

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of Commonwealth)	Docket Nos.
Edison Company (Zion Station,)	50-295
Units 1 and 2))	50-304

TESTIMONY OF
WALTER J. SHEWSKI

Contentions 2(k) and 2(e):
Quality Assurance for the
Neutron Absorbing Spent Fuel
Storage Racks for Zion Station

May 25, 1979

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My name is Walter J. Shewski and I am the Corporate Manager of Quality Assurance for Commonwealth Edison Company. I have held this position for the past five and one half years. Just prior to this assignment, I was General Manager of the Project Management Corporation involving the Clinch River Breeder Reactor Project. Before that, I was assigned to other technical and management positions within Commonwealth Edison Company involving engineering, operations, power plant construction and nuclear design and construction of Dresden Unit 1 Nuclear Power Station.

I have 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 and the Edison Electrical Institute Quality Assurance Task Force. Also, I am a member of the Institute of Electrical and Electronic Engineers, American Society of Mechanical Engineers, American Society of Quality Control and the Western Society of Engineers.

The Quality Assurance Program which is employed by Commonwealth Edison Company in the design, procurement, construction and preservice testing of safety-related systems, structures and components involving the neutron absorbing spent fuel storage racks for the Zion Nuclear Power Station is the Commonwealth Edison Quality Assurance Program and its implementing Quality Assurance Procedures.

The Quality Assurance Program meets the requirements of each of the 18 Criteria of Appendix B to 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Plants;" Section III of the ASME Boiler and Pressure Vessel Code; ANSI Standard N45.2 - "Quality Assurance Program Requirements for Nuclear Power Plants;" and applicable NRC Regulatory Guides. The Company Quality Assurance Program is augmented by Quality Assurance Procedures and other procedures covering Nuclear Regulatory Commission Criteria and Regulatory Guides, the ASME Code and other applicable codes and standards. The operating nuclear stations and construction sites have been audited many times by personnel from the Nuclear Regulatory Commission's Region III, and we are not aware of any deficiencies in our Program or its implementation. Furthermore, the Program has been carefully and satisfactorily 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.

Also, on many occasions our Quality Assurance Program has been successfully evaluated as to content and implementation by ASME Survey Teams in connection with the eleven Certificates of Authorization issued to Edison by ASME for Section III Code work. All of the above provide added credibility and confidence that Commonwealth Edison has a complete and implemented Quality Assurance Program

which will ensure that the spent fuel storage racks will be an installation of high quality.

A brief review and description of the Quality Assurance Program applicable to the Zion Station spent fuel racks follows.

In the case of the spent fuel storage racks for Zion, Nuclear Services Corporation has been hired as a Consulting Engineer to perform inspections and surveillances during manufacturing work by Brooks and Perkins (manufacturer of the neutron absorbing tubes) and Leckenby (manufacturer of the racks). Commonwealth Edison Quality Assurance personnel reviewed and accepted the Nuclear Services Corporation, Brooks and Perkins and Leckenby Quality Assurance programs in conjunction with award of their respective contracts. Furthermore, Commonwealth Edison personnel have and will continue to audit Nuclear Services Corporation's quality assurance activities, to assure that Nuclear Services Corporation complies with its own Quality Assurance Program. Also, Commonwealth Edison has and will continue to independently inspect and audit Brooks and Perkins and Leckenby's fabrication activities at their plants to assure the fuel storage rack assemblies are built as provided by the drawings, specifications and other procurement documents. The contract specifications entitle Commonwealth Edison to inspect the production of the spent fuel racks and supporting documentation at any time.

Commonwealth Edison Company is ultimately responsible for the assurance of quality in all phases of design, procurement, construction and testing of the spent fuel racks. As Manager of Quality Assurance, I direct the quality assurance activities for the design, procurement construction and testing of the spent fuel racks and I have the responsibility and authority to stop work or stop further processing and use of unsatisfactory material and equipment. Copies of audit reports by Nuclear Services Corporation are sent to Commonwealth Edison Company Quality Assurance personnel and reviewed to insure that the audits were performed in accordance with Nuclear Services Corporation's Quality Assurance Programs and that there are no unresolved problems with respect to the vendor's Quality Assurance Program. Conditions found adverse to quality during vendor audits and inspections and which require prompt corrective action but which cannot be resolved with the vendor by Nuclear Services Corporation Quality Assurance must be promptly reported to me or my designee for action. Likewise, adverse conditions found by Commonwealth Edison Quality Assurance personnel once the racks are received at Zion Station which require corrective action but cannot be resolved at the Station will be promptly reported to me or my designee for action.

Contention 2(k) asserts that Commonwealth Edison has not adequately described the procedures it will employ to prevent the possible degeneration of the Boral density in

the neutron absorbing tubes due to generic or mechanical defects. My testimony will briefly outline the Quality assurance procedures designed and established to assure that the Boral density in the tubes conforms to the applicable standards and specifications. It is important to note that technical decisions concerning the types of materials and fabrication processes to be used in the production of the spent fuel racks and the applicable standards to which those materials and processes must conform are made by engineering personnel. Quality Assurance's responsibility is to assure that the racks are manufactured in compliance with the materials, processes and standards which are designated as applicable by engineering. Accordingly, the following testimony should be viewed in this context.

The Quality Assurance Program of Commonwealth Edison Company, Nuclear Services Corporation, Brooks & Perkins and Leckenby are designed to comprehensively achieve two basic objectives: (1) assure the quality of the materials used in fabrication of the racks, and (2) assure the quality of the manufacturing process. The first objective is achieved in the following manner:

(1) The boron carbide, aluminum sheet, aluminum powder and stainless steel to be used in the neutron absorbing tube fabrication process is certified by the supplier of these materials to meet applicable ASTM standards for these materials as required by the procurement specifications. The

certification documents which are traceable to specific lot numbers of the material are provided to Brooks & Perkins along with the actual materials;

(2) Brooks & Perkins Quality Assurance personnel review the certification documents to ensure that the materials conform with the procurement specifications;

(3) Additionally, upon receipt of the materials, Brooks & Perkins sends a sample of each boron carbide lot to Isotopic Analysis, Inc., an independent testing laboratory, where an isotopic analysis is performed;

(4) The Brooks & Perkins certification review and the isotopic analysis report are documented in a "Nuclear Material Review Report" prepared by Brooks & Perkins Quality Assurance personnel which is forwarded to Nuclear Services Corporation;

(5) Nuclear Services Corporation is required to review this Report and ascertain whether the certification documents and Brooks & Perkins review thereof are acceptable. If such a finding is made, the materials are released to Brooks & Perkins for use in the fabrication process.

Quality assurance of the manufacturing process is achieved as follows:

(1) One of the initial fabrication processes results in the production of Boral sheets. Each sheet yields several plates which will eventually be inserted between the walls of the tubes. 100% of a prescribed random sampling of

plates are inspected for proper thickness. Also, a sample is taken from each end of the Boral plates, and 10% of these samples are analyzed for boron content either chemically or by isotopic absorption capability testing. This process assures that the neutron absorbing qualities of the boron carbide has not been altered during the course of the manufacturing process;

(2) Another associated fabrication process forms stainless steel plates into tubes which are then welded. Each weld of both the inner and outer tubes are visually inspected for defects. In addition, dye penetrant inspections are performed on 10% of the outer tube seam welds. The completed tube assembly consisting of the inner and outer tubes with the Boral plates between, then is given an inside and outside visual and dimension tolerance check. In addition, 10% of the final tubes are given a full length check using a simulated fuel element to verify straightness and proper clearances and ensure no binding occurs;

(3) Brooks & Perkins is required to forward data, inspection and weld reports to Nuclear Services Corporation for review and acceptance. In addition, Nuclear Services Corporation has been hired by Commonwealth Edison Company to perform independent inspections of the tube fabrication activities. Only upon a determination that the Brooks & Perkins quality requirements have been complied with and that design and fabrication requirements have been met will

the tubes be released for rack fabrication;

(4) The tubes are then shipped to Leckenby. Upon receipt, Leckenby is required to inspect the tubes for shipping damage and verify that design and fabrication requirements have been met. Upon a determination by inspection that the tubes conform to specifications, they are assembled and welded into the racks. Rack measurement and other design requirements are verified during the assembling process and when each rack is completed. The welding is 100% visually and 10% dye penetrant inspected by Leckenby Quality Control personnel;

(5) The data sheets and weld reports documenting Leckenby's quality assurance inspection and review are then reviewed for acceptance by Nuclear Services Corporation. In addition, Nuclear Services Corporation has been hired by Commonwealth Edison Company to perform periodic independent inspections of the fuel rack assembly activities. If the design, fabrication and quality requirements are determined to be acceptable as a result of Nuclear Services Corporation's inspections and the documentation review, Nuclear Services Corporation will release the completed fuel storage racks for shipment to Zion Station;

(6) Upon receipt of the racks at Zion, Commonwealth Edison on-site Quality Control personnel will perform a receipt inspection. Also, Quality Assurance personnel will inspect the fuel storage racks for shipment damage and

other possible defects and review the documentation on materials and welds to assure design and other procurement requirements have been met. In addition, surveillances and audits will have been performed by Commonwealth Edison Quality Assurance personnel during the tube fabrication and fuel rack assembly activities at Brooks & Perkins and Leckenby. If it is determined from the receipt inspections and documentation review as well as from the surveillances and audits that the fuel racks were fabricated according to the procurement specifications, the racks will be accepted by Quality Control and Quality Assurance personnel for delivery. At this point, the dimensions of the racks will be checked by inserting a dummy fuel assembly into each tube to check clearances and that no binding occurs. Fuel racks found to be acceptable will then be released by Quality Assurance for installation in the spent fuel pool in accordance with an approved installation plan and procedure. After the racks are installed, and prior to placing spent fuel into these new fuel storage racks, neutron attenuation tests will be performed by National Nuclear Corporation under the direction of the Station staff to confirm that the required neutron absorbing materials are present in the tubes of the fuel storage racks. On-site Quality Assurance testing and review is also discussed in the testimony of John Leider pertaining to Contention 2(1).

As for follow-up testing, further examination of samples will be performed in the future in accordance with

established and approved procedures to confirm that the neutron absorbing capabilities continue to meet requirements. Quality Assurance personnel will assure that these tests are performed as prescribed and that the neutron attenuation requirements are met.

Based on my knowledge and experience, it is my opinion that the series of procedures, inspections and tests described above and in the referenced testimony of John Leider will prevent the installation of spent fuel storage racks which do not conform with the design requirements.