DUKE COGEMA
STONE & WEBSTER

Mixed Oxide Fuel Fabrication Facility
Construction Authorization Request (CAR)
Revision Summary

Meeting with NRC Staff
NRC Headquarters
14 July 2004

DUKE COGEMA
STONE & WEBSTER

Agenda

- **Overview of CAR Revision**
  - Controlled Area Boundary (CAB)-Related Changes
  - Design Basis-Related Changes
  - Changes to Incorporate Previously Open Items
  - Other Changes
- **Summary of CAR Changes by Chapter**
- **CAR Revision Review Schedule**

DUKE COGEMA
STONE & WEBSTER

CAB-Related Changes

- CAB-related changes generally consist of the following:
  - CAB Location
  - Receptor Definition
  - Methodology
  - PSSC
  - Editorial
- Minimal design changes resulted from change in CAB
  - New CAB similar to original distance used for "site worker"
  - Worker and public dose limits are different by less than an order of magnitude
  - Significant margins in design and accident analysis assumptions

DUKE COGEMA
STONE & WEBSTER

CAB-Related Changes

- CAB Location
  - Revised physical location of *controlled area boundary*
    - Moved from existing Savannah River Site boundary (minimum distance ~ 8 km) to MFFF site boundary (minimum distance ~160 m from MFFF stack)
    - Added new figure depicting controlled area boundary
- Receptor Definition
  - Previous "public" receptor changed to "individual outside controlled area" (IOC) throughout the CAR
  - IOC is located at 160 m
  - Deleted commitment to train non-workers within controlled area under 10CFR70.61(f)(2) and will now comply with 10CFR70.61(f)(1)

DUKE COGEMA
STONE & WEBSTER

CAB-Related Changes

- Methodology
  - Revised ARCON96 Methodology
    - Added X/Q information for 160 m receptor
  - Deleted MACCS2 Methodology
    - Not the preferred methodology for distances close to the release point (e.g., 100 to 160 m)
  - Deleted ALOHA Methodology
- PSSC
  - Upgrade Depressurized Exhaust System (POE)
- Editorial
  - Added Units to Equations
  - Added Information for Completeness

DUKE COGEMA
STONE & WEBSTER

CAB-Related Changes

- Impacts of CAB-related Changes on Results
  - POE is now designated as a PSSC
  - Analyses demonstrate that 10 CFR 70.61 Performance Requirements are satisfied with margin

DUKE COGEMA
STONE & WEBSTER

Design Basis-Related Changes

- Additional changes were provided in this CAR update, but were not directly related to the CAB change
- These additional changes were:
  - Design Progress
  - Clarification of Crane/Hoists Equipment Requirements
  - Codes/Standards
  - Geotechnical Report

DUKE COGEMA
STONE & WEBSTER

Design Basis-Related Changes

- Design Progress
  - System Updates
    - Uranium Oxide Dissolution Unit replaced with Uranyl Nitrate System
    - Added Waste Organic Solvent Unit
  - Updated Chemical Inventory List
  - Updated Am and Waste Stream Values
  - Revised Release Values from DOE Reference for Pu Powders
  - PSSCs
    - Maintenance Activity Control (Electrolyzer Fire)
    - Sintering Furnace Pressure Controls
    - Pneumatic transfer system – double walled pipes

DUKE COGEMA
STONE & WEBSTER

Design Basis-Related Changes

- Clarification of Crane/Hoists Equipment Requirements
  - seismic requirements were clarified
  - updated information regarding codes and standards
- Corrections to Codes and Standards
  - Corrected typographical errors on code dates from previous CAR
  - Corrected code versions to be consistent with basis of design document
- Geotechnical Report Related Changes
  - References to 2000 and 2001 report updated to 2003 Geotechnical Report
  - References to 2001 WSRC site-wide spectra report updated to 2003 WSRC Report
  - Changes consistent with revised Geotechnical Report submitted to NRC 30 June 2003
  - There was no impact to CAR information

DUKE COGEMA
STONE & WEBSTER

Incorporation of Previously Open Items

- Resolution of previously Open Items have been incorporated into the CAR
  - CS-01 Red Oil
  - CS-05b TEELS
  - MP-01 Uranium Burnback
  - AP-10 Titanium Fires

DUKE COGEMA
STONE & WEBSTER

Other Changes

- Treatment of Secured Warehouse Material
  - Regulated under 10 CFR Part 40 (will be discussed in operating license application)
- Editorial Changes
  - Updated Building Dimensions
  - Added Information for Completeness
  - Added Units to Equations
  - Updated DCS Corporate Officer Information and Titles

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 1

- Section 1.1.2.1
  - Updated Definition of CAB and defined Individual Outside Controlled Area (IOC)
  - Updated Figure 1.1-2 to show new CAB and restricted area
  - Deleted Figure 1.1-3 (previously showed CAB at SRS boundary)
- Section 1.2.1
  - Updated the names/titles of the MFFF DCS corporate officers
- Sections 1.3 – 1.8
  - Updated references to 2003 Geotechnical Report and WSRC Site-Wide Spectra Report

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 4

- Section 4.1.1
  - Editorial change to reflect the revised DCS organizational structure and titles

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 5

- Generic to Chapter 5
  - Editorial change - Public to IOC
  - System Information
    - Deleted Uranium Dissolution (replaced with RUN as necessary)
    - Added Solvent Waste Reception Information
    - Revised Depleted Uranium Information
  - Miscellaneous Editorial
- Sections 5.1-5.4
  - Revised Discussion on receptors and locations to be consistent with Chapter 1 and new CAB
  - Revised Methodology Discussion for *X/Q*
    - Deleted MACCS2 information (for 5 mile receptor)
    - Added ARCON96 methodology for IOC

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 5 (continued)

- Section 5.5
  - Revised event scenarios
    - Added prevention/mitigation features for IOC (deleted Public)
    - Credited POE as a PSSC
    - Revised/Added defense-in-depth discussion (i.e., C2/C3)
    - Added bounding events for IOC
  - Revised bounding events due to mature design information
    - Revised Release Fractions consistent with waste drum
    - Used established criticality limit for waste drums
    - Added Waste Reception Unit tanks
  - Updated Red Oil safety strategy to reflect open item CS-01 resolution
  - Revised depleted uranium discussion in the secured warehouse

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 5 (continued)

- Section 5.5 (cont.)
  - Updated material inventory
    - Form (i.e., powder)
    - Location (identified new/deleted tanks)
    - Updated MAR information for Americium
  - Updated Fire Information
    - Revised fire areas as design matured
    - Updated Material Inventory in some fire areas
    - Added description of AP Electrolyzer Fire
  - PSSCs
    - Regrouped generic glovebox information into specific Electrolyzer Group
    - Added maintenance activity for electrolyzer
    - Identified Combustible Loading Controls for C1/C2 areas
    - Regrouped Process Safety Control Information into Sintering Furnace Control

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 6

- Section 6.5
  - Editorial – made consistent with words in Chapter 14 regarding Emergency Plan

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 8

- Generic to Chapter 8
  - Editorial - Public to IOC
  - Updated Chemical Inventory information
  - Deleted Uranium Dissolution; added Waste Organic Solvent titles
  - Miscellaneous editorial
- Section 8.3
  - Methodology information deleted or revised due to deleting public receptor at 5.0 miles and using the IOC at 160 meters
  - ALOHA and MACCS2 information deleted
  - Updated commitment to IDLH and use of TEELs as result of closure of open item CS-05b

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 8 (continued)

- Section 8.4
  - Deleted depleted uranium analysis in secured warehouse
- Section 8.5
  - Included commitment on solution temperature and rate of temperature rise for red oil control (Open Item CS-01 closure)
  - Changed from instrument air to service air and changed the flow rate from 1.3 to 0.92 kg/hr

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 8 (continued)

- Chapter 8 Tables
  - Added CAS number for Hydrogen
  - Added footnote 3 to quantity definition (indicates that these table values are approximate values)
  - Change to the reaction product
  - Uranyl nitrate - updated comment; deleted reference to Note 1
  - Updated discussion on reaction product for water and changed public to IOC
  - Expanded the diluent discussion added footnote identifier
  - Updated Chemical Inventory List and Added TEEL information (sodium sulfite)

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 9

- Section 9.1
  - Editorial - refers to Chapter 10 for Environmental Protection discussions
  - Editorial - remove distinction of minimizing exposure to only site workers and public

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 10

- Editorial
- Section 10.1
  - Revised Waste Acceptance Criteria discussion. Waste stream will now go to the WSB and the chloride concern expressed earlier is not valid at this point.
  - Removed reference to the high alpha waste and depleted uranium streams. WSB is designed to manage the MFFF liquid and solid wastes.
  - Waste Solvents - Deleted level of detail for HP technician actions
  - Chloride streams - Reference to the SRS Effluent Treatment Facility changed to SRS LLW treatment facility
  - Potentially Contaminated Water- Removed leak detection previously identified on the transfer lines
  - Laboratory Waste - "solidified" has been replaced with "will be packaged"
- Section 10.2
  - Deleted "20%" of 10CFR20, Appendix B, Table 2. No specific percent specified.
  - Deleted detail associated with collection of grab samples from the stack

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 11

- Generic to Chapter 11
  - Updated System/Unit Information
    - Replaced Uranium Dissolution Unit with Uranyl Nitrate System
    - Added Solvent Waste Reception (Waste Organic Solvent) Information
    - Revised Depleted Uranium Information
  - Editorial Changes (e.g., IOC Terminology, text and terminology made consistent with other changes)
- Section Chapter 11.1
  - Added/revised descriptive information (i.e., areas, dead loads, structural model description)
  - Added Codes and Standards (i.e., Supplement 1 of ANSI/AISC N690-1994; AWS D1.6 for Structural Welding Code of SS)

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 11

- Section 11.3
  - Updated System/Unit Information
    - Deleted Uranium Dissolution Unit Information
    - Revised through-put (i.e., amount of Cl_2 decreased)
    - Added Solvent Waste Reception (Waste Organic Solvent) Information

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 11 (Cont)

- Section 11.4
  - Revised Text to Reflect Upgraded POE design
  - Added Descriptive Information to VHD Exhaust System
  - Corrected Typo (AMCA-1999 should have been AMCA-99-1986)
  - Corrected Date on Design Basis for Non-Principal SSCs
    - ASHRAE 90.1-1999 corrected to 1989
    - NFPA 90A-1999 corrected to 1996
  - Added Additional Codes and Standards
    - Gloveboxes (i.e., AAWS D1.6-1999, EJMA-1993)
    - Loads and Forces (i.e., AISC N690)
    - Load Combinations and Stress Limit Coefficients (i.e., AISC N 690)

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 11 (Cont)

- Section 11.7
  - Identified Double Wall Pneumatic Transfer Piping in C2 Areas
  - Added Clarification Information for Cranes, Hoists and Lifting Equipment (i.e., maintenance cranes vs overhead cranes)

- Section 11.9
  - Updated System/Unit Information
    - Deleted Uranium Dissolution Unit Information (text and figure)
    - Added Uranyl Nitrate System (text and figure)
    - Added Solvent Waste Reception (Waste Organic Solvent) Information
    - Revised Scavenging Air System (POE related)
    - Added Methane/Argon System to List of Gas Systems

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 11 (Cont)

- Section 11.10
  - Added Clarification Information for Cranes, Hoists and Lifting Equipment (i.e., types, locations)

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 13

- Editorial corrections

DUKE COGEMA
STONE & WEBSTER

Summary of CAR Changes
Chapter 14

- Editorial - clarified language

DUKE COGEMA
STONE & WEBSTER

CAR Revision Review Schedule

- CAR update submitted June 10, 2004
- Construction anticipated in May 2005
- DCS does not anticipate any additional CAR updates
- NRC discussion of anticipated Construction Authorization
  - CAR update review schedule
  - Schedule for closure of remaining open items