December 19, 2008

MEMORANDUM TO: Nader Mamish, Deputy Director
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

FROM: Michele Sampson, Senior Project Manager /RA/
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF DECEMBER 4, 2008, MEETING WITH CROFT REGARDING THE MODEL NOS. SAFKEG-LS, SAFKEG-HS, AND SAFESHIELD 2999A TRANSPORTATION PACKAGES

Background

On December 4, 2008, a meeting was held in Rockville, Maryland, at the request of Croft Associates, Ltd. (Croft), to discuss three proposed transportation package designs, Model Nos. Safkeg-LS, Safkeg-HS, and Safeshield 2999A. The meeting was held to discuss the design, the package evaluation that is being prepared, and the submittal schedule for each. No regulatory decisions were requested nor made at the meeting.

The meeting was noticed on November 17, 2008 [ML083220478]. The list of meeting attendees is provided as Enclosure 1. A data sheet with pictorial representation of each package was provided by Croft at the meeting (Enclosures 3-5).

Discussion

The discussion generally followed the Agenda (Enclosure 2). The initial area discussed related to the results of the recent NRC quality assurance program inspection at Croft and potential impacts to the proposed package application submittals. Croft discussed their current corrective action plans and provided a brief overview of proposed enhancements to their existing program. Croft discussed their intent that there be no potential for impact to the submittal schedule for the Safkeg designs and development of the manufacturing schedule for the Safkeg-LS, as a result of their quality assurance program changes. The Safkeg packagings are being developed to support future shipment needs at the University of Missouri Research Reactor (MURR) facility. MURR staff also attended the meeting.

Croft provided an overview of the Safkeg-LS design (Enclosure 3). One prototype packaging is complete and a second is being fabricated. The physical tests will begin in January 2009. Croft indicated that they are finalizing the Safety Analysis Report in parallel with the testing, and anticipate completion in March 2009. The following technical issues were discussed.

- Contents. The use of alternate insert designs to support a variety of contents types (liquid and solid). The proposed contents would include radionuclides for cancer treatment, biomedical research, and industrial use. The inserts would vary in both the level of shielding provided and material of construction. The testing performed would consider the weight differential and also any size differences in these proposed inserts to ensure the worst case scenario is addressed.

- The inclusion of fissile material contents, limited to the quantities authorized for transport in a Type A packaging in accordance with 10 CFR 71.22. Croft proposed to include these limited fissile contents without developing a criticality analysis chapter for the Safety Analysis Report.

- Hydrogen gas generation for liquid contents. Croft proposed to follow the approach taken in the Certificate of Compliance for the Model No. CNS 10-160B to either inert the contents or verify the percent by volume of hydrogen by either tests and measurements or analysis prior to shipment. Staff indicated that the approach should clearly demonstrate, for the authorized contents, that combustible gases will not exceed 5% by volume in any confined region of the package.

- Engineering drawings. The level of detail required for engineering drawings accompanying the packaging submittal. Staff stressed the importance to clear identification of the structures, systems or components important to safety in the drawings. Croft confirmed that materials specifications would be restricted to U.S. standards to facilitate the review. Staff provided a copy of NUREG/CR-5502 "Engineering Drawings for 10 CFR Part 71 Package Approvals."

- Package testing. Three drop configurations will be performed on the prototype package followed by the fire test. Finite element analysis (FEA) in accordance with Regulatory Guide 7.9 is also being performed. Croft expects to confirm their results for both structural and thermal modeling by comparison to the actual test data.

Croft provided an overview of the Safkeg-HS design (Enclosure 4) and highlighted the primary differences between the designs. The Safkeg-HS is slightly taller, incorporates depleted uranium for additional shielding capability, and is slightly heavier than the Safkeg-LS. Many of the elements on the agenda for the Safkeg-HS were addressed during the discussion of the Safkeg-LS.

- Testing. Croft identified the potential that instead of fire testing for the Safkeg-HS, they would instead use the FEA thermal modeling, and benchmark against the results of the Safkeg-LS fire test. Staff noted the importance to demonstrate that there is no path for exposure of the depleted uranium during the fire test.

- Schedule. Croft anticipates submittal of the application for Safkeg-LS package certification in late March 2009, followed by the Safkeg-HS submittal in May 2009.

Croft provided an overview of the Safeshield 2999A design (Enclosure 5). This design is similar to the Model No. 2777A packaging which is authorized in the U.S. for import and export shipments.

- Contents. The Safeshield 2999A package will be used for transport of multiple Co-60 sources. The contents would be special form, and the sources would be positioned in an internal structure to facilitate handling.

- Testing. Physical testing performed on a prototype packaging several years ago will be used as the basis for the Safeshield 2999A safety analysis report. Staff confirmed the need for clear documentation and support tying the tested prototype configuration to the final design.

- Schedule. Croft plans to submit an application for approval of the Safeshield 2999A packaging design in the last half of calendar year 2009.

Docket Nos. 71-9337, 71-9338, and 71-9346
TAC No. L24135

Enclosures:
1. Meeting Attendees
2. Meeting Agenda
3. Data sheet for the Safkeg-LS
4. Data sheet for the Safkeg-HS
5. Data sheet for the Safeshield 2999A

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- Testing. Physical testing performed on a prototype packaging several years ago will be used as the basis for the Safeshield 2999A safety analysis report. Staff confirmed the need for clear documentation and support tying the tested prototype configuration to the final design.

- Schedule. Croft plans to submit an application for approval of the Safeshield 2999A packaging design in the last half of calendar year 2009.

Docket No. 71-9337, 71-9338, and 71-9346
TAC Nos. L24135

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SFST r/f NRC Attendees

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MEETING ATTENDEES
Meeting Between the Nuclear Regulatory Commission
and Croft Associates, Ltd.
December 4, 2008

Chris Bajwa	NRC/SFST
Michel Call	NRC/SFST
Jimmy Chang	NRC/SFST
JoAnn Ireland	NRC/SFST
Nancy Osgood	NRC/SFST
Kim Ropon	NRC/SFST
Michele Sampson	NRC/SFST
Rob Temps	NRC/SFST
John Vera	NRC/SFST
David Tang	NRC/SFST
Rod Clayton	CROFT
Norman Jorgensen	CROFT
Sarah Marshall	CROFT
Bob Vaughan	CROFT
John Ernst	MURR
Michael Flagg	MURR

AGENDA
Meeting between Croft Associates, Ltd., and the
Nuclear Regulatory Commission
December 4, 2008

1:00 p.m. **Introductions**

1:10 p.m. **Quality Assurance**

1. Croft QMS
   - Current system – ISO 9001
     - Croft update on status of QMS
   - Issues arising from NRC Inspection – May 2008
     - Discussion on points of clarification
     - QA manager independence [2.1]
     - SCAQ [2.2]
     - Requirements of 10 CFR Part 71, Subpart H [2.2]
     - Technical documentation to support grading in Q-List [3.1.2]
   - Advice on interpretation/procedure for getting advice
2. Procurement Options
   - UK Fabrication
     - Subcontractor auditing
     - Croft as fabricator
   - US Fabrication
     - Fabrication by company having a current USNRC QAP approval
     - Fabrication by company having NAQ-1 QA program, but not current USNRC QAP approval
     - US packaging fabricators having a current USNRC QAP approval
3. Effect of adopting US fabricator on Croft QMS audit

1:45 p.m. **Safkeg-LS and Safkeg-HS**

1. Project Status
   - Design
   - Prototype manufacture
   - Testing
   - SARP compilation
   - Program
2. Technical Issues
   - Contents and shielding inserts
   - License drawings
   - Review proposed regulatory testing
   - FEA stress analysis for NCT & HAC to augment test data
   - Review thermal FEA analysis status
   - Review shielding issues and calculational methods

3. Approval Process
   - Review of application
   - Review schedule
   - Review costs/payments
4. Schedule for Submittal

2:50 p.m. **Break**

3:00 p.m. **Safeshield 2999A**

1. Project Status
   - Design
   - Prototype manufacture
   - Testing
   - SARP compilation
   - Program
2. Technical Issues
   - Contents
     - Special form
     - Open form
   - Source carriers
   - License drawings
   - Review regulatory testing
   - Review SARP issues for proof by testing
   - Review thermal analysis
   - Review shielding issues and calculational methods
3. Approval Process
   - Review of application
   - Review schedule
   - Review costs/payments
4. Schedule for submittal

3:50 p.m. **Questions or Comments from the Public**

4:00 p.m. **Adjourn**