Attachment 3 to Transnuclear, Inc. Expression of Interest and Comments on DOE's Notice of Waste Acceptance, Storage, and Transportation Services, FR Doc. 96-13244, dated 5-24-96.

TRANSNUCLEAR, INC.

SUMMARY OF TRANSNUCLEAR'S CAPABILITIES AND EXPERIENCE RELEVANT TO STORAGE AND TRANSPORTATION SYSTEMS AND TRANSPORTATION SERVICES FOR SPENT FUEL, RADIOACTIVE WASTE, AND OTHER RADIOACTIVE MATERIALS

FEBRUARY 1996

TRANSNUCLEAR, INC.

Capabilities and Experience Relevant to Storage and Transportation Systems and Transportation Services for Spent Fuel, Radioactive Waste and other Radioactive Materials

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TRANSNUCLEAR, INC.

Capabilities and Experience Relevant to Storage and Transportation Systems and Transportation Services for Spent Fuel, Radioactive Waste and other Radioactive Materials

I. INTRODUCTION

Transnuclear, Inc. provides specialized services for the nuclear fuel cycle that support transportation, storage, and handling of spent nuclear fuel, radioactive waste, and other radioactive materials. Transnuclear was incorporated in the State of New York in 1965.

Transnuclear, Inc. has been involved in the design, analysis, fabrication, testing, certification and operation of numerous packagings for spent fuel, radioactive waste, and other radioactive materials for nearly three decades. During this time Transnuclear has developed and demonstrated the full capabilities required for successful support of customer needs for procurement and operation of spent fuel canisters, and transportation and storage systems. This expertise is not limited to the packagings themselves, but extends to all considerations needed for operation, such as canister lifting and handling equipment, vacuum drying equipment, transport frames and trailers, operating procedures, training, and quality assurance.

Transnuclear, Inc. is a member of the international Transnuclear Group, a worldwide organization of affiliated companies employing more than 100 engineers with special expertise in fuel cycle engineering, operations and transportation. The Transnuclear Group has operations in France, the United Kingdom, Belgium, Spain and Japan in addition to the United States.

Transnuclear, Inc., in close cooperation with other members of the Transnuclear Group, has developed innovative nuclear material transport and storage systems since its formation. The Group pioneered the use of dry transport of spent fuel, the only method now being used in the United States.

In the area of special equipment development, Transnuclear has developed equipment designs for positioning and loading large spent fuel casks onto rail cars; a design for a dry vault storage system for spent fuel canisters that includes equipment for cask handling and for unloading the canisters into the vault; a design for a 40 ton cask handling system that includes equipment for vertical lifting, a variable angle horizontal lifting system, remotely operated fuel handling tools, cask lifting and transport frames and transport trailers; and, in a study for EPRI, a conceptual design for a dry spent fuel transfer system to move fuel from a limited access pool via a small transfer cask to the transfer facility and to remotely unload the fuel into a large dry storage or transport cask.

Transnuclear has extensive experience in transporting radioactive materials. This experience

includes domestic as well as international shipments of spent fuel, uranium hexafluoride, and other radioactive materials. Transnuclear's experience includes loading- and unloading-site and facility surveys; design and fabrication of facility/package system interface equipment; package tiedown and restraint designs for truck, railroad car, and ship carriage; package maintenance; and transportation planning and implementation.

Transnuclear has a very broad base of skills, with specialists in the mechanical, nuclear, structural, transportation and quality assurance disciplines. Additionally, Transnuclear maintains a support staff including traffic managers and administrative service personnel. This engineering talent represents many person-years of nuclear experience and is just one of the reasons for Transnuclear's position of leadership in fuel cycle support services.

Transnuclear personnel for the major areas of engineering responsibility (structural, thermal and nuclear, and operations) are all senior engineers, averaging more than 15 years of direct experience in the nuclear industry in their respective disciplines. All have advanced engineering degrees and have authored technical papers related to their disciplines and to transport and storage cask systems. In addition, each has been involved in the design, licensing/certification, testing, and fabrication of major packaging, handling and storage systems. The senior members of the transportation section each have more than 20 years of experience coordinating the transport of radioactive material and the section head is an engineer with an advanced degree which permits excellent liaison with the engineering section.

Transnuclear, Inc. personnel are also involved in furthering progress in the nuclear industry by maintaining active membership in many key technical and policy committees of:

- U.S. Council for Energy Awareness
- American National Standards Institute
- American Nuclear Society
- American Society of Mechanical Engineers
- American Society of Testing and Materials

Active participation on and leadership of such committees indicates the level of commitment of Transnuclear to this industry.

The Transnuclear Group is recognized as one of the world leaders in providing transport and storage systems and related equipment for spent fuel, radioactive waste, and other radioactive materials, as well as supporting services.

II. EXPERIENCE

Transnuclear, Inc. and the Transnuclear Group have been involved with the development of nuclear material transport and storage systems starting with the TN-2 spent fuel transport cask in 1966. Over the last decade, the Group has developed a family of high payload, dry casks for the transport of spent fuel from light water reactors to storage facilities or reprocessing centers

and for the on-site storage of spent fuel. Transport casks designed for highway, rail and marine transport are presently being used for spent fuel shipments within the United States, within Europe, between Japan and Europe, and between Europe and the United States. Several models for different types of fuel at a variety of reactor plants. The majority of the light water reactor spent fuel shipped to the COGEMA reprocessing facility in France and the BNFL reprocessing facility in the U.K. is packaged in casks designed, certified, manufactured, and operated by the Transnuclear Group. More than 90 of the TN-12 series of rail and marine transport casks are in operation throughout the world, with additional units planned for the future. Ten of the TN-8/9 series of truck casks are in operation around the world. In addition, approximately 85% of all shipments of spent fuel from test reactors in Europe to DOE reprocessing facilities has been handled by the Transnuclear Group.

Transnuclear, Inc. has developed an Advanced Storage Cask design that is consistent with utilities' storage needs and the price levels that utilities are willing to pay to meet those dry storage needs. The basis for Transnuclear Inc.'s Advanced Storage Cask design is the TN-12 transport cask and the TN-BRP and TN-REG storage/transport casks. The TN-BRP and -REG designs were the first high capacity storage cask designs and were developed in the mid-80's for Nuclear Fuel Services. These casks were certified for transport by the NRC in 1989 and 1990, respectively, and are suitable for spent fuel storage although no application for storage approval was submitted to the NRC. These designs utilized a ferritic steel body for both containment and shielding. This material meets the NRC requirements for protection against brittle fracture. The design concept for the basket was developed jointly with UST&D, Inc. By selecting a basket supplier and jointly developing a basket utilizing existing technology, production lines, and fabrication practices already approved by the NRC, learning curve costs were reduced.

Based on experience with design, certification, fabrication, and operation of these cask designs, Transnuclear, Inc, in cooperation with its parent company, Transnucleaire, designed the TN-24 as a spent fuel storage/transport cask. The capacity of this design is 24 PWR or 52 BWR assemblies. The NRC approved the topical report for this design for utility reference in ISFSI applications based on 10 CFR 72 requirements. Subsequently, the NRC issued Certificate of Compliance No. 1005 in accordance with 10CFR72 Subpart L for this design. The TN-24P (prototype) was fabricated for Virginia Power as part of their Cooperative Agreement with DOE for a spent fuel storage demonstration. This demonstration was successfully completed.

Experience with the design, certification, and fabrication of these casks allowed Transnuclear to develop an optimum design for commercial spent fuel storage through use of a multi-shell body, and a lighter, more efficient basket design. This optimization is reflected in the designs of the TN-32 and TN-40.

The Advanced Storage Cask design concept has a capacity of 32 to more than 40 PWR assemblies or up to 69 BWR assemblies in a cask weighing a maximum of 125 ton . The design separates the shielding function from the containment function, much like concrete storage systems have done, significantly reducing the material costs of the casks. This approach requires a multi-shell cask body, but since multiple shells have already been approved by the NRC (e.g.,

stainless steel and lead), this is an accepted design modification.

The details of the activities that are summarized above are the section below titled "Spent Fuel and Radioactive Waste Packaging Systems".

Transnuclear, Inc. has completed two development projects for canister for failed light water reactor fuel assemblies. These projects involved the design of the canisters, certification of transport casks for use of the canisters, and procurement of the canisters.

Transnuclear, Inc. developed canisters for standard Dresden-1 spent fuel and special canisters to hold failed D-1 fuel. Transnuclear also obtained a Certificate of Compliance amendment for its TN-9 transport cask to permit transport of the specially-canistered failed fuel, the first cask vendor to obtain NRC approval of failed fuel canisters and failed fuel transport.

Transnuclear, Inc. also developed spent fuel transport canisters for failed, grossly deformed and damaged Oyster Creek fuel. As with the Dresden fuel, Transnuclear, Inc. obtained a Certificate of Compliance amendment for its TN-9 transport cask to permit transport of the specially-canistered failed fuel.

Special nuclear materials handling equipment was also provided to meet unique interface requirements at the West Valley site. Handling equipment for the fuel assemblies, canisters and canister lids designed for both local and remote operation were furnished, along with design documentation, operating and maintenance procedures and technical manuals. Special spent fuel and canister handling equipment for both remote and local operation was also designed and provided for use at the reactor pools .

Transnuclear, Inc. also provides equipment and engineering services as part of waste removal and disposal programs at several nuclear stations, under contract to a waste handling service contractor.

In support of these programs, Transnuclear, Inc. designed, supplied, inspected and tested a special canister, compatible with the TN-8L cask, for transporting irradiated non-fuel core components to the Barnwell Waste Disposal Site. Transnuclear, Inc. also developed an innovative approach to allow horizontal unloading of the waste canisters from the cask. This approach required a unique system for dry horizontal removal of the lid from a loaded cask and a special, adjustable unloading platform onto which the waste canisters could be remotely withdrawn and lowered into the ground for burial. The system was designed, developed, procured and tested by Transnuclear.

The experience described above is detailed in the section below titled "Canistering, Handling and Transfer Systems".

In addition to the projects and products discussed, Transnuclear, Inc. has been involved in design and engineering studies of equipment, facilities, and systems for the handling, packaging, transportation of spent fuel or other radioactive materials. Transnuclear, Inc. was selected for these studies because of its experience and capabilities as described above. These activities are described in the section below that details Transnuclear, Inc.'s "Systems Engineering, Evaluation and Development" experience.

III. CAPABILITIES

Transnuclear, Inc. has been involved in the design, analysis, fabrication, testing,, licensing and operation of numerous packagings and containers for spent fuel, radioactive waste, and other radioactive materials for three decades. During this time Transnuclear, Inc. has developed the full capabilities required for successful design, certification, procurement, fabrication, and operation of radioactive material packaging systems. This expertise is not limited to the packagings, but extends to all considerations needed for operation, such as canister systems, lifting and handling equipment, vacuum drying equipment, transport frames and trailers, operating procedures, training, and quality assurance.

Transnuclear, Inc. has a staff of graduate engineers principally located at the corporate headquarters in Hawthorne, New York. A field office in Aiken, South Carolina, provides additional engineering support. The combined staff of these two offices has the skills and experience that is necessary to carry out nuclear, mechanical, structural, and thermal design, analyses and testing for development and NRC or DOE licensing of handling, storage and transportation systems.

Particular areas in which Transnuclear has expertise relevant to packaging, transportation, and storage of spent fuel include:

- QA Program and plan development in compliance with the requirements of the NRC and NQA-1 for design, fabrication, and operations;
- Preparation of design criteria consistent with regulatory requirements of 10CFR71 and 10CFR72;
- Performance of design calculations and analyses to meet regulatory requirements of 10CFR71 and 10CFR72;
- performance of components testing;
- performance of certification testing to the criteria of 10CFR71;
- preparation of certification documentation (Design Reports, Safety Analysis Reports, Topical Reports) consistent with regulatory guidance;
- developing performance analyses and predictions;
- carrying out design optimization based on technical and economic considerations;
- development of specification packages;
- preparation of concept, detail, fabrication and assembly drawings;
- performance of hardware procurement and fabrication follow;

- operations and maintenance procedure development; and
- preparation and presentation of training programs.

All activities are carried out in accordance with Transnuclear, Inc.'s corporate Quality Assurance Program which has been approved by the NRC in accordance with 10CFR71 and 10CFR72, and which has been accepted under 10CFR50. Additionally, the Quality Assurance Program has been audited and approved for compliance with NQA-1, with supplements, by a USDOE site operating contractor.

IV. DETAILS OF TRANSNUCLEAR, INC.'s RELEVANT EXPERIENCE

Spent Fuel and Radioactive Waste Packaging Systems

1. Design, License, Testing and Supply of TN-FSV Transport Casks for Public Service of Colorado

In September 1992, Transnuclear, Inc. was awarded a subcontract by Foster-Wheeler Energy Corporation (FWEC) for the design, licensing and fabrication of a cask system designed for the transport of canistered High Temperature Gas Cooled Reactor spent fuel. The spent fuel is from the Fort St. Vrain Nuclear Plant and is presently stored in canisters at the Public Service of Colorado (PSC) ISFSI. The cask system, designated the TN-FSV, is similar to the TN-RAM cask. It is a right circular cylinder fabricated of lead and stainless steel with a maximum loaded weight of 25 tons, including wood-filled impact limiters attached at both ends of the cylindrical body. The subcontract is for two casks with transport trailers, spare parts and ancillary equipment for cask operations.

The Safety Analysis Report, based on Transnuclear, Inc.'s design and analysis of the TN-FSV, was submitted by PSC to the NRC in April 1993, more than a month ahead of schedule. Transnuclear, Inc. met with the NRC to discuss pertinent licensing issues and how the TN-FSV design addresses those issues. The NRC responded favorably to the TN-FSV design and suggested areas that should be further examined and the approach that should be taken in scaled testing.

To assure that the TN-FSV meets all regulatory requirements, Transnuclear, Inc. designed and implemented a comprehensive test program to complement the design and certification analyses. Static and dynamic testing were performed on one-half scale models of the impact limiters. The results were evaluated and, following a meeting with the NRC to discuss the tests, were added to the Safety Analysis Report and submitted to the NRC in February 1994. The NRC issued Certificate of Compliance No. 9253 for the TN-FSV to Public Service of Colorado on June 15, 1994, only 15 months after the original application.

The fabrication of two casks and trailers is underway with delivery expected in early 1995.

Transnuclear, Inc.'s NRC-approved QA program is being applied to all safety-related aspects of this project.

2. Design, Licensing and Supply of Advanced Storage Casks for Northern States Power and Virginia Power

These projects are the first involving the use of Transnuclear, Inc.'s Advanced Storage Cask design, which, for PWR fuel, is represented by the TN-32/40 cask design series.

In 1989, Transnuclear, Inc. was awarded a contract by Northern States Power for the design and licensing of a cask system specifically designed for the 14x14 fuel used at NSP's Prairie Island plant. The cask system, designated the TN-40, is designed for 14x14 fuel which has a smaller cross-section than standard PWR fuel (i.e., 15x15, 16x16, or 17x17 arrays) and, therefore, can hold 40 rather than 32 assemblies.

The design and analysis of the TN-40 was completed by Transnuclear, Inc. and Northern States Power submitted the Safety Analysis Report for the Prairie Island Independent Spent Fuel Storage Installation (ISFSI), including the TN-40 design and analysis, to the NRC in August, 1990, Transnuclear, Inc. met with NRC to discuss pertinent licensing issues and how the TN-40 design addressed those issues. Transnuclear, Inc. also responded satisfactorily to all NRC questions and achieved NRC acceptance of the TN-40 design. The NRC issued the Prairie Island Station ISFSI license in October, 1993. Transnuclear, Inc. began fabricating TN-40 casks in November, 1992, and expects to deliver at least 17.

Transnuclear, Inc. was selected by Virginia Power in May, 1993, to design, certify and fabricate fourteen TN-32 casks for use at its Surry ISFSI. The TN-32 cask design has a capacity of 32 of the Surry 15x15 PWR assemblies, but is basically the same design as the TN-40.

The design and analysis for the TN-32 was completed in late 1993 and the Topical Safety Analysis Report was submitted to the NRC by Transnuclear, Inc. in December, 1993. Transnuclear, Inc. will receive the NRC approval of the Topical Report. Virginia Power will reference the approved Topical Report in their request to the NRC to amend the Surry ISFSI license to allow use of the TN-32 at Surry.

The fabrication of the cask bodies, fuel baskets and supporting hardware is subcontracted to U.S. fabricators with whom Transnuclear, Inc. has previous cask fabrication experience. Transnuclear, Inc. has subcontracted the performance of testing on some aspects of the design to testing service organizations.

Transnuclear, Inc. has applied its NRC-approved QA program for all design, testing, licensing and procurement aspects of these projects.

3. <u>Storage/Transport Cask Systems for Nuclear Fuel Services, Inc. (NFS)</u>

This project is representative of Transnuclear, Inc.'s experience in design, certification, fabrication and timely delivery of innovative packaging systems. Under contract to NFS, Transnuclear, Inc. agreed to supply two, DOE-certified, forged steel storage/transport casks of innovative design and high capacity for removing NFS's spent fuel from the former reprocessing facility at West Valley, New York. These casks, weighing in excess of 100 tons, were designed to contain more spent fuel assemblies than any previous casks and remain the highest capacity storage casks ever delivered. Cask handling equipment, ancillary systems and the cask rail transporters were also provided, along with operating and maintenance procedures. This work was part of the DOE West Valley Demonstration Project.

Transnuclear, Inc. developed and designed the two Type B packaging systems, designated the TN-BRP and TN-REG. Two Safety Analysis Reports for Packaging (SARP's) were prepared and submitted to Oak Ridge National Laboratory (ORNL) which acted as DOE's independent reviewer of the SARP's for compliance with DOE's transport regulations. Transnuclear, Inc. responded to all ORNL questions on a timely basis and after completion of the review, ORNL recommended to DOE-ID that a Certificate of Compliance (COC) be issued.

Subsequently, DOE decided to submit the designs to NRC and contracted with Transnuclear, Inc. to apply for the transport COC from NRC. Transnuclear, Inc. prepared a Certification Plan that called for early interaction with NRC to identify the major certification issues and approaches to resolving them. During this period, the contract was suspended while DOE negotiated with New York State about the disposition of spent fuel at West Valley.

When contract work was resumed, Transnuclear, Inc. worked with EG&G, Sandia National Laboratory (SNL), DOE and NRC to obtain transport certification. Transnuclear, Inc. revised the SAR's for both cask designs and submitted them to the NRC in support of an application for transport certification under 10CFR71.

Several meetings were held with NRC, and Transnuclear, Inc. responded to NRC questions on the TN-BRP and TN-REG casks. Transnuclear, Inc. also conducted engineering testing and scale model design verification testing of impact limiters with SNL to support the NRC review.

In January, 1989, the final TN-BRP SAR was submitted to NRC. In July,1989, NRC issued Certificate of Compliance (COC) No. 71-9202 for the TN-BRP. The TN-REG final SAR was submitted in September, 1989. An NRC COC for the TN-REG, number 71-9206, was received in May, 1990. These are the <u>first</u> storage cask designs ever certified for transport in the U.S.

Transnuclear, Inc. was responsible for the testing, fabrication, delivery and inspection of the casks and supporting equipment and systems. In the summer of 1985, both casks were delivered ahead of schedule, 19 months after the date of the contract. This is an example of Transnuclear, Inc.'s experience in, and capabilities for, meeting schedules for innovative cask designs. The design innovations of the TN-BRP and TN-REG casks include: a new, ferritic steel cask body material developed by Transnuclear, Inc. and Kobe Steel that meets NRC fracture toughness and brittle fracture requirements; a cask body design that requires no neutron-specific shielding, a concept pioneered by Transnuclear, Inc.; and a novel fuel basket design incorporating structural strength and criticality control into a single material, another design feature developed by Transnuclear, Inc..

Transnuclear, Inc. applied its NRC-approved QA program for all of the design, procurement, fabrication and testing aspects of this contract.

4. Prototype Spent Fuel Storage Cask for Virginia Power

Transnuclear, Inc. designed the TN-24, a spent fuel storage/transport cask for long term dry storage of 24 PWR or 52 BWR intact assemblies weighing in excess of 100 tons. In July, 1988, Transnuclear, Inc. prepared a final Topical Report with all licensing analyses and submitted it to NRC for approval under 10CFR72. A Topical Report is essentially the same as a SAR for transport packagings. In July, 1989, NRC approved the Topical Report, less than 12 months after the final Topical Report was submitted. Utilities can reference the TN-24 in their applications for licensing of independent spent fuel storage installations. Subsequently, in 1993, the NRC issued Certificate of Compliance No. 1005 for the TN-24 storage cask design in accordance with the requirements of 10CFR72.

Transnuclear, Inc. procured a prototype of the TN-24 spent fuel storage cask, designated the TN-24P, from Kobe Steel of Tokyo, Japan, under contract with Virginia Power. This prototype, designed in cooperation with our affiliate, Transnucleaire S.A. of Paris, France, was fabricated as part of a development program with Kobe Steel and was sold to Virginia Power under a fixed price contract as part of their cooperative demonstration program with DOE. Transnuclear, Inc., Inc. provided the QA program support for our affiliate, and the procurement and fabrication-follow for the cask and special features required by Virginia Power. The cask was delivered ahead of schedule in September, 1985, and was loaded with intact fuel for a dry storage demonstration at Idaho National Engineering Laboratory. This demonstration was successfully completed in 1986. The TN-24P was also loaded and tested with consolidated fuel in canisters for the first large scale demonstration of dry storage of consolidated fuel in metal casks. The TN-24P is the only dry storage cask in the world to have stored as many as 48 assemblies of consolidated fuel.

Transnuclear, Inc. applied its NRC-approved QA program for all of the design, procurement, fabrication and testing aspects of the special cask features required by Virginia Power.

5. Overweight Truck Spent Fuel Transport Cask Systems

This project was a complex engineering and procurement effort, during which Transnuclear, Inc. designed, developed, tested, certified and managed the fabrication of six large transport cask systems of the TN-8, TN-8L and TN-9 designs. Transnuclear, Inc. also designed and provided cask handling equipment, ancillary systems, and trailers; and prepared operating and maintenance procedures and Technical Manuals. Three of the casks were for Transnuclear, Inc.'s ownership, two were sold to Nuclear Transport Limited (NTL), and one was sold to Commonwealth Edison. Four of the six casks are currently in use in the U.S. and the other two NRC-licensed casks are being used in Europe by NTL.

The TN-8 and TN-8L carry 3 PWR spent fuel assemblies and the TN-9 carries 7 BWR assemblies. The casks are constructed of steel with lead for gamma shielding and resin for neutron shielding. These were the first casks licensed in the U.S. to ship spent fuel in a dry environment.

Transnuclear, Inc. designed these casks, prepared and submitted the SAR's to the NRC for review and approval, defended the SAR's by responding to NRC questions, and obtained NRC certification for both designs (COC Nos. 9015 and 9016). The certification process involved scale model testing as well as analytical justification of the designs. Transnuclear, Inc. applied its NRC-approved QA program for all of the design, testing, certification and fabrication aspects of this project.

Since the original certification, Transnuclear, Inc. has continued to work with NRC by submitting requests for amendments to the TN-8, TN-8L and TN-9 COC's. These amendments have been obtained for transporting contents with characteristics different from those in the original SAR, including:

- a method for the transport of failed fuel; Transnuclear, Inc. was the first cask supplier to receive a COC revision allowing shipment of failed fuel;
- the transport of irradiated, non-fuel bearing core components; and
- the use of a newly designed lid for the TN-8/8L which increases the length of the cask internal cavity.

6. <u>Design, Analysis and Certification of the TN-RAM Waste Transport Packaging System</u>

In mid-1988, Transnuclear, Inc. began development of the TN-RAM cask system. The TN-RAM cask is a Type B transport packaging configured as a right circular cylinder and designed for the transport of dry, irradiated, high-activity components. The packaging is fabricated of lead and stainless steel with a maximum loaded weight of less than 40 tons, including wood-filled impact limiters attached at both ends of the cylindrical cask body.

The system also includes a transport trailer with a personnel barrier, handling equipment, waste canisters, and assorted ancillary equipment for cask operations. Operation and maintenance manuals have also been prepared.

Transnuclear, Inc. developed the certification plan and prepared the SAR and application to NRC for transport certification of the TN-RAM cask, consistent with the plan. In early December 1988, NRC began its review of the SAR. Transnuclear, Inc. met with NRC prior to submitting the SAR and on several occasions thereafter to assure that all issues were being addressed to NRC's satisfaction. Because of early and regular interface with NRC in accordance with the certification plan, Transnuclear, Inc. was able to meet NRC requirements and maintain the licensing and fabrication schedules. On September 14, 1989, NRC issued COC No. 71-9233 for the TN-RAM, a certification review period of only <u>nine</u> months. In April, 1989, fabrication of the TN-RAM was initiated by Transnuclear, Inc.'s subcontractor for fabrication. Additionally, fabrication of the TN-RAM trailer system was also released. On October 10, 1989, the TN-RAM transport cask system was delivered. The cask began operations in November, 1989.

Transnuclear, Inc.'s NRC-approved QA program was applied to all safety-related aspects of this project.

7. Design of Transportation System for the Hanford K-Basin Spent Fuel in Multicanister Overpacks

In January 1996, Westinghouse Hanford Company issued a purchase order to Transnuclear, Inc. for the Preliminary Design of a Cask and Conveyance System for the transport of canisters (MCO) from the K-Basins' Spent Fuel Pools to the Canister Storage Building on the Hanford Site. The MCO design is the responsibility of others. There are two options (1 and 2) to this purchase order: Option 1 is the final design, fabrication, and delivery of two casks and conveyance systems and the operating equipment; Option 2 is the fabrication and delivery of the remaining three casks and conveyance systems. The options will be awarded in accordance with the project milestones upon satisfactory progress of the preliminary design.

The cask and conveyance system concept consists of a transport cask with a dedicated semi-trailer. This cask is designated the TN-WHC cask. It will be designed to transport a single Multiple Canister Overpack (MCO) loaded with spent fuel baskets from the K-Basins Loadout Facility to the Canister Storage Building (CSB).

The transport cask consists of a body fabricated from stainless steel forgings with welded on trunnions and a bolted-on stainless steel lid. It incorporates features for ease of loading, decontamination and routine handling. The design is intended to minimize cask maintenance and maximize in-service time and for ease of fabricability to enhance project completion.

The conveyance system is a semi-trailer which can be attached to a standard tractor. The trailer provides the necessary supports and attachment points for the tie-down of the cask. Its design is intended to facilitate the transportation of the cask in the vertical orientation.

The operating equipment concept uses a work platform and immersion pail to preclude contamination and facilitate simultaneous achievement of all the above objectives. The work platform is an I-Beam structure which spans the K-Basins' fuel cask loadout pits. It will support the cask and contents at a storage/work elevation allowing ease of operator access, and facilitate lowering the casks to the pit floor elevation for loading with fuel baskets. The platform is a passive structure that does not need to be removed during the normal cask operational cycle.

The Transnuclear Team design approach for the TN-WHC packaging system is to assure reliability, availability, and ALARA radiation exposures from the system through appropriate material selection, simplicity, equipment design and operation, and operation of the cask in an environment that is isolated from the major operating staff. In addition, the design approach avoids changes in the K-Basin facility and roadways.

Transnuclear has formed a project team to perform the required scope of work.

The Team members and their respective scopes of work for this Project are as follows:

Transnuclear, Inc.
Team Role: Team lead, project and contract management, quality assurance
Design products: cask, cask lift beam, cask trailer support system
Hardware procurement: lift beams through fabrication vendor tbd

NAC International
Team Role: Operations equipment, basin/cask and cask/MCO interfaces coordination
Design products: work platform, pail, and related equipment; trailer platform
Hardware procurement: work platform, pail, and related equipment, trailer platform through fabrication vendor tbd

Nelson Manufacturing Company
Team Role: conveyance design and fabrication
Design products: conveyance
Hardware procurement: conveyance

Precision Components Corporation, Inc.
Team Role: cask fabrication, integrated testing tbd
Design products: test facility tbd
Hardware procurement: none

NUMATEC, Inc.
Team Role: systems integration, design review, and on-site coordination with WHC
Design products: none
Hardware procurement: none

The project schedule calls for initiation of fuel transfers in December 1997.

8. <u>Relicensing of the UF-6 Cylinder Overpacks</u>

In 1995, design and fabrication issues involving the foam insulation and valve protectors of the UF-6 overpacks fabricated by Nuclear Containers, Inc. (NCI) were brought to the attention of the NRC and DOT. As a result of the insulation issue, the packages were removed from service until the issue could be resolved. The US Enrichment Corporation proposed a plan to the DOT and NRC to evaluate approaches to resolving the issue. The plan for resolution chosen enabled the DOT and NRC to issue certificates that enabled the packages to be used for three months (NRC) and one year (DOT) while the issues are being resolved.

Transnuclear is leading the relicensing effort on the NCI-21PF-1 and the DOT-21PF-1 UF-6 cylinder overpacks. This project includes preparing a revised Safety Analysis Report for the NCI package and preparing a submittal to the DOT with information needed to resolve outstanding issues on their package. Transnuclear will prepare the fabrication specification for the overpacks. Transnuclear will manage a regulatory testing program to

verify that DOT and NRC requirements are met by the overpack, the valve protection device and the UF-6 cylinder.

Transnuclear will also prepare evaluations of the package and valve protector design based on the test data to determine that the designs meet regulatory requirements. Transnuclear will then prepare revised SAR sections and responses to DOT, as necessary, and resolve any licensing issues raised by NRC and /or respond to DOT questions.

IV. DETAILS OF TRANSNUCLEAR, INC's RELEVANT EXPERIENCE

Canistering, Handling and Transfer Systems

1. Concept Design of Transfer System for Spent Fuel Storage Casks

In October 1989, Transnuclear, Inc. was selected by EPRI to develop a concept design for a spent fuel transfer system that could be used at nuclear plants with cranes having severe lift weight restrictions. The transfer system would be used to transfer spent fuel to large storage casks outside of the fuel building at the plant. Detailed design criteria for the system were developed in cooperation with EPRI.

The scope of the design included the transfer cask and handling systems, as well as the transfer facility and the transfer adaptor system that interfaces between the storage cask and transfer cask. Additionally, an economic indifference analysis was developed to define an economically defensible target cost for the complete system. Cost estimates were also developed and compared to the target cost.

Finally, system operations descriptions, O&M requirements, failure modes and effects analysis, and potential licensing issues were defined and provided.

The system design has been completed and the final report was issued by EPRI in September, 1991.

2. Spent Fuel Canisters, Handling Equipment, and Interface Hardware for Commonwealth Edison.

Commonwealth Edison Company (CECo) contracted with Transnuclear, Inc. to provide engineering, transportation and procurement services as required to complete the transfer of 205 Dresden 1 (D-1) fuel assemblies from West Valley, New York to the Dresden Nuclear Power Station.

As part of this shipping campaign, Transnuclear, Inc. developed, designed, obtained NRC certification for, supplied and inspected canisters for standard D-1 spent fuel and special canisters to hold failed D-1 fuel. Transnuclear, Inc. also obtained a Certificate of Compliance amendment for its TN-9 transport cask to permit transport of specially-canistered failed fuel, the first cask vendor to obtain NRC approval of failed fuel canisters and failed fuel transport.

Special nuclear materials handling equipment was also provided to meet unique interface requirements at the West Valley site. Handling equipment for the fuel assemblies, canisters and canister lids designed for both local and remote operation were furnished, along with design documentation, operating and maintenance procedures and technical manuals. Transnuclear, Inc.'s NRC-approved Quality Assurance program was applied and followed for all safety related equipment.

The engineering effort to accomplish the design and procurement of the required equipment was performed under very tight time constraints. The design and procurement

efforts were carefully managed so that CECo's schedule was maintained. Cost estimates, schedules, specifications and procurement packages were prepared and approved by CECo. Subcontracting of the fabrication of equipment was conducted by the Project Manager in accordance with Transnuclear, Inc.'s procedures that have also been approved and used for government procurements. As a result, equipment was delivered on schedule and within budget.

3. Spent Fuel Canisters, Handling Equipment, and Interface Hardware for GPU Nuclear Corporation

GPU Nuclear (GPUN) Corporation contracted with Transnuclear, Inc. to provide engineering, transportation and procurement services as required to complete the transfer of 224 Oyster Creek (OC) fuel assemblies from West Valley, New York to the Oyster Creek Nuclear Generating Station. Transnuclear, Inc.'s scope of activities for this contract was very similar to that for the CECo contract discussed above.

Transnuclear, Inc.'s equipment scope of supply included the design, NRC licensing, procurement and inspection of BWR fuel transport canisters for failed, grossly deformed or damaged fuel, and special spent fuel and canister handling equipment at Oyster Creek and West Valley for both remote and local operation. Transnuclear, Inc.'s NRC-approved QA program was applied for all safety related equipment. Design and procurement efforts were managed so that equipment was delivered on schedule and within budget.

4. Handling Equipment and Interface Hardware for Virginia Power

This contract provided for the supply of spent fuel and cask handling systems and hardware for Virginia Power (VP). Transnuclear, Inc. is responsible for providing the design, engineering, procurement, testing and delivery of, and Quality Assurance for, all equipment necessary to assure safe and efficient handling of the TN-8L cask system at each VP nuclear station.

Transnuclear, Inc.'s scope of activities for this contract was similar to those for the CECo and GPUN contracts in the areas of equipment design, procurement, and Quality Assurance.

All design and procurement efforts have been managed so that equipment has been delivered on schedule and within budget.

5. Waste Package Canisters and Handling Equipment for Various Utilities

Under contract to WasteChem Corporation, Transnuclear, Inc. provides equipment and engineering services as part of waste removal and disposal programs at several nuclear stations.

In support of these programs, Transnuclear, Inc. designed, supplied, inspected and tested a special canister, compatible with the TN-8L cask, for transporting irradiated non-fuel core components to the Barnwell Waste Disposal Site. Transnuclear, Inc. also developed an innovative approach to allow horizontal unloading of the waste canisters from the cask. This approach required a unique system for dry horizontal removal of the lid from a

loaded cask and a special, adjustable unloading platform onto which the waste canisters could be remotely withdrawn and lowered into the ground for burial. The system was designed, developed, procured and tested by Transnuclear, Inc..

Transnuclear, Inc. was also responsible for transport management for these contracts and conducted similar interface activities with state and local governments as discussed in Sections C.3 through C.6.

6. Design and Operation of Spent Fuel Cask Handling and Transfer Equipment

Over the last several years, Transnuclear, Inc. has been involved in the design, development, engineering, testing, supply and inspection of large cask handling and transfer equipment. Under contracts with government contractors such as EG&G Idaho and with major utilities such as Commonwealth Edison, Virginia Power, GPU Nuclear and Duke Power, Transnuclear, Inc. has designed and operated both generic and site specific cask handling and transfer equipment for nuclear plants and government facilities throughout the U.S.

As part of these efforts, Transnuclear, Inc. has developed two major cask handling and transfer systems for use with the 40-ton TN-8/9 series of spent fuel transport casks. The first of these was a vertical lifting and transfer system which is used for remote rotation, lifting, and placement of a cask. Transnuclear, Inc. developed this system to decrease the handling and operations time of the casks and to reduce operator exposure during cask handling operations.

Transnuclear, Inc. has also developed a variable-angle, horizontal lifting system for the same 40-ton spent fuel casks. This lifting system was designed to address special site conditions at Virginia Power's Surry Power Station.

Transnuclear, Inc. designed and procured both of these lift systems, as well as other handling and transport equipment such as crane hook adapters, remotely operated fuel handling tools, cask tilting and transport frames, and truck cask transport trailers to support utility customers' transportation programs. These systems were designed and procured after interface needs were determined from site surveys by Transnuclear, Inc. personnel. In addition, Transnuclear, Inc. personnel supervised operation of these systems at such nuclear facility sites as: Dresden, Surry, North Anna, Oyster Creek, Oconee, McGuire, Hatch, Connecticut Yankee, Duane Arnold, Millstone, Brunswick, St. Lucie, Beaver Valley, Limerick, Vermont Yankee, Peach Bottom, Allied General Nuclear Services facility, West Valley Nuclear Service Center, Idaho National Engineering Laboratory TAN facility, Nevada Test Site EMAD facility, the Barnwell, SC Waste Disposal Facility, and the Hanford, WA Waste Disposal Facility. Transnuclear, Inc.'s NRC-approved Quality Assurance program was applied and followed for all safety related equipment.

7. Design of Dry Transfer System.

Transnuclear, Inc. is under contract to with EPRI to design a cask to cask Dry Transfer System. The purpose of this system, for use at reactor facilities with limited spent fuel pool access, is to transfer bare spent fuel assemblies from small transfer casks to the

Multipurpose Canister in either a storage overpack or a transportation overpack. The project was initiated in January 1994 and preliminary design will be completed in September 1994. Final design is to be completed in mid-1995. The system will have minimum impact on other site activities and operate independent of the reactor operating systems. The design includes the means to dismantle and transport the mechanical equipment to other sites. It is intended to obtain NRC approval of the design and for EPRI to make the design available for member-utilities use.

IV. DETAILS OF TRANSNUCLEAR,INC's RELEVANT EXPERIENCE

Systems Engineering, Evaluation, and Development

1. Conceptual Design of a Mobile, Dry, Rod Consolidation System and Cask Handling Equipment

In August 1984, Transnuclear, Inc. was awarded a contract by DOE under the Program Research and Development Announcement for a Nuclear Waste Packaging and Handling Design Initiative to perform a technical evaluation of and conceptual designs for Extra Large Storage Casks (XLSC's) and supporting equipment. The storage of consolidated fuel in XLSC's was a major aspect of the evaluation, which included a conceptual design for a transportable fuel disassembly and rod consolidation hot cell to provide dry spent fuel consolidation services at utility nuclear plant sites. The system effectively decouples fuel consolidation from the reactor building.

Transnuclear, Inc. conducted independent systems engineering reviews of a previously proposed design for the system, taking into account our knowledge of spent fuel assembly/disassembly, spent fuel handling, and mechanical systems design and analysis.

In addition to the transportable dry consolidation system, Transnuclear, Inc. developed conceptual designs for equipment to handle and position loaded XLSC's without direct contact by personnel. This handling equipment included: a 200 ton capacity straddle hauler for vertical or horizontal positioning of casks; a double boom hydraulic crane for vertical positioning of casks; a 200 ton capacity mobile gantry for loading of casks onto rail cars; and a rail car cask transporter based upon the Schnabel car design.

2. Conceptual Design of Extra Large Storage Casks (XLSC) for DOE

Under the PRDA contract for the Nuclear Waste Packaging and Handling Design Initiative, conceptual designs for an extra large spent fuel storage cask and for the supporting systems that would permit dry, on-site loading of such a cask were developed. These supporting systems include two transfer casks, one for removing the fuel from the spent fuel pool to a lag storage facility or to the consolidation unit, and one for transferring canistered consolidated fuel from the consolidation unit to the extra large storage cask.

Transnuclear, Inc. developed several unique components to address the areas of concern during dry fuel transfer and cask loading. One component provides a leak-tight interface between fuel-containing units. Another is a cask lid interface system that provides access to any coordinate within the cask without breaking the lid seal. Great emphasis was placed on assuring the practicality and workability of the resulting systems.

Transnuclear, Inc.'s skills in conceptual design development are also demonstrated in that most of the PRDA-generated design concepts selected by DOE for follow-on development were produced by Transnuclear, Inc. under this contract.

3. Transport Cask Systems Concepts for Centralized Waste Packaging Facility for E.R.Johnson Associates and DOE

This study, prepared for E. R. Johnson Associates (JAI) under a prime contract from DOE, developed three major transport cask systems for spent fuel and high level nuclear waste for use at a centralized waste packaging facility. Two of the designs were for rail transport casks and one was for a legal weight truck (LWT) transport cask.

The Centralized Waste Packaging Facility (CWPF) concept is an MRS with an integral facility to re-package spent fuel into repository waste packages. Transnuclear, Inc. performed the conceptual designs for the transport cask systems to transport the spent fuel to the CWPF and to transport the Salt, Basalt or Tuff waste packages to the appropriate repositories. These conceptual transport cask system designs included the thermal, structural, material, shielding and criticality considerations for optimizing the waste package and spent fuel contents of the cask systems.

4. Safety Criteria for Spent Nuclear Fuel Transports for EPRI

Transnuclear, Inc. has completed a study program with EPRI on the validation of 10CFR71 design criteria using risk assessment methods. The purpose of the EPRI program was to credibly evaluate the adequacy of transport packages designed to 10CFR71 bounding test conditions to meet the challenges of real and credible accidents and to identify and quantify the kinds, levels, contributors to and mitigators of risk for accident conditions beyond those covered by design.

The study involved development of a validation methodology and process so that real accident severity can be directly related to hypothetical accident severity. Within the specified limitations of the study program (e.g., radiological impacts of highway transport accidents), real accidents which fall outside the hypothetical accident design envelope have been identified and conservative predictions of frequency, consequences and risk have been developed.

The study concludes that, based on very conservative analyses, the level of risk is acceptable. Additional margins of safety, not specifically taken into account in the study, are also identified which add further conservatism to, and thus confidence in, the study's conclusions.

5. Extended Fuel Burnup Considerations for Transnuclear, Inc. Transport Casks for Virginia Power and DOE

This study was prepared for Virginia Power under a prime contract from DOE, and presented a system evaluation of the adequacy of three of Transnuclear, Inc.'s casks (TN-8L, TN-9, and TN-12Y) for transport of extended burnup fuel. Transnuclear, Inc. evaluated high initial enrichment and high burnup fuel assemblies of the W, CE, GE and B&W designs. Highest permissible enrichments were established on the basis of criticality consideration for fully loaded and partially loaded casks. Shielding, heat rejection and fission gas release limits for current designs were used to establish minimum cooling times prior to transport of fully loaded casks or, alternatively, reduced numbers of assemblies for partial loadings.

Analysis methods and assumptions used for current designs were re-examined to improve transport capabilities for extended burnup fuel by reducing excessive conservatism and refining models to be more representative of real physical situations.

6. Dry Vault Storage Facility for TVA

Transnuclear, Inc. prepared a design for a complete dry vault storage facility for intact or consolidated spent fuel for TVA. The facility is designed for 1500 sealed spent fuel canisters stored in a subcritical configuration in two loading galleries with a controlled induced air flow for cooling. The design was developed and analyzed to assure that performance requirements for heat transfer, cooling flow, criticality, shielding, containment, structural integrity, and operability could be met. Special emphasis was placed on sizing of cooling ducts, pressure losses, and decay heat removal. In addition, considerable effort was involved in the cask handling and dry unloading system designs.

The concept has applications for a Monitored Retrievable Storage/Interim Storage facility, a large scale, on-site storage facility, or as a lag storage facility at a repository.

7. Spent Fuel Cask Contamination Studies for EPRI and SNL

Under separate contracts from EPRI and SNL, Transnuclear, Inc. has participated in two studies of the factors that affect the radioactive material contamination of spent fuel casks and the parameters that are most directly correlated with the occurrence of the "weeping" or "sweating" phenomenon. Both studies involved working as part of a team and required the precise definition of data requirements; working with numerous sources for the collection and organization of large data bases with numerous parameters for each observation; and the processing, reduction and analysis of these data bases. The studies have been focused upon developing special design, materials and/or operations criteria to reduce the surface uptake of radioactive material and subsequent sweating of the contaminated surface.

8. Spent Fuel and High Level Waste Shipping Cask Interface Study for Sandia National Laboratories (SNL)

Under contract to SNL, Transnuclear, Inc. evaluated interface and physical performance information for existing plants and spent fuel casks. This information was used to develop interface criteria and specifications for a new generation of spent fuel and high level waste shipping casks. Interface criteria and specifications were developed which addressed legal weight truck, heavy weight truck, rail, and dual or special purpose casks. Transnuclear, Inc. worked with several other contractors under similar contracts with SNL to develop the interface criteria and specifications.

9. Cask Fleet Operations Study for MMES

Under contract to MMES, Transnuclear, Inc. performed a two phase transport cask fleet operations study. Phase 1 of the study addressed Transnuclear, Inc.'s cask fleet usage, maintenance, and repair experience, and was completed in 1988. Phase 2 addressed conceptual designs for cask body and cask basket maintenance work stations in a cask maintenance facility.

IV. DETAILS OF TRANSNUCLEAR,INC's RELEVANT EXPERIENCE

Transportation Engineering and Operations Services

Transnuclear has over 25 years of experience in the transportation of radioactive and hazardous materials. The following sections summarize this experience.

1. Material/Test Reactor (MTR) Spent Fuel Transports

In 1977, Transnuclear, Inc., in cooperation with European affiliates, is began transporting irradiated test reactor fuel from European test reactors to DOE facilities in South Carolina and Idaho. A total of 12 different spent fuel casks of 5 different designs have been used. Over 250 of these shipments which all involve intermodal transfers have been completed by Transnuclear. The intermodal transfers involve both legal weight and overweight truck cask transfers from and to ships.

At the outset of this program, it was decided that these intermodal transfers of spent fuel casks should be accomplished to minimize handling time, manpower (cost) and exposure at the pier. Rather than use load-on, load-off (Lo-Lo) transport, Transnuclear opted for the roll-on, roll-off (Ro-Ro) concept which takes advantage of the truck-transport modal features of the cask systems and which is highly compatible with modern containerized cargo ships. To optimize this system which uses several differing cask designs, the Ro-Ro concept was implemented with three variations.

The first involved cask system designs which could be adapted for transport on standard ocean shipping flats. For shipments using these cask systems, Transnuclear found that some standard ocean shipping flat designs did not have sufficient strength for handling the concentrated 30 ton cask loadings which were possible. Transnuclear directed the design of load spreading systems so that the casks could be used on the standard shipping flats. This permitted the use of the Ro-Ro concept and the use of standard, on-board containerized cargo handling systems which enhanced the flexibility of this approach.

The second variation involved cask systems which could be transported on the same trailer in Europe and the U.S. Transnuclear Group trailers were modified to carry concentrated cask loads up to 40 tons for highway transport in both Europe and the U.S. This approach is a direct application of the Ro-Ro concept and results in the most efficient cask handling times at the pier.

The third variation was applied to cask systems having special handling considerations at French MTR's. With this approach, the cask is delivered to the pier and transferred from its European transport trailer to a special Ro-Ro ocean freight flat called a MAFI, a heavy duty semi-trailer designed for ocean carriage but not permitted for over-the-road travel. At the U.S. seaport, the cask is transferred to a specially modified trailer for delivery to DOE. Transnuclear, in cooperation with its motor carrier, designed and procured the special features for these trailers which optimize the transfer and provide appropriate restraint and hold down during transport.

Transnuclear was the first domestic cask supplier to incorporate intermodal transfer methods used in containerized cargo transport into the intermodal transfer of large numbers of spent fuel transport casks. Based on this extensive experience, Transnuclear is keenly aware of the significant role of the transport in the design and operation of intermodal transfer systems for spent fuel casks.

2. Transport and Intermodal Transfer of Uranium Hexafluoride

For over 28 years, Transnuclear has been importing and exporting natural and enriched uranium hexafluoride (UF_6) a radioactive and chemically hazardous material. The natural UF_6 is transported in 48 inch diameter cylinders of 10 and 12.5 foot lengths weighing approximately 26,000 pounds and 33,000 pounds respectively. These shipments have all involved intermodal transfers and have been made using Ro-Ro and container bay methods.

For these shipments, Transnuclear has developed specialized steel cradles to accept these cylinders and act as the tie-down interface between the cylinders and the ocean container flat. This cradle tie-down has also been accepted by the American Association of Railroads for rail transport. Thus, this cradle design is used for rail, truck and ship transport.

The cradle design expedites loading and unloading of the cylinders and was developed to replace the older approach of blocking and bracing with timbers. These timbers had a tendency to fail during routine transport conditions of coupling/uncoupling rail cars. DOE and pier facilities much prefer the cradle design because of the inherent time and manpower savings. Transnuclear's approach also improved on other competitive designs in that it placed restraint systems in tension rather than in shear when under design load, a stronger and safer design.

For the enriched UF_6 transports, the cylinders used are 30 inches in diameter and 81 inches in length, and are shipped in double walled steel overpacks filled with foam. This material is also shipped using intermodal methods.

Transnuclear has designed a modification to the standard 20 foot open flat to permit four of these packages to be loaded per flat. This modification consists of incorporating the package tie-down into the steel structure of the flat. This tie-down has also been accepted by the Association of American Railroads and the method is used for transport by air, truck and ship. Transnuclear also designed the flat to accommodate one of the natural UF_6 cylinder cradles. Thus, a single flat can be used either for natural or enriched UF_6. Transnuclear was the first transport service company to develop this innovation which provided cost and time savings in the intermodal transfer and transport of large volumes of these cylinders.

In 1980, Transnuclear began shipment of 1607 cylinders containing depleted uranium hexafluoride in cylinders similar to those used for the transport of natural UF_6 but of a thinner wall thickness. This project was the largest single campaign ever undertaken for movement of this type material and was subject to severe financial penalties for late delivery. It was completed on schedule in a period of 15 months without any penalties claimed or paid.

As part of the effort for the project, several modes of transport were investigated including rail and truck for the inland portion and conventional ocean freighters and LASH (Lighter Aboard Ship) vessels for the cross-Atlantic portion. The investigation, which evaluated the economic, safety and schedular aspects of the various modes of transport, resulted in the selection of rail transport utilizing Container on Flat Car (COFC) mode for most of the cylinders. This method, which had not been previously used by commercial shippers from the DOE gaseous diffusion plants, allowed as many as 40 cylinders to be shipped at one time and also permitted the intermodal transfer of the cylinders onto the ship directly from the rail car at a great savings in time and cost.

The engineering effort for this project required designing and fabricating transport cradles and hold-down devices for five different configurations of Type 48G depleted UF_6 storage cylinders. These thin-wall cylinders, which are described in ORO-651, were designed only for storage of depleted UF_6 and were not intended for transport. Therefore, the tie-down system design had to assure DOE that no damage would occur in transit or during intermodal transfer. With 5 different types of cylinders to be transported, a single tie-down configuration which would accept each of the 5 types of cylinders was designed and fabricated. This saved time and cost by not having to match certain cylinder types to specific transport equipment. Approval of the tie-down system was obtained from the Association of American Railroads.

Transnuclear believes that its success in performing this transport was due largely to developing and implementing an innovative, time-and-cost saving method for transport and intermodal transfer which had not been utilized previously by commercial shippers in transporting this material from the three U.S. gaseous diffusion plants.

3. Transport Services for Commonwealth Edison.

Commonwealth Edison Company (CECo) contracted with Transnuclear to provide transport services as required to ship 205 Dresden 1 (D-1) fuel assemblies from West Valley, New York to the Dresden Nuclear Power Station.

Prior to beginning the shipments, training sessions for personnel at both West Valley and Dresden were conducted by Transnuclear. Complete run-throughs of all procedures and operations involving the casks, ancillary systems and handling equipment were supervised by Transnuclear engineers to assure that operators would be familiar with equipment and procedures before beginning hot operations. Complete training documentation was provided. CECo also contracted with Transnuclear to provide personnel to supervise loading and unloading operations. These training and supervisory programs are principally directed at ensuring the safe handling and control of components and systems containing irradiated nuclear materials. Such programs are part of Transnuclear's commitment to industrial and radiological safety.

Transnuclear was also responsible for managing all transport operations for the duration of the shipping campaign. Transnuclear obtained spent fuel route approvals from the NRC, arranged contacts with state governments as required by NRC regulations, contacted local governments and local law enforcement agencies along the route as required, and arranged for properly trained guards to be available as escorts through urban areas. Transnuclear has dealt with federal, state and local governments as well as law enforcement officials

for more than 25 years in all areas related to safety and security for the transport of radioactive material.

4. Transport Services for GPU Nuclear Corporation

GPU Nuclear (GPUN) Corporation contracted with Transnuclear to provide transport services as required to ship 224 Oyster Creek (OC) fuel assemblies from West Valley, New York to the Oyster Creek Nuclear Generating Station. Transnuclear's scope of activities for this contract was very similar to that for the CECo contract discussed above.

Transnuclear provided consulting and technical support services for handling, loading and unloading of the two TN-9 transport casks at Oyster Creek and West Valley, including 24 hour per day on-site technical supervision and direction at Oyster Creek. A full time Transnuclear Site Project Manager carried out the required on-site and inter-organizational interfacing.

As with the CECo contract, personnel training, transport planning including route selection and approvals, interface with federal, state and local governments, cask and equipment maintenance, and full documentation services were included in Transnuclear's work scope.

5. Transport Services for Virginia Power

This long term contract provided for the supply of spent fuel cask services through 1991 for Virginia Power (VP). Transnuclear was responsible for providing transport cask services, training and personnel supervision similar to the services cited in the above contracts. Transnuclear managed 23 transports of 69 spent fuel assemblies for VP.

6. Transport Services for Duke Power

This is a long term contract to provide spent fuel transport cask services to move spent fuel from Duke's Oconee units to the McGuire units. The scope of services for this contract is similar to that cited in the above contracts. Transnuclear's TN-8L casks performed more than 80 transports (over 240 assemblies) of spent fuel for Duke Power under this contract.

7. Transport Cask Facility Licensing

Transnuclear owns and operates a cask storage and maintenance facility in Aiken, SC. Transnuclear has licensed this facility with the State of South Carolina for the storage and maintenance of casks. These licensing efforts have required the establishment of radiation safety programs, personnel monitoring programs, security procedures, emergency response plans, and approved operating procedures. Transnuclear is familiar with the requirements and engineering support work necessary to obtain and maintain facility licenses.

Attachment 1 to Transnuclear, Inc. Expression of Interest and Comments on DOE's Notice of Waste Acceptance, Storage, and Transportation Services, FR Doc. 96-13244, dated 5-24-96.

Transnuclear, Inc. Comments on Issues

1. The ability of transportation service contractors and individual Purchasers to reach agreement on methods and schedules for servicing specific utility sites, including ways to foster Purchaser cooperation.

   Transportation service contractors should be experienced in dealing with utilities and understand utility requirements and restrictions regarding spent fuel transportation activities. In particular, early contacts between the contractor and the utilities are required in order to develop shipment plans and facility and site interface requirements. Included in the early phases of the planning must be contacts with local and state officials and community leaders whose support is essential for successful shipping campaigns.

   Most important is the need for complete autonomy of the contractor with respect to the development of the plan with the utility. OCRWM must clearly state the policy to be followed during planning and implementation and allow the contractor and utility to function without interference or changes in policy direction.

2. The willingness of Purchasers to construct temporary or permanent physical plant modifications and to obtain license amendments or technical specification changes that would improve the efficiency and reduce the costs of loading and removal of spent fuel from individual plants.

   This issue is best addressed by utilities. Transnuclear, Inc. can point out that one of the benefits of early planning mentioned above is the mutual understanding between the utility and the contractor regarding the physical interface between transportation equipment and the utility site and structures. The contractor, as part of early site surveys and early interactions with the utility site staff, can identify the optimum approach and equipment required for loading and shipping spent fuel and can minimize the need for plant modifications.

3. The reasonableness of dividing the country into a number of regions to preserve competition and industrial capability in the marketplace, while still ensuring low cost services to OCRWM.

   OCRWM should think long and hard before developing arbitrary constraints on this program. The very nature of the transportation process is national in character, not regional as implied in a division of the country into regions. In addition, expertise in this field is limited and duplication of equipment and functions would certainly result if several regional contractors are utilized. Transnuclear, Inc.

recommends that a decision not be made regarding this issue until late in the development of this program.

4. The capability of the nuclear industry to acquire sufficient spent fuel canister, transportation cask, and storage module production capacity to meet near-term service contractor requirements.

   This capability will be driven by the perceived market. Once OCRWM policy has matured and the industry assured of its lasting nature, the capability will develop to serve the market. The policy and its implementation must avoid unnecessary specification by OCRWM and the capability required must be reasonable, i.e. avoid the duplication of technical capability, equipment and services implied by too many regions.

5. Potential business arrangements/pricing structures which might increase contractor freedom and flexibility to develop and implement innovative approaches to improve system efficiency and lower costs, reduce or eliminate the need for front end financing by OCRWM of contractor activities and procurements, or mitigate risks associated with program uncertainties.

   The main ingredient to a successful program is a rational approach to the OCRWM policy mentioned above, a firm commitment to maintenance of the stated policy (and thus the market for the contractor services), and a guarantee of independence of the contractor from OCRWM interference under that policy.

   It will be difficult for contractors to offer long term, full service, fixed price contracts for the full range of services expected to be required by OCRWM. Phased development contracts may be more realistic once the contractor(s) is selected. The contractor would be selected by OCRWM based on qualifications and experience. Contracts would be awarded for various phases of the program and would be fixed price or cost reimbursable based on the nature of the phase and the ability of the OCRWM to identify policy and to guarantee its constancy over the anticipated contract life.

   Transnuclear, Inc. recommends that contracts be based on the principle of "take or pay". This type of financing arrangement can work well for supply of either services or equipment or both.

6. Alternative methods of structuring this procurement to ensure competition on future procurements.

   Transnuclear's current suggestions are included in the response to the first five issues.

Attachment 2 to Transnuclear, Inc. Expression of Interest and Comments on DOE's Notice of Waste Acceptance, Storage, and Transportation Services, FR Doc. 96-13244, dated 5-24-96.

Transportation Services

1. Material/Test Reactor (MTR) Spent Fuel Transports

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Spent Fuel Transport, Storage, and Handling

1. Design, License, Testing and Supply of TN-FSV Transport Casks

In September 1992, Transnuclear, Inc. was awarded a subcontract by Foster Wheeler Energy Corporation (FWEC) for the design, licensing and fabrication of a cask system designed for the transport of canistered High Temperature Gas Cooled Reactor spent fuel. The cask system, designated the TN-FSV, is similar to the TN-RAM cask. It is a right circular cylinder fabricated of lead and stainless steel with a maximum loaded weight of 25 tons, including wood-filled impact limiters attached at both ends of the cylindrical body. The subcontract is for two casks with transport trailers, spare parts and ancillary equipment for cask operations.

The Safety Analysis Report, based on Transnuclear, Inc.'s design and analysis of the TN-FSV, was submitted by PSC to the NRC in April 1993, more than a month ahead of schedule. Transnuclear, Inc. met with the NRC to discuss pertinent licensing issues and how the TN-FSV design addresses those issues. The NRC responded favorably to the TN-FSV design and suggested areas that should be further examined and the approach that should be taken in scaled testing.

To assure that the TN-FSV meets all regulatory requirements, Transnuclear, Inc. designed and implemented a comprehensive test program to complement the design and certification analyses. Static and dynamic testing were performed on one-half scale models of the impact limiters. The results were evaluated and, following a meeting with the NRC to discuss the tests, were added to the Safety Analysis Report and submitted to the NRC in February 1994. The NRC issued Certificate of Compliance No. 9253 for the TN-FSV to Public Service of Colorado on June 15, 1994, only 15 months after the original application.

The fabrication of two casks and trailers was completed and delivery made in early 1995.

Transnuclear, Inc.'s NRC-approved QA program is being applied to all safety-related aspects of this project.

2. Design, Licensing and Supply of Advanced Storage Casks

These projects are the first involving the use of Transnuclear, Inc.'s Advanced Storage Cask design, which, for PWR fuel, is represented by the TN-32/40 cask design series.

In 1989, Transnuclear, Inc. was awarded a contract by Northern

States Power for the design and licensing of a cask system specifically designed for the 14x14 fuel used at NSP's Prairie Island plant. The cask system, designated the TN-40, is designed for 14x14 fuel which has a smaller cross-section than standard PWR fuel (i.e., 15x15, 16x16, or 17x17 arrays) and, therefore, can hold 40 rather than 32 assemblies.

The design and analysis of the TN-40 was completed by Transnuclear, Inc. and Northern States Power submitted the Safety Analysis Report for the Prairie Island Independent Spent Fuel Storage Installation (ISFSI), including the TN-40 design and analysis, to the NRC in August, 1990. The NRC issued the Prairie Island Station ISFSI license in October, 1993. Transnuclear, Inc. began fabricating TN-40 casks in November, 1992, and expects to deliver at least 17.

Transnuclear, Inc. was selected by Virginia Power in May, 1993, to design, certify and fabricate fourteen TN-32 casks for use at its Surry ISFSI. The TN-32 cask design has a capacity of 32 of the Surry 15x15 PWR assemblies, but is basically the same design as the TN-40.

The design and analysis for the TN-32 was completed in late 1993 and the Topical Safety Analysis Report was submitted to the NRC by Transnuclear, Inc. in December, 1993. Transnuclear, Inc. will receive the NRC approval of the Topical Report. Virginia Power will reference the approved Topical Report in their request to the NRC to amend the Surry ISFSI license to allow use of the TN-32 at Surry.

The fabrication of the cask bodies, fuel baskets and supporting hardware is subcontracted to U.S. fabricators with whom Transnuclear, Inc. has previous cask fabrication experience. Transnuclear, Inc. has subcontracted the performance of testing on some aspects of the design to testing service organizations.

Transnuclear, Inc. has applied its NRC-approved QA program for all design, testing, licensing and procurement aspects of these projects.

3. <u>Storage/Transport Cask Systems for Nuclear Fuel Services, Inc. (NFS)</u>

This project is representative of Transnuclear, Inc.'s experience in design, certification, fabrication and timely delivery of innovative packaging systems. Under contract to NFS, Transnuclear, Inc. agreed to supply two, DOE-certified, forged steel storage/transport casks of innovative design and high capacity for removing NFS's spent fuel from the former reprocessing facility at West Valley, New York. These casks, weighing in excess of 100 tons, were designed to contain more spent fuel assemblies than any previous casks and remain the highest capacity storage casks ever delivered. Cask handling

equipment, ancillary systems and the cask rail transporters were also provided, along with operating and maintenance procedures. This work was part of the DOE West Valley Demonstration Project.

Transnuclear, Inc. developed and designed the two Type B packaging systems, designated the TN-BRP and TN-REG. Two Safety Analysis Reports for Packaging (SARP's) were prepared and submitted to Oak Ridge National Laboratory (ORNL) which acted as DOE's independent reviewer of the SARP's for compliance with DOE's transport regulations. ORNL recommended to DOE-ID that a Certificate of Compliance (COC) be issued.

Subsequently, DOE decided to submit the designs to NRC and contracted with Transnuclear, Inc. to apply for the transport COC from NRC. Transnuclear, Inc. prepared a Certification Plan that called for early interaction with NRC to identify the major certification issues and approaches to resolving them. Transnuclear, Inc. worked with EG&G, Sandia National Laboratory (SNL), DOE and NRC to obtain transport certification. Transnuclear, Inc. revised the SAR's for both cask designs and submitted them to the NRC in support of an application for transport certification under 10CFR71.

Several meetings were held with NRC, and Transnuclear, Inc. responded to NRC questions on the TN-BRP and TN-REG casks. Transnuclear, Inc. also conducted engineering testing and scale model design verification testing of impact limiters with SNL to support the NRC review.

In January, 1989, the final TN-BRP SAR was submitted to NRC. In July,1989, NRC issued Certificate of Compliance (COC) No. 71-9202 for the TN-BRP. The TN-REG final SAR was submitted in September, 1989. An NRC COC for the TN-REG, number 71-9206, was received in May, 1990. These are the <u>first</u> storage cask designs ever certified for transport in the U.S.

In the summer of 1985, Transnuclear delivered both casks ahead of schedule, 19 months after the date of the contract. This is an example of Transnuclear, Inc.'s experience in, and capabilities for, meeting schedules for innovative cask designs. The design innovations of the TN-BRP and TN-REG casks include: a new, ferritic steel cask body material developed by Transnuclear, Inc. and Kobe Steel that meets NRC fracture toughness and brittle fracture requirements; a cask body design that requires no neutron-specific shielding, a concept pioneered by Transnuclear, Inc.; and a novel fuel basket design incorporating structural strength and criticality control into a single material, another design feature developed by Transnuclear, Inc..

Transnuclear, Inc. applied its NRC-approved QA program for all of the design, procurement, fabrication and testing aspects of this contract.

4. Prototype Spent Fuel Storage Cask for Virginia Power

Transnuclear, Inc. designed the TN-24, a spent fuel storage/transport cask for long term dry storage of 24 PWR or 52 BWR intact assemblies weighing in excess of 100 tons. In July, 1988, Transnuclear, Inc. prepared a final Topical Report with all licensing analyses and submitted it to NRC for approval under 10CFR72. A Topical Report is essentially the same as a SAR for transport packagings. In July, 1989, NRC approved the Topical Report, less than 12 months after the final Topical Report was submitted. Utilities can reference the TN-24 in their applications for licensing of independent spent fuel storage installations. Subsequently, in 1993, the NRC issued Certificate of Compliance No. 1005 for the TN-24 storage cask design in accordance with the requirements of 10CFR72.

Transnuclear, Inc. procured a prototype of the TN-24 spent fuel storage cask, designated the TN-24P, from Kobe Steel of Tokyo, Japan, under contract with Virginia Power. The cask was delivered ahead of schedule in September, 1985, and was loaded with intact fuel for a dry storage demonstration at Idaho National Engineering Laboratory. This demonstration was successfully completed in 1986. The TN-24P was also loaded and tested with consolidated fuel in canisters for the first large scale demonstration of dry storage of consolidated fuel in metal casks. The TN-24P is the only dry storage cask in the world to have stored as many as 48 assemblies of consolidated fuel.

Transnuclear, Inc. applied its NRC-approved QA program for all of the design, procurement, fabrication and testing aspects of the special cask features required by Virginia Power.

5. Overweight Truck Spent Fuel Transport Cask Systems

This project was a complex engineering and procurement effort, during which Transnuclear, Inc. designed, developed, tested, certified and managed the fabrication of six large transport cask systems of the TN-8, TN-8L and TN-9 designs. Transnuclear, Inc. also designed and provided cask handling equipment, ancillary systems, and trailers; and prepared operating and maintenance procedures and Technical Manuals. Three of the casks were for Transnuclear, Inc.'s ownership, two were sold to Nuclear Transport Limited (NTL), and one was sold to Commonwealth Edison. Four of the six casks are currently in use in the U.S. and the other two NRC-licensed casks are being used in Europe by NTL.

The TN-8 and TN-8L carry 3 PWR spent fuel assemblies and the TN-9 carries 7 BWR assemblies. The casks are constructed of steel with lead for gamma shielding and resin for neutron shielding. These were the first casks licensed in the U.S. to ship spent fuel in a dry environment.

Transnuclear, Inc. designed these casks, prepared and submitted the SAR's to the NRC for review and approval, defended the SAR's by responding to NRC questions, and obtained NRC certification for both designs (COC Nos. 9015 and 9016). The certification process involved scale model testing as well as analytical justification of the designs. Transnuclear, Inc. applied its NRC-approved QA program for all of the design, testing, certification and fabrication aspects of this project.

7. Design of Transportation System for the Hanford K-Basin Spent Fuel in Multicanister Overpacks

In January 1996, Westinghouse Hanford Company issued a purchase order to Transnuclear, Inc. for the Preliminary Design of a Cask and Conveyance System for the transport of canisters (MCO) from the K-Basins' Spent Fuel Pools to the Canister Storage Building on the Hanford Site.

The cask and conveyance system concept consists of a transport cask with a dedicated semi-trailer. This cask is designated the TN-WHC cask. It will be designed to transport a single Multiple Canister Overpack (MCO) loaded with spent fuel baskets from the K-Basins Loadout Facility to the Canister Storage Building (CSB).

The transport cask consists of a body fabricated from stainless steel forgings with welded on trunnions and a bolted-on stainless steel lid. It incorporates features for ease of loading, decontamination and routine handling. The design is intended to minimize cask maintenance and maximize in-service time and for ease of fabricability to enhance project completion.

The conveyance system is a semi-trailer which can be attached to a standard tractor. The trailer provides the necessary supports and attachment points for the tie-down of the cask. Its design is intended to facilitate the transportation of the cask in the vertical orientation.

The operating equipment concept uses a work platform and immersion pail to preclude contamination and facilitate simultaneous achievement of all the above objectives. The work platform is an I-Beam structure which spans the K-Basins' fuel cask loadout pits. It will support the cask and contents at a storage/work elevation allowing ease of operator access, and facilitate lowering the casks to the pit floor elevation for loading with fuel baskets. The platform is a passive structure that does not need to be removed during the normal cask operational cycle.

The Transnuclear Team design approach for the TN-WHC packaging system is to assure reliability, availability, and ALARA radiation exposures from the system through appropriate material selection, simplicity, equipment design and operation, and operation of the cask in an environment that is isolated from the major operating staff. In addition, the design approach avoids changes in the K-Basin facility and roadways.

Transnuclear has formed a project team to perform the required scope of work.

The Team members and their respective scopes of work for this Project are as follows:

Transnuclear, Inc.
Team Role: Team lead, project and contract management, quality assurance
Design products: cask, cask lift beam, cask trailer support system
Hardware procurement: lift beams through fabrication vendor tbd

NAC International
Team Role: Operations equipment, basin/cask and cask/MCO interfaces coordination
Design products: work platform, pail, and related equipment; trailer platform
Hardware procurement: work platform, pail, and related equipment, trailer platform through fabrication vendor tbd

Nelson Manufacturing Company
Team Role: conveyance design and fabrication
Design products: conveyance
Hardware procurement: conveyance

Precision Components Corporation, Inc.
Team Role: cask fabrication, integrated testing tbd
Design products: test facility tbd
Hardware procurement: none

NUMATEC, Inc.
Team Role: systems integration, design review, and on-site coordination with WHC
Design products: none
Hardware procurement: none

The project schedule calls for initiation of fuel transfers in December 1997.

Spent Fuel Handling Equipment

1. Concept Design of Transfer System for Spent Fuel Storage Casks

In October 1989, Transnuclear, Inc. was selected by EPRI to develop a concept design for a spent fuel transfer system that could be used at nuclear plants with cranes having severe lift weight restrictions. The transfer system would be used to transfer spent fuel to large storage casks outside of the fuel building at the plant. Detailed design criteria for the system were developed in cooperation with EPRI.

The scope of the design included the transfer cask and handling systems, as well as the transfer facility and the transfer adaptor system that interfaces between the storage cask and transfer cask.

Finally, system operations descriptions, O&M requirements, failure modes and effects analysis, and potential licensing issues were defined and provided.

The system design has been completed and the final report was issued by EPRI in September, 1991.

2. Spent Fuel Canisters, Handling Equipment, and Interface Hardware for Commonwealth Edison.

Commonwealth Edison Company (CECo) contracted with Transnuclear, Inc. to provide engineering, transportation and procurement services as required to complete the transfer of 205 Dresden 1 (D-1) fuel assemblies from West Valley, New York to the Dresden Nuclear Power Station.

As part of this shipping campaign, Transnuclear, Inc. developed, designed, obtained NRC certification for, supplied and inspected canisters for standard D-1 spent fuel and special canisters to hold failed D-1 fuel. Transnuclear, Inc. also obtained a Certificate of Compliance amendment for its TN-9 transport cask to permit transport of specially-canistered failed fuel, the first cask vendor to obtain NRC approval of failed fuel canisters and failed fuel transport.

Special nuclear materials handling equipment was also provided to meet unique interface requirements at the West Valley site. Handling equipment for the fuel assemblies, canisters and canister lids designed for both local and remote operation were furnished, along with design documentation, operating and maintenance procedures and technical manuals.

3. Spent Fuel Canisters, Handling Equipment, and Interface Hardware for GPU Nuclear Corporation

GPU Nuclear (GPUN) Corporation contracted with Transnuclear, Inc. to provide engineering, transportation and procurement services as required to complete the transfer of 224 Oyster

Creek (OC) fuel assemblies from West Valley, New York to the Oyster Creek Nuclear Generating Station. Transnuclear, Inc.'s scope of activities for this contract was very similar to that for the CECo contract discussed above.

Transnuclear, Inc.'s equipment scope of supply included the design, NRC licensing, procurement and inspection of BWR fuel transport canisters for failed, grossly deformed or damaged fuel, and special spent fuel and canister handling equipment at Oyster Creek and West Valley for both remote and local operation. Transnuclear, Inc.'s NRC-approved QA program was applied for all safety related equipment. Design and procurement efforts were managed so that equipment was delivered on schedule and within budget.

4. Handling Equipment and Interface Hardware for Virginia Power

This contract provided for the supply of spent fuel and cask handling systems and hardware for Virginia Power (VP). Transnuclear, Inc. is responsible for providing the design, engineering, procurement, testing and delivery of, and Quality Assurance for, all equipment necessary to assure safe and efficient handling of the TN-8L cask system at each VP nuclear station.

Transnuclear, Inc.'s scope of activities for this contract was similar to those for the CECo and GPUN contracts in the areas of equipment design, procurement, and Quality Assurance.

All design and procurement efforts have been managed so that equipment has been delivered on schedule and within budget.

5. Waste Package Canisters and Handling Equipment for Various Utilities

Under contract to WasteChem Corporation, Transnuclear, Inc. provides equipment and engineering services as part of waste removal and disposal programs at several nuclear stations.

In support of these programs, Transnuclear, Inc. designed, supplied, inspected and tested a special canister, compatible with the TN-8L cask, for transporting irradiated non-fuel core components to the Barnwell Waste Disposal Site. Transnuclear, Inc. also developed an innovative approach to allow horizontal unloading of the waste canisters from the cask. This approach required a unique system for dry horizontal removal of the lid from a loaded cask and a special, adjustable unloading platform onto which the waste canisters could be remotely withdrawn and lowered into the ground for burial. The system was designed, developed, procured and tested by Transnuclear, Inc.

Transnuclear, Inc. was also responsible for transport management for these contracts and conducted similar interface activities with state and local governments as discussed in Sections C.3 through C.6.

6. Design and Operation of Spent Fuel Cask Handling and Transfer Equipment

Over the last several years, Transnuclear, Inc. has been involved in the design, development, engineering, testing, supply and inspection of large cask handling and transfer equipment. Under contracts with government contractors such as EG&G Idaho and with major utilities such as Commonwealth Edison, Virginia Power, GPU Nuclear and Duke Power, Transnuclear, Inc. has designed and operated both generic and site specific cask handling and transfer equipment for nuclear plants and government facilities throughout the U.S.

As part of these efforts, Transnuclear, Inc. has developed two major cask handling and transfer systems for use with the 40-ton TN-8/9 series of spent fuel transport casks. The first of these was a vertical lifting and transfer system which is used for remote rotation, lifting, and placement of a cask. Transnuclear, Inc. developed this system to decrease the handling and operations time of the casks and to reduce operator exposure during cask handling operations.

Transnuclear, Inc. has also developed a variable-angle, horizontal lifting system for the same 40-ton spent fuel casks. This lifting system was designed to address special site conditions at Virginia Power's Surry Power Station.

Transnuclear, Inc. designed and procured both of these lift systems, as well as other handling and transport equipment such as crane hook adapters, remotely operated fuel handling tools, cask tilting and transport frames, and truck cask transport trailers to support utility customers' transportation programs. These systems were designed and procured after interface needs were determined from site surveys by Transnuclear, Inc. personnel. In addition, Transnuclear, Inc. personnel supervised operation of these systems at such nuclear facility sites as: Dresden, Surry, North Anna, Oyster Creek, Oconee, McGuire, Hatch, Connecticut Yankee, Duane Arnold, Millstone, Brunswick, St. Lucie, Beaver Valley, Limerick, Vermont Yankee, Peach Bottom, Allied General Nuclear Services facility, West Valley Nuclear Service Center, Idaho National Engineering Laboratory TAN facility, Nevada Test Site EMAD facility, the Barnwell, SC Waste Disposal Facility, and the Hanford, WA Waste Disposal Facility. Transnuclear, Inc.'s NRC-approved Quality Assurance program was applied and followed for all safety related equipment.

7. <u>Design of Dry Transfer System</u>.

Transnuclear, Inc. is under contract to with EPRI to design a cask to cask Dry Transfer System. The purpose of this system, for use at reactor facilities with limited spent fuel pool access, is to transfer bare spent fuel assemblies from small transfer casks to the Multipurpose Canister in either a storage overpack or a transportation overpack. The project was initiated in January 1994 and will be completed in mid 1996. It is intended to obtain NRC approval of the design and for EPRI to make the design available for member-utilities use.

Transnuclear has formed a project team to perform the required scope of work.

Resource Applications, Inc.
Engineers • Scientists • Planners

(37)

Tara Singh, Ph.D., P.E., DEE
President

June 17, 1996

Ms. Michelle Miskinis, Contracting Officer
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Attention: HR 561.21

Dear Ms. Miskinis:

This letter is in response to the "Request for Expression of Interest and Comments Regarding (the) Office of Civilian Radioactive Waste Management Transportation Plan", which appeared in the Commerce Business Daily of May 24, 1996.

Resource Applications, Inc., a Small Disadvantaged Business, is interested in potential business opportunities associated with the OCRWM Transportation Plan. We would like to receive any and all future documentation and notices concerning this Plan. We would also like to be placed on the list of potential SDB subcontractors. Please address information to:

Dr. John W. Bartlett
Resource Applications, Inc.
2980 Fairview Park Drive Suite 1000
Falls Church, Virginia 22042

Our comments on the information provided in the CBD notice are presented below.

1. Order and Rate of Spent Nuclear Fuel (SNF) Receipt.

The OCRWM Transportation System must have flexibility and capability to receive and store SNF independent of the Acceptance Priority Ranking. Some reactors with priority ranking may not need early-on services or may need delays while preparing for SNF transfers. Other reactors without priority ranking may need near-term services to reduce on-site inventories in order to remain in operation. The OCRWM system will have to have a "brokerage" which aids trading of rights and timing for DOE receipt actions.

2. Contractor Capabilities.

The DOE SNF receipt, transport, and handling system involves a range of capabilities not held in aggregate by existing commercial suppliers such as trucking companies. Teams will have to be formed

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☐ 1465 Northside Dr., N.W., Suite 221 • Atlanta, GA 30318 • Tel: (404) 352-8236 • Fax: (404) 352-8504
☐ 150 South Wacker Drive, Suite 1900 • Chicago, IL 60606 • Tel: (312) 332-2230 • Fax: (312) 332-7869

to respond to the scope of work required, and the teams will have to provide effective management of highly-disparate functions. The Department might consider, as an alternative, that the contract be placed with a holding or management company with good understanding of, and and capability for, the systems-engineering aspects of the program and with responsibility and capability to contract with existing specialized companies that can provide the services required.

3. Regional Approach.

A regional approach is not needed or appropriate until operation of the system approaches or achieves its full-capacity, steady-state rate on the order of 2,000 MTU received per year. The geographic distribution of reactor sites is highly uneven, and in the early stages of operation the receipts will be relatively few in number and may be widely scattered in location. A multiplicity of contractors could not sustain a viable business base under these circumstances.

4. Stakeholder Involvement.

Stakeholder involvement, and likely intervention, is crucial to startup and operation of the DOE SNF transport system. Stakeholder confidence in availability and capability of emergency response systems is especially important; use of existing capabilities at facilities such as airports and military reservations is strongly recommended. Intervention actions, such as those experienced by DOE in association with the return of research reactor spent fuel and by Germany in the transport of wastes to Gorleben is to be expected. The Department should seek to use rail transport exclusively for interstate transport, and should make use of existing contracting and safety requirements for rail transport of materials such as SNF. Innovations which provide targets of opportunity for intervention actions should be avoided as much as possible.

5. Logistics.

Long lead times on the order of ten years or more will be required for certification, fabrication, and deployment of transport casks of new design. Lead times for fabrication and deployment of a fleet of certified casks using existing designs may be on the order of 24-30 months because there is no proven manufacturing capability currently in operation. The Department should plan for the lead times needed to have transport casks available in sufficient numbers when needed, and should anticipate the need for two or more generations of transport cask designs.

Thank you for this opportunity to provide input concerning the OCRWM Transportation Plan. We look forward to further information and opportunity to comment as the program proceeds.

Very truly yours,

John W. Bartlett

John W. Bartlett, PhD
Senior Associate

cc: Tara Singh, Ph.D., P.E., President

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ESSEX

June 17, 1996

Ms. Michelle Miskinis
Contracting Officer
Attention: HR-561.21
US Department of Energy
1000 Independence Ave, SW,
Washington, DC, 20585

REFERENCE: Notice of Waste Acceptance, Storage, and Transportation Services, published in the Federal Register on May 28, 1996

Dear Ms. Miskinis,

Essex Corporation is extremely interested in supporting the Office of Civilian Radioactive Waste Management's efforts in insuring the safe transport of spent nuclear fuel to a Federal storage or disposal site. We have been working with the Department of Energy for over 15 years training nuclear material couriers and evaluating emergency response plans. Our capabilities and experience are summarized here to demonstrate our unique ability to provide cost effective support for the many safeguards, security, training, standards, and crisis management issues that will be a part of your program. The challenge will be to effectively transfer these disciplines to the private industry groups that will ultimately support the actual transfer of the waste materials. However, it is a challenge that Essex is highly qualified to support.

Essex Corporation has over thirty years experience in major programs directly linked to transportation safeguards and security of nuclear materials, crises management, and antiterrorism training for the US Departments of Energy, State, and Defense, and the International Olympic Committee. We also have a longstanding working relationship with both the Federal Highway Department and the American Trucking Association on numerous truck driver safety programs.

Our philosophy for all these programs has been to form multidisciplinary teams to balance the needs of people, equipment, and the environment. These teams combine the talents of engineers, human factors specialists, operations analysts, security specialists, etc., to provide comprehensive solutions that meet the needs of the entire system.

If it moves on land, by sea, or in the air and needs to have its cargo protected, tamper-proofed, monitored for status, alarmed, or otherwise secured, our Albuquerque division has the expertise to assist the client. We are currently under contract to the Department of Energy (Transportation Safeguards Division) for training, logistics, and exercise support.

ESSEX CORPORATION • Systems Effectiveness Division • 1430 Springhill Road, Suite 510, McLean, VA 22102
(703) 556-9400 • FAX (703) 790-8180

Essex has 15 years of experience in planning and coordinating with many agencies at the local, state, and federal levels. This experience includes, but is not limited to, all planning for 13 Joint Training Exercises with DOE, FBI, EPA, FEMA, and subordinate agencies. We also coordinate with state and local law enforcement agencies (LEAs) and have written inter-agreements for DOE. We have worked closely with the Department's Radiological Assistance Program (RAP) and Accident Response Group (ARG) personnel, as well as, DOE and contractor personnel from major sites (Oak Ridge, Pantex, Savannah River, Nevada Test Site, and Albuquerque). We have coordinated activities with LEAs in 18 states, including city and county agencies.

Essex has experience in exercise site selection, vulnerability assessments, requirements identification, transportation management, and establishment of and support to training events at remote locations. We are skilled at providing the framework for successful Department of Energy exercises in any venue. Additionally, our personnel are skilled and experienced in highway route surveys, scenario development, and opposition force.

We have experienced instructors who have instructed in truck driving techniques that include defensive driving, emergency recovery procedures, tactics, counter-surveillance, response to emergencies, demonstrators, use of force, blockades, etc. We were instrumental in teaching the truck drivers for the Waste Isolation Pilot Project (WIPP) in New Mexico. Our instructors conduct basic, in-service, and advanced driving courses. They certify all nuclear materials couriers annually on driving abilities. We have developed curriculum and lesson plans to support all forms of driver training. Our instructors teach specific statutes pertaining to the defense of shipments, transportation of Hazardous Materials as codified in US CFR 49, vehicle safety, vehicle inspections, offensive as well as defensive driving, and Department of Transportation and Federal Motor Carrier Regulations.

Essex is also experienced in the collection and evaluation of security and antiterrorism data for facilities worldwide. Essex developed a Security System Operational Recording and Analyses System (SSORA) for the Defense Nuclear Agency. The equipment and procedures associated with this system were designed to allow for a total system evaluation of weaknesses associated with physical security, command and control, training, and crisis management. Data collection from separate groups in an exercise can be quickly correlated to show who was doing what and when it was being done. The data can be video, radio and computer communications, and direct observations. It makes comprehensive training examples for post-exercise review.

Essex was the prime contractor for the DOD "RED CELL" Antiterrorism Assistance Program. Essex evaluated the threat, conducted realistic exercises, collected and analyzed data, and developed both site specific and generic training materials for US Navy bases worldwide. Over 100 training video products were produced during this program. Essex is currently conducting security training programs for the Department of State and the Federal Aviation Administration. A list of recent Crisis Management, Security Training, and Antiterrorism programs are included in Attachment "A".

Essex conducted numerous studies on operator performance, fitness for duty, and truck driver safety for the Departments of Defense and Transportation. Essex was responsible for the original research that led to the development and adoption of the national Commercial Driver's License (CDL). Essex developed and pre-tested a battery of skill and knowledge tests that became the standard in each state. Essex personnel wrote a comprehensive Model Driver's License Manual containing all the information needed by CDL applicants to pass the CDL knowledge tests and an Examiner's Manual for use by CDL license examiners in administering the tests.

We currently have a contract with the Federal Highway Administration to research the causes of truck driver fatigue and its effect on driver performance. The ultimate goal of the research is the development of effective countermeasures to driver fatigue.

This overview illustrates the fact that Essex has developed the expertise and skills needed to maximize efficiency and safety in nuclear fuel transportation. We would like to have the chance to work with DOE in support of the transfer of the training, lessons learned, and safeguards and security technologies which must be an integral part of the success of this upcoming program.

We look forward to attending the pre-solicitation conference this summer and the development of this important program. If you have any questions, please don't hesitate to call on us.

Sincerely,

Martin G. Every
Senior Vice President

Attachment (1)
Orig. + 3 copies

ATTACHMENT A

ESSEX CORPORATION'S RELEVANT CONTRACTS IN ANTITERRORISM AND SECURITY EVALUATION AND TRAINING

Contract Number	Contract Amount	Award Date	Completion Date	Contracting Agency/Officer	Extent and Scope
DNA-001-82-C-0066	$4,100,000	1982	1988	Defense Nuclear Agency Special Exercises, 703/325-7395	Located at various training and operational facilities worldwide. Includes Force on Force, WADS, and Special Forces Training involving MILES. Number of exercise sites: over 60 worldwide.
DNA-001-85-C-0016	$3,900,000	1985	1987	Defense Nuclear Agency, 703/325-7395	Air Force (storage site and quick response areas). Navy (storage depots). Army (storage depots and system test site). NATO (storage sites) (over 400 total events). Number of exercise sites: 14 U.S. and 10 Europe.
Classified contract	$3,000,000+	1985	1988	U.S. Navy, Navy Security Coordination Team	Average of 20 events at each base for a total of over 500 events. Over 100 final video anti/counter-terrorism products developed. Number of exercise sites: 8 U.S., 7 Europe, 12 Pacific.
DE-AC04-86-AL-32307 DE-AC04-88AL43518 DE-AC04-93AL91124	$25,000,000	1985	present	U.S. Department of Energy, Ms. Debbi Miller, TSD-Albuquerque	Won award to manage the Transportation Safeguards Academy for DOE. Includes all Curriculum Development and Instruction for DOE couriers, etc.
P.O. 87545 DOE	$12,400	1986	1986	Assist. Sec, Defense Affairs, DOE	Design and conduct of security system evaluation at Savannah River and Idaho Falls facilities.
OPM-87-9036	$396,000	1987	1987	U.S. Army, Jack Vincent (OPM), 202/632-6172	Development and delivery of a classified multimedia, computer-based, interactive system to teach individual or group armed response tactics to defeat an attempted theft of nuclear materials from a weapons storage site.
Subcontract to XYZYX Corp	$19,000	1988	1988	Department of State, Office of Diplomatic Security, Mr. Al Gowing, 202/663-7395	Comprehensive hostage/barricade situations at embassy locations. Number of exercise sites: 3 U.S. Evaluation and counter-terrorism training videos were developed.
NA	$20,000	1988	1988	International Olympic Committee, Seoul, Korea, 1988	Essex with ISM, Inc. was contracted to the International Olympics Committee to do final evaluation of anti- and counterterrorism preparedness at all major Olympic sites in Korea for the Seoul Olympics 1988.
OPM-91-2975	$130,000 $73,000	1995 1991	present 1991	FAA Security, Ms. Florence Potter, 202/267-3114 FAA Security, Ms. Rochelle Kober, 202/267-3328	Essex conducted in-depth task analysis from existing documentation and interview with subject matter experts to develop a course to support security specialists participate in facility acquisition activities. Essex conducted a task analysis and developed a curriculum for initial training of the FAA Federal Security Manager position. Essex provided management overview of the entire course, coordinated the input of several independent training subcontractors, and developed and conducted a classroom security exercise.
OPM-91-2975	$11,200	1992	1992	Department of State, Dr. Cap Frank(OPM), 202/653-7057	Review of training course lessons being developed for the Antiterrorism Program for US Department of State.
OPM-91-2975	$55,000	1996	present	Department of State, Mr. John Cupp, 202/663-0265	Essex is developing a CD-ROM database for the Office of Antiterrorism Assistance. The database will combine an existing landmine database with improvised explosive device data from the FBI's database and several relevant documents.

Western Interstate Energy Board/ WINB

June 12, 1996

Mr. Daniel A. Dreyfus, Director
Office of Civilian Radioactive Waste Management
RW-1 Room 5A-085
Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Dreyfus:

Enclosed are the comments of the Western Interstate Energy Board's High-Level Radioactive Waste Committee on OCRWM's *Notice of Waste Acceptance, Storage, and Transportation Services* issued on May 28, 1996.

The Committee does not believe that the *Notice* provides adequate information with which to evaluate the scope of services which OCRWM intends to obtain from private parties with regard to a nuclear waste shipping campaign under the Nuclear Waste Policy Act. The Committee is fearful that this lack of information could result in the implementation of a totally unacceptable and inadequate transportation system.

It is also not clear to the Committee what step in the administrative process the *Notice* represents. However, despite this lack of clarity, the Committee wishes to ensure that it provides OCRWM with its views prior to any important decision being made with regard to this critical program.

Sincerely,

Daniel Nix, Co-Chair
High-Level Radioactive Waste Committee

Richard Moore, Co-Chair
High-Level Radioactive Waste Committee

cc: Linda Desell, Director Environmental and Operational Activities Division
Michelle Miskinis, Contracting Officer, U.S. Department of Energy
Markus Popa, Office of Civilian Radioactive Waste Management

600 17th Street, Suite 1704 South Tower, Denver, CO 80202-5447
Phone 303/573-8910 Fax 303/573-9107
Home Page http://www.westgov.org/wieb

Comments of the High-Level Radioactive Waste Committee
of the
Western Interstate Energy Board
on the OCRWM Notice of Waste Acceptance, Storage, and Transportation Services
Issued May 28, 1996

The *Notice of Acceptance, Storage and Transportation Services* issued by the Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) on May 28, 1996 presents inadequate information upon which to evaluate the scope of services being requested from private parties. The lack of information about OCRWM's intentions leaves open the prospect that a wholly inadequate transportation system may result. Such a system would fail to meet the objectives of western governors as outlined in numerous policy statements[1] and would be unacceptable to western states.

The entire approach taken by DOE in the *Notice* represents a major departure from its past approach for dealing with transportation planning and fails to build upon lessons learned from other DOE radioactive waste program activities including, most notably, DOE's Waste Isolation Pilot Plant (WIPP) transportation program. As the Committee has stated several times in the past, in order to establish a credible and effective radioactive waste transportation program, DOE cannot abdicate its responsibility for coordinating with states and tribes and for evaluating the various required transportation components.

There are six specific shortcomings that may result from the transportation system outlined in the *Notice*.

1. It appears that DOE's selected contractor, not the department, will be responsible for "interface with those States, Local and Tribal governments along the selected routes." It has taken DOE years to establish responsible relationships with western governors and regulators. As years of experience have shown in DOE's weapons production and subsequent cleanup activities, where DOE contractors are put in charge of interacting with state and local governments on federal programs, failure will follow. An important lesson from these experiences is that those who are ultimately responsible for implementing federal policy (i.e., DOE) must be directly accountable for actions taken to implement such policy. DOE cannot delegate this responsibility to a contractor.

Therefore, the *Notice* should clearly state that any selected contractor is responsible for "<u>assisting</u> DOE in interfacing with those State, Local and Tribal governments along the selected routes." If DOE issues contracts for services, the contracts should provide a clear system of incentives and rewards that effectively encourage the contractor to successfully work with DOE and state, local, and tribal governments.

2. It appears that DOE will rely on contractor recommendations on the routes to be used to ship spent fuel and HLW to a federal facility. It is inappropriate for DOE to delegate such a critical public policy decision to a contractor. As western governors have repeatedly

stated, it is the responsibility of the Department of Energy to evaluate alternative shipping modes and routes.

Additionally, the proposal to allow a contractor to select routes is incongruous with the schedule for efficient preparations along shipping routes. Efficient allocation of Section 180(c) resources requires advanced notice of shipping routes. Based on the work of western states, we estimate that such notice of shipping routes needs to be provided at least five years before shipments begin. According to the May 28 *Notice*, DOE will sign 5-10 year contracts for transportation services. However, based on western states' views of the time needed to designate routes, the contractor would not be shipping any material for at least the first five years of its contract, since its first task would be to recommend routes. The *Notice's* allowance of two to three years for the selected contractor to procure transportation and storage equipment and achieve operational readiness is therefore clearly an insufficient amount of time if DOE intends to rely on carriers to select routes.

The problems associated with the carrier selecting routes are exacerbated by DOE's proposal to have up to four carriers. For the western states, this means potentially dealing with four different contractors, using four different routing analyses through the same region. Such potential inconsistency in route selection will aggravate an already difficult problem, and underscores the importance of DOE establishing routes in advance, in consultation with affected states and tribes. Although the Committee supports the use of competition as a means of minimizing program costs, it is nevertheless imperative that multiple contractors utilize uniform routes.

3. It appears from the Notice that DOE is delegating to its contractor the decision of which transportation mode(s) will be used to ship spent fuel and HLW. Will the decision of which mode to use be decided by default based on cask availability or carrier preference? What role will corridor states have in the selection of the transportation mode? What role will utilities have in the selection of the transportation mode?

The major public policy decision of which mode of shipment to use should not be delegated to a contractor, but should be the product of careful analysis of the relative safety of alternative modes and routes conducted by the accountable agency — the Department of Energy.

Furthermore, the mode selected will likely be dictated by the type of canister chosen for the transportation program. The choice of canister is yet another area where contractors under the *Notice* could be making decisions which should be made by DOE on the basis of a careful analysis of risks. It should be noted that when deciding upon the type of canister to use, the analysis provided by the Navy in its currently developing *Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel*, should be taken into account.

Also regarding the choice of canister, the Committee recommends that DOE reexamine both the scope of services requested from a potential contractor and the intention stated in the *Notice* to use competitive "fixed-price type" contracts. Fixed price contracts may be appropriate to competitively procure direct transportation services. However, such a contract may be

inappropriate where the costs involved are less certain, as with the design and fabrication of transportation casks. The Committee recommends that DOE consider using separate contracts for such services.

4. It appears that DOE intends to give its contractor the authority to alter the order of spent-fuel acceptance to achieve efficiency of operation or to lower cost. Improving efficiency of operation and lowering cost are important. However, the exercise of such contractor discretion must not result in insufficient notice to corridor states of the shipping modes and routes to be used. Specifically, no alterations of the order of spent fuel acceptance should be permitted if such alteration would result in the use of shipping routes which have not been identified at least five years prior to shipment and on which inadequate preparations are in place.

The Standard Contract for the Disposal of Spent Fuel and/or High-Level Radioactive Waste allows the exchange of approved delivery commitment schedules with parties to other contracts with DOE for disposal, providing that DOE approves such exchanges in advance. Pursuant to the Notice, is DOE delegating this approval authority to the contractor? If not, what role will DOE have in approving changes to pickup schedules that the contractor wishes?

5. The *Notice* ignores the need to properly integrate waste acceptance, storage, and transportation with other key responsibilities which DOE has under the NWPA. For instance, the *Notice* does not provide for coordination with activities required of DOE under Section 180(c) of the Nuclear Waste Policy Act. Section 180(c) requires the Secretary of Energy to provide training for emergency responders through whose jurisdiction the Secretary plans to transport spent nuclear fuel. Conducting this transport through a privatization effort does not eliminate the need to provide such training. Therefore, any request for services by OCRWM should specifically require the contractor to factor in a schedule for the provision of training under Section 180(c).

6. The *Notice* fails to specify any role for corridor states in advising DOE on appropriate elements of a future Request for Proposals or in the review of proposals. As the experience with WIPP transportation preparations has shown, there are features of carrier contracts which are important to maintaining the safety of shipments. For example, the WIPP carrier contract requires the use of drivers who have at least 100,000 miles of accident free driving experience, establishes driver screening and driver training programs that are auditable, requires carriers to provide an operating plan to corridor states, establishes safe parking areas, creates vehicle maintenance in inspection procedures, allows for state audit of contractor compliance with contract provisions, etc. Critical safety features, such as limitations on times of transit in high risk areas, and limitations on travel during seasons of severe weather, need to be incorporated into carrier contracts. Provisions for operational coordination between DOE, the carrier, and state and local officials in corridor states also need to be incorporated into the carrier contract. At a minimum, OCRWM needs to adopt the successful WIPP model in which states participated in the selection of transportation service contractors.

Finally, the WIEB High-Level Radioactive Waste Committee recommends that OCRWM clarify the process it will use from this point forward in the acquisition of transportation services.

The Committee also requests that it be provided with all future notices from OCRWM associated with the acquisition of transportation services. Such notices should be sent to:

Western Interstate Energy Board
600 17th Street, Suite 1704 South
Denver, CO 80202

FAX: 303/573-9107
E-mail: ddecesare@westgov.org

1. WGA Resolution 95-020 identifies eight necessary steps to prepare for NWPA shipments:

1. The preparation of a comprehensive transportation plan that includes the analysis of all needed transportation safety activities in a single document;

2. The development of responsible criteria for selecting shipping routes;

3. The development of a sound methodology for evaluating optional mixes of routes and transportation modes;

4. The expeditious amendment of the Nuclear Waste Policy Act to provide states and tribes with technical assistance and training funds prior to any large-scale shipment of spent fuel to a repository and/or centralized storage facilities, whether such facilities are publicly or privately owned.

5. The prohibition on an major shipping campaign to interim storage facilities until such technical assistance and training funds have been provided at least three years prior to the commencement of such shipping campaign;

6. Adoption of regulations to implement a mutually acceptable program of technical assistance and training funds, such as those recommended by the Western Governors' Association;

7. Appropriations to fund technical assistance and training monies to states and tribes through whose jurisdiction spent fuel and high-level radioactive wast4e are to be transported; and

8. The full-scale testing of casks to be used to transport spent nuclear fuel and high-level radioactive waste.

In WGA resolution 92-004 (readopted June 23, 1995), the governors state that:

1. The objective of the Western Governors' Association is the safe and uneventful transport of nuclear waste from current temporary storage facilities to more suitable permanent repositories. The Western Governors are committed to working with Congress and DOE to achieve this objective.

2. Early coordination and effective communications with state, tribal and local governments is essential to the ultimate success of any nuclear waste transportation program.

3. DOE should proceed expeditiously with the implementation of the initiatives identified in the TRAIN to provide uniform safety procedures and coordination with state, tribal , and local governments for route-controlled DOE shipping campaigns and shipments to DOE facilities.

4. A safety and information program similar to that developed with western states for shipments of transuranic waste to WIPP should be utilized for all route-controlled DOE shipping campaigns. Safety programs should be

evaluated and improved as needed.

5. DOE should work to identify flexible funding resources and cooperative agreements between their civilian, power and defense agencies as a means for supporting WGA and DOE application of lessons learned through the WIPP safety program to other DOE shipping campaigns.

WGA Resolution 93-003 states:

1. The Western Governors' Association finds that, as a result of previous federal government inaction and delays, and a lack of strategic planning involving stakeholders, DOE cannot develop a national transportation program in time to meet the 1998 spent fuel acceptance date.

2. In order to expedite development of a system for accepting commercial spent nuclear fuel and high-level radioactive waste, the federal government must expand its focus beyond siting and development, in coordination with the states, a logical, and timely transportation program. This involves DOE policy commitments to:

- develop responsible routing criteria.
- develop a sound methodology for evaluating optional mixes of routes and transportation modes;
- fix the shipping origins and destinations points as early as possible;
- ensure the availability of rail and truck shipping casks;
- expeditiously evaluate and select the design for a multi-purpose cask;
- conduct full-scale cask testing;
- fulfill emergency preparedness requirements (Section 180(c) of the Nuclear Waste Policy Act Amendments) prior to shipping spent fuel.

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ENERGY RESOURCES INTERNATIONAL, INC.

1015 18TH STREET, N.W., SUITE 850, WASHINGTON, D.C. 20036
PHONE:(202) 785-8833 FAX: (202) 785-8834

DATE:
June 20, 1996

TO: Michelle Miskinis

FROM: Eileen Supko

COMPANY: DOE OCRWM

TOTAL NO. OF PAGES INCLUDING COVER: 1

FAX NUMBER: (202) 634-4419

RE: OCRWM Private sector transportation

Please send me material related to the presolicitation conference to be held July 9, 1996 related to the Expression of Interest and Comments on DOE's Notice of Waste Acceptance, Storage and Transportation Services, 61 Fed Reg 103 (May 28, 1996).

(41)

HOLTEC INTERNATIONAL

Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053
Telephone (609) 797-0900
Fax (609) 797-0909

June 13, 1996

Ms. Michelle Miskinis
Contracting Officer
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585

Attention: HR-561.21

Dear Ms. Miskinis:

Holtec International herewith wishes to express an interest in the subsequent actions, notices and correspondence related to the Office of Civilian Radioactive Waste Management contracting for spent nuclear fuel acceptance, storage and transportation supplies and services noticed in the Federal Register, Volume 61, Number 103 dated May 28, 1996.

Holtec International is a leading supplier of spent nuclear fuel storage technology in the world, having supplied over 70,000 storage cells for spent fuel pools. This represents approximately 60% of all the spent fuel assemblies discharged to-date in our U.S. commercial power plants. In addition, over the past year, Holtec has had a major impact in the dry spent fuel storage market with the commercial sale of eleven (11) of our HI-STAR 100 MPC Systems to ComEd for Dresden Unit 1 fuel. These large dual-purpose casks are designed for both storing and transporting spent fuel and are in strict compliance with Revision 5 of the U.S. DOE's Design Procurement Specifications for MPC Systems. Holtec has submitted the HI-STAR 100 MPC System to the NRC for 10CFR Part 72 storage certification (Docket# 72-1008) and for 10CFR Part 71 transport certification (Docket# 71-9261). In addition, Holtec has developed a HI-STORM 100 concrete storage module for the HI-STAR MPCs and this system has also been submitted to the NRC for eventual storage certification. Holtec was selected recently as one of two technologies to be used in the design process by a consortium of twelve U.S. utilities engaged in siting and licensing a Private Spent Fuel Storage facility. Over the next several years, Holtec anticipates the sale of approximately 50-60 of the HI-STAR/HI-STORM 100 Systems to utilities needing dry spent fuel storage.

Holtec has several initial comments and general concerns with respect to the information and issues outlined in the Federal Register Notice. They are:

HOLTEC INTERNATIONAL

Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053
Telephone (609) 797-0900
Fax (609) 797-0909

a) Free market policies should dictate the sale of MPC canisters and transport casks for use by the service contractors and a specification of system design requirements and capabilities should be used to establish the dollar amount of rebates and credits at the repository or interim storage site(s). Simply stated, the U.S. DOE should a priori establish a concise definition for a standard and acceptable canister system and identify those additional features and desirable characteristics which would result in avoided costs to DOE or the service contractors. Systems which minimize DOE costs and repository requirements or storage site infrastructure should be selected with higher priority or stated preference in the purchases of vendor spent fuel canister, transportation casks and storage modules.

b) Nuclear utilities should have some direct management role and/or oversight function with the service contractors since these contractors will in effect be reimbursed for their services with funds provided by the various utilities. This would include some flexibility and discrimination within each utility organization with respect to selecting fuel assemblies and setting schedules for shipments to the repository or interim storage site.

Holtec would also like to receive some guidance and insight as to whether it needs to link itself within potential service contractor teams in order to ensure it has an opportunity to bid our HI-STAR and HI-STORM MPC Systems in the procurement phase. Does Holtec need to be on a winning service contractors team at the time of award in order to supply these systems?

If you have any questions or comments, or if you require additional information on Holtec International in regard to this expression of interest, please do not hesitate to contact me at (609)797-0900 (x-611 or x-612).

Very truly yours,

Dave Ferg

David A. Ferg
Vice President

cc: Dr. D. Elias (ComEd)
Mr. S. Brewer (AEPSC)

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CALLE & ASSOCIATES

429 Overlook Drive • Lusby, Md 20657 • Telephone (410) 326-4389 • Fax (410) 326-4088

June 26, 1996

Ms. Michelle Miskinis
Contracting Officer
U.S. Department of Energy
1000 Independence Ave. S.W.
Attn: HR-561.21
Washington, D.C. 20585

Dear Ms. Miskinis,

Thank you for discussing contractual opportunities with me earlier today. I would like to take this opportunity to formally introduce our firm, Calle & Associates. We specialize in Engineering and Environmental Consulting Services. Calle & Associates qualifies as a Small Disadvantage Business Enterprise under the provisions of the Small Business Act.

Per our conversation, I am requesting copies of the Draft Statement of Work and other pertinent documents associated with the Office of Civilian Radioactive Waste Management's plan for the acceptance, storage and transportation of radioactive waste. Our firm is very interested in participating in the presolicitation conference for this program scheduled for July 9, 1996. Please send all documentation to the above address.

Thank you very much for your assistance. Please contact us at (410)326-4389 with any questions you may have.

Sincerely,

Jorelito O. Calle. P.E.
President

JOC/eac

cc: File
OCRWM-001

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Kindrick Trucking Company

2818 Roane State Highway, Harriman, Tennessee 37748
(423) 882-0457 Facsimile (423) 882-9715

June 19, 1996

Ms. Michelle Miskinis
Contracting Officer
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Attn: HR-561.21

RE: Federal Register Notice, May 28, 1996

Dear Ms. Miskinis,

Kindrick Trucking Co., Inc. (KTC) has been in business since 1946 and transporting radioactive, and hazardous materials/wastes since 1981. We wish to be notified of meetings, regulations, etc. concerning waste acceptance, storage and transportation services.

Comments:

#3 While understanding your desire to preserve competition by dividing the country into regions, you will drive your final costs up by not allowing a single contractor more than two regional service contracts. There are many fixed costs associated with transportation. Limiting the volume to apply these fixed costs will result in higher quotes. Additionally, the majority of your nuclear qualified carriers are presently providing nation-wide service.

Please contact me personally if additional information is needed.

Sincerely,

KINDRICK TRUCKING COMPANY, INC.

Blake R. Williams

BRW:keb

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To: Deborah Evans
cc:
From: Markus Popa
Date: 06/28/96 08:27:31 AM
Subject: person for Dwight's stuff

Please put this person on "the mailing list" for anything involving what Dwight and Dave are doing with the market driven strategy....and if you could, anything you've already sent....thanks...mp

Dale DeCesare
Western Interstate Energy Board
600 17th Street, Suite 1704 South Tower
Denver, CO 80202-5401

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MARTIN GUERIN & ASSOCIATES, INC.

5501 Backlick Road, Suite 202
Springfield, VA 22151-3940
703-941-6091 ▲ Fax 703-941-6299

June 28, 1996

Ms. Connie Macaluso AND Ms. Michelle Miskinis
Environmental and Operational Activities
The Office of Civilian Radioactive Waste
US DOE
Forrestal Building
1000 Independence Ave SW
Washington DC 20585

VIA FAX 202 586 1047
202 634 4419

RE: PRESOLICITATION CONFERENCE FOR ACQUISITION OF TRANSPORTATION SERVICES

Dear Ms. Macaluso and Ms. Miskinis:

We request to be registered for the referenced conference to be held on July 9,1996.

We request to receive the Draft STATEMENT OF WORK and the Draft Waste Acceptance, Transportation and Storage Concept of Operations in Hardcopy.

We appreciate your cooperation and look forward to meeting you.

Most sincerely yours,

Joseph A. Malley

Joseph A. Malley, Sr. Principal

TOTAL P.01

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To: Deborah Evans
cc: David K Zabransky
From: William Lemeshewsky
Date: 07/01/96 09:07:06 AM
Subject: RSA Mailing

Per telcon with Miskinis today, pls send copy of same info to:
J. Pride
Scientific Ecology Group
P O Box 2530
Oak Ridge, Tn. 37830

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inmark, inc.
INNOVATIVE CONTAINER MARKETING
20 FISK DRIVE S.W.
ATLANTA, GA 30336-0309
(404) 349-4432
FAX (404) 349-5249

June 27, 1996

Dear Ms. Miskinis,

Thank you very much for the information you gave me via phone 6/27/96.
Will you please provide me with the draft statement of work and the draft concept of operations.

Sincerely,

Tim Dooley

Tim Dooley
Product Manager
Hazmat Packaging Dept.

3330 AMBROSE AVENUE
SPACE PARK EAST
NASHVILLE, TN 37207-4716
(615) 262-8961
FAX (615) 262-9755

8301 TRIAD DRIVE
GREENSBORO, N.C. 27409-9621
(910) 668-4279
FAX (910) 668-4089

800 SUEMAC ROAD
SUITE 84
JACKSONVILLE, FL 32254-2700
(904) 786-4991
FAX (904) 786-4996

165 GOODRICH DRIVE
SUITE 101
BIRMINGHAM, AL 35217-1465
(205) 856-9077
FAX (205) 856-9063

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Facsimile Cover Sheet

Ref: General Policies and Procedures. No. 39 5005 110

RAYTHEON

Date: July 2, 1996

Message No.

To	Telephone No.	Location/Department
Ms. Michelle Miskinis		
Organization	Fax No.	
DOE	202-634-4419	
From	Telephone No.	Mail Stop
Bob Branick - Director, Engineering & Construction Programs	703-416-5885	

Raytheon Engineers & Constructors
Washington Operations
1215 Jefferson Davis Highway
Suite 1500
Arlington, VA 22202

Telephone (703) 416-5800
FAX (703) 416-5909
RayComNet 333

Message:

Dear Ms. Miskinis:

Per our discussion, please add me to your bidder's/mailing list for OCRWM's Acquisition of Transportation Services for Spent Nuclear Fuels and Other Associated Activities.

Thank you for your help.

Contents: Total Pages Transmitted 1 Including Cover Page

Notes:
1. *If message is not received completely or not received by intended party, please contact sender.*
2. *No classified information shall be sent via facsimile.*
3. *No technical data related to defense articles or services shall be transmitted out of the United States.*
4. *No "Company Private" material shall be sent to an unattended machine and transmission to an attended machine requires telephone confirmation be intended recipient upon receipt.*

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To: Deborah Evans, David K Zabransky
cc: Dwight Shelor
From: William Lemeshewsky
Date: 07/02/96 09:22:56 AM
Subject: RSA mailing

Based on Miskinis call today, pls mail a package to
Rita Bowser
c/o Studsvik Inc.
12110 Sunset Hills Rd.
Reston, Va. 22090

tsmt®
a TRISM company

Tri-State Motor Transit Co.
Post Office Box 113
Joplin, Missouri 64802
417 624 3131

0050

July 2, 1996

Ms. Michelle Miskinis
Contracting Officer (DOE/HR 561.21)
U.S. Department of Energy
1000 Independence Ave. S.W.
Washington, D.C. 20585

Fax: 202-634-4419

I am requesting copies of the following documents which are planned for distribution at the pre-solicitation conference on July 9, 1996.

Draft Statement of Work
Draft Statement of Waste Acceptance
Transportation and Storage Concept of Operations

Thank you for your assistance.

Respectfully,

Joei Carroll-Maxwell

Joei Carroll-Maxwell
Logistics Coordinator

A Commitment To Excellence

TOTAL P.01