

From: William Reckley  
To: WND1.WNP7.MGB, WND1.WNP7.EJL *Marissa Bailey & Eric Tuck*  
Date: 07/25/96 3:45p *NMSS*  
Subject: Green Ticket on VSC-24

Attached are the incoming and a draft response to a Shillinglaw letter dated 6/20. This is a green ticket due early next week. I'll be out Friday but thought I might grease the skids for NMSS concurrence/comment on this.

CC: WND1.WNP7.PLE

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 6  
FOIA 96-322

June 20, 1996  
[REDACTED]

Shirley Jackson, NRC Chairman,

Something is very wrong here. The explosion in the VSC-24 cask at Pt. Beach was apparently caused by exposed carbozinc 11 paint on the interior of the MSB. NRC document ACN9606030039 from Carboline who manufactures the paint is very clear. In large print it says "Not recommended for immersion or indirect exposure to acids or alkalies without suitable topcoat." As I wrote to you June 3, I had directly asked NRC about coatings. Actually in my June 15 letter to Mr. Paperiello I reference 3 letters with questions on coatings March 21 to Mr. Kugler NRC, April 29 to Mr. Leu, NRC, and May 14 to Mr. Hansen NRC. I received no response to any of them. If only one had checked with Carboline, the explosion could have been prevented.

I asked you about the memo of July 18, 1995 referenced in Pt. Beach SCR-94-041-04 concerning exposed carbozinc for cask #3. I've asked many others at NRC about it also. No response. Please see to it I get a copy of that memo now and the explanation of it. Who sent it to who? Was it internal at Pt. Beach? Certainly it is directly related to my 2.206 petition which Mr. Kugler now says will include the Pt. Beach "gas ignition". I am supposed to receive all related documents according to NUREG/BR-0200 and I have received practically nothing.

Please make sure these questions on coatings are passed down to the right person for a response to me. They refer to ACN9606030039 which is the fax to Dr. Jankovich from Sierra including the Carbo Zinc 11 and Dimecote 6 data sheets. The Dimecote one is completely illegible. Please send me a clear copy. The Carboline one has to be read with a magnifying glass.

- 1) The small print on the 1st page says the technical data are accurate of the date of issuance which was Oct 1986- 10 years ago. It says user must contact Carboline to verify correctness before specifying or ordering. Did Sierra contact Carboline at all? This needs to be verified. NRR needs to request all correspondence between coating manufacturers and Sierra.
- 2) The Carboline data sheet is very clear that a topcoat is required. What topcoat was used on Palisades and Pt Beach casks in areas other than the exposed interior of MSB? How has the top coat been tested?
- 3) The word "explosion" appears three times on the data sheet. This is dangerous material when applied. It says "Ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. (Was it?) It says fresh air respirators or hoods must be used by applicators and explosion proof lighting equipment must be used. It says (at the bottom of the page) that it contains flammable solvents and workmen should use nonferrous tools and wear nonsparking shoes in area where explosion hazards exist. (Was this all done?)

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- 4) There are stipulations for mixing, for temperatures of application, for curing times, for shelf life. There are cleanliness stipulations before painting. Was this all done correctly? At Palisades and Pt. Beach?
- 5) It says loose zinc should be removed after curing by rubbing with aluminum screen wire before top coated. Was this done?
- 6) The temp. resistance "(non immersion)" is listed as continuous 750°F and noncontinuous 800°F yet the ACN9606040424 Sargent and Lundy report for unloading at Pt Beach lists temps of 731°, 856° and 878°. is it not certainly possible that the coating could go above its temp limit in unloading? The hot steam heats the shield lid to 900° I read someplace (can't find the ref. right now) but its up under it so it makes sense. (Also how does the temp in unloading affect the RX-277 which was only baked at 350°) Seems to me that we could have offgassing of hydrogen from carbozinc 11 and RX-277. This needs to be checked. Has this been done for both?
- 7) The SAR presented by Sierra for certification of the VSC-24 cask says on p. 4-3 that coating temperatures have manufacturers recommendation up to 1300°F acceptable. - Which coating? Certainly not carbozinc. Please get all documents on top coats and correspondence between Seirra and topcoat manufacturers. Same goes for the material used to patch chipped areas, for solvents, cleaners, adhesives for tiles, etc.

I have repeatedly, over many years, said that anything that goes into fabricating these casks needs to be checked and that changes need to be evaluated as to how they affect everything else in the cask. That is the problem with your trying to develop standard review plan which is up for public comment and rulemaking now. You can't have a standard review plan for a cask that is not standard. These casks are not generic. They change at each utility. How on earth can any NRC inspector keep up with chameleon nature of the design and operating procedures! Even WEPCO didn't know how much the shield lid weighed in the emergency situation and they were the ones making the 72.48 change to the design causing the extra ton of the plate attached to the lid.

Has the event and all materials in casks with possible chemical reaction now been applied to your standard review plan?

- 8) Sargent and Lundy say normal operating temp for the fuel is 600°F yet the VSC-24 SAR 0 says fuel at center is 688°F for steady state normal long term on P 4-4 figure 4.1-1 Also it uses 100° for off normal there So why does Sargent and Lundy us 95°F indoor? Please explain.

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Well enough for today. I am very concerned about all this. It needs your personal attention. Thank you- Fawn Shillinglaw

Ms. Fawn Shillinglaw  
[REDACTED]

Dear Ms. Shillinglaw:

I am responding to your letter of June 20, 1996, to Chairman Jackson of the U. S. Nuclear Regulatory Commission (NRC) in which you expressed concerns about VSC-24 spent fuel dry storage casks. A response to your letter of June 3, 1996 was sent to you on \_\_\_\_, 1996.

As discussed in my letter dated \_\_\_\_, 1996, the licensee for the Point Beach Nuclear Plant evaluated the possible effect of the VSC-24 carbozinc coating on the fuel pool and reactor coolant system. The licensee initially decided to approve the use of the coating for only the first two multi-assembly storage baskets (MSBs), pending further evaluation of the effects of zinc in the fuel pool water. The licensee eventually decided that the zinc released to the pool would not pose a problem and future use of the coating for MSBs was acceptable. These evaluations are the subject of the licensee internal memorandum you reference in your letter. A copy of the memorandum is not contained in any correspondence between the licensee and the NRC and is therefore not available in our record management system. However, the staff's assessment of the licensee's evaluations and their failure to recognize all of the possible consequences of the chemical reaction between the fuel pool and carbozinc coating are discussed in the augmented inspection team (AIT) inspection report (50-266/96005 and 50-301/96005).

In accordance with your request, Enclosure 1 is a copy of the facsimile from Sierra Nuclear with the data sheets for CarboZinc 11 and Dimecote coatings. These are the best copies available to the staff.

In response to your specific questions:

- Enclosure 2 is a copy of NRC Inspection Report No. 72-1007/96-204 which documents an NRC inspection of Sierra Nuclear Corporation following the event at Point Beach. The report discusses the failure of Sierra Nuclear to adequately evaluate the compatibility of the coating with the spent fuel pool environment or include reviews by Carboline or other appropriate technical specialists.
- Other coatings or paints were not applied over the Carbozinc 11 used on the interior of VSC-24 casks. An epoxy coating was applied to the exterior of the multi-assembly sealed basket. Evaluations of the responses to NRC Bulletin 96-04, "Chemical, Galvanic, or Other Reactions in Spent Fuel Storage and Transportation Casks," will assess whether the

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use of the epoxy coating introduces material compatibility concerns.



- Questions 3, 4 and 5 in your letter deal with recommendations and cautions provided by Carboline on the Carbozinc 11 data sheet. Although the NRC staff is aware of the recommendations pertaining to the application of the coating, the NRC has not specifically observed or reviewed the application of coatings to the surfaces of VSC-24 cask components.
- As you state in Question 6, evaluations using licensing basis assumptions regarding parameters such as heat loads and heat transfer characteristics resulted in calculated fuel temperatures above 800°F. The maximum temperatures associated with surfaces coated with Carbozinc 11 will be significantly lower than the calculated fuel temperatures. However, the NRC staff does not currently have estimates of the margins between the coating temperature limits and the maximum temperatures that these surfaces may reach during the unloading procedure. This question, as well as other material and environmental compatibility issues, will be reviewed as part of the NRC staff's evaluation of responses to the bulletin.
- As discussed in Inspection Report 72-1007/96-204, Sierra-Nuclear did not effectively document their evaluations of coatings and the environmental conditions to which they would be exposed. Information related to all coatings and other materials used in the construction of the casks will be reviewed as part of the NRC staff's evaluation of responses to the bulletin.
- The importance of a standard review plan for dry cask storage systems is made more important by the existence of different cask designs and the variations in the designs introduced by licensees. The purpose of a standard review plan and other guidance for reviewers and inspectors is to ensure that all technical issues are resolved for each cask design and storage facility. The event at Point Beach revealed that possible chemical reactions had not been fully addressed in our review and inspection guidance. Lessons learned from the staff's investigation into the event at Point Beach will be incorporated into the standard review plan and other review and inspection guidance.
- Licensees perform various calculations that supplement those performed by the vendors and presented in the safety analysis reports. These calculations may be based on the same assumptions or a licensee may utilize site specific information. In some cases, the licensees will be imposing more restrictive limitations upon operations while in others they may be justifying less restrictive requirements. For example, the assumption of 95°F for an indoor temperature versus a SAR value of 100°F imposes a burden on the licensee to ensure that conditions are maintained below the 95°F assumed value or to perform additional evaluations to justify operations if temperatures exceed 95°F. The flexibility afforded to licensees is limited by those requirements imposed in licenses or certificates of compliance and by regulations such as 10 CFR 50.59 and 10 CFR 72.48.

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maybe as other

I trust that this information addresses your concerns. Please contact Bill Reckley of my staff on 301-415-1314 if you have any additional questions or concerns.

Sincerely,

William T. Russell, Director  
Office of Nuclear Reactor Regulation

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Docket Nos. 50-266, 50-301, 72-5, 72-1007 (w/incoming)

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