



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

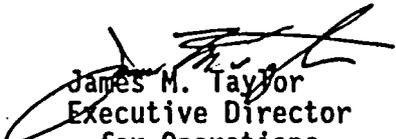
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March 10, 1993

MEMORANDUM FOR: The Chairman
FROM: James M. Taylor
Executive Director for Operations
SUBJECT: UNIVERSAL CONTAINER SYSTEM (UCS) PROPOSED BY VIRGINIA
POWER

Enclosed are responses to your questions concerning Virginia Power's proposal to the Department of Energy to develop a Universal Container System. I understand that the General Counsel will address the legal aspects of the proposal under separate cover.


James M. Taylor
Executive Director
for Operations

Enclosure: Responses to Questions
concerning VP's Proposal

cc: Commissioner Rogers
Commissioner Curtiss
Commissioner Remick
Commissioner de Planque
OGC
SECY
OPA
OCA

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PDR. COMMS NRCC
CORRESPONDENCE PDR

- A. Do NRC Regulations present any problem with the overall approach to a Universal Container System (UCS)? Do we need rule changes to consider an application for a UCS?

The UCS concept involves a common inner container with separate overpacks for storage, transportation and disposal. The UCS represents essentially three separate systems for the purposes of NRC review and approval. Under current regulations, each of the required NRC approvals, (certification as a storage container under Part 72, certification as a transportation container under 71, and approval of the repository license application which includes waste package/engineered barrier system (EBS) and its contained UCS for disposal under Part 60) would require submittal of a separate application and review.

While the Commission's regulations in 10 CFR Part 60 do not specifically address the UCS concept, the regulations do not present any problem with the overall approach to a UCS and no rule changes would necessarily be needed to evaluate the concept. However, 10 CFR Part 60 currently has no provision for approval of waste package components prior to receipt of an application for construction authorization.

- B. What is the Staff's reaction to the concept?

The UCS concept is not totally new. Staff has met with an applicant for a proposed storage-transportation container system, which has a common inner metal container with different configurations for storage and transportation. This ongoing activity is being done under existing regulations and to accepted codes, standards and practices. The UCS would extend this activity to include waste disposal.

As a concept, the UCS proposal appears to have merit. Standardized containers could contribute to efficiency in handling and in the overall economy for storage, transport and disposal. It is less certain if the UCS would reduce exposures from handling.¹

The staff does not have sufficient information about the proposal to identify specific problems. Staff has, however, identified the following areas which might be of concern:

¹ In a formal presentation to the Nuclear Waste Technical Review Board on January 6, 1993, DOE stated that its Multi-Purpose Canister Study may show that the UCS concept may result in higher occupational exposure than with the use of existing reference container designs.

- DOE has not completed site characterization, repository design, and design of the waste package and engineered barrier system. VP will need to integrate their development of a UCS with DOE's high-level waste program plans and schedules.
- Material property performance requirements for storage, transportation, and disposal are different. The inner container and its overpacks must be shown to satisfy the requirements appropriate for each application.
- The measures needed to assure subcriticality in the inner containers (i.e., moderation control, neutron poisoning, fuel geometry, etc.) vary between storage, transportation, and disposal. This concern must be considered in UCS design.
- Operational controls differ for storage, transportation and disposal (e.g., provisions for monitoring and leak tests). The design features required for operational controls must be considered in an UCS design.
- The effects of long-term storage and transportation on the integrity of the UCS and its contents must be assessed for disposal requirements.

Because three different sets of criteria need to be addressed in a UCS application, staff believes that it is essential that meetings with the applicant be held at the earliest possible time in the design process.

C. What resources would be needed for reviewing and licensing an UCS?

The resources needed to review and approve a UCS would consist primarily of the resources needed to complete the individual reviews under Parts 60, 71 and 72 and are shown below:

Storage: Approximately 1 FTE, and between \$200K to \$500K in contract dollars, would be required to complete the technical review of the UCS as a storage container under Part 72. (Some savings may be achieved by relying on appropriate analyses conducted for the transportation certification review.) An estimated 0.25 to 1 FTE (uncertain at this time) would also be required to complete a rulemaking to add the UCS to the list of approved storage casks in Part 72.

Transportation: The review and certification of a UCS as a transportation package under Part 71 would require approximately 0.75 FTE - the same level required for the review and certification of a typical spent fuel cask.

Disposal: An estimated one additional FTE would be required for the proposed review period (about one-quarter FTE per year), if NRC were to conduct a pre-licensing review of the ongoing development of the UCS as a disposal container. This estimate is based upon experience in reviewing

analogous waste acceptance process documents for glass/vitrified waste forms and the assumption that DOE will continue development of alternate waste form designs. No additional resources would be required for the UCS review as part of a license application for a geologic repository (i.e., a repository application which includes a UCS container would take no more resources than an application which includes a non-universal container system).

D. What is the feasibility of the proposed schedule?

The five-year schedule proposed by Virginia Power (VP) for obtaining the necessary NRC approvals is ambitious. While concurrent reviews may be feasible, it would be prudent for the applicant and the staff to identify critical parameters for each activity and determine their potential impacts for the overall UCS concept. Scheduling estimates for the required individual reviews for storage, transportation, and disposal are given below.

Storage: The VP schedule estimates that a UCS would be approved for storage under Part 72 by 1995. Since the technical review and approval would take approximately 18 months to 2 years, VP would have to submit an application in 1994. The rulemaking to enable licensees to use the container under the general license provisions of Part 72, could require an additional year. Thus, if an application is submitted in 1994, it is feasible that the container could be approved under Part 72 in 1995, and that the rulemaking to use the container under general license could be completed in 1996.

Transportation: The VP schedule estimates that a UCS would be certified as a transportation package under Part 71 by 1996. Since the review and approval would take approximately 18 months to 2 years, VP would have to submit an application in 1994 or early 1995. Since the proposal indicates that NRC licensing submittal will be prepared in 1994, staff believes that the schedule for obtaining certification under Part 71 is feasible.

Disposal: VP's proposed schedules deal primarily with storage and transportation issues. However, the staff notes that VP's development of the UCS concept should be integrated with DOE's existing plans and schedules for development of a repository waste package and engineered barrier system. Staff would provide pre-repository licensing guidance concurrently with the Part 71 and 72 reviews.

In any event, to meet the proposed schedule, it is important that the UCS design be based on both sound and established engineering principles, and contain a clear demonstration that safety standards for each area are met.