Overview of Options for Operating HCAN

Nuclear Material System Plan

Eloy Saldivar, Jr.
SRNS EM Operations Program Manager

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Acronyms

- ATR – Advanced Technical Reactor (Idaho)
- AROD – Amended Record of Decision (SNF)
- DRR – Domestic Research Reactor
- FCA – Fast Critical Assembly (Japan)
- FRR – Foreign Research Reactor
- HALEU – High Assay Low Enriched Uranium (Research)
- HCAN – H Canyon
- HFIR – High Flux Isotope Reactor (Oak Ridge)
- ALT HLW – Alternative to High Level Waste (ex: Melter in HCAN)
- LEU – Low Enriched Uranium (TVA)
- MOU – Memorandum of Understanding
- MTR – Material Test Reactor (DRR & FRR)
- NEPA – National Environmental Policy Act
- SNF – Spent Nuclear Fuel
- TRM – Target Residue Material (Canada)
<table>
<thead>
<tr>
<th>DECISION</th>
<th>OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>How fast do you run HCanyon?</td>
<td>Current (5 Dissolutions/yr) vs Accelerated (15 Dissolutions/yr)</td>
</tr>
<tr>
<td>How long do you run HCanyon?</td>
<td>AROD (2024), Dry Storage Validation (2027), HLW System (2030), All Al Clad Fuel (2040)</td>
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<tr>
<td>What feed does HCanyon process?</td>
<td>MTR (Commerce), HFIR (Science), TRM (Canadian HEU), ATR (INL), FCA (NNSA)</td>
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<tr>
<td>What product does HCanyon produce?</td>
<td>LEU (4.95%) vs HALEU (19.75%)</td>
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</table>

* Until Law changed – Ensure High State of Readiness in Perpetuity
Key Points

- U.S. Law states that H Canyon must remain in a high state of readiness and operational, but the Integrated Life Cycle Ultimate H Canyon Shutting Down by 2024.

- H Canyon is the nation's only operating production-scale nuclear chemical separation facility, making it a national asset. ALL DOE offices should be considered during decision making.

- If Canyon is currently the only technically proven disposal path for Spent Nuclear Fuel (SNF) and Excluding M&O, defines EM's responsibility and financial liability for SNF disposition.

Current Mission (EM $200M/yr)

- Approved H Canyon Scope
- DRR/FRD
- L. Basin Diocoritory
- Idaho National Laboratory
- Critical National Needs
  - NNSA (FRD, FCA)
  - Commerce (DOE)
  - HE-URD
  - Science (HFIR)
  - EM (German HEU, Canada LEU)

Potential Future Missions

-集中 National Needs

2024
- Est. Completion of AR00 Campaign

2027
- H Canyon Deactivated, EM Liability

2030
- Last High Level Waste Receipt

2040

2057

Material At Risk If Dry Storage Is Unsuccessful

Rate of Production (Can Generate First NTR)

- $200 million = $12 billion
- Per Year = Life Cycle

Other Decisions

- What feed to process?
  - MTR
  - HFIR
  - TRA
  - ATR
  - FCA

- What product?
  - LEU
  - HALFUE

Key Decisions

- How fast/long does it run?
  - Slow/Flat Funding
  - Accelerated (Full) Operations
    - Option 1 Through AR00 (2024)
    - Option 2 Through Dry Storage (2027)
    - Option 3 Through All SNF Processing (2040)
# COMPARISON OF OPTIONS

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>AROD (2024)</th>
<th>Dry Storage (2027)</th>
<th>HLW (2030)</th>
<th>All SNF (2040)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNF Processing</td>
<td>Stop Dissolution 2024. 2,000 MTR Bundles / 200 HFIR Cores Remain in L-Basin</td>
<td>Stop Dissolution 2027. 1,000 MTR Bundles / 120 HFIR Cores Remain in L-Basin</td>
<td>Stop Dissolution 2030. 500 Bundles / 115 Cores Remain in L-Basin</td>
<td>ALL SNF Processed. No Remaining Bundles or Cores</td>
</tr>
<tr>
<td>Annual Funding</td>
<td></td>
<td>A. $234M/Yr.</td>
<td>A. $234M/Yr.</td>
<td>A. $234M/Yr.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. $270M/Yr.</td>
<td>B. $270M/Yr.</td>
<td>B. $270M/Yr.</td>
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<td>Waste Management</td>
<td>No Alternative HLW Required</td>
<td>No Alternative HLW Required</td>
<td>No Alternative HLW Required</td>
<td>Alternative HLW post 2030, $820M</td>
</tr>
<tr>
<td>Long Term Storage</td>
<td>Dry Storage required after 2024, $1.3B</td>
<td>Dry Storage required after 2027, $845M</td>
<td>Dry Storage required after 2030, $260M</td>
<td>No Dry Storage required</td>
</tr>
<tr>
<td>Duration of Operation</td>
<td>2059 ²</td>
<td>2059 ²</td>
<td>2059 ²</td>
<td>2040</td>
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</tbody>
</table>

1 $350M/Yr. includes Alternative HLW and Processing.
2 EM ILCE assumption date for removal of Dry SNF and shipment to the repository.

*DOE has formed an Integrated Project Team to evaluate these and other options.