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Central files

October 22, 1980

Mr. I.T. Yin
United States Nuclear Regulatory Commission
I.E., Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. Yin:

Attached is the first be-weekly report for LaSalle County Station Unit 1 as requested in Section 4 of your report nos. 50-373/80-40; 50-374/80-26. Although this report is inclusive, it is our intention to only include the previous two week activities in our future report Sections b, c, d, and e. Section a, with schedule and totals, will be repeated in its entirety.

If you have any questions or suggestions on this matter, please do not hesitate to call me on (312) 294-2828.

Sincerely,

T E Watts
T.E. Watts

BA/bmb/7556A
Attachment
cc: B.R. Shelton
T.E. Watts
L.O. DelGeorge
W.H. Donaldson/M. Lohman
T.E. Quaka
B. Annis

OCT 24 1980

4a. Schedule Milestone for 2" and under

Item	Original	Proposed
Submit 1st subsystem packages to S&L	9-15-80	9- 9-80*
Receive 1st subsystem package from S&L	9-29-80	10- 6-80*
25% of subsystems complete by S&L	10-20-80	11-10-80
50% of subsystems complete by S&L	11-10-80	11-24-80
75% of subsystems complete by S&L	12- 1-80	12-15-80
100% of subsystems complete by S&L	12-22-80	1- 5-80

*actual date

Note: 184 of 524 subsystems have been submitted to S&L
19 subsystems have been completed and returned by S&L

4b. During the past two week reporting period, the design was completed on the 19 subsystems listed below:

DG: 70, 71, 73, 74, 75, 76, 78
DO: 29, 30, 31, 32, 33, 34
FC: 69
LP: 73, 74
RI: 85
TE: 60, 61

4c. No subsystems have been installed and QC inspected.

4d. The following QA Audits and Surveillances were performed by CECo, with respect to small bore piping:

On S&L:	#80-467,	9-12-80
	#80-508,	9-26-80
	#80-511,	9-26-80
	#80-577,	10-17-80
On MCCo:	#80-565,	9-22-80
	#80-568,	10-3-80
	#80-569,	10-8-80
	#1-80-73,	10-15-80
On NSC:	#80-512,	9-26-80
	#80-524,	10-2-80
	NSC offsite audit,	9-30-80

4e. NCR 454 found calculations were not kept by MCCo. The calculations were reviewed and approved by S&L 10-3-80 and the NCR was approved by CECo. Engineering 10-14-80. No other NCR is open on this subject.

The only open audit or surveillance findings are from the NSC offsite audit. The audit report is attached.

ATTACHMENT A

Finding #1:

Contrary to 10CFR50 Appendix B Criterion III, NSC Q.A. Manual section 3.3 and Project Specification SAR-0303 section 1.3.1, NSC has not adequately accounted for self-weight excitation in pipe support design.

Discussion:

10CFR50 Appendix B Criterion III states in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions", and "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment and processes that are essential to the safety-related functions of the structures, systems and components".
The NSC Q.A. Manual section 3.3 states in part, "Design input is required for items to be designed, and for design services to be provided (e.g., analysis, design verification). Design input shall be specified and documented on a timely basis and provide consistent bases for making design desicions, accomplishing design verification, and evaluating design changes." "Design input shall include the following to the extent applicable: Design criteria and requirements provided by the client".
Project Specification SAR-0303 for LaSalle County Units 1 and 2 requires that "Self-weight excitation for all Class A, B, and C pipe supports and warping effect shall be considered in the design of all pipe supports."

At the time of the audit, NSC was using 50% of pipe support component weights (excluding pipe clamp) in the analysis of pipe supports. Full combined weights of pipe clamp and support components must be used in the support analysis. Any pipe clamp and support component weights inputed into the PIPSYS piping analysis program is used only for pipe stresses. These inputed weights are not reflected into pipe support attachment loadings as originally assumed by NSC.

Finding #2:

Contrary to paragraph 2.4.7 of the NSC Q.A. Program, the project plan issued for the LaSalle project does not describe which Engineering procedures are applicable for the LaSalle project.

Discussion:

Paragraph 2.4.7 of the NSC Q.A. program states that "Prior to the performance of client project activities, the person assigned responsibility for technical control of the project shall document those activities in project plans. Project plans will include, as appropriate to the scope of the project:

A. A project manual or other form of overall plan of project activities, and,

B. Detailed plans of related activities (e.g., design, procurement testing), as necessary to control quality achievement, quality assurance and Q.A. records."

Engineering procedure 8.1 describes the corrective action to be taken in respect of significant conditions adverse to quality. However, at the time of the audit, the project personnel were unable to show a document which indicates that this Engineering procedure is applicable to the LaSalle project

Finding #3:

Attachment

Contrary to specification SAR-0303 for LaSalle County Station Units 1 and 2 section 1.3.1, NSC has not reviewed expansion anchors in accordance with LS-CEA.

Discussion:

SAR-0303 Rev. 5, section 1.3.1 states that NSC shall review pipe support base plates in accordance with Form LS-CEA and the S&L interoffice memo dated 2/11/80 on expansion anchor allowables. LS-CEA Rev. 5 section 3.1.10 requires that review of edge distance dimensions be conducted for compliance to minimum allowed distances from embeded plates, concrete edges, and steel lined openings. At the time of the audit, NSC was not performing such reviews for concrete expansion anchor plates within its scope of work.

Finding #4:

Contrary to SAR-0303, certain aspects of LaSalle Station pipe support design work has not been performed in accordance with PI-LS-16 in the area of support tolerance considerations.

Discussion:

SAR-0303 Rev. 5 page 3 item f, lists PI-LS-16, Rev. 3 as a standard to be employed for design. PI-LS-16 Rev. 3 Appendix O pages 7-12 states that installation tolerances such as lateral structural steel misalignments, vertical structural steel misalignments and location tolerances must be considered in the pipe support design. This consideration may be done by exact analysis of these tolerances or may be accounted for the use of a "Ø" factor for allowable stress reduction in the interaction equation. At the time of the audit, neither technique was being employed by NSC.

Finding #5:

Contrary to 10CFR50 Appendix B Criterion III and NSC Q.A. Manual section 3.2.2, interface documents for the NSC-S&L interface do not include what measures will be taken when design criteria changes during the course of the LaSalle project.

Discussion:

10CFR50 Appendix B Criterion III states in part, "Measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations. These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces."
The NSC Q.A. Manual section 3.2.2 states, "Methods shall beestablished for communicating design information, including changes, and for coordinating activities across external and internal design interfaces. These methods shall include decision making; resolution of problems; provision and review of information; and preparation, review, approval, distribution and revision of documents when more than one organization or Group is involved."

At the time of the audit, several documents containing important design criteria for piping system analysis, including PI-LS-16, had been revised by S&L during the course of the LaSalle project. The interface documents between NSC and S&L did not include provisions for the revision of design criteria during the course of the project including the disposition of calculations made previous to the design criteria revision.

Discussion: (Continued)

In calculation MO9-PC01-101GS, the review of a support extension tube analysis indicated that criteria used for the analysis had since been superceded.

In calculation MO9-FC30-1069 pg. 79, the base plate stress check was based upon charts in PI-LS-16 (app K page 62) that had been superceded by S&L since the calculation was performed. At the time of the audit, no provisions had been made for the review of these calculations and other calculations that have been performed previous to design criteria revisions.

Finding #6:

Contrary to 10CFR50 appendix B criteria III and VI and the NSC Q.A. Manual section 3.3 revisions to design criteria made by S&L have not been incorporated into NSC design standards and instructions.

Discussion:

10CFR50 appendix B criterion III states in part," Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Criteria VI states in part,

"Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed, for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed."

The NSC Q.A. Manual section 3.3 states in part, "Design input is required for items to be designed, and for design services to be provided (e.g., analysis, design verification). Design input shall be specified and documented on a timely basis and provide consistent bases for making design decisions, accomplishing design verification, and evaluating design changes. Design input shall include the following to the extent applicable: Design criteria and requirements provided by the client."

At the time of the audit the following revisions to PI-LS-16 had not been incorporated into NSC Quad 7-79-027 "Pipe Support Procedures and Guidelines".

1. Pages 60 and 62 had been deleted in PI-LS-16 Rev. 3 appendix K. These pages were still in QUAD 7-79-027 Rev. 3 section 4.B.

2. The revision levels of drawing M-1100 sheets 19-23 were Rev. C, in PI-LS -16 Rev. 3 Appendix O. The revision levels of these sheets in QUAD 7-79-027 Rev. 3 section 4.A were Rev. A. In addition, PI-LS-16 Rev. 3 appendix O had sheets 24 and 25 of drawing M-1100 and these sheets were absent in QUAD 7-79 -027 Rev. 3 section 4A.

Finding #7: Attachment

Contrary to 10CFR50 Appendix B Criterion III and NSC Q.A. Manual section 3.3, design criteria has not been correctly translated into the design.

Discussion:

10CFR50 Appendix B Criterion III states in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures and instructions."

"Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

The NSC Q.A. Manual section 3.3 states in part, "Design input is required for items to be designed, and for design services to be provided (e.g. analysis, design verification). Design input shall be specified and documented on a timely basis and provide consistent bases for making design decisions, accomplishing design verification, and evaluating design changes." "Design input shall include the following the extent applicable: Design criteria and requirements provided by the client."

Contrary to the above requirements, the following items were observed.

1. In calculation PC01-1800S a K factor of 1.2 was employed in the analysis. This factor is not correct for the end-conditions of the support and must be increased.

2. In calculation PC01-1800S chart #3 was employed for CEA bolt analysis. This chart was incorrectly employed since it is for existing installations only and the support had not yet been installed.

3. In calculation FC-28-1805x the designer employed SSE allowable forces for CEA analysis. The governing condition for this case should be OBE allowable forces.

4. In calculation FC-28-1808x an amplification factor for the analysis of the CEA baseplate is required per S&L's Design Criteria for Mechanical Component Support members dated 2/12/80. No amplification factor was used in the calculation.

5. In calculations M09-FC30-1079X and M09-FC30-1084 interaction equations were not employed for combined stress analysis as required by PI-LS-16 Rev. 3 appendix O pages 7-12.

6. In calculation M09-PC01-1018V, the weld of BOM items #16 to #3 was specified as a fillet weld when only a groove weld could be physically installed. This is not in compliance with SAR P2.3, where a check of welding feasability is required.

7. In calculation M09-FC3-1063X an incorrect member property for BOM item #1 was inputed into the computer program for a pipe support frame analysis resulting in an incorrect output.

Finding #8: Attachment

Contrary to 10CFR50 Appendix B Criterion III and NSC Q.A. Manual section 3.3 design calculations have not been adequately documented.

Discussion:

10CFR50 Appendix B Criterion III states in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures and instructions."
"Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components."

The NSC Q.A. Manual section 3.3 states in part, "Design input is required for items to be designed, and for design services to be provided (e.g. analysis, design verification). Design input shall be specified and documented on a timely basis and provide consistent bases for making design decisions, accomplishing design verification, and evaluating design changes."
"Design input shall include the following to the extent applicable: Design criteria and requirements provided by the client."

Contrary to the above requirements the following items were found where calculations do not adequately document how design criteria were implemented.

1. In calculation M09-PC01-1017S, BOM item 8 was classified as a shim plate and not analyzed. However when the lateral support is in tension item #8 is a load (tension) carrying member and requires analysis.
2. In calculation PC01-1800S a 3/16" weld all around was specified on a weld to BOM Item 8. The chart referenced, 5.2.1, from QUAD 7-79-024, lists a 1/4" weld on two sides. There were no additional calculations to justify the smaller weld size. It was noted that the weld was verified as acceptalbe during the audit. In the same calculation, the welds of BOM items #6 to #8 were not analyzed since the designer felt that the stresses were negligible. Is is not clear by observation that the stresse are negligible and that the calculations are not required.
3. In calculation M09-FC30-1079X the weld between BOM items 3 and 2 were not analyzed since the designer felt the load was negligible. The 1200 lb. faulted load was not obviously negligible by observation. It was noted that this item was verified as acceptable during the audit.
4. In calculation M09-PC01-1018V, the shear forces due to torsion were regarded as small in the analysis of welds between BOM items 11, 12, and 13 to item 2. It was not obvious by observation that these forces were negligable and that the forces should not be included in the analysis. It was noted that the welds were verified as acceptable during the audit.
5. In calculation M09-FC30-1069 stiffner plate attachment welds were not analyzed since involved stresses were considered to be small. It is not obvious by observation that these stresses are small enough to make the calculations unwarrented.
6. In calculation M09-FC30-1084 no analysis of stiffner plates or their attachment welds was performed. It is not obvious by observation that the stresses involved are small enough to make the calculations unwarrente

7. In support calculation [illegible] BOM item 5, a pipe support [illegible] tube, was checked using table 6.6-2 in QUAD 7-79-024, Safety-Related Pipe Support Design Manual. Neither this table nor any additional calculations took into account seismic forces causing bending in the extension.

8. In support calculation M09-FC30-1079X BOM item 7, a pipe support extension tube was analyzed using tables 6.6-2 and 6.6-4 in QUAD 7-79-024. Neither these tables nor additional calculations took into account seismic forces causing bending in the support extension.

Attachment

Finding #9:

Contrary to 10CFR50 Appendix B Criterion III and NSC Q.A. Manual section 3.5.3.1, inadequate design review has been performed.

Discussion:

10CFR50 Appendix B Criterion III states in part, "The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."
The NSC Q.A. Manual section 3.5.3.1 states, "Design reviews shall be sufficiently thorough to:

a. Verify, the appropriateness of the design input, including assumptions, design bases, and applicable regulations, codes and standards.
b. Verify that the design is adequate for the intended application of the design.
c. Ensure that design characteristics can be controlled in fabrication or construction and verified by inspection, testing or other suitable means.
d. Ensure that acceptance criteria for inspection or testing are defined."

Contrary to the requirements listed above, NSC failed to perform adequate design review to identify the deficiencies noted in previous findings numbers 8 thru 16 inclusive.

Comment #1:

There is no LaSalle project procedure describing the format requirements for ECN's. The following problems were noticed.

1. The description of the actual problem is not being shown on the ECN. It is being shown as "Revision of supports and Restraints" & one has to go through the various attachments to discover what the actual change is.

2. Many attachments are being enclosed with the ECN. But no reference to the attachments is being provided in the ECN itself.

3. The sequential page number of the ECN, project number etc. are not being indicated on the attachments.

4. The names of the commentors and their signatures are not being included on the ECN Form.

5. The distribution of the ECN is not being shown on the ECN. Some examples of the ECN's examined are:

   a. ECN-NSC-501
      approved on 8/25/80

   b. ECN-NSC-629
      approved on 9/2/80

   c. ECN-NSC-285
      approved on 6/19/80

Comment #2:

On support calculation PC01-1800S the design sheets were not numbered correctly. References between sheets were not correct.

Comment #3:

Any corrective action for conditions adverse to quality discovered during design work should include an evaluation of previous calculations for effects of said conditions.