

MARKET DRIVEN STRATEGY FOR ACQUISITION OF WASTE ACCEPTANCE AND TRANSPORTATION SERVICES FOR COMMERCIAL SPENT FUEL IN THE UNITED STATES

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SUMMARY

The Office of Civilian Radioactive Waste Management (OCRWM) in the United States Department of Energy (DOE) has the responsibility under the Nuclear Waste Policy Act of 1982 (the Act) for the shipment of spent nuclear fuel (SNF) from commercial reactors to a Federal facility for storage and/or disposal. The Act requires the utilization of private industry to the "fullest extent possible" in the transportation of spent fuel.

An OCRWM goal is to develop a safe, efficient, and effective transportation system while meeting the mandate of the Act. Initially, as existing equipment and systems were not optimally designed for the large quantities of older and cooler SNF that would have to be transported, OCRWM embarked on a program to have private industry design, certify, and fabricate high capacity, advanced technology transportation casks.

However, OCRWM's later assessment of activities in the private sector indicated that several storage-transport canister and cask designs were being developed for utility applications. It became apparent to OCRWM that private industry could take a greater role than originally envisioned. These factors and others lead OCRWM to develop a strategy for a market driven approach for the acquisition of transportation services and equipment.

To implement this strategy, OCRWM is planning to issue a Request for Proposal (RFP) for the provision of the required services and equipment to accept SNF from the utilities and transport the SNF to a Federal facility. Two draft RFPs have been issued with the second draft incorporating comments on the first draft from potential contractors and other interested parties. The overall strategy as outlined in the draft RFP relies on private industry to use the innovative powers of the marketplace to help DOE accomplish its mission objectives. DOE intends to pursue this procurement strategy whether or not the OCRWM program includes interim storage. The concept described in the draft RFP provides for DOE to purchase services and equipment from a contractor-operated waste acceptance and transportation organization. The contractor is expected to provide initial financing for the project including that necessary for initial acquisition of operational equipment, establish the necessary management organization, and mobilize the necessary resources and capabilities to provide the SNF delivery services at a fixed rate. DOE

will retain final approval on all routes and maintain primary responsibility to the States, Tribes, and local units of government for assuring appropriate interaction and consideration of their input on transportation of SNF through affected jurisdictions.

DISCUSSION

Spent nuclear fuel has been transported safely and effectively for decades in the United States and worldwide. However, the SNF that will have to be transported by OCRWM to implement the Act is unprecedented both in quantity and rate of shipment. Over 70,000 metric tons of uranium (MTU) will be shipped at rates of up to 3000 MTU per year which will require as many as 400 shipments per year. This contrasts with about 2500 shipments made to date in the United States. It was clear to OCRWM from the outset that existing SNF transportation equipment and systems would not be adequate for the projected shipments. As the original concept for the nuclear fuel cycle in the United States, as in the rest of world, was for reprocessing of spent fuel with subsequent recycle of the recovered uranium and plutonium, the existing SNF transportation equipment was designed to ship short-cooled fuel. However, the SNF to be shipped in accordance with the Act will be cooled for at least 5 years after discharge from the reactor.

In order to have adequate and efficient equipment available for shipments that were originally scheduled to begin in 1998, OCRWM embarked on the Cask System Development Program. A Request for Proposal was issued in 1986 and five contracts were placed in 1988. These contracts were for the design and certification of high capacity advanced technology rail and truck casks. For various reasons including lack of funding, all of these contracts have been terminated or completed. One design for a truck cask with a capacity of four PWR assemblies or nine BWR assemblies was submitted to the NRC for approval prior to contract termination. Certification of the PWR design is now being sought by private industry.

Increased private sector activity in developing dual purpose (storage and transportation) systems to meet utility requirements indicated to OCRWM that the government role could be revised and a strategy to maximize the involvement of private industry in all aspects of the transportation of SNF was developed.

The objective of this "market driven" strategy is to contract with private industry for the provision of services, including equipment, to accept SNF located at utility reactor sites on behalf of DOE and transport the SNF to a Federal facility for storage or disposal. OCRWM is implementing this strategy by developing a solicitation asking for proposals from private industry to provide the required services and equipment.

The development of the solicitation started in 1996 with the issuance of a draft Statement of Work and a Concept of Operations. A meeting was held in July 1996 to present the approach to potential vendors and other interested parties. A draft Request for Proposal was issued in December 1996 and a presolicitation conference was held in February 1997. Comments on the draft RFP were accepted through May of 1997 and a revised draft RFP giving consideration to the comments was prepared and issued in November 1997. The remainder of this paper will discuss the procurement strategy in the revised draft RFP.

The strategy has been developed to share risk between the DOE and the contractors. The contractors will be asked to provide the equipment and services at fixed prices and at fixed rates. The involvement of OCRWM will generally be limited to policy decisions, stakeholder relations,

and provision of financial and technical assistance to States and Tribes for training of public safety officials. Only minimal requirements will be placed on the equipment to be supplied by the RSCs; the most important requirement is that the packaging be approved by the NRC. A company must have an NRC-approved Quality Assurance Program to be qualified to respond to the RFP. Winning contractors must conduct their activities in accordance with their QA program. One exception to OCRWM's minimal involvement will be audits and surveillances as required by OCRWM's QA program.

For purposes of the solicitation, the contiguous forty-eight states have been divided into four Servicing Regions which correspond to regions defined by the US NRC. Each contractor (hereafter called a "Regional Servicing Contractor" or RSC) will be responsible for all activities and services originating in its Servicing Region, including the provision of Transportation Cask Systems and Storage Systems as required to provide the necessary waste acceptance and transportation services.

The RSC will be responsible for performing all planning, preparations, waste acceptance and transportation of SNF from the utilities in its Servicing Region to the Federal Facility at fixed rates. The work scope for the proposed contracts has been phased to facilitate contract definition and performance. The phases are: Phase A - Planning; Phase B - Acquisition of Equipment and Mobilization; and Phase C - SNF Acceptance and Transport.

OCRWM expects to award one or more contracts in each Servicing Region for Phase A which will last 12 months. Its purpose is for the contractor to produce comprehensive plans and pricing for the work scope defined in Phases B and C. Phase A will provide DOE the information needed to evaluate and potentially authorize one, and only one, RSC in each Servicing Region to proceed with Phase B and subsequently with Phase C. However, one RSC can be awarded a contract for up to two Servicing Regions. Therefore, there could be two, three, or four RSCs in Phases B and C.

The initial three years of Phase B involves marshaling of the required equipment, procedures, facilities, and personnel and preparing to start up waste acceptance and transportation operations. Phase B also includes the following ten years of management and acquisition of required equipment. Phase C, commencing approximately three years after the start of Phase B, includes 10 years of waste acceptance and transportation operations. Phase C will start after a Federal facility becomes operational. Figure 1 shows the alignment of the contract phases.

RSC Contract Phases

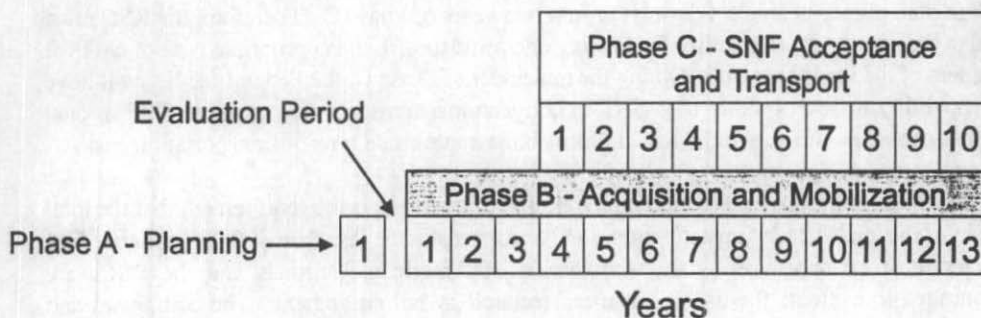


Figure 1

PHASE A: PLANNING

During Phase A, the RSC will develop plans for the Phase B and Phase C activities. These will describe how the RSC plans to manage the project, procure the required equipment and services, work with the utilities at each site in its Servicing Region, schedule all shipments to the Federal facility, propose transportation routes, communicate with stakeholders such as State and local governments and Indian Tribes, develop emergency response procedures, apply its NRC-approved Quality Assurance Program to the project, and get commitments for project financing. In addition the RSC will develop a proposal for Phase B and C work with firm fixed prices and rates. The proposal and the plans will be delivered to OCRWM at the end of Phase A and will be used by OCRWM to determine which contractors will be authorized to proceed with Phases B and C.

The plans will be based on SNF acceptance schedules to be provided by OCRWM to the RSCs. Each utility in the United States with SNF to be accepted for disposal by OCRWM has a contract with DOE that defines the conditions and schedule for acceptance and transportation of the utility's SNF. The schedules to be furnished to the RSCs will be based on these contracts.

Interactions between OCRWM and the contractors during Phase A will be limited. The contractors must submit monthly progress reports and periodic management reviews will be held. The contractors will be paid a pre-determined firm-fixed price at the end of Phase A after OCRWM acceptance of all plans.

PHASE B: EQUIPMENT ACQUISITION AND MOBILIZATION

Phase B is anticipated to last approximately thirteen years. The first three years will cover initial equipment acquisition and pre-operational mobilization activities. The last ten years will run concurrently with Phase C and will cover management of Phase C waste acceptance and transportation activities and continuing equipment acquisition.

Several types of equipment must be furnished by the RSC including transportation casks, dual purpose canisters, storage only canisters, storage modules, and all required ancillary and support equipment.

The transportation casks must be approved by the NRC and must be suitable for use at the utility sites. For the purposes of the RFP, it has been assumed that the Federal facility will only accept SNF in dual purpose canisters during the first two years of Phase C. Therefore, the RSC must furnish the canisters to the utility for loading and must furnish the appropriate type of cask for shipment of the loaded canister. During the remainder of Phase C, the Federal facility will have the capability to accept either bare SNF in conventional transportation casks or SNF in dual purpose canisters. It is up to the RSC to furnish the appropriate type of transportation cask.

The only other significant restriction on the design of the casks is the requirement that the total weight of the loaded cask, impact limiters, and transport skid be less than 300,000 pounds. The railcars must be approved by the Association of American Railroads and the RSCs are encouraged to evaluate the use of advanced technology rail equipment. The equipment and procedures used for highway transport must meet applicable Commercial Vehicle Safety Alliance inspection standards.

As discussed above, the RSC must supply dual purpose canisters during the first two years of Phase C. Storage only canisters must also be provided to the Federal facility during the next three years of Phase C to accommodate the bare SNF being shipped by the RSC. Furthermore, during the first five years of Phase C, the RSC must provide storage modules to the Federal facility which will be compatible with either the dual purpose or storage only canisters. All storage systems must be approved by the NRC. After the first five years of Phase C, the storage only canister and the storage modules will be procured separately by OCRWM.

All ancillary equipment required to handle and load the dual purpose canisters and the transportation casks must be provided to the utility by the RSC. Any system specific equipment required to handle and unload the transportation casks at the Federal facility must be supplied by the RSC. Also, any equipment required to load the storage modules and move them to a storage location at the Federal facility must be furnished by the RSC. The DOE will take title to some of the equipment as it is delivered and will have title to the remaining equipment, including the transportation casks, at the end of the contract.

This scope of supply is different in that vendors supplying transportation services are not usually requested to provide storage systems and vendors of storage systems do not normally provide transportation services. OCRWM is committed to maximizing the utilization of private industry and this expanded scope of supply is one way of meeting this goal.

Other important work during the first three years of Phase B includes operational demonstrations of equipment both at the Federal facility and in the RSC Servicing Regions. Training of utility and Federal facility personnel in the use of the RSC supplied equipment will be necessary prior to first use. The RSC must also maintain and update the plans submitted at the conclusion of Phase A.

PHASE C: SNF ACCEPTANCE AND TRANSPORT

Phase C is the ten-year operational period for waste acceptance and transportation. Commencing with the startup of Phase C operations, the RSC will accept the SNF at the utility on behalf of the DOE, transport the SNF to the Federal facility, and provide all communications, reporting, special handling, in-transit physical protection, and emergency response services. The RSC will also provide outreach activities to stakeholders as required.

The RSC is responsible for making all arrangements for transportation including contracts with rail or highway carriers. If rail access is not available at a reactor with the capability to use a heavy cask, the RSC must provide heavy haul or barge transport and the necessary intermodal transfer. In-transit physical security to meet NRC regulations must be provided. Continuous tracking of each shipment using TRANSCOM or a similar system is required. In short, the RSC must perform all activities necessary to ship irradiated fuel from one NRC licensee to another in accordance with all applicable laws and regulations.

The specific SNF to be shipped from each utility in each year of Phase C will be as agreed between the DOE and the utility and the information will be furnished to the RSC. The exact schedule for shipment each year will be coordinated among the RSC, the utility, and the operator of the Federal facility.

CONTRACT TYPE

Many contracts with the United States Department of Energy are of the cost reimbursement type which allows the contractor to be reimbursed for all allowable costs plus a profit which can be determined in several ways. A fixed price contract requires the contractor to perform a specified scope of work for an agreed upon fixed price. This fixed price is to cover all of the contractor's costs including profit. If the contractor is able to perform the work at less than its expected price, the profit will be higher. Conversely, if the costs are higher than expected, the profit will be lower, and the contractor could even lose money on the contract if the costs are higher than the fixed price.

OCRWM chose the fixed price type of contract as the appropriate approach for a phased procurement of waste acceptance and transportation services. Both fixed prices and fixed rates must be provided by the contractor. Equipment which will be supplied to the Federal facility to support operations of the RSC transportation casks and storage systems will be delivered at a fixed price and paid for on delivery. Storage modules and canisters will also be delivered at a fixed price and paid for on delivery.

In Phase C the RSC will be paid at a fixed rate per fuel assembly delivered. All of the RSC's estimated costs except those for equipment delivered to the Federal facility are to be included in their proposed rate. These costs would include freight charges, in-transit physical security, communications, Quality Assurance, engineering, and amortization of design and certification costs, general and project management and all other personnel costs. Financing costs are to be included as is profit. The RSC can request an advanced payment to cover the fabrication costs of the transportation casks; any advanced payment has to be deducted from the Phase C payments.

COMMUNICATIONS AND OUTREACH

Although OCRWM retains primary responsibility for interactions with State, local, and Tribal governments and other interested parties, which are collectively called stakeholders, the RSC must plan on meeting with the stakeholders, providing information to them on request, and keeping them informed of progress. A base amount of this effort is to be included in the Phase C fixed rates. If DOE requests additional effort, the RSC will be reimbursed on a time and materials basis.

CONCLUSION

The United States Department of Energy is planning to contract with private industry to the "fullest extent possible" for the provision of waste acceptance and transportation services for the Civilian Radioactive Waste Management Program. The DOE will procure on a fixed price and fixed rate basis all equipment and services necessary to accept and transport spent nuclear fuel from reactors around the country to a Federal facility for storage or disposal. The schedule for awarding contracts is dependent on the development of storage or disposal facilities, but regardless of the schedule the Department is committed to this course for waste acceptance and transportation services.