

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of Commonwealth) Docket Nos: 50-237
Edison Company (Dresden Station,) 50-249
Units 2 and 3))

TESTIMONY OF
WALTER J. SHEWSKI

Contention 2:
Quality Assurance for the
Neutron Absorbing Spent Fuel
Storage Racks for Dresden Station

Contention 3:
Preventing and Protecting Against
Transportation Damage.

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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 seven 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 Electric 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 Dresden 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 the Illinois Office of the State Fire Marshall, Division of Boiler and Pressure Vessel Safety, and several times by the Nuclear Regulatory Commission Headquarters Staff, as well.

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 Dresden Station spent fuel racks follows.

In the case of the spent fuel storage racks for Dresden, Nuclear Services Corporation has been hired as a Consulting Engineer to also perform inspections and surveillances during manufacturing work by Brooks and Perkins (manufacturer of the neutron absorbing tubes) and Leckenby (fabricator 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 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 tubes and fuel racks and associated supporting documentation at any time. As part of the audit activities, Commonwealth Edison Quality Assurance personnel verify that the tubes and racks are designed, fabricated, handled and packaged for shipment in accordance with the safety-related requirements of each

organization's Quality Assurance Program.

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 ensure 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 in the course of performing inspections, surveillances and audits by Commonwealth Edison Quality Assurance personnel at Brooks and Perkins and Leckenby or at Dresden Station, once the racks are received, which require corrective action but cannot be resolved at Brooks and Perkins, Leckenby or the Station will be promptly reported to me or my designee for action.

Contention 2 asserts that Commonwealth Edison's application does not show that its quality control and quality assurance program, as well as those of its contractors are adequate to assure that tube and rack construction and the boron-10 loading of the Boral in the tubes will meet specifications. The following testimony briefly outlines the Quality Assurance procedures designed and established to assure that the tube and rack construction will meet specifications including the boron-10 loading of the Boral in the tubes. 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 drawings, materials, specifications, processes and standards which are designated as applicable by Engineering. Accordingly, the following testimony should be viewed in this context.

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

(1) The boron carbide, aluminum sheet, aluminum powder and stainless steel materials to be used in the neutron absorbing tube fabrication process are certified by the supplier of these materials as meeting applicable ASTM standards for these materials as required by the procurement specifications. The certification documents which are traceable to specific lot numbers of the supplied materials are provided to Brooks and Perkins;

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

(3) Additionally, Brooks and Perkins audits the supplier of the boron carbide to ensure their certifications are acceptable;

(4) The Brooks and Perkins certification review and verification are documented in a "Nuclear Material Review Report" prepared by Brooks and 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 and Perkins' review thereof are acceptable. If such a finding is made, the materials are released by Nuclear Services Corporation to Brooks and Perkins for fabrication.

Assurance of quality and correctness in 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. All plates are inspected for proper thickness at six various locations. 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 neutron attenuation measurement. This process assures that the neutron absorbing quality 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. As was done for the tubes for the Zion fuel racks, each weld of both the inner and outer tubes are visually inspected for defects by Brooks and Perkins Quality Control personnel. 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) As an overall check against possible human errors, Brooks and Perkins also utilizes a new computerized system to check the chemical analysis, materials, and fabrication, and personnel inspection activities to verify the

acceptability of the Boral sheets, other tube materials and the identification of each tube. Only where these quality related aspects of a tube are found to be acceptable is each specific tube released by computer printout.

(4) Brooks and Perkins is required to forward data, inspection and weld reports to Nuclear Services Corporation for review and acceptance. Brooks and Perkins Quality Assurance performs surveillances of the Quality Control activities involved with the fabrication activities including the proper documenting and submittal of such reports to Nuclear Services Corporation for review and acceptance. Each tube is reviewed by Brooks and Perkins Quality Assurance to verify its acceptability. 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 by Nuclear Services Corporation that the Brooks and Perkins quality requirements have been complied with and that design and fabrication requirements have been met will the tubes be released for rack fabrication.

(5) The tubes are then shipped to Leckenby using specific packaging, banding, loading, tie-down and bracing methods to prevent damage to the fuel tubes during truck transit.

(6) 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 Dresden Station;

(7) Upon receipt of the racks at Dresden, 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 and 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 Dresden. At this point, the dimensions of the rack will be checked by inserting a dummy fuel assembly into each tube to again 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 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.

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.

Contention 3 asserts that Commonwealth Edison Company has not demonstrated that rack and tube packaging, transportation, and receipt inspections are adequate to prevent and detect transportation damage. This portion of my testimony will outline the methods taken by Brooks and Perkins and Leckenby to prevent transportation damage and by Leckenby and Commonwealth Edison to assure that any tubes or racks which have been damaged as a result of improper packaging and/or transportation will be detected.

As addressed in Terry Pickens' testimony, there was damage caused during transportation to some of the boxes containing tubes in the first two shipments which Brooks and Perkins sent to Leckenby in early August, 1979. The tubes

contained in the boxes evidencing damage were shipped back to Brooks and Perkins for inspection and acceptance. Three tubes required minor repair. Repairs were made and the tubes were reinspected, accepted and shipped back to Leckenby. In order to avoid any future incidents of this nature, the procedures for transporting the tubes and racks were modified.

The modified procedures are as follows. Brooks and Perkins uses specific packaging, banding, loading, tie-down and bracing methods to prevent damage to the fuel tubes during truck transit. The tubes for Dresden Station are packaged in heavy duty corrugated boxing and protected inside by cardboard separators. Each such box, which contains eight tubes, is banded individually and then all are banded together three high to a wooden skid. These package units are loaded so as to have two such units butt against a front restraint on the truck bed and the next row of two package units butt solidly to the skids of the first row of fuel tube packages. On the truck, each row of two skids are braced and held down by tie-downs to the truck to prevent shifting and weather protected with visquine and canvas covering during transit. As of mid-September, 1980, 1,579 Dresden tubes have been shipped involving 9 shipments pursuant to this modified procedure and no transportation damage has occurred.

Upon receipt by Leckenby, each shipment is fully inspected by Leckenby Quality Control personnel to detect any transportation damage. Prior to release for fabrica-

tion into fuel racks, each tube is visually inspected and dimensionally checked to assure the tubes are acceptable.

Likewise, Leckenby uses special packaging, loading, tie-down and bracing methods to prevent damage to the fuel racks during truck transit. Each rack is mounted for handling and shipment on a specially designed heavy steel frame padded with rubber on the rack supporting surfaces to distribute the loading and provide protection from the metal frame. The fuel rack is firmly butted against the steel shipping and handling frame, tied to the frame with threaded tie rods around and over the fuel storage racks to prevent forward shifting of the racks and weather protected with visquine and canvas covering during truck transit. On the truck, the frame holding the fuel rack is placed against the front restraint on the truck bed and is blocked and braced and chained down to the truck using chain binders to prevent forward or side movement during transit and to hold the steel frame with the fuel rack to the truck bed. Shipments are made using dedicated tractor-trailer units. Also, instructions are given to each driver relative to the precautions and requirements of the shipment before Leckenby releases the truck.

At Dresden, as described on pages 9 and 10 of this testimony, inspections of the fuel racks are performed by Commonwealth Edison Company Quality Control and Quality Assurance personnel upon receipt to detect any transportation damage.

Based upon my knowledge and personal experience,

and the fact that shipment has not resulted in any damage since the above noted modified procedure was implemented, I believe that the tubes and racks will be transported without any damage in the future and am confident that the series of procedures, inspections and tests described above will disclose any such damage and prevent the installation of spent fuel storage racks which do not conform to the design requirements and specifications.