MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

November 19, 1982

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
License No. NPF-13
File: 0260/16360
Ref: AECM-81/427
MAEC-82/169
AECM-82/338
AECM-82/149
Amended Response to EG&G Comments on Six Month Heavy Load Report, Nine Month Report Load Drop Analysis.
AECM-82/415

On August 6, 1982 in AECM-82/338 Mississippi Power & Light Company (MP&L) responded to the comments that EG&G submitted on MP&L's first Heavy Load submittal sent to your organization with a letter from L. F. Dale to Mr. D. G. Eisenhut on November 23, 1981. On September 1, 1982, a telephone conference was held between staff members of EG&G, the Nuclear Regulatory Commission, TERA Corporation and MP&L to discuss our response. As a result of agreements reached during the conference certain changes were made and are reflected in the attached amended responses. Also included are three replacement pages (Rev 2) of the six month report with insertion and removal instructions.

On May 24, 1982, Mississippi Power & Light Company submitted its nine-month report on Heavy Load Handling Evaluations (AECM-82/149). As discussed in the report, analyses of postulated Reactor Pressure Vessel Head and Drywell Head drops were being performed to verify certain assumptions made in the report (e.g., see Tables 7 and 11). Those analyses have now been completed. The analyses were performed to determine the potential impact to safe shutdown equipment due to postulated drops of the Drywell Head and RPV Head onto their respective storage areas. The results of the analyses indicate that no damage to equipment inside the drywell is expected and, therefore, the assumptions made in the nine-month report are valid.

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MISSISSIPPI POWER & LIGHT COMPANY

We believe that this information closes out the NUREG-0612 Heavy Load issue for Grand Gulf, and no further submittals are planned. If you have any questions, please advise.

Yours truly,

L. F. Dale
Manager of Nuclear Services

PJR/JDR:sap
Attachment

cc: Mr. N. L. Stampley (w/o)
Mr. R. B. McGehee (w/o)
Mr. T. B. Conner (w/o)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a)
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MP&L Revised Comments as a
Result of September 1
Telephone Conference

Open Item Number:

HLR6-1, 3, 4, and 13

Concern:

EG&G had cautioned that all procedures for safe load paths, load hand ing, training and maintenance would be developed by fuel load and available for audit. MP&L's response to all of these concerns was: "All appropriate procedures have been developed and are available for audit".

During the conference call NRC requested that the response be directed to the NUREG.

Amended Response:

All procedures required by NUREG 0612, have been developed and are available for audit.

HLR6-5

Concern:

MP&L addressed ANSI N14.6-1978 to the special lifting devices but found Designer's Responsibilities (Sect. 3.1.1) difficult to apply in retrospect. NRC however is especially concerned about specifying limitations on the use of the devices. There was also concern about whether or not there were proper quality assurance measures in place (Sect. 3.1.2).

Amended Response:

The Drywell Head Strongback was supplied in accordance with a general specification for catagory I structures, 9645-C-131.0, Rev. 21, as shown on drawing 9645-C-1092B, Rev. 3. The Drywell Head Strongback was designed in accordance with the Project Quality Assurance Program. The strongback was fabricated and delivered by Bristol Steel, Inc. in accordance with an approved quality assurance program. This program is outlined in the Bristol Steel quality assurance manual identified by vendor document No. 9645-C-131.0-QS-6.0-1-17. All 18 points required by quality assurance as called out in specification 9645-C-131.0, Appendix C, are covered by this manual. Field work on the strongback was performed in accordance with the Project Quality Assurance Program.

The Dryer Separator Strongback was purchased under General Electric Purchase Order No. 205 AF606 Rev. 0 which directed the Vendor to employ QAR 2 Rev. 0 supplements 21 and 23 Rev. 0, N. L. 75 Rev. 1 and QRL 7, Rev. 2. The Reactor Head Strongback Carousel was purchased under General Electric Purchase order 205 AH750 Rev. 17 which directed the vendor to employ QAR 1, Rev. 1, N. L. 159, Rev.0 and QRL 10, Rev. 0.

To insure against improper use, the special lifting devices will be used only in the controlled environment of the containment. Procedures will be modified to exclude their loads to those intended: i.e., the Drywell Head Strongback will only be used to lift the Drywell Head or the RPV Head insulation with support structure, except for special test loads as specified in HLR6-11, below.

HLR6-8

Concern:

In MP&L's response to concerns that dynamic loads were not included in stress design factors it was contended that maximum dynamic loading of the polar crane would be insignificant. The NRC requested that actual speeds be supplied and that the guidelines of CMAA-70 be employed.

Amended Response:

While the evaluation of stress design factors for devises did not specifically address the combined maximum static and dynamic loads which could be imparted, an assessment of the magnitude of the dynamic loading has been performed to demonstrate its negligible effects on the stress design factors. For example, CMAA-70 Specifications indicate that dynamic loads may be determined based on ½% of the load per foot per minute of hoisting speed. The special lifting devices of interest used at Grand Gulf are lifted by the polar crane main hook which has a maximum hoisting speed of 5 feet per minute. Therefore, the dynamic load increase would be on the order of 2.5%, which is considered negligible. (The auxiliary hook has a hoist speed of 20 feet per minute; however, it is not used in conjunction with any special lifting devices).

HLR6-12

Concern 1:

One of the MP&L responses to the concern about slings was that "Load handling procedures will require use of ANSI B30.9 criteria for sling selection and rigging techniques". The NRC requested that MP&L include the appropriate NUREG-0612 guidelines in the statement.

Amended Response:

Load handling procedures will require the use of ANSI B30.9 and NUREG-0612 5.1.1(5) criteria for sling selection and rigging techniques.

Concern 2:

Sling procedures should include consideration of dynamic loads .

Amended Response:

With regard to lifts identified, which utilize slings, plant procedures will require that sling selection, use, and marking will be based on rated loads which include the sum of both the maximum static and dynamic load.

HLR6-13

Concern:

MP&L's response that "all information concerning specifications of cranes and showing how the specifications would conform to NUREG Guidelines are available for audit" could imply that there may be areas of non-conformance. MP&L should make a more emphatic statement.

Amended Response:

All information concerning specifications of cranes and showing that the specifications conform to Guideline 7 of NUREG-0612 section 5.1.1 are available for audit.

There were additional items reviewed that were resolved but the resolutions pointed to changes that should be made in the six month report. The issues discussed and their resolutions are as follows:

HLR6-9 A-53 steel was erroneously believed to have been used in load bearing components of the RPV-Head. Since A-53 steel is subject to possible brittle fracture an inspection program was suggested in the six month report. It was later discovered that A-53 steel is not used in any load bearing component, therefore, reference to A-53 steel and an inspection program is being deleted from the six month report. Revised page 26 is attached.

HLR6-11 It was agreed by the parties, during the conference call that load testing of special lifting devices need only be performed after evidence of deformation or damage is discovered. It was also further agreed that the load test need not be 150% but 125% in keeping with the initial 125% load test. Pages 26 and 27 of the six month report, attached, has been revised to change the reference to a 125% load test.

While not discussed during the conference call, MP&L is proposing a further modification of the periodic inspection of special lifting devices.

HLR6-10 The parties agreed that because of the limited use of the special lifting devices which are kept in a controlled environment, inspection on a five year internal would be satisfactory. On reflection, inspections would be tied to refueling outages, therefore, MP&L proposes that the following change be made to HLR6-10.

Amended Response:

Annual inspections for all components of the Reactor Head Strongback Carousel, Dryer/Separator Strongback and Drywell Head Lifting Frame (strongback) are not believed to be required. The inspection frequencies that have been established for these Grand Gulf devices are judged to be equivalent to the intent of ANSI N14.6-1978 in that this standard was intended for cask lifting rigs that are used on a frequent basis (potentially 50 to 100 times per year), and such lifting rigs would be subjected to potential abuse in transportation between sites as well as harsh environments during transportation. These harsh environments can include rain, road dust, road salt, or other deliterious materials.

Since the lifting devices identified above for Grand Gulf are typically used to support refueling operations, the frequency of use is considerably less than that of the lifting rigs for which ANSI N14.6 is intended. Additionally these Grand Gulf special lifting rigs are stored in an area where they will not be subjected to harsh environments.

Accordingly, while the visual inspections of the lifting rigs will be performed before each initial use during a refueling outage, the more difficult and time consuming nondestructive examinations and dimensional examinations will be performed every fifth refueling outage. This extended inspection interval is considered equivalent to the intent of ANSI N14.6-1978 to provide sufficient periodic inspection and examination to identify wear or degradation that could potentially lead to weakening of the lifting devices. Pages 27 and 28 of the six month report, attached, has been revised to reflect these changes.

Replacement Pages to Six Month Heavy Load Report

Instructions

Remove	Insert
Page 26 Rev 0	Page 26 Rev 2
Page 27 Rev 0	Page 27 Rev 2
Page 28 Rev 0	Page 28 Rev 2

loads as critical loads and, accordingly, to apply Section 6 of ANSI N14.6-1978 to their designated lifting devices.

ANSI N14.6 - Section 3.2

Section 3.2 of ANSI N14.6-1978 establishes design criteria for special lifting devices. Specifically, it establishes (1) stress design factors for load-bearing members and (2) requirements to assure that materials used in load-bearing members have adequate toughness.

Stress Design Factors - The Head Strongback Carousel and Dryer/Separator Strongback were designed with stress design factors consistent with ANSI N14.6, Section 3.2. The Drywell Head Lifting Frame was designed to AISC criteria which resulted in lower design factors being realized than required by ANSI N14.6. However, based on conservative load criteria used in the design of the lifting frame, the resulting design factors are consistent with those generally required for safety related items.

Fracture Toughness Considerations - The materials utilized to fabricate the load bearing components in each of the lifting devices have been evaluated in terms of their fracture toughness properties. All materials have been determined to possess adequate resistance to brittle fracture.

ANSI N14.6 - Section 5

A program for inspection, testing, and maintenance of the devices will be established that meets the provisions of ANSI N14.6-1978, Section 5 with the following four exceptions.

Exception 1: Plant procedures will not specify a visual inspection by maintenance or other nonoperating personnel at intervals of three months or less as required by Section 5.3.7 of ANSI N14.6-1978. Between periods of usage, these devices are stored in a specific location under controlled environment and are not subjected to any other usage except the dedicated and specific usage mentioned in the description of the devices. Procedures have been revised so that the devices are inspected by qualified personnel prior to each usage and a thorough testing and nondestructive examination is performed during every fifth refueling outage. Based on the controlled storage, dedicated single usage, and the complete inspection schedule, the equivalency of Section 5.3.7 is demonstrated.

Exception 2: Section 5.3.3 of ANSI N14.6-1978 requires that special lifting devices be load tested according to Section 5.2.1 to 150% of maximum load following any incident in which any load-bearing component may have been subjected to stresses substantially in excess of those for which it was qualified by previous testing, or following an incident that may have caused permanent distortion of load-bearing parts. Since 125% initial load testing was found satisfactory, approval has been obtained to have subsequent 125% load tests. Since distortion may already have occurred or since defects may have already developed due to the overstressed condition, it seems more prudent and practical to perform the dimensional examinations for deformation and the nondestructive examinations for defects to determine whether the device is still acceptable for use rather than to subject the device to 125% load testing. If defects or deformation are detected, then the device shall be repaired or modified and then tested to 125% load followed by examination for defects or deformation. This alternative achieves the same objective as Section 5.3.3 of the standard.

Exception 3: The lifting devices were subjected to proof load tests of 125% of rated load as compared to 150% required by Section 5.2.1 of ANSI N14.6-1978. Following the proof tests, all load bearing welds were subjected to NDE. The potential for overloading these devices is extremely remote because the devices are dedicated to one or two specific loads throughout their service life. In addition, they will receive thorough periodic examinations and, if damaged or repaired, will be subjected to a 125% load test before being returned to service. For these reasons, the 125% initial proof test is judged to be adequate.

Exception 4: Several components of the lifting devices will be subjected to NDE and dimensional inspections on intervals longer than those required by Section 5.3.1(2) of ANSI N14.6-1978. These are those components that require disassembly or removal of paint. They will be inspected prior to use every fifth refueling outage because the inspections are difficult and time consuming and are not judged to be justified on a shorter interval based on the very limited and dedicated use of these devices.