



# U.S. DEPARTMENT OF **ENERGY**

## **Planning for Future Disposal of DOE-Owned High-Level Waste and Spent (Used) Nuclear Fuel**

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**EM** *Environmental Management*

safety ♦ performance ♦ cleanup ♦ closure

[www.em.doe.gov](http://www.em.doe.gov)

# Regulatory Framework for EM's Management of HLW and SNF

- Atomic Energy Act provides DOE authority for self-regulation of HLW and SNF at DOE sites
  - Some commercial SNF for which DOE has custody is stored under NRC licenses issued pursuant to 10 CFR Part 72
- Nuclear Waste Policy Act of 1982, Amended 1985 (NWPAA) requires DOE HLW and SNF to be prepared for disposal in a geologic repository
- Office of Civilian Radioactive Waste Management (RW) 1982-2010
  - Established by NWPAA to provide timely disposal of the Nation's nuclear waste in a geologic repository in a manner that protects the health and safety of the public and workers and maintains environmental quality
  - RW developed and maintained Yucca Mountain specific technical requirements documents
  - MOA between EM and RW provided “contract” for acceptance of EM waste forms , including technical and quality assurance requirements



# Regulatory Framework for EM's Management of HLW and SNF

- Public Law 107-200 of 2002 approved development of a repository at Yucca Mountain, Nevada, for disposal of HLW and SNF, pursuant to the NWPA.
- License Application for Yucca Mountain (LA) repository submitted to NRC June 2008, which evaluated
  - EM HLW in borosilicate glass
  - EM SNF in standard canisters, Navy fuel in Navy canisters
  - EM's N-Reactor SNF in Multi-Canister Overpacks (partially)
- DOE withdrawal of LA (February 2010) pending



# Existing Requirements for Managing EM HLW and SNF

- Pursuant to DOE's AEA authority, DOE Orders (and accompanying manuals and guides) provide requirements for management of HLW and SNF
- Applicable DOE Order requirements
  - Safety orders
  - DOE Order 435.1, Radioactive Waste Management (under revision)
    - Currently references RW requirements documents, based on Yucca Mountain repository
  - DOE Order 414.1, Quality Assurance.
- DOE/DOT transportation requirements for shipping SNF and HLW between sites
- Records of decision, consent orders, and agreements with stakeholders for all HLW and SNF intended for disposal in geologic repositories
  - Programmatic Waste Management Environmental Impact Statement
  - Site-specific Environmental Impact Statements
  - Idaho Settlement Agreement
  - Hanford Tri-Party Agreement and Consent Order



# DOE Requirements Document Hierarchy

## Documents that apply to both HLW and SNF:

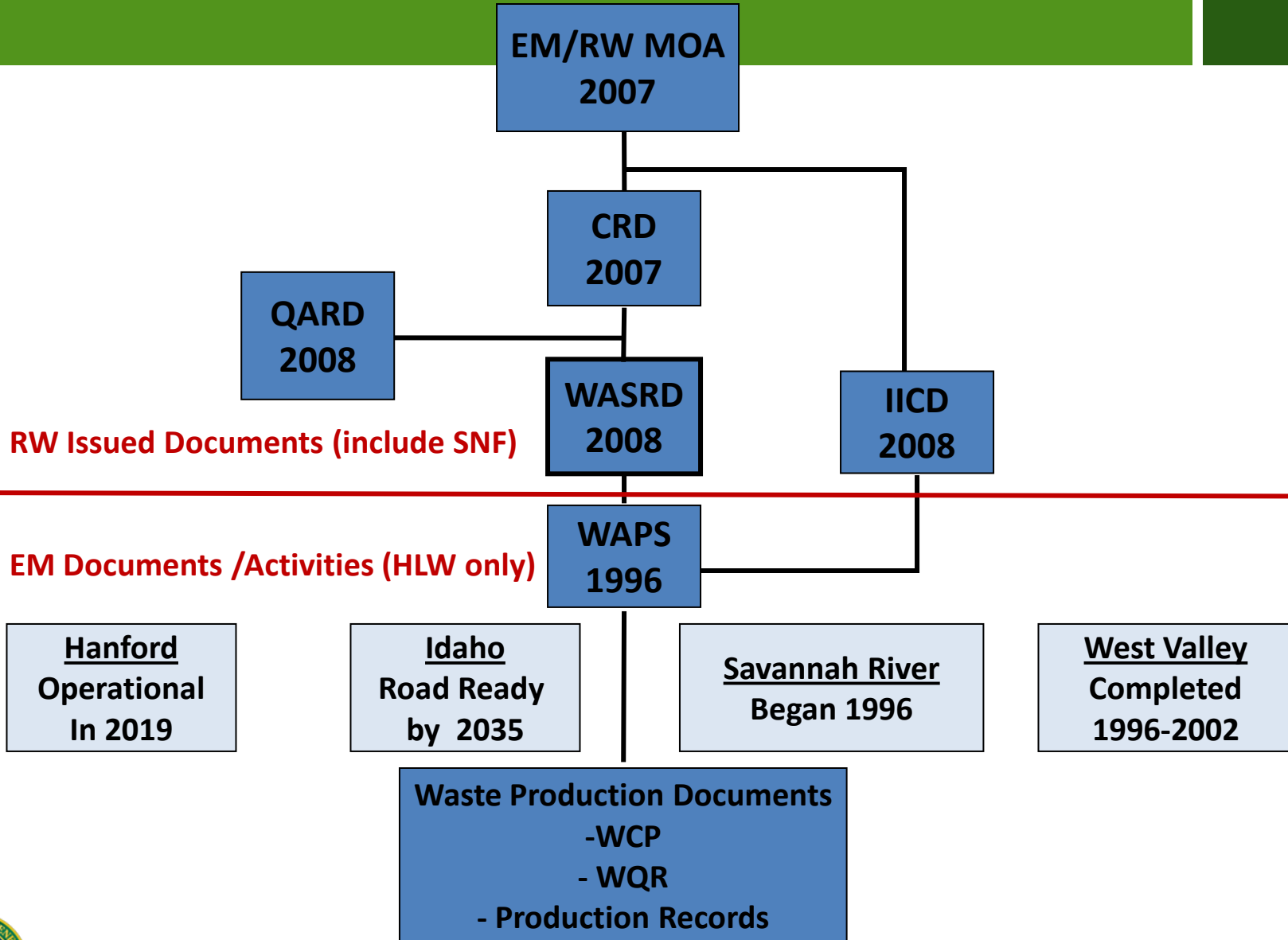
- MOA – Memorandum of Agreement between EM and RW, Feb. 2007
- CRD – Civilian Radioactive Waste Requirements Document, Rev. 8, 2007  
[http://www.energy.gov/media/CRWM\\_System\\_Requirements.pdf](http://www.energy.gov/media/CRWM_System_Requirements.pdf)
- QARD – Quality Assurance Requirements Document, Rev. 20, 2008
- WASRD – Waste Acceptance System Requirements Document, Rev. 5, 2008 (can be found in the LSN under document number DN2002409775)
- IICD – Integrated Interface Control document, Rev 4, 2008  
[http://www.energy.gov/media/CRWM\\_System\\_Requirements.pdf](http://www.energy.gov/media/CRWM_System_Requirements.pdf)
- LA - License Application (not shown in hierarchy)
  - <http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app/yucca-lic-app-safety-report.html>

## Documents that apply only to HLW:

- WAPS – Waste Acceptance Product Specifications, Rev. 2, 1996; update pending
- Site Documents – Waste Form Compliance Plan, Waste Qualification Reports, and others identified in the MOA (Production, Shipping and Storage Records)



# DOE Requirements Document Hierarchy



# Current Direction for Managing

- Continue storage of final HLW forms and canistered SNF in a safe, secure manner under site safety bases pending ability to ship it offsite
- Manage HLW and SNF consistent with current baseline plans, which were developed in concert with RW requirements
- Continue implementing technical requirements previously agreed to with RW
  - MOA, WASRD, IICD for HLW and SNF; WAPS for HLW
- Maintain rigorous configuration control to ensure EM waste forms retain pedigree for future disposal
  - EM QA programs provide oversight
  - Implement QARD, Rev 20 per January 24, 2011, memorandum on EM Interim Policy for Maintaining Integrity of Quality Assurance Program Commitments for Spent Nuclear Fuel/High-Level Waste
  - Continue field site audits, as required by QARD
- Adapt requirements to address other waste forms and to optimize future actions



# EM's Planning Context...

- Yucca Mountain Repository program will not be restored
  - NRC may continue review of the LA and produce a SER document for future reference
- MOA between EM and RW has been overtaken by events
  - Requirements such as repository acceptance planning , waste/SNF transfer arrangements, and payment of repository fees will be revisited in future
- Management requirements must be maintained, such as:
  - Packaging SNF in disposable canisters
  - Limits on free liquids and organic content, canister design requirements for HLW
  - QA programs for both HLW and SNF management activities
- EM is now both issuer, maintainer, and implementer of HLW/SNF management requirements as they pertain to EM wastes and materials



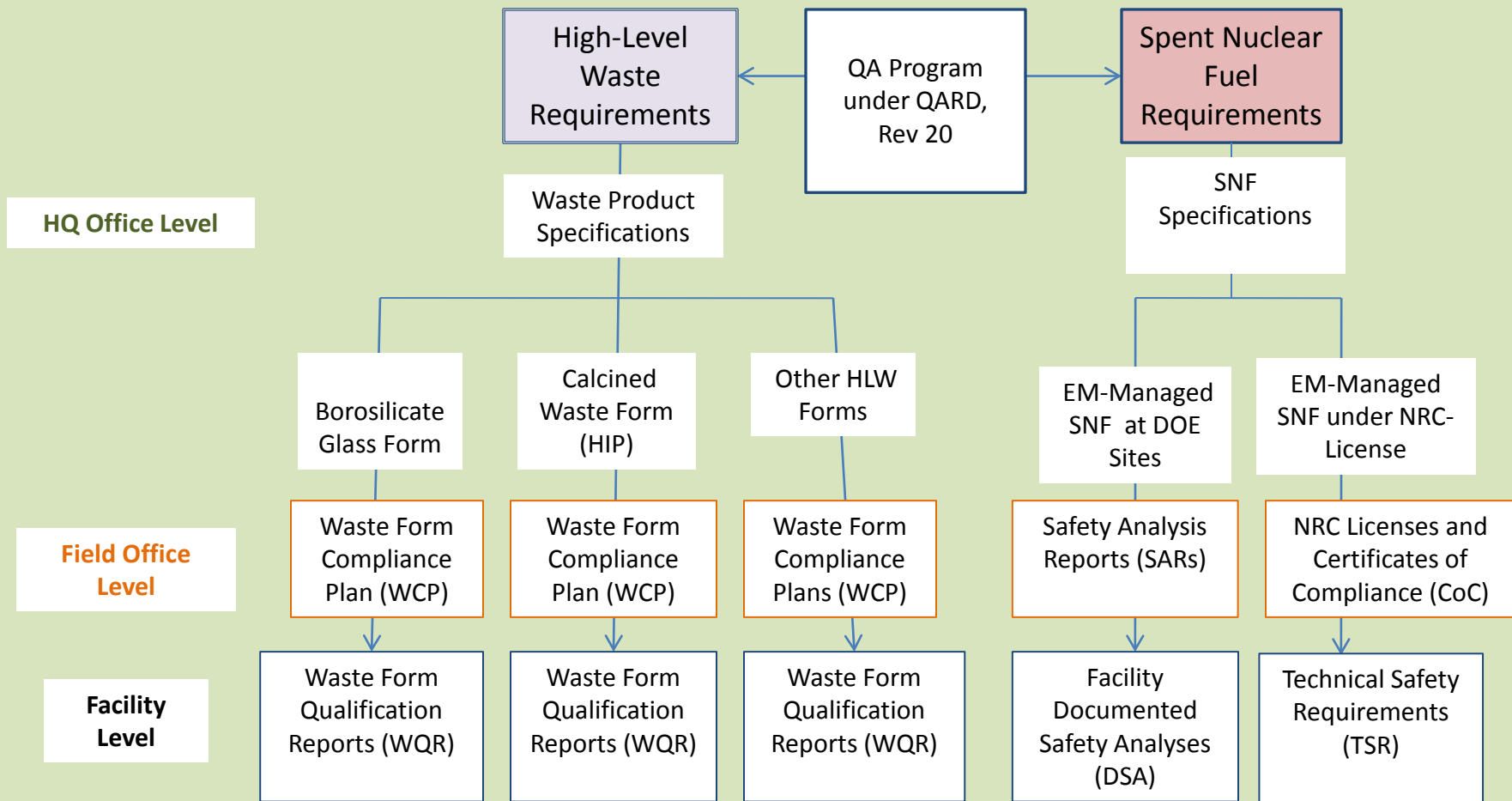


# ...moving forward

- Complete WAPS revision to incorporate the latest RW requirements for HLW
  - WAPS last updated in 1996, and numerous RW documents were revised several times
  - This alignment will “freeze” pedigree of EM waste forms to details of License Application
- Develop requirements for other EM/DOE HLW and SNF forms, as appropriate
- Propose and incorporate revised requirements that support enhance tank waste treatment and SNF management strategies
- Maintain rigorous records management programs to support future repository development efforts
- Pursue delisting of listed HLW/SNF as needed
- Complete revision of DOE O 435.1, HLW chapter
- Continue coordination with other DOE offices, e.g., NE, NR, SC, GC
- Implement DOE policies, including any changes resulting from response to BRC recommendations



# Proposed Program Requirements Flow



# Assumptions Regarding Future Repository

- Geologic repositories will likely be designed to:
  - dispose of the HLW forms and canistered SNF managed by EM
  - accept all DOE-managed materials that require repository disposition
- Require NRC licensing and compliance with regulations for disposal of commercial SNF.
  - Regulations may be generic (10 CFR Part 60) or site-specific (such as 10 CFR Part 63) for Yucca Mountain
  - Regulations will be risk-based; compliance will rely heavily on:
    - Implementing established technical requirements
    - QA oversight program
    - Records management programs
- EPA will have responsibility for establishing environmental standards that require impact analyses of potential radionuclide releases for long time periods
- Transportation system will be the responsibility of a separate organization



# Government Accountability Office & Blue Ribbon Commission Interests

## Government Accountability Office

- Investigated impacts of terminating Yucca Mountain Repository and issued reports that:
  - Addressed impacts of termination on DOE HLW and SNF activities
  - Addressed impacts on the commercial nuclear power industry
  - Proposed alternative uses for the Yucca Mountain site

## Blue Ribbon Commission

- Established by Presidential Memorandum dated January 29, 2010, to evaluate alternatives and make recommendations for storing, processing, and disposal of commercial and defense SNF, HLW, and materials derived from nuclear activities
  - Visited selected DOE sites including the Waste Isolation Pilot Plant in Carlsbad, NM, in January 2011
  - Draft report issued June 30, 2011
  - Final report to be issued in January 2012



# In Closing...

- EM is committed to continued safe management of its HLW and SNF inventories
- We have extensive experience that can be relied upon in development of future repository systems
  - Managing materials and wastes within NRC and DOE regulatory frameworks
  - Transporting SNF between sites
  - Developing and operating geologic repository
- As future fuel cycle, energy production and disposition plans develop, we will adjust program plans as needed
- As EM optimizes its near term plans to treat and/or package and store HLW and SNF, we are likely to propose and implement revised technical requirements...
  - While ensuring safety and security
  - In order to reduce total volumes requiring storage and disposal
  - In order to reduce lifecycle costs and schedule for systems used to prepare HLW and SNF for final disposal and to fulfill compliance commitments

