

PHILADELPHIA ELECTRIC COMPANY

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JUN 20 1984

JOHN S. KEMPER
VICE PRESIDENT
ENGINEERING AND RESEARCH

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Limerick Generating Station
Design Verification Program, Unit 1

References: 1) A. Schwencer to J. S. Kemper letter,
dated May 15, 1984
2) J. S. Kemper to A. Schwencer letter,
dated May 6, 1984

File: GOVT 1-1 (NRC)

Dear Mr. Schwencer:

The reference 1) letter requested additional information concerning the design experience of Torrey Pines Technology reviewers. Enclosed are 15 copies of completed experience forms for each of the reviewers. The summary, also enclosed, reflects the Task assignments for each reviewer.

Sincerely,

JW Sullivan
for
JS Kemper

See Attached Service List

GJB/pd 17/2

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PDR ADDCK 05000352
A PDR

3001
1/14

cc: Judge Lawrence Brenner (w/o enclosure)
Judge Richard F. Cole (w/o enclosure)
Troy B. Conner, Jr., Esq. (w/o enclosure)
Ann P. Hodgdon, Esq. (w/o enclosure)
Mr. Frank R. Romano (w/o enclosure)
Mr. Robert L. Anthony (w/o enclosure)
Charles W. Elliot, Esq. (w/o enclosure)
Zori G. Ferkin, Esq. (w/o enclosure)
Mr. Thomas Gerusky (w/o enclosure)
Director, Penna. Emergency (w/o enclosure)
Management Agency
Angus R. Love, Esq. (w/o enclosure)
David Wersan, Esq. (w/o enclosure)
Robert J. Sugarman, Esq. (w/o enclosure)
Spence W. Perry, Esq. (w/o enclosure)
Jay M. Gutierrez, Esq. (w/o enclosure)
Atomic Safety & Licensing (w/o enclosure)
Appeal Board
Atomic Safety & Licensing (w/o enclosure)
Board Panel
Docket & Service Section (w/o enclosure)
Martha W. Bush, Esq. (w/o enclosure)
Mr. James Wiggins (w/o enclosure)
Mr. Timothy R. S. Campbell (w/o enclosure)
Ms. Phyllis Zitzer (w/o enclosure)
Judge Peter A. Morris (w/o enclosure)

EXPERIENCE SUMMARY

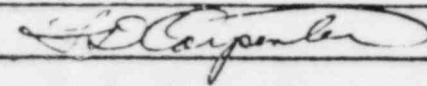
| <u>Project Management</u> | <u>Years Experience</u> | <u>(Design)</u> | <u>Average</u> |
|-------------------------------|-------------------------|-----------------|-------------------|
| F. D. Carpenter | 33 | | |
| <u>PFR Committee - Task E</u> | | | 27.8 |
| S. L. Koutz | 28 | | |
| F. O. Hall | 29 | | |
| T. R. Colandrea | 25 | | |
| A. M. Harris | 25 | | |
| R. G. Wunderlich | 32 | | |
| <u>Tasks A & B</u> | | | 12.8 |
| S. Bresnick | 18 | | |
| W. P. Malay | 28 | | |
| R. B. Patten | 1 | | |
| K. J. Baylor | 12 | | |
| <u>Tasks C & D</u> | | | $\frac{17.}{15.}$ |
| A. A. Schwartz | 22 | (Design- 11) | |
| J. D. Stanley | 35 | 35 | |
| W. R. Arnold | 15 | 15 | |
| L. E. Penzes | 15 | 15 | |
| E. P. Gagnon | 15 | 15 | |
| C. F. Dahms | 5 | 3 | |
| F. T. Lin | 16 | 16 | |
| P. K. Patel | 13 | 13 | |

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|---------------------|--|---|
| Feb 1957 to present | GA Technologies, Inc San Diego, CA (27+ years) | Research, development, design, and manufacture in nuclear materials technology for HTGR reactors (Peach Bottom, Ft. St. Vrain). Design and construction of inpile experiments for the TRIGA, MTR, ETR, GETR test reactors including testing and operation phases. Development and implementation of QA programs associated with nuclear power NSS suppliers. Project and Program management of independent design verification and quality systems evaluation for major safety systems in nuclear power plants. Directed nuclear materials management, health physics programs, nuclear hot cell facility, nuclear waste processing facilities, and licensing activities for SNM handling and reactor operations. |
| 1951 to 1957 | U.S. Navy Electronics laboratory (5yrs.) U.S. Naval Air Station (1 yr.) | Materials engineering technology associated with the development, design, and manufacture of navy electronic systems and hardware. Chemical, metallurgical, and physical testing of materials for U.S. Naval Station. |

TOTAL EXPERIENCE YEAR(S) 33 MONTH(S) 4

SIGNATURE


DATE 5/31/84

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|---------------------|---|
| 1956 to present | GA San Diego, CA | <p>HTGR design, LWR design reviews</p> <ul style="list-style-type: none"> o Chief Engineer reporting to Vice President on engineering and technical issues o Chairman of Potential Findings Committee for all IDVPs on LWRs o Director - Plant Engineering Division responsible for design and development of gas-cooled reactor systems (HTGR & GCFR) o Director - New Concepts Division for work on gas turbine cycle power plants, process heat and heat dissipation systems, and fusion power plants o Technical Director of Asia-Pacific Division of General Atomic International o General Manager of Gas-Cool Reactor Division for 300 MW(e) power plant design, start-up of Peach Bottom #1 and Fort St. Vrain gas-cooled reactors o Manager of the design and installation of the first TRIGA test reactor and a prime contributor in the nuclear and engineering analysis of the TRIGA reactor series. |

TOTAL EXPERIENCE YEAR(S) 28 MONTH(S) _____

SIGNATURE

S. L. KoutzDATE 6/1/84

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|-------------------|--------------------------------|---|
| 55 TO 2-63 | Westinghouse Bethesda Plant | Designed steam generators and main condenser pumps for PWR primary coolant systems Designed heat exchangers, demineralizers and filters for PWR purification systems |
| -63 TO present | GA Technologies | Designed 14 systems for HTGR at Ft. St. Vrain. Spent 7 months starting up and troubleshooting all FSV systems Spent 11 months as Sr. Technical Advisor during FSV start to power Branch Manager for Fluid System Design of Philadelphia Electric and Pullman 1100 MWe HTGRs Served on Potential Findings Review Committee for Shoreham, Palo Verde, Windsor and Marble Hill design reviews. |

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|--------------------------|--|
| 59 to 9/65 | PRATT & WHITNEY AIRCRAFT | Manufacturing Metallurgist. 2 Yrs out (from 6/60 to 6/62) as an Officer in the US Army |
| 60 - 9/66 | ELECTRIC BOAT | Mat'l Engrng Supervisor |
| 66 - 1/74 | COMBUSTION ENGG | Design Liaison - Mat'l Supervisor, Nuclear Lab until 1969; QA Systems Dept Mgr. |
| 64 to Present | GA | Quality Systems Mgr to 7/76 QA Mgr to 6/84 QA & Compliance Director ... to present |

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|---------------------------|--|
| 1959 | General Atomic, SD | Head of Engineering Analysis. Peach Bottom HTGR Project |
| 1960 | " | Section Chief Reactor Design. In charge of Peach Bottom reactor vessel, control and emergency rod and fuel handling equipment design and development |
| 1982 | " | Associate Manager - Reactor Plant Engineering. In charge of NSS plant preliminary design (excluding core), including prototype component development (ESADA and RG&E Brookwood Proj.) |
| 1965 | " | Associate Manager - Reactor plant engineering for Fort St. Vrain Project. In charge of NSS preliminary design (excluding core), including prototype component development. Participated in PCRV development and plant licensing. |
| 1967 | " | Associate Division Manager - Large HTGR. Participated in conceptual and preliminary designs for large steam-cycle HTGR power plants and for a possible helium direct-cycle gas turbine HTGR power plant. |
| 1970 | " | Senior Technical Advisor - HTGR Engineering. Involved in analysis of Fort St. Vrain startup problems and rectification. Pursued technical liaison with GA's German licensee. Became familiar with pebble bed reactors including THTR. Also involved in review and development of Large HTGRs for Delmarva, Philadelphia Electric, etc. |
| 1975 | " | Department Manager - Preliminary Design. Responsible for design studies of an alternate large steam cycle HTGR power plant, contributing to component design, and for direct cycle HTGR and steam-cycle GCFR plant studies. |
| 1980 | GA Technologies Inc SD | Senior Technical Advisor - HTGR Engineering. Design Review Board member and principal reviewer for systems engineering of 2240 MW and 1160 MW revised Large HTGR designs. |

PROFESSIONAL EXPERIENCE YEAR(S) 25 MONTH(S) 2 SIGNATURE A.M. Harris DATE 6/1/84

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|----------------------|----------------------------------|---|
| 1952 ↓ 5/64 | A.O. SMITH CORP MILWAUKEE, WI | DESIGN OF COMMERCIAL AND NAVY NUCLEAR POWER PLANT COMPONENTS I.E. REACTOR VESSELS, STEAM GENERATORS, PRESSURIZERS. |
| 6/64 ↓ PRESENT | GA TECHNOLOGIES | ENGINEERING AND ENGINEERING MANAGEMENT POSITIONS ASSOCIATED WITH DESIGN, FABRICATION AND ERECTION OF HTGR PLANT COMPONENTS, I.E. PCRV, LINERS, THERMAL BARRIER, STEAM GENERATORS. |

TOTAL EXPERIENCE YEAR(S) 32 MONTH(S) —SIGNATURE R. G. Wunderlich DATE 5/20/84

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|--------------------|--|
| 74-present | GA TECHNOLOGIES | Auditing of fuel fabrication. Management of program for independent design + construction verification at Shoreham, Pals Valley, for Oyster, and Poudre Hill plants. |
| 1966-1974 | BUEF NUCLEAR FUELS | Development Development of manufacturing processes, inspection processes, and specifications for low enriched fuel. Surveillance of fuel fabrication activities. QA program development and management for fuel design and manufacturing. |

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|---|---|
| 1952-5/54 | Westinghouse Elec. Corp, Bettis Lab., Pittsburgh, Pa. | Nuclear Power Plant: Fluid systems design engineer - first nuclear powered submarine and its prototype. Responsible for preparation P&ID, systems description, sizing pumps, valves; preparation equipment specifications |
| 1955-11/57 | Bettis Laboratory | Same as above for next generation of submarines. Also served one year as project engineer interfacing with testing operations on the prototype plant. |
| 1957-12/65 | W'house - Resident Mechanical Engr at Mare Is. Naval Shipyard, Vallejo, Ca. | Represented NSSS on (1) resolution and disposition shipbuilder identified problem/deficiencies of equipment (2) check-out and testing of installed equipment and systems for new construction modification, overhaul, and refueling. |
| 1966-10/66 | W'house - Submarine Air Craft Carrier Nuclear Prototype Site, Idaho Falls | Prepared repair and modification procedures for components and fluid systems associated with the primary plant. |
| 1966-12/72 | General Atomic Co. San Diego, Ca. | Quality Engineer - Assigned the Quality responsibilities for components control rod drives, steam generators, various ASME nuclear class pressure vessels, piping, valves. |
| 1973-12/75 | " | Branch Mgr., Procurement and Quality Engineering - responsible for assuring quality requirements were specified in design documents, drawings, specifications, and the preparation of inspection plans, and the review of supplier documentation. Branch Manager, Quality Compliance - responsible for inspection of equipment at suppliers plant, surveys and evaluations of suppliers. |
| 1976-12/79 | Southern Cal Edison Co., San Onofre San Clemente, Ca. | Site QA Engineer at commercial nuclear operating power plant. Performed audits for compliance to Station Orders, Station Operating Procedures, Technical Specifications, and regulatory requirements. Performed surveillance on repair, modification, and refueling activities. |
| 1980-12/82 | General Atomic | Performed internal audits of all divisions. |

TOTAL EXPERIENCE YEAR(S) 28 MONTH(S) _____

SIGNATURE W. P. Malay DATE 6/1/84

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|--|--|
| 6/83 - 7/83 | GA @ MARBLE HILL NUCLEAR GENERATING STATIONS UNITS 1 & 2. MARBLE HILL, INDIANA | REVIEW OF SAFETY-RELATED EQUIPMENT MAINTENANCE AND STORAGE AND THEIR COMPLIANCE WITH RELEVANT PROCEDURES & CONCRETE TESTING AND INSPECTION. DATA PACKAGE REVIEW FOR ACCURACY AND COMPLETENESS AND DATA ANALYSIS FOR FINAL REPORT |
| 9/82 - 11/82 | GA @ SUSQUEHANNA STEAM ELECTRIC STATION. DEWICK, PENN. | INSPECTION OF REACTOR CONTROL ROOM COMPONENTS, DATA COMPILATION FOR NUCLEAR SAFETY EQUIPMENT QUALIFICATIONS AND PHOTOGRAPHING KEY COMPONENTS FOR INCLUSION WITH DATA PACKAGES. |
| 7/82 - 10/82 | GA @ SHOREHAM NUCLEAR POWER PLANT. SHOREHAM, N.Y. | REVIEW OF DATA PACKAGES FOR ACCURACY AND COMPLETENESS, WALKDOWN RECLASSIFICATIONS, AND DATA ANALYSIS FOR THE FINAL REPORT |

TOTAL EXPERIENCE YEAR(S) _____ MONTH(S) ~ 7 1/2 MONTHS
SITE EXPERIENCE

SIGNATURE R.B. Patten

DATE 5-30-87

PROJECT 2524

Reviewer K. J. BaylorLIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCEEngineer
B.S. in Physics-
Penn State Univ.

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|---|---|
| 1-84 | GA Technologies, Inc San Diego, CA | <ul style="list-style-type: none"> o Quality Assurance Reviews of: San Onofre 2 (Seismic Review) Palo Verde 1, 2, 3 (Design Control) Waterford 3 (Design Control) Marble Hill 1, 2 (Construction Review) o Equipment Qualification Analyses for Susquehanna 1, 2 o Nuclear Analysis and Shielding Calculations for Generic Studies and for Peach Bottom Control Rods in the FSV-1 Shipping Cask o Stress Analysis (Thermal) in HTGR Fuel Blocks |
| Dec 1980 | GA Technologies, Inc San Diego, CA | <p>On loan to Bechtel Power Corp., Norwalk, CA to perform nuclear analysis and shielding work for</p> <ul style="list-style-type: none"> o Vogtle 1, 2 o Maanshan 1, 2 o Kuosheng 1, 2 o Korea 5, 6 |
| 76 - 80 | GA Technologies, Inc San Diego, CA | <ul style="list-style-type: none"> o Analysis and determination of nuclear performance characteristics of gas-cooled fast breeder reactor. Calculations of breeding ratio, mass flows, blanket shuffling effects, recriticality of slumped cores, power distribution, effect of steam entry on criticality, sensitivity of performance to fuel types using diffusion theory, transport theory and auxiliary codes. Reporting in detail on the methods and calculational results. |
| 64-57 | Convair, San Diego, CA | <ul style="list-style-type: none"> o Preliminary studies of radiation effects on humans, materials, components, and systems for proposed nuclear-powered airplane. |
| 62-54 | GE - Knolls Atomic Power Lab, Schenectady, N.Y. | <ul style="list-style-type: none"> o Analysis of radiation effects on properties of metal cladding, elastomeric seals, etc., for nuclear submarine "Seawolf." |

EXPERIENCE YEAR(S) 12 MONTH(S) _____SIGNATURE Katherine J. Baylor DATE 06/01/84

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|----------------------|--|
| 72 - Present | GEA, San Diego, CA | <p>Engineering task leader for Independent Review and Physical Verification of Waterford SES Unit 3 Emergency Feedwater System</p> <p>Coordinated technical review of Palo Verde Units 1, 2, and 3. Also served as lead engineer for structural review.</p> <p>Identified review features for seismic review of San Onofre Units 2 and 3; and performed technical review of structures and components.</p> <p>Performed piping analysis for LWR plants.</p> <p>Responsible engineer for filter related modifications to Rancho Seco plant.</p> <p>Responsible engineer for liners, penetrations, closures, and cooling water systems in PCRV for HTGR plants.</p> <p>Lead engineer for development and testing of a circumferential prestressing system for PCRVs.</p> |
| TOTAL EXPERIENCE | YEAR(S) <u>11/22</u> | MONTH(S) <u>8/4</u> SIGNATURE <u>A. Schwartz</u> DATE <u>6/1/84</u> |

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|------------------------|--|
| 9-1984 | GA | <ol style="list-style-type: none"> Mechanical Section Leader, Peach Bottom 1 (Steam Generators, Helium Circulators, Primary Coolant Piping & Reactor Auxiliary Systems) Section Leader, Ft. St. Vrain, piping and valves. Gas Turbine HTGR, (BOP design and plant costs) HTGR Process Heat and Process Steam/Cogeneration Plant (preliminary design, heat cycles and economics) Previous Nuclear Plant independent design reviews and equipment modification reviews (SOWGS, PP&L, Palo Verde, LPL) |
| 6-1959 | Aero-jet/General Corp. | Mechanical Section Leader, Gas-cooled Reactor Experiment |
| 9-1953 | Giffels & Voth, Inc. | Piping Design, Gas Diffusion Uranium Enrichment Plants. |

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYER | ACTIVITIES |
|-----------------|--|
| GA TECHNOLOGIES | PARTICIPATED IN CONTROL ROOM DESIGN REVIEWS ON SOUTH TEXAS PROJECT, PILGRIM NPS, INDIAN POINT 2, AND KEWAUNEE NPS. |
| 2 TO PRESENT | PARTICIPATED IN INDEPENDENT VERIFICATION OF SHOREHAM NPS. |
| 2 TO 10-82 | WORKED ON EQUIPMENT QUALIFICATION PROGRAM FOR SUSQUEHANNAH NPS, UNIT 1 |
| 1 TO 6-82 | REVIEWED EQ DATA FOR PALO VERDE NPS. |
| 1 TO 8-81 | DESIGN OF BOP LOOP & LOGIC DIAGRAMS FOR KORI 5 & 6 (AT DECENTEL OFFICES) |
| 1 TO 2-81 | DESIGN WORK ON LARGE HTGR PLANT PROTECTION SYSTEM |
| 1 TO 2-80 | REVIEW OF STARTUP ANOMOLIES & DESIGN CHANGES FOR FORT ST. VRAIN NGS. |
| 5 TO 8-79 | DESIGN WORK ON LARGE HTGR PLANT PROTECTION SYSTEM. |
| TO 2-75 | SITE ELECTRICAL ENGINEER AT FORT ST. VRAIN - RESPONSIBLE FOR CONTROL ROOM AND INSTRUMENTS ASSOCIATED WITH THE PCRV - INTERIORS AND ADJACENT. |
| TO 6-73 | DESIGN OF PLANT PROTECTION SYSTEM FOR FORT ST. VRAIN. |
| TO 3-70 | |

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYER | ACTIVITIES |
|------------------------------------|--|
| to Present GA Technologies Inc | Staff Engineer. Seismic analysis and design of GCFR and HTGR Flow induced stability studies of nuclear reactors. Stress analysis of nuclear reactor components. Stress analysis of <u>steam generators</u> . Principal NSS Engineer. Pump and flow induced vibration analysis of reactor components. Creep buckling analysis of fuel cladding. stress and <u>seismic analysis</u> . |
| - 6/74 Combustion Engineering Inc. | Assistant to Chief Engineer of Pumps. General pump design for power plants. Study of Vibration and water hammer effects in pumps. Stress analysis. |
| - 5/63 Foster Wheeler Corp. | |

LIMERICK INDEPENDENT DESIGN REVIEW
TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|------------------|-----------------|---|
| 1969 to present | GA TECHNOLOGIES | <ol style="list-style-type: none"> 1. Performed simulation studies and evaluations of nuclear power plant transient performance/safety analyses, control systems, control room configurations and plant startup procedure. 2. Senior Technical Representative @ FSU responsible for technical coordination & guidance on conduct of evaluation of startup test program 3. Developed safety/licensing positions, criteria & specification for various applications of nuclear power plants. 4. Developed nuclear power plant transient performance specifications, including a method for deterministic safety evaluations of core cooling capabilities to guide ^{residual} advanced heat removal capabilities. 5. Evaluated nuclear power plant systems & components to identify & prioritize technical, safety & licensing issues. 6. Performed environmental qualification review of electrical equipment in nuclear power plants including development of justified for interim plant operation with unqualified equipment. 7. performed an independent review of Environmental Report for a nuclear power plant. 8. Identified the minimum number of systems & components of a nuclear power plant to achieve cold shutdown (minimum path to cold shutdown). |

AL EXPERIENCE YEAR(S) 15 MONTH(S) 0

SIGNATURE E. P. Gaffney

DATE 5-31-74

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | Nuclear Experience: | ACTIVITIES |
|------------------|----------------------|---------------------|--|
| 9-9/79 | GA Technologies, Inc | | In Structural Engr. Dept., assisted in stress analysis of GCFR core support structure. |
| 9-9/80 | San Diego, Cal. | | In Structural Engr. Dept., performed stress analysis on graphite post/seat for core support structure of an HTGR. |
| 1-10/81 | " | | In General Engineering Dept, performed inelastic stress analysis of HTGR reheater tubing experiencing cyclic loading at high temperature. |
| 1-12/81 | " | | In Gen. Engr. Dept., performed electric equipment walkdown at a BWR, and assisted in equipment qualification program. |
| 1-3/82 | " | | In Gen. Engr. Dept., performed seismic design review of a PWR and assisted in writing procedure for review program. |
| 2-8/82 | " | | In Materials Engr. & Testing Dept., performed fossil fired power plant research (steam generator). |
| 2-9/82 | " | | In Gen. Engr. Dept., performed mechanical equipment and piping walkdown at a PWR. |
| 2-7/83 | " | | In Mat. Engr. & Testing Dept., performed magnetic load analysis and stress analysis for a fusion reactor first-wall/blanket structure. |
| 2-8/83 | " | | In Gen. Engr. Dept., performed structural walkdown at a PWR and assisted in selection of items to be reviewed in walkdown. |
| 2-present | " | | In Mat. Engr. & Testing Dept., performed fracture analysis of HTGR superheater and superheater and reheater tubing. Also performed thermal stress and fracture analysis of a fission reactor first-wall. |

EXPERIENCE YEAR(S) 35 MONTH(S) 5

SIGNATURE

Charles E. DahmsDATE 6/1/84

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|-------------------------|----------------------|--|
| 17-'68 to present | GA Technologies Inc. | <p>Acted as a project engineer for construction, supervision and inspection of TRIGA MARK II Reactor shield structure at Savar Bangladesh for Bangladesh Atomic Energy Commission.</p> <p>Participated in the independent construction review of Marble Hill Nuclear Generating Station Units 1 and 2 for Public Service Indiana. Acted as team leader of civil structural inspection group and walked down for verification of reinforced concrete structures, steel structures and cable tray supports of selected safety-related systems. Prepared walkdown procedures and final walkdown reports.</p> <p>Performed the design reviews of condensate storage pool, steam generator support and sliding base and cable raceway supports for Louisiana Power & Light, Waterford Steam Electric Station Unit 3. Also reviewed the on-site construction design at the field.</p> <p>Participated in New York Long Island, Shoreham Nuclear Power Plant construction independent verification program. Acted as a team leader of pipe support verification walkdown and inspected 29,000 pipe supports. Prepared walkdown procedures and final walkdown report.</p> <p>Performed a seismic design review of safety injection system connecting to reactor coolant nozzle 1A for San Onofre Nuclear Power Units 2 and 3.</p> <p>Performed stress analysis of Class 1 piping safety injection lines for San Onofre Nuclear Generating Station and Palo Verde Nuclear Generating Station.</p> <p>Performed seismic analysis and prepared a Design Report of underground prestressing concrete pipes for nuclear service cooling water system, Korea Nuclear Units 5 and 6.</p> <p>Author of design reports (equivalent to FDAR and FSAR) on structural design of containment building and fuel building, Korea Nuclear Units 5 and 6.</p> |

EXPERIENCE YEAR(S) 15 MONTH(S) 11

SIGNATURE

Frederick LinDATE May 31, '84

LIMERICK INDEPENDENT DESIGN REVIEW
 TECHNICAL REVIEWERS - NUCLEAR PLANT DESIGN EXPERIENCE

| EMPLOYMENT DATES | EMPLOYER | ACTIVITIES |
|---------------------|------------------------|--|
| -6/72 | Foster Wheeler Corp. | Design and stress analyses of an intermediate heat exchanger which transports heat energy from a primary sodium to the secondary sodium loop. The equipment was designed per ASME Code criteria for the FFTF. (Associated with this task from 6/70 to 6/72) |
| -6/74 | Gulf United Fuel Corp. | Performed design and stress analyses on a two mechanical components, namely, Dump Heat Exchanger (sodium to air) and cold trap for the FFTF. Both components were analysed based on the ASME Code criteria for elevated temperature operation (1331-5) |
| -8/81 | General Atomic | <ol style="list-style-type: none"> 1) Conceptual design and analyses of the various components including PCRV, reactor containment, heat exchanger, thermal barrier, etc., for a direct cycle HTGR. Analysis were performed using either hand calculations or finite element programs. 2) Work as consultant to Bechtel's Los Angeles Power Division. Carried out Class 1 and Class 2 piping analyses on the different projects including ANPP units 1, 2, & 3, San Onofre Units 2 & 3, Korea Units 5 & 6. |
| -6/83 | Cygn Energy Services | <ol style="list-style-type: none"> 1) Piping support design and analyses for Diablo Canyon Unit 1 2) Equipment qualification of mechanical equipment for Washington Power WNP 2 3) Block wall design and analysis for Boston Edison |
| -present | GA Technologies Inc. | |

EXPERIENCE YEAR(S) 13 MONTH(S) —

SIGNATURE

R. K. Patel

DATE

6/5/84