

DEC 27 1982

Docket Nos. 50-329/330

APPLICANT: Consumers Power Company

FACILITY: Midland Plant, Units 1 and 2

SUBJECT: SUMMARY OF MEETING HELD WITH CONSUMERS POWER ON ENVIRONMENTAL EQUIPMENT QUALIFICATION - NOVEMBER 9, 1982

On November 9, 1982, the NRC staff met in Bethesda, Maryland with Consumers Power Company, Bechtel, and NUTECH to discuss the environmental equipment qualification program for the Midland Plant. This subject relates to section 3.11 of the Midland SER. A list of meeting attendees is included as Enclosure 1. Enclosure 2 is a compilation of the handouts and visual aids used in the course of the meeting.

SUMMARY

As discussed in the Midland SER (NUREG-0793), additional information had been requested from Consumers Power Company (CPCo) in order that the staff can complete its evaluation of the Midland environmental equipment qualification. Since issuance of the SER, the staff received a revised Equipment Qualification Report and held a meeting with Consumers Power on June 16, 1982. An on-site audit of the environmental equipment qualification program will be conducted by the staff as part of the safety evaluation of this area. The meeting on November 9, 1982 was held for the purpose of updating the staff on progress in this area, including preparations for the audit.

The applicant had made available to the staff at staff request, a number of completed environmental qualification "packages" prior to the meeting for pre-audit. The staff conducted an audit of the packages and stated at the meeting that they appeared to be complete and in proper format.

Consumers Power described various changes that have been made to the EQ Report and to the program. Examples of completed checklists were displayed and an explanation of the responsibilities of each group involved in the process was given. The staff emphasized the importance of continuity in the records such that it is possible to follow through the process by reviewing the associated records.

A discussion was held on what had been done to assure that the synergistic effects of radiation and heat would not result in unacceptable degradation of electrical cable insulation materials. The conclusion resulting from recent testing and analyses was presented (see Enclosure 2).

| | | | | | |
|--------------------|--|--|--|--|--|
| 8301050142 821227 | | | | | |
| PDR ADOCK 05000329 | | | | | |
| PDR | | | | | |
| DATE | | | | | |

At the conclusion of the meeting, Consumers Power stated that they were essentially ready for the audit and requested it be scheduled for the week of December 13, 1982, if possible. The staff stated a review of other audits during that time frame would be made to determine if that is possible.

151

Ronald W. Hernan, Licensing Project Manager
Licensing Branch #4
Division of Licensing

Enclosures:
As stated

| | | | | | | | |
|---------|--------------------|------------------|---------------|--|--|--|--|
| OFFICE | DL:LB#4 <i>RWH</i> | DL:LB#4 | DL:LB#4 | | | | |
| SURNAME | RWHernan:ms | <i>M. Dunson</i> | <i>E. ...</i> | | | | |
| DATE | 12/21/82 | 12/21/82 | <i>W. ...</i> | | | | |

MIDLAND

Mr. J. W. Cook
Vice President
Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

cc: Michael I. Miller, Esq.
Ronald G. Zamarin, Esq.
Alan S. Farnell, Esq.
Isham, Lincoln & Beale
Three First National Plaza,
51st floor
Chicago, Illinois 60602

James E. Brunner, Esq.
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Ms. Mary Sinclair
5711 Summerset Drive
Midland, Michigan 48640

Stewart H. Freeman
Assistant Attorney General
State of Michigan Environmental
Protection Division
720 Law Building
Lansing, Michigan 48913

Mr. Wendell Marshall
Route 10
Midland, Michigan 48640

Mr. Roger W. Huston
Suite 220
7910 Woodmont Avenue
Bethesda, Maryland 20814

Mr. R. B. Borsum
Nuclear Power Generation Division
Babcock & Wilcox
7910 Woodmont Avenue, Suite 220
Bethesda, Maryland 20814

Cherry & Flynn
Suite 3700
Three First National Plaza
Chicago, Illinois 60602

Mr. Don van Farrowe, Chief
Division of Radiological Health
Department of Public Health
P.O. Box 33035
Lansing, Michigan 48909

Mr. Steve Gadler
2120 Carter Avenue
St. Paul, Minnesota 55108

U.S. Nuclear Regulatory Commission
Resident Inspectors Office
Route 7
Midland, Michigan 48640

Ms. Barbara Stamiris
5795 N. River
Freeland, Michigan 48623

Mr. Paul A. Perry, Secretary
Consumers Power Company
212 W. Michigan Avenue
Jackson, Michigan 49201

Mr. Walt Apley
c/o Mr. Max Clausen
Battelle Pacific North West Labs (PNWL)
Battelle Blvd.
SIGMA IV Building
Richland, Washington 99352

Mr. I. Charak, Manager
NRC Assistance Project
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

James G. Keppler, Regional Administrator
U.S. Nuclear Regulatory Commission,
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. J. W. Cook

- 2 -

cc: Lee L. Bishop
Harmon & Weiss
1725 I Street, N.W., Suite 506
Washington, D. C. 20006

Mr. Ron Callen
Michigan Public Service Commission
6545 Mercantile Way
P.O. Box 30221
Lansing, Michigan 48909

Mr. Paul Rau
Midland Daily News
124 McDonald Street
Midland, Michigan 48640

Billie Pirner Garde
Director, Citizens Clinic
for Accountable Government
Government Accountability Project
Institute for Policy Studies
1901 Que Street, N.W.
Washington, D. C. 20009

LIST OF ATTENDEES

NRC

R. LaGrange
H. Walker
H. Garg
M. Harper
G. Reinmuth
R. Hernan

Consumers Power Company

D. Budzik
J. Zabritski
B. Cloutier
P. Jacobsen

Bechtel

D. Lewis

NUTECH

W. Rutherford
P. DiBenedetto

CONSUMERS POWER COMPANY
MIDLAND PLANT UNITS 1 AND 2
ENVIRONMENTAL QUALIFICATION OF EQUIPMENT
November 9, 1982
Bethesda, MD

A G E N D A

- I. Introduction and Meeting Purpose
- II. Revisions to EQ Report and Program
- III. Discussion of Sample Packages
- IV. Mechanical Equipment Program
- V. EQ Program Status
- VI. EQR Submittal and Audit
- VII. Technical Approach for Addressing Potential Synergistic Effects on Cables

II REVISIONS TO EQ REPORT AND PROGRAM

- A. COMPLETE NEW REVISION
- B. MILD ENVIRONMENT - QA ISSUE
- C. HELBA
 - IDENTIFIED AFFECTED AREAS
 - IDENTIFIED EQUIPMENT
 - ESTABLISHED QUAL PROGRAMS
 - ADDED P-T VS TIME CURVES
- D. TABLE 1-1 SYSTEMS WITH COMPONENT WHICH PERFORM SAFETY FUNCTIONS
 - IDENTIFIED SYSTEMS REQUIRED FOR EACH OF SIX SAFETY FUNCTIONS
- E. TABLE 1-2 SAFETY GRADE EQUIPMENT LIST
 - ADDED COLUMN FOR HELBA
 - ADDED EQUIPMENT FOR HELBA PROGRAMS AND REFINEMENTS
- F. RADIATION DOSE CALCULATION SUMMARY
 - ADDED SAMPLES OF IN-CONTAINMENT AND AUX. BUILDING AREAS
- G. CONFIGURATION CONTROL PER ADMINISTRATIVE PROCEDURE

DOCUMENTATION REVIEW PROCESS/HISTORY

- EQ REPORT (4/82) SUBMITTED APRIL 30, 1982
- INDEPENDENT AUDIT BY NUTECH OF ALL PROGRAMS IDENTIFIED SPECIFIC AND GENERIC PROBLEMS
- REVISION OF PROGRAMS WITH CONSUMERS INTERFACE AND SIGNIFICANT WYLE INPUT
- PRESENT PROGRAM REVIEW PROCESS
 - PROGRAM PREPARED USING DETAILED DOCUMENTS (CDES, EEQS, EQC)
 - INDEPENDENT REVIEW WITHIN ORGANIZATION
 - CONSUMERS REVIEW USING DETAILED CHECKLIST (3 PAGES)
 - MEETING TO DISCUSS COMMENTS
 - PROGRAM REVISED ACCORDING TO COMMENT RESOLUTION
 - BECHTEL/NUTECH REVIEW AND APPROVAL
 - CONSUMERS REVIEW FOR COMMENT INCORPORATION
 - CONSUMERS APPROVAL

CONSUMERS(MIDLAND) EEQ CHECKLIST

Name William Kelly

Date 7/27/82

5.3 TRE EVALUATION

5.3.1 EQ Report Section Number 2.2.1.3

P.O. Number M-12300

| | Acceptable | References | EQ Report Impact | Comment |
|---|------------|------------|------------------|---------|
| 5.3.2 QUALIFICATION PARAMETERS (VII) | | | | |
| 5.3.2.1 Temperature (VII.A) | ✓ | ✓ | | |
| 5.3.2.2 Pressure (VII.B) | ✓ | ✓ | | |
| 5.3.2.3 Humidity (VII.C) | ✓ | ✓ | | |
| 5.3.2.4 Radiation (VII.D) | ✓ | ✓ | | |
| 5.3.2.5 Spray (VII.E) | ✓ | ✓ | | |
| 5.3.2.6 Submergence (VII.F) | ✓ | ✓ | YES | |
| 5.3.2.7 Accuracy (VII.G) | ✓ | ✓ | YES | |
| 5.3.2.8 Response Time (VII.H) | ✓ | ✓ | | |
| 5.3.2.9 Operability Period (VII.I) | ✓ | ✓ | YES | |
| 5.3.2.10 Long-Term Failure Mechanisms (VII.J) | ✓ | ✓ | | |
| 5.3.2.11 Model Tested, Configuration, Interface (VII.K) | ✓ | 7 | NO | |
| 5.3.3 AGING (VIII) | | | | |
| 5.3.3.1 Test (VIII.A) | | | | |
| 5.3.3.1.1 Temperature VII.A.1) | ✓ | 8 | NO | |
| 5.3.3.1.2 Operating Cycles (VIII.A.3) | ✓ | ✓ | | |
| 5.3.3.1.3 Nonseismic Vibration (VIII.A.4) | ✓ | ✓ | | |
| 5.3.3.2 Analysis (VIII.B) | ✓ | ✓ | | |
| 5.3.3.3 Other (VIII.C) | ✓ | ✓ | | |
| 5.3.4 QUALIFIED LIFE (IX) | ✓ | ✓ | | |
| 5.3.5 NUREG 0588 CONFORMANCE (X) | ✓ | ✓ | | |
| 5.3.6 APPLICABLE STANDARDS (XI) | ✓ | ✓ | | |

CONSUMERS (MIDLAND) EEQ CHECKLIST

Name William Killy

Date 7/27/82

5.3.7 TRE/CATEGORY I EQC EVALUATION

5.3.7.1 EQ Report Section Number 2.2.3

P.O. Number M-123CC

| | Acceptable | References | EQ Report Impact | Comments |
|---|------------|------------|------------------|----------|
| 5.3.7.1 TYPE TEST | | | | |
| 5.3.7.1.1 Conforms to IEEE 323-74(6.3) | ✓ | ✓ | | |
| 5.3.7.1.2 Failure or Acceptance Criteria Established | ✓ | ✓ | | |
| 5.3.7.1.3 Rep. Sample Subjected to All Tests in Series | ✓ | ✓ | | |
| 5.3.7.1.4 Operability Status Monitored During Testing | ✓ | ✓ | | |
| 5.3.7.1.5 Performance Verif. Before, During, & After Test | ✓ | ✓ | | |
| 5.3.7.1.6 Power Supply Extremes Applied | ✓ | ✓ | | |
| 5.3.7.1.7 Temp. Measured by Thermocouples Near Equip. | ✓ | ✓ | | |
| 5.3.7.1.8 Spray Incorp. at Appropriate Pressure and Temp. | ✓ | ✓ | | |
| 5.3.7.2 OPERATING EXPERIENCE | | | | |
| 5.3.7.2.1 Conforms to IEEE 323-74(6.4) | ✓ | ✓ | | |
| 5.3.7.2.2 Partial Type Test on Vital Comp. Provided | ✓ | ✓ | | |
| 5.3.7.3 ANALYSIS | | | | |
| 5.3.7.3.1 Conforms to IEEE 323-74(6.5) | ✓ | ✓ | | |
| 5.3.7.3.2 Partial Type Test on Vital Comp. Provided | ✓ | ✓ | | |
| 5.3.7.4 MARGIN | | | | |
| 5.3.7.5 Temperature | ✓ | ✓ | | |
| 5.3.7.6 Pressure | ✓ | ✓ | | |
| 5.3.7.7 Radiation | ✓ | ✓ | | |
| 5.3.7.8 Time | ✓ | ✓ | | |
| 5.3.7.9 AGING | | | | |
| 5.3.7.9.1 Considered Synergistic Effects | ✓ | ✓ | | |
| 5.3.7.9.2 Method Other Than Arrhen. Supported by Test | ✓ | ✓ | | |
| 5.3.7.9.3 Considered Material Phase Changes/Reactions | ✓ | ✓ | | |
| 5.3.7.9.4 Accel. Aging Rate/Activation Energy Justified | ✓ | ✓ | | |
| 5.3.7.9.5 Basis for Qualified Life was Defined | ✓ | ✓ | | |
| 5.3.7.10 DOCUMENTATION | | | | |
| 5.3.7.10.1 Type Test Data Conform to IEEE 323-74(8.3) | ✓ | ✓ | | |
| 5.3.7.10.2 Oper. Exp. Data Conform to IEEE 323-74(8.4) | ✓ | ✓ | | |
| 5.3.7.11 Analysis Data Conform to IEEE 323-74(8.5) | ✓ | ✓ | | |
| 5.3.7.12 Data are Pertinent and Auditable | ✓ | ✓ | | |

Comment No.
Check Sect.

Comment

Plan to Correct

Resol.
Comp.

①
GENERAL

THERE IS NO COLLECTIVE ACTION PLAN IN THE FILE.

Draft in Package

wkk
1/23/78

②
CDE

RADIATION IS MISPELLED IN THE NOTE SECTION.

Mark-up CDES

wkk
1/26/78

③
CDES

THE KEOS GIVES THE TID TO BE 1.6E08 HOWEVER THE EQR SHOWS 1.52E08 FURTHER BOTH UNITS SHOULD HAVE SAME VALUE NOTE: (SEE TABLE 16 OF EQR)

4012-3.5E04 2.2 E07 + 1.3 E08 = 1.52 E08
4661-3.5E0 2.2 E07 + 1.3 E08 = 1.52

Revised CDES w/2.0 \$ EEQS

wkk
1/27/78

④

THE POTENTIAL FOR ELECTRICAL FAILURE SHOULD BE ADDRESSED FOR SUBMERGENCE. IF POTENTIAL DOES NOT EXIST THAT SHOULD BE STATED.

ADDRESSED IN THE EQR
Section 1.4.3.2.5

wkk
1/27/78

⑤
TE/EQR
14

THE CHEMICAL STAIN REQUIREMENTS ARE MISPLACED IN THE REPORT AND NOT PROPERLY LABELED (2.2.1.3.4)

Complete

wkk
1/27/78

QUALIFICATION RESTRICTION SHEET

Preliminary QUALIFIED
 Final

Page 1 of

Attach to

Equip Descrip ROTOR - VALVE

Part No. 1M0 (MMO) - 105B, 1M0 (MMO) - 1059,

ACTUATORS

1M0 (MMO) - 115B, 1M0 (MMO) - 1159

Qual Number M-123CC

RESTRICTIONS RESULTING FROM ENVIRONMENTAL QUALIFICATION

A. REPLACE THE TERMINAL ECOXY
AND NITRILE RUBBER O-RING SEALS
EVERY TWO (2) YEARS.

D. REPLACE ADD-ON - PAISS SWITCHES
EVERY SIXTEEN (16) YEARS.

B. REPLACE THE SWITCH COMPONENTS,
THE TERIL WIRE, AND VITON SEALS
EVERY FOUR (4) YEARS.

B. RESTRICTIONS A. THROUGH D. SHALL BE
INTEGRATED INTO THE SURVEILLANCE AND
MAINTENANCE PROGRAM DEVELOPED FOR THE
VALVE OPERATORS.

C. REPLACE THE MECHANICAL SWITCHES
EVERY SIX (6) YEARS.

F.

Prepared by Willie Kelly Date 10/4/62

This drawing and the design it covers are the property of BECT. They are merely loaned and on the borrower's express agreement it y will not be reproduced, copied, loaned, exhibited, or used except in the limited and private use permitted by the lender. the borrower.

CENTRAL FILE
 QUALIFICATION PROGRAM
 M123CC
 VALVE OPERATOR (ROTORK)
 INSIDE CONTAINMENT

| | | | | | | |
|--------|------|----------------|-------------------|--------------|-----------|------------|
| | | | | | | |
| | | | | | | |
| | | Issued for Use | | <i>KR/WH</i> | <i>WO</i> | <i>TH/</i> |
| No. | DATE | REVISIONS | QE | BY | EN K | APPR |
| ORIGIN | | | JOB No. 7220 | | | |
| | | | SPEC/DES GUIDE No | | REV | |
| | | | M123CC | | 0 | |

100-100-100-100

MIDLAND ENVIRONMENTAL QUALIFICATION OF
ELECTRICAL EQUIPMENT LOCATED IN HARSH ENVIRONMENT
CONSUMERS POWER COMPANY FINAL REVIEW AND APPROVAL

QUALIFICATION PROGRAM M-123CC

EQUIPMENT DESCRIPTION VALVE OPERATOR - ROTORK

Qualification Checklist Complete

Corrective Action Plan Reviewed

Site Restriction Form Completed

APPROVAL RESTRICTIONS: None

Reviewed by: Peter W. [Signature] Date 10-25-82
CPCo - Design Production - Midland Project

Reviewed by: C.T. Springer NCR NOT REQUIRED Date 10/26/82
CPCo - Midland Project - Quality Assurance Department

Approved by: [Signature] Date 10/29/82
CPCo - Design Production - Midland Project

MECHANICAL EQUIPMENT QUALIFICATION PROGRAM

- o IDENTIFICATION OF MECHANICAL EQUIPMENT REQUIRING QUALIFICATION

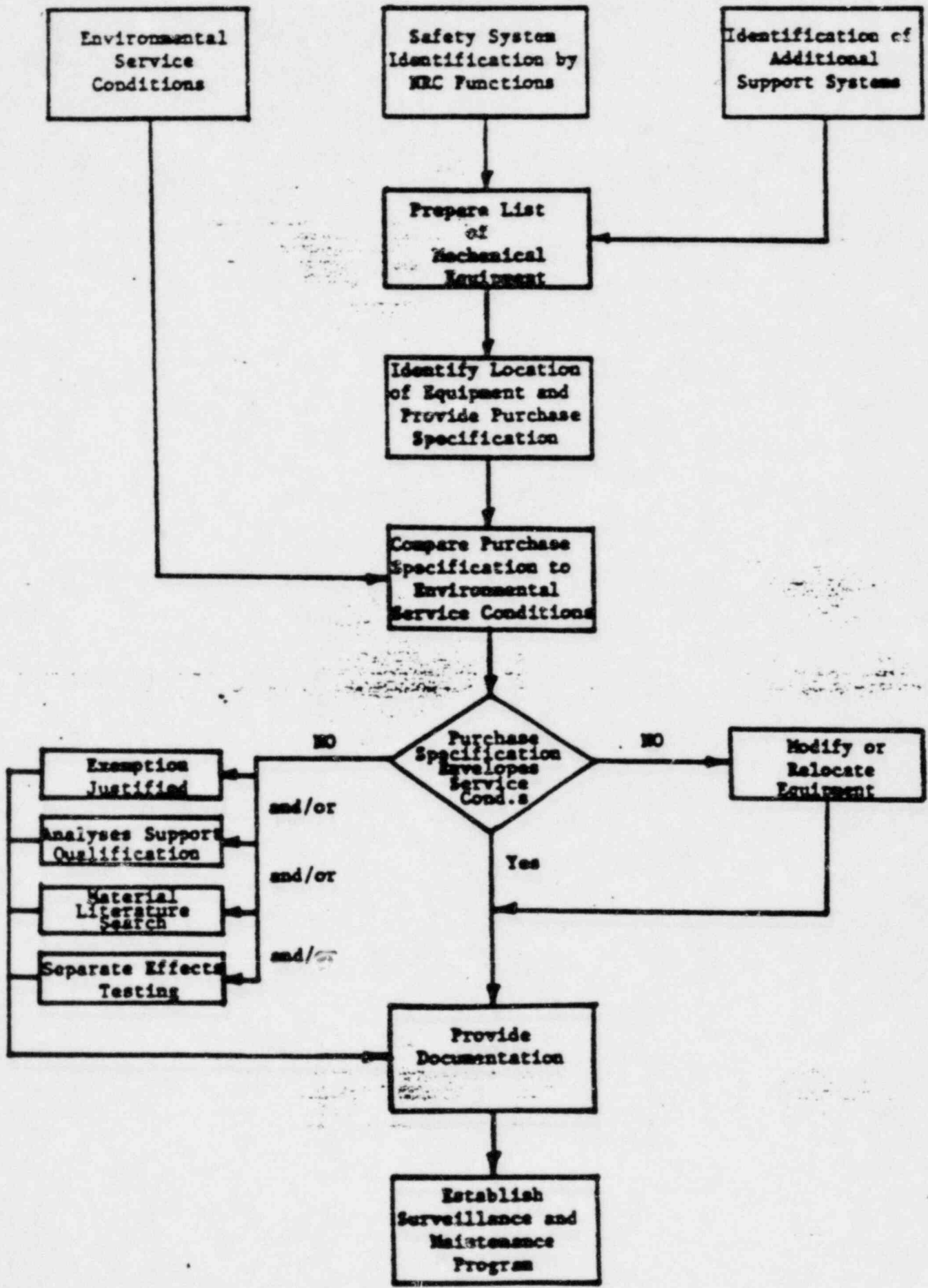
- o ENVIRONMENTAL SERVICE CONDITIONS

- o REVIEW OF EQUIPMENT

- o DOCUMENTATION

- o CORRECTIVE ACTIONS

- o JUSTIFICATION FOR INTERIM OPERATION



CONSUMERS POWER COMPANY
MIDLAND UNITS I & II

STATUS OF ENVIRONMENTAL QUALIFICATION OF ELECTRICAL
EQUIPMENT LOCATED IN HARSH ENVIRONMENT AS OF 11/8/82

TOTAL NUMBER OF PROGRAMS 64

COMPLETED PROGRAMS* 54(84%)

| | |
|--------------------------|----|
| QUALIFIED | 30 |
| INTEST OR TO BE RETESTED | 14 |
| TO BE REPLACED | 9 |
| MOVE, SHIELD OR MODIFY | 1 |

PROGRAMS UNDER ANALYSIS 10

| | <u>PROGRAM DESCRIPTION</u> | | <u>DATE FOR ACTION PLAN DETERMINATION</u> |
|------|----------------------------|-------------|---|
| (1) | E60A INSTR. CABLE | ROCKBESTOS | 11/12/82 |
| (2) | F002A TERMINAL BLOCKS | STATES | 11/12/82 |
| (3) | G33A CONAX CONNECTORS | CONAX | 11/12/82 |
| (4) | J233A RTDs | WEED | 12/6/82 |
| (5) | T256A SOLENOID VALVES | TARGET ROCK | 1/31/83 |
| (6) | L-AC OUT AC VALVE OPER | LIMITORQUE | 1/31/83 |
| (7) | L-DC OUT DC VALVE OPER | LIMITORQUE | 1/31/83 |
| (8) | M-146A CHILLERS | CARRIER | 1/17/83 |
| (9) | M-149A FAN MOTORS | RELIANCE | 3/83 |
| (10) | E-56A INSTR. CABLE | ROCKBESTOS | 11/19/82 |

* ALL TECHNICAL ISSUES HAVE BEEN RESOLVES. CLERICAL TASKS
MAY REMAIN ON SAME PROGRAMS WHICH WILL BE COMPLETED BY
11/24/82

5-1-82

Consumers Power Company Midland Units I and II
Status of Environmental Qualification of Equipment as of 11/8/82

| Qualification Program | Equipment Description | Manufacturer | | | | | | |
|-----------------------|-----------------------------------|--------------|-----------|---------|---------|--------|----------------|-------|
| | | | Qualified | In Test | Replace | Modify | Under Analysis | |
| E20A | Electrical Penetrations | Amphenol | C* | | | | | |
| E22A | Low Voltage Power Cable | Essex | C* | | | | | |
| E22B | LV Power Cable Rework | Essex | C* | | | | | |
| E26A | 600 V Control Cable | Rockbestos | C* | | | | | |
| E26B | 600 V Control Cable Rework | Rockbestos | C* | | | | | |
| E26C | 600 V control Cable Rework | Rockbestos | C* | | | | | |
| E34A | Local Control Station | Gould | | | C | | | |
| E45A | Distribution Panel | Square D | | C | | | | |
| E56A | Coax, Triax, Twinax Cable | Rockbestos | | | | | | 11/19 |
| E60A | Instrumentation Cable | Rockbestos | | | | | | 11/12 |
| E60B | Instrumentation Cable Rework | Rockbestos | C* | | | | | |
| E60C | Instrumentation Cable Rework | Rockbestos | C* | | | | | |
| E120A | Conax Penetration Modifications | Conax | C* | | | | | |
| ERAY A | Splices - NMCK | Raychem | C* | | | | | |
| ERAY B | Splices - WCSF | Raychem | C* | | | | | |
| F001A | Switchboard Wire | Anaconda | C* | | | | | |
| F002A | Terminal Blocks | States | | | | | | 11/12 |
| F002B | Terminal Blocks | GE | C | | | | | |
| G33A | Conax Connectors | Conax | | | | | | 11/12 |
| J233A | RTDs | Weed | | | | | | 12/6 |
| J244A | Radiation Monitors | Victoreen | | C* | | | | |
| J244B | Radiation Monitors - Cable Asm. | Victoreen | | | C* | | | |
| J245A | Pressure Transmitters (1153D) | Rosemount | | C | | | | |
| J245B | Pressure Transmitters (1152) | Rosemount | C* | | | | | |
| J245C | Pressure Transmitters (1153B) | Rosemount | C* | | | | | |
| J249A | Acoustic Flow Monitor | TEC | C* | | | | | |
| J255A | Electro-Hyd Valve Oper. | ITT | C* | | | | | |
| J256A | Solenoid Valve | Target Rock | | | | | | 1/31 |
| J278A | Level Switches | Vitro | | C | | | | |
| J297A | RB Level Monitor | GEMS-Delaval | | C | | | | |
| L-AC In | AC Valve Oper. in Containment | Limitorque | | | C* | | | |
| L-AC Out | AC Valve Oper. not in Containment | Limitorque | | | | | | 1/31 |
| L-DC In | DC Valve Oper. in Containment | Limitorque | | | C* | | | |
| L-DC Out | DC Valve Oper. not in Containment | Limitorque | | | | | | 1/31 |

Consumers Power Company Midland Units I and II
Status of Environmental Qualification of Equipment as of 11/8/82

| Qualification Program | Equipment Description | Manufacturer | | | | | | |
|-----------------------|------------------------------------|-------------------|-----------|---------|---------|--------|----------------|------|
| | | | Qualified | In Test | Replace | Modify | Under Analysis | |
| M18A | SW Booster Pump Motors | Siemens-Allis | C* | | | | | |
| M54A | RB Spray Pump Motors | Allis Chalmers | C | | | | | |
| M56A | Chilled Water Pump Motors | Westinghouse | | | C* | | | |
| M118B(A) | Solenoid Valve | Keane | | C | | | | |
| M118B(B) | Limit Switch | NAMCO | | | C | | | |
| M123A(B) | Limit Switch | NAMCO | | | C | | | |
| M123C(C) | Valve Operator and Limit Switch | Rotork | C | | | | | |
| M123C(D) | Limit Switch | NAMCO | | | C | | | |
| M125C(C) | Solenoid Valve | Asco | C | | | | | |
| M125C(D) | Limit Switch | Honeywell | | | C | | | |
| M146A | Safeguard Chillers | Carrier | | | | | | 1/17 |
| M149A | Air Handling Fan Motors | Reliance | | | | | | 3/31 |
| M163A | RB Air Coolers | Joy Manufacturing | | | | C | | |
| M169A | Hydrogen Recombiners | Westinghouse | G* | | | | | |
| M349A | Thermostats | Johnson Controls | | | C | | | |
| M374A | Hydrazine Pump Motor | Reliance | C | | | | | |
| M1.10A | Pressurizer Heaters | Weigand | | C* | | | | |
| M1.10B | P&R Heater Connector Assembly | Gulton | | C* | | | | |
| M1.11A | PORV | Target Rock | | C* | | | | |
| M1.16 | Makeup Pump Motor | GE | C* | | | | | |
| M1.17 | Decay Heat Removal Pump Motor | GE | C* | | | | | |
| MM1.31A | PWR Range Neutron Detector | Westinghouse | C* | | | | | |
| M1.31B | Connector for Neutron Detector | Amphenol | C* | | | | | |
| M1.35A | Diff Pressure Transmitter | Bailey | C* | | | | | |
| M1.35B | Pressure Transmitter | Bailey | C* | | | | | |
| M1.35C | RTD and Connector Head | Rosemount | C* | | | | | |
| M1.35D | Incore Thermocouple | Belfab | | C* | | | | |
| M1.35E | Connectors for Incore Thermocouple | Cannon | | C* | | | | |
| JC100A | Fission Neutron Detector (Gamma) | Gamma-Metrics | | C* | | | | |
| JC1001B | Fission Neutron Detector Conn. | Amphenol | | C* | | | | |

VI EQR SUBMITTAL AND AUDIT

- A. BY 11/19/82 - EQR TEXT, TABLES AND FIGURES
- 17/64 PROGRAMS

- B. BY 11/29/82 - 37 ADDITIONAL PROGRAMS
- 54 TOTAL - 84%

MIDLAND NUCLEAR PLANTS 1 & 2

CONTENTION #7

THE CONTENTION DEALS WITH THE EFFECTS OF LOW DOSES OF RADIATION ON POLYMER CABLE INSULATION AND JACKETING AND THE SYNERGISTIC EFFECTS OF RADIATION AND TEMPERATURE IN DEGRADING THOSE MATERIALS.

QUESTION:

FOR WHAT PERCENTAGE OF THE ESTIMATED LIFETIME OF THESE PLANTS CAN THE CABLE INSULATION BE EXPECTED TO RETAIN ITS INTEGRITY BEFORE ITS DEGRADATION BY SYNERGISTIC EFFECTS MAKES IT UNSAFE?

ANSWER:

100%

TEST DATA FOR MIDLAND CABLES

CABLE INSULATION

QUALIFICATION TESTS

NRC/SNL TESTS

1. CROSS-LINKED POLYOLEFIN

CPC QUAL. PACKAGE
E-26A, 26B, 26C
E-56A, E-60A, E-60B
AND E-60C.

NUREG/CR
2157
NUREG/CR
2932

2. ETHYLENE PROPYLENE

CPC QUAL. PACKAGE
E-22A AND 22B

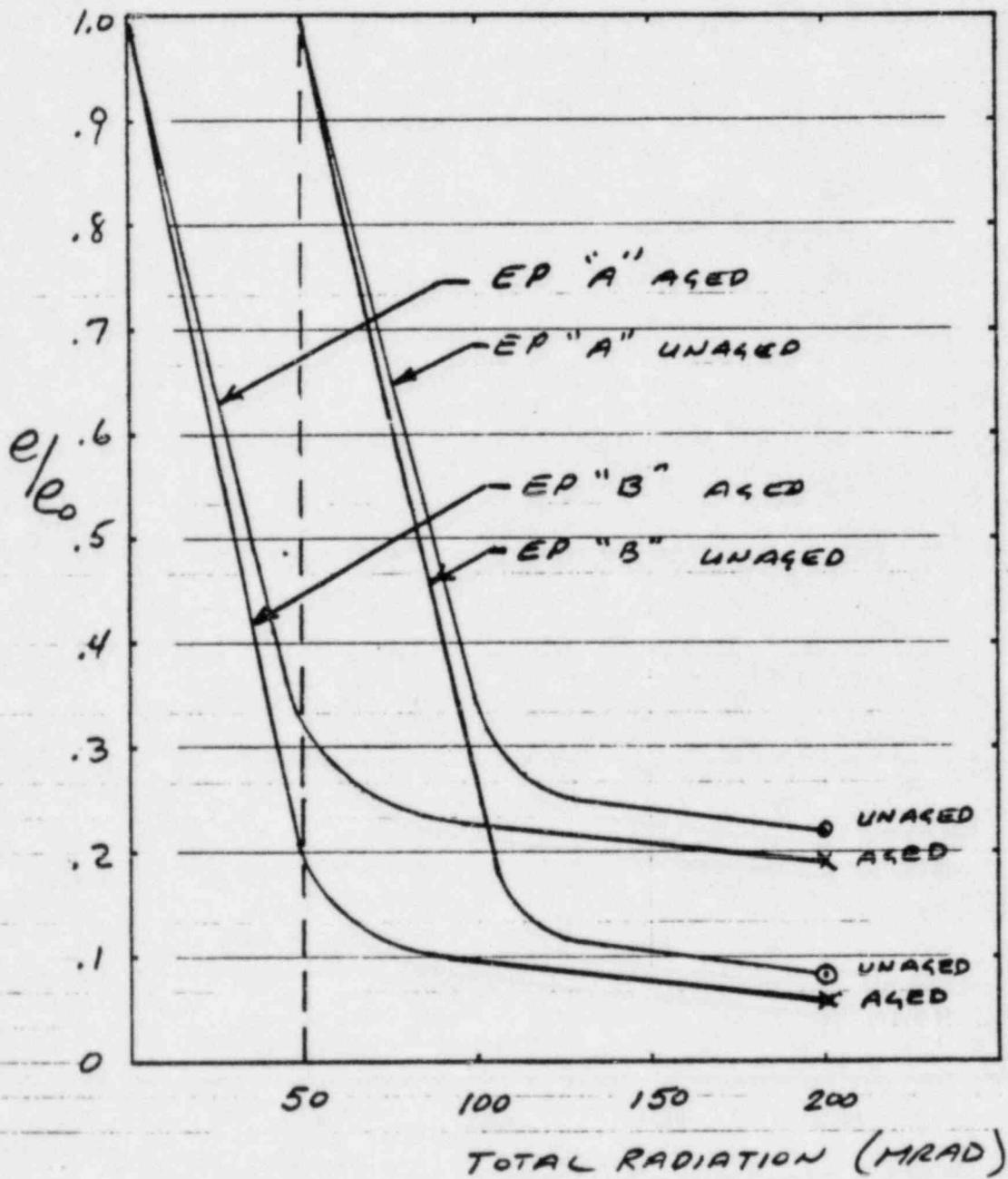
NUREG/CR
2157
NUREG/CR
2553
JAPANESE PAPER
OCT. 1982

JAPANESE DATA
UNAGED VS. AGED
INSULATION SPECIMENS
AFTER LOCA TEST*

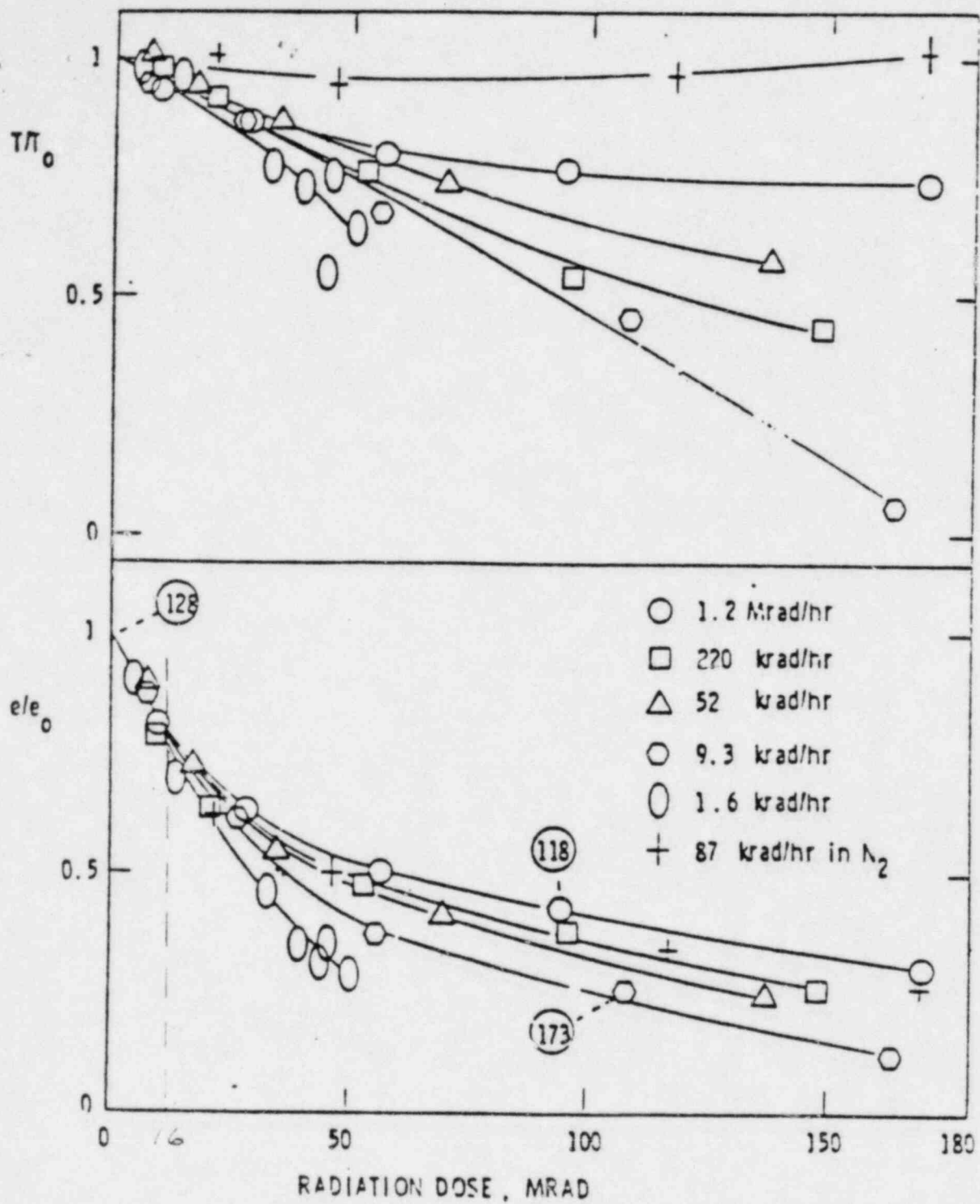
| | <u>E/E_o</u> | <u>DIFFERENCE IN RETAINED ELONGATION*</u> |
|----------------|------------------------|---|
| EPR "A" AGED | 0.19 | 4% |
| EPR "A" UNAGED | 0.23 | |
| EPR "B" AGED | 0.06 | |
| EPR "B" UNAGED | 0.08 | 2% |

* LOCA TEST: TYPICAL PWR PROFILE, 150 MRAD RADIATION

* AGING: 121°C FOR 7 DAYS FOLLOWED BY 50 MRAD RADIATION



AGED VS UNAGED
EP



EP

FIGURE 1

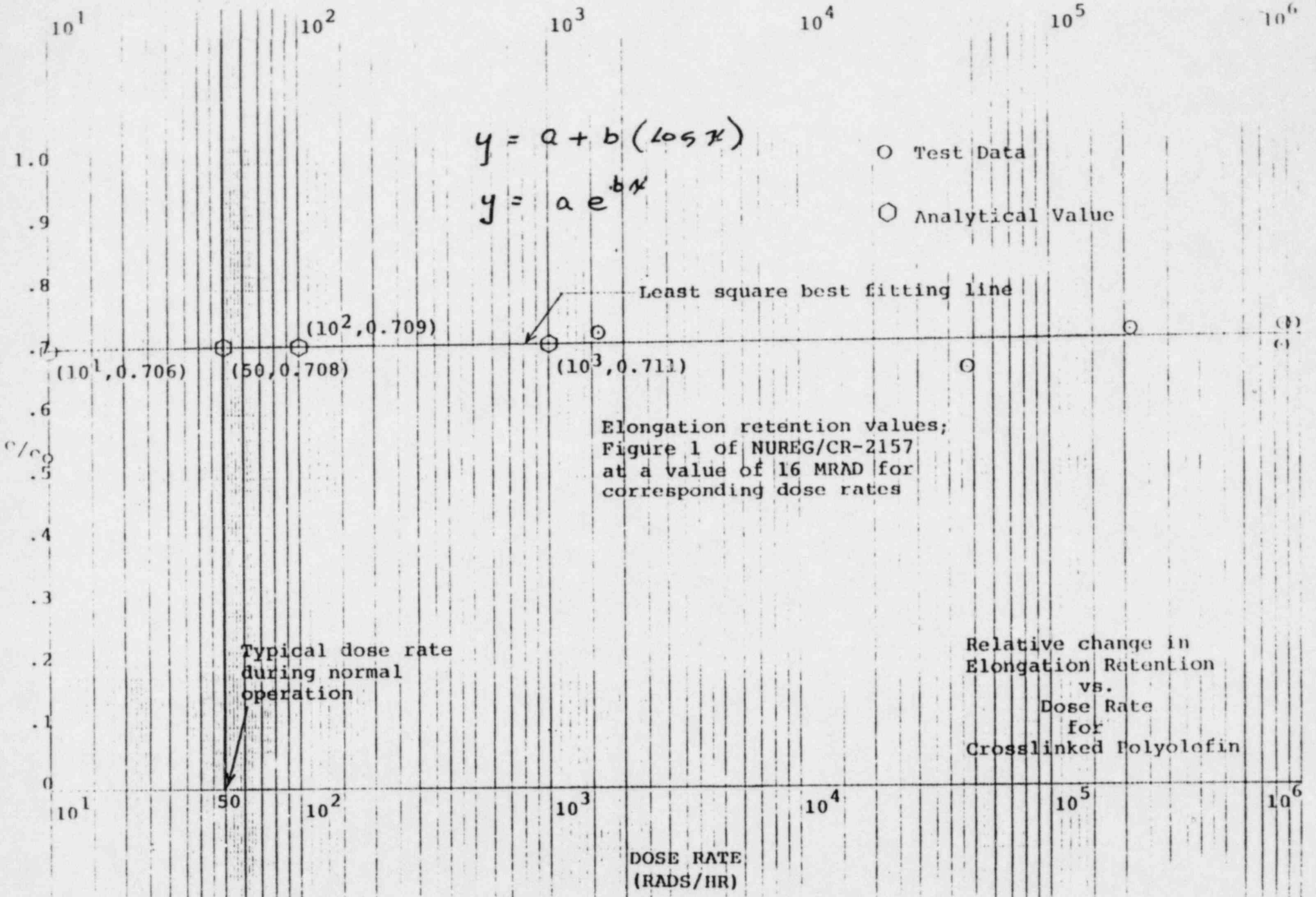


FIGURE 2

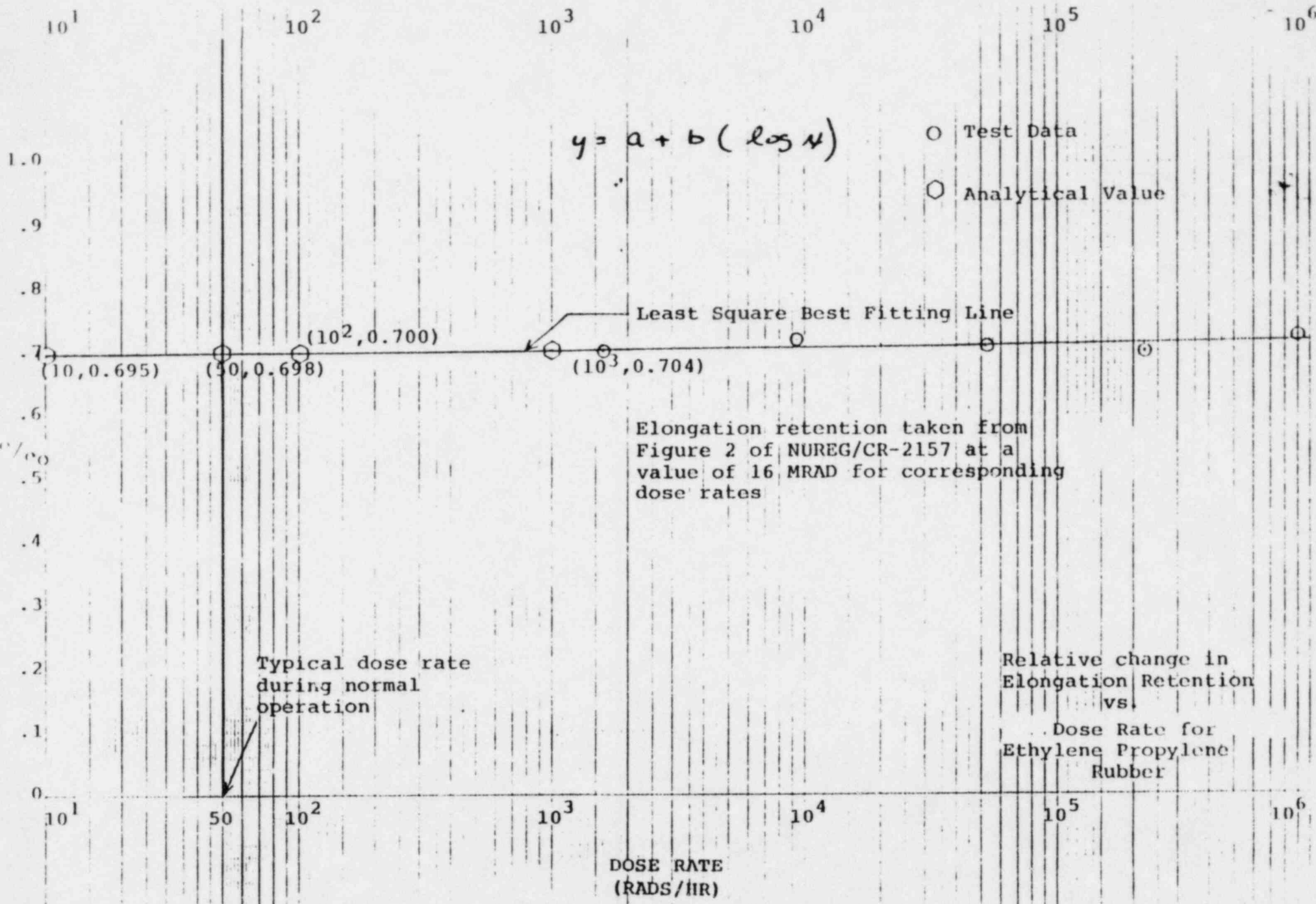


FIGURE 3

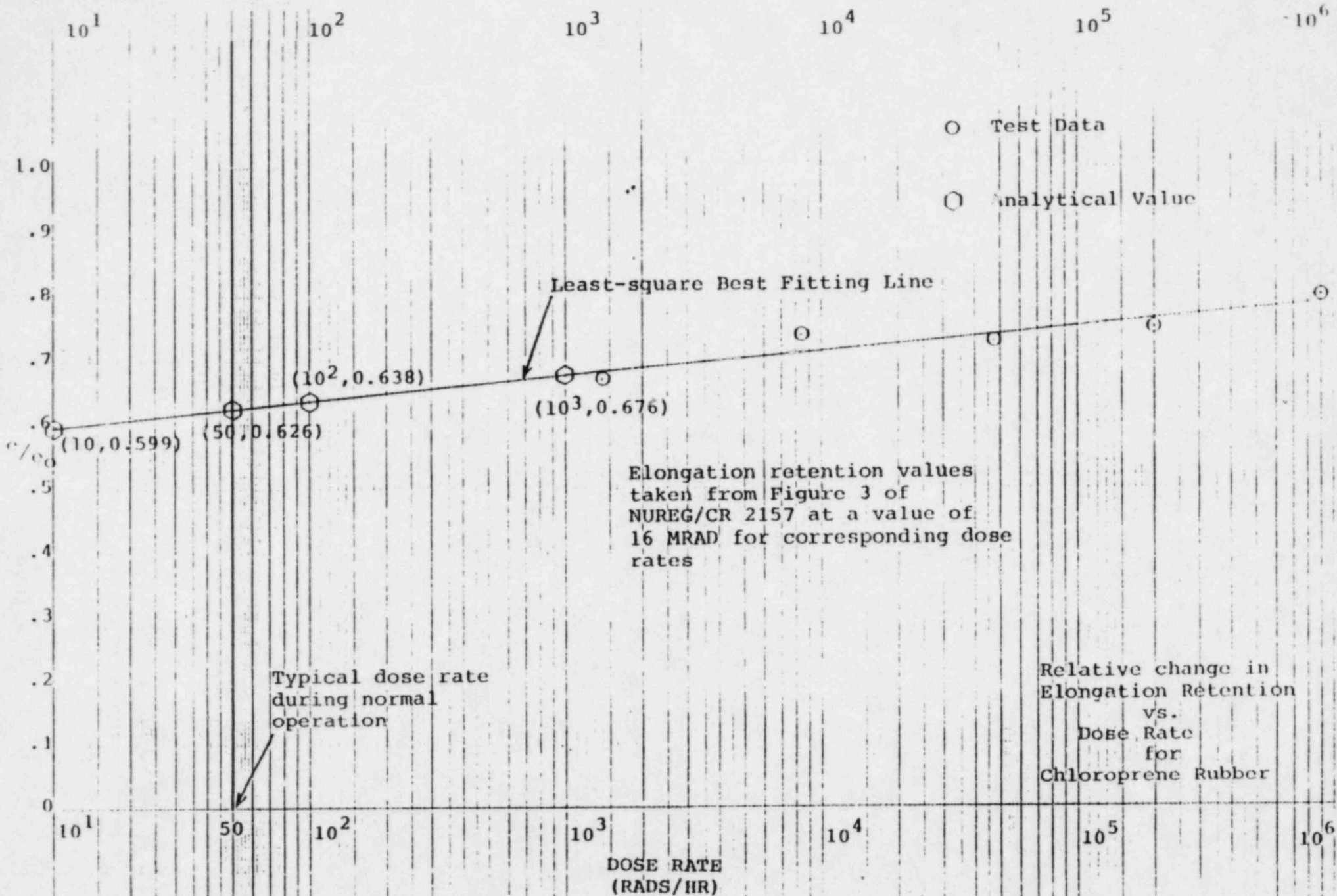
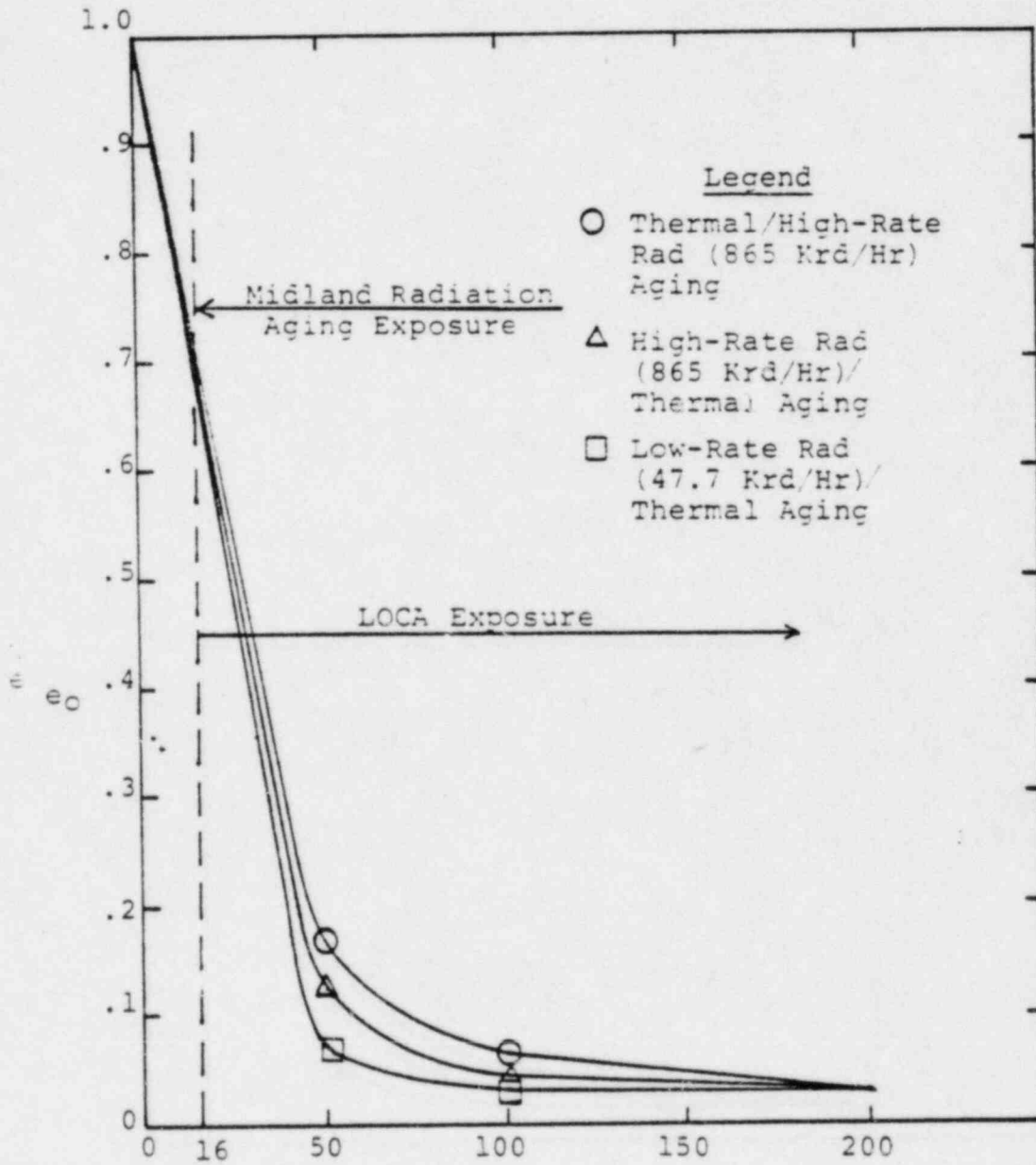


FIGURE 4



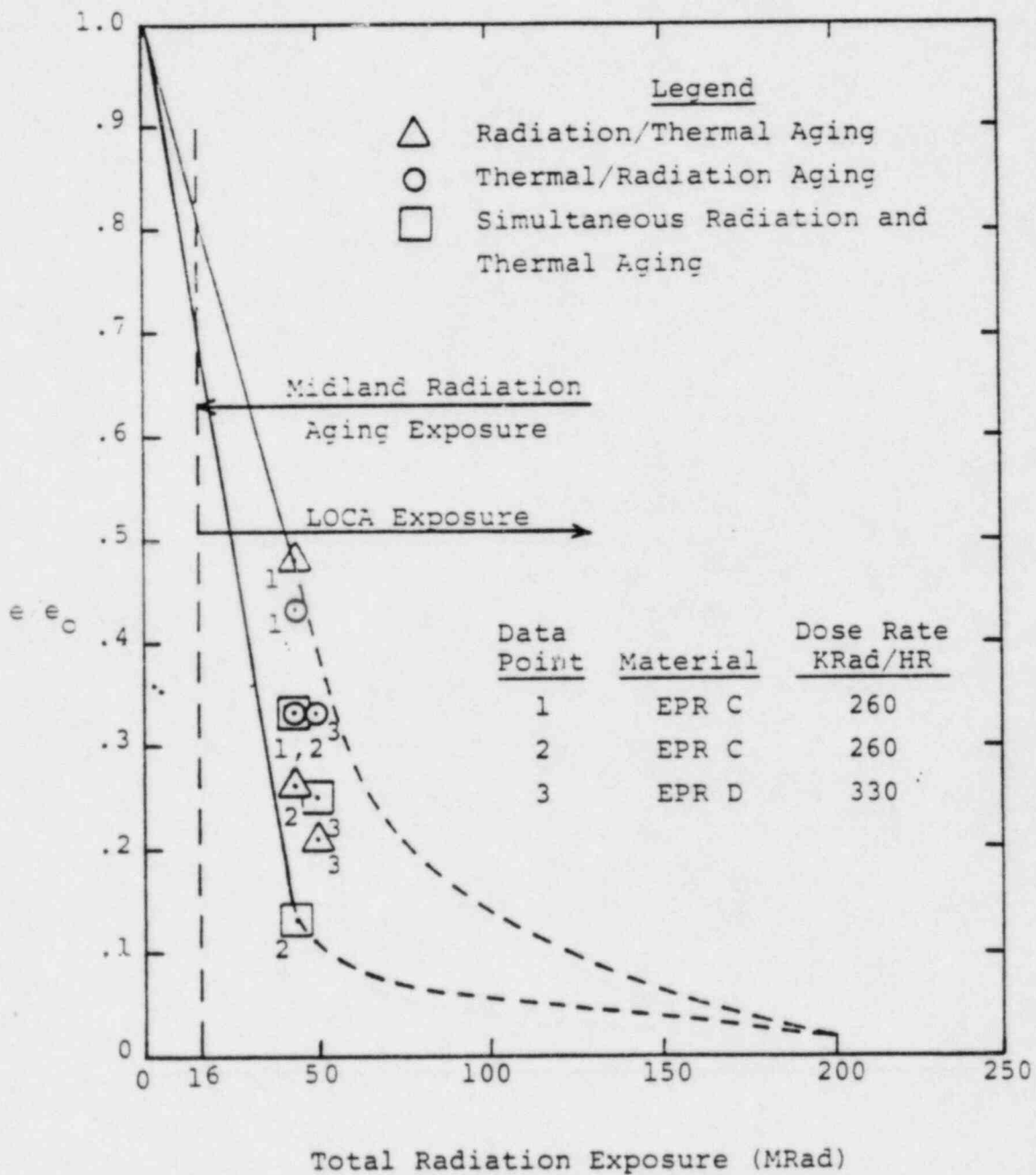
Total Radiation Exposure (MRAD)

Elongation Retention vs Radiation Exposure

for

Crosslinked Polyolefin.

FIGURE 5



Elongation Retention vs Radiation Exposure
for
Ethylene Propylene

CONCLUSIONS

- o BASED ON NRC/SNL TEST DATA MIDLAND CABLE INSULATION CAN BE EXPECTED TO HAVE ELONGATION RETENTION VALUES(E/EO) OF APPROXIMATELY 0.7 AT THE END OF PLANT LIFE.
- o DOSE-RATE AND TEST SEQUENCE EFFECTS BECOME OBSCURE AT THE END OF TESTING
- o SEVERELY DEGRADED INSULATION MATERIAL CONTINUES TO PROVIDE SUFFICIENT INSULATION PROPERTIES TO ALLOW THE CABLE TO PERFORM ITS INTENDED FUNCTION

MEETING SUMMARY DISTRIBUTION

Docket No(s): 50-329/330

NRC/PDR

Local PDR

NSIC

PRC System

LB #4 r/f

Attorney, OELD

E. Adensam

Project Manager R. Hernan

Licensing Assistant M. Duncan

D. Hood

NRC Participants:

R. LaGrange

H. Walker

H. Garg

M. Harper

G. Reinmuth

R. Hernan

bcc: Applicant & Service List