

RELATED CORRESPONDENCE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In The Matter of

COMMONWEALTH EDISON COMPANY

Docket Nos. 50-454 OL
50-455 OL

(Byron Nuclear Power Station,)
Units 1 & 2))

SUMMARY OF WALTER J. SHEWSKI'S TESTIMONY
ON
CONTENTION 1

- I. Walter J. Shewski is the Corporate Manager of Quality Assurance for Commonwealth Edison Company.
- II. Mr. Shewski will explain:
 - A. The Edison Quality Assurance Program;
 - B. The manner in which Quality Assurance will be implemented at Byron Station;
 - C. Why specific incidents Intervenor DAARE/SAFE have identified do not demonstrate Edison is unwilling or unable to operate Byron Station within NRC regulations.
- III. Edison's Quality Assurance Program as it applies to Byron Station:
 - A. Byron Station's Quality Assurance Group will inspect, survey, and audit safety-related and ASME Code related work.
 - B. Quality Assurance personnel are trained in the skills necessary for their jobs.
 - C. Edison has the responsibility for the control of purchased material, equipment, and services.

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- D. The Station Quality Control and Quality Assurance groups at Byron will function independently from the Maintenance and Operating groups.
 - E. The Quality Assurance Program applicable to Byron Station meets all requirements of Appendix B to 10 CFR Part 50.
 - F. Mr. Shewski believes Edison's Quality Assurance Program will be implemented satisfactorily at Byron Station during operations.
 - G. Edison is dedicated to a comprehensive program of assuring that all requirements are met and that its nuclear stations are operated safely.
 - H. The NRC has raised questions regarding the turn-over of Quality Assurance Superintendents at Byron Station, but Edison has responded to these questions.
- IV. Edison has formally halted work at Byron on several occasions.
- A. In May, 1977, Edison stopped the placement of concrete because of the improper installation of reinforcing steel. Corrective action was taken.
 - B. In January, 1981, Edison ordered Hatfield to stop work on safety-related cable pulling activities due to programmatic inconsistencies. Corrective action was taken by both Edison and Hatfield.
 - C. In September, 1982, Edison ordered Reliable Sheet Metal to stop work on new installation of safety-related HVAC systems and attachments to safety-related structures. Corrective action was taken by Edison and Reliable Sheet Metal.
 - D. Six other stop-work orders have been issued, and corrective action was taken.
- V. Because of allegations of improper Quality Assurance implementation at Edison's LaSalle County Station, certain reviews and revisions to procedures were performed at Byron.
- VI. Quality Control Inspectors at Byron Station:
- A. During construction, Quality Control inspectors are responsible for in-line acceptance inspection

of the workmanship, materials and final installation of facilities.

- B. The scope of Byron's Quality Control Inspection Program is described in Exhibit 1 to Mr. Shewski's testimony.
- C. Quality Control inspectors must be trained, qualified, and capable of performing the inspection activity.
- D. Edison is committed to implement Regulatory Guide 1.58, Revision One, on the standards for qualifications of Quality Control inspectors.
- E. The NRC has inspected the qualifications of Byron's Quality Control inspectors. Cited deficiencies were corrected.
- F. Mr. Shewski believes Edison has been and is in compliance with industry standards and NRC requirements for qualification of Quality Control inspectors at Byron.

TESTIMONY OF WALTER J. SHEWSKI

ON CONTENTION 1

Q.1. State your name and present occupation.

A.1. My name is Walter J. Shewski and I am the Corporate Manager of Quality Assurance for Commonwealth Edison Company.

Q.2. Briefly state your educational background and professional qualifications.

A.2. I received a Bachelor of Science Degree in Electrical Engineering from Purdue University and a Masters of Business Administration from the University of Chicago. I am a member of the ASME/ANSI Nuclear Quality Assurance Committee, the Edison Electrical Institute Quality Assurance Committee and the Atomic Industrial Forum Subcommittee on Inspection and Enforcement. Also, I am a member of the Institute of Electrical and Electronic Engineers, American Society of Quality Control, American Society of Mechanical Engineers, and the Western Society of Engineers.

I have been Manager of Quality Assurance for nine years. My immediately previous assignment

was as General Manager of the Project Management Corporation which was managing the Clinch River Breeder Reactor Project. I have been employed by Commonwealth Edison for nearly thirty-five years in a number of technical and management positions in the areas of engineering, computers, operations, power plant construction, and nuclear design and construction of Dresden Unit 1 Nuclear Power Station.

Q.3. What is the purpose of your testimony?

A.3. DAARE/SAFE and the Rockford League of Women Voters have stated in their Contention 1 that Edison's past record ". . . demonstrates its inability, unwillingness, or lack of technical qualifications to operate the Byron Station within NRC regulations and to protect the public health and safety" In documents which have explained the basis for this contention, the Intervenor's have asserted that the history of all of Edison's plants demonstrate its failure to observe on a continuing and adequate basis the applicable quality control and quality assurance criteria and plans adopted pursuant thereto. In addition, the Intervenor's have referred to certain incidents, the NRC inspection at Byron Station in the Spring of 1982 and certain allegations

with respect to construction quality assurance made just prior to the issuance of an operating license for the Company's LaSalle County Station, Unit 1, as specific demonstrations of the Company's inability or unwillingness to implement an effective quality assurance program.

The purpose of my testimony is to describe Edison's Quality Assurance Program as it applies to the Byron Station. I further describe the corporate response to observed deficiencies in quality at the Byron Station and the manner in which quality assurance will be implemented during operation of Byron. Finally, my testimony deals with identified aspects of the incidents described above. Mr. Stanish's direct testimony deals with the other aspects of those incidents.

Q.4. Have there been instances in which the Company's operating personnel, architects-engineers or contractor personnel have failed to adhere to applicable Quality Control and Quality Assurance criteria?

A.4. There have been deficiencies identified through audits performed by contractors, Commonwealth Edison Company and the NRC. When deficiencies

are identified, however, timely corrective action is required and steps are taken to avoid recurrence of the deficiencies. Construction activities are subjected to a multi-layer series of inspections, surveillances and audits by the contractors with an overlay of inspections, surveillances and audits by Commonwealth Edison Company at the construction site.

At the operating stations, the operating functions are performed in accordance with written procedures and are verified by supervisors. In addition, surveillances and audits are performed by Commonwealth Edison Company Quality Assurance personnel to assure operating activities are performed in accordance with license requirements. Similarly, maintenance and modification activities at the plants are subjected to independent inspections by Station Quality Control personnel with Quality Assurance also performing independent inspections plus surveillances and audits including verification of inspections performed by Station Quality Control to assure requirements are met. Surveillances and audits of all plant activities are performed to preplanned and approved schedules to ensure complete coverage of plant activities. Due to the thorough scrutiny given to all activities

of the Company, it is not in any way extraordinary that some deficiencies are identified for correction.

Q.5. Please describe Edison's Quality Assurance Program as it applies to operation of the Byron Station.

A.5. Quality Assurance is one of the Administrative controls employed to assure that activities important to safety are performed in the appropriate manner. Edison is responsible for the assurance of quality in all phases of plant operations. The Quality Assurance group located at the Byron Station, under the direction of a Station Quality Assurance Supervisor will be primarily involved in inspections, surveillances and audits of all safety-related and ASME Code related work and activities performed by operating plant personnel, contractors and other Commonwealth Edison personnel. Audits will be planned using agenda and checklists approved, as applicable, by Supervisor Quality Assurance (Maintenance) or Director of Quality Assurance (Operating). Reports will be written covering surveillances and for each audit and both distributed to responsible management. The Quality Assurance group will also

be responsible for verifying that appropriate corrective action is taken to remedy any deficiencies identified whether it be by Quality Control, Quality Assurance or others.

The Quality Assurance personnel assigned to specific quality activities such as nondestructive examination, auditing or inspection are provided training in the skills required for their work. Generally, this training is an extension of the formal education and work experience of the Quality Assurance personnel. At least one of the Quality Assurance people performing surveillances and audits of operating activities will be a licensed reactor operator or have been a licensed operator.

Commonwealth Edison has the responsibility for control of purchased material, equipment and services including that supplied by the NSSS vendor. The control of the quality of purchased material, equipment and services is achieved through the evaluation of vendors, through surveillance of their operations, and through appropriate inspections. In-coming material and equipment will be inspected by Edison, or its agents, to assure physical integrity and compliance with procurement document requirements. For ASME

Code and safety-related items which are not inspected at the vendor's plant, specific receipt inspection measures, such as material and dimension checks against approved drawings and specifications, will be performed to verify conformance to procurement requirements. Final receipt inspections will be performed by qualified Quality Control and Quality Assurance personnel according to written procedures using checklists approved by Quality Assurance.

The Station Quality Control group of the Station which mainly performs inspections, reports to the Administration and Services Assistant Superintendent so as to function independent of the Maintenance and Operating groups which also are headed by Assistance Superintendents who, in turn, also report to the Station Superintendent. In addition, like for all other activities in the station, Quality Assurance ensures the Quality Control functions are properly carried out plus also perform quality control inspections.

The Company Station Quality Assurance organization functions independent of the Edison Station Operating Department. It verifies and assures requirements are fulfilled under the direction of a Station Quality Assurance Supervisor who reports

off-site to a Quality Assurance Supervisor for maintenance, and to the Director of Quality Assurance for operating activities. They in turn report to me and I report to the Vice Chairman of the Company. Conditions adverse to quality found by quality personnel that require prompt action which cannot be resolved at the station will be promptly reported to me or my designated alternate for action. I direct the quality assurance activities for the operation, maintenance, design and modification activities of the Company's nuclear power stations and have the responsibility and the authority to stop unsatisfactory work or plant operation and to stop further processing of unsatisfactory material during design, construction or operation of the plant.

Q.6. Does the Quality Assurance Program applicable to the Byron Station meet all of the requirements of Appendix B to 10 CFR Part 50?

A.6. Yes. The Quality Assurance Program for the operation, design, procurement, maintenance, plant modification and in-service inspection of safety-related systems, structures and components of the Byron Station is the same Quality Assurance

Program with implementing procedures which is applicable to all our nuclear power plant construction projects and operating stations. This Quality Assurance Program meets the requirements of each of the 18 Criteria of Appendix B to 10 CFR Part 50, as well as the requirements of Section III of the ASME Boiler and Pressure Vessel Code, ANSI Standard N45.2 and its daughter standards, and applicable NRC Regulatory Guides. The Company Quality Assurance Program is augmented by Quality Assurance Procedures and other procedures covering NRC Criteria and Regulatory Guides, the ASME Code and other applicable codes and standards.

Q.7. Do you believe that the Company's Quality Assurance Program will be satisfactorily implemented at the Byron Station during operations?

A.7. Yes. In my opinion, Edison's Quality Assurance Program as implemented is one of the best Quality Assurance programs in the nuclear industry. The operating nuclear stations and construction sites, including Byron construction and pre-startup operation activities, have been audited many times by personnel for the Nuclear Regulatory Commission's Region III. The Program has also been carefully

reviewed by Nuclear Regulatory Commission Headquarters Staff, as well as by the Illinois Office of the State Fire Marshall, Division of Boiler and Pressure Vessel Safety. No significant deficiencies in our Program or its implementation have been identified during these reviews.

Also, our Quality Assurance Program has been evaluated fifteen times over the past seven years by ASME Survey Teams. The Survey Teams have included representatives of the NRC and the Illinois State Boiler Board. We have passed all the surveys and ASME has issued Edison NA and NPT Certificates of Authorization for Zion, Dresden, Quad Cities, LaSalle County and Byron Stations and N, NA and NPT Certificates of Authorization to the corporate organization of the Company. These Certificates are an accreditation of Commonwealth Edison as having had the adequacy of their Quality Assurance Program verified for design (N), fabrication (NPT) and installation (NA) of ASME Code-covered items and work at our nuclear stations. The Byron operating station organization passed its ASME Survey in mid-1982.

In view of the Company's very good record in implementing its Quality Assurance Program, a record which has been repeatedly verified by

independent reviewers, I have every reason for confidence that the Quality Assurance Program will be satisfactorily implemented at Byron during station operation.

Q.8. Earlier you mentioned that deficiencies in adherence to Quality Assurance criteria by contractors and Edison personnel have been identified by both Edison Quality Assurance and the NRC. Is the fact consistent with your confidence that the Quality Assurance Program will be satisfactorily implemented at Byron Station during operation?

A.8. Yes, it is. The mere existence of incidents of non-compliance with Quality Assurance criteria does not in itself indicate a lack of dedication to safety, or a lack of capability to achieve safe operations. A sufficiently thorough Quality Assurance program of inspection and audits can always be expected to identify some deficiencies. In fact, a program that does not identify deficiencies would be suspect.

It is important to evaluate the significance of the individual deficiencies, the appropriateness of the corrective action taken, and the overall trend in performance. On these measures, Edison's

past performance has certainly been adequate to assure safe operations and the trend has been one of continuing improvement.

Edison's overall adherence to quality is undergoing a continuing improvement over time. This can be seen by the continuing reduction in the number of deficiencies identified by the NRC in their inspections of Edison's operating stations over the past five years even with the intensity and comprehensiveness of the NRC inspections being increased during the same period. Even though our performance has improved with respect to deficiencies identified by the NRC, we also have raised our internal standards in our quality assurance audits. The Company's Quality Assurance department has increased the frequency and intensity of its own audits and I feel the downward trend is the result of our intensified surveillance and audit activities. These results show that Commonwealth Edison is dedicated to a comprehensive program of assuring that all requirements are met and of ensuring the safe operation of its stations.

Q.9. Please describe the basis on which employees are assigned as site quality assurance superintendents for Edison nuclear power plants under construction.

- A.9. Employees are selected for Site Quality Assurance Superintendents on the bases of indicated and demonstrated managerial skills, past performance and experience, future potential, demonstrated attitude about insistence on achieving quality in the design and construction of the plant, tenacity and persistence, ability to perform properly under pressure, construction and engineering knowledge, intelligence, ability to work with others, knowledge of and experience with the implementation of the Company Quality Assurance Program and knowledge of the ASME Code plus applicable National Standards and NRC and other Regulatory requirements.
- Q.10. How many such superintendents have been assigned to Byron Station?
- A.10. We have had just one at Byron and he is the current Quality Assurance Superintendent. This job position was newly established in January, 1981 when it was deemed appropriate to expand the supervision coverage to adequately match the level of construction. Under this organization change the higher level position of Site Quality Assurance Superintendent was established plus two Supervisor

positions were made to provide a better supervisory span of control and to achieve more comprehensive and stronger supervisory coverage over the daily site Quality Assurance organization activities. In addition, qualified lead technical people over smaller work groups, reporting to these supervisors, are used. For the prior years back to 1976, a Site Quality Assurance Supervisor was in charge of the site Quality Assurance organization at Byron supported by lead technical people covering, respectively, structural, electrical, mechanical and documentation areas of activity. As to the number of Quality Assurance Supervisors, there has been a total of four prior to the current superintendent.

Q.11. Has the number of QA superintendents at Byron been a subject of NRC attention?

A.11. Yes. In May, 1982, the NRC performed an extensive evaluation of the Byron construction site. This inspection was referred to as the Construction Assessment Team inspection. During the inspection, the NRC raised questions regarding the turnover of personnel and in particular, the turnover of supervision. Edison responded to these questions

explaining the logic and reasons for the personnel moves. It is our understanding that the assignment and movement of Quality Assurance personnel at Byron is no longer a subject of question.

Q.12. Explain the circumstances under which Quality Assurance Superintendents were replaced at Byron.

A.12. As I stated earlier, there has only been one Quality Assurance Superintendent at the Byron site and he has been in that position for a little over two years. In regards to the four Supervisors who preceded this Superintendent, the circumstances of the replacements were part of the normal corporate management development and promotional sequence available to promising management personnel except for one supervisor who was killed in an automobile accident on his way home from the site. The other three were promoted to higher positions. Furthermore, to have deprived these people of the promotions would have resulted in their leaving the Company.

Q.13. Do you believe that these changes in QA personnel have had an adverse effect on quality assurance implementation at Byron?

- A.13. No. On the contrary, as the construction work progresses from concrete and structural work to mechanical and electrical work and then into preoperational testing and start up modes over a period of eight to ten years it is beneficial for the project to periodically change the Quality Assurance person in charges with a person who has experience matching these various project phases. Also, it is healthy to have a new managerial review and to bring new ideas, approaches and concepts periodically into Quality Assurance activities involving construction. Moreover, the disruption is short lived because continuity during a supervision change is sustained through the membership of the site Quality Assurance group.
- Q.14. Have there been any occasions on which the Company itself has halted construction at Byron?
- A.14. Yes. Commonwealth Edison has formally stopped work on a number of occasions since the beginning of construction at the Byron Site.
- Q.15. What was the first such occasion?

A.15. The first stop work was issued by Commonwealth Edison on May 6, 1977. Concrete placement was stopped because of improper installation of reinforcing steel. Corrective action was completed and work resumed on May 11, 1977.

Q.16. Who was the contractor involved?

A.16. The stop work was imposed on Blount Brothers who was the concrete placement contractor. The contractor responsible for installation of the reinforcing steel was Delta-Delta Midstates.

Q.17. Please describe the circumstances under which another stop-work order was issued by Commonwealth Edison Company.

A.17. In January 1981, Commonwealth Edison ordered Hatfield to stop work on safety-related cable pulling activities due to programatic inconsistencies. The key reasons leading to the stop work order were: cables not installed in a neat, parallel manner in cable trays; cables were piled higher than the edge of the cable tray; inadequate separation of cable; cable pan marking and routing questions; and cable storage and cable tray cleanliness.

Q.18. Please describe the corrective action taken by Edison and Hatfield.

A.18. Commonwealth Edison directed Hatfield to undertake a broad range of action to ensure the root cause of the stop-work was addressed. The items addressed included, but were not limited to: ensuring correct separation of class IE cable from nonclass 1E; checking cable tray bridge locations for proper routing; reinspecting cable pan stiffener welds; checking cable trays for cable overfill; arranging cables in parallel; checking cables for proper suspension support when installed temporarily; revising procedures to assure cables are stabilized at the proper temperature prior to installation; checking cables for proper end seals; checking conduits for proper support; checking cables for damage; ensuring cable tray inspection prior to pulling cables; reviewing all NCR's to assure Hold Tags were issued accordingly; revising procedures as necessary do accomplish the above; and retraining personnel as necessary to address the above items.

Q.19. Was the NRC Staff satisfied with this corrective action?

A.19. Yes. On June 7, 1981 the NRC accepted the corrective actions with two comments. The bundling

of safety-related and non-safety related cables was deemed not acceptable and the proposed corrective action on cable pan stiffener welds was studied and ultimately accepted by the NRC on 7/9/81.

Q.20. Please describe the circumstances under which another stop work order was issued by Commonwealth Edison Company.

A.20. On September 17, 1982, Commonwealth Edison ordered Reliable Sheet Metal to stop work on all new installation of safety-related HVAC systems and attachments to safety-related structures. The stop work was issued because of inadequate and incomplete inspections, inadequate procedures, lack of documented evidence that some material purchased by Reliable Sheet Metal met procurement requirements and due to a number of open audit deficiencies.

Q.21. Please describe the corrective action taken by Edison and Reliable Sheet Metal.

A.21. In order to ensure that backfit inspections as well as inspection of new installations are performed in a timely manner, the QA/QC organization of Reliable Sheet Metal has been reorganized and expanded. A program has been established to

complete backfit inspections as well as to provide inspection coverage for new work. Procedures for installation and inspection have been reviewed and revised where necessary. Documentation required for materials is being acquired from vendors who supplied the material. Also, progress is being made on outstanding open audit deficiencies to complete corrective actions. In order to ensure that the revised program continues to be followed properly, after the current corrective actions are completed to Commonwealth Edison's Quality Assurance Group's satisfaction and the stop work is lifted, Commonwealth Edison will audit Reliable Sheet Metal on a more frequent schedule. The Reliable Sheet Metal audit and surveillance program has also been upgraded so that deficiencies can be identified and corrected internally.

- Q.22. How many other stop-work orders have been issued by Commonwealth Edison Company at Byron Station?
- A.22. On 6 other occasions. In each of them appropriate corrective action was taken by the site organization involved and the NRC is satisfied with the resolution of each incident.

Q.23. Please describe the actions taken at Byron Station following certain allegations of improper quality assurance implementation at Edison's LaSalle County Station.

A.23. As a standard practice, deficiencies identified at any of Edison's construction sites are reviewed to determine if they could also be applicable to the other two sites. The same is true for allegations.

In regard to LaSalle allegations, three resulted in extensive reviews and revisions to procedures at Byron. The first deals with drilling holes for concrete expansion anchors. The architect engineer has always required that reinforcing steel bars which are cut on the drilling process be reported to the Architect-engineer for review and analysis. This has always been implemented by Edison. However, as a result of allegations at LaSalle, it was decided that a complete accountability system be established for all concrete expansion anchor holes drilled in concrete. Records are now kept for all holes drilled in concrete so it can be demonstrated for each hole if a reinforcing bar was contacted or not contacted, nicked or cut.

have Quality Control groups to implement these inspections. In addition, an independent testing agency, the Pittsburgh Testing Laboratory, under the direction of the Edison Site Quality Assurance group is responsible for a large portion of the quality control inspection program. In general, P.T.L. performs the inspections in the non-destructive testing disciplines such as radiography, magnetic partical, liquid penetrant, ultasonic examinations, and leak rate testing. Also, they perform the concrete, reinforcing steel and cardweld testing. The scope of the quality control inspection program at Byron is very extensive and a more detailed description of the work performed by the quality control inspectors is included in Exhibit 1 to this testimony.

Q.25. Please describe the qualifications for quality control inspectors at Byron.

A.25. Commonwealth Edison has required, since the beginning of construction, that personnel performing quality control inspections at the Byron Nuclear Construction Site be trained, qualified and capable of performing the inspection activity. All contractors performing safety related work at the Byron Site were required to commit, in their Quality Assurance Program, to have trained and

qualified quality control inspectors. This commitment was required prior to Commonwealth Edison granting the award to the contractor. The contractor's Quality Assurance Program, which included this commitment, was made part of the contract award and, as such, Commonwealth Edison complied to the pertinent quality requirements of Appendix B to 10 CFR Part 50.

Q.26. Is there a recognized standard for qualification of quality control inspectors?

A.26. Yes. During the early stages of construction at Byron, beginning in December, 1975, the industry standard which provided guidelines for qualification of inspection personnel was the American National Standards Institute document, designated N45.2.6-1973, which was approved by the Institute on January 25, 1973 and endorsed by the Atomic Energy Commission in Regulatory Guide 1.58 dated August, 1973. Commonwealth Edison, in its licensing documents, committed to comply to this industry standard.

It is important to note that in the period 1974 to 1977, there was wide variation in the interpretation and application of this standard by the utilities, contractors and regulating agencies. The standard was new, contained generic language and was going through a growing stage in becoming

a truly meaningful document for industry use. Much of the variation in interpretation was due to the manner in which the standard was written which allowed wide latitude in application. For example:

Paragraph 1.2 read . . . "The extent to which the individual requirements of this standard apply will depend upon the nature and scope of the work to be performed and the importance of the item or service involved."

Paragraph 3.1 read . . . "The education and experience requirements specified for the various levels should not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task. Other factors may be demonstrated capability in a given job through previous performance of satisfactory completion of proficiency testing."

Q.27. Did the NRC recognize that ANSI standard?

A.27. Yes. The Regulatory Guide which endorsed the 1973 version of N45.2.6 did not take any exception to the language of the standard, and it did not give any further guidance.

Q.28. How did Edison interpret that standard at the Byron site?

A.28. In applying the standard at the Byron Site,

Commonwealth Edison enforced the original commitments imposed on the contractors; that is, the contractor's Quality Control inspectors had to be trained and qualified. The basis for qualification of inspection personnel varied from contractor to contractor and generally was geared to the significance and complexity of the inspection activity. To assure the inspectors performed competent work, Commonwealth Edison conducted regular surveillances and audits of the construction work and inspection activities. In 1977 and 1978 Edison's Byron Site QA performed 486 and 550 surveillances respectively. In 1976, 1977 and 1978, Edison's Byron Site Quality Assurance performed 37, 50 and 68 formal audits, respectively.

In addition, an Independent Testing Agency performed in-line acceptance inspections for certain portions of the contractors work and performed a 10% over check of the contractors work. The Edison Project Construction Department also performed surveillances of the contractors' work activities. From the beginning of the project, Commonwealth Edison expended a great amount of effort to assure the equipment installed in the plant conformed to design specifications and drawings and was of acceptable quality.

Q.29. Did the ANSI standard for qualifying quality control inspectors change?

A.29. Yes. On Aug. , 1978, a revised version of the standard was approved by the institute. As noted in the forward of the new document, one of the key reasons for the revision was to make clarifications especially with regard to education and experience considerations. The revised standard provided more specific guidance for qualifying inspection personnel and also significantly reduced many of the recommended requirements of the 1973 version. For example, in the 1973 version, a Level I Inspector required a high school education and one year of equivalent experience; this was reduced to two years of related experience or a high school graduate with six months of experience. For a Level II, the requirements were reduced from a high school graduate plus four years of experience or a college graduate plus two years; to one year as a Level I, or a high school graduate plus three years of experience or a college graduate plus one year of experience. Other requirements were similarly reduced. The revised version of the standard was formally issued on January 15, 1979.

Q.30. What was the NRC's reaction to the revised ANSI standard on quality control inspector qualification?

A.30.

In September, 1980, the Nuclear Regulatory Commission issued Regulatory Guide 1.58, Revision One which endorsed the 1978 standard with certain exceptions. The most significant exception was in Regulatory Position 6 which stated that Level I, II, and III personnel shall meet the recommended education and experience levels in Paragraph 3.5 of the standard. However, Regulatory Position 10 gave further guidance stating that . . . "to establish that an individual has the required qualifications in lieu of required education and experience should result in documented objective evidence demonstrating that the individual indeed does have comparable or equivalent competence to that which would be gained from having the required education and experience." The Regulatory Guide further stated that implementation schedules for Regulatory Positions 6 and 10 will be determined on a case-by-case basis by the NRC, but it is expected that they will be required to be implemented by February 27, 1981.

Q.31.

Did Edison commit to implement this revised Regulatory Guide?

A.31.

Commonwealth Edison committed to Regulatory Guide 1.58, Revision One in its Topical Report CE-1-A Revision 16 dated March 16, 1981.

Q.32. Has the NRC inspected the qualifications of quality control inspectors?

A.32. Yes. Throughout the period of construction at Byron, the Nuclear Regulatory Commission performed inspections during which the qualifications of quality control inspectors were thoroughly reviewed. An NRC inspection conducted in August, 1978 (IE Inspection Report Nos. 50-454/78-07 and 50-455/78-07) stated that work in progress on Refueling Water Storage Tanks was observed. It was found that two qualified non-destructive examination personnel were inspecting the installation and qualification records of other QA/QC inspection personnel were current and reflect adequate qualifications for the activities performed. In regards to welding, the report stated that prescribed inspections were performed by qualified personnel. One deficiency was identified in the report, which stated that for two site contractors, personnel qualification and certification were not prescribed in procedures or instructions. This deficiency was corrected and closed by the NRC in February, 1979.

Perhaps the most significant inspection conducted by the NRC covering qualification of inspection personnel prior to 1982 was done September 11-28, 1979. During this inspection the full requirements of

N45.2.6-1978 were applied to all site contractors although the Regulatory Guide endorsing the 1978 version had not yet been issued and Edison had not yet committed to N45.2.6-1978. As a result of this inspection, Commonwealth Edison performed field evaluations of quality control inspection personnel to assure they possess the proficiency and knowledge necessary to perform the inspection functions. In addition, site contractor's procedures for qualification and certification of inspection personnel were reviewed by Commonwealth Edison against the requirements of N45.2.6-1978. Inadequacies in the contractors' procedures were identified and corrected accordingly. Particular emphasis was placed on documenting the basis for certification as required by each contractor. Upon completion of this corrective action, all site contractors were in compliance with N45.2.6-1978 requirements to the extent felt necessary by each contractor based on the complexity and significance of the work being performed. This corrective action was reviewed by the NRC on January 16-17, 1980, found acceptable and closed out. (IE Report 50-454/80-01; 50-455/80-01). At this time, it was the common understanding by the site contractors, Commonwealth Edison and the Nuclear Regulatory Commission that

the requirements of N45.2.6-1978, as interpreted at that time, were being properly applied and implemented in qualifying quality control inspections at the Byron Site.

Q.33. Please describe the manner in which the qualifications of quality control inspectors were inspected by the NRC in 1982.

A.33. In the Spring of 1982 (March 29 - May 11), the most extensive inspection to date covering compliance to N45.2.6-1978 was conducted by the NRC. Large numbers of quality control inspectors were interviewed by NRC Inspectors and the NRC Report (Nos. 50-454/82-05 and 50-455/82-04) concluded the following: . . . "When asked to discuss their opinion of the overall finished product of their contractor's activities, the majority of inspectors stated that the work generally exceeded minimum acceptable standards, a few stated the work generally met minimum standards, and no inspectors felt that the work did not meet minimum acceptable standards." The report also stated . . . "Based on a sample review of CECO audits conducted in the area of training, qualification and certification for the period 1979-81 it was

determined that a program exists to routinely review the acceptability of QA/QC personnel. It was noted that many audit findings were identified and resulted in notable improvements of contractor adherence to ANSI N45.2.6-1978." Although these favorable aspects regarding quality control inspectors were reported, the NRC felt that the qualification program at Byron was still lacking primarily because Commonwealth Edison had not established minimum features and methodologies to be employed when training/qualifying/certifying QA/AC personnel to N45.2.6-1978. The NRC felt that Edison should apply a minimum standard interpretation to all contractors rather than allowing a variation in interpretation of the standard as had been done heretofore. As a result, on June 9, 1982 Commonwealth Edison issued a directive to all site contractors spelling out specifically the minimum requirements to be used as the basis for certification. This directive was intended to standardize the certification process at Byron. Additionally, the minimum standard requirements of the June 9, 1982 directive were in excess of the requirements previously accepted by all parties as being a reasonable

interpretation of the standard. Quality control inspection personnel on site have been recertified to the new quantified requirements of the June 9, 1982 directive.

Q.34. What steps were taken with respect to quality control inspectors whose employment at Byron had ended?

A.34. Commonwealth Edison reanalyzed certification records for quality control inspectors no longer on site to determine the extent of compliance to the new standard requirements of the Edison directive. The object of the reanalysis was to determine the acceptability of inspector qualification based on existing records. Where it is determined that additional documents are needed to complete the certification, an attempt is being made to obtain the missing documents. Also, a sample reinspection will be made of each contractor having documentation inadequacies in its quality control inspector records of the involved inspectors' work.

Q.35. Do you believe Edison has been and is in compliance with industry standards and NRC require-

ments for qualification of quality control inspectors at Byron?

A.35. Yes. As described above, the standards have changed through the years and the interpretation and application of the standards have also changed through the years. Throughout the construction period, Commonwealth Edison was in compliance with the applicable standard at that time based on the interpretation commonly accepted in the industry. When deficiencies in qualifications were identified either through Edison audits/surveillances or NRC inspections, Commonwealth Edison took corrective action to resolve the deficiencies. Furthermore, for a large majority of the construction activity at the site, there were multiple levels of inspection, over-inspections and re-inspections plus surveillances and audits, thus adding to the overall confidence that the work at the Byron Site was completed in accordance with the design drawings, specifications and construction procedures. Exhibit 1 to my testimony describes the multiple inspection levels in place at the Byron Station.

Q.36. How has Edison resolved the NRC's concern regarding the qualifications and certification of

quality control inspectors which were the subject of an item of non-compliance in the NRC inspection report numbered 50-454/82-05 and 50-455/82-04?

A.36.

To resolve the NRC's concerns, Edison has developed and submitted to the NRC a sample reinspection plan, which is acceptable to the NRC, involving the specific contractors who were identified as having quality control inspector documentation inadequacies at Byron. The plan requires each such contractor to reinspect the work performed by the identified inspectors. This reinspection will be done by a sample selection of the first three months of the inspectors' inspection activities. Provisions exist to increase the reinspection where necessary from the results obtained for each quality control inspector.

WALTER J. SHEWSKI EXHIBIT "1"

A. IN LINE ACCEPTANCE INSPECTIONS

1. Contractor Quality Control

All site contractors performing safety-related installation activities have inspection programs established and implemented which determine the acceptability of their installations. These inspections are an on-going, in-line activity which evaluates the various elements of the contractor's work. Some of the area included in the contractor QC inspections are bolting, cadwelding, concrete (reinforcing steel, preplacement, placement and curing), masonry, post tensioning, welding, material verification for size-type-placement, cable pulling and terminating, concrete expansion anchors, pipe bending, coating applications, et cetera. Each of these areas have numerous elements of inspection under them. For an expanded view of these inspection elements, see attachment "A" (25 pages).

2. Pittsburgh Testing Laboratory In-Line Acceptance Inspections.

The independent testing laboratory, PTL, performed tests or inspections on contractor work to determine the adequacy of the work. Test areas include concrete, soils, NDE, and structural. These activities were begun in September, 1977.

- a. Concrete - slump, air content, unit weight, compressive strength, aggregate, cement and mixing water tests were typically performed on the concrete used in construction. These activities were begun in December, 1975.
- b. Cad-Welds - tensile tests and field inspections. These activities were begun in February, 1976.
- c. Nondestructive Examinations - performed to meet code or specification requirements. This includes radiography, ultrasonic, magnetic particle, and liquid penetrant testing. These activities were begun in March, 1976.
- d. CEA - Torque - Verification of torque requirements for concrete expansion anchors. These activities were begun in February, 1978.
- e. Soils - density, gradation, moisture density relationships were typically performed on soils prepared for construction. These activities were begun in May, 1975.

- f. Structural Bolting - ten percent or a minimum of two bolts per connection on all safety related structures were verified. These activities were begun in March, 1977.

3. In-Line Project Construction & Quality Assurance Concrete Placement.

Project Construction inspected all concrete pours made during plant construction. This included pre-placement, placement, and post-placement inspections. Also, Quality Assurance performed preplacement inspections on all safety-related structures. Typically, QA also did placement and post-placement inspections in addition to the PCD required inspections.

4. Authorized Nuclear Inspector Involvement

- a. The ANI performs audits of contractor QA/QC program by the home office.
- b. Monitors contractor QA/QC program by site ANI.
- c. Witness 100% of Hydrostatic test
- d. Review 100% of final radiographs
- e. Review process sheets for insertion of hold points
- f. Review completed process sheets
- g. Review documentation for preparation of Code Data forms
- h. Sign-off on contractor Code Data forms

B. OVERVIEW OR RECHECK INSPECTIONS, SURVEILLANCES AND AUDITS

1. Independent Testing Laboratory Overview or Recheck Inspections and Surveillances

The independent testing laboratory, PTL, under the direction of CECO. Site Quality Assurance performs various overview or recheck inspections and surveillances on contractor's work after the contractor's own QC inspections have been performed and accepted. This overview by the independent testing laboratory provides additional assurance that the contractor's QC personnel are performing credible inspections. These overview or recheck inspections and surveillances include:

- a. Field Change Requests - PTL performs a sampling verification of the approved field design change requests against the installed and inspected contractor work.
- b. Visual Weld Inspections - Approximately 5100 reports have been issued documenting PTL over-inspections of AWS welds performed by various contractors. These are on-going inspections performed on a sampling basis.
- c. Turn-of-the-Nut-Bolting Inspections - Approximately 100 reports have been issued documenting PTL over-inspections on items requiring bolt tightening in accordance with the turn-of-the-nut method. These inspections are performed on a sampling basis as an on-going activity.
- d. Electrical Cable Pulling - PTL has performed approximately 520 over-inspections on electrical cable pulls. This inspection is performed at the frequency of five per week minimum.
- e. Electrical Housekeeping - PTL has performed approximately 600 inspections on electrical housekeeping. This inspection is performed at the frequency of five per week minimum.
- f. Surveillances of Contractor Activities - PTL has performed approximately 90 surveillances on various elements of contractor's work activities. These include such items as pre-service inspection NDE, pipe and hanger installation, duct and hanger installation and post tensioning. These are performed as requested by CECO. QA.

2. Commonwealth Edison Quality Assurance Overview

The site Quality Assurance department ensures the requirements of the Corporate Quality Assurance Manual, Final Safety Analysis Report and Codes & Standards are being met by the site construction forces.

- a. Audits are performed of all contractors to verify adequacy of their program. Also, randomly selected surveillances of all construction aspects are performed. This method provides a thorough sampling of the work activity on site and provides sufficient data to determine its adequacy.

- b. A minimum of ten percent of all radiographs are reviewed. This review is over and above the 100% interpretive review by PTL and the cognizant contractor and the other requirements for radiographic film.

3. Project Construction - SQP Checklist

Inspection checklists are completed according to an approved schedule for the three major disciplines. The areas for each discipline are outlined below.

a. Structural

- 1. Cement, Aggregate, Sand, Admixture Storage
- 2. Batch Plant Operation
- 3. Storage Survey
- 4. Masonry
- 5. General Housekeeping
- 6. Welding
- 7. Concrete & Grout Pour Preparation
- 8. Concrete & Grout Placing & Curing

b. Mechanical:

- 1. Storage Survey
- 2. Installed Equipment
- 3. Material Receipt and Storage

c. Electrical

- 1. Cable Pan Installation
- 2. Storage Survey
- 3. Cable Pulling
- 4. Exposed Conduit Installation
- 5. Installed Equipment

C. REINSPECTION PROGRAMS

To maintain a high level of confidence regarding the quality of site work, reinspection programs of specific work elements have been undertaken as the result of such things as NRC Bulletins, industry and site identified potential problems, criteria changes or where CECO. felt the need for better documentation of inspections. These reinspection programs include:

1. Concrete Expansion Anchors

Resulting from NRC Bulletin 79-02.

2. Safety Related Cable Pans, Cable Pan Hangers and Conduit Installations

Better documentation of dimensional and detail inspections.

3. Cable Pan Stiffener Welds

Reinspection performed to resolve potential problem with weldsize and quality.

4. Containment Structural Steel Slip Connections

Due to a change in design, slip connections were reworked and reinspected to the changed criteria.

5. Structural Welding Weld Quality

Reinspections of contractor's structural welds to evaluate to revised undercut criteria and assure a site problem does not exist.

6. High Strength Structural Steel Bolting

Due to a lack of documentation, reinspections were performed on high strength structural steel bolting in the Auxiliary building, Fuel Handling building and River Screen House.

7. Safety Related HVAC Installations

Better documentation of dimensional and detail inspections.

8. Post Tensioning Tendon Rust Inspections

To assure that tendons which could have exhibited unacceptable degradation due to rusting from storage were not installed, all stored tendons were inspected to specific corrosion criteria.

9. Post Tensioning Button Heads

As a result of problems identified at other sites, a reinspection program was undertaken to evaluate size and quality of button heads at Byron.

10. Post Tensioning Anchor Heads

As a result of material failures at Byron and other sites, material and thread engagement verification programs were performed.

11. Inspection Verification

Due to lack of complete inspector qualification documentation to the June 9, 1982 quantitative requirements memorandum, a sample reinspection program was undertaken for each contractor not otherwise found acceptable or was being verified under another program, covering their first three months of inspection to verify acceptability of inspection.

Conclusion:

It is our opinion that through all the in-line inspections, overview inspections, reinspections, technical audits and surveillances which have occurred and will continue throughout the duration of the project, a high level of confidence regarding the quality of work exists.