## NINE MILE POINT NUCLEAR STATION

# SITE ADMINISTRATIVE PROCEDURES

## PROCEDURE NO. AP-3.7

## PROCESS CONTROL PROGRAM

## DATE AND INITIALS

APPROVALS	SIGNATURES	REVISION 2	KEATZION 3	REVISION 4
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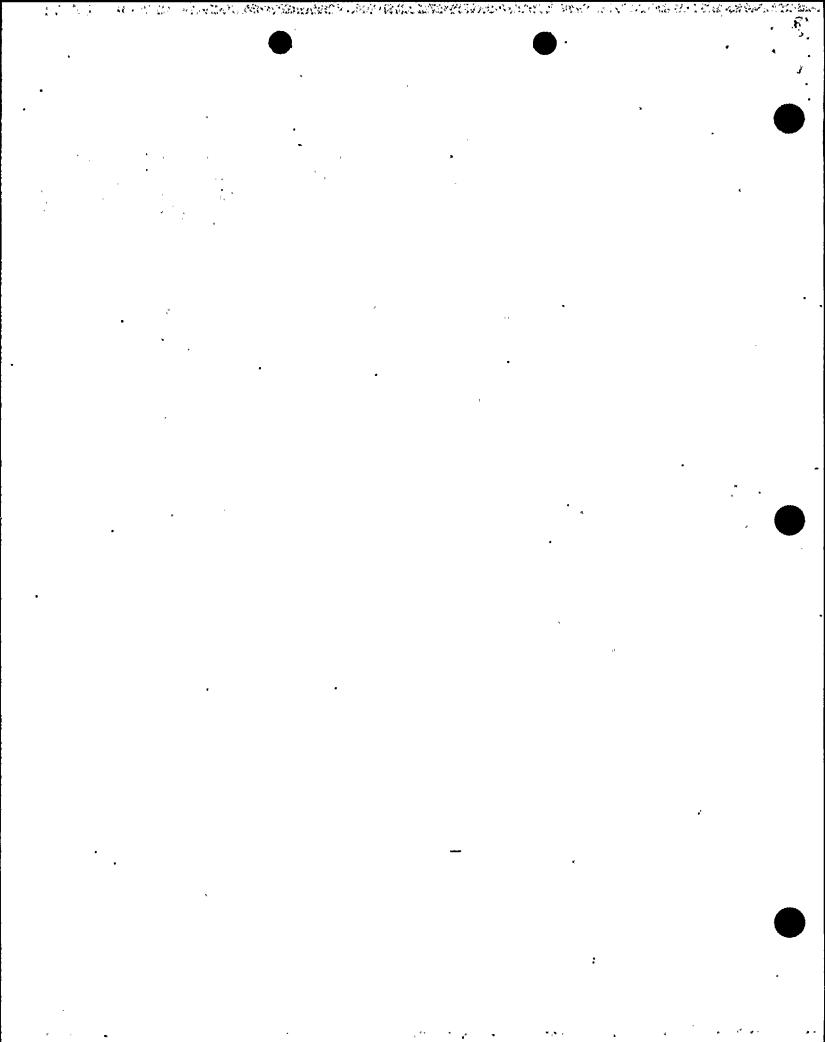
## Summary of Pages

 Pages
 Date

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 May 1987

# NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE USED AFTER MAY 1989 SUBJECT TO PERIODIC REVIEW.



# PROCEDURE NO. AP-3.7

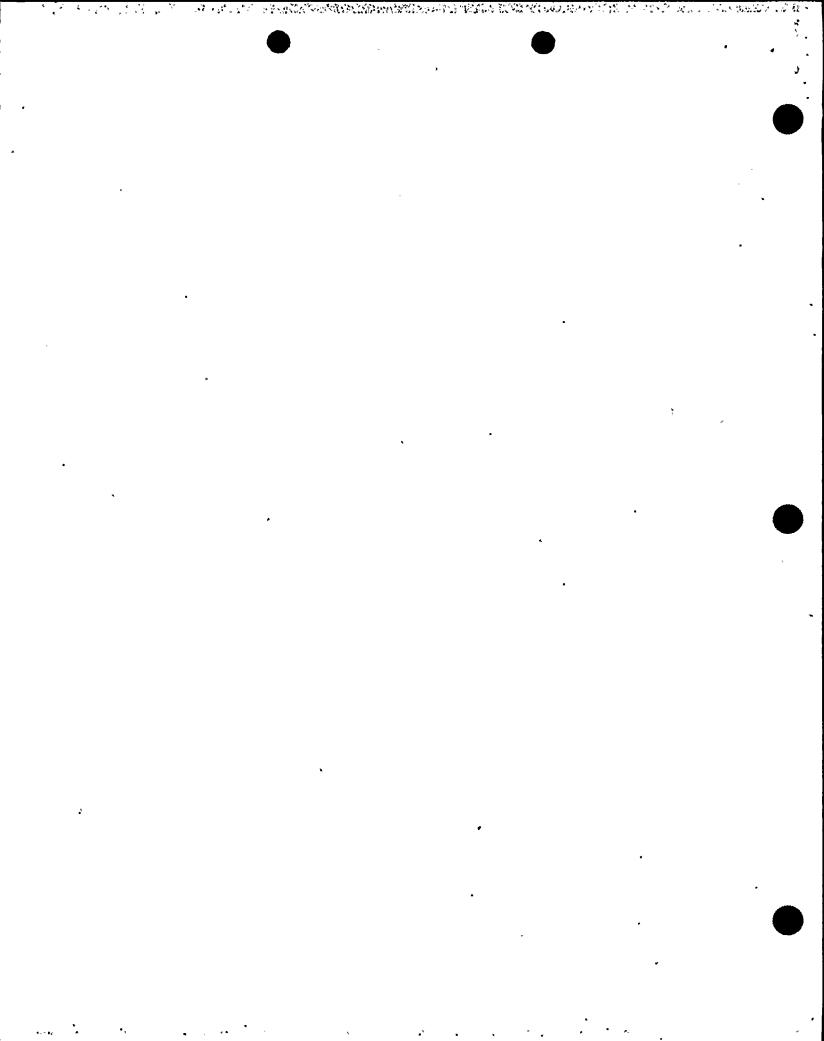
# PROCESS CONTROL PROGRAM

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#### AP-3.7

### PROCESS CONTROL PROGRAM

## 1.0 PURPOSE

The Process Control Program (PCP) formally establishes the procedures, process parameters, sampling methods, administrative and technical controls on radioactive waste systems which provide assurance that Niagara Mohawk is in compliance with 10CFR Parts 20, 61 and 71, 49CFR, Department of Transportation, state and burial site regulation requirements.

#### 2.0 SCOPE

During development of 10CFR Part 61, the NRC staff determined that compliance with the radioactive waste form requirements of Part 61 and the certification requirements of 10CFR20.311 could be achieved by the development and use of a process control program as an attendant part of the licensees' Radiological Effluent Technical Specifications (RETS). This approach was determined to be acceptable by the responsible state regulatory agencies that license the current disposal sites.

The Process Control Program at the Nine Mile Point Unit 1 Nuclear Station shall:

- 1) Establish process parameters within which radioactive waste processing systems must be operated to obtain complete solidification or dewatering;
- Assure proper waste form properties are achieved;
- Assure radioactive waste processing systems are operated within established process parameters;
- 4) Assure that the radwaste operators are trained and qualified in the operation of the radioactive waste processing equipment;
- 5) Assure that the Chemistry technicians are trained and qualified in the sampling and analysis of wet radioactive waste; and
- 6) Assure that the Radiation Protection technicians are trained and qualified in radiological controls monitoring of radioactive waste shipments.

#### 3.0 REFERENCES

- A. Nine Mile Point Unit 1 Operating License No. DPR-63 (Docket No. 50-220).
- B. "Radiological Effluent Technical Specifications", Amendment No. 66.
- C. NRC's Branch Technical Position on Waste Classification and Waste Form, May 1983.

#### 3.0 (Cont.)

- D. NUREG-0800, "Standard Review Plan for Solid Waste Management Systems" Section 11.4.
- E. 10CFR Parts 20, 61, 71 and 49CFR.
- F. NUREG-0473, "Draft Radiological Effluent Technical Specifications for BWR's", Sections 3.11.3, 6.13.
- G. NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants", Section 3.5.
- H. . Nine Mile Point Nuclear Station Waste Handling Procedures (WHPs).
- I. Nine Mile Point Nuclear Station Radiation Protection Procedures (RP-1 through RP-6).
- J. DOW System Topical Report, "The DOW System for Solidification of Low Level Radioactive Wastes from Nuclear Power Plants" (DNS-RSS-OO1-P-A).
- K. Stock Equipment Company's Topical Report as revised.
- L. Chem Nuclear Systems, Inc. Topical Report, CNSI-2 (4313-01354-01PA).
- M. Nine Mile Point Nuclear Station Quality Assurance Procedures (QAPs).
- N. Nine Mile Point Nuclear Station Process Survey Procedure N1-CSP-14V, "Collection and Analysis of Waste Samples".
- O. Nine Mile Point Nuclear Station Training Procedure NTP-14, "Training and Continued Training of Radiation Protection Technicians".
- P. Nine Mile Point Nuclear Station Training Procedure NTP-1, "Training and Continued Training of Chemistry and Radiochemistry Technicians".
- Q. Nine Mile Point Nuclear Station Training Procedure NTP-13, "Training and Continued Training of Radwaste Operators".

#### 4.0 TECHNICAL SPECIFICATION REQUIREMENTS

- 4.1 Technical Specifications, Section 6.5.2.11, "Technical Review and Control".
- 4.2 Technical Specifications, Section 3.6.16(c) and 4.6.16(c), "Radioactive Effluent Treatment Systems".
- 4.3 Technical Specifications, Section 6.9.1(e), "Semiannual Radioactive Effluent Release Report".

## 5.0 RADIOACTIVE WASTE PROCESSING

#### 5.1 Wet Radioactive Waste

Niagara Mohawk's Nine Mile Point Unit 1 Nuclear Station has the capability of solidifying wet radioactive waste (spent bead resins, filter sludges and evaporator bottoms) by the DOW polymer, Stock cement and Chem Nuclear cement solidification systems. Dewatered spent bead resins or filter sludge are disposed only in approved High Integrity Containers (HICs).

## 5.1.1 DOW Polymer Solidification System

This polymer solidification system combines the wet radioactive waste with a vinyl ester monomer (binder) plus a catalyst and promoter to produce a solidification product in 55 gallon drums. Nine Mile Point Nuclear Station (NMPNS) Procedure No. N1-WHP-9B, "Polymer Solidification", shall be implemented to identify the steps required to provide for safe, normal operation of the polymer solidification system. NMPNS Procedure No. N1-WHP-11D, "Polymer Process Control Procedure", defines the steps and conditions required for sample verification of the waste to be solidified and assures that the final product will meet all requirements for transport and burial.

## 5.1.2 Stock Equipment Company (SECO) Cement Solidification System

The Stock Cement Solidification System has not become operational as yet. Upon installation of additional equipment, NMPNS Procedures Nos. NI-WHP-9C and NI-WHP-11C ("Cement Solidification (SECO)" and "Process Control Cement (SECO)") shall be implemented.

#### 5.1.3 Chem Nuclear Systems, Inc. (CNSI) Waste Processing Systems

Niagara Mohawk also utilizes the CNSI portable solidification unit (PSU-C-26) to solidify wet radioactive waste. NMPNS Procedure No. N1-WHP-9, "Cement Solidification Procedure", identifies the steps required to provide support to the system. Incorporated in this procedure is CNSI's SD-OP-041 "Operating Procedure for CNSI Portable Cement Solidification Unit". NMPNS Procedure No. N1-WHP-11E, "Process Control CNSI Cement Solidification", ensures the safe and effective solidification of radioactive wastes with the CNSI portable solidification unit. Incorporated in this procedure is CNSI's SD-OP-003, "Process Control Program for CNSI cement solidification units".

For disposal of radioactive waste oil, NMPC has employed a CNSI mobile oil/cement solidification unit (MSU/drum - C-3). NMPNS Procedure No. N1-WHP-9A, "Cement/Oil Solidification Procedure", provides instructions for normal startup, operation and shutdown, as well as precautions for the safe operation of the unit. Incorporated in this procedure is CNSI's SD-OP-060, "Operating Procedure for CNSI Mobile Solidification Unit for 55 Gallon Drums". NMPNS Procedure No. N1-WHP-11B, "Process Control Procedure for Oil/Cement Solidification", ensures the safe and effective solidification of radioactive waste oil. Included in this procedure is CNSI's SD-OP-026, "Process Control Program for Cement/Oil Solidification".

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#### 5.1.3 (Cont.)

For the disposal of the dewatered spent bead resins and dewatered filter sludge, NMPC uses CNSI-supplied high integrity containers (HICs). NMPNS Procedure No. NI-WHP-4, "Cask Loading Procedure", identifies the actions required to load all radioactive waste into shipping casks. Included in this procedure are CNSI's FO-OP-022 and FO-OP-023, "Ecodex Precoat/Powdex/Diatomaceous Earth Dewatering Procedure for CNSI 14-195 or Smaller Liners" and "Bead Dewatering Procedure for CNSI 14-195 or Smaller Liners".

## 5.2 Dry Active Waste (DAW)

NMPNS Procedure No. N1-WHP-12, "Solid Dry Waste Collection and Compaction", describes the proper and safe steps required to collect and prepare low level DAW (LSA) for offsite shipment. Procedure No. N1-WHP-11A, "Process Control DAW", assures the process control of Dry Waste Collection and Compaction by identifying those items which most directly influence the quality of the end product. All dry active waste is examined before compaction, and any liquids or items found that would compromise the integrity of the package or violate the burial site license and/or criteria are removed and separated as specified in this procedure. Dry active waste is shipped in containers that meet the transport requirements of 49CFR173.425. At times, radiation limits preclude disposing of DAW in LSA boxes or drums, and this waste is disposed in liners per NMPNS Procedure No. N1-WHP-4.

#### 6.0 WASTE CLASSIFICATION DETERMINATION

Nine Mile Point Unit 1 Nuclear Station has correlated results from analyses completed by Teledyne, Inc. on wet radioactive waste samples. These correlations have been incorporated in N1-CSP-14V, "Collection and Analysis of Waste Samples" and RP-6, "The Packaging and Transportation of Radioactive Material" and are used to classify waste for shipment to disposal sites. All waste shipments are classified according to the system established in Section 61.55 of 10 CFR Part 61.

#### 7.0 TRAINING

The Chemistry technicians responsible for collection and analysis of wet radioactive waste are trained and qualified in the instructions of Procedure No. N1-CSP-14V, "Collection and Analysis of Waste Samples". All Chemistry technicians are trained and qualified by Procedure No. NTP 1, "Training and Continued Training of Chemistry and Radiochemistry Technicians". Radiation Protection technicians responsible for performing radiological controls monitoring on radwaste shipments are trained and qualified in accordance with RP-6, "The Packaging and Transportation of Radioactive Material" and in the applicable Waste Handling Procedures (WHPs). All Radiation Protection technicians are trained and qualified as described by Procedure No. NTP-14, "Training and Continued Training of Radiation Protection Technicians". The training and qualification program for Radwaste Operators is described in Procedure No. NTP-13, "Training and Continued Training of radwaste Operation".

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## 7.0 (cont'd.)

Only qualified personnel shall perform PCP analyses on wet radioactive waste samples. These operators or technicians shall be trained and qualified in the applicable Process Control Procedures for each solidification system mentioned in Section 5.

## 8.0 ALARA

ALARA considerations are addressed in all phases of the solidification and dewatering of wet radioactive waste and with all processes involving the handling, packaging and shipping of radioactive waste.

## 9.0 QUALITY ASSURANCE

The Quality Assurance Program assures the proper preparation, packaging and transportation of radioactive waste and that the proper records and documents are maintained. Only QA personnel trained and qualified in radioactive waste packaging, transportation and disposal criteria shall conduct these QA inspection/surveillance activities.

## ATTACHMENT 1

# PROCEDURES WHICH IMPLEMENT THE PCP

Waste Handling Procedures (WHPs)					
N1-WHP-1	"Required Documentation Concerning Packaging and Shipping of Radioactive Wastes"				
N1-WHP-2	"Paperwork for Radioactive Waste Shipments"				
N1-WHP-3	"Cask Handling Procedure"				
N1-WHP-4	"Cask Loading Procedure"				
N1-WHP-5	"Onsite Drum Handling Procedure"				
N1-WHP-6	"Van Handling Procedure"				
N1-WHP-7	"Van Loading Procedure"				
N1-WHP-9	"Cement Solidification Procedure"				
N1-WHP-9A	"Cement/Oil Solidification Procedure"				
N1-WHP-9B	"Polymer Solidification"				
*N1-WHP-9C	"Cement Solidification (SECO)"				
N1-WHP-11A	"Process Control DAW"				
N1-WHP-11B	"Process Control Procedure for Oil/Cement Solidification"				
*N1-WHP-11C	"Process Control Cement (SECO)"				
N1-WHP-11D	"Polymer Process Control Procedure"				
N1-WHP-11E	"Process Control CNSI Cement Solidification"				
N1-WHP-12	"Solid Dry Waste Collection and Compaction"				

# Radiation Protection Procedures (RPs)

S-RP-1	"Access and Radiological Control"
S-RP-2	"Radiation Work Permit Procedure"
S-RP-3	"Performance of Radiological Surveys"
S-RP-4	"Picking Up, Receiving and Opening Packages Containing Radioactive Materials"

### PROCEDURES WHICH IMPLEMENT THE PCP

## Radiation Protection Procedures (RPs) (Cont.)

S-RP-5	"Radiation	and	Radioactive	Contamination	Control"
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. RP-6 "The Packaging and Transportation of Radioactive Material"

N1-CSP-14V "Collection and Analysis of Waste Samples"

## Quality Assurance Procedures (QAPs)

QAP-10.03 "QAE	Surveillance	Activities"
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QAP-10.30 "QAD Inspection Activities

QAP-15.01 "Control of Nonconforming Items"

QAP-16.03 "Corrective Action Requests"

QAP-18.10 QAD Audits"

\*Procedures not presently written

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#### ATTACHMENT 2

South Carolina Department of Health and Environmental Control Bureau of Radiological Health

# CERTIFICATE OF COMPLIANCE

High Integrity Container

AMENDMENT A TO:

CERTIFICATE NO .: DHEC-HIC-PL-001

ISSUED TO:

Chem-Nuclear Systems, Inc.

Bellevue, Washington

To Amend: \_ Section\_2.\_-\_General\_Design to read: \_ -

2. General Design:

The design, material, manufacture and use of the containers shall confain to the documents and drawings which have received approval of the Department including the latest revision of:

CNSI Specification:

#900-1234-A02 Rev. B

CNSI Drawings:

#900-0502-D02 Rev. A (Resin liners)

#900-0503-D03 Rev. B (Solidification liners) #900-0504-D01 Rev. B (Closure detail)

#900-0519-D01

Rev. B (External Foam)

For the South Carolina Department of

To Amend: Section 4. - Quality Assurance to read:

4. Quality Assurance:

The containers shall be manufactured, stored, and used in accordance with Chem-Nuclear's Quality Assurance Program for Polyethylene High Integrity Containers dated May 13, 1981, and approved revisions thereto.

To Amend: Section 6.B. and 6.D. to read:

- B. Radiation: The specific activity of dewatered resins shall not exceed 350  $\mu$  Ci/cc of isotopes having greater than five year half-lives. Other waste forms shall not exceed 1.0x108 rads ( $\beta$ ,  $\delta$ ) maximum integrated dose to the container.
- D. Thermal: The container and contents must be kept below 170°F for handling, lifting, and disposal. At no time can the container be subjected to temperature in excess of 200°F due to a process or its contents.

Any modifications or changes of the container design, materials or usage are subject to prior approval by the Department.

	Health and Environmental Control
Issue Date: August 19, 1981	By: Heyward G. Shealy, Chief Bureau of Radiological Health
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South Carolina Départment of Health and Environmental Control Bureau of Radiological Health

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CERTIFICATE OF COMPLIANCE

High Integrity Container

N.M.P.C. **Cocument Control** 

Certificate No.: DHEC-HIC-PL-001 (This number shall be imprinted on all containers for which this Certificate is applicable)

ISSUED TO:

Chem-Nuclear Systems, Inc. Bellevue, Washington

1. Application:

This certificate is applicable to containers specified below for use at Chem-Nuclear Systems, Inc. burial facility, Barnwell, South Carolina for containment and disposal of solidified and dewatered low-level radioactive waste as specified in S.C. Radioactive Material License No. 097.

2. General Design:

The design, materials, manufacture and use of the containers shall conform to the specification and analysis which have received approval of the Department including the latest revision of:

CNS1 Specification #900-1234-A02

CHSI Drawing #900-0502-D02 and #900-503-D03

CHSI Structural Analysis #900-1234-A03

3. Applicable Approved Containers:

This certificate shall apply to the following identified containers:

- Smooth Top Solidification Liners
  - PL 6-80 (1) (2)
  - PL7-100
  - PL8-120
  - PL14-195
  - PL21-300

- B. Dewatered Resin Process Liners
  - (1) PL4-85R
  - (2) PL6-80R
  - (3) PL7-100R
  - 4) PL8-120R
  - (5) PL14-195R
  - (6) PL21-3COR
- 4. Quality Assurance:

The containers shall be manufactured, stored, and used in accordance with Chem-Nuclear's Quality. Assurance Program for High Integrity Containers dated May 13, 1921.

5. User Requirements:.

Use of this container shall be in accordance with Chem-Nuclear's Operating Procedure # FO-AD-002

6. Specific Limitations:

The following specific limitations for the containers described and identified in this certificate shall apply and be strictly adhered to:

- A. Free Standing Liquid: Any free standing liquid must be non-corrosive and less than one-percent (12) by waste volume.
- B. Radiation: The specific activity of dewatered resins shall not exceed 350uCi/cc. Other waste forms shall not exceed 1.0x10<sup>8</sup> rads (β.Χ) maximum integrated dose to the container.
- C. Chemicals: Organic solvents, petrochemicals, concentrated acid and other chemicals specified in CNSI Utility Operating Procedures # FO-AD-002 are not allowed to be introduced into the container nor the container subjected to these materials.
- D. Thermal: The container and contents must be kept below 150°F for handling, lifting and disposal. At no time can the container be subjected to temperature in excess of 170°F due to a process or its contents.
- E. Ultraviolet: The containers shall not be stored in such a way as to cause exposure to sunlight or other ultraviolet radiation to exceed one year.

Any modifications or changes of the container design, materials or usage are subject to prior approval by the Department.

For The South Carolina Department.01, Health and Environmental Control

16500 Date: may 29 1991.

Hygward G. Snealy, Chief Sureau of Radiological Health

South Carolina Department of Health and Environmental Control Bureau of Radiological Health

## CERTIFICATE OF COMPLIANCE

High Integrity Container

AMENDMENT B AMENDS: .

CERTIFICATE NO.: DHEC-HIC-PL-001

In its Entirety

ISSUED TO:

Chem-Nuclear Systems, Inc. Columbia, South Carolina

Application:

This certificate is applicable to containers specified below for use at Chem-Nuclear Systems, Inc. burial facility, Barnwell, South Carolina for containment and disposal of solidified and dewatered low-level radioactive waste as specified in S.C. Radioactive Material License No. 097.

2. General Design:

The design, materials, manufacture and use of the containers shall conform to the specification and analysis which have received approval of the Department including the latest revision of:

CNSI Specification:

#900-1234-A02 Rev. B

CNS1 Drawings:

#900-0502-D02 Rev. B (Resin liners)

#900-0503-D03 Rev. C (Solidification liners)

#900-0504-D01 Rev. C (Closures)

#900-0519-D01 Rev. B (External Foam)

# B-900-E-0004

(Resin liners)

# B-900-E-0005

(Solidification liners)

3. Applicable Approved Containers:

This certificate shall apply to the following identified containers:

- A. Smooth Top Solidification Liners
  - (I) P56-80
  - (2) PL7-100
  - (J) PL8-120
  - (4) PL14-170
  - (5) PL14-195
  - (6) PL21-300

- B. Dewatered Resin Process Liners
  - (1) PL4-85R
  - (2) PL6-8UR..
  - (3) PL7-100R
  - (4) PLB-120R
  - (5) PL14-170R
  - (6) PL14-195R
  - (7) PL21-300R
- 4. Quality Assurance:

The containers shall be manufactured, stored and used in accordance with the quality assurance documents and procedures which have received approval of the Department including the latest revision of:

CNSI Quality Assurance Program for Polyethylene High Integrity Containers, May 13, 1981

#HIC-1, Manufacturing Procedures for High Integrity Containers

#11725-41, Rev. B. Quality Assurance Plan for Crossed-Linked High Density Polyethylene Containers

#QAP-CNSI-U1, Rev. A, Quality Assurance Program to be Utilized in the Manufacture of Cross-Linked Polyethylene HIC for CNSI

5. User Requirements:

Use of this container shall be in accordance with the latest approved revision of Chem-Nuclear's Operating Procedure #FO-AD-002.

6. Specific Limitations:

The following specific limitations for the containers described and identified in this certificate shall apply and be strictly adhered to:

- A. Free Standing Liquid: Any free standing liquid must be non-corrosive and less than one-percent (1%) by waste volume.
- B. Radiation: The specific activity of dewatered resins shall not exceed 350 KCi/cc of isotopes having greater than five year half-lives. Other waste forms shall not exceed 1.0x103 rads (6, 8) maximum integrated dose to the container.



- C. Chemicals: Organic solvents, petrochemicals, concentrated acid and other chemicals specified in CNSI procedure #FO-AD-002 are not allowed to be introduced into the container nor the container subjected to these materials.
- D. Thermal: The container and contents must be kept below 170°F for handling, lifting, and disposal. At no time can the container be subjected to temperature in excess of 200°F due to a process or its contents.
- E. Ultraviolet: The containers shall not be stored in such a way as to cause exposure to sunlight or other ultraviolet radiation to exceed one year.

Any modifications or changes of the container design, materials or usage are subject to prior approval by the Department.

For The South Carolina Department of Health and Environmental Control

Issue Date Opul 8/193

Heyward G. Shealy, Chief Burenu of Radiological Health

South Carolina Department of Health and Environmental Control Bureau of Radiological Health

## CERTIFICATE OF COMPLIANCE

High Integrity Container

AMENDMENT C to:

DHEC-HIC-PL-001

ISSUED TO:

Chem-Nuclear Systems, Inc. Barnwell, South Carolina

TO ADD: Section 6.F. to read:

6. Specific Limitations:

The following specific limitations for the containers described and identified in this Certificate shall apply and be strictly adhered to:

F. Weight: The payload weight for cement solidified waste only may not exceed:

Liner Size	Weight (lbs.)
PL 14-195	18,500
PL 14-170	16,850
PL 8-120	12,000
PL 1,6680	8,000

Any modifications or changes of the container design, materials or usage are subject to prior approval by the Department.

For the South Carolina Department of Health and Environmental Control

Issue Date February 19, 19

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derward G. Shealy, Phief pureau of Radiological Health (2):44.

South Carolina Department of Health and Environmental Control Bureau of Radiological Health

#### CERTIFICATE OF COMPLIANCE

High Integrity Container

AMENDMENT D to: CERTIFICATE NO. DHEC-HIC-PL-001

ISSUED TO: Chem-Nuclear Systems, Inc.
Barnwell, South Carolina

TO AMEND: Section 2. General Design to read:

General Design:

The design, materials, manufacture and use of the containers shall conform to the specification and analysis which have received approval of the Department including the latest revision of:

CNSI Specifications: #900-1234-A02 Rev. B

CNSI Drawings: #900-0502-D02 Rev. B (Resin liners)

#900-0503-D03 Rev. C (Solidification liners)

#900-0504-D01 Rev. C (Closures)

#900-0519-D01 Rev. B (External Foam)

#B-900-E-0004 (Resin liners)

#B-900-E-0005 (Solidification liners)

#B-122-E-0023, Rev. A, Poly HIC Vent

Installation

#B-122-C-0024, Rev. C, Poly HIC Filter Vent

Topical Report: Polyethylene HIC Passive Vent Design

TO ADD: Section 6.G. Specific Limitations to read:

6. Specific Limitations:

The following specific limitations for the containers described and identified in this Certificate shall apply and be strictly adhered to:

G. Vent: A passive vent as per Drawing #B-122-E-0023, Rev. A, and #B-122-C-0024, Rev. C is mandatory.

-2-

Any modifications or changes of the container design, materials or usage are subject to prior approval by the Department.

For the South Carolina Department of Health and Environmental Control

Issue Date Felin 24 1986

Bv:

Heydard G. Shealy, Chief

Bureau of Radiological Health