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RSPA-00-7421-4

12468-N

**EXEMPTION EVALUATION FORM**  
(Revised as of December 7, 1995)

DEPT. OF TRANSPORTATION

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**PART 1 APPLICANT**

1A. Application Number: 37506

Exemption Number : 12468

Project Officer : Richard Boyle

1B. Date of Application: 3/30/2000

1C. Name of Applicant: Mr. G.P. van Noordennen

Company Name: Connecticut Yankee Atomic Power  
Co.Address: 362 Injun Hollow Road  
East Hampton, CT 06424  
Phone Number: 860-267-3938

1D. U.S. Agent for foreign applicant or Consultant Name:

Same as Applicant

1F. Summary of What Applicant is Requesting:

The applicant requests authority to transport in commerce a reactor pressure vessel from the Connecticut Yankee Site at Haddam Neck, CT to the low level radioactive waste burial site located in Barnwell, SC. All internal components which are greater than class C waste have been removed from the vessel and the entire vessel will be transported in a Reactor Vessel Transport System package under a detailed transport plan. This transport system, fully described in the application, provides an equivalent level of safety to the packages and procedures specified in Title 49 of the Code of Federal Regulations.

1G. Regulation(s) exempted:

a. 49 CFR 173.403(3) in that the reactor vessel and its internals may be classed as LSA-III even though not all portions of the definition are satisfied.

b. 49 CFR 173.411(a) and 49 CFR 173.411(b)(2) in that the Reactor Vessel Transport System, when transported in accordance with the provisions of this exemption, has

demonstrated an equivalent level of safety to an IP-2 package containing LSA-III material and may be certified as such even though compliance with each listed provisions has not been explicitly demonstrated.

c. 49 CFR Part 173.427(a)(1) in that the dose rate at 3 meters from each unshielded piece of low specific activity material or surface contaminated article in this shipment may exceed 10 mSv/hr (1 rem/hr).

1H. Modes of Transportation:

1 MV (Y) 2 RF (N) 3 CV (Y) 4 CGAIR (N) 5 PSAIR (N)

**PART 2 REVIEW FOR DOCKETING**

- (X) Application contains sufficient information to support docketing.
- ( ) Application is incomplete and should be returned for the following reason(s).

**PART 3 HAZARDOUS MATERIALS**

3A. Hazardous Materials to be shipped:

Hazardous materials description -- proper shipping name	Hazard Class/ Division	Identi- fication Number	Packing Group
Radioactive material, low specific activity, n.o.s.	Class 7	UN 2912	N/A

3B. Is the hazardous material capable of being detonated? NO  
(NO - go to 3C.)

If so, under what conditions?

- (1) What special precautions have been taken to prevent these conditions in transportation?
- (2) Has the hazardous material been classed as an explosive? \_\_\_\_

Has it been tested and approved under § 173.56? \_\_\_\_  
Is stabilization required and what type? \_\_\_\_

3C. Is the hazardous material listed in the Hazardous

Materials Table § 172.101? Yes

If it is not listed has sufficient information been supplied in order to determine the hazard class?     

- 3D. Other risks presented by the material that warrant special assessment. None (ex: flammable or toxic gases produced upon contact with water)

#### **PART 4 PACKAGING**

- 4A. Is the applicant seeking an exemption from the packaging requirements? Yes  
(No - Go on to Part V.)

- 4B.      - Non authorized specification package.  
     - Authorized Specification package with quantity variation.  
     - Over authorized pressure.  
  X   - Non specification package. Most comparable spec. package.

Applicant requests authorization to ship reactor vessel as LSA in non-specification package. This request is based on the fact that the reactor vessel, its packaging and their transportation plan provide equivalent safety to LSA shipped in an industrial package (IP-2).

- 4C. Is the material of construction appropriate? Yes

Will the packaging integrity be sufficient? Yes

In the case of a pressurized packaging, will the package adequately contain any pressure that might develop? Not applicable

Have evaluation of tests shown the package to be equivalent? Yes

- 4D. Are special handling measures needed (specify)?

Yes, the special handling and transportation requirements are described in the application and transportation plan. This transportation plan is also cited in the exemption.

#### **PART 5 SPECIAL TRANSPORT AND INFORMATIONAL CONTROLS**

- 5A. Is the applicant seeking an exemption from Special Transport and Informational Controls? No (No - go to Part VI.)
- 5B. Indicate control from which variance is sought. (i.e., placarding requirements, etc.)

**PART 6 SHIPPING EXPERIENCE**

- 6A. Satisfactory shipping experience: Yes X No \_\_\_  
or
- 6B. New package with no shipping experience: Yes \_\_\_ No X
- 6C. Explanation if 5A and 5B are both marked "Yes" or both marked "No":

**PART 7 SAFETY AND RISK ASSESSMENT**

- 7A. 49 CFR § 107.105(d) prescribes requirements for justification of an exemption through comparisons with established levels of safety and risk assessment. Has the applicant demonstrated equivalent levels of safety or provided an appropriate risk analysis?

I concur with the applicant's assertion that their proposed package and transport plan provide an equivalent level of safety to transport in accordance with the regulations.

- 7B. What are the hazards (worst case) posed by the proposed exemptions? What could go wrong? Are the risks significant? What is the degree of uncertainty as to likelihood or consequences?

Risk is no greater than that posed by other LSA-III.

- 7C. What are the benefits to the public and the applicant of granting the exemption? What trade-offs have been made?

The main benefit of this exemption is removal of the components from the reactor site.

- 7D. Does this exemption (and other similar exemptions) point to the need for possible regulatory changes? If so what other information is needed to support a regulatory change.

Yes, DOT and NRC are studying the current LSA/SCO system.

## **PART 8 DOCKET COMMENTS/INFORMATION**

8A. Date checked: October 2, 2000

8B. Comments: None

8C. Has **CONFIDENTIAL** or **PROPRIETARY** information (49CFR 107.5) been considered in this application? No

Note: [\*\* All statements made in PART VII which are based on proprietary or confidential material submitted by the applicant must be contained in brackets and preceded and followed by asterisks - e.g. as is this statement. \*\*]

## **PART 9 OVERALL EVALUATION & RECOMMENDATION**

Provide standard of equivalency and rationale supporting equivalent level of safety or comment on additional requirements needed to establish equivalency. Include main issues, evidence (i.e. tests), and technical conclusions. See note in Part VI concerning confidential information.

I recommend approval of this exemption request. The rationale behind the IAEA's (and DOT's) regulations for low specific activity material and surface contaminated objects is to provide a system so that materials which have very low concentrations of radioactive contamination (LSA) or low levels of surface contamination (SCO) can be shipped safely. This current system for these materials has been used since the 1985 regulations were published with no safety hazard to transport workers, the general public, or the environment.

This exemption is necessary because the regulations were developed to ship the most common forms of LSA and SCO and not unusual items such as a reactor vessel. Briefly, there are two problems with applying the packaging regulations for LSA to objects as large and robust as a reactor vessel. The first is the regulations require that the dose rate 3 meters from any of the unshielded LSA or SCO be less than 1 rem/hr. This requirement makes great sense when you have LSA or SCO which is authorized to be shipped in non-accident resistant packages where loss of containment is possible. In this case, the less than Class C waste are components of the reactor vessel which were manufactured to stay in place during operation. These components are further restrained when the reactor vessel is filled with concrete. The entire reactor vessel is then held

within an outer package where the void between the two is filled with concrete. Thus, the requirement is not realistic because it is impossible for the LSA components to be released into the environment. The reactor internals are fixed within the reactor vessel, the vessel is then filled with concrete, and then the vessel is held in place in its package with concrete. Thus, the loss of containment is impossible. The second portion of this exemption is for packaging itself. Given that the robust shell of the reactor vessel (several inches of steel), the amount of concrete holding everything in place, and the walls of the packaging, I believe they provide an adequate containment barrier and that, in conjunction with their transportation plan, an equivalent safety to an IP-2 package.

**Office of Hazardous Materials Technology (OHMT)**

Office DHM-21 22 23  
Project Officer  Richard Boyle Date 10/9/00  
Team Leader  Date \_\_\_\_\_  
Office Director Jim O'Steen Date 10/11/2000