



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 27, 2002

MEMORANDUM TO: Eric J. Leeds, Chief  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Thru: Joseph G. Giitter, Chief  
Enrichment Section  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Handwritten signature of Joseph G. Giitter.

FROM: Andrew Persinko, Sr. Nuclear Engineer  
Enrichment Section  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

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SUBJECT: FEBRUARY 13, 2002, MEETING SUMMARY: MANAGEMENT MEETING  
WITH DUKE COGEMA STONE & WEBSTER TO DISCUSS MIXED  
OXIDE FUEL FABRICATION FACILITY PROGRAM CHANGES AND  
APPLICANT REORGANIZATION

On February 13, 2002, U.S. Nuclear Regulatory Commission (NRC) staff met with Duke Cogema Stone & Webster (DCS), the mixed oxide fuel fabrication facility (MFFF) applicant, to discuss: 1) what impacts the Department of Energy (DOE)-announced changes to the Surplus Plutonium Disposition Program have on the MFFF and on the construction authorization request (CAR) and environmental report (ER) that were submitted to NRC; and 2) the recent purchase of Duke Engineering and Services (DES) by Framatome. A summary of the meeting is provided below. A more detailed summary, the attendance list, meeting agenda, and meeting handouts are attached (Attachments 1, 2, 3, and 4 respectively). A small portion of the meeting was closed to the public in order to discuss proprietary information.

Summary

DCS stated that Duke Energy is selling DES to Framatome. DCS further stated that the sale will not affect the plutonium disposition program because DES's ownership/interest in DCS will transfer to Duke Energy along with key personnel working on the MFFF. DCS will remain the applicant and there will be no changes in project staffing.

DCS stated that the MFFF will now receive and process approximately eight additional metric tons of plutonium (six metric tons of that material was previously planned to be immobilized; two metric tons will come from sources yet to be determined). This will require design changes to the MFFF to accommodate material having impurities that were not included in the previous design. Additionally, high alpha and uranium waste streams from the MFFF, previously planned to be processed through the Savannah River Site (SRS) high level waste tanks, will now be solidified at an SRS facility to be constructed off the MOX site. DCS's revised schedule calls for submitting a supplement to the ER and construction authorization request in October 2002. However, at the meeting, DCS stated that the ER could be submitted as early as August 2002. NRC staff plans to issue the Draft Safety Evaluation Report on schedule by April 30, 2002, but will delay issuing the Draft Environmental Impact Statement (EIS) until after a revised or supplementary ER is submitted by DCS. The impact of the changes is expected to be greater on the EIS than on the SER.

Docket: 70-3098

Attachments: 1. Meeting summary  
2. Attendance List  
3. Meeting Agenda  
4. Meeting Handouts

cc:

P. Hastings, DCS

J. Johnson, DOE

H. Porter, SCDHEC

J. Conway, DNFSB

D. Moniak, BREDL

G. Carroll, GANE

R. Thomas, Environmentalists, Inc.

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\*See previous concurrence

<b>OFC</b>	SPB	SPB	SPB		
<b>NAME</b>	DPersinko:ddw*	DHoadley*	JGiitter <i>JG</i>		
<b>DATE</b>	2/25/02	2/25/02	2/27/02		

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OFC	SPB	E	SPB	E	SPB			
NAME	DPersinko:ddw	JHoadley		JGiitter				
DATE	2/25/02	2/24/02		2/ /02				

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## MEETING SUMMARY

The following summarizes discussions at the meeting:

### Purchase of Duke Energy and Services by Framatome

Duke Cogema Stone & Webster (DCS) stated that Duke Energy is selling Duke Engineering and Services (DES) to Framatome. DCS further stated that the sale will not affect the plutonium disposition program because DES's ownership/interest in DCS will transfer to Duke Energy along with key personnel working on the mixed oxide fuel fabrication facility (MFFF). DCS will remain the applicant and there will be no changes in project staffing. Personnel who are now working on the mixed oxide (MOX) project will be employed by Framatome in the future and will be contracted back to continue to work on the MOX project. DCS stated that the details of the sale and its effect on MFFF will be captured in a revision to the Construction Authorization Request (CAR). The transition is expected to be complete in approximately three months.

U.S. Nuclear Regulatory Commission (NRC) staff questioned whether the sale will affect the foreign ownership, control or influence (FOCI) determination made by the U.S. Department of Energy (DOE). DCS indicated that it will review any potential effects on the FOCI determination. NRC staff also stated that portions of the CAR and the quality assurance program will have to be revised to reflect the new ownership and any other organizational changes.

### Impacts of DOE-Announced Changes in the MFFF and Associated Documents

The major change announced by DOE is that it will no longer immobilize the surplus plutonium and thus will not be constructing the immobilization facility as previously planned. Impacts of the change on the MFFF are presented in the handouts provided by DCS at the meeting (Attachment 4).

The MFFF will now process approximately eight additional tons of plutonium into MOX fuel. Of the eight tons, approximately six tons will be material that was to be immobilized. The source of the additional two tons of plutonium is to be determined. The MFFF will now process 34 tons of plutonium into MOX fuel, which is the total amount of plutonium that the U.S. agreed to dispose of in its agreement with the Russian Federation. DCS also indicated that the high alpha waste and stripped uranium waste will now be solidified at the Savannah River Site (SRS) instead of being transferred to the SRS F-Area tank farm. A new waste processing building will be constructed in F-Area, not on the MOX site, to process this waste. DCS expects the liquid waste volume to increase by approximately 10 percent and the solid waste volume to remain the same.

Processing the plutonium that was previously planned to be immobilized will require that the MFFF be redesigned to include additional chemical processing capability to remove additional impurities such as salts and chlorides. The footprint of the MFFF is expected to increase by approximately 10 percent to accommodate the additional chemical processing equipment; however, there will be no change to the disturbed area.

Regarding the impact of the changes on the project schedule, DCS stated that it expects to submit supplements to its CAR and environmental report (ER) in October 2002; however, it is possible that the ER supplement will be submitted in August 2002. DCS would like to begin construction for such items as clearing land and excavating for foundations in October 2003 and would like to begin laying concrete for foundations in March 2004. This schedule is based on a need to provide fuel to the reactors in the Fall of 2008. DCS also stated that the date for

submitting the application to possess and use special nuclear material will change. DCS does not intend to submit the application to possess and use special nuclear material until after it receives approval to begin construction. DCS stated its opinion that it believes that the changes will have minimal environmental and safety impacts.

NRC staff stated that it does not plan to issue an Environmental Impact Statement (EIS) until sometime after it receives the supplemental ER from DCS. The staff estimated that a Final EIS could be issued in December 2003; however, this date is not firm. The staff stated that it does not intend to rescope the EIS. The staff will revise its review schedules in approximately one month based on the new information provided by the applicant.

### Major Open Items

DCS believes that the major open items in the staff's review are:

- Qualitatively describing highly unlikely for nuclear criticality safety analyses.
- High efficiency particulate air (HEPA) filter efficiency.
- Tri-butyl phosphate and HAN/hydrazine analyses (i.e., "red oil").

DCS indicated that it has recently completed its analysis for meeting effluent release performance requirements at the restricted area boundary, instead of the controlled area boundary.

The staff agreed that these issues probably represent the major issues remaining; however, these do not encompass the entirety of items that remain unresolved.

### Questions from Members of the Public

The meeting was then opened for members of the public to ask questions of the NRC staff. Most of the questions asked, however, were directed toward DCS or DOE. Although not obligated to answer since this was a meeting between an applicant and the NRC, both DOE and DCS answered numerous questions posed by members of the public.

In response to questions, DOE and DCS stated that (list is not inclusive of all questions posed):

- No plutonium metal will be provided the MFFF; all material provided to the MFFF will be in oxide form.
- DOE is currently reviewing National Environmental Policy Act (NEPA) requirements to determine what actions may be necessary as a result of the program changes.
- DOE has included money in the 2003 budget to perform supplemental EIS work if such work is necessary.

In response to questions, NRC stated that (list is not inclusive of all questions posed):

- The NRC staff position on controlled area boundary was discussed at the meeting with DCS on October 11, 2001, and was included the meeting summary of that meeting. That portion of the October 11, 2001, meeting summary is provided below.

Excerpt from the October 11, 2001, meeting summary: "With respect to controlled area boundary, the staff stated that 10 CFR 70.61(f) requires that applicants/licensees establish a controlled area boundary, as defined in 10 CFR 20.1003. Section 20.1003 of 10 CFR defines the controlled area as an area outside of the restricted area but inside the site boundary, access to which can be restricted by the licensee for any reason. There are two regulations concerning this issue, 10 CFR Part 70 that deals with performance requirements (i.e., combinations of likelihoods and consequences) and 10 CFR Part 20 that deals with doses. Section 70.61(f)(2) of 10 CFR allows individuals who are not workers, defined in 10 CFR 70.4 as individuals who receive an occupational dose, who perform ongoing activities in the controlled area to satisfy worker performance requirements described in 70.61(b) and (c) if those individuals receive training that satisfies 10 CFR 19.12(1)-(5). Part 20 of 10 CFR defines occupational dose as dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation. The important clause is "...in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material...." As a result of this clause, NRC regulations allow Savannah River employees to be treated either as members of the public subject to 10 CFR 20.1301/dose limitations or as workers subject to 10 CFR 20.1201 dose limitations depending on the individual's assigned duties."

- NRC is reviewing its physical security regulations as a result of the September 11 events. It is possible that the results of the NRC review will affect the MFFF. However, DCS should be able to readily incorporate any resulting design changes because there is sufficient lead time before the operating license application will be submitted. NRC will keep DCS informed of the NRC review and potential impacts on the MFFF.

## ATTENDEES AT THE MEETING ON FEBRUARY 13, 2002

<u>NAME</u>	<u>AFFILIATION</u>
Andrew Persinko	Nuclear Regulatory Commission (NRC)
Michael Weber	NRC
John Greeves	NRC
Eric Leeds	NRC
Joe Giitter	NRC
Tom Essig	NRC
Timothy Johnson	NRC
Fred Burrows	NRC
Wilkins Smith	NRC
Alex Murray	NRC
Christopher Tripp	NRC
David Brown	NRC
Bill Gleaves	NRC
Joel Kramer	NRC
Harry Felsher	NRC
Rex Wescott	NRC
Magaret Chatterton	NRC
Sharon Steele	NRC
Herman Graves	NRC
Mike Lamastra	NRC
Phyllis Sobel	NRC
Susan Chidakel	NRC
John Hull	NRC
Jennifer Davis	NRC
Tim Harris	NRC
Tom Pham	NRC
J. Keith Everly	NRC
Robert Martin	NRC
Peter Hastings	Duke Cogema Stone & Webster (DCS)
Ed Brabazon	DCS
Gary Kaplan	DCS
Ken Ashe	DCS
Tommy Touchstone	DCS
Michel De Donder	DCS
Mary Birch	DCS
Jamie Johnson	Department of Energy (DOE)
David Nulton	DOE
John Connelly	DOE
Mark Williams	DOE
Paul Gubanc	Defense Nuclear Facilities Safety Board (DNFSB) (on detail to DOE-EM)
Don Williams	Oak Ridge National Laboratory (ORNL)

David Alberstein Faris Badwan	Los Alamos National Laboratory (LANL) LANL
Mark Orr Donald Palmrose	ATL ATL
Ed Pentacost	Argonne National Laboratory (ANL)
Donald Silverstein	Morgan, Lewis and Bockius
Edward Lyman Tom Clements	Nuclear Control Institute (NCI) NCI
Diane Curran	Georgians Against Nuclear Energy (GANE)
Philipp Bleek Benjamin Rasek	Arms Control Association (ACA) ACA
Paul Delozier	NUMARK Associates
Clifton Farrell	Nuclear Energy Institute (NEI)
Bill Towson	Exchange Monitor
Linda Gunter	Edlow International

**ATTENDING BY TELEPHONE**

Don Moniak	Blue Ridge Environmental Defense League
Donald Spellman	ORNL
Glenn Carroll	GANE
Sam Thomas	DOE
Robin Rektor	NUMARK Associates
Skip Copp	Duke Energy
Dan Bruner Kent Sullivan	Westinghouse Savannah River Corporation (WSRC) WSRC
David Ayres	NRC Region II

**AGENDA  
MEETING AGENDA  
MOX FUEL FABRICATION FACILITY  
MANAGEMENT MEETING  
FEBRUARY 13, 2002**

1:00 PM	Introduction
1:15 PM	Changes to Surplus Plutonium Disposition Program
2:00 PM	Anticipated licensing program and schedule changes
2:30 PM	Status of outstanding review items
4:00 PM	Summary / Actions

NOTE: Meetings between the NRC staff and licensees are open for interested members of the public to attend as observers pursuant to the "Open Meeting Statement of NRC Staff Policy", 65 Federal Register 56964, September 20, 2000.

Portions of this meeting may be closed to members of the public due to the proprietary nature of information to be discussed pursuant to 10 CFR 2.790.



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STONE & WEBSTER

**Mixed Oxide Fuel Fabrication Facility (MFFF)**

**NRC Staff Briefing on  
Surplus Plutonium Disposition Program Changes**

Duke Cogema Stone & Webster  
13 February 2002

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# Agenda

- Introduction
  - Executive Summary: program changes and schedule impact
  - Changes to SPD Program
    - Processing of “alternate feedstock” (material previously slated for immobilization)
    - Waste solidification
    - Changes to ER and CAR
    - Licensing program and schedule
  - Status of outstanding CAR items
-



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# Introduction

- Program changes
  - Process some materials previously slated for immobilization
  - Solidification of waste in lieu of processing through SRS waste tanks
- Changes to facility necessitates delay in completion of design, but licensing basis not significantly impacted
  - Design addition to facility to insert new AP process step
  - Remainder of facility largely unaffected
  - Minimal environmental and safety impacts anticipated



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# Executive Summary

## Program Changes and Schedule Impact

- Processing of some materials previously slated for immobilization
    - Total resulting quantities
      - 25.6 MT PuO<sub>2</sub> through Pit Disassembly and Conversion Facility
      - ~6.4 MT PuO<sub>2</sub> originally slated for immobilization
      - ~2 MT PuO<sub>2</sub> future allocation
      - Total 34 MT Pu (consistent with Russian agreement)
    - Material originally slated for immobilization includes impurities that require additional processing
  - Waste processing of high- $\alpha$  and uranium waste streams
    - Processing & solidification at SRS facility off the MFFF site
    - In lieu of processing through SRS HLW waste tanks
    - Responsive to concerns about adding to SRS HLW waste tank volumes
  - Overall net reduction in environmental impact of MFFF and connected/related activities
-



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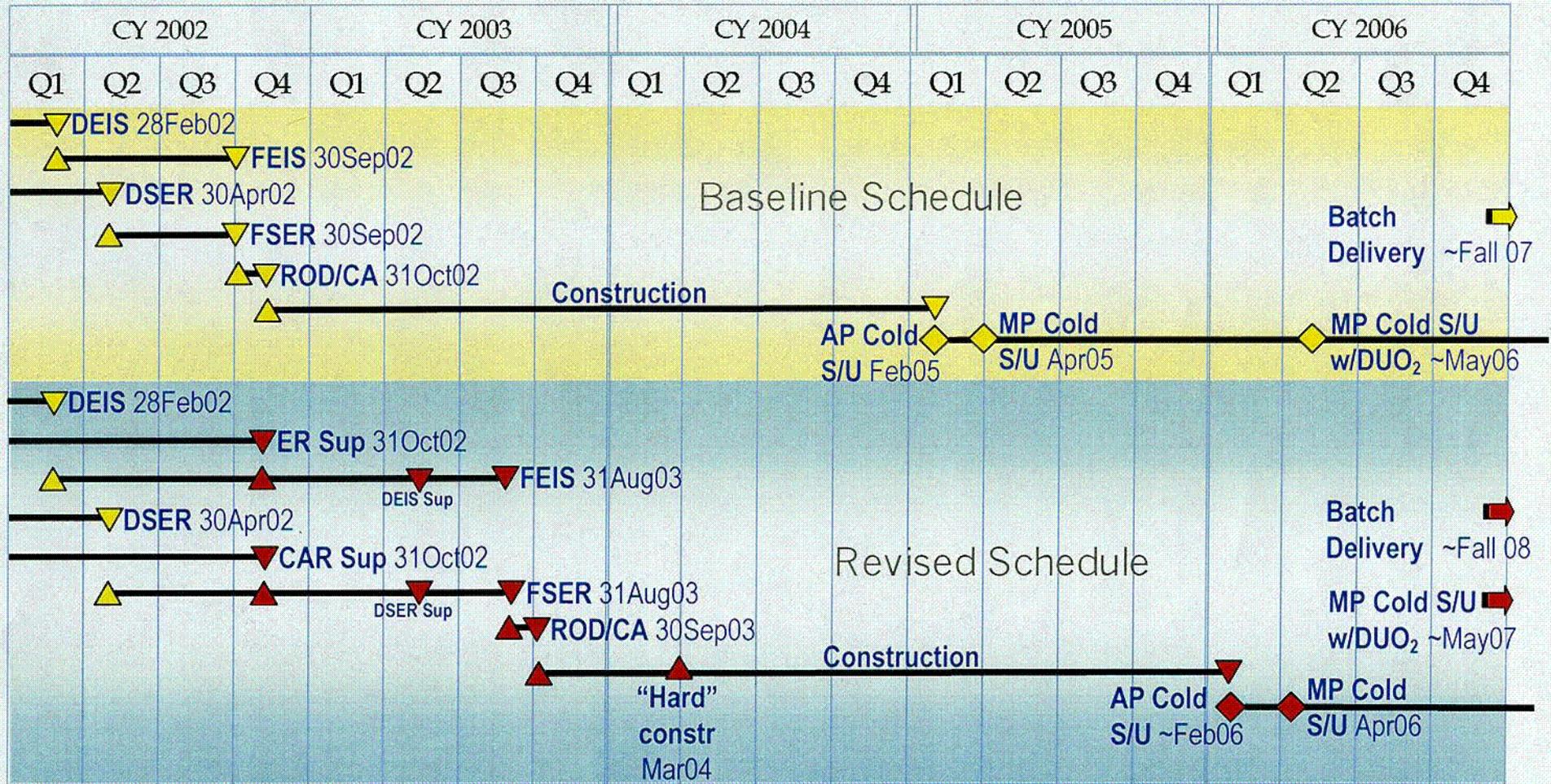
## Executive Summary (continued) Program Changes

- Summary of scope of proposed changes for MOX facility
  - Decanning changes to accommodate different can configurations
  - Additional electrolyzer and ball mill
  - Additions to aqueous polishing (AP) to remove chlorides and other salts
  - <10% change in overall building footprint to accommodate AP change
- Licensing impact
  - Supplement to Environmental Report
    - Description of additional equipment and environmental impact of “alternate feedstock” changes discussed above
    - Revised environmental impact of waste disposition
  - Supplement to Construction Authorization Request
    - Design bases and description of equipment associated with “alternate feedstock” changes discussed above



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# Executive Summary (continued) Preliminary Schedule Evaluation



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# **Changes to Surplus Plutonium Disposition Program**

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## **“Alternate Feedstock” General Material Characteristics**

- Material will be unclassified when received at MFFF
- Feed material will be PuO<sub>2</sub> provided in DOE-STD-3013 containers
- Pu isotopics in same range as material described in existing design (i.e., Pu-240 < 9%)
- Weapons grade Pu isotopics and uranium content well characterized prior to delivery and consistent with PDCF specs
- Precise impurity characterization may not be available



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# **“Alternate Feedstock” Impurity Characteristics**

- **Current baseline impurities**
  - Characterized by americium, gallium, uranium (“PDCF spec”)
- **Alternate Feed Type 1: similar to current baseline PDCF feed**
- **Alternate Feed Type 2 : feed with salts, without chlorides**
  - Main impurities : aluminum, calcium, chromium, copper, iron, tantalum, magnesium, silver, manganese, potassium, silicon
- **Alternate Feed Type 3 : feed with salts and chlorides (~half of material)**



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# **“Alternate Feedstock” Process and Equipment Modifications**

Powder Pretreatment (MP)  
Purification (AP)

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# Changes to MP Powder Pretreatment

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- Footprint not changed
  - Receiving/storage of 3013 containers unchanged
  - Powder pretreatment process (all powders)
    - Ball milling to reduce grain size (2 units)
    - Powder density measurement unit
    - Chemical characterization (quantify impurities)
    - Pretreatment buffer storage
      - Store reusable cans before and after milling, waiting for laboratory results
      - 2-week capacity with similar design to buffer storage between AP and MP
  - Addition of re-canning function (packaging analyzed PuO<sub>2</sub> in 3013 containers)
  - Additional laboratory equipment
    - Sampling glove box after ball milling step
    - Gloveboxes for sample dissolution and preparation
    - Gloveboxes for chlorine and fluorine analysis and specific preparation
    - 2 ion coupled plasma mass spectroscopy units and 1 ion coupled plasma atomic emission spectroscopy unit
-



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# Changes to AP Purification Process (continued)

- Type 1 and 2 Feedstock
  - Process and equipment: no change vs normal feedstock (PDCF feedstock)
  - Impact on the process design: limited
- Type 3 Feedstock - Salt & Chloride
- Process changes to remove chloride
  - For material specification purposes and to limit corrosion
  - Feedstock solution electrolyzed in two steps (dissolution after Cl removal)
  - Filter off-gas, then wash to convert Chlorine into NaCl
  - Process developed/implemented in La Hague UCD plant to treat scrap material with chloride content and extract Pu
- Additional equipment
  - Two dissolution lines (same type equipment as existing processes)
    - One feeding hopper and one electrolyzer each
    - Two filters each with appropriate slab tanks
  - Washing column with soda and chloride salts liquid waste storage tanks



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## Changes to AP Purification Process (continued)

- Changes to AP area
  - Footprint increase in the AP area
  - Reconfiguration of interior spaces and equipment
  - HVAC changes to accommodate room changes and new gloveboxes
- Changes to waste characteristics
  - Additional salts
  - Increase in raffinates volume (by a factor of ~1.5) resulting in increase of ~10% of overall volume of high- $\alpha$  liquid waste
  - Increase of ~10% in low-level liquid waste volume (rinsing)
  - Increase in silver content due to the impurity impact on the efficiency of the silver recovery unit



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# Licensing Impacts

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## Changes to Environmental Report

- **Revise to address “Alternate Feedstock”**
  - No immobilization
  - MFFF will receive ~6 MT feed material not matching original PDCF specification
  - MFFF expects to process 34 MT PuO<sub>2</sub>
- **Revise to reflect changes in SRS waste processing**
  - High- $\alpha$  waste and stripped uranium waste will be solidified by SRS instead of transfer to F-Area Tank Farm
  - New waste processing building (not on MOX site but within F-Area) for MOX and PDCF wastes
- **Also revise to incorporate ER RAI responses and clarifications**



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## Changes to ER: “Alternate Feedstock”

- Describe processing changes
  - Powder processing equipment to prepare the feedstock for chemical processing
  - Minor chemical processing changes to add chloride removal
  - Storage for resulting waste (mainly chlorides, other salts)
  - Building footprint increases <10% to accommodate additional equipment
- Effluents
  - Airborne effluents will contain trace amounts of chlorine, well below regulatory levels
  - Clean condensate and storm water effluents remain unchanged



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## Changes to ER “Alternate Feedstock” (continued)

- Continue to transfer waste to SRS for processing and disposition
  - Liquid waste volumes anticipated to increase ~10% overall
  - Solid waste volumes should not change
- Impacts of changes expected to be bounded by existing analyses for public and worker dose calculations for normal and accident analyses



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# Changes to ER Waste Processing

- Change to SRS waste processing strategy for high- $\alpha$  and uranium waste streams from MFFF
  - Processing and solidification at SRS facility off the MFFF site
  - Replaces SRS F-Area Outside Facility and use of HLW waste tanks
  - Responsive to concerns about adding to SRS HLW waste tank volumes
- Conceptual design underway (by DOE)
  - Receive waste from MFFF and PDCF
  - MFFF piping of waste streams largely unaffected (no substantive impact on CAR)
- MFFF and PDCF waste stream characteristics
  - MFFF raffinate and PDCF sources - TRU waste with proven disposition path
  - Stripped uranium more appropriately disposed as LLW



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# Changes to ER

## Waste Processing (continued)

- Environmental impacts
  - Construction of waste processing building
  - Normal and accident releases (airborne and liquid effluents)
  - Transportation impacts for waste
  - Disposal impacts



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## ER Conclusion

Changes to ER from “alternate feedstock” and waste solidification result in insignificant:

- changes in the types and amounts of any effluents that may be released offsite
- increase in individual or cumulative occupational radiation exposure
- increase in the potential for or consequences from radiological accidents
- MFFF construction impact and minimal impact from construction of new waste processing building



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## Changes to CAR and Safety Assessment

- Revise to address “Alternate Feedstock”
  - Update facility, processes, system descriptions:
    - MOX Receiving and Decanning
    - AP Dissolution and other small changes
    - Facility layout
    - Waste stream(s)
  - Confirm safety analyses are bounding for new processes
- Only minor revision to overall description anticipated for waste changes
- Also revise to incorporate CAR RAI responses and clarifications



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## Changes to CAR and Safety Assessment (continued)

- Anticipated impacts on existing operations
  - CAR safety assessment made conservative bounding assumptions
  - Consequences of changes expected to be bounded by existing analyses
    - Existing events identified in the CAR expected to be representative of any new events identified as a result of new process
- New PSSCs (if any) will be identified



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# **Outstanding CAR Items**

## **Institutional Changes**



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## Status of Outstanding Clarifications

- Nuclear criticality safety
- HEPA filters
- TBP and HAN/Hydrazine
- Likelihood requirements



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# Corporate Change

- Unrelated to program changes
- Duke Engineering & Services (DE&S) being sold by Duke Energy to Framatome ANP
- DE&S ownership/interest in DCS transfer to Duke Energy along with key personnel
- DCS still applicant/licensee
- No changes in project staffing
- Details will be captured in revision to CAR

