

May 5, 1992

Carolina Power and Light Company
ATTN: Mr. R. B. Richey
Vice President
Brunswick Nuclear Project
P. O. Box 10429
Southport, NC 28461

Gentlemen:

SUBJECT: DRAFT INSPECTION NOTES

During the Engineering inspection March 30 - April 10, 1992, at your Brunswick facility an NRC inspector mistakenly provided draft inspection notes to your staff. Providing draft inspection documents to licensees is contrary to Nuclear Regulatory Commission policy. According to agency policy, I am providing you a copy of the released information.

Sincerely,

(ORIGINAL SIGNED BY A. F. GIBSON)

Albert F. Gibson, Director
Division of Reactor Safety

Enclosure:
Inspection notes

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(cc w/encl cont'd - See page 2)

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May 5, 1992

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04/ /92

updated 4-7-92

CHRONOLOGY OF EVENTS CONCERNING THE MASONRY WALLS WITHIN THE
EMERGENCY DIESEL GENERATOR BUILDING

- 1970's Approximately 12 Masonry walls within the EDG building were constructed in accordance with original design specifications as missile protection between the EDG bays by the principle construction contractor Brown & Root. Walls was believed to be required as seismic, although no documentation has been provided (QC records or anything else). Root & Brown was believed? to have done this work although no documentation has been provided. Some confusion on when wall and shield were actually constructed.
- May 8, 1980 IE Bulletin No. 80-11, "Masonry Wall Design" was issued by the NRC during inspections at the Trojan Nuclear Plant in response to non-conservative design criteria for the reactions from supports anchored into the face of concrete masonry walls.
- Feb 13, 1987 Ken Robinson (EDG system engineer in 1987) wrote a "blue" site memo (Brunswick Engineering Support Unit, BESU) to Morris Brown and Bill Monroe (senior engineering supervisors) which identified that the bolts were fake as a result of a recent inspection of the missile protection shield walls. Ken Robinson became aware of this concern when an I&C technician came to him and told him of the problem. The response to the blue memo was by Leo Campbell which stated that a sampling of 4 bolts/wall/side would be adequate to evaluate the problem. If results from this sampling were negative, then evaluate use of hilti bolts or some other fastening mechanism. However, the corrective action (performing the mods to replace the known missing bolts) was not approved by management because of the estimated cost (60,000 dollars).
- Apr 8, 1988 Another blue memo was written by Pat Newton (Tech. Support) requesting another evaluation of the shield walls because the Feb 13, 1987 memo was lost.
- Dec 18, 1990 Calculation #0-1534A-270, Masonry Block Walls EDG Bldg. stated that the masonry block walls is acceptable for the short term structural integrity according to engineering procedure ENP-12, "Requirements for Performing Engineering Evaluations." The calc. shows mapping of the walls where the licensee thought bolts were supposedly

located (note: confirmation of whether or bolts existed was performed using the feeler test).

- Dec 18, 1990 EER #90-0313, "Evaluation of masonry block wall el. 23'." diesel generator bldg." written by Tom Baird, the responsible engineer. The report determined that the as-found condition of the masonry block walls was "good for the short term." Corrective actions identified was to perform repairs and/or mods to the lateral supports to restore long term acceptability. No acceptance testing was required.
- Dec 19, 1990 EER # 90-031, "Evaluation of masonry block wall." This EER determined that a change to the FSAK or the T/S was not required, and the long term corrective actions are mandated by the action items in EER #90-0313 (signed G.E. Bullard).
- Mar 8, 1991 Calculation #ODGB-0001-89106, was in support that the walls were qualified for the short term with the identified anchor bolts which did not penetrate the concrete. The purpose of this calc. was to provide the necessary long term repair details.
- Mar 23, 1992 The Technical Support Dept's temporary change tracking system lists item-No. EER # 91-1200, Block walls 1/4' steel cover plates do not penetrate the concrete. This item was listed as being "opened" back in Dec. of 1990, but still has a priority classification of "99", which means that it hasn't been prioritized yet.
- Mar 31, 1992 The team performed a review of EER #91-1200 and visually confirmed that numerous bolts were still missing.
- April 3, 1992 The team found instances where the calculation that was used to provide short term qualification had numerous errors. The team was also told that the type of verification used to determine the presence or absence of the anchor bolts (both for the original calculation used for short term qualification and for the recent test on April 2, 1992 was based on a feeler gauge test in conjunction with the "Ping" test (i.e., ballpin hammer test).

At the daily 3:00 PM meeting with licensee management, the team asked why the licensee was pursuing testing via the Ping and feeler gauge test and not performing U/T testing. The licensee responded (Al Bishop) by stating that the Ping test gave reliable and consistent results in combination with results from the feeler test. When the team questioned the assumption by the licensee that the

thru-wall bolts were good, the licensee responded that they had no reason to suspect those bolts and that the short-term qualification of the wall did not rely on those thru-wall bolts. The team also requested the QC records on this modification, who performed the work, and when the work was done. (update as of April 7, 1992, the licensee has not been able to answer any of the above. In addition, the team was receiving different responses to the above request at all levels of site management. It has become increasingly apparent that licensee management is not aware of what is going on, they don't have their arms around the scope of this issue, and are trying to do quick fixes to resolve the "symptoms", but not the root cause.

As a result of the "Ping" test, the licensee wacked off a fake "bolt head", which was located in EDG bay #4, north wall. The team asked for this counterfeit bolt as evidence. The team also noted that no attempt had been made to drill through the wall where the bolt was knocked off. The team later learned that at least one case of a faked through-wall-bolt between the north and south plates was present (as indicated by the "Ping" test).

No rigorous testing has been performed to date that the NRC is aware of (i.e., no ultrasonic-type testing). The type of testing employed by the licensee up to this point has been the "feeler" gauge (i.e., a hacksaw blade) and a ball-pin hammer ("ping" test). As far as the team has been able to determine, if the licensee came in contact with metal using the feeler technique, (i.e., the metal sleeve or threaded portion of the bolt), then it was determined to be a "good" bolt. However, the "Ping" test was also used in conjunction with the feeler test to determine if the bolts penetrated the concrete to some extent.

Apr 6, 1992

The licensee has been trying to back out a number of bolts in the worst case wall (EDG # 4 south wall). The team was told that some minimum number of bolts (12 ?) was critical to qualify the wall. The team was told that the licensee has entered the time window for determining short term qualification of the masonry walls and by 1 PM on April 7, 1992, a determination will be made on the short term qualification. In addition, the team raised new concerns that there may be other walls in the EDG rooms which have not been mapped or verified. There is also some question as to what was done in response to the bulletin and what was done as a missile shield wall modification.

Apr 7, 1992

The licensee worked multiple shifts around the clock to identify good/failed bolts. A U/T engineer arrived at the site to test a sample of the thru-wall bolts. 8 of 59 thru-wall bolts were confirmed by U/T to be counterfeit where they could be reached from the ground. In addition, workers were using ladders and a combination of free climbing to reach the higher elevation bolts. The team identified that some of the individuals were not using harness protection at elevations near 20 ft.

The team noted that some of the bolts were being stripped while trying to back torque them out for confirmation. Also, in at least one case there was a bolt engaged into the wall without a threaded anchor sleeve. Many previously-assumed "good" bolts were found bad. The north wall of the south switchgear room around the double doors confirmed that no bolts existed in the top horizontal run of the wall, one side of that wall had only 2 good bolts, with the other side confirming only 4 good bolts. A total of 6 bolts from the 50 percent height elevation was present.

As of April 7, 1992, the licensee does not know who the contractor was for this job (if indeed a contractor did the job) or what other work was done by the individuals in question. The licensee has also been unable to locate the QC records for the EDG block walls.

As of 9:00 AM, work was continuing on confirmation of the angle-anchor bolts. The licensee stated that their short-term qualification LCO expires at 11:30 AM.

The team asked the licensee (Richard Johnstone, CAP) how the bolt issue was going to be tracked (as far as ACRs were concerned). The response was that if corporate decides to follow the issue (and write their own ACR) that site CAP does not track this issue or enter the ACR into their database. The licensee was asked directly how they were going to track this issue. Licensee response will follow in a later update.

At 11:30 AM, the licensee determined that based on the recently completed finite-point analysis seismic modeling for the worst case wall, that the wall failed the acceptance criteria by a factor of 2. Senior licensee management formally declared entry into the T/S 7-day LCO, (of which this event may be the third day of the LCO). The licensee extended

the LCO window for determining short-term operability for the rest of the EDG building masonry walls for another 24 hours. The best-guess estimate for walls 9 and 10 to pass was 50-50 at best. Much debate and confusion ensued among licensee management on what course of action to take, what LCO they were in, and what priority of work needed to be scheduled. It was not clear from the 11:00 AM meeting with the licensee that they knew what was going to happen next and in what order.

April 8, 1992 Results of the around the clock seismic evaluations revealed that the originally identified critical walls (#9 and #10) were not the worst case wall after wall # 8. Wall #4 was subsequently identified as the critical wall. However, the analysis showed (after many assumptions were made too numerous to mention) that Walls 9, 10, and 4 were qualified within a 1%, 5%, and 5% of the safety margin of 3 (although the type of bolting in use requires a safety margin of 5).

Other developments include 50 percent bolts failures in other walls within the EDG building. The licensee has subsequently identified 2 other pieces of equipment (1 core spray loop and 1 nonsafety-related SW pump) which were rendered inoperable by failure of wall # 8 (due to electrical conduit adjacent to the wall). This late identification of the problem has required the licensee to enter 2 more LCO action statements (7-day). However, the time clock did not start at the same time clock when the licensee declared #4 EDG inoperable 24 hours earlier (because of wall #8 was not qualified).

At the 10:00 AM meeting, the licensee is just beginning to expand their search plant-wide for potential inoperable walls (and equipment basemat supports, etc.).

more to follow at the next update.