UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

February 5, 2013

NOTE TO: FILE

FROM: Sherry Meador, Management Analyst ***/RA/***
Advisory Committee on Reactor Safeguards

Request for Additional Information regarding Spent Fuel Transport Risk Assessment from the Office Nuclear Material Safety and Safeguards, Division of Spent Fuel Storage and Transportation, Rules, Inspections and Operations Branch

To: Brown, Christopher
Subject: Requesting additional information on SFTRA
Attachments: Request for Additional Information -Spent Fuel Transport Risk Assessment (2).docx

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From: Brown, Christopher
Sent: Wednesday, December 12, 2012 9:52 AM
To: Cook, John
Cc: Benner, Eric; Gonzalez, Hipolito
Subject: RE: Requesting additional information on SFTRA

John,

Here are the questions for Doug. Please try to get me the response by **January 27, 2013**.

Thanks,

Christopher

From: Cook, John
Sent: Wednesday, December 12, 2012 9:16 AM
To: Brown, Christopher
Cc: Benner, Eric; Gonzalez, Hipolito
Subject: RE: Requesting additional information on SFTRA

Christopher-

OK. With the exception of Dec 18 and 31, I'm off until January. Enjoy the Holidays.

-John

From: Brown, Christopher
Sent: Wednesday, December 12, 2012 7:04 AM
To: Cook, John
Cc: Benner, Eric; Gonzalez, Hipolito
Subject: Requesting additional information on SFTRA

John,

I have received the questions from the Members. I will forward them to you by COB 12/17.

Thank you.

Christopher

Request for Additional Information –Spent Fuel Transport Risk Assessment

The ACRS requests additional information and modification of the NUREG where appropriate. The responses should be sufficiently broad and detailed to reduce the need for follow-on questions. The three issues of interest are:

Applicable Regulations:

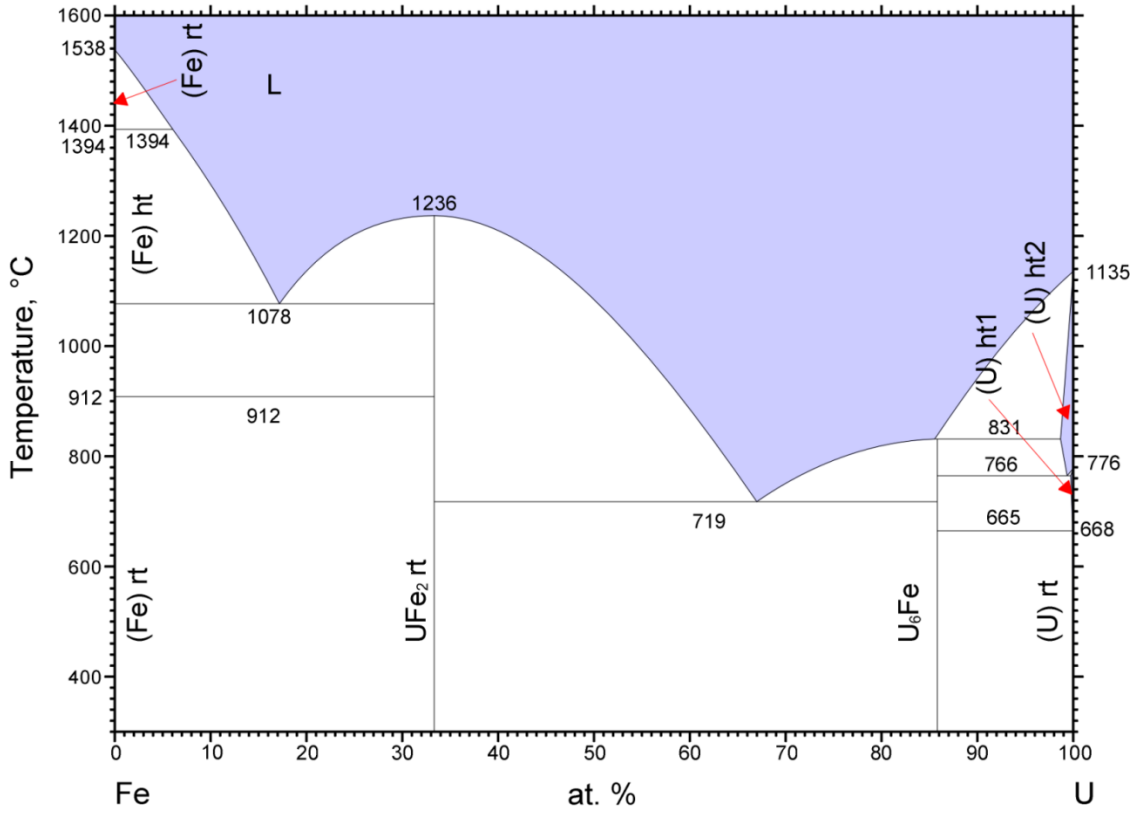
- The report cites "Immersion under 0.9 meters of water. Casks carrying spent fuel also are require to withstand a nonsequential immersion in 200 meters (660 feet) of water for one hour." This is inconsistent with the regulations in 10 CFR 71.73. Please clarify the sources for all cask test requirements

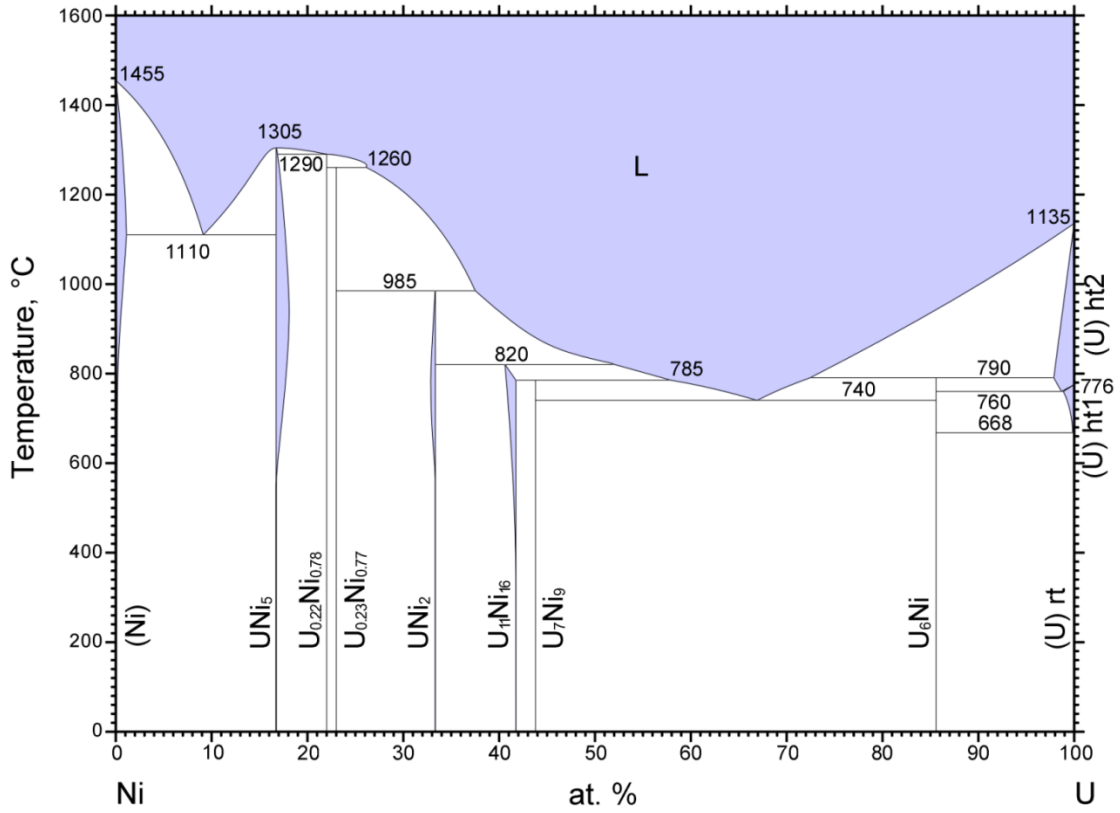
Potential Damage to casks from reactions of depleted uranium shielding with stainless or carbon steel casks during fires.

- For all cask designs in which depleted uranium shielding is used, there is a potential for rapid degradation of the cask due to interdiffusion of the cask and shielding materials at the high temperatures that may encountered in the event of a prolonged fire. During such events the uranium can expand in volume due to phase changes and potentially damage cask and seal components. Depending on time and temperature, interdiffusion of iron and uranium can lead to the formation of Laves phases and possibly liquid eutectics and lead to accelerated penetration of the canisters.
- Provide a narrative and supporting test data and analyses showing that this phenomenon has been addressed and appropriately dispositioned. Additionally, your response should address the exothermic reactions that occur when Uranium forms intermetallic compounds with iron, chromium and nickel constituents of the spent fuel transportation canisters. See phase diagrams below.

Cask Degradation Phenomena , supporting tests, materials properties data and supporting analyses.

- The document should include a discussion of the systematic process used to determine what phenomena should be included in the analysis. The document should explicitly justify why certain phenomena, such as materials interactions, oxidation and associated different material properties of any oxides that could form, phase changes, corrosion, high burnup fuel, new cladding materials, etc., could be excluded.
- The document should include a list of applicable tests for validating phenomena relevant to these calculations (e.g., drop tests, fire tests, etc.). Identify the scale of such tests and any simplifications that could adversely affect the applicability of such tests for various types of canisters and relevant materials. The document should provide confidence that representative data are available for various cask designs or at least materials.
- List and justify simplifying assumptions invoked in the analyses. For example, Appendix D indicates that material properties are often limited to 726 °C or lower, despite the fact that the models predict much higher temperatures where these materials are located.





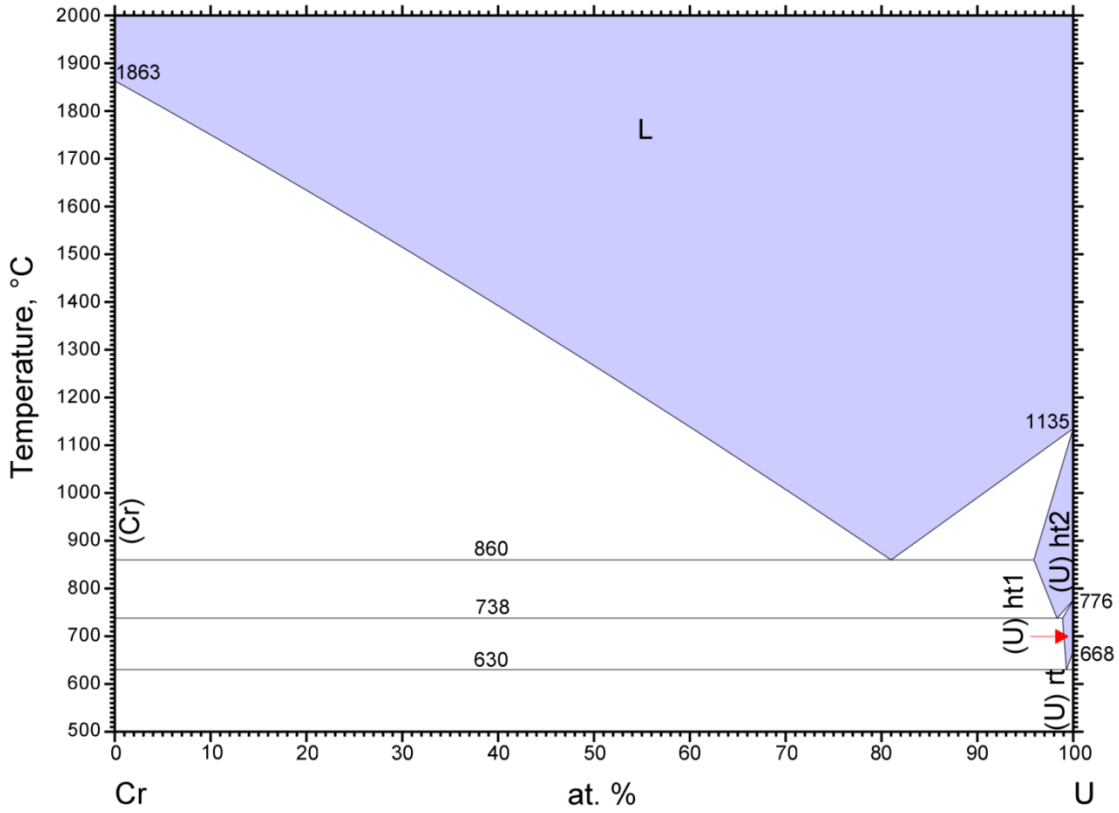


 Diagram No. 900814