) and listed it as an open item. Attached please find Supplement No. 1 to the Draft Technical Evaluation Report Response [Reference (B)]. The results of the comparison study are similar to those of the UGS and CSB lift rigs. Likewise the conclusions drawn in this letter apply equally to the RV head lift rig for the same reasons. The stress margins are substantial and comparable to ANSI N14.6. The stress safety factors meet or exceed ANSI N14.6 requirements for material yield and ultimate strength for all load carrying members of the head lift rig with few exceptions. In these few cases, the safety margins for material yield are very close to ANSI N14.6. Accordingly, we are also committing to NDE required for Class 2 component supports for all load bearing welds over a 10 year ISI interval to insure these substantial stress margins are maintained throughout the useful life of this head lift rig.

The ISI interval testing of all special lifting devices committed to above will consist of visual inspection for weld free components and surface (magnetic particle or liquid penetrant) examination for integrally welded support members. Dimensional testing as discussed in ANSI N14.6 Section 5.3.1 is not specified by the ASME B&PV Code for Class 2 component supports and will not be performed for special lifting device members. The short duration of load application and relatively infrequent use of these devices coupled with the previously described substantial stress margins, precludes the need for dimensional testing of load bearing members.

As a result of our review of Reference (C), we plan to conduct magnetic particle testing (MT) on all load bearing welds not previously tested prior to fuel load for both the UGS/CSB lift rigs and the RV head lift rig. Although weld defects were discovered at another site by MT on a head lift rig not supplied by our NSSS vendor, prudence dictates that we assure ourselves that all welds on our lifting devices were properly performed as part of our compliance with General Guideline 4.

Based on the above information, we request that the Phase I requirements of NUREG 0612 be closed out in the next Supplement to the Waterford SER. As noted in Supplement 5 to the SER, these Phase I requirements were to be the subject of a License Condition for completion by first refueling. We trust that the present submittal obviates the need for such a License Condition.

Should you have any questions or comments on this matter please contact me or Kevin Curley at (504) 363-8950.

Yours very truly,

K. W. Cook

K. W. Cook
Nuclear Support and Licensing Manager

KWC/KNC/cb

Attachment

cc: W. M. Stevenson, E. L. Blake, J. Wilson (NRC), G. L. Constable, T. Chan, F. Clemenson