UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 28, 1995

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: REQUEST FOR WITHHOLDING INFORMATION FROM PUBLIC DISCLOSURE

Dear Mr. Farrar:

By letter from Commonwealth Edison Company (ComEd) dated May 24, 1995, and General Electric Company's (GE) affidavit executed by David Robare, dated May 19, 1995, you submitted proprietary documents entitled, "Back-Up Calculation for RPV Stress Report No. 25A5691, Dresden Units 2 & 3," GENE-771-77-1194, Revision 2; "Backup Calculations for Dresden Shroud Repair, Shroud Stress Report, Volume II, Dresden Units 2 & 3," GENE-771-82-1194, Revision 1; "Shroud and Shroud Repair Hardware Analysis, Shroud Repair Hardware Backup Calculations, Dresden Units 2 & 3," GENE-771-83-1194, Revision 1; "Shroud Repair Seismic Analysis, Dresden Units 2 & 3," GENE-771-84-1194, Revision 2; "Shroud Repair Seismic Analysis Backup Calculations, Dresden Units 2 & 3," GENE-771-85-1194, Revision 2; "Top Ring Plate and Star Truss Stress Analysis Backup Calculations, Dresden Units 2 & 3," GENE-771-96-0195, Revision 1; "Dresden Units 2 & 3, Primary Structure Seismic Models," GENE-523-A181-1294, Revision 1, December 1994, and requested that they be withheld from public disclosure pursuant to 10 CFR 2.790.

GE stated that the information should be considered exempt from mandatory public disclosure for the following reasons:

"(4)a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

(4)b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

(8) ...it contains detailed results of analytical models, methods and processes, including computer codes, and it contains the supporting Design Record File (DRF) detailed calculations, results and bases for conclusions. These reports are part of the DRF supporting information to evaluate a hardware design modification (stabilizer for the shroud horizontal welds) intended to be installed in a reactor to resolve the reactor pressure vessel core shroud weld cracking concern. This detailed level of information usually resides in GENE files, only for audit by customers and the NRC. This information shows in specific detail the processes, codes and methods employed to perform the evaluations summarized in the above identified document...."

We have reviewed your submittal and the material in accordance with the requirements of 10 CFR 2.790 and, on the basis of GE's statements, have determined that the submitted information sought to be withheld contains trade secrets or proprietary commercial information.

Therefore, we have determined that the documents entitled "Back-Up Calculation for RPV Stress Report No. 25A5691, Dresden Units 2 & 3," GENE-771-77-1194, Revision 2; "Backup Calculations for Dresden Shroud Repair, Shroud Stress Report, Volume II, Dresden Units 2 & 3," GENE-771-82-1194, Revision 1; "Shroud and Shroud Repair Hardware Analysis, Shroud Repair Hardware Backup Calculations, Dresden Units 2 & 3," GENE-771-83-1194, Revision 1; "Shroud Repair Seismic Analysis, Dresden Units 2 & 3," GENE-771-84-1194, Revision 2; "Shroud Repair Seismic Analysis Backup Calculations, Dresden Units 2 & 3," GENE-771-85-1194, Revision 2; "Top Ring Plate and Star Truss Stress Analysis Backup Calculations, Dresden Units 2 & 3," GENE-771-96-0195, Revision 1; "Dresden Units 2 & 3, Primary Structure Seismic Models," GENE-523-A181-1294, Revision 1, December 1994, marked as proprietary will be withheld from public disclosure pursuant to 10 CFR 2.790(b)(5) and Section 103(b) of the Atomic Energy Act of 1954, as amended.

Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned to inspect the document. If the need arises, we may send copies of this information to our consultants working in this area. We will, of course, insure that the consultants have signed the appropriate agreements for handling proprietary information.

If the basis for withholding this information from public inspection should change in the future such that the information could then be made available for public inspection, you should promptly notify the NRC. You should also understand that the NRC may have cause to review this determination in the

future, for example, if the scope of a Freedom of Information Act request includes your information. In all review situations, if the NRC needs additional information from you or makes a determination adverse to the above, you will be notified in advance of any public disclosure.

Sincerely,

John F. Stang, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237, 50-249

cc: see next page

cc:

Michael I. Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60603

Mr. Thomas P. Joyce
Site Vice President
Dresden Nuclear Power Station
6500 North Dresden Road
Morris, Illinois 60450-9765

Mr. J. Heffley
Station Manager
Dresden Nuclear Power Station
6500 North Dresden Road
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U.S. Nuclear Regulatory Commission
Resident Inspectors Office
Dresden Station
6500 North Dresden Road
Morris, Illinois 60450-9766

Regional Administrator
U.S. NRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Illinois Department of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Chairman
Grundy County Board
Administration Building
1320 Union Street
Morris, Illinois 60450

David J. Robare
General Electric Company
175 Curtner Avenue
San Jose, California 95125

future, for example, if the scope of a Freedom of Information Act request includes your information. In all review situations, if the NRC needs additional information from you or makes a determination adverse to the above, you will be notified in advance of any public disclosure.

Sincerely,

Original signed by:

John F. Stang, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237, 50-249

cc: see next page

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DATE	07/ /95		07/ /95		07/ /95		07/ /95			

OFFICIAL RECORD COPY

General Electric Company

AFFIDAVIT

I, David J. Robare, being duly sworn, depose and state as follows:

(1) I am Project Manager, Plant Licensing/Renewal Projects, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the following GE proprietary reports:

GENE-771-77-1194, Rev. 2, Back-Up Calculation for RPV Stress Report No. 25A5691, Dresden Units 2 &3.
GENE-771-82-1194, Rev. 1, Backup Calculations for Dresden Shroud Repair, Shroud Stress Report, Vol. II, Dresden Units 2 & 3.
GENE-771-83-1194, Rev. 1, Shroud and Shroud Repair Hardware Analysis, Shroud Repair Hardware Backup Calculations, Dresden Units 2 & 3.
GENE-771-84-1194, Rev. 2, Shroud Repair Seismic Analysis, Dresden Units 2 & 3.
GENE-771-85-1194, Rev. 2, Shroud Repair Seismic Analysis Backup Calculations, Dresden Units 2 & 3.
GENE-771-96-0195, Rev. 1, Top Ring Plate and Star Truss Stress Analysis Backup Calculations, Dresden Units 2 & 3.
GENE-523;A181-1294, Rev. 1, Dresden Units 2 & 3, Primary Structure Seismic Models, Dec. 1994.

The proprietary information is delineated by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory

Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results of analytical models, methods and processes, including computer codes, and it contains the supporting Design Record File (DRF) detailed calculations, results and bases for conclusions. These reports are part of the DRF supporting information to evaluate a hardware design modification (stabilizer for the shroud horizontal welds) intended to be installed in a reactor to resolve the reactor pressure vessel core shroud weld cracking concern. This detailed level of information usually resides in GENE files, only for audit by customers and the NRC. This information shows in specific detail the processes, codes and methods employed to perform the evaluations summarized in the above identified document. The development and approval of this design modification utilized systems, components, and models and computer codes that were developed at a significant cost to GE, on the order of several hundred thousand dollars.

Development of the supporting processes, as shown in part in this DRF detailed information, was at a significant additional cost to GE, in excess of a million dollars, over and above the large cost of developing the underlying individual proprietary report information.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

David J. Robare, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 19TH day of MAY 1995 ~~1993~~

David J. Robare
General Electric Company

Subscribed and sworn before me this 19th day of May 1995.

MARY L. KENDALL
COMM. # 987864
Notary Public — California
SANTA CLARA COUNTY
My Comm. Expires MAR 26, 1997

Notary Public, State of California

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Licensing Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE proprietary drawings 107E5719, Rev. 5, *Reactor Modification/Installation Drawing*, and those drawings listed in the attachment. These documents, taken as a whole, constitutes a proprietary compilation of information, some of it also independently proprietary, prepared by General Electric Company. The independently proprietary elements that are drawings are marked as proprietary information.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

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To John Stang | From Sumpkin

Co | Co

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a., (4)b. and (4)e., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it constitutes a confidential compilation of information, including detailed design drawing results of a hardware design modification (stabilizer for the shroud horizontal welds) intended to be installed in a reactor to resolve the reactor pressure vessel core shroud weld cracking concern. The development and approval of this

design modification utilized systems, components, and models and computer codes that were developed at a significant cost to GE, on the order of several hundred thousand dollars.

The detailed results of the analytical models, methods, and processes, including computer codes, and conclusions from these applications, represent, as a whole, an integrated process or approach which GE has developed, and applied to this design modification. The development of the supporting processes was at a significant additional cost to GE, in excess of a million dollars, over and above the large cost of developing the underlying individual proprietary report and drawings information.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 23rd day of May 1995.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 23rd day of May 1995.

Notary Public, State of California

PAULA F. HUSSEY
COMM. #1046120
Notary Public — California
SANTA CLARA COUNTY
My Comm. Expires DEC 1,1998

ATTACHMENT

Drawing

112D5636, Revision 1, Bracket Yoke Assembly
112D6637, Revision 0, Lock, Bolt
112D6638, Revision 0, Lower Stabilizer Assembly
112D6639, Revision 0, Toggle Bolt Assembly
112D6640, Revision 0, Tie Rod Assembly
112D6641, Revision 1, Stabilizer Support Assembly
112D6642, Revision 1, Upper Stabilizer Assembly
112D6644, Revision 0, Screw, Mid Support
112D6645, Revision 0, Ring, Mid Support
112D6646, Revision 0, Washer, Jack Bolt
112D6647, Revision 0, Sleeve, Jack Bolt
112D6648, Revision 0, Retainer
112D6649, Revision 0, Nut, Top Support
112D6650, Revision 0, Bolt, Top Support
112D6651, Revision 1, Pin
112D5652, Revision 1, Nut, Tie Rod
112D5653, Revision 0, Pin, Clevis
112D6655, Revision 1, Extension, Lower Spring
112D6656, Revision 0, Screw, Yoke
112D6657, Revision 0, Bracket, Upper Spring
112D6658, Revision 0, Clip, Retainer
112D6659, Revision 0, Bolt, Jack
112D6660, Revision 0, Nut, Toggle Bolt
112D6661, Revision 0, Washer, Toggle Bolt
112D6662, Revision 0, Pin, Toggle Bolt
112D6663, Revision 0, Toggle
112D6664, Revision 0, Support, Lower
112D6665, Revision 0, Bolt, Toggle
112D6666, Revision 0, Contact, Upper
112D6667, Revision 0, Contact, Lower
112D6668, Revision 2, Support
112D6669, Revision 1, Upper Support Long
112D5670, Revision 2, Spring, Upper
112D5671, Revision 2, Spring, Lower
112D6672, Revision 1, Rod, Tie
112D6673, Revision 0, Tie Rod Spring Assembly
112D6674, Revision 0, Spring, Retainer
112D6675, Revision 0, Bracket Yoke
112D6676, Revision 2, Upper Support, Short
112D6677, Revision 0, Nut, Lock
112D6678, Revision 0, Bolt, Tension Arm

Drawing

112D6679, Revision 0, Arm, Torsion 2 drwgs - 3
112D6680, Revision 1, Mid Support Assembly
112D6681, Revision 2, Support, Mid Shroud
112D6734, Revision 1, Core Plate Wedge Assembly
112D6735, Revision 1, Wedge, Core Plate
112D6736, Revision 1, Clip, Core Plate
112D6737, Revision 1, Bolt, Wedge

112D6679: does not indicate 102

112D6643
107E5719 1
107E5719 2
107E5719 3

Commonwealth Edison Company
1400 Opus Place
Downers Grove, IL 60515

ComEd

June 7, 1995

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Document Control Desk

Subject: Dresden Nuclear Station Units 2 and 3
Additional Information - Dresden Station Core Shroud Repair
NRC Docket Nos. 50-237 and 50-249

Reference: J.L. Schrage letter to USNRC, dated May 24, 1995.

In the referenced letter, ComEd submitted the Design Documents for the proposed repair of the Dresden Station Unit 2 and 3 core shrouds. Enclosure 9 of the referenced letter provided GENE-771-84-1194, Revision 2, "Dresden Units 2 & 3, Shroud Repair Seismic Analysis." The attachment to this letter transmits the computer runs associated with the information provided in Enclosure 9 of the referenced letter.

This submittal contains items which are proprietary in nature to the General Electric Nuclear Company. ComEd has specifically marked the portions of the submittal (with vertical bars in the right margin) that are considered proprietary and requests that all material specifically marked as proprietary be withheld from public disclosure. ComEd has included, as Attachment 2, an affidavit per the requirements of 10CFR 2.790(b) explaining the reasons and circumstances for withholding the applicable information from public disclosure.

To the best of my knowledge and belief, the statements contained in this response are true and correct. In some respects, these statements are not based on my personal knowledge, but obtained information furnished by other ComEd employees, contractor employees, and consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

[redacted]

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A018 1/1 Change: NRC POR 1 0 4r Encl
Add: PD3-2 PD 1 1 4r Encl
PD3-2 LA 1 1

9506130218

Please direct any questions you may have concerning this response to this office.

OFFICIAL SEAL
MARY JO YACK
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11/28/97

John L. Schrage
Nuclear Licensing Administrator

Mary Jo Yack 6-7-95

Attachment 1 Computer Runs for Shroud Repair Seismic Analysis, dated June 1, 1995

Attachment 2 Dresden Station Unit 2 and 3 Core Shroud Repair Design Documents - General Electric Company Affidavit

cc: J. B. Martin, Regional Administrator - RIII
M. N. Leach, Senior Resident Inspector - Dresden
J. F. Stang, Project Manager - NRR
Office of Nuclear Facility Safety - IDNS

Attachment 2

General Electric Nuclear Company Affidavit
June 1, 1995

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Licensing Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE letter, M. D. Potter to John Schrage, *Transmittal of Computer Runs For Shroud Repair Seismic Analysis*, dated June 1, 1995 with proprietary attachment Computer runs 2788T, 2794T, 2790T and 2466T, (General Electric Company Proprietary Information), dated April 1995. The proprietary information is delineated by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

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The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

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(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results of analytical models, methods and processes, including computer codes, and it contains the supporting Design Record File (DRF) detailed calculations, results and bases for conclusions. These reports are part of the DRF supporting information to evaluate a hardware design modification (stabilizer

for the shroud horizontal welds) intended to be installed in a reactor to resolve the reactor pressure vessel core shroud weld cracking concern. This detailed level of information usually resides in GENE files, only for audit by customers and the NRC. This information shows in specific detail the processes, codes and methods employed to perform the evaluations summarized in the above identified document. The development and approval of this design modification utilized systems, components, and models and computer codes that were developed at a significant cost to GE, on the order of several hundred thousand dollars.

The development of the supporting processes, as shown in part in this DRF detailed information, was at a significant additional cost to GE, in excess of a million dollars, over and above the large cost of developing the underlying individual proprietary report information.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 1st day of June 1995.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 1st day of June 1995.

Notary Public, State of California

JULIE A. CURTS
COMM. # 974657
Notary Public — California
SANTA CLARA COUNTY
My Comm. Expires SEP 30, 1996

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 2, 1995

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: REQUEST FOR WITHHOLDING INFORMATION FROM PUBLIC DISCLOSURE

Dear Mr. Farrar:

By letter from Commonwealth Edison Company (ComEd) dated June 7, 1995, and General Electric Company's (GE) affidavit executed by George B. Stramback dated June 1, 1995, you submitted a proprietary document entitled, "Transmittal of Computer Runs for Shroud Repair Seismic Analysis," dated June 1, 1995, with attached computer runs 2788T, 2794T, 2790T and 2466T, dated April 1995, and requested that it be withheld from public disclosure pursuant to 10 CFR 2.790.

GE stated that the information should be considered exempt from mandatory public disclosure for the following reasons:

"(4)a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

(4)b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

(8) The information identified ... above, is classified as proprietary because it contains detailed results of analytical models, methods and processes, including computer codes, and it contains the supporting Design Record File (DRF) detailed calculations, results and bases for conclusions. These reports are part of the DRF supporting information to evaluate a hardware design modification (stabilizer for the shroud horizontal welds) intended to be installed in a reactor to resolve the reactor pressure vessel core shroud weld cracking concern. This detailed level of information

usually resides in GENE files, only for audit by customers and the NRC. This information shows in specific detail the processes, codes and methods employed to perform the evaluations summarized in the above identified document. * * *"

We have reviewed your submittal and the material in accordance with the requirements of 10 CFR 2.790 and, on the basis of GE's statements, have determined that the submitted information sought to be withheld contains trade secrets or proprietary commercial informai on.

Therefore, we have determined that the document entitled "Transmittal of Computer Runs for Shroud Repair Seismic Analysis," dated June 1, 1995, with attached computer runs 2788T, 2794T, 2790T and 2466T, dated April 1995, marked as proprietary will be withheld from public disclosure pursuant to 10 CFR 2.790(b)(5) and Section 103(b) of the Atomic Energy Act of 1954, as amended.

Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned to inspect the document. If the need arises, we may send copies of this information to our consultants working in this area. We will, of course, insure that the consultants have signed the appropriate agreements for handling proprietary information.

If the basis for withholding this information from public inspection should change in the future such that the information could then be made available for public inspection, you should promptly notify the NRC. You should also understand that the NRC may have cause to review this determination in the future, for example, if the scope of a Freedom of Information Act request includes your information. In all review situations, if the NRC needs additional information from you or makes a determination adverse to the above, you will be notified in advance of any public disclosure.

Sincerely,

John F. Stang, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237, 50-249

cc: see next page

cc:

Michael I. Miller, Esquire
Sidley and Austin
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Chicago, Illinois 60603

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Site Vice President
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Morris, Illinois 60450-9765

Mr. J. Heffley
Station Manager
Dresden Nuclear Power Station
6500 North Dresden Road
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U.S. Nuclear Regulatory Commission
Resident Inspectors Office
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Regional Administrator
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Lisle, Illinois 60532-4351

Illinois Department of Nuclear Safety
Office of Nuclear Facility Safety
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Springfield, Illinois 62704

Chairman
Grundy County Board
Administration Building
1320 Union Street
Morris, Illinois 60450

David J. Robare
General Electric Company
175 Curtner Avenue
San Jose, California 95125

usually resides in GENE files, only for audit by customers and the NRC. This information shows in specific detail the processes, codes and methods employed to perform the evaluations summarized in the above identified document. * * *"

We have reviewed your submittal and the material in accordance with the requirements of 10 CFR 2.790 and, on the basis of GE's statements, have determined that the submitted information sought to be withheld contains trade secrets or proprietary commercial information.

Therefore, we have determined that the document entitled "Transmittal of Computer Runs for Shroud Repair Seismic Analysis," dated June 1, 1995, with attached computer runs 2788T, 2794T, 2790T and 2466T, dated April 1995, marked as proprietary will be withheld from public disclosure pursuant to 10 CFR 2.790(b)(5) and Section 103(b) of the Atomic Energy Act of 1954, as amended.

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If the basis for withholding this information from public inspection should change in the future such that the information could then be made available for public inspection, you should promptly notify the NRC. You should also understand that the NRC may have cause to review this determination in the future, for example, if the scope of a Freedom of Information Act request includes your information. In all review situations, if the NRC needs additional information from you or makes a determination adverse to the above, you will be notified in advance of any public disclosure.

Sincerely,

Original signed by:

John F. Stang, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237, 50-249

cc: see next page

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DOCUMENT NAME: 0607.PRC *see previous concurrence

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DATE	08/ /95		08/ /95		07/28/95		08/02/95			

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 15, 1994

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III, Suite 500
1400 OPUS Place
Downers Grove, IL 60515

SUBJECT: REQUEST FOR WITHHOLDING INFORMATION FROM PUBLIC DISCLOSURE

Dear Mr. Farrar:

By letter from Commonwealth Edison Company (ComEd) dated September 2, 1994, as supplemented October 28, 1994, and General Electric Company's (GE) affidavit dated September 1, 1994, as corrected October 25, 1994, you submitted GE-NE-L12-00819-05, "Core Shroud Blowdown Load Calculation During Recirculation Suction Line Break by TRACG Analysis for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, dated August 1994, and requested that it be withheld from public disclosure pursuant to 10 CFR 2.790. A non-proprietary version of pages associated with GE-NE-L12-00819-05 were also included in the submittal.

GE stated that the information should be considered exempt from mandatory public disclosure for the following reasons:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

In addition to proprietary treatment given to material meeting the standards enumerated above, GE customarily maintains in confidence preliminary and draft material which has not been subject to complete proprietary, technical and editorial review. This practice is based on the fact that draft documents often do not appropriately reflect all aspects of a problem, may contain tentative conclusions and may contain errors that can be corrected during normal review and approval procedures. Also, until the final document is complete it may not be possible to make any definitive determination as to its proprietary nature. General Electic is not generally willing to release such

9411180002

a document in such a preliminary form. Such documents are, however, on occasion furnished to the NRC staff on a confidential basis because it is GE's belief that it is in the public interest for the staff to be promptly furnished with significant or potentially significant information. Furnishing the document on a confidential basis pending completion of GE's internal review permits early acquaintance of the staff with the information while protecting GE's potential proprietary position and permitting GE to insure the public documents are technically accurate and correct.

We have reviewed your submittal and the material in accordance with the requirements of 10 CFR 2.790 and, on the basis of GE's statements, have determined that the submitted information sought to be withheld contains trade secrets or proprietary commercial information.

Therefore, we have determined that the document GE-NE-L12-00819-05, "Core Shroud Blowdown Load Calculation During Recirculation Suction Line Break by TRACG Analysis for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, dated August 1994, marked as proprietary will be withheld from public disclosure pursuant to 10 CFR 2.790(b)(5) and Section 103(b) of the Atomic Energy Act of 1954, as amended.

Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned to inspect the document. If the need arises, we may send copies of this information to our consultants working in this area. We will, of course, insure that the consultants have signed the appropriate agreements for handling proprietary information.

If the basis for withholding this information from public inspection should change in the future such that the information could then be made available for public inspection, you should promptly notify the NRC. You should also understand that the NRC may have cause to review this determination in the future, for example, if the scope of a Freedom of Information Act request includes your information. In all review situations, if the NRC needs additional information from you or makes a determination adverse to the above, you will be notified in advance of any public disclosure.

Sincerely,

original signed by

John F. Stang, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237, 50-249,
50-254, 50-265

cc: see next page

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D. L. Farrar
Commonwealth Edison Company

Dresden Nuclear Power Station
Quad Cities Nuclear Power Station

cc:

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Sidley and Austin
One First National Plaza
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Rock Island, Illinois 61201

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San Jose, California 95125

Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

September 2, 1994

Mr. William T. Russell, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Dresden Nuclear Power Station Units 2 and 3
Quad Cities Nuclear Power Station Units 1 and 2
Response to NRC Request for Information: TRAC-G 3D Model Results; Recirculation Pipe Break
NRC Docket Nos. 50-237/249 and 50-254/265

References: (1) Teleconference between ComEd and the NRC on July 11, 1994

(2) P.L. Piet to W.T. Russell letter dated July 12, 1994

(3) Teleconference between ComEd (P. Piet) and the NRC (J.Stang) on August 18, 1994

Dear Mr. Russell:

In the Reference (1) teleconference, the NRC Staff requested the revised schedule for delivery of the TRAC-G 3D model results for the Dresden Station and Quad Cities Station core shroud. In the Reference (2) letter, Commonwealth Edison (ComEd) indicated that the requested information would be provided by August 19, 1994.

In the subsequent Reference (3) teleconference, ComEd provided an updated schedule for submittal of the TRAC-G 3D model results. During that teleconference, ComEd indicated that the information would be provided by September 2, 1994. This letter transmits the TRAC-G 3D model results for the Dresden Station and Quad Cities Station core shroud in Enclosure 1.

The information in Enclosure 1 which is marked with side bar lines (pages i, ii, 3, 4, 6, 8, and 10) is considered to be Proprietary Information to General Electric, and is supported by an affidavit signed by General Electric, the owners of the information. Enclosure 2 contains the affidavit that sets forth the basis on which the information may be withheld from public disclosure by the NRC and addresses the considerations listed in paragraph (b)(4) of 10 CFR 2.790 of the NRC regulations. Accordingly, ComEd requests that the information contained in Enclosure 1 be withheld from public disclosure in accordance with 10 CFR 2.790. Enclosure 3 provides the applicable pages from Enclosure 1 (pages i, ii, 3, 4, 6, 8, and 10), with all proprietary information removed.

The asymmetric blowdown load calculations performed as part of this analysis are the first step of the BWR-VIP Assessment Subcommittee project to review and further define the loads induced on the core shroud due to a recirculation line break. The BWR-VIP is currently working on a subsequent project to extend the results of this TRACG modeling for Dresden and Quad Cities Stations to the rest of the BWR's. The asymmetric blowdown loads calculated in this analysis are larger than those used by ComEd for the flaw evaluations, but will not effect the conclusions stated regarding the required remaining ligament. ComEd is actively participating in the BWR-VIP efforts to develop an industry approach to the core shroud cracking and will incorporate the results of this, and any subsequent BWR-VIP projects, into our December 1994 update to the NRC. We are currently working with the BWR-VIP to prepare the "BWR Core Shroud Inspection and Flaw Evaluation Guidelines". This document will define a comprehensive approach for the evaluation of core shroud flaws and is currently in a final review cycle prior to submittal to the NRC.

To the best of my knowledge and belief, the statements contained in this response are true and correct. In some respects, these statements are not based on my personal knowledge, but obtained information furnished by other Commonwealth Edison employees, contractor employees, and consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Please direct any questions you may have concerning this response to this office.

Sincerely,

John L. Schrage
Nuclear Licensing Administrator

Enclosures

(1) GE-NE-L12-00819-05, Core Shroud Blowdown Load Calculation During Recirculation Suction Line Break by TRACG Analysis for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, August 1994 (with pages i, ii, 3, 4, 6, 8, and 10 marked "Proprietary").

(2) General Electric Company Affidavit

(3) Non-Proprietary version of pages associated with GE-NE-L12-00819-05 (pages i, ii, 3, 4, 6, 8, and 10)

cc: J. B. Martin, Regional Administrator - RIII
C. Miller, Senior Resident Inspector - Quad Cities
M. Leach, Senior Resident Inspector - Dresden
R. Pulsifer, Project Manager - Quad Cities
J. Stang, Project Manager - Dresden
Office of Nuclear Facility Safety - IDNS

ENCLOSURE 2

General Electric Company Affidavit

General Electric Company

AFFIDAVIT

I, **George B. Stramback,** being duly sworn, depose and state as follows:

(1) I am Project Manager, Licensing Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE proprietary report GENE-L12-00819-05, *Core Shroud Blowdown Load Calculation During Recirculation Suction Line Break by TRACG Analysis for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2,* Class 3 (GE Company Proprietary Information), dated September 1994. This document, taken as a whole, constitutes a proprietary compilation of information, some of it also independently proprietary, prepared by the General Electric Company. The independently proprietary elements are delineated by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

Both the compilation as a whole and the marked independently proprietary elements incorporated in that compilation are considered proprietary for the reason described in items (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. That information is of a sort customarily held in confidence by GE, and has, to the best of my knowledge, consistently been held in confidence by GE, has not been publicly disclosed, and is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified by bars in the margin is classified as proprietary because it contains detailed results and conclusions from these evaluations, utilizing analytical models and methods, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of transient and accident events in the GE Boiling Water Reactor ("BWR"). The development and approval of these system, component, and thermal hydraulic models and computer codes was achieved at a significant cost to GE, on the order of several million dollars.

The development of the evaluation process along with the interpretation and application of the analytical and inspection results is derived from the extensive experience database that constitutes a major GE asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods, including justifications for not including certain analyses in applications to change the licensing basis.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to avoid fruitless avenues, or to normalize or verify their own process, or to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions

While some of the underlying analyses, and some of the gross structure of the process, may at various times have been publicly revealed, enough of both the analyses and the detailed structural framework of the process have been held in confidence that this information, in this compiled form, continues to have great competitive value to GE. This value would be lost if the information as a whole, in the context and level of detail provided in the subject GE document, were to be disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources, including that required to determine the areas that are <u>not</u> affected by a power uprate and are therefore blind alleys, would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing its analytical process.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 1st day of September 1994.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 1st day of September 1994.

Notary Public, State of California

JULIE A. CURTIS
COMM. # 974657
Notary Public — California
SANTA CLARA COUNTY
My Comm. Expires SEP 30, 1996

ENCLOSURE 3

Non-Proprietary version of pages associated with GE-NE-L12-00819-05
(pages i, ii, 3, 4, 6, 8, and 10)

Enclosure 1

GENE Design Specification, 25A5688, Revision 2

Dresden 2 and 3 - Shroud Stabilizer Hardware

K-1

GE Nuclear Energy

25A5688	SH NO. 1
REV. 2	

EIS IDENT: SHROUD STABILIZER HDW

REVISION STATUS SHEET

DOC TITLE SHROUD STABILIZER HARDWARE

LEGEND OR DESCRIPTION OF GROUPS

TYPE: DESIGN SPECIFICATION

FMF: Dresden 2 AND 3

MPL NO: PRODUCT SUMMARY SEC. 7

THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM ☒ NO ☐ EQUIP CLASS P

REVISION			C
0	RM-01993 MAR 06, 1995		
1	JL TROVATO 3/29/95	RJA	
	CN02416 CHK BY: JL TROVATO ER MOHTASHEMI		
2	JL TROVATO MAY 11 1995	RJA	
	CN02638 CHK BY: ER MOHTASHEMI		

PRINTS TO

MADE BY	APPROVALS	GENERAL ELECTRIC COMPANY
A. FORTIN 1/30/95	E.R. MOHTASHEMI 3/6/95	175 CURTNER AVENUE SAN JOSE, CALIFORNIA 95125
CHK BY	ISSUED	
A. FORTIN 1/31/95	MAR 6 1995 R.J. AHMANN	CONT ON SHEET 2

MS-WORD

1. SCOPE

1.1 This document defines the design and performance requirements for stabilizers for the core shroud which will functionally replace welds H1 through H7. In addition, this design addresses the circumferential jet pump support plate H8 weld assuming that it is cracked completely through and 360 degrees around. A sketch of the welds and their nomenclature is given in Figure 1. All ASME Code requirements are defined in the documents listed in Paragraph 2.1.1.g. This specification herein contains those requirements that are not specific ASME Code requirements.

2. APPLICABLE DOCUMENTS

2.1 General Electric Documents. The following documents form a part of the specification to the extent specified herein.

2.1.1 Supporting Documents

a.	Arc Welding of Austenitic Stainless Steel	P50YP102	Rev. 10
b.	Sensitization Tests for Austenitic Stainless Steel, Modified ASTM A262 Practice E	E50YP13	Rev. 2
c.	Determination of Carbide Precipitation in Wrought Austenitic Stainless Steel (Modified ASTM A262 Practice A)	E50YP20	Rev. 4
d.	Examination for Intergranular Surface Attack	E50YP11	Rev. 3
e.	Age Hardening of Ni-Cr-Fe Alloy X750	P10JYP2	Rev. 12
f.	Liquid Penetrant Examination	E50YP22A	Rev. 3
g.	Reactor Pressure Vessel - Code Design Specification	25A5689	Rev. 1
h.	Reactor Vessel Thermal Cycles	921D265	Rev. 1
i.	Seismic Analysis of Reactor Internals for the Dresden II and Milestone Plants" dated December 1968, (DAR 67).	257HA718	Rev. 0

j. NEDC-32406, Class II, September 1994, "Final Test Report CRD Peformance Evaluation Testing with Driveline Misalignment."

k. Ge Nuclear Energy Document GENE-523-A181-1294,
" Dresden Units 2 & 3- Primary Structure Seismic Models" dated December 1994.

2.1.2 Supplemental Documents. Documents under the following identities are to be used with this specification:

a. Reactor Components	383HA715	Rev. 4
b. Essential Components	22A3041	Rev. 1

2.2 Codes and Standards. The following documents of the latest issue (or specified issue) form a part of this specification to the extent specified herein.

2.2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code

a. Section III, Appendices, 1989 Edition.

b. Section IX, Welding and Brazing Qualifications, 1989 Edition.

c. Section III, Subsection NG, 1989 Edition.

d. Section XI, Rules for Inservice Inspection, 1989 Edition.

e. Section II, Materials Specification, Latest edition.

2.2.2 American Society for Testing and Materials (ASTM)

a. ASTM A-182, Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature.

b. ASTM A-240, Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.

c. ASTM A-262, Detecting Susceptibility to Intergranular Attack in Stainless Steel.

d. ASTM A-479, Specification for Stainless and Heat-Resisting Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.

e. ASTM A-480, Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.

f. ASTM B-637, Specification for Precipitation Hardening Nickel Alloy Bars, Forgings, and Forging Stock for High-Temperature Service.

g. ASTM A-276, Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steel.

2.3 ComEd Documents

a. Dresden Station UFSAR.

b. ComEd Technical Requirements document for Dresden/Quad Cities Core Shroud Repair, NEC-12-4056, Rev. 0.

c. ComEd Purchase Order No. 354965.

d. Babcock & Wilcox Stress Report(s): VPF # 1248-436-1 (Dresden 2)
VPF # 2252-181-1 (Dresden 3)

2.4 Other Documents

a. Project Instruction - Shroud Repair for H1 through H7 Welds for Commonwealth Edison Dresden Nuclear Power Station GENE-771-80-1194, Rev.0.

b. BWROG - VIP, Core Shroud Repair Design Criteria.

c. GENE-L12-00819-05, September 1994, "Core Shroud Blowdown Load Calculation During Recirculation Suction Line Break by TRACG Analysis for Dresden Units 2 & 3 and Quad Cities Nuclear Power Stations, Units 1 & 2.

d. DRF B13-01749, Section B-2, "Shroud Fix for Dresden 2 and 3, Design Specification"

e. GENE-771-84-1194, Rev. 2; "Dresden Units 2 &3 Shroud Stabilizer Seismic Report."

2.5 U.S. Federal Register Code of Federal Regulations (CFR)

a. 10CFR50.55a(a)(3), Use of an Alternate to Code Requirements.

b. 10CFR50-Title 10, Energy: Chapter 1, Nuclear Regulatory Commission, Part 50, Licensing of Production and Utilization Facilities, Appendix B, Quality Assurance Criteria for Nuclear Power Plants.

3. GENERAL DESCRIPTION

3.1 The purpose of the shroud stabilizers is to structurally replace welds H1 through H7. Welds H1 through H6 are all of the circumferential welds in the shroud, as well as the (H7) bimetallic attachment weld of the shroud to the shroud support cylinder. These welds were required to both vertically and horizontally support the core top guide, core support plate, and shroud head; and to prevent core flow bypass into the downcomer region. Weld H8 is a circumferential inconnel-to-

inconnel weld between the shroud support ring and jet pump support plate which provides horizontal support for the core shroud. It also resists differential pressure and dead loads(vertical). The core top guide and core support plate horizontally support the fuel assemblies and maintain the correct fuel channel spacing to permit control rod insertion.

4. REQUIREMENTS

4.1 Code

4.1.1 The shroud stabilizer components are not classified as ASME Section III Code components. However, material strength properties shall be obtained from the document in Paragraph 2.2.1.a. Material Physical Properties may be obtained from the document in Paragraph 2.2.1.e or documents in Paragraph 2.2.2, or CMTR's as deemed appropriate. Welding qualification shall be performed in accordance with the document in Paragraph 2.2.1.b. The nomenclature for stress intensity used in this document is the same as that used in the document of Paragraph 2.2.1.c.

4.2 Structural Criteria

4.2.1 All structural analysis shall be performed in accordance with the criteria given in the Dresden UFSAR (Ref. 2.3.a), ComEd Technical Requirements Document for Dresden/Quad Cities Core Shroud Repair (Ref. 2.3.b) and BWROG - VIP, Core Shroud Repair Design Criteria (Ref. 2.4.b). All of the load combinations given in Paragraph 4.3.5 shall be shown to satisfy the primary stress limits given in the Dresden UFSAR, with values of SFmin as defined in Paragraph 4.3.6. The appropriate SFmin values have been incorporated into the allowable stress intensity values given in Paragraphs 4.2.1.1 and 4.2.1.2.

4.2.1.1 The primary stresses (Pm, Pl, and Pl + Pb) in the existing shroud (NB-3221-1), during Normal and Upset events, shall be shown to be less than Sm, 1.5Sm, and 1.5Sm respectively. During Emergency events, the allowable stresses are increased by a factor of 1.5 times the values for Normal and Upset events. During Faulted events, the allowable stresses are increased by a factor of 2.0 times the values for Normal and Upset events.

4.2.1.2 The stresses (Pm, Pm + Pb, and Pm + Pb + Q) in the repair hardware (NG-3221-1), during Normal and Upset events, shall be shown to be less than Sm, 1.5Sm, and 3.0Sm respectively. During Emergency events, the allowable primary stresses are increased by a factor of 1.5 times the values for Normal and Upset events. During Faulted events, the allowable primary stresses are increased by a factor of 2.0 times the values for Normal and Upset events. Secondary stresses are not required to be evaluated for Emergency and Faulted events.

4.2.2 The values of Sm and Sy as well as any other required material property shall be obtained from the document in Paragraph 2.2.1.a (ASME Code, Section III Appendices), except for alloy X-750. The values of Sm and Sy for alloy X-750 at operating temperature are 47,500 psi and 92,300 psi respectively. These values must be verified from the Certified Material Test Reports (CMTR's). The value of Sm must be determined using the method of Appendix III from the

document of paragraph 2.2.1.a. If Certified Material Test Reports (CMTR's) are used to determine stress allowable values, the value of Sm for XM-19, or for stainless steel may be determined using the method in Appendix III of the document in Paragraph 2.2.1.a.

4.2.3 Stress limit values for bolts shall be from Subsection NG-3230 of reference Document 2.2.1.c.

4.2.4 The maximum permanent deflection of any point on the shroud adjacent to either the H2 or the H3 weld shall be less than 2.1 inches divided by SFmin, during all of the load combinations specified in Paragraph 4.3.5. The maximum permanent deflection of any point on the shroud adjacent to either the H5 or H6 weld shall be less than 0.75 (Reference 2.1.1.j) inch divided by SFmin, during all of the load combinations specified in Paragraph 4.3.5. The maximum transient elastic deflection during the seismic event adjacent to either the H5 or H6 weld shall be less than 1.68 inches, and adjacent to either the H2 or H3 weld shall be less than 5.4 inches, each divided by SFmin specified in Paragraph 4.3.6. The allowable deflections are in part based on test data from the document in Paragraph 2.1.1.j.

4.3 Design Requirements

4.3.1 General. The shroud repair hardware shall be designed to horizontally support the top guide, core support plate, the fuel assemblies and the shroud head. The shroud repair shall be designed to prevent upward displacement of the shroud. The shroud repair shall be designed for 40 years, to include 30 effective full power years. The shroud repair shall be removable. Because any existing defects in the shroud horizontal welds will not be removed by implementing this repair, the requirements of IWB-3142 cannot be met. Therefore, approval of this alternative code repair must be granted by the office of the NRR.

4.3.2 Spring Preload

4.3.2.1 Installation Preload. All of the springs shall be installed with a preload due to bending deflection greater than the deflection resulting from the limiting design upset condition, exclusive of seismic events. The required installation spring bending preload is 0.07 inch for the upper springs, and 0.01 inch for the lower springs. (Middle spring is installed without bending preload).

4.3.2.2 Preload Relaxation. The design shall consider an End-of-Life preload relaxation of 5% for the upper springs near the H2 and H3 welds and a relaxation of 5% for the middle spring near the H4 weld and a relaxation of 5% for the lower springs near the H5 and H6 welds. Preload relaxation value of 5% is based on the reference document 2.4.d.

4.3.3 Environmental Conditions

4.3.3.1 Temperature. The design temperature for the repair hardware is 575 degrees F. The operating temperature is 550 degrees F. Operating temperature shall be used for emergency and

faulted evaluations. For upset transient (scram with loss of feedwater pumps) condition use 300 degrees F based on report #11 in reference 2.3.d.

4.3.3.2 Radiation. The maximum neutron radiation level (flux) at the shroud stabilizers in the shroud vessel annulus is 3.3E11 neutrons/cm^2/sec. This will not affect the properties of the stabilizer materials for the design life specified in Paragraph 4.3.1.

4.3.3.3 Water Chemistry

	Power Operation	Cold Shutdown/ Refuel (max Values)
Conductivity (@25°C)	0.3 umho/cm	2.0 umho/cm
Chloride	5.0 PPB	100 PPB
Sulfate	5.0 PPB	100 PPB
pH @ 25°C)	7.0	5.3 - 8.6
Dissolved Oxygen (HWC)	20 PPB	NA
Dissolved Oxygen (NWC)	300 PPB	7.0 PPM

4.3.3.4 Water Flow in the Annulus

a. At and above the jet pump suction inlet 98,000,000 lbs/hr.

b. Below the jet pump suction inlet - 34,200,000 lbs/hr.

4.3.4 Physical Interfaces

4.3.4.1 The shroud repair hardware shall restrain the shroud during all of the load combinations in Paragraph 4.3.5. The allowable permanent motion is dependent on the safety significance of the portion of the shroud under consideration. The allowable permanent motion for those portions of the shroud, which affect control rod insertion, is given in Paragraph 4.2.4. For the remaining portion of the shroud below H3, the allowable permanent motion is determined such that the reflooding of the inside of the shroud up to two thirds of core height is assured. For the portion of the shroud above H2, the allowable motion is 2.56 inches, which assures that the core spray lines are not impacted by the shroud (note-1). The allowable motion of the Shroud Repair Hardware shall be less than 0.55 inch near the jet pump riser brace to prevent impact (note-2).

Note(s): 1) 2.56 inches is estimated from; Shroud Dwg 718E861, Rev.6 and Reactor Assembly Dwg #104R861, Rev. 10.

2) This dimension will be verified by the installer.

4.3.4.2 The shroud repair hardware must provide features which facilitate handling during installation and removal. The upper and lower springs shall be movable without removing the tie rod and without welding, in order to permit inspection of the reactor pressure vessel with GERIS 2000. The upper springs must also permit inspection of the core spray line and the previously designed clamp modification fix.

4.3.4.3 All parts shall be captured and held in place with a method that will last for the design life given in Paragraph 4.3.1.

4.3.5 Load Combinations. The load combinations that the shroud and the shroud repair shall be analyzed for are from the Dresden UFSAR, ComEd Technical Requirements document for Dresden/Quad Cities Core Shroud Repair, and BWROG - VIP shroud design criteria recommendations. The limiting Normal/Upset event is an Operating Basic Earthquake (OBE), plus Normal pressure differences, plus dead weight plus Thermal Load. The Emergency 1 event is a Design Basis Earthquake (DBE), plus normal pressure differences, plus dead weight. The Emergency 2 event is a main steam line LOCA plus dead weight. The Emergency 3 event is a recirculation line LOCA plus dead weight. The Faulted 1 event is a Design Basis Earthquake (DBE), plus a main steam line LOCA, plus dead weight. The Faulted 2 event is a Design Basis Earthquake (DBE), plus a recirculation line LOCA, plus dead weight. Additionally, an analysis shall be performed for the upset thermal case of a loss of feedwater pump transient, as defined by report #11 in reference 2.3.d.

4.3.5.1 The pressure differences for normal/upset and faulted conditions are given in the table below. The pressure inside the shroud is higher than that outside of the shroud, and the pressure is higher below the core plate than above the core plate (Ref. 2.3.b).

Component	RRLB Faulted Condition/ Normal/Upset Condition	MSLB Faulted Condition
Shroud Head and Upper Shroud	7 psi	12 psi
Core Plate	17 psi	20 psi
Lower Shroud	25 psi	30 psi

4.3.5.2 A new seismic analysis based on the documents in Paragraph 2.1.1.i , 2.3 and 2.4 shall be performed which includes the shroud stabilizers. The shroud stabilizers shall function for the entire continuum from an uncracked shroud to a fully cracked shroud. Therefore, multiple conditions must be analyzed, for both the DBE and the LOCA events. As a minimum, the following shroud conditions shall be analyzed:

a. The OBE in both the E-W and N-S directions for:

1. Uncracked shroud

2. Hinge at all welds
3. Hinge at H3
4. Hinge at H4
5. Hinge at H7

b. The DBE in both the E-W and N-S directions for:

1. Uncracked shroud
2. Hinge at all welds
3. Hinge at H3
4. Hinge at H4
5. Hinge at H7
6. Roller at H1
7. Roller at H3
8. Roller at H4
9. Roller at H7

The limiting seismic loads on the stabilizer are given in the table below (Ref. 2.4.e).

Component	OBE	DBE	
		Emergency	Faulted
Upper Spring	67,000 lb.	134,000 lb.	140,000 lb.
Middle Spring	12,000 lb.	23,000 lb.	24,000 lb.
Lower Spring	93,000 lb.	186,000 lb.	190,000 lb.
Set of 4 Tie Rods (each)	96,000 lb.	310,000 lb.	169,000 lb.* 310,000 lb.*

* 169,000 lb. (DBE/Faulted for combination with MSLB LOCA pressure)
* 310,000 lb. (DBE/Faulted for combination with RRLB LOCA pressure)

4.3.5.3 Two steady state thermal conditions shall be evaluated. The first is Normal operation with the shroud at 550 degrees F, and the stabilizer assembly at 538 degrees F. The second condition is an Upset transient (scram with loss of feedwater pumps) with the shroud at 433 degrees F, and the stabilizer at 300 degrees F. The number of events is defined by 921D265 (document 2.1.1.h), except for upset transient condition which are 10 cycles. (Reference 2.3d)

4.3.5.4 During the recirculation line LOCA event, based on the document in Paragrpah 2.4.c., there is a maximum resultant force applied to the shroud of 169,000 lbs, with a moment of 13.0E6 in-lb acting at the base of the shroud. This is due to asymmetric pressures imposed on the shroud. This force exists for a sufficient time (~5 seconds) to be treated as an equivalent static force. The accoustic component is bounded by the steady state blowdown component.

4.3.6 Required Safety Factors. The minimum safety factors (SFmin) shall be 2.25 for Normal and Upset events, 1.5 for Emergency events, and 1.125 for Faulted events. These are based on GE Design Safety Standards for Boiling Water Reactors (NEDE-1037D, Class II, 71NED 15, June 1971) These SFmin will be used to determine the acceptable displacements.

4.4 Materials. ASTM specification material is acceptable for the Shroud Repair. CMTRs are required for all material. Materials shall be highly resistant to Intergranular Stress Corrosion Cracking (IGSCC) or Irradiation Assisted Stress Corrosion Cracking (IASCC).

4.4.1 The springs shall be made of nickel-chrome-iron alloy X-750 (UNS N07750). The cobalt content shall be limited to a maximum of 0.09%. Alloy X-750 shall be purchased per ASTM B-637 and age hardened per P10JYP2. Alloy X-750 material shall be tested per E50YP11. In lieu of testing per E50YP11, all finished components may incorporate the removal, after solution heat treatment, of a minimum of 0.030 inches of material from all surfaces of the original raw material form.

4.4.2 The components may be made of either 304, 304L, 316, or 316L material with a maximum carbon content of 0.02%, and annealed at 1900 to 2100 degrees F followed by quenching in circulating water to a temperature below 400 degrees F. The tie rod material shall be tested per E50YP11 and E50YP20. The maximum hardness shall be R_B 90 for 304 and R_B88 for 304L. The maximum hardness shall be R_B 92 for 316 and 316L. XM-19 with a maximum carbon content of 0.04% may also be used for fabrication of the tie rods. XM-19 shall be annealed at 2,000 $\pm$ 50 degrees F, followed by rapid cooling, and shall be tested per E50YP13, or per ASTM A-262 Practice E.

4.4.3 Other parts shall be made of any of the materials listed in Paragraph 4.4. The filler material for any required weld buildups on 300 series stainless steel shall be Type 308L per P50YP102. All assembly welds shall satisfy P50YP102.

4.5 Leakage Due to Repair. Zero leakage is not required. However, the design shall control the Normal and Upset operating condition leakage to prevent cavitation of the jet pumps. The leakage after any required load combination shall be limited such that core flooding to 2/3 the height of the core is assured.

4.6 Inspections. Liquid penetrant examination shall be performed on all final machined surfaces of all stabilizer components, and on all structural welds in accordance with the requirements E50YP22A.

4.7 Fabrication

Welding requirements are only included herein as a repair contingency.

4.7.1 Welder and Weld Procedure Qualification. Welders and weld procedures shall be qualified per the document in Paragraph 2.2.1.b. Welder qualifications shall include limited access similar to the actual welds to be completed.

4.7.2 Root Pass. The root pass of all full penetration single sided stainless steel welded joints shall be made by the GTAW process. Protective gas back-purging is required for all full penetration single sided welded joints until a minimum of 3/16 inch of weld thickness is completed.

4.7.3 Weld Surface Finish. All welds shall have the final outer surface suitable for liquid penetrant examination. The final surface shall meet the hardness requirements of Paragraph 4.4.

5. QUALITY ASSURANCE

5.1 The shroud repair hardware components are Safety Related as referenced in Paragraph 2.1.2.b, and design, fabrication, and installation activities shall be controlled per GE Quality Assurance Manual #QAM-001, revision 4 which satisfies 10CFR50 Appendix B, in order to assure safe and reliable components.

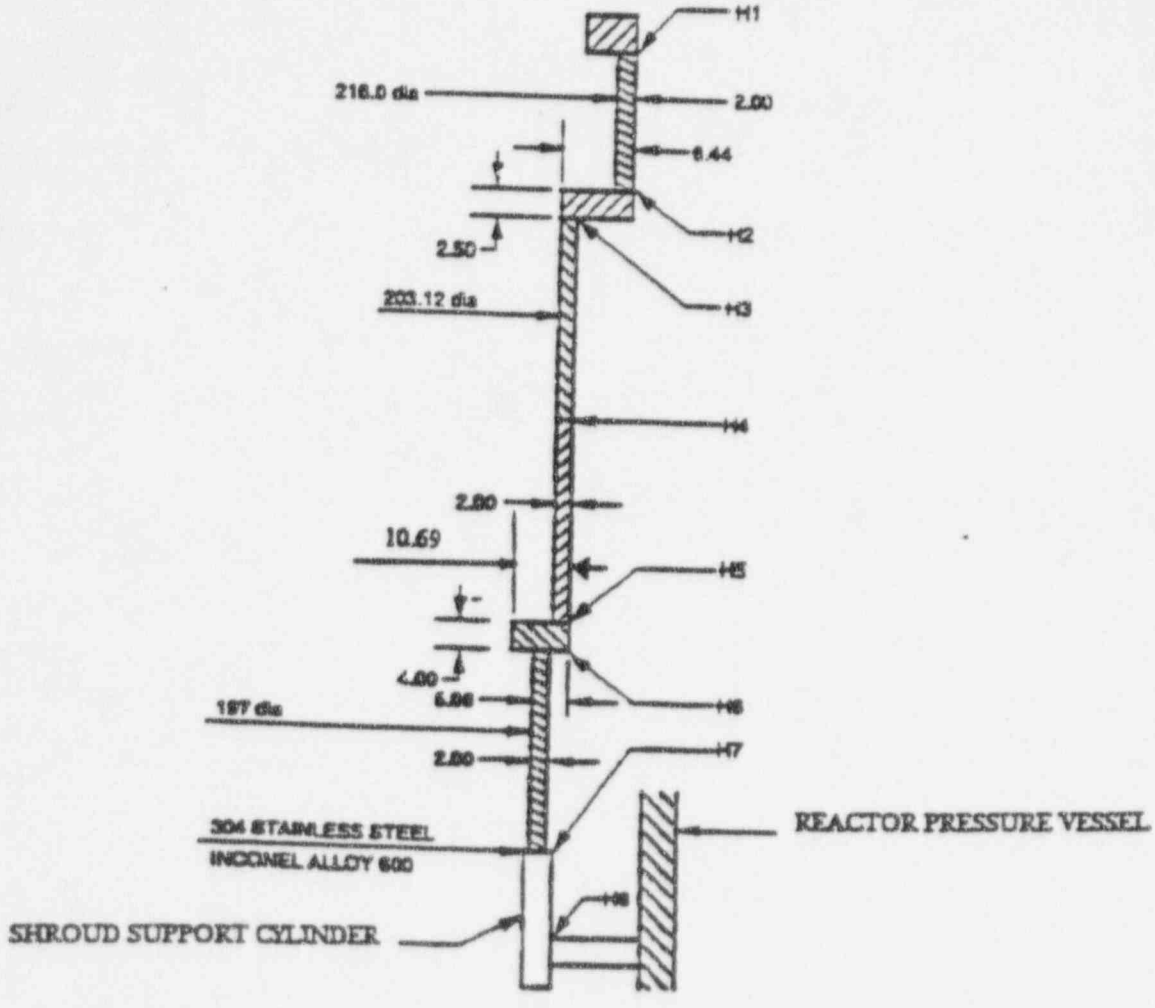

Figure 1. Horizontal Weld Locations In Shroud

NOTE: All dimensions are in. inches.

Enclosure 2

GENE Code Design Specifica tion, 25A5689, Revision 1

Dresden 2 and 3 - Reactor Pressure Vessel

GE Nuclear Energy

25A5689	SH NO. 1
REV. 1	

REVISION STATUS SHEET

DOC TITLE REACTOR PRESSURE VESSEL

LEGEND OR DESCRIPTION OF GROUPS

TYPE: CODE DESIGN SPECIFICATION

FMF: Dresden 2 AND 3

MPL NO: PRODUCT SUMMARY SEC. 7

THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM ☒ NO ☐ EQUIP CLASS P

REVISION			C
0	RM-01993 APR 06 1995		
1	JL TROVATO MAY 11 1995 RJA CN02638 CHK BY: ER MOHTASHEMI		

PRINTS TO

MADE BY	APPROVALS	GENERAL ELECTRIC COMPANY
A. FORTIN 1/30/95	3/6/95 E.R. MOHTASHEMI	175 CURTNER AVENUE SAN JOSE, CALIFORNIA 95125
CHK BY A. FORTIN 1/31/95	ISSUED MAR 6 1995 R.J. AHMANN	CONT ON SHEET 2

MS-WORD

1. SCOPE

1.1 This document defines the ASME Code design requirements for the reactor pressure vessel stress analysis for the new loads applied to the vessel as a result of the installation of the shroud stabilizers which function to replace the horizontal girth welds H1 through H7 in the shroud. In addition, this design addresses the circumferential jet pump support plate H8 weld, assuming that it is cracked completely through and 360 degrees around.

2. APPLICABLE DOCUMENTS

2.1 General Electric Documents. The following documents form a part of this specification to the extent specified herein.

2.1.1 Supporting Documents

a. Reactor Pressure Vessel Data Sheet — 21A1109AB Rev. 13

b. Reactor Pressure Vessel, Purchase Specification — 21A1109 Rev. 2

c. Reactor Vessel, Purchase Part — 885D660 Rev. 11

Sheet No.	Revision No.
1	6
2	11
3	4
4	8

d. Reactor Thermal Cycles — 921D265 Rev. 1

e. Nozzle Thermal Cycles — 158B7279 Rev. 1

Sheet No.	Revision No.
1	1
2 - 3	0
4	1
5 - 10	0

f. Vessel Flange Bolting — 885D911 Rev.2

g. Nozzle End Preparation — 107C5305 Rev.2

h. Standard Requirements For Core Structure — 21A3319 Rev.5

i. GENE-771-84-1194, Rev. 2; "Dresden Units 2 & 3 Shroud Repair Seismic Analysis".

2.1.9 Supplemental Documents. Documents under the following identities are to be used with this specification:

a. Shroud Stabilizer Hardware Design Specification 25A5688 Rev. 2

2.2 Codes and Standards. The following documents of the specified issue form a part of this specification to the extent specified herein.

2.2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code

a. Section III, 1963 Edition with Addenda through Summer 1964 (Dresden Unit 2)

b. Section III, 1965 Edition with Addenda through Summer 1965 (Dresden Unit 3)

c. Section XI, Rules for Inservice Inspection, 1989 Edition.

2.2.2 Other Documents

a. Dresden Station UFSAR

b. Shroud Support VPF 1248-114-4 (Dresden 2)
VPF 2252-131-3 (Dresden 3)

c. Certified Design Documents (Stress Report) VPF 1248-436-1 (Dresden 2)
VPF 2252-181-1 (Dresden 3)

d. ComEd Technical Requirements Document for Dresden/Quad Cities Core Shroud Repair, NEC-12-4056 Rev.0

e. BWROG - VIP, Core Shroud Repair Design Criteria, latest revision.

f. DRF B13-01749, " Shroud Fix For Dresden 2 & 3".

3. GENERAL DEFINITION

3.1 The purpose of the shroud stabilizers is to structurally replace all of the horizontal welds (H1 through H7) in the shroud. These welds were required to both horizontally and vertically support the core top guide, core support plate, and shroud head, and to prevent core bypass flow to the downcomer region. Weld H8 is a circumferential inconnel-to-inconnel weld between the shroud support ring and jet pump support plate which provides horizontal support for the core shroud. It also resists differential pressure and dead loads (vertical). The core top guide and core support plate horizontally support the fuel assemblies and maintain the correct fuel channel spacing to permit control rod insertion, as well as having other

structural functions. New loads are applied to the reactor pressure vessel as a result of the installation of the shroud stabilizers.

3.2 All of the non ASME Code requirements for the shroud stabilizers are defined in the Document of Paragraph 2.1.2.a. The ASME Code requirements are defined herein.

4. REQUIREMENTS

NOTE(S):

1) The shroud stabilizer hardware will be designed and fabricated to the requirements of GE Specifications 25A5688 and 25A5690, respectively.

2) The core shroud was not supplied as an ASME Code Component. However, Section XI requires Inservice Inspection (ISI) of the core support structures.

3) The required Replacement Program is different than most Replacement Programs, because the stabilizers are not a direct replacement. Instead, the structural functions of the shroud horizontal welds are replaced by new components. Any defects found in the horizontal welds H1-H7 and weld H8 also are acceptable after the installation of the stabiliziers.

4.1 The shroud stabilizers change the points of application of the forces applied to the reactor pressure vessel and jet pump support plate from the core shroud. These new forces shall be analyzed in accordance with the original Codes of Construction (documents of Paragraphs 2.2.1.a & 2.2.1.b).

4.2 The new forces and their points of application are defined in Figure 1, and in Table 1. The values given in Table 1 shall be combined with the forces defined in the Design Specification (documents of Paragraphs 2.1.1.a through 2.1.1.e), for the analysis of the RPV.

4.3 The original purchase specification for the reactor pressure vessel (document of Paragraph 2.1.1.b) specified that the boundary of jurisdiction of Section III of the ASME Code (documents of Paragraph 2.2.1.a & b) shall include all attachments to the pressure boundary parts, but does not include the components that are welded to the attachments. Thus, the jurisdiction of the original Code of Construction included all weld build up pads used to attach internal components to the reactor pressure vessel, but did not include the shroud support within the boundary of Code jurisdiction. The boundary of ASME Code jurisdiction is shown in Figure 2.

4.4 The analysis required by this Design Specification shall be Certified, to the applicable ASME Boiler and Pressure Vessel Code (Paragraphs 2.2.1 a & b, for Dresden 2 & 3 respectively).

5.0 PROFESSIONAL ENGINEER CERTIFICATION

To the best of my knowledge and belief, this Design Specification satisfies the requirements of the ASME Boiler and Pressure Vessel Code; 1) 1963 Edition with Addenda through Summer 1964 (Dresden 2) & 2) 1965 Edition with Addenda through Summer 1965 (Dresden 3).

Signature: Edward R Mohtashemi Date: 5/11/95

License Number: State: California

ENVELOPE OF ADDITIONAL MECHANICAL DESIGN LOADS

FORCE	NORMAL LBS	UPSET THERMAL LBS	UPSET WITH OBE LBS	EMERGENCY LBS	FAULTED LBS
F1	———	———	93000	186000	190000
F2	———	———	12000	23000	24000
F3	———	———	67000	134000	140000
F4 (Envelope Of Cracked/un-Cracked Shroud)					
WITH PRE-LOAD	98000	170000	194000	408000	408000
WITHOUT PRE-LOAD	25000	25000	123000	339000	339000

F_1, F_2, F_3 and F_4 are discrete loads applied over a small area. At any one point in time, F_1 F_2 and F_3 are each applied to one location. At any one point in time, F_4 is applied to 4 locations 90° apart for the installation of four shroud stabilizer assemblies. The load F4 shown is the maximum and applies to one tie rod 180° apart, while, remaining 3 tie rods have loads much lower than F4 values shown above.

F_1, F_2 & F_3 loads are from document of Paragraph 2.1.1.i.

The stress intensities shall meet the allowables of the ASME Code, Section III, for the load combinations defined by the Dresden UFSAR. The original Code of Construction did not include Emergency and Faulted load combinations. Emergency and Faulted load combinations shall meet the allowables as defined by the Dresden UFSAR for the reactor pressure vessel.

TABLE 1

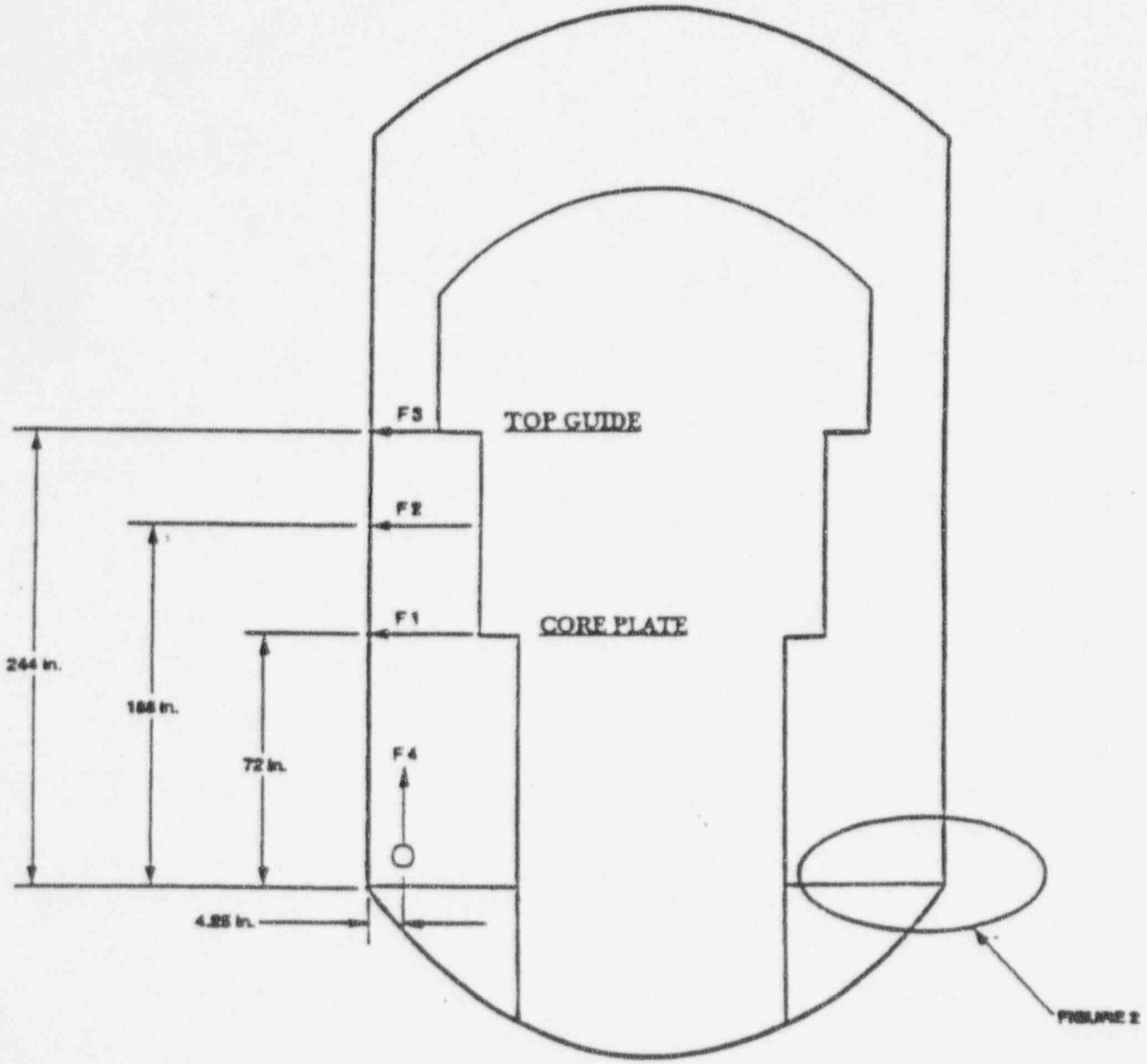

Figure 1. Application of Design Mechanical Loads

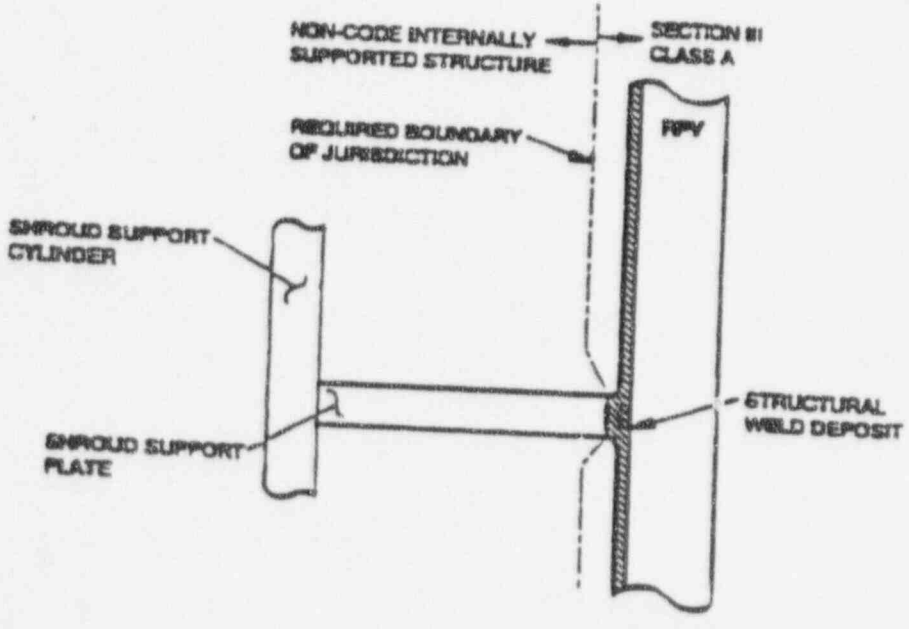

Figure 2. Boundary of ASME Code Jurisdiction

Enclosure 3

GENE Fabrication Specification, 25A5690, Revision 2

Dresden 2 and 3 - Fabrication of Shroud Stabilizer

GE Nuclear Energy

25A5690	SH NO. 1
REV. 2	

EIS IDENT: FAB SHROUD STABILIZER

REVISION STATUS SHEET

DOCUMENT TITLE FABRICATION OF SHROUD STABILIZER

LEGEND OR DESCRIPTION OF GROUPS

TYPE: FABRICATION SPECIFICATION

FMF: DRESDEN 2 AND 3

MPL NO PRODUCT SUMMARY SECTION 7
B13-D001

THIS ITEM IS OR CONTAINS A SAFETY-RELATED ITEM YES [X] NO [ ] EQUIP CLASS CODE P

REVISION			C
0	RM-01872 JAN 18, 1995		
1	JL TROVATO	RJA	
	CN02316 CHK BY: JL TROVATO ER MOHTASHEMI		
2	JL TROVATO MAR 29 1995	RJA	
	CN02416 CHK BY: JL TROVATO ER MOHTASHEMI		

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MADE BY	APPROVALS	GENERAL ELECTRIC COMPANY 175 CURTNER AVENUE SAN JOSE CALIFORNIA 95125
A. FORTIN 12/22/94	E.R. MOHTASHEMI 1/18/95	
CHKD BY: A. FORTIN 12/22/94	ISSUED JAN 18,1995 R. J. AHMANN	CONT ON SHEET 2

1. SCOPE

1.1 This specification defines the requirements for fabrication of the shroud stabilizer hardware. These requirements apply as described herein to wrought austenitic stainless steels, types 316, 316L, stainless steel type XM-19, and Ni-Cr-Fe alloy X-750 materials.

1.2 Definitions

Buyer - GE Nuclear Energy (GENE)

Fabricator - The supplier authorized by GENE to perform fabrication services for the hardware items comprising the shroud stabilizers.

2. APPLICABLE DOCUMENTS

2.1 GE Nuclear Energy Documents. The following documents form a part of this specification to the extent specified herein. In case of any conflict between this document and any of the following, the requirements of this document shall govern.

a.	P50YP102 (Rev. 10)	Arc Welding of Austenitic Stainless Steels
b.	P50YP211 (Rev. 1)	Cleaning and Cleanliness Control of Reactor System Components
c.	E50YP20 (Rev. 4)	Determination of Carbide Participation in Wrought Austenitic Stainless Steels
d.	E50YP11 (Rev. 3)	Examination for Intergranular Surface Attack
e.	E50YP22A (Rev. 3)	Liquid Penetrant Examination
f.	Y1010A3 (Rev. 0)	Shop Applied Practices
g.	P10JYP2 (Rev. 12)	Age Hardening of Ni-Cr-Fe Alloy X-750
h.	P16BYP3 (Rev. 6)	Chromium Alloy Coating "Electrolizing"

2.2 Codes and Standards. The following codes and standards (issue in effect at the date of the purchase order, or as specified in this specification or its supporting documents) form a part of this specification to the extent specified herein.

2.2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code

a. Section III, Subsection NG, Core Support Structure, 1989 Edition.

b. Deleted.

c. Section II, Material Specification, 1989 or later edition approved by NRC.

2.2.2 Deleted

a. Deleted

b. Deleted

2.2.3 American Society for Testing and Materials (ASTM)

a. ASTM A-370, Specification for Mechanical Testing of Steel Products

b. ASTM A-182, Specification for Forged or Rolled Alloy Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service

c. ASTM A-240, Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels

d. ASTM A-479, Specification for Stainless and Heat-Resisting Steel Wire, Bars, and Shapes for Use in Boilers and Other Pressure Vessels

e. ASTM B-637, Specification for Precipitation Hardening Nickel Alloy Bars, Forgings, and Forging Stock for High-Temperature Service

f. ASTM A-262, Detecting Susceptibility to Intergranular Attack in Stainless Steel

g. ASTM A-412, Specificiation for Stainless and Heat Resisting Chromium-Nickel-Magenese Steel Plate, Sheet and Strip.

h. ASTM E-384, Standard Test Method for Microhardness of Materials.

I. ASTM A-336, Specification for Steel Forgings, Alloy, for Pressure And High-Temperature Parts.

j. ASTM A-751, Test Methods, Practices , and Terminology for Chemical Analysis of Steel Products.

k. ASTM E-8, Test Methods for Tension Testing Of Metallic Materials.

l. ASTM E-353, Test Methods For Chemical Analysis Of Stainless, Heat Resisting,Maraging, and other similar Chromium-Nickel-Iron Alloys.

2.2.4 US Federal Register Code of Federal Regulations (CFR)

a. 10 CFR 50 - Title 10, Energy; Chapter 1, Nuclear Regulatory Commission; Part 50, Licensing of Production and Utilization Facilities, Appendix B, Quality Assurance Criteria for Nuclear Power Plants.

b. 10 CFR 21, Reporting of Defects and Noncompliance

2.2.5 American National Standard Institute (ANSI/ASME)

a. ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities, 1986 Edition.

b. ANSI/ASME N45.2.2 Packing, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants, 1978 Edition.

c. ANSI/ASME N45.2.13, Quality Assurance Requirement for Control of Procurement of Items and Services for Nuclear Power Plants, 1976 Edition.

2.3 Other Documents

a. BWROG-VIP, Core Shroud Repair Design Criteria, Latest revision.

b. Com Ed Technical Requirements document for Dresden/Quad Cities Core Shroud Repairs, NEC-12-4056, Rev 0.

3. REQUIREMENTS

3.1 General. This specification is for use in conjunction with detail product drawings which define the requirements for each part of the shroud stabilizers. It is intended that all parts will be fabricated without welding.

3.2 Materials. Parts shall be fabricated from materials specified on the detail product drawings and the additional requirements of this specification. The material for each completed part shall be traceable to its certified material test report (CMTR). Physical and chemical overcheck tests are required for each heat number of material in accordance with ASTM A-370, A-751, E-8, or E-353 as applicable.

3.2.1 X-750 Material. Nickel-chrome-iron (Ni-Cr-Fe) alloy X-750 shall be in accordance with ASTM B-637, UNS N07750, and the additional requirements specified below.

3.2.1.1 X-750 Maximum Cobalt. The maximum cobalt content of Ni-Cr-Fe alloy X-750 material shall be 0.09 percent.

3.2.1.2 X-750 Hot Forming. Ni-Cr-Fe alloy X-750 shall be hot formed in accordance with a buyer approved fabricator's procedure.

3.2.1.3 X-750 Heat Treatment. Ni-Cr-Fe alloy X-750 shall be annealed at 1975 ± 25°F (metal temperature) and forced-air cooled after hot forming operations. The center of the cross-section shall be held at this temperature for 60 to 70 minutes. Equalizing heat treatment at 1500°F to 1800°F is prohibited. Product forms with both cross section dimensions less than six inches by six inches may be water quenched after annealing as a vendor option, and with buyer approval. Materials tests shall be performed at both 70°F and 550°F, on specimens which have been annealed and age hardened.

3.2.1.4 X-750 IGA Testing. Intergranular attack (IGA) testing per E50YP11 shall be performed after annealing for each heat and heat treat lot. IGA examination is not required if a minimum of 0.030 inch of material is removed from all surfaces of the product form after final heat treatment. IGA examination is not required after age hardening.

3.2.1.5 X-750 Age Hardening. Ni-Cr-Fe alloy X-750 shall be age hardened at 1300 ± 15°F for 20 hour minimum and air cooled in accordance with P10JYP2D, and a buyer approved procedure. Age hardening may be performed before or after machining as long as the final part meets all dimensional requirements.

3.2.2 Austenitic 300 Stainless Steel. Austenitic 300 series stainless steel shall be in accordance with ASTM A-479, A-182, A-336, or A-240 type 316 or 316L with a maximum carbon content of 0.020 percent. The type and applicable ASTM specification shall be as specified on the specific part drawing. The additional requirements below also apply.

3.2.2.1 Austenitic 300 SST Heat Treatment. Austenitic 300 series stainless steel shall be solution annealed at 2000 ± 100°F (metal temperature) for a minimum of 15 minutes per inch of thickness, but not less than 15 minutes total, immediately followed by quenching in circulating water to a temperature below 400°F. The solution anneal shall be performed after completion of final reduction, sizing, and forming operations. In addition, after final machining materials will be re-solution annealed and sensitization tested per 3.2.2.2 with exception of; 1) Locking pins of sizes 0.19 and 0.50 inches diameter which are electrolized (hard chrome plated) after being centerless ground to size , and 2) The lower contact spacer, which must be trimmed to final dimension in acordance with site measurements. After trimming, the affected surface shall be polished with progressively finer grits to remove 0.003-0.004 inch of material.

Electrolizing shall be performed in accordance with P16BYP3A. A test sample shall be provided from the same material, same fabrication shop and the same process variables, prior to electrolizing. The sample shall be evaluated per paragraph 3.5.

A typical polishing process for the lower contact surface consists of; 1) Flap with a 60 grit flapper wheel, 2) Flap with a 80 grit flapper wheel, 3) Flap with a 3M or equivalent Level Cut Medium (LCM) grit polishing wheel, 4) Flap with a 3M or equivalent level cut fine wheel.

Solution annealing shall be performed in accordance with qualified procedures approved by the buyer and shall meet the following requirements;

a. Parts and any fixtures used in the heat treatment shall be visibly clean prior to heat treatment

b. All surfaces shall appear reasonably bright and clean after heat treatment and shall meet buyer approved limits for oxide discoloration.

c. Solution heat treated parts shall be tested by demonstrating with a mockup that the temperature is obtainable at a location in the center thickness, farthest from all heated surfaces or perform testing in accordance with E50YP11 and E50YP20.

d. Minor cold straightening (up to 2 1/2% maximum outer fiber strain) may be performed after final solution anneal. Cold straightening over 1% strain shall be noted in the records package of the affected material or part.

3.2.2.2 Austenitic 300 SST Sensitization. All Austenitic 300 series stainless steel shall have sensitization testing performed for each heat and heat treat lot in accordance with the requirements of E50YP20, or by ASTM A-262 Practice E. Sensitization heat treatment shall be at 1250° ±25°F for one hour followed by 930° ± 25°F for twenty four hours. Successful completion of the sensitization testing shall be accepted as evidence of the correct solution heat treatment, if time and temperature charts are not available.

3.2.2.3 Austenitic 300 SST IGA Testing. Intergranular attack (IGA) examination shall be performed for each heat and heat treat lot in accordance with the requirements of E50YP11. IGA examination is not required if a minimum of 0.030 inch of material is removed from all surfaces of the product form after final heat treatment.

3.2.2.4 Austenitic 300 SST Hardness. The maximum hardness of types 316 or 316L shall be R_B 92.

3.2.3 XM-19 Stainless Steel. Type XM-19 stainless steel shall be in accordance with ASTM A-479, A-182, A-336, A-412 or A-240. The maximum carbon content is limited to 0.040 per cent. The applicable ASTM specification shall be as specified on the specific piece part drawing. The additional requirements below also apply.

3.2.3.1 XM-19 SST Heat Treatment. XM-19 stainless steel shall be solution annealed at 2000°F ± 50°F (metal temperature) for 15 to 20 minutes for each inch of thickness, but for not less than 15 minutes regardless of thickness. The material shall be quenched in circulating water to a temperature below 500°F. As a vendor option to avoid distortion, the tie rods may be forced- air

cooled so that the metal temperature is below 500°F within 20 minutes of removal from the furnace. The solution anneal shall be performed after completion of final reduction, sizing, and straightening operations. Re-solution anneal of critical, highly stressed, machined areas such as tie rod threads need not involve the entire part, but can be limited to just the newly machined portions. The threaded portions of the tie rod will be re-solution annealed per following:
1- Induction heat will be applied at 7-8 kHz and temperature will be held at 1900-2000°F for 1 minute +10 seconds/-0 seconds.
2- Forced-air cooling will be applied directly on the threaded area for a minimum of 20 minutes and until the surface temperature less than 400°F is acheived.

3.2.3.2 XM-19 SST Sensitization. Each heat and heat treat lot of XM-19 material shall be tested for sensitization in accordance with the requirements of E50YP20 or ASTM A-262 Practice E. Sensitization heat treatment shall be at 1250° ±25°F for one hour followed by 930° ± 25°F for twenty four hours. Successful completion of the sensitization testing shall be accepted as evidence of the correct solution heat treatment, if time and temperature charts are not available.

3.2.3.3 XM-19 SST IGA Testing. Intergranular attack (IGA) examination shall be performed for each heat and heat treat lot in accordance with the requirements of E50YP11. IGA examination is not required if a minimum of 0.030 inch of material is removed from all surfaces of the product form after final heat treatment.

3.2.3.4 XM-19 SST Hardness. The maximum hardness of XM-19 stainless steel material and completed parts shall be R_B100.

3.3 Cutting, Forming, and Cleaning

3.3.1 Mechanical Cutting Methods. Methods such as machining, grinding (see also paragraph 3.6) and sawing are acceptable. Methods such as shearing or punching that form a hardened layer on the metal surface shall not be used, except where the cold-worked material is subsequently and completely removed by machining, grinding, or solution heat treatment.

3.3.2 Thermal Cutting Methods. Plasma arc cutting may be used with the following restrictions: Interpass temperature control shall be in accordance with P50YP102 for stainless steels. If a minimum of 0.12 in of the cut surface is subsequently removed by machining or grinding, the interpass temperature control is not required. Surfaces shall be machined or ground to a bright metal finish following the cutting operation. Preventive measures shall be taken to assure that spatter will not enter areas that are inaccessible to cleaning operations.

3.3.3 Bending and Forming Control for Stainless Steel. There shall be no cold forming, bending, or cold reduction for austenitic stainless steel, unless otherwise specified in the paragraphs below, or unless the component is subsequently solution heat treated.

3.3.4 Prohibited Processes. Processes such as shot peening, hammering, or power deslagging of final surfaces are prohibited.

3.3.5 Straightening. Straightening or reforming shall be within the limits of paragraph 3.2.2.1d and shall be performed in accordance with an approved procedure.

3.3.6 Control of Deformation. For parts that are straightened, reformed, or otherwise subjected to deformation as part of the normal fabrication process, the following controls shall be met: (1) Hardness of any wrought stainless steel in the final fabricated condition shall not exceed the hardness requirements of paragraphs 3.2.2.4 and 3.2.3.4 as determined by an approved procedure. The buyer approved procedure shall include the specification of locations for hardness testing. If the dimensions of the part permit, the hardness shall be measured with a test device specifically designed to perform Rockwell B measurements for all materials. (2) Cold bending strain, after solution annealing, shall be limited to two and one-half percent maximum.

3.3.7 Cleaning and Control of Miscellaneous Process Materials. Miscellaneous process materials include such things as machining lubricants, liquid penetrants, solvents, tapes, ultrasonic testing couplant, abrasive grit, packing materials, marking materials, weld spatter compounds, and other materials which will be in contact with the part being fabricated. All miscellaneous process materials shall be controlled to prevent contamination of stainless steel and Ni-Cr-Fe materials. The known contaminants of concern are chlorides, fluorides, sulfur, lead, mercury and all metals with low melting points. In addition, when welding or heat treating is involved, all carbonaceous material and phosphates must be considered harmful on stainless steel which can pick up these contaminants. Parts may be cleaned in accordance with P50YP211 as one method to control contamination.

3.4 Heating Control for Stainless Steel. Austenitic stainless steel shall not be heated above 800°F by thermal cutting unless the process will be followed by solution heat treatment.

3.5 Metallographic and Microhardness Evaluation. Machined components that are not solution annealed after machining shall have metallographic and microhardness evaluation on test samples per requirements of 2.2.3h. Samples shall be provided from the same material, same fabrication shop and using the same process variables.

3.5.1 Cold Work Surface . The depth of cold work on the sample(s) shall be reported based upon any severely deformed, featureless surface layer plus near-surface cross-slip or curvature of twin boundaries and by microhardness readings. Microhardness measurements shall be made in series from the surface (first indication within 0.001 inch of the surface) to a sufficient depth to demonstrate the variation of the hardness as a function of depth below the surface. Hardness data shall be reported in microhardness units and also converted to Rockwell units.

3.5.2 Cold Work Depth. The total depth of the surface cold work on the sample(s), including the heavily deformed, featureless surface layer shall be determined by metallography and microhardness and shall not exceed:

	XM-19 and X-750	316 Locking Pins	316 Lower Contact Surface
Featureless Layer	0.0003 inch	None Allowed	None Allowed
Twin Region	0.003 inch	0.002 inch	0.003 inch
Total	0.003 inch	0.002 inch	0.003 inch

3.6 Deleted.

3.7 Repair. Minor surface grinding or machining may be performed to remove surface defects or to change contour provided the following conditions are met:

a. The thickness of the section is not reduced to less than minimum required thickness.

b. The depression or ground area is blended uniformly into the surrounding surface with not less than a 4 to 1 taper.

c. After final grinding or machining, examine the surfaces by liquid penetrant to ensure that no unacceptable defects remain to demonstrate process capability.

d. Grinding or machining processes shall not introduce unacceptable surface coldwork or hardness in machining process qualification samples evaluated.

3.8 Deleted.

3.9 Final Surfaces. All nicks and scratches are to be removed. Surface finishes shall be uniform in appearance.

3.10 Shop Applied Practices. The buyer's specification Y1010A3, "Shop Applied Practices", shall be considered an integral part of the fabrication drawings, and be so implemented during fabrication and inspection.

3.11 Identification and Marking. Finished parts shall be marked as specified on the detail product drawings. Low stress interrupted dot stamping is an acceptable method of marking. Parts which are too small for practical marking may be identified by individual bagging and tagging.

4.0 Deleted.

5. QUALITY ASSURANCE

5.1 Submittals. Submittal requirements shall apply to the Fabricator and the Fabricator's subcontractors. The Fabricator shall be responsible for all submittals including those of the Fabricator's subcontractors. If any changes are made to the submittals, the Fabricator shall send revisions to the Buyer.

5.1.1 Required Submittals. The following items shall be submitted to the Buyer for approval prior to use:

a. Bending and forming procedures

b. Heat treating procedures

c. Deleted.

d. Nondestructive examination procedures

e. Packaging procedure

f. Results of the metallographic and microhardness evaluation of fabrication induced surface cold work in samples evaluated, that are not solution annealed after final fabrication. Samples shall be provided from the same material , same fabrication shop and using the same process variables.

g. Sampling procedures used to produce process capability test samples and finished parts.

5.2 Material Control. Material shall be controlled within the fabricator's shops under a quality assurance program which has been determined by survey/audit to meet material traceability and safety grade manufacturing practices as required by the Code of Federal Regulations 10 CFR 50, Appendix B, and 10 CFR, Part 21.

5.3 Inspection and Tests. All materials, part final surfaces, and welds (if any) shall be inspected for quality and cleanliness prior to the last operation which results in inaccessibility. Following such inspection, measures shall be taken to prevent the entry of soils into inaccessible areas during subsequent fabrication steps.

5.3.1 Liquid Penetrant Examination. All final part surfaces, except small inaccessible openings, shall be examined by the liquid penetrant method in accordance with E50YP22A, except that no cracking is permissible and linear indications shall not exceed 0.06 inch in length. Liquid

penetrant materials shall be in accordance with E50YP22 or buyer approved equivalent. Provision shall be made to avoid the entrapment of liquid penetrant materials in any inaccessible areas.

5.3.2 Radiographic Examination. Radiographic examination shall be performed on all structural welds, if any are allowed as a repair, in accordance with the ASME Code, Article NG-5000 and acceptance criteria in accordance with Subarticle NG-5320. Acceptance standards and penetrameters shall be based on the final section thickness.

5.3.3 Ultrasonic Examination. Material shall be ultrasonically examined in accordance with ASME Code Subsection NG, paragraph NG-2540, or a buyer approved equivalent procedure.

6. PREPARATION FOR SHIPMENT

6.1 General Requirement. Components fabricated to this specification shall be prepared and packaged for shipment in such a manner that the components will not be damaged or lost by handling or environment during transit, in accordance with the document in Paragraph 2.2.5.b.

6.2 Procedure. The Fabricator shall package the product in accordance with Buyer approved procedures.

6.3 Identification. The component(s), when prepared for shipment, shall be identified by the purchase order number and other pertinent information in such a manner that component(s) identity shall be maintained during shipment. When more than one component is included in a crate or package, the marking on the packaging shall indicate the identity and quantity of all parts.

Enclosure 4

GENE Installation Specification, 25A5698, Revision 1

Dresden 2 and 3 - Shroud Stabilizer Installation

GE Nuclear Energy

25A5698 SH NO. 1
REV.1

REVISION STATUS SHEET

DOC TITLE SHROUD STABILIZER

LEGEND OR DESCRIPTION OF GROUPS

TYPE: INSTALLATION SPEC

FMF: DRESDEN 2 & 3

MPL NO: PRODUCT SUMMARY SEC. 7

THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM ☒ NO ☐ EQUIP CLASS P

REVISION				C
0	RM-01950 3/10/95			
1	JL TROVATO APR 13 1995	RJA		
	CN02506 CHK BY: NA			

PRINTS TO

MADE BY	APPROVALS	GENERAL ELECTRIC COMPANY
1/20/95 M.D. POTTER	2/28/95 M.D. POTTER	175 CURTNER AVENUE SAN JOSE, CALIFORNIA 95125
CHK BY 1/23/95 J.L. TROVATO	ISSUED 3/10/95 R.J. AHMANN	CONT ON SHEET 2

MS-WORD

1. SCOPE

1.1 Purpose. This specification provides the engineering requirements for installing shroud stabilizers which replace the H1 through H7 horizontal shroud welds in the Dresden reactor assembly.

1.2 If any conflict exists between this document and any other document referenced herein, this document shall govern.

1.3 This document, along with the reactor modification and installation drawing, defines all the engineering requirements for installation of the shroud stabilizers.

1.4 As used herein, the term "Installer" refers to the company or personnel contracted by the Plant Owner to install the shroud stabilizers.

2. APPLICABLE DOCUMENTS

2.1 General Electric Documents. The following documents form a part of this specification to the extent specified herein.

2.1.1 Supporting Documents

a. 25A5688, Shroud Stabilizers Design Specification

b. 107E5719, Reactor (Modification & Installation)

c. 21A2040, Cleaning and Cleanliness Control

d. D50YP5, Nickel-Graphite Thread Lubricant

e. 112D6667, Contact, Lower

f. 112D6638, Lower Stabilizer (lower contact assembly)

g. 112D6666, Contact, Upper

h. 112D6642, Upper Stabilizer Assembly (upper spring assembly)

i. 112D6640, Tie Rod Assembly

j. 112D6671, Spring, Lower

k. 112D6677, Nut, Lock

l. 112D6673, Tie Rod-Spring Assembly

2.1.1 (Continued)

m. 112D6681, Support, Mid-Shroud

n. 112D6680, Mid Support Assembly

o. 112D6664, Support, Lower

p. 112D6639, Toggle Bolt Assembly

q. 112D6661, Washer, Toggle Bolt

r. 112D6660, Nut, Toggle Bolt

s. 112D6653, Pin, Clevis

t. 112D6641, Stabilizer Support Assembly

u. 112D5636, Bracket Yoke Assembly

v. 112D6645, Ring, Mid Support

w. 112D6734, Core Plate Wedge Assembly

2.1.2 Supplemental Documents

a. NEDC-31735P GE BWR Operator's Manual - Materials and Processes

3. DESCRIPTION

3.1 The purpose of the stabilizer installation is to structurally replace horizontal girth welds H1 through H7 in the shroud; weld designations and the design requirements for the stabilizers are defined in the Design Specification, Paragraph 2.1.1.a. The installation of the shroud stabilizers involves electric discharge machining (EDM) of some slots and holes in the existing structure, assembling the stabilizer hardware in the reactor, and preloading the threaded fasteners. No structural welding or defect removal by machining are involved.

4. RESPONSIBILITIES

4.1 The Installer shall accept full responsibility for his work. The Installer shall comply with the requirements of this document and the supporting documents listed herein.

4.2 The Installer shall take the responsibility for coordination of his work with the work of others including the coordination of work planning and radiation monitoring with the Plant Owner.

4.3 The Installer shall be responsible for providing all specialized handling, alignment, and installation equipment, as may be necessary to perform this work, except as otherwise agreed to by the Plant Owner.

4.4 The Installer, except as otherwise agreed to by the Plant Owner, shall be responsible for machining as specified and limited by the applicable modification drawing.

4.5 The Installer shall supply adequately qualified personnel for supervision and for performing the tasks required to complete the stabilizer installation.

5. REQUIREMENTS

5.1 General

5.1.1 During installation, the installer, except as otherwise agreed to by the Plant Owner, shall complete data sheets and quality control checksheets as required by the specifications and instructions listed in this document. The Installer shall also keep log notes, records, etc., for future reference. Video tapes shall be taken of the completed repair. Tabular data entries designated for as-built measurements on the installation drawing shall be recorded.

5.1.2 Procedures and installation equipment shall be developed and designed to minimize the potential of loose parts within the RPV.

5.1.3 Following completion of the installation of the stabilizers, verification, inspection and signoff shall be performed to ensure that all unnecessary objects have been removed from the RPV.

5.1.4 All uncontaminated tools shall be stored in an uncontaminated controlled area and brought to the work area only as needed for fit-up and installation.

5.1.5 Refer to Paragraph 2.1.2.a for miscellaneous consumables approved for use in the reactor vessel.

5.2 Personnel Safety

5.2.1 Radiation Control

5.2.1.1 All work shall be done with the concurrence of and per the instructions of the authorized site Health Physics Personnel. At no time shall their requirements for dosimeter monitors, protective clothing or devices, time limits, exposure limits, etc., be violated.

5.2.1.2 Machining on contaminated surfaces, as required, shall be done in accordance with Health Physics and Safety Personnel requirements.

5.2.1.3 Radiation control practices shall be used to reduce exposure to workers to levels which are as low as reasonably achievable (ALARA).

5.2.2 Safety Precautions

5.2.2.1 Concern for personnel safety shall govern all work operations. All personnel working in hazardous locations shall be under constant surveillance by other personnel. All electric equipment shall be grounded or double insulated. Welding cables and leads shall be in good condition.

5.2.2.2 All work areas shall be kept neat and orderly. Protective measures and devices shall be used to keep all tools, equipment, and materials from inadvertently dropping into the RPV.

5.2.2.3 Care shall be exercised to keep contamination of articles which must enter and leave contamination zones to a minimum. In all cases, site radiation control requirements shall be met.

5.3 Cleaning and Cleanliness Control

5.3.1 During this stabilizer installation program, cleaning and cleanliness control shall be in accordance with the document listed in paragraph 2.1.1.c. In addition, no graphite lead pencils are allowed to contact stainless steel and nickel alloys.

5.4 Prerequisites

5.4.1 Jet Pump Throat Covers. Prior to the shroud stabilizer installation jet pump throat covers shall be installed as required.

5.4.2 Reactor Temperature. The reactor water temperature shall be less than 100°F, however the RHR shutdown cooling flow must be off whenever the installation activity in progress involves critical remote underwater handling in the annulus area.

6. INSTALLATION REQUIREMENTS

6.1 The installation sequence described below is not itself mandatory, so long as all specified installation requirements are accomplished. To assist in evaluating alternative sequences, the intent of some requirements, which are not self evident, are summarized in the step description.

6.2 Install protective shielding for the feedwater sparger and core spray line during operations that have the potential to damage their components as determined by the installer.

6.3 Go-gage checks shall be performed to ensure there are no weld fillets that interfere with the installation of the lower support.

6.4 Using a go, no-go gage, assure that there is visible clearance between the jet pump lifting eyes and the upper support hardware. Report any potential hardware interference to GENE Engineering for final disposition.

6.5 Using go, no-go gage, assure that there is at least 0.6 inches of clearance between the shroud and each of the ten (10) jet pump riser braces. If there is less than 0.6 inches clearance, measure the clearance and report it to GENE Engineering for disposition prior to installation.

6.6 Measure and record the annulus width at the top guide support ring and at the core plate support ring elevations as shown on the 107E5719 modification and installation drawing. Examine the RPV and shroud contact areas to assure that there are no abrupt discontinuities that would interfere with the repair hardware; if so, EDM spotface these areas flush, as necessary. The surface finish shall be 750 RMS or better The vessel and shroud contact locations of the final stabilizer parts shall be simulated in taking these measurements.

> CAUTION: Several piece parts are to be machined based on in-reactor measurements at a specific reactor azimuth. These parts shall then be designated by specific serial number, as recorded on the as-built data table on drawing 107E5719, for that specific azimuth.

6.7 Based on the in-reactor measurements, machine the RPV contact surface of the lower contact, drawing 112D6667 as shown on the 107E5719 modification and installation drawing. Assemble the lower contact as shown on the lower stabilizer assembly, drawing 112D6638.

6.8 Based on the in-reactor measurements, machine the RPV contact surface of the upper contact, drawing 112D6666, as shown on the 107E5719 modification and installation drawing. Assemble the upper contact as shown on the upper stabilizer assembly, drawing 112D6642.

6.9 Locate the proper location on the shroud as shown on the 107E5719 modification and installation drawing. Machine (EDM) slots in the shroud as specified on the 107E5719 modification and installation drawing. The slot surface finish shall be 750 RMS or better.

6.10 In accordance with the 107E5719 modification and installation drawing, machine (EDM) two holes in shroud support plate. EDM swarf shall be captured to the maximum extent practical.

6.11 Hone the holes in the shroud support plate. To assure the removal of microfissures from the EDM holes in the shroud support plate, the hone operation shall remove a minimum of 0.005 inch from the inside surface of the hole while meeting the final hole size requirement on the 107E5719 modification and installation drawing.

6.12 Install lower support, 112D6664, over the two shroud support plate holes using two toggle bolt assemblies, 112D6639, and two toggle bolt washers, 112D6661, and two toggle bolt nuts, 112D6660, and the two lock nuts, 112D6677, as shown on the 107E5719 modification and installation drawing. Lubricant (D50YP5B) shall be applied to the threaded surfaces. Tension the two toggle bolts to the tensile force specified on the 107E5719 modification and installation drawing, torque the two toggle bolt nuts in accordance with 107E5719 while the toggle bolts are tensioned. Remove the tensioning tooling and tighten the lock nuts in accordance with 107E5719. Inspect to verify correct installation of the lower support. Crimp the toggle bolt lock nuts, and inspect for proper crimping of the retainers.

6.13 Install the clevis pin, 112D6653, in the mating hole of the lower support in accordance with the requirements of the 107E5719 modification and installation drawing.

6.14 Complete the tie rod-spring assembly. Assemble the tie rod, assembly drawing 112D6640, with the lower spring, drawing 112D6671 (drill pin hole and install lock pin), and the lower stabilizer, drawing 112D6638 as shown on the tie-rod spring assembly drawing 112D6673 (lower stabilizer is rotated 180° from that shown on drawing). Lubricant (D50YP5B) shall be applied to the threaded surfaces.

6.15 Temporarily protect the exposed tie rod thread from damage.

> CAUTION: Maneuvering of the tie rod-spring assembly must be done with extreme care to avoid damaging reactor hardware such as the jet pump sensing lines.

6.16 Install the tie rod-spring assembly, 112D6673, in accordance with the requirements of the 107E5719 modification and installation drawing. Maneuver lower spring clevis over clevis pin and support vertically.

6.17 Position the bracket yoke assembly, 112D5636, in the reactor vessel at the proper elevation above the tie-rod thread protector. The yoke is to be suspended at an elevation which facilitates assembly with the upper support assemblies.

6.18 Position the right-hand and left-hand stabilizer support assemblies, 112D6641P001 and P002, outboard of the respective ends of the bracket yoke assembly. Then position the upper stabilizer support assemblies in the shroud flange pockets, in accordance with the requirements of the 107E5719 modification and installation drawing.

6.19 Remove the temporary thread protection from the tie rod. Install the tie rod nut and torque in accordance with the requirements of the 107E5719 modification and installation drawing. Verify that the tie rod nut is properly locked by its retainers. Lubricant (D50YP5B) shall be applied to the nut threaded surfaces.

6.20 Rotate and position the lower stabilizer assembly, 112D6638, as shown on the 107E5719 modification and installation drawing. Verify that the lower stabilizer assembly latch is engaged in the tie rod slot.

6.21 Measure the radial gap from the tie rod to the vessel wall and the radial gap from the tie rod to the shroud outside surface at the mid support elevation in accordance with 107E5719. Bowing of the tie rod should be minimized while taking these measurements. The vessel contact locations of the mid support shall be simulated in taking these measurements. Based on this in-reactor measurement, machine the contact surfaces of the mid support, drawing 112D6681, in accordance with the requirements of the 107E5719 modification and installation drawing.

6.22 Install the mid support assembly, 112D6680, in accordance with the requirements of the 107E5719 modification and installation drawing. Verify that the mid support latches are engaged over the mid support ring (112D6645).

6.23 Install upper stabilizer (spring) assemblies, 112D6642, in accordance with the requirements of the reactor modification drawing. Lubricant (D50YP5B) shall be applied to the 0.50 inch slot areas and the jacking bolt (threaded and sliding surfaces). Engage with stabilizer support assembly and adjust the jacking bolt as specified on the 107E5719 modification and installation drawing to preload the upper spring. Check that the spring retainers are properly engaged to lock the jacking bolt.

6.24 Remove the protective shielding for the feedwater sparger and core spray line.

6.25 Repeat steps 6.2 through 6.24 for the installation of stabilizer hardware at the remaining azimuth locations.

6.26 If required, install the Core Plate Wedge Assemblies, 112D6734, in accordance with the requirements of the 107E5719 modification and installation drawing.

7. EXAMINATION AND TESTING

7.1 Visual Examination. Visually examine the stabilizer installation preparations to verify that all of the required holes have been machined in the proper locations and that all debris has been removed from the area. Visually examine the installed stabilizers to verify compliance with the 107E5719 modification and installation drawing.

8. RECORDS AND SUBMITTALS

8.1 Prior to implementation of this stabilizer installation program, the following procedures shall be submitted by the Installer and approved by the Owner.

8.1 (Continued)

a. Installation and inspection procedures including sequence data sheets, measurement data sheets, quality control checksheets, drawings, sketches, instructions, etc..

b. Cleaning and cleanliness control procedures.

c. Machining procedures as applicable.

d. As-built drawing (data required by 107E5719).

8.2 After implementation of this stabilizer installation program, all recorded data records, photographs, video tapes, logs, etc., shall be submitted by the Installer to the Owner for file and information within 30 days. The 107E5719 modification and installation drawing shall be updated to incorporate the in-reactor as-built measurements, and the as-built measurements with corresponding serial numbers of the parts machined as part of the installation process. One copy shall be submitted to GENE within 30 days.

9. DEVIATIONS AND SUBSTITUTIONS

9.1 All deviations, as a result of damaged equipment, nonconforming conditions, or any proposal by the Installer for substitutions, modifications, or relaxation of the specified materials, procedures or design shall be submitted to the Owner for consideration and approval.

Enclosure 5

GENE 771-81-1194, Revision 1

Commonwealth Edison Company
Dresden Nuclear Power Plant Units 2 & 3
Shroud and Shroud Repair Hardware Analysis
Volume I, Shroud Repair Hardware