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May 26, 1982

NUCLEAR REGULATORY COMMISSION

In the Matter of:

COMMONWEALTH EDISON COMPANY

)
)
) Docket Nos. 50-373
) 50-374
)
)

LaSalle County Nuclear
Generating Station, Unit 1
and Unit 2

Mr. Harold Denton
Director of Nuclear Reactor
Regulation
9720 Norfolk Avenue
Bethesda, Maryland 20814

Dear Mr. Denton:

This office has recently received three reports concerning the procedures for drilled and cored holes at the LaSalle County Nuclear Station, two by Commonwealth Edison Company and one by the NRC Region III staff. Edison's Final Report, dated May 7, 1982, was received May 12. Edison's Report in Response to Amended Petition, concerning rebar damage in the Unit 1 primary containment, dated May 18, 1982, was received May 25. Upon reading Edison's Final Report, I first learned that Region III had submitted its own report on the drilling procedures (No. 50-373/52-21, DETP) to Edison on April 27, 1982. Upon my request, Mr. C.E. Norelius, the Region III Director of Engineering and Technical Programs, furnished a copy of the April 27 inspection report. Mr. Norelius advised, however, that "another report will be issued which will identify the specific allegations and our related findings." (Letter of C. E. Norelius, May 14, 1982) The lack of specificity and factual findings in the April 27 report of Region III has thus been acknowledged and hopefully will be corrected.

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This letter is intended to comment on a few questions which are raised by Edison's Final Report of May 7, 1982 and which, in the opinion of this office, remain to be addressed in the pending inquiry. In view of Region III's intention to issue another report, it is hoped that these questions will also be addressed with specific findings before the investigation is considered "closed."

1. Edison's Final Report purports to address rebar damage in "all structural elements in all Unit 2 areas and in those Unit 2 areas required for Unit 1 operation." (Page 33) There is no indication on the record thus far that Edison or the NRC staff intends to investigate possible damage to the integrity of Unit 2. It is obvious that Unit 1 has been reviewed first because of Edison's intention of keeping to its most recently revised start up schedule. However, we trust that the safety of Unit 2 will also be addressed before the NRC rules on our Section 2.206 request.

2. Neither Edison nor Region III has addressed the question of how non-conformance reports were treated in the current investigation. At the hearing on March 31, 1982 Edison admitted that two incidents of rebar damage in non-conforming cored passageway holes, which were cited in Mr. Garrison's affidavit in our original petition, had in fact occurred. (Transcript, pp. 62-63.) Yet to date Edison has not reported on:

- a. The procedures for reporting all non-conformances in cored passageway holes.
- b. The total number of non-conformance reports filed with respect to rebar damage in cored passageway holes.
- c. The manner, if any, in which non-conforming cored rebar damage was accounted for in the total assessment of rebar damage.

These questions are not addressed in Section 2.4 of Edison's Final Report. The Final Report reviews only the cored passageway holes which were drilled according to the structural design drawings. Edison's recent review of cored passageway rebar damage is based entirely on assumptions made at the time the drawings were made, and not on any field verification or written procedure for carrying out the instructions on the drawings. Yet the record shows clearly that deviations from the drawings did in fact occur.

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3. The only written control on rebar damage in cored passageway holes was the use of instructional notes on an unknown number of structural design drawings. Edison's Final Report gives two examples of such notes, which call for the use of metal detectors in two specific instances. (Section 2.4.4) A total of 11 cored passageway holes have been documented. (Table 2.4-1) Edison has not reported on:

- a. The total number of holes for which metal detectors were required in drawing notes.
- b. How many bars, if any, were assumed to have been damaged in the drilling of such holes.
- c. What, if any, verification procedures were employed by the contractors to ensure that metal detectors were in fact used, and that undesired rebar damage did not in fact occur.

Our concerns about the failure to specifically account for non-conformances and the failure to explain how the use of metal detectors was actually verified are reinforced by a management audit on the LaSalle site which was made available to this office a few days ago. In a 1977 review of the planning and controls of Edison's construction activities at the LaSalle County Station, Arthur Andersen & Co. made several recommendations to Edison for improvements at the site.* Among the recommended improvements were:

"uniform procedures for routine construction tasks;"
"extension of internal auditing to include these procedures;" "implementation of exception reporting;" and
"establishment of training programs for construction engineers and auditors." (Letter from Jon H. Knoll [Andersen] to Wallace B. Behnke [Edison] dated 10/7/77)

*Copies of the cited portions of the Andersen audit are attached to this letter.

These recommendations stemmed in part from the following findings by Arthur Andersen's auditors:

- a. Because of the way the H. P. Foley contract was written, "C. F. Co. has to fight to get adequate supervision." (Document 40-V. 301, Interview with Site Project Superintendent.)
- b. "Quality Assurance. Staff is too young and inexperienced. Creates problems and extra cost." (Document 40-V. 301, Interview with Site Project Superintendent.)
- c. "No formal training is available for new engineers. Experience in construction, estimating, and contract negotiating and administration is gained in the field." (Document 40-IV. 302, Interview with Mechanical Coordinating Engineer.)
- d. "Control over drawings is well established. A central file is maintained Engineers check out drawings, and if a revision comes in the file clerk notifies all engineers who have checked out the previous version. When a drawing comes in, the transmittal letter is routed to the engineers involved. Procedures do not call for review of drawings by the engineers, which would be impractical due to the high volume." (Emphasis supplied) (Document 40-V. 300, Interview with Administrative Assistant.)
- e. ". . . not all design changes on large jobs are routed through engineering for approval [The Administrative Supervisor] was not aware of any effort to verify the required approval process." (Document 40-IV. 303, Interview with Administrative Supervisor.)

Thus deficiencies in personnel training and supervision and in administration were apparent at the LaSalle construction site in 1977. From 1976 to at least 1980 passageway holes were cored without any procedure for verifying that the drawings were being followed in the field. As late as 1978-79, long after Edison was advised to beef up its training and quality assurance programs, Mr. Garrison was ordered by his supervisors to drill non-conforming cored passageway holes. Yet Edison and the Region III inspectors

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have continued to rely upon assumptions that drawing notes were implemented, that metal detectors were used, and that instructions to notch walls for grouted anchor holes necessarily prevented rebar damage.

An explanation of the matters raised in paragraphs 1, 2, and 3 above is necessary to fill in the gaps in the information presented. Without such an explanation, we still do not have assurance that all rebar damage has been accounted for. Only about reported damage from anchor bolt drilling and damage from cored holes located on structural drawings.

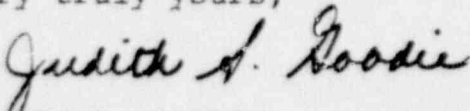
The contrast between the incomplete controls over drilling under the electrical equipment contract, and the careful supervision and control reported by Edison for the drilling of holes in the primary containment, is striking. Edison's most recent submittal, dated May 18, 1982, describes detailed calculations, written instructions, close field supervision, and complete reporting, with regard to rebar damage in the primary containment.* Such care is not evident with respect to the core drilling in other safety related structures. Thus the need to provide a more thorough analysis of the issues raised here.

*It is noteworthy that the May 18th report describes holes cored into the containment walls as varying from 1' 5-1/4" to 2' 4-7/8" in depth (at p. 11). On March 31 Edison stated that holes in the primary containment wall were up to 6" in depth. (Transcript, p. 60)

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Once the pending inquiry is complete, this office looks forward to meeting with you to discuss your findings, with our consultant in attendance, pursuant to the invitation extended in April by your staff.

Very truly yours,



JUDITH S. GOODIE
Assistant Attorney General
Environmental Control Division
188 West Randolph Street
Suite 2315
Chicago, Illinois 60601
(312) 791-2491)

JSG:bl

Enclosures

cc: James G. Keppler, Regional Administrator, Region III
C. E. Norelius
Richard Hoefling
Philip P. Steptoe

ARTHUR ANDERSEN & Co.

69 WEST WASHINGTON STREET
CHICAGO, ILLINOIS 60602

(312) 343-6262

October 7, 1977

Mr. Wallace B. Behnke
Executive Vice President
Commonwealth Edison Company
One First National Plaza
Chicago, Illinois 60690

Dear Mr. Behnke:

Our planning and controls review of the Commonwealth Edison Company (Edison) construction activities has now been completed. This letter will summarize our conclusions regarding this area based on our review.

Objectives and Scope

The overall objective of our work was to evaluate the operating systems and procedures that comprise the management process to determine whether they promote economy and efficiency, and to develop specific recommendations as to where improvements were possible, leaving to you whether the benefits of making such improvements were sufficient to justify their costs. The management process has four components: planning, authorizing (decision making), executing (carrying out the plans) and monitoring (reviewing results to determine where corrective action is necessary).

The scope of the review of construction activities included detailed review of the Station Construction and Transmission & Distribution Construction Departments which have direct responsibility for supervision and management of generating station and transmission and substation construction. This work included review of the field activities of the Station Construction Department at LaSalle County Station, as well as selected projects involving modification or expansion of operating generating stations. The Construction Scheduling and Cost Control Department (CSCC) which has primary responsibility for collection and reporting of cost and schedule data for major construction projects was also reviewed in detail as were internal audit activities relating to construction. Construction of distribution facilities as performed by the various operating divisions was not included in this review.

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Mr. Wallace B. Behnke

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In carrying out their assigned responsibilities the personnel responsible for construction activities necessarily interact with numerous other company operating departments such as Purchasing, Quality Assurance, Environmental Affairs, and the various engineering departments. Although the nature of the interface between these departments and the construction group was considered, the activities of these departments were not included in the scope of the review.

Work Performed

Our work, conducted jointly with Edison personnel, was performed in accordance with the detailed work program approved by you. In summary, this included:

1. Gathering of selected industry data relating to construction and analysis of Edison performance relative to other companies.
2. Review of the current organization involved in construction.
3. Interviews with management personnel at all levels within the organization.
4. Review of current procedures and other documentation describing or supporting activities involved in construction.
5. Review and analysis of reports received and generated by personnel involved in construction activities.
6. Review and analysis of the management process of planning, authorization, execution and monitoring.

Findings and Recommendations

As you know, the findings and recommendations resulting from our work in the construction area were summarized and presented to Edison's management. A copy of the presentation outline is attached.

In summary, our review disclosed that basic systems and procedures necessary for economical and efficient execution of the management process are in place and operating. Our analysis of available industry data indicated

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Mr. Wallace B. Behnke

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that the company generally compares favorably with other utilities in terms of construction cost per kilowatt and schedule duration. The recent implementation of the Project Management System has provided Edison management at all levels a valuable tool for monitoring and control of construction cost and schedule performance. The decentralization of the Station Construction Department has greatly improved the job site controls over construction. Procedures governing certain detailed construction activities are being expanded and audits of construction expenditures are conducted on an on-going basis.

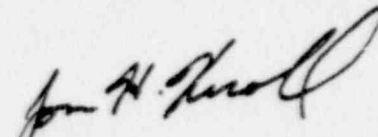
[Our review did disclose several specific areas where we believe further improvements can be made. Among these are the further definition of uniform procedures for routine construction tasks and the extension of internal auditing to include these procedures after they have been defined, review of CSCC objectives and reporting, implementation of exception reporting, and establishment of training programs for construction engineers and auditors.]

It was a pleasure to assist you in this important work. If we can further assist you in any way, please contact us.

Very truly yours,

ARTHUR ANDERSEN & CO.

By


Don H. Knoll

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Enclosure

COMMONWEALTH EDISON COMPANY
PLANNING AND CONTROLS REVIEW
CONSTRUCTION
MEMORANDUM FOR THE FILES

Prepared by: J. McAnally
M. Thran
April 25, 1977

Subject: Interview With Mr. Leo Burke
Site Project Superintendent
LaSalle County Station

Reference

The salient points made by L. Burke are summarized in this note.

1. There is a lot of ignorance about the building trades in C.E.Co. Outside of Art Kleinrath, there are no specialists who know how to deal with trade unions.
2. The C.E.Co. system of personnel rotation presents continuity problems at a construction site due to it being a different situation then the rest of the Company. Need people for the duration of the contract they are assigned.
3. The Walsh type contract (cost plus fixed negotiated fee) is the best type of contract for cost-plus jobs. Morrison, Foley have incentive clauses and it has created a lot of problems on what is in or out of scope when changes occur. Also, we tried to put too many items in the Fee, e.g. supervision is in the fixed portion of Foley's fee. C.E.Co. has to fight to get adequate supervision.
4. Station Construction has been dealt out of contract negotiation by Purchasing. Station Construction does not know what has been bought, Purchasing does not understand (technically) what they have bought. e.g. Foley's site computer, P.O. said was to be furnished, but confusion over who was to pay. Purchasing has no accountability after award.

5. Project Managers

There is a great deal of confusion over the role of the Project Manager (Bill Donaldson). He is in the Construction Department and reports to my boss. It is a strange situation having my bosses man outside my door all the time. We tolerate because we do not know what else to do.

Project Manager should be independent of any department and work on major problems.

[6. Quality Assurance]

Staff is too young and inexperienced. Creates problems and extra cost.

7. The key success factors in construction projects is meeting the schedule. Cost performance generally follows schedule performance. C.E.Co. builds plants cheaper because it builds them faster.

COMMONWEALTH EDISON COMPANY
PLANNING AND CONTROLS REVIEW
CONSTRUCTION

MEMORANDUM FOR THE FILES

Prepared by T. Tubergen
April 19, 1977

Subject: Interview With Mr. Les Bird,
Mechanical Coordinating Engineer,
Station Construction

Reference

1. As coordinating engineer. Les has no people reporting directly to him. He maintains a functional relationship with the mechanical engineers at the sites. His job is to "keep the mechanical situation on an even keel" at LaSalle, Collins, Byron, and Braidwood Stations.
2. Les functions as a problem solver for field personnel. He is not notified of difficulties at the site unless the problems cannot be alleviated by the mechanical engineers in the field.
3. Construction Scheduling and Cost Control is currently working with Les and the other coordinating engineers to determine detail CPM schedules for Carroll County and Fossil X. This will be the first time a schedule has been compiled which includes target dates and elapsed times for bid awards, engineering and procurement. Les is participating in this effort as no Station Construction field personnel have yet been assigned to these stations.
4. The coordinating engineers do not serve any cost control function. Although Les receives transmittal letters for drawing releases, he does not receive drawings as he could not handle the volume of changes associated with constructing four generating stations.
5. Les is not involved in estimating cost for contracts or contract changes. On cost plus contracts Edison does no change estimating at all. Sargent & Lundy forwards an estimate to the field with the drawing changes, but no effort is made to relate these

to contractor estimates or actual cost. Les is involved in bid evaluation of contracts for field labor or mechanical work. Les relies on past experience with the contractor and his own background to do this. No contract review procedure exists to provide a guide for contract evaluation. Due to bid security, no cost analysis can be performed by Les in judging contract proposals.

6. Initial bidding for the large cost plus contracts at new station construction is done without any detail design drawings. Les noted that bids are prepared by considering several major items: job duration, number, size and type of units, equipment and tool requirements and target man hour projections gathered from industry statistics. Specifications, general arrangement drawings and P&ID's are used in estimating costs although they may be incomplete or may not represent all the systems that eventually will be required in the plant. Detail design drawings may not be available until they are required in the field. Les is hoping to begin establishing a somewhat uniform work scope for Carroll County and Fossil X for use as an estimating and scheduling tool. Les feels that the data currently available to the contractors for use in preparing proposals is not sufficient to produce a contract which will generally resemble the actual work performed in the field.
7. Although Les is not responsible for the work performed by the field engineers, he does participate in the annual salary review. Salary recommendations are made jointly by Art Kleinrath, the site superintendent and the coordinating engineer.
8. No formal training is available for new engineers. Experience in construction, estimating and contract negotiating and administration is gained in the field. Little or no help is available from Company procedures. Professional estimators have recently been hired at LaSalle to teach estimating to the engineers and to do estimating at the site.
9. Les noted the differences in the handling of material and procurement at the different construction sites. No buying is done by the Edison people on the site at LaSalle. All material receiving and inspection is handled by the responsible contractor with Edison ensuring compliance with shipping and storage QA requirements. Byron and Braidwood have on site purchasing and material coordinators to control receiving and storage. Collins station has no material coordinator. Little assistance in material handling is available through Company procedures.

COMMONWEALTH EDISON COMPANY
PLANNING AND CONTROLS REVIEW
CONSTRUCTION
MEMORANDUM FOR THE FILES

Prepared by: J. Knoll
A. Burgess
M. Thran

April 22, 1977

Subject: Interview with Al Kief,
Administrative Assistant
LaSalle County Station

Reference

1. The positions and activities for which Al has responsibility are as follows:

Office Supervisor - J. L. Gorling

The six clerks in this area perform the following tasks:

- Print Control (reviewed by the Q.A. Department).
- Files, including Specifications, Purchase Order and General files.
- Telephones/receptionist/mail opening and date stamping.
- Mail routing and delivery, attendance and timekeeping and overtime report preparation.
- General and contract administration related typing.
- Steno for the site superintendent and project manager and maintenance of superintendent's files.

Material Receiving Coordinator - C. H. Lenth.

Responsible for receiving and monitoring of Edison materials. This function deals primarily with Q.A. related materials.

Assistant Planner - E. G. Otto

This function is responsible for invoice clerical checking and processing, maintenance of purchase order files, maintenance of control cards tracing for payments and changes, and for control and monitor of change order proposals.

Site Accountant - R. M. Shwer

The Site Accountant is closely linked to the Construction Scheduling and Cost Control Department and is primarily responsible for providing necessary data for that system.

2. Al indicated that lack of Station Construction participation in final field contract negotiations has created some problems for the field in contract interpretation for payment and in instructing vendors in administrative requirements. LaSalle Station is preparing a modified version of the contractor instruction book prepared by Maywood to aid in communication of administrative requirements to vendors.
3. LaSalle has no formal training programs for any of the administrative activities. However, several meetings have been held to provide review and discuss the various activities and provide an understanding of overall site activity for the Edison field office personnel.
4. LaSalle Station has no formal procedures relating specifically to the station. They do have appropriate General Procedures and the Station Construction Department Field Procedures (Greenbook) and will receive the Station Construction Administrative Procedures when completed. They also have prepared numerous memos and instructions for such administrative activities as drawings and document control, receiving, security and handling of audit memos.
5. The positions of material coordinator and site accountant have been recently established at LaSalle. LaSalle does not perform site purchasing as do Byron and Braidwood.
6. The material receiving activity is responsible for receipt and tracking of equipment and material ordered on Edison purchase orders. A procedure has been established for receiving, inspection, storage, and paperwork control for all Q.A. related items. Engineering is responsible for defining storage requirements. Contractors are responsible for receipt and control of their own material.
7. Control over drawings is well established. A central file is maintained, usually with several copies of a drawing. Engineers check out drawings, and if a revision comes in the file clerk notifies all engineers who have checked out the previous version.

When a drawing comes in, the transmittal letter is routed to the engineers involved. Procedures do not call for review of drawings by the engineers, which would be impractical due to the high volume.

8. Scrap is disposed of by C.E.Co., not by the contractors, following normal company procedures.
9. Field changes on cost plus contracts are not estimated by C.E.Co. engineers, due to the volume. The contractor is relied on to estimate the impact of changes and include it in his best estimate of contract cost, which is required as part of his cost reports. The contractor's estimate is the basis for preparing the monthly company records only CR that is used to update commitments in PMS.
10. Authority and responsibility for settlement of claims is somewhat nebulous. Site personnel feel that they don't have authority to settle a claim, but the definition of what constitutes a claim, especially for cost plus contracts, is not clear. Most items which might become considered claims can be settled by a CR and are small enough to be approved at the site.

Andersen Audit Document

COMMONWEALTH EDISON COMPANY
PLANNING AND CONTROLS REVIEW
CONSTRUCTION

MEMORANDUM FOR THE FILES

Interviewers: Dave Smith
T. Tubergen
April 18, 1977

Subject: Interview With Mr. Jerry Harlow,
Administrative Supervisor, Station Construction

Reference

1. The position of Administrative Supervisor was established a year ago to provide control and coordination for Substation Construction office work. The main impetus was to reduce the time lag in processing vendor payments.
2. Payments to vendors for material and labor used at most construction sites are processed through Station Construction. LaSalle, Collins, Byron and Braidwood invoices are processed at those locations. Station Construction processing time for invoices has dropped from 32 days to 5½ days on the average. Invoices with discounts applicable are hand carried through Accounts Payable to ensure that the discount is received.
3. The Administrative Supervisor is responsible for ensuring clerical support within the office, time-keeping for all department members and financial contract administration, i.e., processing bills.
4. Jerry has authored a booklet for distribution to all contractors. This book offers explanations of basic contract terms and includes examples of documentation required of the contractors. (See Exhibit 40-IV.506)
5. A new Construction Cost Documentation Manual has been written and is currently being prepared for distribution to the field.
6. Station Construction receives copies of all drawing release transmittal letters issued by Engineering or the A/E. For small projects (i.e., not new generating stations) Station Construction issues a

contract change authorization (CCA) to the contractor requesting a proposal. These proposals are to be sent to Station Construction and are forwarded to the field engineer upon completion of a field estimate. The field engineer is responsible for negotiating the contract change with the contractor. An acceptance CCA is issued by Station Construction when an agreement has been reached. This process is controlled via a contract change log (Exhibit 40-IV.406), and has been flowcharted for the department (Exhibit 40-IV.600). Jerry noted that field engineers have, on occasion, received a proposal before their estimate has been received at Station Construction.

7. Jerry noted that no system exists to ensure notification is forwarded to Station Construction of any field changes which may be initiated by a field engineer.
8. Station Construction is initiating technical audits to ensure the field engineers are providing adequate control over contracts and contract changes. This effort has just begun and no procedures or reports have been defined. An outside estimator has been contacted to re-estimate changes and these will be compared with the field estimates. No results are yet available from these audits.
9. Jerry has totally reworked the paperwork processing done in Station Construction. (See Exhibit 40-IV.600). The voucher processing done in the office is duplicated by the staff at Byron, Braidwood, LaSalle, and Collins. Efforts are underway to streamline the processing done at the sites. Braidwood has completed an initial draft of the proposed processing structure (see Exhibit 40-IV.601). Byron's current processing (Exhibit 40-IV.602) is typical of the situation at the large construction sites.
10. Jerry is responsible for determining departmental goals for station construction. He does not participate in the development of the departmental budget. Jerry did not know of anyone who was concerned with monitoring the departmental budget.
11. Jerry feels that not all design changes on large jobs are routed through engineering for approval. He feels this is an item that should be a concern of the internal audit. He was not aware of any effort to verify the required approval process.
12. Cost reporting for small projects is not currently available in any useable form. The Maywood personnel therefore can not use ECP, PMS or Plant Accounting reports to monitor cost. Jerry is not sure of the usefulness

of these reporting systems to field personnel at LaSalle, Byron, Braidwood or Collins. The only involvement of the Station Construction Maywood personnel in cost reporting is to ensure that contractors send a completed construction report to Plant Accounting for the unit property records. (See Exhibit 40-III.410)