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Washington D.C. 20555-0001

RECEIVED

6/11/2012
77FR 34411 (2)

Subject: Docket ID NRC 2011-0022 Revised Branch Technical Position on Concentration Averaging and Encapsulation of Low-Level Radioactive Waste.

Dear Ms. Bladey,

The American Society of Mechanical Engineers (ASME) Radioactive Waste Systems Committee (RWSC) is a Technical Committee of the ASME Nuclear Engineering Division. Our mission is to provide for the collection and exchange of technical and programmatic information relating to the management and transportation of low-level radioactive waste to identify and support programmatic enhancements, improvements in radioactive waste processing systems designs and the continuity of radioactive waste-related programs. We appreciate the opportunity to provide comments on the revision to the *Branch Technical Position (BTP) on Concentration Averaging and Encapsulation of Low-Level Radioactive Waste*.

The ASME RWSC has been following discussions and comments related to the Revision. We agree that disposal is considered safer and more desirable than interim storage and support those who recommend changes that promote the safe, efficient and reliable disposal of low level radioactive waste (LLRW). We commend NRC Staff's efforts to revise the BTP in a manner that promotes rather than restricts disposal. We would like to offer the following comments:

1. Mixable and Homogeneous Waste Types. Process wastes from Nuclear Power Plants (NPPs) typically consist of ion exchange resins and various types of filter media. Best efforts are employed at most NPP's to promote thorough mixing of these types of wastes and obtain representative samples. (1) While no method may be perfect, process wastes approach homogeneity in the context of the disposal environment. Research conducted by the Electric Power Research Institute (EPRI) evaluated the technical aspects of homogeneity in NPP process waste. (2) The RWSC agrees with EPRI's analysis and supports the treatment of process wastes from NPP's as homogenous wastes for characterization and disposal with no further demonstrations of homogeneity required. Concentrations for the determination of waste classification should be based on the weight and volume of the overall waste mixture.
2. Discrete Items. NRC's treatment of discrete items in LLRW generated from NPP's as being a similar hazard to sealed sources does not make sense and seems to ignore the true root cause of the issue being addressed. NRC states discrete item treatment is based on the improper

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handling of certain types of high activity sealed sources. (3) The cases used as examples more properly describe a loss of license control over sealed sources and not improper disposal issues. The imposition of restrictions on the disposal of such items would seem to promote the very issue that drove the events, i.e. proper handling and disposal was more difficult than simple abandonment of the source. The supporting calculations used by NRC to justify disparate treatment appear to be based on suppositions designed to justify the ends rather than realistic assumptions of potential events. Given the issues with high activity sealed sources involving handling, disposal and security, we believe NRC should implement rules that make disposal as simple and straightforward as possible. The RWSC recognizes that the Revision does make disposal of sealed sources easier than in the 1995 BTP however, we recommend NRC re-evaluate the position and premise that sealed source abandonment issues need to be addressed through restrictions on proper disposal.

3. Concentration Averaging. The RWSC agrees with NRC's use of the Class Limit rather than some arbitrary factor of the package average for determining limits for concentration averaging among items within a waste container. The practice of using a factor of 10 above and below the package average does not truly account for risk in the context of potential intruder scenarios and introduces inconsistent and arbitrary restrictions on averaging. The Class Limits defined in 10 CFR 61.55, while not entirely based on a probabilistic assessment of risk, were at least developed with some evaluation of consequence and are more appropriate to use as limits for averaging in any need to be applied.
4. Treatment of Cartridge Filters. The RWSC agrees with EPRI's assessment of cartridge filters as more properly treated as bulk material, similar to DAW rather than discrete items. (2) Cartridge filters are not mechanically or radiologically similar to either high activity sealed sources or activated metal objects and are unlikely to contain radioactive material as intrinsically part of their structure over long periods of time. Mechanical cartridge filters as used in NPP systems have the lowest decontamination factor of any of the filtration systems typically installed in NPP's and are also unlikely to contain significant quantities of long-lived, gamma emitting radioisotopes. (1) (2) The RWSC recognizes that NRC has identified an alternate approach to the handling of cartridge filters. The RWSC recommends that NRC also explicitly recognize processing techniques that can alter the form of items such as cartridge filters to be consistent with the characteristics of a mixable waste and to specify that the form of the waste in its final presentation for disposal should be the basis for any application of restrictions on concentration averaging.
5. Encapsulation. The Revision continues to require restrictions on encapsulation to volumes of 0.2 m³ (55-gallons). This restriction appears contrary to other stated objectives of encapsulation; namely the creation of a product that is readily identifiable and difficult to manipulate without the assistance of mechanical equipment. The RWSC recommends that NRC revise section 4.5 to provide separate guidance for the encapsulation of cartridge filters and objects versus sealed radioactive source. In section 4.5, recommend that after the second sentence insert Step 4.5.1 Encapsulation of Sealed Sources" and delete bullet # 4. Also add Step 4.5.2 "Encapsulation of Cartridge Filters and Objects Concentration averaging of cartridge filters and objects over the mass and volume of the encapsulation agent is allowed so long as the waste to binder ratio exceeds 14% and the binder meets the NRC stability criteria cited in the BTP on Waste Form. The factor of 2 and 10 constraints for mixtures still apply but, the mass and volume of the encapsulation binder and the waste is included. If an

unstable binder or less than 14 % waste is encapsulated, the mass and volume of the binder cannot be included.

The >14% waste to binder ratio value is based on the 55 gallon drum example in Appendix C of the existing BTP on Concentration Averaging and Encapsulation. This waste to binder ratio for container sizes large than a 55 gallon drum has already been approved via the last NRC Topical Report on Waste Form (DT-VERI-11NP/P-A, Rev 1, Addendum1) issued in 1999. This approval should not be considered an exception but, should apply to any other NRC Stable binder. Two other binders have been approved as Stable after 1999 by the CRCPD after testing to NRC criteria by DOE-Idaho. These binders and any others tested and approved to meet the NRC Stability criteria should be able to apply Concentration Averaging by this guidance.

We understand the NRC is concerned about blessing encapsulation for large components (Reactor Vessels) via this guidance. If any container size limitation must be imposed by NRC, then the maximum container size should be 200ft³ (which was approved in the Topical Report), not a 55 gallon drum.

6. Alternative Approaches. The RWSC appreciates the NRC's new direction for the use of alternate approaches for averaging. While this provision has always been available in one form or another, the identification of the disposal facility regulatory authority as the one to review and approve the alternate method removes an unnecessary test of authority. However, given the tight resources in Agreement State agencies and the highly technical nature that some of these types of approaches may involve, it is hoped that NRC will be in a position to support the Agreement State in a review. It would also be hoped that the Agreement States will be in a position to request such help.
7. ACRS Comments. The RWSC agrees in principle with the Advisory Committee on Reactor Safeguards comments dated December 13, 2011 regarding the Revision. However, we understand that not all of these can be implemented within the context of the limited process of a Branch Technical Position Revision. We hope that the NRC can accommodate more of the ACRS comments in the planned rulemaking to 10 CFR Part 61 now in progress.

We appreciate the opportunity to offer comments to the NRC Staff on this historic Revision to the Branch Technical Position. Thank you for your consideration of this letter.

Sincerely,



Andrew Armbrust

Chair

ASME Radioactive Waste Systems Committee

cc:	Larry Camper	USNRC
	James Kennedy	USNRC
	Gregory Suber	USNRC
	Joseph Miller	ASME
	Erin Dolan	ASME

Works Cited

1. **American Society of Mechanical Engineers.** Radioactive Waste Technology. New York, New York : s.n., 1986.
2. **James, David and Kalinowski, Thomas.** Proposed Modifications to the NRC Branch Technical Position on Concentration Averaging and Encapsulation (BTP), Technical Bases and Consequence Analysis. [ed.] P. Tran. *EPRI Report 1016761*. s.l. : Electric Power Research Institute, November 2008.
3. **U.S. Nuclear Regulatory Commission.** Draft Branch Technical Position on Concentration Averaging and Encapsulation, Revision 1. May 2012.

Gallagher, Carol

From: Andy Armbrust [aarmbrust@ecologyservices.com]
Sent: Thursday, October 04, 2012 12:48 PM
To: Gallagher, Carol
Subject: Comments to Docket ID NRC-2011-0022
Attachments: NRC-2011-0022.pdf

Attached, you will find comments to Docket ID NRC 2011-0022 Revised Branch Technical Position on Concentration Averaging and Encapsulation of Low-Level Radioactive Waste. The comments were prepared by the ASME Radioactive Waste Systems Committee.

Please feel free to contact me if you have any questions.

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