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From: Jenkins, Susan
To: Persinko, Andrew
Cc: Camper, Larry; Kennedy, James; Ridge, Christianne; Suber, Gregory; llwforuminc; Haynes, Richard
Subject: Comments on Draft CA BTP
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Attachments: Comments from SC to NRC on the CA BTP, Rev 1 021/12.docx

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Mr. Persinko,

Please find attached to this e-mail comments from the South Carolina Department of Health and Environmental Control's Division of Waste Management on the NRC's Draft Branch Technical Position on Concentration Averaging and Encapsulation, Rev. 1.

Sincerely,
Susan Jenkins

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SUNSI Review Complete

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South Carolina Department of Health and Environmental Control (SC DHEC) Comments on the Draft Branch Technical Position on Concentration Averaging and Encapsulation, Rev. 1

1. **Waste blending**

   The allowance for blending waste is not expected to have a practical effect on disposal at the Barnwell Disposal Facility. Facility operations are such that all classes of waste (A, B, and C) are disposed in a manner that meets disposal requirements for Class C waste. State regulation requires the use of vaults for all classes of waste. The vaults function as an engineered intruder barrier and also provide structural stability. Disposal site criteria requires that Class A waste that has a concentration greater than 1 microCi/cc of any radionuclide with a ½ life greater than 5 years is required to be stabilized (typically by solidification or use of a high integrity container). This waste is referred to as Class A Stable. Class A waste not requiring stabilization is referred to as Class A Unstable. The Disposal Site Criteria prohibits acceptance of absorbed liquids regardless of waste classification. All liquids must be solidified. (Incidental liquids are allowed up to 1 percent of the waste volume for stabilized waste and up to 0.5% waste volume for waste that is not stabilized.) Furthermore, all waste (other than irradiated hardware components) regardless of waste class is now disposed of in the same trench and is only segregated by placement in different vaults.

2. **Absorbed liquids as a homogeneous waste**

   The Barnwell Disposal Site Criteria requires that all liquids must be solidified.

3. **Factor of 10 constraint for classifying a mixture of activated metals involving radionuclides other than primary gamma emitters**

   The Disposal Site Criteria implements the Barnwell Rule of 10. The Barnwell Rule of 10 is used to compare whole irradiated components for acceptability in blending waste within each package to meet the Class C concentration limits. The Barnwell Rule of 10 must be satisfied in addition to requirements in the 1995 BTP.

   In addition to the 1995 BTP and revised BTP requirements, the Barnwell Rule of 10 requires that all components of the same type must have 10 CFR, Part 61, Table I and Table II sums of the fractions within a factor of 10. Likewise, components of different types must have averaged batch Table I and Table II sums of the fractions within a factor of 10.

It is SC DHEC's understanding that all NRC licensees have agreed to adhere to the Barnwell Rule of 10 when classifying hardware shipments for disposal at the Barnwell Disposal Facility.

The new BTP may allow a few additional pieces of hardware (of higher concentration) to be disposed compared to current guidance but the effect is expected to be minimal compared to the continued adherence to the Barnwell Rule of 10.

4. The significant increase in the sealed-source activity limits

This revision would have minimal effect on disposals at the Barnwell Disposal Facility. The license requirements for sealed source disposal at Barnwell are more stringent than the 1995 BTP. For example, the license limits disposal of sealed source containing any Table 2 radionuclide (including Cs-137 and Co-60) to a maximum activity of 10 Ci per container. Variances up to the limit of the 1995 BTP may be approved on a case-by-case basis. A variance allowing disposal of unlimited activity of Co-60 and up to 130 Ci of Cs-137 would be at least 13 times the current license limit as opposed to 3 times the limit. There are no plans to amend this condition of the license.

Increasing the maximum activity for Co-60 (unlimited) & Cs-137 (130 Ci) that may be encapsulated into a single package increases the associated dose rates. The increased dose rates will likely change the handling of the sources by workers (generators, processors, shippers, disposal operations) in order to maintain doses ALARA. Also in order to meet the DOT requirements, these encapsulated sources will likely require additional or more robust shielding for the associated dose rates.

Such an increase would also increase disposal site inventory which could affect a disposal facility's ability to meet performance objectives depending on total activity received.

Disposal fees and taxes at the Barnwell Disposal Facility are based on volume, not activity. An increase in the maximum activity for sealed sources per container would mean more source term for the Disposal Facility with no corresponding increase in funds for long-term care at the facility.

5. BTP as guidance

Language in the Disposal Site Criteria (a procedure tied to the license) states "all customers shipping radwaste material to the Barnwell Site shall comply with the US NRC Branch Technical Position on Concentration Averaging and Encapsulation, dated 1/17/95". The Disposal Facility License is currently under appeal and has been since 2004. While the Disposal Site Criteria could be revised to reflect the new BTP without amending the license, it is a decision that will be carefully considered.

Since the appeal, the license has only been amended to incorporate more stringent requirements and minor or administrative changes. If the perception is that the new BTP is less stringent, its adoption prior to a final decision on the appeal, may be of concern. Use of the new BTP would be expected to have minimal impact on disposal at the Barnwell Disposal Facility as disposal is limited to generators in the three states of the Atlantic Compact (Connecticut, New Jersey and South Carolina). Also, as described there are several additional site specific requirements that further limit the effect of increased disposal options afforded by the new BTP.

6. **Public Outreach**

Upon finalization of the revision to the BTP, would NRC consider conducting public meetings in sited states to assist states in addressing concerns of the stakeholders adjacent to the disposal sites?

7. **Enforceability**

We are never able to absolutely verify the waste classification or homogeneity even under the current CA BTP. We currently must rely on generators' process knowledge and analytical results (typically dose to Curie conversions using scaling factors). We require the disposal facility to review the paperwork to confirm that the methodology and calculations are satisfactory. Additionally, since about 1997, the Barnwell Disposal Facility is required to forward for SC DHEC review all Class C waste disposal requests whether applying the guidance in the CA BTP or not (although we only require a cover letter describing the request and the classification documentation (i.e., Radman analysis) and not the entire voluminous paperwork package). If we have questions after our review, we may ask to see the entire package or other supporting data.

It would be helpful if a disposal facility's waste acceptance criteria (as approved by the state regulator) required the generator to identify what sections of the guidance in the CA BTP, if any, are being applied in the waste classification process for each waste package. It could be in the form of a checklist. This is an approach that sited states could use to help identify these waste packages and associated generators thereby providing opportunity for paperwork auditing at the least. Including such guidance in the CA BTP would be helpful to sited states as well.

What level of oversight do NRC resident inspectors at nuclear power plants provide related to low-level waste processing and packaging? What assurances will/can the NRC provide to assure that these various waste types generated at nuclear power plants are in fact homogeneous and processed in accordance with the revised CA BTP?

Would upper level managers at generator facilities be willing to provide certification statements certifying that approved waste classification procedures were followed and BTP guidance was strictly adhered to?

8. Performance Assessment

The current PA for the Barnwell Facility took several years to complete. After discussions with NRC, SC DHEC convened a Blue Ribbon Panel of experts to provide a third party review of the "Environmental Radiological Performance Verification" submitted by the disposal facility. SC DHEC monetarily compensated the panel for their review. Costs were in the ballpark of $25,000. Would NRC be willing to assist states in the review of future performance assessments either by providing funding for such third party reviews or providing staff support? Increases in license fees to pay for such reviews are not likely to be approved with the current economic environment.

9. Benefit to very large generators

As stated previously, the current disposal facility license is more stringent than the 1995 BTP with regards to sealed source activity. Disposal is limited to 10 Ci per container without special approval. Currently in SC, there are only three licensed Cs-137 sources greater than 10 Ci. There is one licensed source between 10 and 30 Ci, one between 30 and 130 Ci, and one that is greater than 130 Ci. The first two would require special approval for disposal at Barnwell even under the new BTP. (We have not collected information from Connecticut and New Jersey - the other states in the Atlantic Compact.) What is expected to be the impact to sited states as far as number of sources that potentially be disposed based on the new guidance compared to the current? If it is a small number, could these be approved on a case-by-case basis instead?

10. Alternative Approaches

In general, the allowance for the use of alternative approaches can be positive for regulators. Regulations/guidance that are too specific and too rigid are not easily adaptable to unforeseen/unique situations. For example, the EPA's hazardous waste regulations are very prescriptive making it difficult to find solutions to complex problems at some facilities. It can be helpful to have the option of another approach in unique situations where the benefits for clean-up, decommissioning, ALARA, etc. outweigh the other factors being considered and provide the same or greater protection of the environment/health the state/public.