



ENCLOSURE

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

APR 23 1990

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NOTE TO: Bart Buckley
NRR/PD 2-2

FROM: Everett Wick
LLWM/LLTB

SUBJECT: VEPCO'S PLANNED USE OF JGC'S DRUM MIXER PROCESS FOR
BITUMEN-SOLIDIFICATION OF LLW AT SURRY AND NORTH ANNA

Per your request, a summary of our April 11, 1990 discussions
with VEPCO representatives is enclosed.

We recommend that you refer VEPCO to an NRC information notice
[IN 89-27, LIMITATIONS ON THE USE OF WASTE FORMS AND HIGH
INTEGRITY CONTAINERS FOR THE DISPOSAL OF LOW-LEVEL RADIOACTIVE
WASTE, March 8, 1989] which is germane to our discussions with
them. A copy of this IN is also enclosed.

Everett Wick
Everett Wick

cc: M. Tokar (w/encl.)

9005290077 900423
PDR ADOCK 05000280
PDC

Memorandum

*DF03
50-280
50-281*

MEETING SUMMARY

DATE: April 11, 1990

TIME: 10:00 - 11:00 a.m.

PLACE: OWFN Room 14-B-13

PURPOSE: TO DISCUSS VEPCO'S PLANNED BITUMEN-SOLIDIFICATION OF
LLW AT THE SURRY AND NORTH ANNA SITES

CHAIRMAN: Bart Buckley

ATTENDEES:

NRC

Bart Buckley	NRR/PD 2-2
Charles Nichols	NRR/SPLB
Michael Tokar	NMSS/LLWM/LLTB
Everett Wick	NMSS/LLWM/LLTB

VEPCO

R. F. Saunders, Manager of Licensing
D. A. Sommers, Supervisor-Licensing
E. S. Grecheck, Assistant Station Manager-Surry
W. D. Corbin, Supervisor-Project Engineer
G. L. Nash, Jr., Project Engineer
T. Shaub

SUMMARY

1. NRC's July 1983 approval of JGC's Topical Report (TR) for the Drum Mixer Process for Bitumen-Solidification of LLW was based on the acceptability of the process control plan. The NRR review did not include consideration of the 10 CFR 61 requirements for structural stability of the waste form. NMSS has not received or reviewed a TR for the waste form resulting from this process.
2. We (NMSS) advised the VEPCO representatives that it is incumbent upon the licensee under 10 CFR 20.311 (Transfer for disposal and manifests) to certify that the characteristics of the waste form meet the requirements of 10 CFR Part 61. We explained that the regulation does not require that the vendor submit a TR. The Licensee can state the waste form meets the requirements of 10 CFR Part 61. The NRC Inspector, however, may verify the basis for the Licensee's statement. If the statement is not supported by acceptable test results, the waste cannot be shipped.
3. VEPCO asked about the review cycle for TRs. We explained that because of a backlog of approximately 12 TRs, the review cycle could be one to two years. We also explained that performance by the vendor of the required tests of the waste form to demonstrate structural stability could require an additional 6-12 months.
4. VEPCO invited cognizant NRC staff to visit the facility but no dates were firmed up.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY
AND SAFEGUARDS
WASHINGTON, D.C. 20555

March 8, 1989

NRC INFORMATION NOTICE NO. 89-27: LIMITATIONS ON THE USE OF WASTE FORMS AND
HIGH INTEGRITY CONTAINERS FOR THE DISPOSAL
OF LOW-LEVEL RADIOACTIVE WASTE

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors, fuel cycle licenses and certain by-product materials licenses.

Purpose:

This information notice is being provided to inform addressees of recent actions taken by the NRC concerning the stability of waste forms (WFs) that contain Class B and/or Class C low-level waste. The actions pertain to completion by the NRC Office of Nuclear Material Safety and Safeguards (NMSS) of reviews of vendor topical reports (TRs) on waste forms containing stabilized low level wastes or on high integrity containers (HICs) for burial at low-level waste disposal sites.

It is expected that addressees will review the actions listed in the attached status summary for applicability to their activities and consider actions, as appropriate, to avoid problems in disposing of certain waste streams. Addressees are also expected to distribute the notice to responsible radiological staff and waste handling personnel. However, suggestions contained in this information notice do not constitute any new NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

This information notice applies to TRs that characterize solidified waste forms or high integrity containers that contain Class B and Class C low-level waste from reactor waste streams, from fuel cycle facilities or from certain by-product materials waste streams. The solidification media for the waste forms typically have consisted of cement, cement/gypsum, polymer or bitumen. The HIC materials are typically iron-chromium-nickel alloys (i.e.; ferralium or austenitic stainless steels), polyethylene-impregnated concrete, polyethylene, fiberglass/polyethylene or coated carbon steel (please refer to the status summary in Attachment 1).

NRC reviews of vendor topical reports on solidified low-level waste forms and on high integrity containers are issued as Technical Evaluation Reports (TERs). A copy of each TER and the letter of transmittal to the vendor applicant is sent to the Agreement States in which the current LLW disposal sites are located.

Approvals of stabilization media and HICs are limited to certain waste concentrations or to certain waste streams which are stated in the TER and the letter of transmittal. Thus, not all waste concentrations or waste streams in the original TRs have been approved. These restrictions or limitations could affect the ability of licensees to dispose of certain wastes. An example of an approved stabilization medium (i.e., waste form) is presented in Attachment 2.

The TER and the TR it covers are not legal requirements. However, a user risks rejection of waste shipments by burial site operators if waste forms or HICs are generated outside the limitations of topical reports approved by the NRC.

Waste generating licensees who desire to transfer low-level radioactive waste to a land disposal facility or to a licensed collector and any licensed waste processor who treats or repackages wastes are reminded that they must comply with the requirements of paragraphs (d) and (f), respectively, of 10 CFR 20.311. NRC regulation 10 CFR 20.311 requires the waste generator and/or processor, as pertinent, to certify, through the preparation of shipping manifests, that the transported materials are properly classified, described, packaged, and labeled and are in proper condition for transportation. For the purposes of this information notice, particular attention should be paid to paragraphs (d)(1) and (f)(3), respectively, of 10 CFR 20.311, where it is indicated that a licensee shall prepare all wastes so that the waste is classified according to 10 CFR 61.55 and meets waste characteristics requirements in 10 CFR 61.56. One way for a waste generator or processor to ensure compliance with the Class B and Class C waste stability requirements of 10 CFR 61.56(b) is to process the waste in accordance with the provisions and limitations of the NRC-approved topical reports on waste form stability.

Discussion:

Background -

The Agreement States* have the licensing authority for the disposal sites with respect to whether specific HICs or WFs would be acceptable for disposal at their sites. An agreement, however, was reached in 1983 between NRC and the States that NRC would provide a "central" review of TRs that would be applicable for all the disposal sites. Before the 1983 agreement, the State of South Carolina had issued ten Certificates of Compliance (Cs of C) and had under review two additional requests for approval of HICs. The State of Washington had two requests for approval. It was decided that South Carolina (Nevada and Washington had not yet issued any HIC approvals) would continue to accept the use of HICs that had already been issued a C of C.

For such HICs, revocation of a C of C would take place only if a problem were identified or if new information indicated that the HICs would not meet the

*"Agreement State" means any state with which the NRC has entered into an effective agreement under subsection 274b of the Atomic Energy Act of 1954.

acceptance criteria. For new HICs that were described in TRs submitted to the NRC, the States would not issue Cs of C until the review had been completed by the NRC; it should be noted, however, that periodic temporary approvals or "variances" for limited quantities of certain types of HICs have been granted by the State of Washington. For solidification processes, those processors who submitted information to NRC in TRs submitted before June 30, 1984 would be acceptable under a grandfathering arrangement pending completion of the NRC review. A list of HICs and solidification media that are currently accepted at Barnwell, Hanford, and Beatty can be found in Attachments 3, 4, and 5, respectively. Solidification media and high integrity containers shown in Attachment 1 as "discontinued", "not approved" or "withdrawn" are not acceptable for disposal unless special provisions have been arranged with the disposal site(s).

A case where the NRC staff has concluded that a stabilization product is not capable of meeting 10 CFR Part 61 requirements for waste form stability, unless special provisions are provided at the disposal site, involves the use of high density polyethylene (HDPE) high integrity containers. As indicated in Attachment 1, such containers, as described in topical reports submitted by three vendors (Docket Nos. WM-18, WM-76, & WM-80), were not approved by the NRC. In the list (Attachment 4) of stabilization media and containers approved by the State of South Carolina, however, it is shown that (beginning in 1981) several HDPE containers have been issued Certificates of Compliance. Those containers continue to be accepted for disposal at the Barnwell site "on an interim basis" while South Carolina implements special provisions for disposal beginning April 1, 1989. NRC-licensed waste generators who wish to use polyethylene containers for the disposal of Class B and Class C wastes and who must comply with the provisions of 10 CFR 20.311(d) should either (1) place and ship the polyethylene container in an approved high integrity container (see Attachment 1 for a list of NRC-approved HICs) or (2) obtain assurance and documentation from the disposal site operator that structural stability consistent with Part 61 requirements will be provided at the site. For example, stability requirements may be met by placing the waste in an approved concrete container or structure that provides stability after disposal. The State of South Carolina has authorized the Barnwell Disposal Site Operator to receive class B & C waste in HDPE/HICS for disposal in concrete overpacks. Waste generators desiring to pursue any of these options should contact the facility operator for procedural details.

Accepted Stabilization Procedures -

Licensees can ensure that Class B and/or Class C low-level wastes will be accepted for burial at a disposal site by doing one of the following:

- a. solidifying the waste into a form that is shown in the table in Attachment 1 as "approved" or "under review" by the NRC and which is accepted for disposal on an interim or final basis by the sited State;

- b. placing the waste in a high integrity container (HIC) that is shown in the table in Attachment 1 as "approved" by the NRC and for which a Certificate of Compliance or other State Approval document, as appropriate, has been issued;
- c. solidifying the waste into a form (i.e., using a Stabilization Medium) that has been approved by the States of Nevada, South Carolina, or Washington for burial at the Beatty, Barnwell, or Hanford sites, as appropriate (see Attachments 3, 4 and 5);
- d. placing the waste in a HIC that has been approved by the State of Nevada or for which a Certificate of Compliance has been issued by the States of South Carolina or Washington for burial at the Beatty, Barnwell, and Hanford sites, as appropriate (see Attachments 3, 4 and 5).

The following paragraphs discuss specific issues related to the stability of waste forms and process control procedures.

Process Control Programs -

Many reactor licensees are required to process wastes only in accordance with the plant-specific process control program (PCP). Generic (not plant-specific) process control procedures or programs are addressed in TRs that are also reviewed by NRC's Office of Nuclear Reactor Regulation (NRR), except as noted in Attachment 6. A summary of topical reports for radwaste volume reduction systems that NRR has approved or has under review is presented in Attachment 6.

Variances in Processing Parameters -

Some mixtures of wastes and solidification agents may react adversely with one another. These reactions may not be noticeable during the specimen tests performed before the actual solidification occurs; therefore, it is important to be alert to variances in solidification parameters specified by PCPs, such as increasing temperature of the mixture and reduced amount of solidification agent required to fill the liner or other container. An example of a situation where a licensee either operated outside the bounds of the technical evaluation report (TER) or mixed waste streams of questionable or unknown compatibility is described in Information Notice No. 88-08, "Chemical Reactions with Radioactive Waste Solidification Agents", March 14, 1988.

Cement-Solidified Waste Problems -

The problem identified in Information Notice No. 88-08 is symptomatic of a number of mishaps that have been observed in the field and in laboratory testing of

cement-solidified low-level waste. Such mishaps include but are not limited to waste forms that failed to solidify completely and that swelled and/or disintegrated over relatively short times after solidification. Waste streams that have caused the most concern involve bead resin, decontamination solutions, borates, sulfates, and oils. As illustrated in the example discussed in Information Notice No. 88-08, small amounts of secondary ingredients that were not anticipated to be a problem, and which may not have been known to be present in the waste at the time of processing, were later identified to be the cause of the difficulties encountered. This is a major reason why waste generators and processors should endeavor to store, handle, and process Class B and C low-level radioactive wastes within the boundary conditions, established in the qualification test programs, that are addressed in the vendor topical reports.

It will be noted (see Attachment 1) that NMSS has not yet approved any topical reports dealing with 10 CFR Part 61 stability qualification testing of cement-solidified Class B or Class C wastes. This is a result of the complexity of the issues involving cement-solidified wastes. The NMSS staff plans to host in 1989 a Workshop on Cement-Stabilization of Low-Level Waste. Cement stabilization medium vendors, waste generators, laboratory researchers and industry consultants are expected to participate in the workshop, which is intended to provide an improved understanding of the technical concerns and which would lead to both short-term and long-term regulatory resolution. Interested persons and potential participants may contact Dr. Michael Tokar at (301) 492-0590 for further information. Suggestions regarding the workshop agenda and format are welcome.

Status of Reviews -

As may be seen from Attachment 1, the status of topical report reviews is subject to change as reviews are completed and as new TRs or revisions to existing TRs are submitted for review. Thus, the lists of solidification media or HICs that have been reviewed and approved by NRC and those that are acceptable at Agreement State sites may change. Waste generators should remain aware of the status of TRs reviewed by NRC so as to be informed of any limitations or change in limitations on use of solidified media and HICs. To assist the waste generators and others in this regard, updates of the status of NRC TR reviews will be issued at least annually. Licensees may obtain copies of non-proprietary versions of the TERs and non-proprietary versions of the applicable TRs from NRC Headquarters or from the appropriate NRC regional office.

No specific action or written response is required by this information notice. A summary of topical report reviews is presented in Attachment 1. If you have any questions regarding this information notice, please contact the technical contacts listed below or the Regional Administrator of the appropriate regional office. A list of recent information notices is shown in Attachment 7 for background information.

John T. Greeves

John T. Greeves, Acting Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Technical Contacts: Michael Tokar, NMSS
(301) 492-0590

Charles Nichols, NRR
(301) 492-0854

Attachments:

1. Topical Report Review Status Summary, Solidified Waste Form and High Integrity Containers (HICs)
2. Example of Approved Stabilization Medium and Limitations on Approved Waste Streams
3. List of HICs and Stabilization Media Currently Accepted at Beatty
4. List of HICs and Stabilization Media Currently Accepted at Barnwell
5. List of HICs and Stabilization Media Currently Accepted at Hanford
6. Topical Report Review Status Summary for Radwaste Volume Reduction Systems
7. List of Recently Issued NRC Information Notices

TOPICAL REPORT REVIEW STATUS SUMMARY
SOLIDIFIED WASTE FORM AND HIGH INTEGRITY CONTAINERS (HICs)
JANUARY 5, 1989

Office of Nuclear Material Safety and Safeguards

<u>Vendor</u>	<u>Docket No.</u>	<u>Type</u>	<u>Disposition</u>
Waste Chem	WM-90**	Solidification (bitumen)	Approved.
General Electric	WM-88	Solidification (polymer)	Approved.
DOW	WM-82**	Solidification (polymer)	Approved.
Chichibu	WM-81	HIC (poly impreg/concrete)	Approved.
Nuclear Packaging	WM-45	HIC (ferrallium/FL-50)	Approved.
Nuclear Packaging	WM-85**	HIC (ferrallium/family)	Approved.
LN Technologies	WM-93**	HIC (stainless/poly)	Approved.
Chem-Nuclear	WM-18**	HIC (polyethylene)	Not Approved.
Hittman	WM-80**	HIC (polyethylene)	Not Approved.
TFC Nuclear	WM-76**	HIC (polyethylene)	Not Approved.
U.S. Gypsum	WM-51**	Solidification (gypsum)*	Not Approved.
ATI (U.S.Ecology)	WM-91**	Solidification (bitumen)	Discontinued.
VIKEM	WM-13	Solidification/oil (cement)	Discontinued.
Stock	WM-92**	Solidification (cement)	Discontinued.
Nuclear Packaging	WM-71	Solid/Encap (cement/gypsum)	Withdrawn.
Chem-Nuclear	WM-19**	Solidification (cement)	Withdrawn.
Chem-Nuclear	WM-96**	Solidification (cement)	Withdrawn.
Hittman	WM-79**	Solidification (SG-95)	Withdrawn.
Nuclear Packaging	WM-87**	HIC (316-stainless/SDS)	Withdrawn.
LN Technologies	WM-57	HIC (polyethylene)	Withdrawn.
Chem-Nuclear	WM-47	HIC (fiberglass/poly)	Withdrawn.
Chem-Nuclear	WM-101	Solidification (cement #1)	Under review.
Chem-Nuclear	WM-97	Solidification (cement #2)	Under review.
Chem-Nuclear	WM-98	Solidification (cement #3)	Under review.
LN Technologies	WM-20	Solidification (cement)	Under review.
LN Technologies	WM-99	Solidification (cement/decon)	Under review.
Hittman	WM-46	Solidification (cement)	Under review.
ATI (U.S. Ecology)	WM-100-	Solidification (bitumen)	Under review.
Bondico	WM-94	HIC (fiberglass/poly)	Under review.
Babcock & Wilcox	WM-95	HIC (coated carbon steel)	Under review.

- * Had been approved for single waste stream for one year ending March 3, 1989.
** Actions completed in Calendar Year 1988.

EXAMPLE OF APPROVED STABILIZATION MEDIUM AND LIMITATIONS ON
APPROVED WASTE STREAMS

<u>VENDOR</u>	<u>TYPE</u>
Waste Chem Corporation	Solidification Media (ASTM-D-312 Type III oxidized bitumen)
<u>DOCKET</u>	
WM-90	

Approved For:

WASTE STREAM(s)

Bead Resin
Precoat Filter Cake with Powdered Resin
Precoat Filter Cake with Diatomaceous Earth
Evaporator Concentrates - Neutralization Waste
Evaporator Concentrates - Floor Drain
Evaporator Concentrates
Decontamination Waste
Mixed Resin and Filter Cake Waste

LIMITATION (s)

Waste Forms must
be prepared in
Accordance with
Process Control
Program (PCP)

Waste Form in
55-Gallon Drum or
approved HIC

CONCENTRATION

Maximum waste loadings are as stated in Section A-3.3 of the WasteChem Topical Report, VRS-002, dated August 1987 or in Table I of Appendix A of the NRC TER dated January 22, 1988.

LIST OF HICs AND STABILIZATION MEDIA
CURRENTLY ACCEPTED AT BEATTY

HICs
Manufacturer

Package Identification
Number

Pacific Nuclear
Nuclear Packaging
Chichibu Cement
Chichibu Cement

DSHS-HIC-TMI-01
DSHS-HIC-EA-50
DSHS-HIC-SFPIC200L
DSHS-HIC-SFPIC400L

Stabilization Media

1. Aztech (General Electric)
2. Bitumen* (Waste Chem and ATI)
3. Chem-Nuclear Cement
4. Concrete**
5. Dow Media (Vinyl Ester Styrene)
6. Envirostone (U.S. Gypsum Cement)
7. Westinghouse-LN Technologies Cement
8. Stock Equipment Cement
9. Hittman Grout
10. Other solidification media and processes which have been approved by U. S. Nuclear Regulatory Commission and/or the State as meeting waste form stability criteria.

* Note: Oxidized Bitumen Only

** Note: Concrete when used as an encapsulation medium around a small volume of radioactive material, e.g., a sealed source centered in a fifty-five gallon drum containing concrete, shall have a formulated compressive strength equal to or greater than 2500 psi.

LIST OF HICs AND STABILIZATION MEDIA
CURRENTLY ACCEPTED AT BARNWELL

HIC Certificates of Compliance

<u>Issued to</u>	<u>Issued what</u>	<u>Issued when</u>
Adwin Equipment Company	55-gallon HIC	05/29/84
Chem-Nuclear	HDPE HICs (x 14)	05/28/81
Chem-Nuclear	FRP HIC	02/23/82
Chem-Nuclear	Overpack HICs (x3)	04/08/83
Philadelphia Electric Comp.	PECO-HIC-1	09/28/81
Hittman	Radlok-55 HIC	06/17/82
Hittman	Radlok-100 HIC	06/17/82
Hittman	Radlok-200 HIC	05/05/83
Hittman	Radlok-500 HIC	09/31/85
LN Technologies	Barrier-55 HIC	09/01/83
TFC	NUHIC-120 HIC	11/01/83
NUPAC	HDPE 142 HIC	08/20/84
NUPAC	FL-50 HIC	09/26/85
Chichibu	Concrete HICs (x2)	08/12/86
Vermont Yankee	HDPE HIC	10/10/83

Approved Stabilization Media*

Vinyl Ester Styrene
Cement
** Bitumen

- * Processes shall meet and have been evaluated in accordance with the NRC "Technical Position on Waste Form" or other evaluation criteria specifically approved by the NRC. Other stabilization media shall be acceptable for which a topical Report has been prepared and approval received from the NRC and the State.
- ** Administrative controls at the Barnwell Site are necessary for the disposal of this waste form.

LIST OF HICs AND STABILIZATION MEDIA
CURRENTLY ACCEPTED AT HANFORD

HIC Certificates Of Compliance (C of C)

<u>C of C Number</u>	<u>Manufacturer</u>	<u>Package Identification Number</u>
WN-HIC-01	Pacific Nuclear	DSHS-HIC-TMI-01
WN-HIC-02	Nuclear Packaging	DSHS-HIC-EA-50
WN-HIC-03	Chichibu Cement	DSHS-HIC-SFPIC 200L
WN-HIC-04	Chichibu Cement	DSHS-HIC-SFPIC 400L
WN-HIC-05	Nuclear Packaging	DSHS-HIC-EA 142A
WN-HIC-06	Nuclear Packaging	DSHS-HIC-EA 50A
WN-HIC-07	Nuclear Packaging	DSHS-HIC-EA 140A
WN-HIC-08	Nuclear Packaging	DSHS-HIC-EA 190A
WN-HIC-09	Nuclear Packaging	DSHS-HIC-EA 210A
WN-HIC-10	Nuclear Packaging	DSHS-HIC-EA 50C
WN-HIC-11	Nuclear Packaging	DSHS-HIC-EA 140C
WN-HIC-12	Nuclear Packaging	DSHS-HIC-EA 142C
WN-HIC-13	Nuclear Packaging	DSHS-HIC-EA 190C
WN-HIC-14	Nuclear Packaging	DSHS-HIC-EA 210C

Other High Integrity Containers which have been approved by the State

LIST OF HICs AND STABILIZATION MEDIA
CURRENTLY ACCEPTED AT HANFORD (CONTINUED)

Approved Stabilization Media *

Aztech (General Electric)
Bitumen** (ATI and Waste Chem)
Chem-Nuclear Cement
Dow Media (Vinyl Ester Styrene)
Envirostone (U.S. Gypsum Cement)
Westinghouse-LN Technologies Cement
Stock Equipment Cement
Hittman Cement
Concrete***

* Only those stabilization media which have been evaluated or are in the process of being evaluated and are used with the stability guidance requirements of the NRC "Technical Position on Waste Form" or are specifically approved by the State are considered acceptable stabilization media. Other stabilization media and processes may be approved which have been reviewed and approved by the NRC and/or the State as meeting waste form stability criteria.

** Oxidized Bitumen only.

*** Concrete, when used as an encapsulation medium around a small volume of radioactive material, e.g., a sealed source centered in a fifty-five gallon drum containing concrete, shall have a formulated compressive strength equal to or greater than 2500 psi.

TOPICAL REPORT REVIEW STATUS SUMMARY
FOR RADWASTE VOLUME REDUCTION SYSTEMS

Office of Nuclear Reactor Regulation, January 1989

<u>Vendor</u>	<u>Report No.</u>	<u>Title</u>	<u>Acceptance Date</u>
*Aerojet Energy Conversion Co.	AECC-1	Fluid Bed Dryer	December, 1975
Hittman Nuclear & Development Corp.	HN-R1109-A, Revision 4	Radwaste Solidification System (Cement)	April, 1978
Werner & Pfleiderer Corporation	WPC-VRS-001, Revision 1	Radwaste Volume Reduction & Solidification System	April, 1978
Dow Chemical Company	DNS-RSS-001	The Dow System for Solidification of Low-Level Radioactive Waste from Nuclear Power Plants	June, 1980
ATCOR Engineered Systems, Inc.	ATC-132A	Radwaste Solidification System	September, 1981
*Newport News Industrial Corp.	EI/NNI-77-7	RWR-1 Radwaste Volume Reduction System	October, 1982
Chem-Nuclear Systems, Inc.	CNSI-2 (4313-01354-01)	Mobile Cement Solidification System	March, 1983
*JGC Corporation	JGC-TR-001	The Drum Mixer Process for Volume Reduction & Solidification	July, 1983
*Aerojet Energy Conversion Company	AECC-4	Mobile Volume Reduction System	October, 1984
*Aerojet Energy Conversion Company	AECC-2	Radioactive Waste Volume Reduction System	November, 1984
Associated Technologies Incorporated	ATI-VR-001	ATI Volume Reduction and Bitumen Solidification System	April, 1985
NUS Process Services Corporation	PS-53-0378	Radwaste Solidification System	May, 1985

TOPICAL REPORT REVIEW STATUS SUMMARY
FOR RADWASTE VOLUME REDUCTION SYSTEMS (CONTINUED)

Office of Nuclear Reactor Regulations, January 1989

<u>Vendor</u>	<u>Report No.</u>	<u>Title</u>	<u>Acceptance Date</u>
Chem-Nuclear Systems, Inc.	CNSI-DW-11118-01	CNSI Dewatering Control Process Containers	June, 1985
ATCOR Engineered Systems, Inc.	ATC-8019-1	ATCOR AVRS-80 Volume Reduction Process	July, 1985
Nuclear Packaging, Inc.	TP-02	Nuclear Packaging, Inc. Dewatering System	September, 1985
General Electric AZTECH Plant	NEDE-30878	Transportable Modular	December, 1985
*Koch Process Systems, Inc.	KPS-1	VR-System 350 Low-Level Radwaste Volume Reduction System	March, 1986
Associated Tech., Incorporated	ATI-VR-001 Supplement 1	ATI Transportable Vol. Reduction & Bitumen Solidification System (TVR-111)	April, 1986
UNC Nuclear Industries	UNC-S 8000	UNC Portland Cem./Sodium Silicate Radwaste Solidification Systems	August, 1986
*Aerojet Energy Conversion Company	AECC-3	Radioactive Waste Volume Reduction System	August, 1986
Westinghouse Hittman Nuclear, Incorporated	STD-R-05-011	Hittman Mobile In-Container Dewatering & Solidification System (MDSS)	October, 1986
Bartlett Nuclear, Incorporated	BN-1	Modified Portland Cement (MPC-1) and Portable Mixing Station Solidification	November, 1986
Stock Equipment Company	SRS-003	Quick Dry Process for Dewatering of Bead Resin and Filter Sludge	March, 1988

TOPICAL REPORT REVIEW STATUS SUMMARY
FOR RADWASTE VOLUME REDUCTION SYSTEMS (CONTINUED)

Office of Nuclear Reactor Regulation, January 1989

<u>Vendor</u>	<u>Report No.</u>	<u>Title</u>	<u>Acceptance Date</u>
Duratek Corporation	D-EVR/HED-1	Enhanced Volume Reduction/ Heat Enhanced Dewatering System for Treatment of Nuclear Power Reactor Waste Liquids	August, 1988
Chem-Nuclear Systems, Inc.	RDS-25506-01	RDS-1000 Radioactive Waste Dewatering System	October, 1988
Nuclear Packaging, Inc.	TP-03	Oil Solidification System	Under Review
Pacific Nuclear Systems, Inc.	TP-04	Portable Solidification System	Under Review
Pacific Nuclear Systems, Inc.	TP-05	Radwaste Solidification System	Under Review
Nuclear Packaging, Inc.	TP-06	"Environstone" Cement Encapsulation of Solid Radioactive Materials	Under Review

* Note: All reports except those identified with an asterisk provide generic (not plant-specific) process control procedures or programs.

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-26	Instrument Air Supply to Safety-Related Equipment	3/7/89	All holders of OLs or CPs for nuclear power reactors.
89-25	Unauthorized Transfer of Ownership or Control of Licensed Activities	3/7/89	All U.S. NRC source, byproduct, and special nuclear material licensees.
89-24	Nuclear Criticality Safety	3/6/89	All fuel cycle licensees and other licensees possessing more than critical mass quantities of special nuclear material.
89-23	Environmental Qualification of Litton-Vacum CIR Series Electrical Connectors	3/3/89	All holders of OLs or CPs for nuclear power reactors.
89-22	Questionable Certification of Fasteners	3/3/89	All holders of OLs or CPs for nuclear power reactors.
89-21	Changes in Performance Characteristics of Molded-Case Circuit Breakers	2/27/89	All holders of OLs or CPs for nuclear power reactors.
88-73, Supplement 1	Direction-Dependent Leak Characteristics of Containment Purge Valves	2/27/89	All holders of OLs or CPs for nuclear power reactors.
89-20	Weld Failures in a Pump of Byron-Jackson Design	2/24/89	All holders of OLs or CPs for nuclear power reactors.

OL - Operating License
CP - Construction Permit

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

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