SEP 0 6 1985

Docket No. 50-309 License No. DPR-36

Maine Yankee Atomic Power Company
ATTN: Mr. J. B. Randazza
Vice President
Nuclear Operations
83 Edison Drive
Augusta, Maine 04336

Gentlemen:

Subject: Inspection Report No. 50-309/85-04

This refers to your letters, dated April 30, 1985, June 3, 1985, and August 22, 1985, in response to our letter dated March 26, 1985.

Thank you for informing us of the corrective and preventive actions documented in your letters. These actions will be examined during a future inspection of your licensed program.

With regard to Item B concerning the review and approval of procedures by station management, your letter dated June 3, 1985, indicated that the vendor procedures in question had been incorporated by reference into station procedures that had been appropriately reviewed and approved. This citation is withdrawn and our records will be amended.

No reply to this letter is required. Your cooperation with us is appreciated.

Sincerely,
Original Signed By:
Ronald R. Bellamy/bcs

Thomas T. Martin, Director
Division of Radiation Safety
and Safeguards

cc:
C. E. Monty, President
C. D. Frizzle, Assistant Vice President/Manager of Operations
J. H. Garrity, Plant Manager
P. L. Anderson, Project Manager
G. D. Whittier, Licensing Section Head
J. A. Ritsher, Attorney (Ropes and Gray)
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of Maine

IE04
1/1

OFFICIAL RECORD COPY RL MY 85-04 - 0001.0.0
08/29/85

bcc:
Region I Docket Room (with concurrences)
~~Senior Operations Officer~~
DRP Section Chief

RI:DRSS	RI:DRSS	RI:DRSS	RI:DRSS
Clemons/djh/mmb	Shanbaky	Bellamy	Martin
9/3/85	9/4/85		
8/ /85	8/ /85	9/4/85	8/ /85

OFFICIAL RECORD COPY RL MY 85-04 - 0002.0.0
08/29/85

MAINE YANKEE ATOMIC POWER COMPANY •

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

April 30, 1985
MN-85-82 GDW-85-128

Region 1
United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Dr. Thomas E. Murley, Regional Administrator

References: (a) License No. DPR-36 (Docket No. 50-309)
(b) USNRC Letter to MYAPCo. dated May 11, 1983
(c) USNRC Letter to MYAPCo. dated March 26, 1985 - Inspection Report 85-04

Subject: Inspection 85-04 - Radioactive Materials Transport Program

Gentlemen:

This letter transmits Maine Yankee Atomic Power Company's response to Inspection 85-04. This response addresses the specific violations identified, and provides Maine Yankee's response.

Notice of Violation A

10 CFR 20.311(d)(3), "Transfer for disposal and manifests" requires a licensee who transfers radioactive waste to a land disposal facility to conduct a quality control program to assure compliance with 10 CFR 61.55 and 10 CFR 61.56.

Contrary to the above, on July 19, 1984 and August 17, 1984, the licensee transferred two shipments of radioactive dewatered resin to the Chem-Nuclear, Inc. land disposal facility at Barnwell, South Carolina and the licensee did not conduct a quality control program to assure that the packages did not contain free standing liquid greater than 1% of the waste volume, that the waste was properly classified, and that the waste was structurally stable.

This is a Severity Level IV violation (Supplement V).

Maine Yankee Response

In response to the NRC's guidance regarding implementation of 10CFR61, Reference (b), Maine Yankee submitted a description of our program for 10CFR61 implementation. This program description is attached for your information.

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We believe that we meet the requirements of 10 CFR 20.311 through administrative controls such as the OQAD QA Program, implementing procedures, radioactive waste shipping procedures and department policies. We do not maintain a single document labeled the Radiological Controls QC Program, however due to the confusion this may have led to, we plan to explore the development of such a document.

Maine Yankee maintains the following administrative controls which we believe meet the spirit and intent of the 20.311 requirement for quality control of the radioactive waste transport activities.

A. Radioactive waste shipping activities at Maine Yankee are governed by procedures. The following procedures were used for the shipment referenced in the inspection report:

- Operations Procedure 1-18-4, Spent Resin Storage and Processing - This procedure is used, in part, to ensure the waste shipment is dewatered to less than 1% (10 CFR 61.56).

  The procedure requires Operational Quality Assurance Department (OQAD) personnel check waste container liners for free standing water prior to covering the liner. Procedure 1-18-4 also requires the dewatering pump be run for one hour after continuous flow is lost. This step was verified by Maine Yankee's Radiological Waste Coordinator.

  Not independent

- Radiological Controls Procedure 9.1.15, Shipment of Radioactive Material - This procedure covers packaging of radioactive materials and all preparations for shipment of these materials including Radiological Controls Department and OQAD signoffs.

  At the time of the shipments cited in the inspection report, this procedure required OQAD personnel inspect all solidified or dewatered containers to ensure that there is no detectable free standing liquid (10 CFR 61.56). The procedure has recently been revised and it now requires OQAD verification of the following:

  Procedures is being revised

  - Liquid content of the waste is less than 1% of the volume of the waste if the container is designed to ensure stability (10 CFR 61.56).

  - Liquid content of the waste is less than 0.5% of the volume of the waste if the waste is processed to a stable form (10 CFR 61.56).

- Chemistry Procedure 7-05-1, Operation of Canberra Series 80 Multichannel Analyzer - This procedure is used to determine isotopic content of gamma emmitters in radioactive waste.

- Chemistry Procedure 7-05-6, Operation of the Packard Model 4430 Liquid Scintallation Counter - This procedure is used to determine the tritium content in the radioactive waste.

  Chemistry Procedure 7-05-1 and 7-05-6 are used to determine the isotopic content of the waste being shipped. This information, in conjunction with the scaling factors determind by SAI, ensure proper classification of radioactive waste (10 CFR 61.55).

- Chemistry Procedure 7.102, Process Control for In-Container Solidification of Evaporator Bottoms - This procedure is used to determine the correct amount of cement and additives necessary to ensure a structurally stable waste form and requires independent verification of product stability (10 CFR 61.56).

B. Maine Yankee Radiological Controls and Chemistry administrative practices ensure radiological waste is properly classified.

- Annually, Maine Yankee sends samples to Science Applications, Inc. (SAI) to determine the approprite scaling factors to predict the isotopic content, (10 CFR 61.55). The scaling factors are incorporated into Procedure 9.1.15 and any updates are immediately reflected in the procedure.

- Internal Radioactive Waste Program quality assurance audits are done on an annual basis. One portion of this audit is to verify that the waste classification method is proper (10 CFR 61.55).

- 10 CFR 61.56.b.1 states, in part, "(s)tructural stability can be provided by ... placing the waste in a disposal container or structure that provides stability after disposal." Maine Yankee packaged and shipped the radioactive waste mentioned in the report in HIC shipping containers. The HIC container is commonly used throughout the industry, and the container's stability has been evaluated and is considered acceptable (Barwell License #097, Amendment 41, Condition 39B and NRC Branch Technical Position 5-11-83).

For the reasons mentioned above, Maine Yankee believes we meet the intent of 10 CFR 20.311.d.3 and request reconsideration and either vacating or downgrading the severity of this violation.

Notice of Violation B

Technical Specification 5.8.1 "Procedures", requires that procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November, 1972. Regulatory Guide 1.33 requires procedures for spent resin handling. Technical Specification 5.8.2 states "Each procedure of 5.8.1 above, and changes thereto, shall be reviewed by the PORC and approved by the Plant Manager prior to implementation..."

Contrary to the above, the licensee used a vendor procedure (Westinghouse Hittman Nuclear Inc. Procedure STD-P-02-010, Transfer and Dewatering Bead Resin in Hittman RADLOK ™ 100 or - 200 Containers with Single Layer Underdrain Assembly to Less Than 1% Drainable Liquid), in preparing the two shipments of dewatered resin that were made on July 19, 1984 and August 17, 1984, and the procedure was not reviewed by the PORC and neither was it approved by the Plant Manager prior to its implementation.

This is a Severity Level IV violation (Supplement V).

Maine Yankee Response B

As stated in the notice of violation, Maine Yankee used portions of a vendor procedure in preparing the two shipments of dewatered resin. The portions of Hittman Nuclear Inc. Procedure No. STD-P-03-010 used for the shipments were incorporated in Maine Yankee Operations Department Procedure 1-18-4 by Procedure Change Report Numbers 84-520 through 84-524.

The procedure change report (PCR) is used for temporary changes to procedures to direct activities or provide guidance in an unusual situation not covered in normal procedures. The PCR permits a procedure change without prior review by the Plant Operations Review Committee (PORC) and prior approval by the Plant Manager provided the intent of the original procedure is not altered, the change is approved by two members of plant management (at least one must hold a Senior Reactor Operator's License), and the change is reviewed by PORC and approved by the Plant Manager within fourteen days of implementation. This assessment was accomplished for PCRs 84-520 through 84-524 on July 12, 1984, PORC reviewed the procedure changes and the Plant Manager approved the changes on July 19, 1984. The PCRs were incorporated as a permanent changes to Procedure 1-18-4 on August 10, 1984.

Maine Yankee has made recent policy changes to limit the use of procedure change reports. Although we do not consider this citation to be a violation of Technical Specifications, we believe our current PCR policy should prevent this item from recurring.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G. D. Whittier, Manager
Nuclear Engineering & Licensing

GDW/bjp

cc: Mr. James R. Miller
Mr. Cornelius F. Holden

MAINE YANKEE ATOMIC POWER COMPANY •

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

June 3, 1985
MN-85-105

GDW-85-159

Region I
United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Dr. Thomas E. Murley, Regional Administrator

References: (a) License No. DPR-36 (Docket No. 50-309)
(b) MYAPCo Letter to USNRC dated April 30, 1985 (MN-85-82)

Subject: Inspection 85-04 - Radioactive Materials Transport Program

Gentlemen:

This letter provides additional information regarding our response to the subject inspection report as requested by Mr. P. Clemons of your staff.

Attachment A provides a copy of our letter to USNRC describing Maine Yankee's program for implementation of 10 CFR 61 requirements. A copy of this letter was inadvertently omitted from our earlier response, Reference (b).

A copy of PCR's 84-520 through 84-524 and a copy of Procedure 1-18-4 are also attached as Attachments B and C respectively, at the request of Mr. Clemons.

These documents were referenced in Reference (b) in our response to Notice of Violation B. These documents should be considered as additional information since they apparently were not brought to Mr. Clemens' attention during the inspection.

Please feel free to contact me if you should have any additional question in this matter.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G. D. Whittier

G. D. Whittier, Manager
Nuclear Engineering & Licensing

GDW/bjp

Attachment:

cc: Mr. James R. Miller
Mr. Cornelius F. Holden

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IP

MAINE YANKEE ATOMIC POWER COMPANY •

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

December 22, 1983
MN-83-268

GDW-83-149

Cuyia
YNSD
RESPONSIBILITY Brinkler
RESPOND BY NONE
NRC DUE DATE NONE

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. James R. Miller, Chief
Operating Reactors Branch No. 3
Division of Licensing

References: (a) License No. DPR-36 (Docket No. 50-309)

Subject: Request for Review of 10 CFR 61 Implementation Program

Gentlemen:

Maine Yankee Atomic Power Company has developed a program for implementation of the 10 CFR 61 requirements on waste form and waste classification, effective December 27, 1983. This program is being submitted for your review and concurrence as an adequate means of implementing these requirements.

It is anticipated that most process wastes to be shipped from our facility will not exceed the concentration limits listed in 10 CFR 61.55 for Class A wastes. It is our position that wastes solidified in accordance with our program, or placed within a certified high integrity container, are sufficiently stable such that they will not affect overall disposal site stability, and need not be segregated upon disposal, irrespective of classification.

All operations described in this program will be conducted in accordance with fully approved plant procedures. The waste solidification system, supplied by Hittman Nuclear, will be operated in full conformance with their process control program.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G. D. Whittier

G. D. Whittier
Licensing Section Head

GDW/bjp
Enclosure:

cc: Dr. Thomas E. Murley
Mr. Corneluis F. Holden

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8pp.

2190L-FWS U.S Mail 12/22/83

MAINE YANKEE
10 CFR 61 IMPLEMENTATION PROGRAM

A. WASTE STREAMS

1. Evaporator Concentrates

2. Exhausted Resins

3. Cartridge Filters

4. Compactible and Non-Compactible Dry Active Wastes (DAWs)

B. WASTE FORMS

1. Stable Wastes

In order to preclude trench subsidance after disposal, wastes must have structural stability. Such waste must generally maintain its physical dimensions under expected disposal conditions. Stability can be assured by either the waste form itself or the waste container.

Two options are available to assure stability:

a. Currently, a Hittman Nuclear portable cement system is utilized to solidify evaporator bottoms in accordance with approved procedures and Process Control Program (PCP).

b. Exhausted resins can either be processed by the above cement system or loaded into approved High Integrity Containers (HICs).

c. Cartridge filters are stabilized in concrete in either drums or liners or placed in HICs.

2. Other Wastes

DAW is low in activity and generally will be classified as "Class A waste" requiring segregation upon disposal. These wastes will be packaged within "strong, tight containers". (49 CFR 173.24) Compactible wastes will be processed with a hydraulic box compactor to reduce volume and increase density to the maximum extent practicable. All waste processing and packaging will be in compliance with approved plant procedures.

Brinkley

C. WASTE CLASSIFICATION

1. As a minimum, all radionuclides required by 10 CFR 20.311 and 10 CFR 61.55 will be reported.

2. A sample of each processed waste batch (concentrates, resin, filter) will be analyzed for gamma emitters. The quantity of all major contributors will be reported for each container. The isotopic distribution contained in DAW will be based on the evaporator concentrates.

3. Gamma emitters not detected in (2) above, but required to be reported, will be reported as "below the lower limit of detection" (LLD). LLD values for radionuclides will be reported as required.

4. Non-gamma emitters required to be reported will be reported using scaling factors, where applicable. These scaling factors are currently based upon a data base developed under a cooperative program with the NRC and SAI and modified as the data base expands.

5. Radioisotopes requiring reporting, which are not easily measured or correlatable, will be reported based upon the methods described in the AIF NESP Report, "Methodologies for Classification of LLW From Nuclear Power Plants", November 1983.

6. One sample, typical of each waste stream, will be fully analyzed annually until it is demonstrated to be unnecessary, to ensure the validity of the factors being utilized.

7. Gross changes in waste stream radionuclide concentrations or ratios will require a reevaluation of the classification methods and will be addressed as the situation arises.

PROCEDURE/~~DOCUMENT CHANGE~~ REPORT
(cross out one)

PROCEDURE/DOCUMENT TITLE: Spent Resin Storage and Processing

PROCEDURE/~~PRINT~~ NO. 1-18-4 REV. NO. 12 STEPS AFFECTED 4.5.2

DATE 7/12/84 TIME 0900 REPORT NO. 84-520

TYPE OF CHANGE: ( ) TEMPORARY (✓) PERMANENT

REASON FOR CHANGE:

To reflect new Westinghouse Hittman level indication and stand pipe (fill and dewatering) installation

DESCRIPTION OF CHANGE:

change step 4.5.2 from "Connect a new well point to dewatering hose and lower it into liner" to "Install two stand pipes and level electrodes ~~on~~ Hittman Liner as per Westinghouse - Hittman procedure STD-P-03-010 Rev 5, section 5, equipment set up."

QCAD _______________ LICENSED SRO: [signature]
(Only Req. for "Q" Series procedures) PLANT MGR. [signature]
(Dept. Responsible for the proc.)

PORC REVIEW DATE: 7/19/84 APPROVED BY

PORC RECOMMENDATIONS: PLANT MANAGER EW

(X) Incorporate the above change in the next scheduled procedure revision.
( ) PCR was temporary - report now considered terminated.
( ) DCR - Forward to PED for Document Update
( ) Other: _______________

PORC RECOMMENDATION COMPLETED _______________
(REPORT TERMINATED)

A copy of this report shall be attached to the affected procedure and the original shall be submitted to the Secretary of PORC by the department which initiated the change. Document changes will not be attached to the applicable prints, but shall be submitted to the Secretary of PORC.

Form No. 0-06-2-3
Revised 10/13/82

4104N-WCG

PROCEDURE/~~DOCUMENT CHANGE~~ REPORT
(cross out one)

PROCEDURE/DOCUMENT TITLE: Spent Resin Storage and Processing

PROCEDURE/PRINT NO. 1-48-4 REV. NO. 12 STEPS AFFECTED 4.5.4

DATE 7/12/84 TIME 0900 REPORT NO. 84-521

TYPE OF CHANGE: ( ) TEMPORARY (✓) PERMANENT

REASON FOR CHANGE: To eliminate the change of transfering Spent resin to the waste hold up tank or the resin slurry tank

DESCRIPTION OF CHANGE: Add to step 4.5.4 as to read, "Open WSS-96 P-144 suction from TK-109 and check closed WSS-90 and WSS-92"

CCRD _____
(Only Req. for "CC" Setting procedures)

LICENSED SRO _____
PLANT MGR. STA. _____
(Dept. Responsible for the proc.)

PORC REVIEW DATE: 7/19/84 APPROVED BY

PORC RECOMMENDATIONS: PLANT MANAGER _____

(X) Incorporate the above change in the next scheduled procedure revision.
( ) PCR was temporary - report now considered terminated.
( ) DCR - Forward to PED for Document Update
( ) Other: _____

PORC RECOMMENDATION COMPLETED _____
(REPORT TERMINATED)

A copy of this report shall be attached to the affected procedure and the original shall be submitted to the Secretary of PORC by the department which initiated the change. Document changes will not be attached to the applicable prints, but shall be submitted to the Secretary of PORC.

Form No. 3-06-2-3
Revised 10/13/82

4104N-WCC

PROCEDURE/~~DOCUMENT~~ CHANGE REPORT
(cross out one)

PROCEDURE/DOCUMENT TITLE: Spent Resin storage and processing

PROCEDURE/PRINT NO. I-18-4 REV. NO. 12. STEPS AFFECTED 4.5.9

DATE 7/12/84 TIME 0920 REPORT NO. 84-522

TYPE OF CHANGE: ( ) TEMPORARY (✓) PERMANENT

REASON FOR CHANGE: to reference Westinghouse Hi Hman procedure to transfer resin to Liner

DESCRIPTION OF CHANGE: change step 4.5.9 to read, "when recirc is complete open WSS-91 and close WSS-93 to transfer resin to liner following Hi Hman procedure STD-P-03-010 Rev 5 section 6.0, "transfer and dewatering"

OSRC _____ (Only Rec. for "U" Series procedures.)

RECOMMENDED BY: PLANT MGR. [signature] (Dept. Responsible for the Proc.)

PORC REVIEW DATE: 7/19/84 APPROVED BY

PORC RECOMMENDATIONS: PLANT MANAGER [signature]

(X) Incorporate the above change in the next scheduled procedure revision.
( ) PCR was temporary - report now considered terminated.
( ) DCR - Forward to PED for Document Update
( ) Other: _____

PORC RECOMMENDATION COMPLETED _____
(REPORT TERMINATED)

A copy of this report shall be attached to the affected procedure and the original shall be submitted to the Secretary of PORC by the department which initiated the change. Document changes will not be attached to the applicable prints, but shall be submitted to the Secretary of PORC.

Form No. 3-06-2-3
Revised 10/13/82

4104Y-WCC

PROCEDURE/~~DOCUMENT CHANGE~~ REPORT
(cross out one)

PROCEDURE/DOCUMENT TITLE: Spent Resin Storage and processing

PROCEDURE/PRINT NO. 1-18-4 REV. NO. 12 STEPS AFFECTED 4.5.13

DATE 7/12/84 TIME 0925 REPORT NO. 84-523

TYPE OF CHANGE: ( ) TEMPORARY (✓) PERMANENT

REASON FOR CHANGE:
to referance Westinghouse - Hittman procedure to dewater spent resin

DESCRIPTION OF CHANGE:
Change step 4.5.13 to read, "Start the dewatering pump (P-123) and follow Hittman procedure STD-P-03-010 Rev 5, Section 6.0 "transfer and dewatering"

CCRD _____
(Only Req. for "CR" Series procedures.)

ISSUED BY PLANT MGR. STAFF _____
(Dept. Responsible for the Proc.)

PORC REVIEW DATE: 7/19/84 APPROVED BY

PORC RECOMMENDATIONS: PLANT MANAGER EdW

(X) Incorporate the above change in the next scheduled procedure revision.
( ) PCR was temporary - report now considered terminated.
( ) DCR - Forward to PED for Document Update
( ) Other: _____

PORC RECOMMENDATION COMPLETED _____
(REPORT TERMINATED)

A copy of this report shall be attached to the affected procedure and the original shall be submitted to the Secretary of PORC by the department which initiated the change. Document changes will not be attached to the applicable prints, but shall be submitted to the Secretary of PORC.

Form No. 0-06-2-3
Revised 10/13/82

4104N-WCG

PROCEDURE/DOCUMENT CHANGE REPORT
(cross out one)

PROCEDURE/DOCUMENT TITLE: Spent Resin storage and processing

PROCEDURE/PRINT NO. 1-18-4 REV. NO. 12. STEPS AFFECTED 4.5.15

DATE 7/12/84 TIME 0930 REPORT NO. ~~1-18-4~~ 84-524

TYPE OF CHANGE: ( ) TEMPORARY (✓) PERMANENT

REASON FOR CHANGE:

to reflect Westinghouse Hittman procedure for dewatering Spent Resin

DESCRIPTION OF CHANGE:

change step 4.5.15 to read "Stop dewatering pump following Hittman procedure STD-P-03-010 section 6, Transfer and dewatering"

PORC (Only Req. for "NO" Safety procedures) ATTENDED BY PLANT MGR. OR ~~Assistant~~ (Dept. Responsible for the Proc.)

PORC REVIEW DATE: 7/19/84 APPROVED BY

PORC RECOMMENDATIONS: PLANT MANAGER

(X) Incorporate the above change in the next scheduled procedure revision.
( ) PCR was temporary - report now considered terminated.
( ) DCR - Forward to PED for Document Update
( ) Other:

PORC RECOMMENDATION COMPLETED
(REPORT TERMINATED)

A copy of this report shall be attached to the affected procedure and the original shall be submitted to the Secretary of PORC by the department which initiated the change. Document changes will not be attached to the applicable prints, but shall be submitted to the Secretary of PORC.

Form No. 3-06-2-3
Revised 10/13/82

4104N-WCC

COMPLETED:

DATE/TIME

P.S.S. REVIEW

Dept. Head
Plt. Mgr.
PORC
Mgr. of Ops

Proc. No. 1-18-4
Class. A
Rev. No. 12
Issue Date 5-10-84
Review Date 5/86

1-18-4 SPENT RESIN STORAGE AND PROCESSING

FOR INFORMATION ONLY

DISCUSSION

This procedure provides the operator with specific steps required to store, condition and solidify Spent Resins.

R 4.0 Spent Resin Conditioning in the Waste Resin Storage Tank TK 85 & Resin Holdup Tk-109

4.1 Spent Resin Conditioning in TK-85 and Water Transfer to TK-109

4.2 Resin & Water Transfer from TK-85 to TK-109

4.3 Dewatering Resin Holdup TK-109

4.4 Resin Transfer from TK-85 to Liner

4.5 Transfer of Resin from TK-109 to Liner

1.0 OBJECTIVE

To store, condition and prepare Spent Resins for processing.

To process Spent Resins to achieve a free standing solid in a suitable shipping container.

2.0 PRECAUTIONS

2.1 Always observe the radiation reading in mr/hr on the panel prior to entrance to the Waste Holdup Tank Cubicle. Personnel should have a radiation survey meter when entering this cubicle.

2.2 Be aware of high radiation levels in waste resin storage area, RCA, and waste holdup tank during these operations.

2.3 Ensure there is room in the ADT's to receive water when dewatering TK-109 to the ADT's.

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15pp

2.4 When operating the dewatering pump, ensure oiler in air supply is full.

3.0 INITIAL CONDITIONS — INITIALS

3.1 Ensure that the RCA Storage Building Ventilation System is in operation. _____

3.2 Proper plastic, paper or canvas has been applied to the RCA Building floor or Decon Pad to assure that the truck trailer or container is not contaminated. _____

3.3 A Radiation Work Permit has been obtained for all phases of solidification/Resin Transfer. _____

3.4 Spent Resin has been sluiced to the Waste Resin Storage Tank for storage and decay. _____

3.5 Fill out batch report attached and return to HP. Ensure PEQAG has checked liner for free standing water prior to covering up liner. _____

3.6 Ensure all outside doors to the RCA are closed when waste is being processed. _____

3.7 Have the Chemistry Dept. sample the waste holdup tank bottoms. _____

NOTE: Chemistry must have activity levels for cask shipping records.

3.8 To prevent rupturing FL-90 when starting the dewatering pump, (P-145) ensure it has a discharge path, and air regulator is set at 15 psi or less. _____

3.9 Obtain or manufacture a rig for determining water content in cask via dewatering pump (P-123) discharge. _____

3.10 Vendors procedure available for use. _____

3.11 Flexible hose is connected to WSS-91 and WSS-72 for resin fill and dewatering. _____

NOTE: Double hose clamps shall be used to connect flexible hose to system.

INITIALS

3.12 Assure that the Waste Solidification System Flush Tank, TK-80, level within the operating band as indicated by the Level Gage Glass. Keep water level in the RED ZONE. _____

3.13 Assure that the Waste Solidification System Flush Tank, TK-80 is pressurized to 85-100 psig and is open to the Service Air System. _____

3.13.1 If makeup to TK-80 is necessary, open PW-17 to admit primary water and maintain TK-80 pressure at 100 psig by throttling the muffled vent, SA-206. _____

3.14 Assure that the main Flush Water Isolation Valve, WSS-65 is open. _____

NOTE: This valve should be left open.

3.15 Assure that the main Instrument Air Isolation Valve, IA-201, is open. _____

NOTE: This valve is located behind the RCA Storage Building Condensate Return Unit.

R 3.16 Ensure P-108 suction aligned to TK-85. _____

NOTE: RS-14 is located in a High Radiation, Airborne Acitivity Area and does not have a reach rod. This valve is visible from above and should be checked in this manner.

4.0 SPENT RESIN CONDITIONING IN THE WASTE RESIN STORAGE TANK/RESIN HOLDUP TANK

DISCUSSION

This section gives two methods of transferring and processing resin. The old method of transfer to the radwaste holdup tank (TK-85) allows no means of returning the decant back to the ADT's. The new method allows transfer of water and resin to the resin holdup tank (TK-109) from TK-85. The resin may then be transferred to TK-95 for solidification or directly to a liner. The water may be pumped to the ADT's or TK-85.

The maximum capacity of TK-85 is 100 ft^3 of resin or three charges. This assures that the resin level is below the 3 inch sluice line. Normally, processing of resin should be considered when two charges have been stored in TK-85 for at least 90 days and longer if possible.

The maximum capacity of TK-109 is 704 ft^3 of resin or 22 charges. Charts at rear of this procedure and at TK-109 correlate tank level with number of charges and gallons of water to tank level.

NOTE: Prior to transferring spent resin to the Spent Resin Storage Tank (TK-85), the water level in the Spent Resin Storage Tank must be reduced to achieve a pumpable slurry. This will be accomplished by recircing the spent resin bed for 30 minutes with the SCREEN PLUG CLOSED. After this operation, the excess water will be pumped to TK-109. After this operation has been accomplished, the spent resin is ready for transfer to the Waste Solidification System.

INITIALS

4.1 Spent Resin Conditioning in TK-85 and Water Transfer to TK-109.

4.1.1 Assure that the Resin Storage Tank SCREEN PLUG IS CLOSED. _____

4.1.2 Place the MODE SELECTOR SWITCH in RESINS. _____

INITIALS

4.1.3 Place the PHASE SELECTOR on FILL HOPPER. _____

4.1.4 Close the RESIN INLET VALVE, WSS-A-28. _____

4.1.5 Open tne Resin Transfer pump Recirc. Valve, RS-15. _____

R 4.1.6 Check shut RS-27 Hose Connection. _____

R 4.1.7 Close WSS-89 Resin Transfer to TK 95 manual stop and WSS-92 P-144 Resin Transfer to TK 85/TK 95. _____

NOTE: With WSS-89 closed, we will be filling TK-109, not the hopper.

4.1.8 Hook up the air hose, to the air supply connection to TK-85. Fully open the air valve at the tank and then crack open 1/2 turn the air supply root valve to allow air to be injected into the tank for agitation of resin. _____

CAUTION: The root valve at the air supply line should just be cracked to prevent blowing resin out of the tank.

CAUTION: If level in TK-85 reaches 100%, secure air to TK-85. Restore minimal air flow after TK-85 level has decreased and stabilized.

4.1.9 Start the Resin Transfer Pump, P-108. _____

4.1.10 Run in tnis mode for 30 minutes, or until radiation levels stabilize. _____

NOTE: The resin bed above the screen will purify the recirc. stream and capture any resin beads below the screen.

4.1.11 Open WSS-90, TK-109 inlet. _____

4.1.12 Transfer excess water to TK-109 by opening tne RESINS INLET VALVE, WSS-A-28 and closing recirc. valve RS-15. _____

4.1.13 Continue decant transfer until Waste Resin Storage Tank level decreases to 35%. _____

CAUTION: At levels less than 35%, resin clogging of P-108 may occur.

INITIALS

4.1.14 Stop resin transfer pump P-108. _____

R 4.1.15 Close WSS-A-28 TK-85 Resin Inlet. _____

4.1.16 Open recirc. valve RS-15. _____

4.1.17 Close WSS-90 TK 109 Inlet. _____

R 4.1.18 Open WSS-89 Resin Transfert ot TK 95 manual stop. _____

4.1.19 Place the Phase Selector on Recirc. _____

4.1.20 Refer to Section 5.3 to return decant to ADT's. _____

AUX. OPERATOR _____

DATE/TIME _____

4.2 Resin and Water Transfer from TK-85 to TK-109

4.2.1 Check open the resin transfer pump (P-108) suction valve, RS-14. _____

4.2.2 Open recirc. valve RS-15. _____

4.2.3 Hook up the air hose to the air supply connection to TK-85. Fully open the air valve at the tank and then crack open 1/2 turn the air supply root valve to allow air to be injected for agitation. _____

CAUTION: The root valve should just be cracked to prevent blowing resin out of the tank.

CAUTION: If TK-85 level reaches 100%, secure air to TK-85. Restore minimal air flow after TK-85 level has decreased and stabilized.

4.2.4 Start the resin transfer pump, P-108. _____

4.2.5 After 15 minute recirc. stop P-108 and close RS-15. _____

4.2.6 Open the spent resin storage tank screen plug. _____

R 4.2.7 Close WSS-89 Resin Transfer to TK 95 man stop and close WSS-92 P-144 Resin Transfer to TK 85/TK 95. _____

INITIALS

4.2.8 Place the MODE SELECTOR ON RESINS. _____

4.2.9 Place the SELECTOR ON FILL HOPPER. _____

NOTE: With WSS-89 closed we will be filling TK-109, not the hopper.

4.2.10 Open WSS-90, inlet to TK-109. _____

4.2.11 Open WSS-A-28. _____

4.2.12 Start transfer of spent resin to TK-109 by starting the waste resin transfer pump, P-108. _____

4.2.13 Continue resin transfer until the high level alarm is reached in TK-109. _____

4.2.14 Stop P-108. _____

4.2.15 Dewater TK-109 as per Step 6.3. _____

NOTE: If all resin has been transferred to TK-109, do not dewater as this water will act as shielding.

4.2.16 Transfer remaining resin and water to TK-109 by starting P-108. _____

4.2.17 If high level is not reached before all resin is transferred fill TK-109 with primary water by closing WSS-102 and WSS-98 and opening WSS-102 if shielding is needed. Reference TK-109, Volume Curve attached. _____

NOTE: Do not use more water than needed for shielding.

NOTE: There is no automatic protection against overfilling with water.

4.2.18 Stop P-108 and close WSS-A-28 when transfer is complete. _____

4.2.19 Close RS-15 and WSS-90. _____

4.2.20 Place phase selector in recirc. _____

AUX. OPERATOR _____

DATE/TIME _____

INITIALS

R 4.3 Dewatering Resin Holdup Tank, TK-109 to ADT or WHT

4.3.1 Ensure there is room in ADT's to accept decant. _____

R 4.3.2 Close WSS-98 P-145 Bypass. _____

R 4.3.3 Open WSS-97 FL-89 Inlet. _____

R 4.3.4 Open WSS-99 P-145 Outlet. _____

R 4.3.5 Open WSS-100 FL-90 Outlet. _____

R 4.3.6 Open WSS-101 FL-90 Outlet. _____

R 4.3.7 To send decant to WHT open RS-20. RS-20 Open
To send decant to ADT open RS-21. RS-21 Open _____
(Circle One)

4.3.8 Close vent WSS-103 (in pipe just above WSS-101). _____

R 4.3.9 Close WSS 102 hose connection. _____

4.3.10 Using 15 psi or less start dewatering pump P-145. _____

CAUTION: Do not use greater than 15 psi or FL-90 could rupture - adjust as necessary after start.

CAUTION: When operating P-145, ensure air line oiler is full.

4.3.11 When dewatering is complete stop P-145. _____

4.3.12 Close WSS-97, 99, 100, and 101. _____

4.3.13 Close RS-21 and 20 as opened above. _____

AUX. OPERATOR _____

DATE/TIME _____

4.4 RESIN TRANSFER FROM TK-85 TO LINER

DISCUSSION

During this evolution, the discharge of the dewatering pump is directed back to TK-85. A level increase in TK-85 should be noted soon after cask dewatering is started. Resin transfer should be considered complete when radiation levels on the liner fill line drop significantly.

INITIALS

4.4.1 Perform the following valve line ups.

4.4.1.1 TK-85 cubicle.

NOTE: RS-14 is located in a High Radiation, Airborne Activity Area and does not have a reach rod. This valve is visible from above and should be checked in this manner.

a)	RS-14, P-108 suction	Check open	_____
b)	RS-15, TK-108 recirc	Open	_____
c)	TK-85, screen plug valve	Open	_____
d)	TK-85 air sparger supply valve	Open	_____
e)	WSS-67 P-123 air supply	Open	_____
f)	WSS-68 P-123 air supply	Open	_____
g)	WSS-34 P-123 suction	Closed	_____

R 4.4.1.2 Waste Solidification Panel

a)	WSS-A-28 Resin Inlet to TK 85.	Closed	_____
b)	WSS-A-35 TK-85 suction of P 123.	Closed	_____

4.4.1.3 TK-109 Cubicle

a)	WSS-93, TK-109 recirc	Closed	_____
b)	WSS-94, P-144 discharge	Closed	_____
c)	WSS-91, liner fill stop	Closed	_____
d)	WSS-92, P-108 discharge	Open	_____
e)	WSS-95, TK-109 H.C.	Closed	_____

4.4.2 Hookup flexible hose from WSS-91 to connection at Liner IAW Vendor instructions. _____

4.4.3 Hook up dewatering hose IAW Vendor instructions. _____

4.4.4 Check Service Air supply to TK-85 sparger closed, then hook up air hose to service air supply valve. _____

4.4.5 Start P-108 to recirc TK-85 for at least 15 minutes. _____

4.4.6 Crack open the Service Air supply valve to agitate resin, open no more than 1/2 turn to prevent blowing resin out of tank. _____

CAUTION: If level in TK-85 reaches 100%, secure air to TK-85. Restore minimal air flow after TK-85 level has decreased and stabilized.

NOTE: If P-108 should clog with resin, secure P-108, shut RS-14, connect hose from flush water upstream of RS-27, and flush system thru P-108 to liner by opening RS-27.

INITIALS

4.4.7 When recirc is complete, open WSS-91 and close RS-15 to transfer resin to liner. _____

CAUTION: Radiation levels at the top of the cask may reach as hign as 25 rem/hr. Use a temporary mirror at the top of the cask to visually determine level.

4.4.8 Open liner dewatering hose isolation WSS-72. _____

4.4.9 Start the dewatering pump (P-123) when liner level reaches 2.5" from fill head. Adjust pump speed to maintain a slowly decreasing level. Ensure WSS-A-44 opens. Note level increase in TK-85. _____

NOTE: When operating P-123 ensure air line oiler is full.

4.4.10 When resin transfer is complete, perform the following:

4.4.10.1 Stop P-108. _____

4.4.10.2 Shut WSS-91. _____

4.4.10.3 Shut the Service Air supply valve to TK-85. _____

4.4.11 Continue dewatering Liner IAW Vendor instructions. _____

NOTE: To measure the amount of water in cask, hook up a temporary leak rig to discharge of P-123 and run P-123 in accordance with vendors proceedure.

4.4.12 Stop dewatering pump when liner is dewatered and disconnect hose IAW Vendors instructions. _____

4.4.13 Drain hose into liner. _____

4.4.14 Place hose in yellow poly bag and return to its storage area. _____

4.4.15 Perform the following valve line ups:

4.4.15.1 TK-85 cubicle.

a)	RS-15, TK-85 recirc	Closed	_____
b)	TK-85 screen plug valve	Closed	_____
c)	TK-85 air sparger supply valve	Closed	_____

4.4.15.2 Waste Solidification Panel.

a)	WSS-A-28	Auto	_____
b)	WSS-A-35	Auto	_____

INITIALS

4.4.15.3 On wall near WSS-91.

a) WSS-92 Closed _____

4.4.16 Fill out attached data sheet and forward to Chemistry/HP. _____

AUX. OPERATOR _____ _____

DATE/TIME _____

4.5 Transfer of Resin from TK-109 to Liner

CAUTION: Ensure there is enough room in TK-85 to receive decant from liner prior to commencing the following steps.

4.5.1 Hook flexible hose from WSS-91 to connection at liner. _____

PCR #84-520

4.5.2 Install two stand pipes and level electrodes - Hittman Liner as per Westinghouse - Hittman Procedure STD-P-03-010 Rev. 5, Section 5, equipment set up. _____

4.5.3 Connect air hose to WSS-102 for resin agitation. _____

PCR #84-521

4.5.4 Open WSS-96 P-144 suction from TK-109 and check closed WSS-90 and WSS-92. _____

R 4.5.5 Open WSS-94 P-144 discharge. _____

R 4.5.6 Open WSS-93 P-144 discharge to TK 109. _____

R 4.5.7 Close WSS-91 flexible hose connection. _____

4.5.8 Start P-144 from solidification control panel and open WSS-102 and air supply to reirc. and agitate resin for 15 minutes. _____

PCR #84-522

4.5.9 When recirc. is complete open WSS-91 and close WSS-93 to transfer resin to liner, following Hittman Procedure STD-P-03-010 Rev. 5, Section 6.0, transfer and dewatering. _____

CAUTION: Radiation levels at top of the cask may reach as high as 25 rem/hr. Use a temporary mirror at the top of the cask to visually determine level.

4.5.10 Place the control switch for WSS-A-35 in the closed position. _____

INITIALS

4.5.11 Open liner dewatering hose isol. valve WSS-72. _____

4.5.12 Verify that the dewatering pump air supply isol. valves, WSS-67 and WSS-68 are open. _____

PCR #84-523

4.5.13 Start the dewatering pump (P-123) and follow Hittman Procedure STD-P-C3-010 Rev. 5, Section 6.0, transfer and dewatering. _____

NOTE: When operating P-123 ensure air line oiler is full.

4.5.14 When resin transfer is complete perform the following:

4.5.14.1 Stop P-144. _____

4.5.14.2 Close WSS-96. _____

4.5.14.3 Connect primary water hose to WSS-95, then open WSS-95 and start P-144. _____

4.5.14.4 After clear flush water issues from hose open WSS-93, close WSS-91 and flush recirc. line for 1 minutes. _____

4.5.14.5 Stop P-144. _____

4.5.14.6 Close WSS-96. _____

4.5.14.7 Close WSS-95. _____

4.5.14.8 Close WSS-93. _____

4.5.14.9 Close WSS-94. _____

4.5.14.10 Shut WSS-102 and air supply to secure agitation. _____

PCR #84-524

4.5.15 Stop dewatering pump following Hittman Procedure STD-P-03-010, Section 6, transfer and dewatering. _____

NOTE: Well point will be left in the liner to be shipped off site with the resin.

NOTE: To measure the amount of water in cask, hook up temporary rig to discharge of P-123 and run P-123 in accordance with vendors procedure.

4.5.16 Drain hoses into liner. _____

4.5.17 Place yellow poly bag around hose and return to its storage area. _____

INITIALS

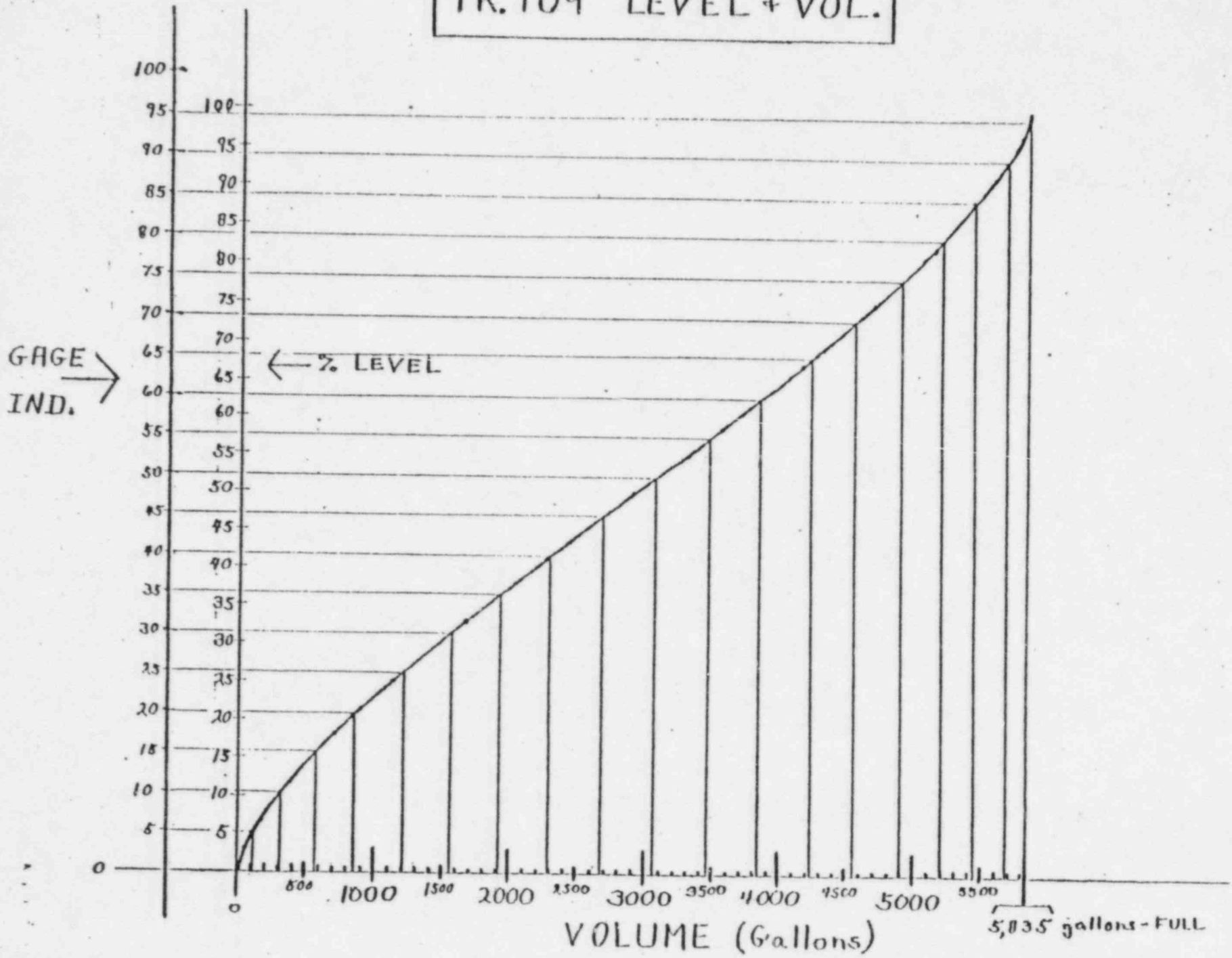
4.5.18 Ensure resin liner is dewatered prior to capping. _____

4.5.19 Fill out attached data sheet and forward to Chem/HP. _____

AUX. OPERATOR_____

DATE/TIME_____

TK. 109 LEVEL + VOL.



1-18-4 WASTE SOLIDIFICATION DATA SHEET

NOTE: This form will be completed and submitted to the Hazardous Waste Coordinator

DATE: _____

(HP) CONTAINER SERIAL # _____

(OPS) WASTE TYPE: EV-1, EV-2, Resin Decant, Resin, Primary Water, Other
(Circle One)

(CHEM) WASTE pH _____

(OPS) WASTE TRANSFER START TIME _____

(OPS) WASTE TRANSFER COMPLETION TIME _____

(OPS) TOTAL WASTE TRANSFERRED _____

(HP) TOTAL CEMENT ADDED _____

(HP) CONTAINER SURFACE DOSE RATE _____

_____
Rad Waste Co-ordinator Signature

_____
Operator Signature

NOTE: Route this Batch Report to the Hazardous Waste Coordinator

MAINE YANKEE ATOMIC POWER COMPANY •

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

August 22, 1985
MN-85-152

GDW-85-225

Region I
United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Dr. Thomas E. Murley, Regional Administrator

References:
(a) License No. DPR-36 (Docket No. 50-309)
(b) USNRC Letter to MYAPCo dated March 26, 1985 - Inspection Report 85-04
(c) MYAPCo Letter to USNRC dated April 30, 1985 - Inspection Report 85-04 - Radioactive Materials Transport Program (MN-85-82)
(d) MYAPCo Letter to USNRC dated June 3, 1985 - Inspection Report 85-04 - Radioactive Materials Transport Program (MN-85-105)

Subject: Inspection Report 85-04

Gentlemen:

In Reference (c), Maine Yankee requested reconsideration of both Violation (A) and Violation (B) noted in Inspection Report 85-04, Reference (b). Based upon recent telephone conversations with members of your staff, Dr. M. Shanbacky and Mr. P. Clemons, we understand that Violation B will be vacated.

During a recent visit to the Maine Yankee site by Mr. Clemons, our representatives D. Sturniolo and F. Setchell had an opportunity to continue the discussion of this Inspection. We now have a better understanding of the specific matter of concern set forth in Violation A and wish to withdraw our request for reconsideration of this violation at this time.

We have taken corrective action to assure that appropriate quality control is exercised over the preparation of radioactive waste for shipment. Enclosed is a copy of a revised version of Procedure 9.1.15 "Shipment of Radioactive Material". You will note that we have provided for specific QQAD sign-off on various aspects of cask and shipment preparation. We believe that this addresses the concern of the inspector.

~~8508290221~~ 290

6304L-FWS

If you have any questions regarding this matter please feel free to contact us.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

Frank W. Setchell

for G. D. Whittier, Manager
Nuclear Engineering & Licensing

GDW/bjp

Enclosure:

cc: Mr. Edward J. Butcher, Jr.
Mr. Cornelius F. Holden

INFO ONLY

Dept. Head MC
PORC P.L. Newcomb
OQAD ajz.

Proc. No. 9.1.15
Class. A
Rev. No. 16
Issue Date 5-16-85
Review Date 5/87

9.1.15 SHIPMENT OF RADIOACTIVE MATERIAL

1.0 DISCUSSION

Radioactive material shipments by any of the normal modes of transportation are subject to controls listed in various sections of the Code of Federal Regulations. Maine Yankee is responsible for the safe packaging and labeling of all radioactive material leaving the plant site. Before a shipment of radioactive material is made, a Radiological Controls supervisor will be notified. Should the shipment consist of any special nuclear materials the Reactor Engineering and Radiological Control Supervisors will also be notified. To insure safe radiation levels, a Radiological Controls representative will perform a radiation and contamination survey of the material to be shipped. A Radiological Controls Supervisor will calculate the activity of the shipment and assure that DOT and NRC requirements are complied with. Authorization to ship any radioactive material from the plant site will be made by a Radiological Controls Supervisor. Due to rapidly changing burial site criteria and State and DOT regulations, it may become necessary to deviate from this procedure in order to meet current requirements.

2.0 OBJECTIVE

Establish a procedure for shipping radioactive material from Maine Yankee.

3.0 REFERENCES

3.1 49 CFR, Parts 170-189.

3.2 10 CFR, Parts 20, 30, 40, 61, 70, 71.

3.3 Waste Disposal Site criteria (latest edition).

3.4 H.P. Procedure 9.1.17 Health Physics Requirements For Radioactive Waste Processing And Shipping.

3.5 AIF NESP Methodologies for Classification of LLW from Nuclear Power Plants, November 1983.

3.6 Latest scaling factors from Science Applications, Inc.

4.0 PRECAUTIONS

4.1 All of the general packaging requirements of 49 CFR 173.411 or 10 CFR 71.43, unless otherwise specified, must be met.

~~8508290223~~ 52pp.

4.2 If the shipment is overweight notify the shipment contractor to obtain an "overweight permit" for the vehicle.

4.3 Transportation of radioactive material on the Maine Turnpike is allowed only during daylight hours (sunrise to sunset). Do not allow any vehicle carrying radioactive waste material that requires placarding of the vehicle to leave the Maine Yankee site property without sufficient time to comply with the daylight travel only regulations of the Maine Turnpike Authority.

4.4 Assure that radiation levels do not exceed the specified limits.

4.5 Assure that the radiation levels on items loaded into shipping casks do not exceed the limits in Attachment A.

4.6 Assure that liquid wastes are adequately mixed prior to sampling to insure that a representative isotopic analysis is performed before determining the disposal method. This is especially critical with oil and water mixtures. [I.E. notice 83-33]

4.7 If the shipment contains transuranic elements, the radioactive shipping contractor and the burial site must be notified before the shipment leaves Maine Yankee.

4.8 Shipments requiring labels or placards must have the appropriate label or placard attached before leaving the plant site. Special precautions must be taken when applying labels or placards during inclement weather conditions to prevent them from falling off during transit.

5.0 PREREQUISITES

5.1 Unless exempt by 173.421 (limited Quantities of Radioactive Materials and Radioactive Devices) or 173.425 (Low Specific Activity), only approved containers will be used for shipment of radioactive material.

5.2 Before Radioactive material is transferred to another licensee, verification of their license to receive, the type, form and quantity of radioactive material must be checked by Maine Yankee. A copy of their license should be on file at Maine Yankee.

5.3 All placarded shipments of radioactive material through the State of Massachusetts require notification of the Massachusetts Department of Public Health. Notification is to be made by telephone. Form No. 9-1-15-HP-3 Masachusetts Department of Health Notification Form, lists the data required and the notification procedure. This form must be filled in for each such notification.

5.4 Shipments of fissile nuclear materials, both entering and leaving the state of Maine, require written notification of the following Maine State Agencies:

1) Maine Turnpike Authority (must be informed three days in advance of shipment).

2) Maine Bureau of Civil Emergency Preparedness.

3) Maine Department of Environmental Protection, Bureau of Oil & Hazardous Material.

4) Maine State Police.

5.5 All shipments of radioactive material that require placarding of the vehicle, will require notification of the following Maine State Agencies by telephone prior to leaving the site.

1) Maine Turnpike Authority.

2) Maine Department of Environmental Protection, Bureau of Oil & Hazardous Material.

3) Maine State Police. (Also requires not less than 24 hour advance notification of any LLW shipment Form No. 9-1-15-HP-8).

Date, time and person contacted for such notification, made pursuant to this paragraph, must be recorded on Maine Yankee State Agency Notification Form. Form No. 9-1-15-HP-4.

5.6 Shipments of spent reactor fuel leaving the Maine Yankee site must be escorted by one individual from the Health Physics Department until the shipment leaves the State of Maine. Additional requirements, see Section 6.5.3.

5.7 Low Specific Activity (L.S.A.) shipments that contain greater than Type A quantities of radioactive material must be packaged in a container that meets the requirements of 10 CFR 71.52.

5.8 Prior to each shipment of fissile radioactive material, Type B or highway route controlled quantity of radioactive materials (see 6.1.5 + 6.5.3) the consignee must be notified of the shipping dates and expected time of arrival. The consignee must also be notified of any special loading/unloading instructions.

5.9 Shipments of radioactive material that require placarding through the State of Conneticut, New Jersey and Rhode Island require a permit unless the material is exempted by the individual state. The carrier is responsible for obtaining the above permits.

5.9.1 Normally a Radiological Controls Supervisor will have the Connecticut application for a Radioactive Permit telecopied to Connecticut as soon as the driver signs it. The permit should come back to Maine Yankee and be part of the driver's paperwork.

5.9.2 Massachusetts Department of Public Health is to be notified of all shipments of radioactive material requiring placarding entering the State (Form No. 9-1-15-HP-3).

5.10 The Radioactive Quality Assurance Record (Form No. 9-1-15-HP-1) must be completed for all shipments of radioactive material.

5.11 Prior to the first use of a package for which a license or certificate of compliance is required the Director of Nuclear Material Safety and Safeguards must be notified in writing of Maine Yankee's intent to use the package.

5.12 A broker must be obtained for shipments to Nevada or Washington if a third party is involved.

5.13 A determination of the type, form, classification, and whether any exemption to the transportation regulations apply has been made for each package.

5.14 A determination of whether each radioactive waste container is Class A, B or C has been made (see Section 6.6 and 6.8.4).

5.15 On a case by case basis as specified in 10 CFR 20.302 very low level radioactive waste may be disposed of in a manner not otherwise authorized in the regulations. [IE Notice 83-05]

6.0 PROCEDURE

6.1 Preshipment Requirements

6.1.1 Arrange with carrier for type of vehicle or cask required.

Chem Nuclear: 1-803-259-1781
Hittman: 1-301-964-5047

6.1.2 Chem Nuclear at Barnwell, South Carolina.

6.1.2.1 Call Chem Nuclear by at least the fifth of the month to schedule a shipment(s) for that month.

NOTE: Maine Yankee has been alotted 506 cubic feet per month.

6.1.2.2 Send prior notification form (DHEC 802) to South Carolina so that it is received no less than 3 days or nor more than 30 days prior to arrival.

Bureau of Radiological Health
Radioactive Waste Management Section
S.C. Dept. of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Telecopier: 1-803-799-6726

Change or add information to PNP form: 1-803-758-7806.

6.1.2.3 Send copy of PNP form to Chem Nuclear at the same time.

Chem Nuclear Systems, Inc.
P.O. Box 726
Barnwell, South Carolina 29812
Attention: Scheduling

Change or add information to PNP form: 1-803-259-1781

6.1.3 U.S. Ecology, Inc. at Richland, Washington.

6.1.3.1 After arranging for carrier, notify U.S. Ecology of the intended shipment and approximate arrival date.

Phone: 1-509-377-2411

NOTE: Carrier has to notify Washington State a minimum of four (4) hours prior to entering State.

6.1.4 Chief of Maine State Police.

6.1.4.1 At least 24 hour advance notification of any shipment of low-level waste is required. Fill out Form No. 9-1-15-HP-8 and call in available information.

6.1.5 If a "HIGHWAY ROUTE CONTROLLED QUANTITY" (49 CFR 173.403(l) is to be shipped, there are special requirements that must be adhered to. See Section 6.5.3.

6.1.5.1 Definition: A quantity within a single package which exceeds:

(1) 3000 times the A_1 value
(2) 3000 times the A_2 value
(3) 30,000 Curies, whichever is least

6.1.5.2 10CFR71.97(3) also has special requirements if a shipment contains:

(1) Greater than 20 curies of other than special form for which A_2 is less than or equal to 4 curies.

(2) Greater than 200 curies of other than special form for which A_2 is greater than 4 curies.

6.2 Initial Survey of Empty Transport Vehicle (Exclusive Use)

6.2.1 Upon arrival, the transport vehicle will be detained outside the plant protected area by Security personnel until authorized to enter the plant by a Radiological Controls Supervisor.

6.2.2 Radiological Controls personnel will survey the transport vehicle for contamination and radiation. They will complete Survey Form MY-HP-102-79.

6.3 Preparation for Shipment

6.3.1 All radioactive material shipping containers must have:

- a contact and three foot radiation reading
- the contamination level on the outside of the container
- a determination of isotopic content of the material
- a determination of total curie content of container
- labels as per Section 6.8
- markings as per Section 6.7 or 6.5.4.1 or 6.5.4.2

6.4 Specific Details

6.4.1 Debris

6.4.1.1 Fifty-Five Gallon Drums

6.4.1.1.1 Isotopic content can be determined from evaporator bottoms isotopic analysis which should be representative of contamination.

6.4.1.1.2 Curie content estimated using the following formula:

Millicuries = MR/HR at 3' x 4

6.4.1.1.3 Normally shipped on exclusive use vehicle as RADIOACTIVE LSA, see Section 6.5.4.2, 6.9.1 and 6.10.2

NOTE: Gross weight limit of DOT 17H drums is 840 lbs. and DOT 6J is 560 lbs.

6.4.1.2 L.S.A. Boxes

6.4.1.2.1 Isotopic content determined as in 6.4.1.1.1.

6.4.1.2.2 Curie content estimated using the following formula:

Millicuries = MR/HR at 3' x 6.85.

NOTE: Ensure that box lids are banded (for waste containers).

6.4.1.2.3 Normally shipped on exclusive use vehicle as RADIOACTIVE LSA, see section 6.5.4.2, 6.9.1 and 6.10.2.

6.4.2 Laundry

6.4.2.1 Normally shipped in LSA boxes, see Section 6.4.1.2.

6.4.3 Disposable Waste Liners

6.4.3.1 Isotopic content determined from an isotopic analysis of the material put into the liner.

Curies = curies/gm or ml X volume in gms or mls

NOTE: If the material cannot be sampled, a Chemistry or Radiological Controls Supervisor will calculate the activity of the material.

NOTE: Spent Resin
Barnwell, S.C. - shipped either solidified in cement or dewatered in a High Integrity Container (HIC). A qualitative and quantitative (isotopic) analysis of all nuclides contained in the resin expressed in uci/cc is required. A summation of the activity of nuclide with half-lives greater than five years is required.
Richland, Washington - The same analysis information is required. If the summation of nuclide activities with half-lives greater than five years is less than 1.0 uci/cc, the resin can be shipped dewatered. If this sum is greater than 1.0 uci/cc, the resin must be solidified in cement.

6.4.3.2 Quality Control personnel must inspect all dewatered or solidified containers to insure that there is not detectable free standing liquid.

Barnwell, S.C. - Less than 0.5% by waste volume in a steel container.
Barnwell, S.C. - Less than 1.0% by waste volume in a High Integrity Container (HIC)
Richland, W.A. - Less than 0.5% or one gallon per container, whichever is less.

6.4.3.3 Normally shipped on exclusive use vehicle as RADIOACTIVE LSA, see Section 6.5.4.2 an 6.9.1 and 6.10.2

6.4.3.4 See Section 6.5 for package requirements.

6.4.4 Spent Liquid Filtration Filters

6.4.4.1 Isotopic content determined by isotopically analyzing a sample of the material deposited on the filters.

6.4.4.2 Curie content is determined by estimating the total amount of material deposited on the filters and using the following formula:

Curies = curies/gm X weight of material in gms

NOTE: If the material cannot be sampled, a Chemistry or Radiological Controls Supervisor will calculate the activity of the material.

6.4.4.3 Analysis requirements are the same as in Section 6.4.3.1 for spent resin.

6.4.4.4 Free standing water requirements as in 6.4.3.2.

6.4.4.5 Normally shipped on exclusive use vehicle as RADIOACTIVE LSA, see Section 6.5.4.2, 6.9.1 and 6.10.2

6.4.5 Samples for Analysis

6.4.5.1 Liquid

6.4.5.1.1 Isotopic content determined from isotopic analysis of each sample to be shipped.

6.4.5.1.2 Curie content of the package is determined using the following formula:

Curies = curies/ml X volume in mls

6.4.5.1.3 Mixed cargo is normally shipped as LIMITED QUANTITY, see Section 6.5.4.1 and 6.10.1.

NOTE: Shipping container must contain enough absorbent material to absorb at least twice the volume of the liquid being shipped. (49CFR173.412(n)(2) and (3)

6.4.5.1.4 See Section 6.5.4.1 for package requirements.

6.4.5.2 Solids

6.4.5.2.1 Isotopic content determined by isotopically analyzing a representative smear(s) from item(s) being shipped.

6.4.5.2.2 Curie content estimated by calculating the surface area of the item(s) and using the following formula:

Curies = area in cm^2 X curies/cm^2

6.4.5.2.3 Mixed cargo is normally shipped as LIMITED QUANTITY, see Section 6.5.4.1 and 6.10.1.

6.4.5.2.4 See Section 6.5.4.1 for package requirements.

6.4.6 Equipment

6.4.6.1 Proceed as in Section 6.4.5.2 (Solid Samples).

6.5 Determination of Type Package

6.5.1 Determine the total curie content of the material by A_1 or A_2 values as listed in 49CFR173.435 or 49CFR173.433 if not listed. See Attachment C for A_1 and A_2 values.

6.5.1.1 A_1 values are for special form material like sealed sources. See 49CFR173.403Z, 469 and 476.

NOTE: Documentation of special form material must be obtained if shipments are made in this category. [IE notice 83-47]

6.5.1.2 A_2 values are for normal form material. Normally shipments are in this category.

6.5.2 Determine if values obtained are greater than or less than the A_1 or A_2 values listed as appropriate.

6.5.2.1 Type A packages are required if the contents do not exceed the A_1 or A_2 values (49CFR173.415).

6.5.2.1.1 A Demonstration of Compliance is required when a TYPE A package is required (49CFR173.461) [IE notice 83-47].

NOTE: See Section 6.5.4 for exemptions.

6.5.2.2 Type B packages are required if the contents exceed the A_1 or A_2 values (49CFR173.416).

6.5.2.3 If a TYPE B package is used, be sure that the Certificate of Compliance (C of C) is onsite and that all of its requirements are fulfilled.

NOTE: No changes can be made to the package as described in the C of C [IE notice 83-10].

6.5.2.4 If a TYPE B package is required assure that the heat generated by the material will not exceed the shipping cask thermal watt limitation as specified by the Certificate of Compliance (C of C). C of C's are located in the Casks Books in the Radwaste Office. Calculation is as follows for each isotope:

WATTS = (e) (Ci) (5.93 E-3)

e = total energy per disintegration (beta energy to be 1/3 max energy + total energy of all gammas)

Ci = total curies of isotope

6.5.3 If it is determined that a "highway route controlled quantity" is to be shipped, special requirements and pre-notifications are required: (49CFR177.825b)

6.5.3.1 Prenotification as described in 10CFR71.97 for waste and 10CFR73.37 for spent fuel.

6.5.3.2 Special placards (49CFR172.527).

6.5.3.3 Special reporting requirements (49CFR173.22).

6.5.3.4 Always requires a RADIOACTIVE YELLOW III label (49CFR172.403c).

6.5.3.5 Each shipping paper related to the shipment must bear the package identification marking indicated in the USNRC approval (49CFR173.471c)

TABLE 7

ACTIVITY LIMITS FOR LIMITED QUANTITIES, INSTRUMENTS, AND ARTICLES

Nature of Contents	Instruments & Devices		Materials
	Instrument & Article Limits[1]	Package Limits	Package Limits
Solids:			
Special form	10^{-2} A_1	A_1	10^{-3} A_1
Other form	10^{-2} A_2	A_2	10^{-3} A_2
Liquids:			
Tritiated water:			
less than 0.1 Ci/liter			1000 Curies
0.1 Ci to 1.0 Ci/l			100 Curies
greater than 1.0 Ci/liter			1 Curie
Other liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases:			
Tritium[2]	20 Curies	200 Curies	20 Curies
Special Form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Other Forms	10^{3} A_2	10^{-2} A_2	10^{-3} A_2

[1] For mixture of radionuclides see §173.433 (b).
[2] These values also apply to tritium in activated luminous paint and tritium absorbed on solid carriers.

Mixtures of Radionuclides

$Ratio_1 + Ratio_2 + ... Ratio_n$ (must not be greater than unity to qualify as limited quantity.)

$$Ratio = \frac{\text{Total Activity of Isotope in Shipment}}{A_1 \text{ or } 2 \text{ Value from Table in Attachment C}}$$

Multiplied times package limit or compared to value in Table 7 as appropriate.

6.5.3.6 Special routing requirements (49CFR177.825c).

6.5.4 Exemptions

6.5.4.1 Limited Quantity (49CFR173.421)

6.5.4.1.1 Package contact dose rate cannot exceed 0.5 mrem/hr.

6.5.4.1.2 Isotopic content of material must be within the limits as listed in table 7.

6.5.4.1.3 Package only required to be a STRONG TIGHT container.

6.5.4.1.4 A seal is not required on the package.

6.5.4.1.5 The outside of the inner package must be marked RADIOACTIVE.

6.5.4.1.6 Certification statement (Form No. 9-1-15-HP-9) must accompany the shipment. (49CFR173.421-1(a))

6.5.4.2 RADIOACTIVE LSA (49CFR173.425)

6.5.4.2.1 Material in which the radioactivity is essentially uniformly distributed and in which the estimated average concentration of contents does not exceed: (49CFR173.403n)

1. 0.0001 millicurie per gram of radionuclides for which the A_2 quantity is not more than 0.05 curie.

2. 0.005 millicurie per gram of radionuclides for which the A_2 quantity is more than 0.05 curie, but not more than 1 curie; or

3. 0.3 millicurie per gram of radionuclide for which the A_2 quantity is more than 1 curie.

NOTE: This includes, but is not limited to, materials such as residues or solutions from chemical processing, waste such as building rubble, metal, wood and fabric, glassware, paper and cardboard; solid or liquid plant wastes, sludges and ashes.

6.5.4.2.2 Packages only required to be a STRONG TIGHT container up through A_2 quantity if shipped in exclusive use vehicle.

CAUTION: Shipments that contain greater than an A_2 quantity must be packaged in a DOT specification container. (10CFR71.52)

6.5.4.2.3 There must always be two (2) markings of RADIOACTIVE LSA on each package 180° apart.

NOTE: Markings must be at least 1/2" high.

6.5.4.2.4 A seal is not required on the package.

6.6 Determination of Waste Burial Class A, B or C; (10CFR61.55)

6.6.1 Determine the amount of activity, if any, of the isotopes listed in Table 1 or 2, found in Attachment D, are contained in the waste.

NOTE: Use Form No. 9-1-15-HP-10 as a worksheet.

6.6.1.1 Non-gamma emitters required to be reported will be reported using scaling factors, where applicable. These scaling factors will be based upon a data base developed under a cooperative program with the NRC and SAI and modified as the data base expands. These scaling factors are given in Attachment E.

NOTE: One sample, typical of each waste stream, will be fully analyzed annually until it is demonstrated to be unnecessary, to ensure the validity of the factors being utilized.

NOTE: Gross changes in waste stream radionuclide concentrations or ratios will require a reevaluation of the classification methods and will be addressed as the situation arises.

6.6.1.2 Radioisotopes requiring reporting, not easily measured or correlatable, will be reported based upon the methods described in the AIF NESP Report, "Methodologies for Classification of LLW from Nuclear Power Plants", November 1983. (Report maintained in Radwaste Office.)

NOTE: A nuclide is considered to be "significant for purposes of classification" if its concentration is greater than 0.01 times the concentration listed in Table 1, Column 1 or 0.01 times the smallest concentration listed in Table 2. This does not include isotopes identified in Table 2 as having half-lives less than 5 years. An isotope (other than Cm-242) having a half-life less than 5 years is considered significant if it is contained in the waste in concentrations greater than 7 uci/cc (0.01 times the Table 2, Column 1 value).

6.6.2 Determination of Waste Class from Table 1

6.6.2.1 If the concentration of the nuclide does not exceed the value in Column 2, the waste is Class A.

6.6.2.2 If the concentration of the nuclide does exceed the value in Column 2, but does not exceed the value listed in Column 1, the waste is Class C.

6.6.2.3 If the concentration of the nuclide exceeds the value in Column 1, the waste is not generally acceptable for near surface disposal.

6.6.2.3.1 Proposals for disposal of waste in this category may be submitted to the NRC for approval under 10CFR61.58.

6.6.2.4 For wastes containing a mixture of nuclides listed in Table 1, the class is determined by the sum of the fractions rule as follows:

CAUTION: All values must be taken from the same column in the same table.

$$\frac{\text{Nuclide 1 uci/cc}}{\text{Value in Column}} + \frac{\text{Nuclide 2 uci/cc}}{\text{Value in Column}} + \ldots + \frac{\text{Nuclide n uci/cc}}{\text{Value in Column}} = \text{less than 1}$$

NOTE: If the answer is less than 1, the class of waste is determined by the column used.

6.6.3 Determination of Waste Class from Table 2

6.6.3.1 If the concentration of the nuclide does not exceed the value in Column 1, the waste is Class A.

6.6.3.2 If the concentration of the nuclide exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B.

6.6.3.3 If the concentration of the nuclide exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C.

6.6.3.4 If the concentration of the nuclide exceeds the value listed in Column 3, the waste is not generally acceptable for near surface disposal. See Section 6.6.2.3.1.

6.6.3.5 For wastes containing a mixture of nuclides listed in Table 2 proceed as in 6.6.2.4.

6.6.4 If the waste does not contain any nuclides listed in Table 1 or 2, the waste is Class A.

6.7 Marking (49CFR172.300)

6.7.1 Each package weighing more than 110 pounds must have its gross weight plainly and durably marked on the outside of the package.

6.7.2 Each package which conforms to the requirements for Type A or Type B packaging (see section 6.5) must be plainly and durably marked on the outside of the package in letters at least 1/2" high with the wording "USA DOT 7A TYPE A and Radioactive Material (49 CFR 178.350-3) or the package identification marking indicated in the USNRC approval (49 CFR 173.471b) respectively".

6.7.3 Any markings must be at least 1/2" high.

6.8 Labeling (49CFR172.403)

6.8.1 Radioactive White I

6.8.1.1 Package content dose rate cannot exceed 0.5 mrem/hr.

6.8.1.2 Package cannot contain FISSILE CLASS I or II material.

6.8.1.2.1 Fissile material is (49CFR173.403j):

Plutonium - 238, 239 or 241
Uranium - 233 or 235

6.8.1.3 Package cannot contain a "HIGHWAY ROUTE CONTROLLED QUANTITY" of material. See section 6.1.5

6.8.2 Radioactive Yellow II

6.8.2.1 Packages with contact dose rates exceeding 0.5 mrem/hr, but not greater than 50 mrem/hr and not exceeding 1.0 mrem/hr at one meter (3.3 feet).

6.8.2.2 Must use on FISSILE CLASS II package having a Transport Index (TI) of 1.0 or less.

6.8.2.2.1 TI is the maximum dose rate in mrem/hr at one meter from the package.

6.8.3 Radioactive Yellow III

6.8.3.1 Package contact dose rates exceeding 50 mrem/hr or greater than 1.0 mrem/hr at one meter.

CAUTION: See section 6.10 for maximum package contact dose rates.

6.8.3.2 Must use on FISSILE CLASS III package.

6.8.3.3 Must use on a package containing a "HIGHWAY ROUTE CONTROLLED QUANTITY" of material. See section 6.1.5 and 6.5.3.

6.8.4 Each package of radioactive waste must be labeled as Class A, B or C as per Section 6.6. (10CFR61.57)

6.8.5 The contents asked for on Radioactive Yellow II and III labels are the major isotopes contained in the material.

6.8.6 There must always be two (2) labels on each package 180° apart.

6.8.7 All packages shipped under a label must be at least TYPE A.

6.8.8 All packages shipped under a label must incorporate a feature such as as seal on the outside of the package, which is not readily breakable and which, while intact will be evidence that the package has not been illicitly opened. (49CFR173.412b)

6.9 Placarding (49CFR172.500)

6.9.1 All RADIOACTIVE LSA shipments sent by exclusive use vehicle must be placarded.

6.9.2 Any vehicle which contains a package bearing a RADIOACTIVE YELLOW III label must be placarded.

6.9.3 Placards must be on each side and each end of the vehicle.

6.9.3.1 If shipping on a tractor trailer, the placards are put on each end and each side of the trailer or load.

6.10 Method of Shipment

6.10.1 Motor Freight (Mixed Cargo)(49CFR173.441a)

6.10.1.1 Packages with contact dose rates up to 200 mrem/hr and a Transport Index of 10 or less.

6.10.2 Motor Freight (Exclusive Use Vehicle) (49CFR173.441b)

6.10.2.1 Packages with dose rates that exceed those in Section 6.10.1.1 can be shipped on an exlcusive use vehicle.

6.10.2.1.1 Up to 1000 mrem/hr on the external accessible surface of the package (closed transport vehicle only).

NOTE: Vehicle must be equipped with an attached exterior enclosure, which during normal transport, restricts the access of unauthorized persons to the cargo space containing the radioactive material. (49CFR173.403c)

6.10.2.1.2 Up to 200 mrem/hr at any point on the external surface of the car or vehicle (closed transport vehicles only).

6.10.2.1.2.1 Open vehicle limited to 200 mrem/hr on contact with the package(s).

6.10.2.1.3 Up to 10 mrem/hr at any point 2 meters (6.6 feet) from the vertical planes projected by the outer lateral surfaces of the car or vehicle.

6.10.2.1.4 Up to 2 mrem/hr in any normally occupied position in the car or vehicle except that this provision does not apply to private motor carriers.

6.10.2.2 Specific instructions for maintenance of the exclusive use (sole use) shipment controls must be provided by the shipper to the carrier.

6.10.2.3 Shipment must be loaded by consignor and unloaded by the consignee from the transport vehicle in which originally loaded.

6.11 Loading of the Transport Vehicle

6.11.1 Radioactive Shipment Quality Assurance Record (Form No. 9-1-15-HP-1).

6.11.1.1 Radiological Controls personnel will complete Sections I.

6.11.1.2 Radiological Controls and Quality Control personnel will complete Section II, III, IV and V. Section II to be completed prior to loading any material.

6.11.2 Opening, loading and closure of casks used to transport radioactive material will normally be done in accordance with Equipment Handling Procedures supplied by the radioactive material shipping vendor, Hittman, Chem-Nuclear, etc.).

6.11.3 Radiological Controls personnel will conduct a final survey on all radioactive material being loaded for highest contact and one meter radiation levels.

6.11.4 Radiological Controls personnel will monitor the external radiation levels of the package for compliance with external radiation criteria [200 MR/HR contact, 10 MR/HR at two (2) meters and no greater than 2 MR/HR inside the tractor cab, 173.441(a)(b)] as the truck is being loaded.

6.11.5 Assure that proper labels are placed on containers, see Section 6.8 or 6.5.4.2, and are properly adhered to prevent removal during inclement weather.

6.11.6 Assure that proper markings are placed on containers, see Section 6.7, and are properly adhered to prevent removal during inclement weather.

6.11.7 Assure that all packages have been adequately blocked or braced to prevent load shifting during transportation.

6.12 Closure of the Transport Vehicle

6.12.1 Radiological Controls personnel will verify compliance with external radiation level criteria (see 6.11.4) before final closure of the transport vehicle.

6.13 Final Vehicle Survey

6.13.1 Radiological Controls will survey and record the highest contact, and 2 meter radiation level of the shipping package as per H.P. Procedure 9.1.17.

6.13.2 Radiological Controls will survey the dose rate of the cab at the closest point ot the load external of the cab if possible and record the results.

NOTE: If the cab reading is greater than 1.5 mrem/hr, the load should be repackaged.

6.13.3 Radiological Controls will check and record the external surface of the package, transporter and vehicle tires for contamination. Contamination shall be less than 100dpm/100cm^2 gross activity or less than 1000 dpm/100 cm^2 beta-gamma and less than 100 dpm/100 cm^2 alpha. (49 CFR 173.443)

6.13.4 The Final Shipment Radiation Surveys of each package(s) and transport vehicle will be performed by two different individuals using different survey meters. The second complete survey will be performed by a Radiological Controls Supervisor.

6.14 Placarding

6.14.1 Assure that the proper placards are placed on the transport vehicle, see Section 6.9 and 6.5.3, and are properly adhered to prevent removal during inclement weather.

6.15 Shipping Manifest: (49CFR172.200)

RADIOACTIVE WASTE (Also 10CFR20.311)

6.15.1 Radioactive waste is normally manifested on forms provided by the burial site.

6.15.1.1 All required information is requested on these forms.

6.15.1.2 The total quantity of the radionuclides H-3, C-14, Tc-99 and I-129 must be shown.

6.15.1.2.1 If any of these nuclides are known not to be present, the quantity should be recorded as "not present".

6.15.1.2.2 If any of these nuclides is known or suspected to be present but in quantities less than the lower limit of detection (LLD), the quantity should be recorded as less than minimum detectable, with the LLD value listed.

6.15.1.3 Other nuclides listed in Table 1 and 2, if significant for purposes of classification, should be listed. See Section 6.6.1.2.

6.15.1.4 Other nuclides not listed in Table 1 or 2 should be reported if they are contained in significant quantities (10% a greater of total activity in container).

6.15.1.5 The total quantity of source or special nuclear material should be reported, if the waste contains such material.

6.15.1.6 Distribute copies of the manifest as indicated on the forms. (10CFR20.311d (5, 6, 7))

6.15.1.6.1 Mail copy to burial site at time of shipment.

6.15.1.6.2 Include one copy with the shipping papers.

6.15.1.6.3 Retain one copy on-site.

6.15.1.7 If Maine Yankee has not received a signed copy of the manifest or equivalent documentation, indicating receipt of the shipment from the burial site within 20 days after the shipping date, an investigation must be started to locate the shipment. (10CFR20.311h(1))

6.15.1.7.1 The investigation shall include tracing the shipment and filing a written report with the nearest NRC office within 2 weeks of the completion of the investigation. (10CFR20.311h(2))

RADIOACTIVE NON-WASTE

6.15.2 Radioactive material that is not waste is normally manifested on Maine Yankee's Radioactive Shipment Record (RSR). (MY-HP-23-72)

6.15.2.1 All required information is requested on these forms.

6.15.2.2 Radionuclides that attribute 10% or greater to the total activity contained in the shipment should be listed on the RSR form.

6.16 Records

The transportation of radioactive material requires various records and forms to be properly completed before the shipment leaves the plant site. A checklist of required forms and records will be maintained and new forms or records will be added to the list as required (Form No. 9-1-15-HP-5). A Health Physics Supervisor will verify that each item on the list is completed before the shipment leaves the plant site.

7.0 FINAL CONDITONS

Radioactive material is properly packaged and ready for shipment.

ATTACHMENT A

RADWASTE DOSE RATE LIMITS BY PKG.

CASK MODEL NO.	TYPE	DOSE RATE (R/HR)	PAYLOAD (MAX)	VOLUME ft^3 / # LINER/DRUMS	INNER PKG. SPEC.	SUPPLIER
CNS 8-120	B	200 R	20,000	124 / 8	SEC. CONTAINER	CNSI
CNS 14-195-H	A	15 R	17,700	195 / 14	SEC. CONTAINER	CNSI
CNS 21-300	A	1 R	27,250	300 / 21	SEC. CONTAINER	CNSI
CNS 6-80-2	A	500 R	7,500	80 / 4	SEC. CONTAINER	CNSI
CNS 14-190	B	5 R	10,000	195 / 14	SEC. CONTAINER	CNSI
CNS 4-45	B	10,000 R	10,000	45 / 4	SEC. CONTAINER	CNSI
CNS6-75	A	150 R	10,300	85 / 6	DOT TYPE A	CNSI
4-85	B	50 R	5,700	88 / 4	SEC. CONTAINER DOT TYPE A	CNSI
HN-100 Ser 1	A	5 R	14,500	170 / 14	SEC. CONTAINER	HNDC
HN-100 Ser 2	A	5 R	14,500	170 / 14	SEC. CONTAINER	HNDC
HN-100 Ser 3	A	5 R	17,800	170 / 14	SEC. CONTAINER	HNDC
HN-100 Ser 3 with shield insert	A	50 R	10,400	125/ 14	SEC. CONTAINER	HNDC
HN-100S	A	1 R	17,000	170 / 14	SEC. CONTAINER	HNDC
HN-200	B	600 R	10,675	80 / 3	SEC. CONTAINER DOT SPEC. 17-H	HNDC
HN-300	A	1 R	8,000	- / 12	DOT TYPE A DOT SPEC. 17-H	HNDC
HN-400	A	1 R	12,000	- / 18	DOT TYPE A DOT SPEC. 17-H	HNDC
HN-600	A	50 R	13,000	87 / 7	SEC. CONTAINER	HNDC
DED VANS	N/A	0.5 R	27,000	- 160	N/A	VARIOUS

ATTACHMENT B

GUIDELINES FOR PROPER SIZE WIRE SLINGS & SHACKLES

TABLE I. SAFE WORKING LOADS ON VARIOUS TYPES OF SLINGS

Type of sling	Nominal size, in.	Single sling, lb	Choker sling, lb	U sling, lb	Basket sling, lb	Total load on two-leg slings (For three-leg sling multiply by 1½. For four-leg sling multiply by 2) 60-deg bridle, lb	45-deg bridle, lb	30-deg bridle, lb	Weight per ft (exclusive of hook, ring, thimble, or splice), lb
6 × 19 improved plow steel rope (Federal spec. RR-R-571)	½	1,350	1,010	2,700	2,360	2,330	1,910	1,350	0.23
	9/16	1,840	1,380	3,680	3,220	3,180	2,600	1,840	0.31
	⅝	2,420	1,815	4,840	4,240	4,180	3,420	2,420	0.40
	11/16	2,900	2,175	5,800	5,080	5,000	4,110	2,900	0.51
Factor of safety = 8	¾	3,800	2,850	7,600	6,650	6,570	5,400	3,800	0.63
	13/16	5,260	3,940	10,520	9,200	9,100	7,430	5,260	0.90
Splice efficiency = 80%	⅞	7,000	5,250	14,000	12,250	12,100	9,900	7,000	1.23
	1	9,000	6,750	18,000	15,750	15,550	12,750	9,000	1.60
Rope diameter →	1⅛	11,200	8,400	22,400	19,600	12,400	15,900	11,200	2.03
	1¼	13,800	10,350	27,600	24,200	23,900	19,550	13,800	2.50
Iron crane chain	½	1,710	1,280	3,420	3,000	2,970	2,420	1,710	1.66
	5/8	2,845	2,130	5,690	4,950	4,940	4,030	2,845	2.75
(ASTM spec. A 56-39)	¾	4,350	3,260	8,760	7,650	7,600	6,200	4,350	4.30
	⅞	6,415	4,820	12,830	12,200	11,150	9,100	6,415	6.15
Factor of safety = 5	1	8,550	6,630	17,700	15,500	15,350	12,550	8,550	8.20
	1⅛	11,750	8,800	23,450	20,600	20,400	16,650	11,775	10.45
Stock diameter →	1¼	15,350	11,500	30,700	26,900	26,650	21,700	15,350	13.10
	1⅜	19,250	14,400	38,500	33,700	33,500	27,250	19,250	16.60

TABLE IV. SAFE LOADS ON SHACKLES*

Shank, in.	Safe load, lbf	Pin, in.	Inside width, in.	Inside length, in.
½	2,830	½	⅞	1⅜
9/16	3,530	9/16	1	1⅝
⅝	4,420	⅝	1⅛	2
¾	6,360	¾	1¼	2⅜
⅞	8,650	1	1⅜	2¾
1	11,310	1⅛	1½	3¼
1⅛	13,360	1¼	1⅝	3½
1¼	16,500	1⅜	2	3¾
1⅜	19,960	1½	2¼	4⅛
1½	23,740	1⅝	2½	5
1⅝	27,900	1¾	2¾	5¼
1¾	32,320	2	3	5⅝
2	42,220	2¼	3½	6½

* U.S. Navy, Bureau of Ships.
† Safety factor = 5.

NOTE: Tables taken from "Handbook of Rigging" by Rossnagel, Third Edition.

ATTACHMENT C

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
ACTINIUM (89)	Ac-227	1000	0.003
	Ac-228	10	4
AMERICIUM (95)	Am-241[5]	8	0.008
	Am-243	8	0.008
ANTIMONY (51)	Sb-122	30	30
	Sb-124	5	5
	Sb-125	40	25
ARGON (18)	Ar-37	1000	1000
	Ar-41[8]	1	1
	Ar-41(uncompressed)	[2] 20	20
ARSENIC (33)	As-73	1000	400
	As-74	20	20
	As-76	10	10
	As-77	300	20
ASTATINE (85)	At-211	200	7
BARIUM (56)	Ba-131	40	40
	Ba-133	40	10
	Ba-140	20	20
BERKELIUM (97)	Bk-249	1000	1
BERYLLIUM (4)	Be-7	300	300
BISMUTH (83)	Bi-206	5	5
	Bi-207	10	10
	Bi-210	100	4
	Bi-212	6	6
BROMINE (35)	Br-82	6	6
	Br-77	70	25
CADMIUM (48)	Cd-109	1000	70
	Cd-115m	30	30
	Cd-115	80	20
CALCIUM (20)	Ca-45	1000	25
	Ca-47	20	20

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
CALIFORNIUM (98)	Cf-249	2	0.002
	Cf-250	7	0.007
	Cf-25	2	0.009
CARBON (6)	C-11	20	20
	C-14	1000	60
CERIUM (58)	Ce-139	100	100
	Ce-141	300	25
	Ce-143	60	20
	Ce-144	10	7
CESIUM (55)	Cs-129	40	40
	Cs-131	1000	1000
	Cs-134m	1000	10
	Cs-134	10	10
	Cs-135	1000	25
	Cs-136	7	7
	Cs-137	30	10
CHLORINE (17)	Cl-36	300	10
	Cl-38	10	10
CHROMIUM (24)	Cr-51	600	600
COBALT (27)	Co-56	5	5
	Co-57	90	90
	Co-58m	1000	1000
	Co-58	20	20
	Co-60	7	7
COPPER (29)	Cu-64	80	25
	Cu-67	200	25
CURIUM (96)	Cm-242	200	0.2
	Cm-243	9	0.009
	Cm-244	10	0.01
	Cm-245	6	0.006
	Cm-346	6	0.006
DYSPROSIUM (66)	Dy-165	100	20
	Dy-166	1000	200
ERBIUM (68)	Er-169	1000	25
	Er-171	50	20

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
EUROPIUM (63)	Eu-152m	30	30
	Eu-152	20	10
	Eu-154	10	5
	Eu-155	400	60
FLUORINE (9)	F-18	20	20
GADOLNIUM (64)	Gd-153	300	100
	Gd-159	300	20
GALLIUM (31)	Ga-67	100	100
	Ga-68	20	20
	Ga-72	7	7
GERMANIUM (32)	Ge-68	20	10
	Ge-71	1000	1000
GOLD (79)	Au-193	200	200
	Au-196	30	30
	Au-198	40	20
	Au-199	200	25
HAFNIUM (72)	Hf-181	30	25
HOLMIUM (67)	Ho-166	30	30
HYDROGEN (1)	H-3 (See Tritium)		
INDIUM (49)	In-111	30	25
	In-113m	60	60
	In-114m	30	20
	In-115m	100	20
IODINE (53)	I-123	50	50
	I-125	1000	70
	I-126	40	10
	I-129	1000	2
	I-131	40	10
	I-132	7	7
	I-133	30	10
	I-134	8	8
	I-135	10	10

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
IRIDIUM (77)	Ir-190	10	10
	Ir-192	20	10
	Ir-194	10	10
IRON (26)	Fe-52	5	5
	Fe-55	1000	1000
	Fe-59	10	10
KRYPTON (36)	Kr-85m[8]	3	3
	Kr-85m (uncompressed)[2]	100	100
	Kr-85[8]	5	5
	Kr-85 (uncompressed)[2]	1000	1000
	Kr-87[8]	0.6	0.6
	Kr-87 (uncompressed)[2]	20	20
LATHANUM (57)	La-140	30	30
LEAD (82)	Pb-201	20	20
	Pb-210	100	0.2
	Pb-212	6	5
LUTECIUM (71)	Lu-177	300	25
MAGNESIUM (12)	Mg-28	6	6
MANGANESE (25)	Mn-52	5	5
	Mn-54	20	20
	Mn-56	5	5
MERCURY (80)	Hg-197m	200	200
	Hg-197	200	200
	Hg-203	80	25
MIXED FISSION PRODUCTS	MF-P	10	0.4
MOLYBDENUM (42)	Mo-99	100	20
NEODYMIUM (60)	Nd-147	100	20
	Nd-149	30	20

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
NEPTUNIUM (93)	Np-237	5	0.005
	Np-239	200	25
NICKEL (28)	Ni-59	1000	900
	Ni-63	1000	100
	Ni-65	10	10
NIOBIUM (41)	Nb-93m	1000	200
	Nb-95	20	20
	Nb-97	20	20
NITROGEN (7)	N-13	20	10
OSMIUM (76)	Os-185	20	20
	Os-191m	200	200
	Os-191	600	200
	Os-193	100	20
PALLADIUM (46)	Pd-103	1000	700
	Pd-109	100	20
PHOSPHORUS (15)	P-32	30	30
PLATINUM (78)	Pt-191	100	100
	Pt-193m	200	200
	Pt-197m	300	20
	Pt-197	300	20
PLUTONIUM (94)	Pu-238[4,5]	3	0.003
	Pu-239[4,5]	2	0.002
	Pu-240[5]	2	0.002
	Pu-241[4,5]	1000	0.1
	Pu-242[5]	3	0.003
POLONIUM (84)	Po-210	200	0.2
POTASSIUM (19)	K-42	10	10
	K-43	20	10
PRASEODYMIUM (59)	Pr-142	10	10
	Pr-143	300	20

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
PROMETHIUM (61)	Pm-147	1000	25
	Pm-149	100	20
PROTACTINIUM (91)	Pa-230	20	0.8
	Pa-231	2	0.002
	Pa-233	100	100
RADIUM (88)	Ra-223	50	0.2
	Ra-224	6	0.5
	Ra-226	10	0.05
	Ra-228	10	0.05
RADON (86)	Rn-222	10	2
RHENIUM (75)	Re-186	100	20
	Re-187	Unlimited	Unlimited
	Re-188	10	10
	Re-natural	Unlimited	Unlimited
RHODIUM (45)	Rh-103m	1000	1000
	Rh-105	200	25
RUBIDIUM (37)	Rb-81	30	25
	Rb-86	30	30
	Rb-87	Unlimited	Unlimited
	Rb-natural	Unlimited	Unlimited
RUTHENIUM (44)	Ru-97	80	80
	Ru-103	30	25
	Ru-105	20	20
	Ru-106	10	7
SAMARIUM (62)	Sm-147	Unlimited	Unlimited
	Sm-151	1000	90
	Sm-153	300	20
SCANDIUM (21)	Sc-46	8	8
	Sc-47	200	20
	Sc-48	5	5
SELENIUM (34)	Se-75	40	40
SILICON (14)	Si-31	100	20

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
SILVER (47)	Ag-105	40	40
	Ag-110m	7	7
	Ag-111	100	20
SODIUM (11)	Na-22	8	8
	Na-24	5	5
STRONTIUM (38)	Sr-85m	80	80
	Sr-85	30	30
	Sr-87m	50	50
	Sr-89	100	10
	Sr-90	10	0.4
	Sr-91	10	10
	Sr-92	10	10
SULPHUR (16)	S-35	1000	60
TANTALIUM (73)	Ta-182	20	20
TECHNETUM (43)	Tc-96m	1000	1000
	Tc-96	6	6
	Tc-97m	1000	200
	Tc-97	1000	400
	Tc-99m	100	100
	Tc-99	1000	25
TELLURIUM (52)	Te-125m	1000	100
	Te-127m	300	20
	Te-127	300	20
	Te-129m	30	10
	Te-129	100	20
	Te-131m	10	10
	Te-132	7	7
TERBIUM (65)	Tb-160	20	10
THALLIUM (81)	Tl-200	20	20
	Tl-201	200	200
	Tl-202	40	40
	Tl-204	300	10

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
THORIUM (90)	Th-227	200	0.2
	Th-228	6	0.008
	Th-230	3	0.003
	Th-231	1000	25
	Th-232	Unlimited	Unlimited
	Th-234	10	10
	Th-natural	Unlimited	Unlimited
	Th-(irradiated)[6]	---	---
THULLIUM (69)	Tm-170	300	10
	Tm-171	1000	10
TIN (50)	Sn-113	60	60
	Sn-119m	100	100
	Sn-125	10	10
TRITIUM (1)	H-3 (uncompressed)[2]		1000
	H-3 (compresses)	1000	1000
	H-3 (activated luminous paint)	1000	1000
	H-3 (absorbed on solid carrier)	1000	1000
	H-3 (tritiated water)	1000	1000
	H-3 (other forms)	20	20
TUNGSTEN (74)	W-181	200	100
	W-185	1000	25
	W-187	40	20
URANIUM (92)	U-230	100	0.1
	U-232	30	0.03
	U-233[4]	100	0.1
	U-234	100	0.1
	U-235[4]	100	0.2
	U-236	200	0.2
	U-238	Unlimited	Unlimited
	U-natural	Unlimited	Unlimited (See 173.434)
	U-enriched[4] less than 20%	Unlimited	Unlimited (See 173.434)
	U-enriched[4] greater than 20%	100	Unlimited (See 173.434)
	U-depleted	Unlimited	Unlimited (See 173.434)
	U-irradiated	----	----

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

ELEMENT & ATOMIC NUMBER	RADIONUCLIDE[3]	A_1(Ci) (Special Form)	A_2(Ci) (Normal Form)
VANADIUM (23)	V-48	6	6
XENON (54)	Xe-127[8]	5	5
	Xe-127 (uncompressed)[2]	70	70
	Xe-131m[8]	10	10
	Xe-131m (uncompressed)[2]	100	100
	Xe-133[8]	5	5
	Xe-133 (uncompressed)[2]	1000	1000
	Xe-135[8]	2	2
	Xe-135 (uncompressed)[2]	70	70
YTTERBIUM (70)	Yb-169	80	80
	Yb-175	400	25
YTTERIUM (39)	Y-87	20	20
	Y-90	10	10
	Y-91m	30	30
	Y-91	30	30
	Y-92	10	10
	Y-93	10	10
ZINC (30)	Zn-65	30	30
	Zn-69m	40	20
	Zn-69	300	20
ZIRCONIUM 940)	Zr-93	1000	200
	Zr-95	20	20
	Zr-97	20	20

[1]Atomic number shown in parentheses.

[2]Uncompressed means at a pressure not exceeding 14.7 psi (absolute).

[3]Atomic weight shown after the radionuclide symbol.

[4]Fissile radioactive material.

TABLE OF A_1 and A_2 VALUES FOR RADIONUCLIDES (Cont'd)

[5]For shipments solely within the United States, the A_1 value is 20 curies americium and plutonium contained in Am-Be or Pu-Be neutron sources or in nuclear powered pacemakers.

[6]The values of A_1 and A_2 must be calculated in accordance with the procedure specified in 173.433 of this subchapter, taking into account the activity of the fission products and of the uranium-233 in addition to that of the thorium.

[7]The values of A_1 and A_2 must be calculated in accordance with the procedure specified in 173.433 of this subchapter, taking into account the activity of the fission products and plutonium isotopes in addition to that of the uranium.

[8]Compressed (greater than 14.7 psi (absolute)).

ATTACHMENT D (10CFR61.55)

Table 1

RADIONUCLIDE	CONCENTRATION (uci/cc)	
	Column 1	Column 2
	Class C Limit	Class A Limit
C-14	8	0.8
C-14 in activated metal	80	8
Ni-59 in activated metal	220	22
Nb-94 in activated metal	0.2	0.02
Tc-99	3	0.3
I-129	0.08	0.008
Alpha emitting transuranic nuclides with half-lives greater than 5 yrs	*100	*10
Pu-241	*3,500	*350
Cm-242	*20,000	*2,000

*Units are in Nanocuries per gram

Table 2

RADIONUCLIDE	CONCENTRATION (uci/cc)		
	Column 1	Column 2	Column 3
	Class A Limit	Class B Limit	Class C Limit
Total of all nuclides with half-lives less than 5 years	700	No Limit	No Limit
H3	40	No Limit	No Limit
Co-60	700	No Limit	No Limit
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	4600

NO LIMIT - Although no limit is specified, practical consideration such as effects of external radiation and internal heat generation on transportation, handling and disposal will limit the concentrations for these wastes. These wastes will be Class B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

ATTACHMENT E

SCALING FACTORS FOR MAINE YANKEE
DETERMINED BY SAI

Date: March 1984

Nuclide	Scaling Factors							
	Scaling Nuclide	All Pwr Samples	All Maine Yankee Samples	Samples This Batch				
				All Samples	Reactor Coolant	Filter Sludge	Evaporator Bottom	Smear
^{3}H	*	*	***	***				
^{14}C	*	*	***	****	(5.70E-6)	(4.56E-3)	(1.39E-3)	(7.03E-4)
^{55}Fe	^{60}Co	$(4.8\pm0.9)\times10^{-1}$	$(1.1\pm0.6)\times10^{0}$	$(1.1\pm0.6)\times10^{-0}$	$(1.7\pm0.2)\times10^{-1}$	$(1.1\pm0.2)\times10^{0}$	$(1.1\pm0.5)\times10^{0}$	$(2.4\pm0.1)\times10^{0}$
^{59}Ni	^{60}Co	$(1.2\pm0.5)\times10^{-2}$	$(2.4\pm0.9)\times10^{-2}$	$(2.5\pm1.7)\times10^{-2}$	$(2.9\pm1.3)\times10^{-3}$	$(2.2\pm0.2)\times10^{-2}$	$(6.4\pm2.3)\times10^{-3}$	$(7.0\pm0.7)\times10^{-2}$
^{63}Ni	^{60}Co	$(3.1\pm0.3)\times10^{-1}$	$(9.8\pm3.2)\times10^{-1}$	$(8.0\pm5.8)\times10^{-1}$	$(2.3\pm0.2)\times10^{-1}$	$(2.6\pm0.2)\times10^{0}$	$(9.3\pm3.2)\times10^{-1}$	$(6.5\pm0.5)\times10^{0}$
^{90}Sr	^{137}Cs	$(4.0\pm1.5)\times10^{-2}$	$(3.8\pm1.8)\times10^{-3}$	$(1.1\pm0.7)\times10^{-3}$	$(3.7\pm2.2)\times10^{-1}$	$(2.0\pm0.2)\times10^{-3}$	$(6.4\pm2.4)\times10^{-4}$	$(8.7\pm2.6)\times10^{-4}$
^{94}Nb	**	**	*	**				
^{99}Tc	^{137}Cs	$(2.9\pm2.7)\times10^{-3}$						
^{129}I	^{137}Cs	$(1.4\pm0.6)\times10^{-3}$						
^{241}Pu	^{144}Ce	$(4.0\pm0.6)\times10^{-1}$	$(1.5\pm0.6)\times10^{0}$	$(1.9\pm1.5)\times10^{0}$	$(1.1\pm0.9)\times10^{1}$	$(2.1\pm0.4)\times10^{1}$	$(1.7\pm0.3)\times10^{0}$	$(1.9\pm0.8)\times10^{0}$
^{242}Cm	^{144}Ce	$(2.2\pm0.4)\times10^{-2}$	$(1.1\pm0.4)\times10^{-2}$	$(8.5\pm5.0)\times10^{-3}$	$(1.1\pm0.8)\times10^{-1}$	$(1.1\pm0.3)\times10^{-2}$	$(8.4\pm1.3)\times10^{-3}$	$(3.4\pm1.3)\times10^{-3}$
TRU 5 yr	^{144}Ce	$(3.3\pm1.1)\times10^{-2}$	$(5.9\pm4.6)\times10^{-2}$	$2.9\pm2.2)\times10^{-1}$	$(1.4\pm0.5)\times10^{-1}$	$(5.0\pm0.5)\times10^{-1}$	$(5.1\pm0.4)\times10^{-2}$	$(6.1\pm1.2)\times10^{-2}$
$^{238,239,240}Pu$ ^{241}Am; $^{243,244}Cm$								
^{60}Co	^{144}Ce	$(1.1\pm0.2)\times10^{0}$	$(3.4\pm1.2)\times10^{2}$	$(1.3\pm0.9)\times10^{3}$	$(2.8\pm1.6)\times10^{3}$	$(6.5\pm1.0)\times10^{3}$	$(1.4\pm0.2)\times10^{3}$	$(7.6\pm2.7)\times10^{2}$
Ce-144	Co-60				(3.57E-4)	(1.54E-4)	(7.14E-4)	(1.32E-3)

NOTE: Units on C-14 Factors are uci/gm, No Unit on Other Factors

*Scaling not applicable.

**Scaling nuclide not currently identified. Use MDL values for estimation purposes.

***Use reactor coolant concentration and estimate of water in waste.

****Use concentration values from analyses of like waste samples for estimation purposes.

+Ratios were developed from non-weighted averages of nuclide concentrations.

DATE: _____

R.C. SUP. _____

Form No. 9-1-15-HP-10
Rev. No. 16
Date Revised:

WORKSHEET FOR DETERMINATION OF WASTE CLASSIFICATION (10CFR61.55)

Table 1 Isotopes	Scaling Factor	Scaling Isotope	Scaling Isotope uci/cc	Isotopic Conc. uci/cc	MY LLD uci/cc	Class A Limit uci/cc	Class A Ratio[c]	Class B Limit uci/cc	Class B Ratio[c]	Class C Limit uci/cc	Class C Ratio[c]
C-14						8E-01		d	////////	8E00	
Tc-99						3E-01		d	////////	3E00	
I-129						8E-03		d	////////	8E-02	
TRU[a]						10		d	////////	100	
Pu-241[a]						350		d	////////	3500	
Cm-242[a]						2000		d	////////	20000	
				RATIOS		////////		////////	////////	////////	
Table 2 Isotopes											
H-3						4E+01		b		b	
Co-60						7E+02		b		b	
Ni-63						3.5E00		7E+01		7E+02	
Sr-90						4E-02		1.5E+02		7E+03	
Cs-137						1E00		4.4E+01		4.6E+03	
With T1/2 less than 5 year						7E+02		b		b	
				RATIOS		////////		////////		////////	

a. Units are nanocuries/gram
b. No limit.
c. It is not necessary to list on manifest any nuclide whose ratio is less than 0.01 except C-14, Tc-99, I-129, H3
d. If Class A limit is exceeded the waste is Class C.

NOTE: For resin assume 50% of Volume is liquid and use reactor coolant H-3 value to determine the amount of H-3 in shipment.

RADIOACTIVE MATERIAL PACKAGING AND SHIPPING QUALITY ASSURANCE RECORD

SECTION I. SHIPPING INFORMATION (Radiological Controls)

Shipment Number _____

Carrier		Tractor License No.	
Date of Arrival		Trailer License No.	
Time of Arrival		Cask Type	
Driver(s) Name		Cask Serial No.	
		Shipping Contractor	

SECTION II. DOCUMENT VERIFICATION

DATE _____

ITEM	RC INITS	RC TIME	QQAD INITS	QQAD TIME
1. Initial Radiological Survey Taken (Exclusive use Vehicle)				
2. An updated copy of the consignee license to recieve radioactive material is on site				
3. Inspect the transport vehicle (exclusive use only) attach Form No. 9-1-15-HP-10.				
4. Handling equipment to be used to load the radioactive material has been inspected, checked and designed to handle the intended load weight. Attachment B is a guide to insure proper slings and shackles are used.				
5. Certificate of Compliance for the shipping cask is on site				
6. Inspect the cask and tie-down system (chains, cables, binder, etc.) to assure that it has not sustained any damage.				
7. Cask has been receipt inspected per Proc. 0-03-1.				
8. Cask is marked with same ID No. as on C of C and M.Y. is identified as a registered user (10CFR71.85c).				
9. Personnel opening and loading the cask have a working copy of the cask handling procedure.				
10. Inspect the cask interior for defects, obstructions to loading, etc.				

RADIOACTIVE MATERIAL PACKAGING & SHIPPING QUALITY ASSURANCE RECORD (Cont'd)

SECTION III. SHIPMENTS WITH ACTIVITY LESS THAN A1 or A2 VALUES (49CFR173.475)

DATE_____

ITEM	RC INITS	RC TIME	OQAD INITS	OQAD TIME
1. The container(s) is proper for the contents to be shipped.				
2. The container(s) is in unimpaired physical condition except for superficial marks.				
3. For fissile material, each moderator and neutron absorber, if required, is present and in proper condition.				
4. Each special instruction for filling, closing, and preparation of the container(s) for shipment has been followed.				
5. Each closure, valve, or other opening of the containment system through which the radioactive content might escape, is properly closed and sealed.				
6. Each closure device of the container(s) including any required gasket, is properly installed, secured, and free of defects.				
7. The internal pressure of the containment system will not exceed the design pressure during transportation.				
8. The case is proper for the contents to be shipped (see C of C).				
9. Inspect the container(s) or cask tiedown system (chains, cables, binders, etc.).				
10. Each cask closure device including any required gasket, is properly installed and secured and free of defects.				
11. The cask has been loaded and closed in accordance with written M.Y. approved procedures and the user check-off sheet has been completed.				
R 12. All user required conditions listed on the C of C for the cask have been complied with and documented and referenced documents are on site.				
13. Package(s) and vehicle radiation and contamination levels are within the allowable limits specified (see Section 6.11.4 and 6.13.3 and H.P. Procedure 9.1.17).				

RADIOACTIVE MATERIAL PACKAGING & SHIPPING QUALITY ASSURANCE RECORD (Cont'd)

SECTION III. (Con't.)

DATE_____(10CFR61.55 & .56

ITEM	RC INITS	RC TIME	QQAD INITS	QQAD TIME
1. Waste material in container(s) has been classified (see Section 6.6).				
2. Waste container and/or form meets the stability requirements of 10CFR61.56.				
3. Liquid content of the waste is less than 1% of the volume of the waste if the container is designed to ensure stability.				
4. Liquid content of the waste is less than 0.5% of the volume of the waste if the waste is processed to a stable form.				

RADIOACTIVE MATERIAL PACKAGING & SHIPPING QUALITY ASSURANCE RECORD (Cont'd)

SECTION IV SHIPMENTS WITH ACTIVITY GREATER THAN A1 or A2 VALUES (10CFR71.87)

NOTE: Section III, Items pertaining to the container(s) must also be completed.

DATE_____

ITEM	RC INITS	RC TIME	QQAD INITS	QQAD TIME
1. The cask is proper for the contents to be shipped. (See C of C)				
2. The cask is in unimpaired physical condition except for superficial defects such as marks or dents.				
3. For fissile material, any moderator or neutron absorber, if required, is present and in proper condition.				
4. Each closure device of the cask, including any required gasket, is properly installed, secured, and free of defects.				
5. Any system for containing liquid is adequately sealed and has adequate space or other specified provision for expansion of the liquid.				
6. Any pressure relief device is operable and set in accordance with written procedures.				
7. Any structural part of the cask which could be used to lift or tiedown the cask during transport is rendered inoperable for that purpose unless it satisfies the design requirements of §71.45.				
8. Accessible cask surface temperatures will not exceed the limits specified (122°F for mixed cargo, 180°F for exclusive use vehicle).				
9. Inspect the cask tiedown system (chains, cables, binders, etc.				
10. The cask has been loaded and closed in accordance with written M.Y. approved procedures and the user check-off sheet has been completed.				
R 11. All user required conditions listed on the C of C for the cask have been complied with and documented and referenced documents on site.				
12. Package(s) and vehicle radiation and contamination levels are within the allowable limits specified. (See Section 6.11.4 and 6.13.3 and H.P. Procedure 9.1.17).				

RADIOACTIVE MATERIAL PACKAGING & SHIPPING QUALITY ASSURANCE RECORD (Cont'd)

SECTION V Final Shipment Verification

DATE_____

ITEM	RC		QQAD	
	INITS	TIME	INITS	TIME
1. Material to be shipped has a contact and three foot radiation survey taken.				
2. The outside of each container or cask must have a seal that is not easily breakable that will demonstrate that the package has not been illicitly opened. (Not applicable for LSA or exempt shipments).				
3. Final health physics survey of the package and/or transporter is completed as per H.P. Procedure 9.1.17.				
4. Final vehicle survey results have been verififed (exclusive use vehicle).				
5. The consignee has been notified if the shipment contains fissile material. Type B or a Highway Route Controlled Quantity.				
6. The State of New Jersey has been notified if the shipment contains greater than 20 curies and will pass through the State of New Jersey.				
7. The routine determination required by 10CFR71.87 and/or 49CFR173.475 have been performed and are acceptable.				
8. Connecticut Radioactive Permit obtained for carrier.				
9. Copy of RSR mailed to Hittman and called prior to shipment leaving.				
10. Reactor Engineering and Health Physics notified if spent fuel & X Core detectors being shipped.				
11. Appropriate markings and labels have been adequately applied to container(s) and cask if applicable (see Section 6.7 & 6.8).				
12. Appropriate placards have been adequately applied. (See Section 6.9).				

RADIOACTIVE MATERIAL PACKAGING & SHIPPING QUALITY ASSURANCE RECORD (Cont'd)

DATE_____

ITEM	RC INITS	RC TIME	QQAD INITS	QQAD TIME
13. Driver satisfied with arrangement of load (driver's initials).				
14. Shipping papers have been completed.(10CFR20.311)				
15. Radiological Control Supervisor final vehicle inspection completed.				
16. Required notifications either by telephone or letter have been made.				
Maine Turnpike				
State Police				
Department of Environmental Protection				
Mass. Dept. of Public Health				
Burial Site Representative				
So. Carolina Dept. of Health if Applicable				
Maine Bureau of Civil Emergency Preparedness				

GUIDELINE FOR EXCLUSIVE USE VEHICLE INSPECTION

Vehicle Identification:

Tractor_____

Trailer_____

Shipment No._____

Date _____

OQAD Inspector _____

Items to Inspect	SAT	UNSAT
A. Tires: 1. Tread and general condition. 2. Rims and lugs intact.		
B. Brake Tubing and Hose: 1. Long and flexible enough to accommodate, without damage, all normal motion. 2. Suitably secured against chafing, kinking, or other mechanical damage.		
C. Headlights and Reflectors: 1. Headlamps, turnsignals, clearance lamps, and reflectors intact and functional.		
D. Mirrors 1. Two rear vision mirrors - one on each side.		
E. Coupling Device: 1. No cracking, warping or deformation of the frame. 2. Installation includes a device for positive prevention of shifting.		
F. Fire Extinguishers: 1. Properly filled and located so that it is readily accessible.		
G. Brakes: 1. All brakes operative. 2. Low air pressure warning device present. 3. Pressure gauge indicating pressure available.		
H. Windshield Wipers: 1. Equipped with two automatically operating windshield wiper blades.		
I. Tiedown System: 1. Tiedown cables secure and free from interferences. 2. Turnbuckles and clamps free from visual defects.		
J. Frame: 1. Bolted or pinned connections have no loose, missing or bent parts. 2. No signs of cracks, abrasion or corrosion that would reduce thickness significantly. 3. Examination of frame for signs of buckling, twisting or misalignment.		

DRIVER INSTRUCTION RECORD

1.0 SHIPMENT INFORMATION

1. Shipment Number _____
2. Type of radioactive material _____
3. Transport index _____
4. Vehicle radiation levels
   - 1 - contact _____ mr/hr
   - 2 - one meter _____ mr/hr
   - 3 - two meters _____ mr/hr
   - 4 - inside cab _____ mr/hr

2.0 EXCLUSIVE USE (SOLE USE) VEHICLE INSTRUCTION (if applicable)

1. This shipment of radioactive material is being transported in an exlcusive use vehicle.
2. The material is to be loaded by the shipper and unloaded at its final destination only.
3. Repositioning or movement of any loaded material without the written permission of the consignor is prohibited.
4. Changing of the tractor is prohibited without the express consent of Maine Yankee.
5. Frequently check to ensure that the four (4) placards are still present.
6. Other _____

3.0 EMERGENCY INSTRUCTIONS

1. In case of an accident, keep all unnecessary personnel clear and call Maine Yankee Atomic Power Company, phone 207-882-6321. Give details of accident.

   DAYS - Radwaste Coordinator NIGHTS - Plant Shift Superintendent

2. Notify State Police in state of accident. Give details of accident.
3. Notify the U.S. Department of Transportation, phone 202-426-1830.

4.0 TRAVEL INSTRUCTIONS IN THE STATE OF MAINE

1. Routing: Depart Maine Yankee via Route 144 to U.S. Route 1 to Interstate 95 and enter the Maine Turnpike at Entrance 9. Remain on the Maine Turnpike throughout until leaving the State of Maine. DO NOT DEVIATE from this route.
2. Hours of Travel: Transportation of radioactive material on the Maine Turnpike is allowed only during daylight hours (sunrise to sunset).

I have read and understand the above. Driver's Signature: _____

Company: _____ Date: _____

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

NOTIFICATION FORM

The Massachusetts Department of Public Health must be notified of all shipments of radioactive material entering the state. If possible, 24 hour notification is to be given.

Shipment Number_____
Curie Content of Shipment_____

Date Called_____

Time of Call_____

Person Making the call_____

Type of Material
1. Radioactive waste
2. Radioactive laundry
3. Spent fuel
4. New reactor fuel
5. Other_____

Person contacted in Department of Public Health _____

Time and Date of Shipment _____

Shipping Contractor _____

Vehicle Registration _____

Vehicle Destination _____

Route through Massachusetts _____

_____

_____

During normal work hours the phone numbers for the following are:

1. R. Hallisey (617) 723-6214
2. G. Swibble (617) 727-6248
3. Emergency (617) 729-9710

During off hours, weekends or holidays contact one of the following:

1. R. Hallisey (617) 729-5728
2. G. Swibble (617) 387-7768

In the event contact cannot be made in the above manner, call Massachusetts State Police Headquarters (617) 566-4500, Extension 237 or 238. Ask for Communication Room and explain circumstances.

MAINE STATE AGENCY NOTIFICATION FORM

Shipment Number _____

1.0 SHIPMENTS OF FISSILE NUCLEAR MATERIALS AND/OR RADIOACTIVE WASTE:

For all shipments of Fissile Nuclear Materials and/or Radioactive Waste leaving the plant site, the following State of Maine Agencies must be notified by telephone before the shipment leaves the plant site. Time and content of notification is to be recorded below.

a) Maine Turnpike Authority
Fare Collection:
Phone: 871-7724

Person Notified_____
_____
Date/Time/Notified By:

b) Dept. of Environmental Protection
Bureau of Oil & Hazardous Material
Phone: 289-2651

Person Notified_____
_____
Date/Time/Notified By:

c) Maine State Police
State Officer of the Day
Phone: 289-2155

Person Notified_____
_____
Date/Time/Notified By:

Fissile Nuclear Material Only

d) Maine Bureau of Civil
Emergency Preparedness
Phone: 622-6201

Person Notified_____
_____
Date/Time/Notified By:

The following information has been conveyed to the above named agency as applicable to the shipment concerned:

___ ___ This shipment contains Fissile Nuclear Material requiring prior written notification. The written notification has been mailed on (the date shown in paragraph 2.0 below).

OR

___ ___ This shipment contains Radioactive Waste only which does not require prior notification in writing.

___ ___ This shipment meets the legal weight limits and does not require an overload permit.

OR

___ ___ This shipment is overweight and requires an overload permit.

MAINE STATE AGENCY NOTIFICATION FORM (CONT.)

2.0 SHIPMENTS OF FISSILE NUCLEAR MATERIALS ONLY:

For all shipments of Fissile Nuclear Materials entering or leaving the State, the agencies listed below must be notified in writing no later than three days prior to the expected shipping or receiving date.

a) Maine Turnpike Authority
Mr. David H. Stevens
17 Bishop Street
Portland, Me 04103

b) Dept. of Environmental Protection
Bureau of Oil and Hazzardous Material
Statehouse Station #7
Augusta, Me 04330

c) Maine State Police
36 Hospital Street
Augusta, Me 04330

d) Director
Maine Bureau of Civil
Emergency Preparedness
State House
Augusta, Me 04330

The written notification required under this paragraph have been mailed by:_____ on:_____.

MAINE YANKEE ATOMIC POWER COMPANY

RADIOACTIVE MATERIAL RELEASE FORM

Date:_____

Shipment Number _____

Time:_____

NOTE: This form must be completed by a Radwaste Supervisor before plant security will allow any radioactive material to leave the plant site. Plant security will note the date and time of departure and return this form to Radwaste.

Description of Material

_____

_____

_____

_____

_____

_____

Approved for Shipment_____
Radwaste Supervisor

To be completed by Plant Security

Date:_____

Time of Departure:_____

Officer:_____

RADWASTE SHIPMENT ROUTE

Shipment No._____ Date_____

According to the dispatcher at _____ the truck routing from Maine Yankee Nuclear Power Station to _____ is as follows:

_____
Driver's Signature

CHIEF OF MAINE STATE POLICE

RADIOACTIVE WASTE SHIPMENT PRENOTIFICATION*

TITLE 25, Section 2109

SHIPMENT NUMBER: _____ SHIPMENT DATE: _____

DATE CALLED: _____

TIME CALLED: _____

CONTACTED: _____ at 289-2155

CONTACTED BY: _____

*A minimum of 24 hour advance notification is required.

SHIPMENT INFORMATION

CARRIER: _____

VEHICLE REGISTRATION:

TRACTOR: _____ TRAILER: _____

ROUTE THRU MAINE: Route 144 to US Route 1 to Interstate 95 and enter the Maine Turnpike at Entrance 9. Remain on Maine Turnpike until leaving the State of Maine at Kittery.

DESTINATION: _____ FACILITY: _____

CONTENTS:

VOLUME: _____

CURIES: _____

TYPE MATERIAL: _____

DATE FORM MAILED: _____

Maine State Police
36 Hospital Street
Augusta, Maine 04330

ATTENTION: Communications

LIMITED QUANTITY CERTIFICATION

49CFR173.421-1(a)

SHIPMENT NO._____ DATE:_____

Maine Yankee Atomic Power Company certifies that:

"This package conforms to the conditions and limitations specified in:

|___| 49CFR173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910 or

|___| 49CFR173.422 for excepted radioactive material, instruments and articles, UN2911 or

|___| 49CFR173.424 for excepted radioactive material, articles manufactured from natural or depleted uranium or natural thorium, UN2909."

_____
RAD CONTROLS SUPERVISOR

RADIOACTIVE MATERIAL SHIPMENT CHECKLIST

Shipment Number _____

A. The following forms have been completed if applicable:

ITEM	INITIALS
1. Form No. 9-1-15-HP-1 (Radioactive Shipment Quality Assurance Record)	
2. Form No. 9-1-15-HP-2 (Drivers Instruction Record) Original to carrier, retain copy	
3. Form No. 9-1-15-HP-3 (Mass. Dept. of Public Health Notification Form)	
4. Form No. 9-1-15-HP-4 (Maine State Agency Notification Form)	
5. Form No. 9-1-15-HP-5 (Radioactive Material Shipment Checklist)	
6. Form No. 9-1-15-HP-6 (Radioactive Material Release Form)	
7. Form No. 9-1-15-HP-7 (Radioactive Shipment Route) Exclusive use vehicle only Original to carrier, retain copy	
8. Form No. 9-1-15-HP-8 (Chief of the Maine State Police - Radioactive Waste Shipment Prenotification)	
9. Form No. 9-1-15-HP-9 (Limited Quantity Certification) Must accompany a limited quantity shipment.	
10. MY-HP-23-72 (Maine Yankee Radioactive Shipment Record) Completed if consignee does not have one Original to carrier, retain copy	
11. DHEC 802 (South Carolina's Prior Notification and Manifest Form) Original to carrier, retain copy	
12. DHEC 803 (South Carolina's Certification Form) Original to carrier, retain copy	
13. DSHS RHF-318 (Washington State Certification Form) Original to carrier, retain copy	
14. US Ecology (Rad. Waste Shipment & Disposal Form) Retain indicated copy, mail copy to US Ecology, other 2 to carrier.	
15. Chem Nuclear (Rad. Shipment Record Form) Retain indicated copy, mail copy to CNSI, other to carrier.	

RADIOACTIVE MATERIAL SHIPMENT CHECKLIST - CONT'D

16. Maine Yankee straight bill of lading Last copy retained, others to carrier	
17. Acknowledgement of shipment receipt must be received by: DATE DUE _____ DATE RECEIVED _____	