Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 24 Boiling Water Reactor Disposal Container, with Thick Absorber Plates

Level 4: N/A

Level 3: Outer Barrier

Level 5: N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the uncanistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The outer barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

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Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 24 Boiling Water Reactor Disposal Container, with Thick Absorber Plates

Level 4: N/A

Level 3: Outer Barrier

Level 5: N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4:** N/A

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Associated filler and criticality control materials maintain the waste package in a subcritical configuration during storage, emplacement and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The associated filler and criticality control material mitigates design basis events which have the potential to reconfigure the SNF.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure of the associated filler and criticality control material could result in a release of radioactive material.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The associated filler and criticality control material is part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials will be selected that will not impact the site characteristics.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4: N/A**

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

The associated filler and criticality control material performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

The associated filler and criticality control material performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of the associated filler and criticality control material would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety or waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

The associated filler and criticality control material does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

The associated filler and criticality control material does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4:** N/A

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The associated filler and criticality control material has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

The associated filler and criticality control material is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4: N/A**

Level 3: Basket **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

Various important to radiological safety functions are performed by the basket within the waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the fuel assemblies inside the disposal container, transferring heat from the assemblies to the inner barrier, maintaining fuel geometry, and reducing criticality potential.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

This SSC will help mitigate several design basis events including those events which involve collision/crushing where the SNF assembly supports and basket will help maintain the integrity of the fuel assemblies. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Direct failure of the basket could effect the fuel assembly geometry which could lead to a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The Waste Package Basket is part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4: N/A**

Level 3: Basket **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

The WP Basket performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

The WP Basket performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates

Level 4: N/A

Level 3: Basket

Level 5: N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package Basket has no function relating to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates

Level 4: N/A

Level 3: Inner Barrier

Level 5: N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The inner barrier provides for containment of radioactive material contained in, or external to, the uncanistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The inner barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The inner barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates — **Level 4:** N/A

Level 3: Inner Barrier — **Level 5:** N/A

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4:** N/A

Level 3: Inner Barrier **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package inner barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates

Level 4: N/A

Level 3: Outer Barrier

Level 5: N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the uncanistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The outer barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container, with Absorber Plates **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates **Level 4:** N/A

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Associated filler and criticality control materials maintain the waste package in a subcritical configuration during storage, emplacement and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The associated filler and criticality control material mitigates design basis events which have the potential to reconfigure the SNF.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure of the associated filler and criticality control material could result in a release of radioactive material.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The associated filler and criticality control material is part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials will be selected that will not impact the site characteristics.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates **Level 4: N/A**

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

The associated filler and criticality control material performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

The associated filler and criticality control material performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of the associated filler and criticality control material would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety or waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

The associated filler and criticality control material does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

The associated filler and criticality control material does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates **Level 4:** N/A

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The associated filler and criticality control material has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

The associated filler and criticality control material is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Basket

Level 5: N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

Various important to radiological safety functions are performed by the basket within the waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the fuel assemblies inside the disposal container, transferring heat from the assemblies to the inner barrier, maintaining fuel geometry.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

This SSC will help mitigate several design basis events including those events which involve collision/crushing where the SNF assembly supports and basket will help maintain the integrity of the fuel assemblies. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Direct failure of the basket could effect the fuel assembly geometry which could lead to a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

The Waste Package Basket is part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Basket

Level 5: N/A

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

The WP Basket performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

The WP Basket performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Basket

Level 5: N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package Basket has no function relating to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates **Level 4:** N/A

Level 3: Inner Barrier **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

The inner barrier provides for containment of radioactive material contained in, or external to, the uncanistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

The inner barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

The inner barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Inner Barrier

Level 5: N/A

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Inner Barrier

Level 5: N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package inner barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Outer Barrier

Level 5: N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the uncanistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

The outer barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP01 - Uncanistered SNF Disposal Containers

SSC: 44 Boiling Water Reactor Disposal Container. No Absorber Plates

Level 4: N/A

Level 3: Outer Barrier

Level 5: N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Associated filler and criticality control materials maintain the waste package in a subcritical configuration during storage, emplacement and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The associated filler and criticality control material mitigates design basis events which have the potential to reconfigure the SNF.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure of the associated filler and criticality control material could result in a release of radioactive material.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The associated filler and criticality control material is part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials will be selected that will not impact the site characteristics.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of the associated filler and criticality control material would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety or waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material does not perform an accountability function.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4:** N/A

Level 3: Associated Filler and Criticality Control Materials (if needed) **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** **Rationale:**

The associated filler and criticality control material is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** **Rationale:**

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:
The inner barrier provides for containment of radioactive material contained in, or external to, the canistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:
The inner barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:
Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:
The inner barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:
It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package inner barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the canistered SNF.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The outer barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4:** N/A

Level 3: Outer Barrier **Level 5:** N/A

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ Yes? Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ Yes? Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ Yes? Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ Yes? Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ Yes? Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP02 - Canistered SNF Disposal Containers

SSC: Boiling Water Reactor Disposal Container **Level 4:** N/A

Level 3: Outer Barrier **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4:** N/A

Level 3: Canister Support **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

Various important to radiological safety functions are performed by the canister support within the DHLW waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the DOE fuel assemblie canister inside the disposal container, transferring heat to the inner barrier, and maintaining canister geometry.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The canister support will help mitigate several design basis events including those events which involve collision/crushing where the canister supports help maintain the integrity of the DHLW and DOE fuel canisters. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its support function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Canister Support **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Canister Support **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The canister support has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Center Canister **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

Various important to radiological safety functions are performed by the Center Canister within the DHLW waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the fuel assemblies inside the canister, transferring heat from the assemblies to the inner barrier, maintaining fuel geometry, and reducing criticality potential.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

This SSC will help mitigate several design basis events including those events which involve collision/crushing where the DOE canister will help maintain the integrity of the fuel assemblies. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☐ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Center Canister **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Center Canister **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The center canister has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The inner barrier provides for containment of radioactive material contained in, or external to, the DHLW co-disposal containers.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The inner barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

The inner barrier forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4:** N/A

Level 3: Inner Barrier **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package inner barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the DHLW co-disposal container.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ Yes? Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ Yes? Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ Yes? Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ Yes? Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ Yes? Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ Yes? Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ Yes? Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ Yes? Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Canister Support **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

Various important to radiological safety functions are performed by the canister support within the DHLW waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the fuel assemblies canisters inside the disposal container, transfering heat to the inner barrier, and maintaining fuel canister geometry.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The canister support will help mitigate several design basis events including those events which involve collision/crushing where the canister supports help maintain the integrity of the DHLW and DOE fuel canisters. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its support function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Canister Support **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ Yes? Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ Yes? Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ Yes? Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ Yes? Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ Yes? Rationale:

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Canister Support **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The canister support has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4:** N/A

Level 3: Center Canister **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

Various important to radiological safety functions are performed by the center canister within the DHLW waste package during packaging, storage, emplacement, and retrieval. These include; providing stability for the fuel assemblies inside the canister, transferring heat from the assemblies to the inner barrier, maintaining fuel geometry, and reducing criticality potential.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The center canister will help mitigate several design basis events including those events which involve collision/crushing where the DOE SNF canister supports and basket will help maintain the integrity of the fuel assemblies. This SSC will also mitigate the effects of external events including seismic activity.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Center Canister **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Center Canister **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The center canister has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Inner Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☐	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The inner barrier provides for containment of radioactive material contained in, or external to, the DHLW co-disposal containers.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The inner barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4:** N/A

Level 3: Inner Barrier **Level 5:** N/A

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☐ **Yes?** **Rationale:**

This SSC does not perform an accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4:** N/A

Level 3: Inner Barrier **Level 5:** N/A

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package inner barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The outer barrier provides for containment of radioactive material contained in, or external to, the DHLW co-disposal container.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

The outer barriers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP03 - High Level Waste Disposal Containers

SSC: 5 DHLW Co-Disposal Hanford Disposal Container **Level 4: N/A**

Level 3: Outer Barrier **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Waste package outer barrier has no function relating to minimizing personnel radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.2 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Aluminum Based Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Aluminum Based Fuel Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Aluminum Based Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Aluminum Based Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The aluminum based fuel disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Disrupted Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Disrupted Fuel Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Disrupted Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Disrupted Fuel Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The disrupted fuel disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Intact Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Intract Oxide Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Intact Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Intact Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The intact oxide disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Thorium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ Yes? Rationale:

The Thorium Oxide Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Thorium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Thorium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ Yes? Rationale:

The Thorium Oxide disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ Yes? Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ Yes? Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Carbide Disposal Container **Level 4:** N/A

Level 3: N/A **Level 5:** N/A

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

The Uranium Carbide Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Carbide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** **Rationale:**

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Carbide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Uranium Carbide disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Metal and Alloy Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

The Uranium metal and Alloy Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Metal and Alloy Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** **Rationale:**

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** **Rationale:**

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** **Rationale:**

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** **Rationale:**

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** **Rationale:**

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Metal and Alloy Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Uranium Metal and Alloy disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☑ **Yes?** Rationale:

The Uranium Oxide Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ **Yes?** Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ **Yes?** Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ **Yes?** Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ **Yes?** Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ Yes? Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ Yes? Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ Yes? Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ Yes? Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ Yes? Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Uranium Oxide Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Uranium Oxide disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Zirconium Hydride Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-1	QA-2	QA-3	QA-4	QA-5	QA-6	QA-7	Non-Q
☑	☑	☐	☐	☐	☑	☐	☐

QA-1 - Important to Radiological Safety:

1.1 Is the SSC required to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the federal limits?

☐ Yes? Rationale:

The Zirconium Hydride Disposal Container provides for containment of radioactive material. Various important to radiological safety functions are performed by this SSC during packaging, storage, emplacement, and retrieval.

1.2 Is the SSC required to function to prevent, mitigate, or monitor a credible Design Basis Event which would otherwise result in a radioactive release above the federal limits?

☑ Yes? Rationale:

These disposal containers are required to mitigate design basis events since it must continue to perform its containment function at all times.

1.3 Will the direct failure of the SSC result in a credible Design Basis Event which would lead to a radioactive release above the federal limits?

☑ Yes? Rationale:

Failure to perform its containment function could result in a radioactive release above the federal limits.

QA-2 - Important to Waste Isolation:

2.1 Does the SSC perform a waste isolation function by forming part of the natural or engineered barriers?

☑ Yes? Rationale:

This SSC forms part of the engineered barrier.

2.2 Can direct failure of the SSC significantly affect the hydrological, geochemical, or geomechanical characteristics of the natural or engineered barriers which may prevent them from performing their waste isolation function?

☐ Yes? Rationale:

It is expected that materials used in this SSC will be selected such that they will not impact the characteristics of the natural or engineered barriers.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Zirconium Hydride Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-3 - Important to Radioactive Waste Control:

3.1 Is the function of the SSC designed for collection, containment, and/or monitoring of site-generated radioactive waste?

☐ **Yes?** Rationale:

This SSC performs no site-generated radioactive waste control function.

QA-4 - Important to Fire Protection:

4.1 Does the SSC protect QA-1 or QA-2 SSCs from the effects of fire?

☐ **Yes?** Rationale:

This SSC performs no fire protection function.

QA-5 - Important to Potential Interaction:

5.1 As a result of a Design Basis Event, could failure of the SSC impair the capability of QA-1 or QA-2 SSCs from performing their radiological safety or waste isolation function?

☐ **Yes?** Rationale:

Failure of this SSC would not impact or impair a QA-1 or QA-2 SSC from performing its radiological safety of waste isolation function.

QA-6 - Important to Physical Protection of Facility and Materials:

6.1 Does the SSC's function provide detection or alarm of unauthorized intrusion or unauthorized explosive materials in the restricted area?

☐ **Yes?** Rationale:

This SSC does not perform a physical protection function.

6.2 Is the SSCs function required for special nuclear material accountability?

☑ **Yes?** Rationale:

This SSC provides identification of individual waste packages and their contents for a material accountability function.

Q-List Questions

SDD: WP04 - DOE Waste Forms Disposal Containers

SSC: Zirconium Hydride Disposal Container **Level 4: N/A**

Level 3: N/A **Level 5: N/A**

QA-7 - Important to Occupational Radiological Exposure:

7.1 Does the SSC provide personnel radiation shielding, reduce dose rates in radioactive areas, or require personnel access into radiation areas by its own radioactive source term?

☐ **Yes?** Rationale:

The Zirconium Hydride disposal container has no functions related to minimizing radiological exposure.

7.2 Is the SSC a permanently installed radiation monitor which monitors areas for personnel radiation protection?

☐ **Yes?** Rationale:

This SSC is not a radiation monitor.

Previous QA Classification:

This question is for historical and traceability purposes only. A "yes" answer to this question does not provide inclusion to the Q-List

8.0 Are there other factors, such as previous analyses, a body of consensus, or by direct inclusion, that led to the previous conclusion that this SSC is important to radiological safety (QA-1) or waste isolation (QA-2)?

☑ **Yes?** Rationale:

This SSC is contained on the Q-List by direct inclusion for the Waste Package, SSA 2.1 Spent Fuel, as QA-1.

Interoffice Correspondence

Civilian Radioactive Waste Management System
Management & Operating Contractor

TRW Environmental
Safety Systems Inc.

WBS: 1.2.1
QA: N/A

Subject	Date	From
Distribution of the MGDS SDD Identification List and Draft Summaries	February 21, 1997 LV.RIC.KRH.02/97-011	M. Sam Rindskopf
To	**cc**	**Location/Phone**
Distribution	RPC = 73 pages	TES3/423 702.295.3943

Enclosed is the Mined Geologic Disposal System (MGDS) System Description Document (SDD) Identification List, Revision 0, dated 12/03/96. This list identifies the SDDs that will be developed by the Management & Operating Contractor (M&O). The list was coordinated within Engineering and Integration (E&I) Operations among Sam Rindskopf, Hugh Benton, and Kalyan Bhattacharyya, and approved by both Richard Wagner and Alden Segrest. The purpose of this list is to provide coordination and communication among the organizations within the E&I Operations. Changes to this list will require the same coordination and approval as Revision 0. Please contact Barry Thom at (702) 295-3952 to initiate change coordination.

Also enclosed is the current working drafts of the SDD Draft Summaries. These drafts represent work in progress and are being distributed to provide a single point summary of the scope of each SDD. The draft summaries were developed jointly among the cognizant E&I Operations' organizations. Changes to these draft summaries will require coordination among the impacted E&I Operations' organizations. Again, please contact Barry Thom at (702) 295-3952 to initiate change coordination for the draft summaries.

MSR/KRH:ddh

Enclosures:
(1) MGDS Description Document
(2) System Description Document

Distribution w/encl:
J. Bailey, M&O, Las Vegas, Nevada, SUM1/423
K. Beall, M&O, Las Vegas, Nevada, SUM1/423
H. Benton, M&O, Las Vegas, Nevada, SUM1/423
K. Bhattacharyya, M&O, Las Vegas, Nevada, SUM1/423
C. Chagnon, M&O, Las Vegas, Nevada, SUM1/423
V. Dulock, M&O, Las Vegas, Nevada, SUM1/423
K. Harbert, M&O, Las Vegas, Nevada, SUM1/423
R. Howard, M&O, Las Vegas, Nevada, SUM1/423
F. Lane, M&O, Las Vegas, Nevada, SUM1/423
D. McKenzie, M&O, Las Vegas, Nevada, SUM1/423
S. Meyers, M&O, Las Vegas, Nevada, SUM1/423
A. Segrest, M&O, Las Vegas, Nevada, SUM1/423
R. Snell, M&O, Las Vegas, Nevada, SUM1/423
D. Stahl, M&O, Las Vegas, Nevada, SUM1/423
B. Stanley, M&O, Las Vegas, Nevada, SUM1/423
J. Teal, M&O, Las Vegas, Nevada, SUM1/423
R. Wagner, M&O, Las Vegas, Nevada, SUM1/423

Distribution w/out encl:
M. Sellers, M&O, Las Vegas, Nevada, SUM1/423
G. Sequiera, M&O, Las Vegas, Nevada, SUM1/423
B. Thom, M&O, Las Vegas, Nevada, SUM1/423

Civilian Radioactive Waste Management System
Management & Operating Contractor

Mined Geologic Disposal Systems Description Document (SDD)

Identification List

Rev 0

December 3, 1996

Prepared for :

U.S. Department of Energy
Yucca Mountain Site Characterization Project
P. O. Box 98608
Las Vegas, Nevada 89193-8608

Prepared by:

TRW Environmental Safety Systems Inc.
101 Convention Center Drive
Las Vegas, Nevada 89109

Under Contract Number
DE-AC01-91RW00134

Civilian Radioactive Waste Management System
Management & Operating Contractor

Mined Geologic Disposal Systems Description Document (SDD)

Identification List

Rev 0

December 3, 1996

Approved by:

R. C. Wagner, System Engineering Manager
System Engineering

12/6/96
Date

A. M. Segrest, Engineering Design Manager
Engineering Design

12/5/96
Date

SDD IDENTIFICATION LIST CONCURRENCE SHEET

M. S. Rindskopf — Date 12/5/96
MGDS Systems Engineering Requirements

C.B. Thom

H. A. Benton — Date 12/4/96
Waste Package Design

C. Chagnon

K. K. Bhattacharyya — Date 12/6/96
Repository Design

S. J. Meyers 12-4-96

D. G. Mckenzie

Purpose

The purpose of the MGDS System Description Document (SDD) Identification List is to identify SDDs that will be developed by the M&O. The concurrence and approval of this list is necessary to ensure the various engineering organizations are working, planning, budgeting, and scheduling activities in an integrated and timely fashion. Systems selected to be represented by SDDs are identified in this initial list and will be used for advancing the conceptual designs into preliminary design and eventually into a licenseable repository design. These systems are integral parts of the MGDS and will be designed to meet the safety, performance, and regulatory requirements defined by criteria established in the SDDs and traceable from the MGDS requirements document. This list defines the systems currently identified in the conceptual design of the MGDS and will updated and modified as the design matures.

SYSTEM DESCRIPTION DOCUMENT LIST (ORGANIZED BY SYSTEM GROUPS)

MGDS Element

MGDS Site Layout (Bin1)

Carrier/Cask Shipping & Receiving Systems Group

Carrier Staging Shed System (Bin 2)
Carrier Staging Shed Material Handling System (Bin 2)
Carrier/Cask Transport System (Bin 1)

Waste Preparation Systems Group

Waste Handling Facility System (Bin 2)
Waste Handling Facility Electrical System (Bin 2)
Waste Handling Facility Fire Protection System (Bin 2)
Waste Handling Facility Radiological Monitoring System (Bin 2)
Waste Handling Facility Ventilation System (Bin 2)
Cask/Canister Handling System (Bin 3)
Uncanistered Waste Transfer System (Bin 3)
Canistered Waste Transfer System (Bin 3)
Disposal Container Handling System (Bin 3)
Waste Package Remediation System (Bin 3)

Waste Emplacement & Retrieval Systems Group

Subsurface Facility System (Bin 2)
Subsurface Safety and Monitoring System (Bin 2)
Ground Control System (Bin 3)
Waste Emplacement System (Bin 3)
Subsurface Ventilation System (Bin 3)
Backfill Emplacement System (Bin 3)
Waste Retrieval System (Bin 3)
Subsurface Emplacement Transportation System (Bin 2)
Subsurface Closure & Seal System (Bin 3)

Subsurface Utility Systems Group

Subsurface Electrical Distribution System (Bin 2)
Subsurface Lighting System (Bin 1)
Subsurface Water Collection/Removal System (Bin 1)
Subsurface Fire Suppression System (Bin 2)

Subsurface Water Distribution System (Bin 1)
Subsurface Compressed Air System (Bin 1)

Waste Treatment System Group

Radiological Waste Treatment Facility System (Bin 2)
Site-Generated Radiological Waste Handling System (Bin 2)
Radiological Waste Treatment Facility Ventilation System (Bin 2)

Waste Isolation System Group

Engineered Barrier System (Bin 3)
Uncanistered SNF Disposal Container (Bin 3)
Canistered SNF Disposal Container (Bin 3)
High Level Waste Disposal Container (Bin 3)
DOE Waste Forms Disposal Container (Bin 3)
Performance Confirmation System (Bin 3)

U.G. Development System Group

Subsurface Excavation System (Bin 2)
Muck Handling System (Bin 1)

Utility Systems Group

Site Electrical Power System (Bin 2)
Site Water System (Bin 2)
Site Communications System (Bin 2)
Off-Site Utilities System (Bin 1)
Site Compressed Air System (Bin 1)

Safety and Security Systems Group

Security and Safeguards System (Bin 2)
Emergency Response System (Bin 2)
Health Safety System (Bin 1)
Surface Environmental Monitoring System (Bin 2)

Management & Administration Systems Group

Central Command & Control Operations System (Bin 1)
Maintenance & Supply System (Bin 1)
Administration System (Bin 1)

Subsurface Operational Monitoring System (Bin1)

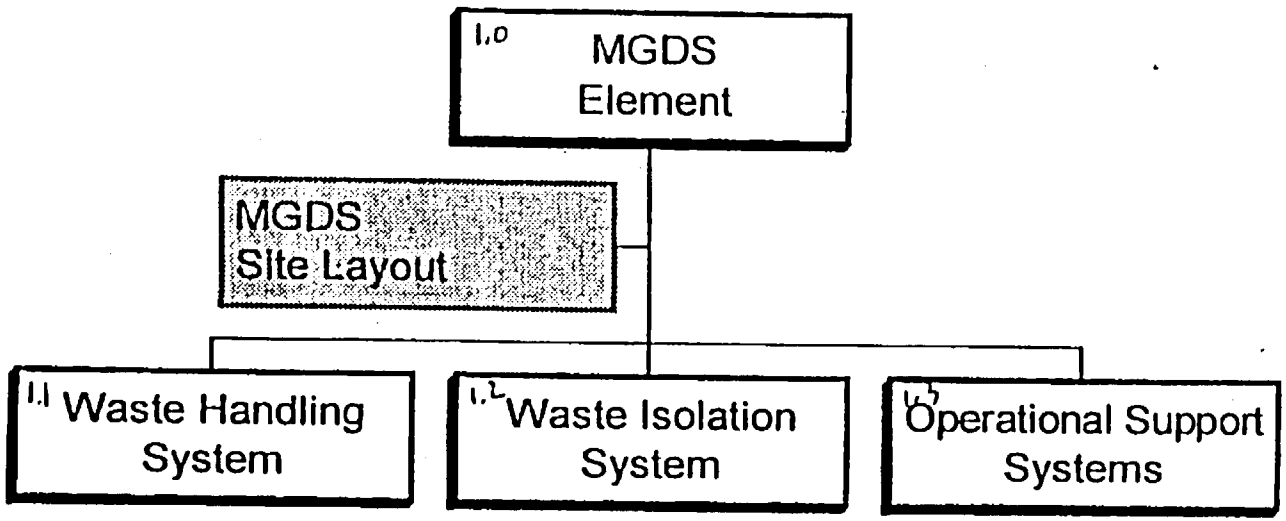
Transportation Systems Group

General Site Transportation System (Bin 1)
Off-site Rail and Road System (Bin 1)
Subsurface Development Transportation System (Bin 1)

Non-Radiological Waste System Group

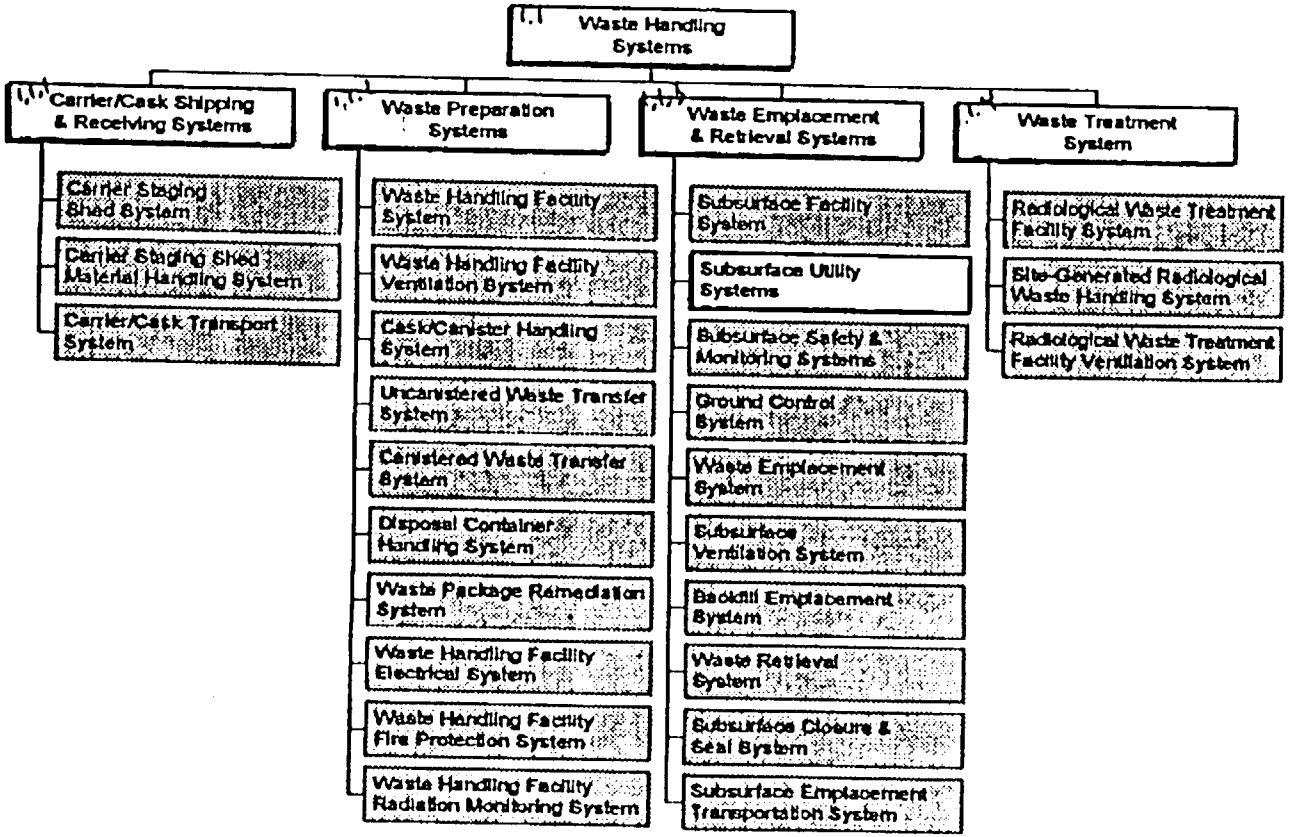
Site-Generated Hazardous & Nonhazardous Waste Disposal System (Bin 1)

MGDS
SDD Organization



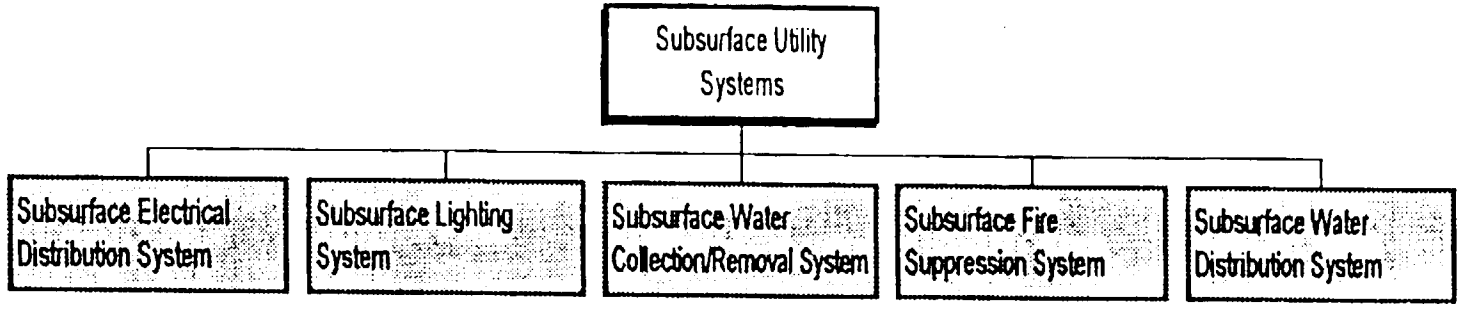
Note: Shaded Boxes are SDDs

Waste Handling System
SDD Organization



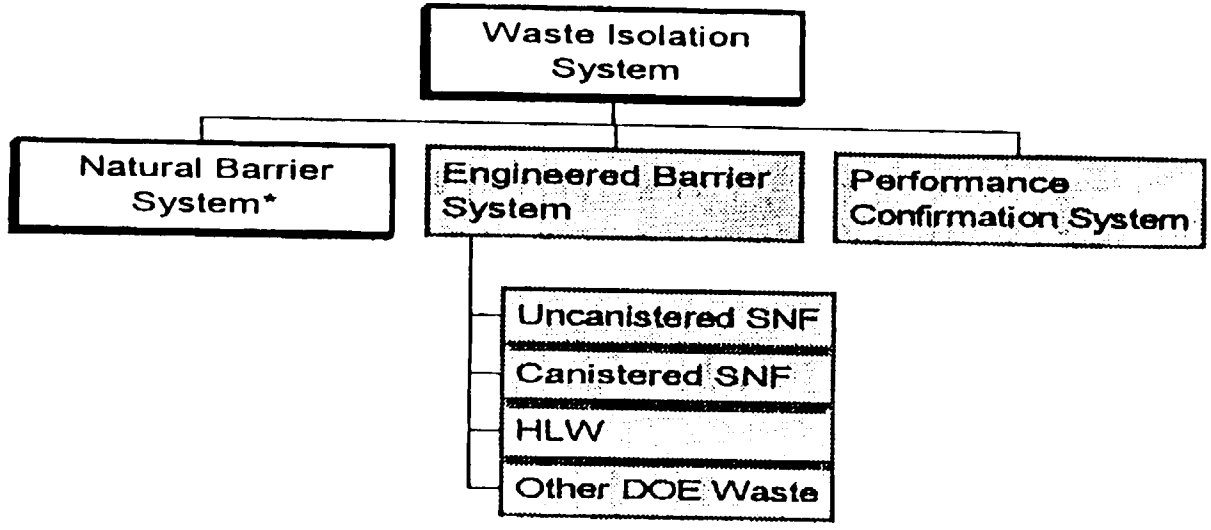
Note: Shaded Boxes are SDDs

Subsurface Utility System
SDD Organization



Note: Shaded Boxes are SDDs

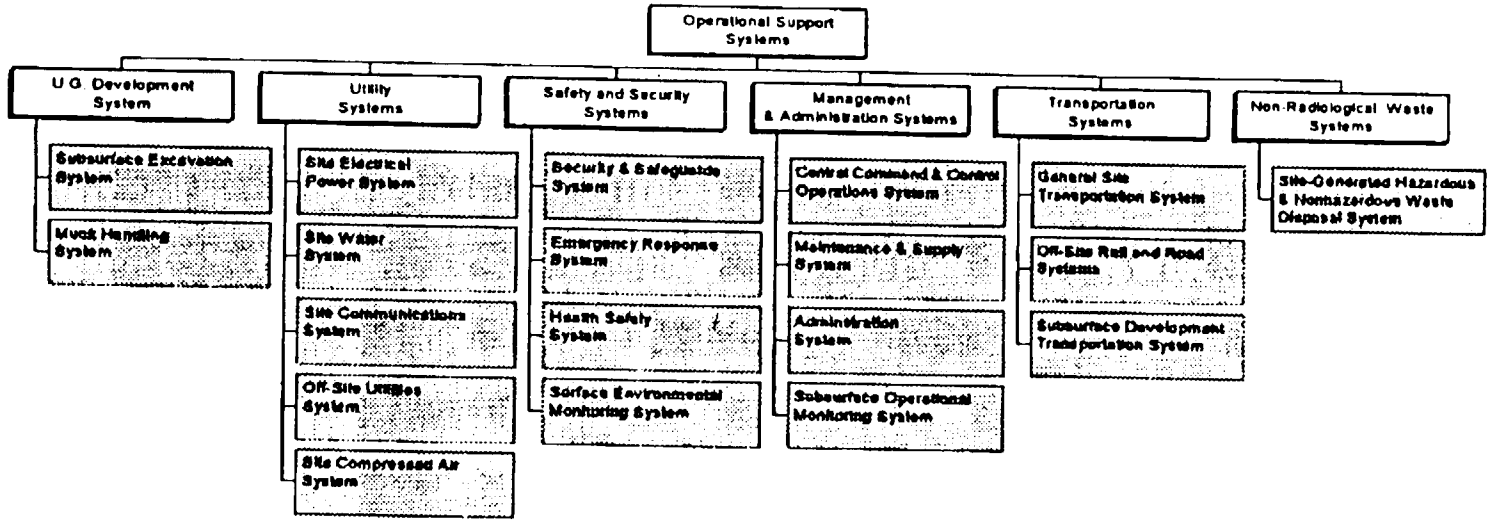
Waste Isolation System
SDD Organization



Note: Shaded Boxes are SDDs

* Natural Barrier Description Document

Operational Support Systems
SDD Organization



Note: Shaded Boxes are SDDs

SYSTEM DESCRIPTION DOCUMENTS (SDD)

DRAFT SUMMARIES

(Unapproved)

14 February 1997

Group	System
MGDS Element	MGDS Site Layout
Carrier/Cask Shipping & Receiving Systems Group	Carrier Staging Shed System
	Carrier Staging Shed Material Handling System
	Carrier/Cask Transport System
Waste Preparation Systems Group	Waste Handling Facility System
	Waste Handling Facility Electrical System
	Waste Handling Facility Fire Protection System
	Waste Handling Facility Radiological Monitoring System
	Waste Handling Facility Ventilation System
	Cask/Canister Handling System
	Uncanistered Waste Transfer System
	Canistered Waste Transfer System
	Disposal Container Handling System
	Waste Package Remediation System
Waste Emplacement & Retrieval Systems Group	Subsurface Facility System
	Subsurface Safety and Monitoring System
	Ground Control System
	Waste Emplacement System
	Subsurface Ventilation System
	Backfill Emplacement System
	Waste Retrieval System
	Subsurface Emplacement Transportation System
	Subsurface Closure & Seal System
Subsurface Utility Systems Group	Subsurface Electrical Distribution System
	Subsurface Lighting System
	Subsurface Water Collection/Removal System
	Subsurface Fire Suppression System
	Subsurface Water Distribution System
	Subsurface Compressed Air System
Waste Treatment System Group	Radiological Waste Treatment Facility System
	Site-Generated Radiological Waste Handling System
	Radiological Waste Treatment Facility Ventilation System
Waste Isolation System Group	Engineered Barrier System
	Uncanistered SNF Disposal Container
	Canistered SNF Disposal Container
	High Level Waste Disposal Container
	DOE Waste Forms Disposal Container
	Performance Confirmation System
U.G. Development System Group	Subsurface Excavation System
	Muck Handling System
Utility Systems Group	Site Electrical Power System
	Site Water System
	Site Communications System
	Off-Site Utilities System
	Site Compressed Air System
Safety and Security Systems Group	Security and Safeguards System
	Emergency Response System
	Health Safety System
	Surface Environmental Monitoring System
Management & Administration Systems Group	Central Command & Control Operations System
	Maintenance & Supply System
	Administration System
	Subsurface Operational Monitoring System
Transportation Systems Group	General Site Transportation System
	Off-site Rail and Road System
	Subsurface Development Transportation System
Non-Radiological Waste System Group	Site-Generated Hazardous & Non- hazardous Waste Disposal System

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU01A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

MGDS Site Layout

Summary

The MGDS Site Layout encompasses the topography and incorporates the necessary civil engineering required to support the arrangement of the surface repository facilities and systems for safe and efficient operations. The site is organized around the subsurface accesses, and is configured considering owner and radiological exposure boundaries, flood/fault zones, and meteorological patterns. In addition, it supports surface and subsurface operations and the required facility and transportation arrangements.

The site identification and layout meets the siting criteria identified in the regulations and supports the long term waste isolation objectives. The system layout is designed to maximize preclosure radiological safety for the transportation and handling of radiological waste. The integrated layout of radiological and support facilities provides maximum efficiency for the MGDS operations and while minimizing environmental impacts. The site layout and boundaries meet requirements for prevention of accidental radiological release to the public. The site layout is designed to limit the impacts to the waste handling operations and long term isolation performance caused by worst case environmental conditions.

The MGDS Site Layout interfaces with the MGDS facilities for their location and layout features. The system interfaces with the Site Security and Safeguards System for the locations of security fences, access gates, and surveillance systems. The system interfaces with the Off-Site Rail and Road System and General Site Transportation System for controlling the flow of personnel materials and waste shipments to and within the site.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU05A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Carrier Staging Shed System

Summary

The Carrier Staging Shed System facilitates the preparation of a waste transportation cask for entering the waste handling facilities or for leaving the repository. This system is located on the surface at the north portal pad and will house the equipment and support systems required for receipt/dispatch of transportation casks, removal/installation of personnel barriers and impact limiters, inspection of transportation casks, and staging carriers awaiting transfer to other repository facilities or off-site. This system must provide the civil structure and several subsystems, including power distribution, commercial grade HVAC, radiological monitoring, fire protection and detection, compressed air, water distribution, communications, local monitoring and control, local security, and sanitary waste collection.

The Carrier Staging Shed System must provide adequate area for transportation cask preparation and staging activities. This system must also provide a structure commensurate with the expected service loads and natural phenomena hazards such as earthquakes, winds, and flooding. Due to the nature of the operations to be conducted by the Carrier Staging Shed System, radiological confinement features are not expected to be required.

The Carrier Staging Shed System interfaces with the site provided utilities. This system also interfaces with the safeguards and security system for the transportation of nuclear materials, the Carrier/Cask Transport System for the road and rail bed that is used to move the casks and carriers over, and the waste handling facilities for the proper staging of casks to be processed or returned to service.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU08A.WPD
SYSTEM DESIGN DESCRIPTION

Carrier Staging Shed Material Handling System

Summary

The Carrier Staging Shed Material Handling System prepares waste transportation casks and their carriers for entering the waste handling facilities or for leaving the repository. This system is located within the Carrier Staging Shed structure. The primary functions performed by the Carrier Staging Shed Material Handling System before a cask enters the waste handling facilities include removing the personnel barriers from the carriers, performing a radiological survey to determine if contamination on the transportation cask surface exceeds allowable limits, decontaminating if necessary, removing or retracting the impact limiters, and staging the carrier until the waste handling facilities are ready to receive the transportation cask. The primary functions performed by the Carrier Staging Shed Material Handling System before a cask exits the repository include reinstalling the impact limiters, reinstalling the personnel barriers, and staging the carrier until it can be moved from the Carrier Staging Shed structure to the truck/rail parking area.

This system must handle the size, weight, and total throughput of the transportation casks to be received at the repository and subsequently returned to service. This system must also minimize the generation of mixed (radioactive and hazardous) waste.

The Carrier Staging Shed Material Handling System receives loaded transportation casks for subsequent processing in the waste handling facilities and returns empty casks to the transportation segment of CRWMS. This system also interfaces with the utilities and structure provided by the Carrier Staging Shed System. In addition, it receives support from the site generated waste handling and disposal systems for the disposal of the low level radioactive, hazardous, and sanitary wastes generated by the transportation cask preparation activities.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU16A.WPD
SYSTEM DESIGN DESCRIPTION

Carrier/Cask Transport System

Summary

The Carrier/Cask Transport System moves transportation casks and their carriers between the waste entry point of the repository, the cask staging shed, and the waste handling facilities. This system is located on the surface at the north portal pad.

This system moves rail and truck casks and their carriers in a certain amount of time to support the waste emplacement schedule and return of casks and carriers to service, and handles the size and weight of a carrier with a fully loaded cask.

This system interfaces with the transportation segment of CRWMS for the type of cask/carrier delivered to the repository or returned to service. This system interfaces with the MGDS Site Layout for the location and arrangement of rail and road beds as well as the parking area that are all a part of the system. This system also interfaces with the Cask Staging Shed and Waste Handling Facilities for the movement of casks/carriers into those structures for subsequent operations.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU02.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Handling Facility System

Summary

The Waste Handling Facility System provides the structures and embedded subsystems which support the waste preparation operations. The facility is located on the surface within the radiological protected area of the MGDS site. The facility provides a controlled environment for the waste preparation operational systems and protects the operations from the natural environments. The Waste Handling Facilities primary function is to confine contaminants and provide radiological protection to personnel. The facility accommodates space for storing disposal containers, control, monitoring, and safety systems in addition to the waste preparation systems. The facility also provides decontamination systems for the safe removal of contaminated equipment and surfaces. This system must provide the civil structure and several subsystems, including compressed air, water distribution, communications, local monitoring and control, local security, and sanitary waste collection.

The Waste Handling Facility System integrates the waste preparation systems within its protective structure to meet waste preparation throughput rates established to support waste shipment and emplacement. The facility radiological protection limits the exposure of radiation to the personnel below established thresholds. The facility protects the waste preparation systems from natural and induced environmental conditions for the duration of the waste emplacement operation.

The Waste Handling Facility interfaces with the waste preparation systems by accommodating space and providing radiation protection. The facility also interfaces with the Waste Emplacement and Carrier/Cask Transport Systems by providing accesses and staging areas for waste transport. The facility interfaces with the waste handling facility; electrical, fire protection, radiological monitoring, and ventilation systems by providing space for piping, cabling, and duct banks. The facility interfaces with the Site-Generated Radiological Waste Handling System by collection and transferal of low-level waste products.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU18B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Handling Facility Electrical System

Summary

The Waste Handling Facility Electrical System performs the function of conditioning, distributing, monitoring, and controlling site AC power to all waste handling facility users. The system consists of the transformers, switchgear, controllers, uninterruptable power supplies and distribution subsystems required to power facility lighting, ventilation, instrumentation and mechanical equipment. Standby power is automatically maintained to the facility ventilation system, emergency lighting, other safety related systems and systems that require controlled shut down. Uninterruptable power is provided to subsystems that maintain status and safety monitoring of the facility.

The Waste Handling Facility Electrical System distributes and controls primary and standby power to acceptable industry standards, and with a dependability compatible with waste handling facility reliability objectives. Uninterruptable power will be provided to performance standards similar to the main power, and will be sustained for a period that is reasonable compared to typical outage durations, and the facility support requirements.

The Waste Handling Facility Electrical System interfaces with the Site Electrical Power System, and waste handling facility power users. The primary facility interfaces include the ventilation, lighting, facility mechanical, office, fire protection, safety monitoring and control, security, and communications subsystems. The primary material handling interfaces include the shipping cask and canister handling system, the waste handling systems, and the disposal container handling systems.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU33B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Handling Facility Fire Protection System

Summary

The Waste Handling Facility Fire Protection System performs the function of detecting and automatically suppressing fire in the Waste Handling Facility. The fire detection subsystem provides automatic monitoring, and annunciation of fire and potential fire conditions at the facility. It alerts facility personnel, the fire house, site security, and other emergency response stations of the fire conditions, and initiates the facility fire suppression subsystem in the affected areas. The subsystem consists of the smoke, heat detection, fire pull boxes and alarm instrumentation required to perform this function.

The fire suppression subsystem automatically iniates the wet sprinkler or water deluge equipment installed where fire or smoke is detected. The subsystem includes dry chemical extinguisher, fire hose and fire equipment stations located throughout the facility.

The Fire Protection System is required to provide quick and reliable initiation of fire alarm suppression equipment, suppress or mitigate the fire conditions in a timely manner, and provide accurate location of the fire to emergency response and support personnel. The fire protection systems is also required to provide for manual alarm initiation and suppression of minimal fires. The system incorporates unambiguous fire alarm, and posted warnings, and for the safe and controlled egress of facility personnel.

The Fire Protection System interfaces with all facility operating areas through the automatic and manual fire alarm and suppression equipment, the site fire water system, the facility monitoring and control system, the and the site wide security and emergency response systems. The system interfaces with the facility ventilation system to detect smoke and fire in specific areas and to minimize the conditions through controlled ventilation.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU29C.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Handling Facility Radiological Monitoring System

Summary

The Waste Handling Facility Radiological Monitoring System monitors, displays, annunciates and reports on the radioactivity levels in the Waste Handling Facility (WHF) areas, the facility effluents, and the personnel leaving the facility or performing hazardous area operations. The system is installed in the WHF, and provides local and central display of all radiation levels, audible annunciation of unsafe levels and trends, and communication with the facility central alarm, security, Health Physics, and emergency response system. Exhaust air and liquid effluents are monitored continuously, and alarmed when safe levels are exceeded. The readings are trended by the system to provide advanced warning of possible excessive radiation levels in or around the WHF.

The system consists of work area and egress monitors, exhaust stack monitors, continuous air monitors, and criticality detection instruments, which operate independently and communicate with the WHF central monitor and control system. The minimum detectable radiation levels of the instruments is sufficiently low to ensure that personnel are safe to operate in an area, and for the planned durations. Radiation trending tracks any unsafe increase in the expected levels, and provides warnings, and advisories. Exceeded limits are alarmed, and the sensitivity and reaction time of the system is adequate to protect personnel. The system and instruments perform self tests on the operating status and calibration, record the results, and report anomalies and failures.

The system interfaces with the Waste Handling Facility System, Waste Handling Facility Ventilation System, and the facility support systems including security, facility monitor and control, and communications. The system interfaces with the Health Safety System for instrument augmentation such as personnel dosimeters, portable and hand and foot radiation monitors to monitor individual exposures within the facility.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU22B1.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Handling Facility Ventilation System

Summary

The Waste Handling Facility Ventilation System supplies air and controls the environmental conditions to equipment and personnel areas within the facility. The system confines airborne radiological particles within designated safety boundaries during normal and off-normal waste handling operations. The Waste Handling Facility Ventilation System removes the airborne contamination and protects the personnel from radiation exposure. The system maintains air flow away from penetration barriers to create air flow paths that minimizes inadvertent release of radiological particles in populated areas. The system safely controls the air temperature and flow rates in all ventilated areas to protect against unsafe conditions resulting from natural and induced events such as; seismic events, fires, and power outages. The system detects the presence of hazardous conditions (such as radiological release, hazardous gas, smoke, etc..) and controls the ventilation in the personnel protection areas.

The Waste Handling Facility Ventilation System confines the radioactive and hazardous material within the facility such that the release rates are within the environmental standard limits. The system internally controls the confinement areas such that the radiological releases to the personnel occupancy zones are below the health safety standards. The system maintains the minimum required pressure differentials in confinement areas to facilitate controlled air flow within the facility. The system controls the ambient environmental temperature and the rate of change in temperature within the facility to within prescribed equipment and occupancy safety limits.

The Waste Handling Facility Ventilation System interfaces with the Waste Handling Facility System by creation of a pressure differential between the facility confinement barriers. The system interfaces with the Canistered Waste Transfer System, Uncanistered Waste Transfer System, Cask/Canister Handling System, and Disposal Container Handling System) by filtering any radiological airborne contaminants accidentally released from exiting the facility. The system interfaces with the facility electrical system by providing electrical loads consistent with the worst case operating profile.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Cask/canister Handling System

Summary

The Cask/Canister Handling System performs the functions required to prepare shipping casks and canisters for waste removal, empty shipping casks for re-shipment, and empty dual purpose canisters for disposal. The system is located in the Waste Handling Facility, which includes multiple cask/canister handling stations to maintain the waste emplacement and shipping schedules. Incoming casks are prepared for waste removal by unloading the casks from the carrier (Carrier/Cask Transport System), inspecting the cask, removing the lid, and transporting the casks to the Waste Transfer System. Dual Purpose Canisters are cut open, transferred to the Uncanistered Waste Transfer System, and the resulting particles and fines are collected, and transferred to the Waste Treatment System. Empty casks are decontaminated, reassembled, inspected, and loaded on the Cask/Carrier Transport System to be staged for re-shipment. Used Dual Purpose Canisters are decontaminated, prepared for disposal, and loaded on disposal carriers.

The system utilizes remotely operated cranes, hoists, manipulators, lid removal and canister opening tooling, vision and inspection equipment, and cask/canister transporters. The system is designed with the necessary tooling and fixtures required to handle the variety of casks and canisters defined in the waste agreements. System performance and reliability are sufficient to maintain the shipping and emplacement schedules.

The system interfaces with the Cask/Canister Transport System, The Uncanistered and Canistered Waste Transfer System, and the Waste treatment System. Facility interfaces include the Waste Handling Building, and related support systems including electrical power, ventilation, communications and safety.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Uncanistered Waste Transfer System

Summary

The Uncanistered Waste Transfer System removes spent fuel assemblies from the shipping containers or from lag storage, and loads the assemblies into Disposal Containers (DC) or lag storage. The system is also required to position containers at the unloading station, install contamination barriers, inspect the shipment, and remove empty containers and low level waste from the station. .

The system utilizes remotely operated equipment to perform these functions including, a bare fuel transfer machine, fuel assembly grapples, container transfer carts, contamination barriers, inspection instruments, and low level waste removal subsystems. The system is required to remove bare fuel from any truck or rail shipping cask, and Dual Purpose Canister (DPC) types identified in the waste shipment schedules. System dependability is sufficient to maintain the planned waste emplacement schedules, and the system is designed with interchangeablity and redundancy such that failures and maintenance operations will not impact the schedule. The system is semi automatic where the operator initiates the function to be preformed, and the system automatically performs the tasks required for that function. The operator can operate the system manually, and override the automatic operation at any time. The system is designed for ease of maintenance, and for decontamination to a level required for hands on maintenance.

The Uncanistered Waste Transfer System interfaces with the Cask/Canister Handling System, which prepares and opens the cask/containers, and with the Disposal Container Handling System, which prepares the DC for loading. The system also interfaces with the Waste Handling Facility, the Waste Handling Facility Electrical System, and other Waste Handling Facility support systems.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Canistered Waste Transfer System

Summary

The Canistered Waste Transfer System removes canistered waste from transportation casks and loads the canister into Disposal Containers (DC). The system provides direct transfer to the disposal container or moves the canistered waste to a temporary holding area. The transfer system is also required to position containers at the unloading station, inspect the shipment, and provide personnel radiological protection during the transfer and temporary storage of canistered waste.

The system will be capable of utilizing remotely operated equipment to perform these functions including, a canistered transfer machine, canister grapples, container transfer carts, contamination barriers, inspection instruments, and low level waste removal subsystems. The system is required to remove canistered waste from any truck or rail shipping cask type identified in the waste shipment schedules. System dependability is sufficient to maintain the planned waste emplacement schedules, and designed with interchangeablity and redundancy such that failures and maintenance operations will not impact the schedule. The system is semi automatic where the operator initiates the function to be preformed, and the system automatically performs the tasks required for that function. The system should be designed with override and protection features that allows manual control of automatic operations. The system is designed for ease of maintenance, and for decontamination to a level required for hands on maintenance.

The Canistered Waste Transfer System interfaces with the Cask/Canister Handling System which prepares and opens the transportation cask, and with the Disposal Container Handling System, which prepares the DC for loading. The system also interfaces with the Waste Handling Facility, the Waste Handling Facility Electrical System, and other Waste Handling Facility support systems.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Disposal Container Handling System

Summary

The Disposal Container (DC) Handling System performs the functions for receiving empty and retrieved DC's, preparing filled DC's for disposal, and supporting any corrective actions required on prepared and retrieved DC's. The system is located in the Waste Handling Facility, and includes multiple DC handling stations, and subsystems as required to maintain the waste emplacement schedules. Empty DC's are selected from inventory, inspected, and prepared for waste transfer. The DC's are loaded by the Uncanistered or Canistered Waste Transfer System, following which, the DC Handling System prepares the container for closure. DC closure includes welding the inner and outer lids, decontamination, and inspection of each step. Once completed, the DC's are installed on the subsurface transporter, and prepared for emplacement (by the Waste Emplacement System), or stored for emplacement at a later time. Retrieved DC's are received from the Waste Retrieval System, and transported to the Waste Package Remediation System which performs DC inspection. The DC Handling System utilizes remotely operated equipment, including cranes, hoists, welders, container transporters, vision/inspection instruments, and specialized tooling to perform it's functions.

The system is required to handle various size DC's configured for the variety of Canistered and Uncanistered waste forms defined in the waste agreements. The system prepares, closes and inspects the DC's to comply with engineered barrier specifications, and provides corrective actions as required to bring the containers into compliance. System reliability and performance are sufficient to maintain the waste emplacement schedules.

The DC Handling System interfaces with the Uncanistered and Canistered Waste Transfer Systems, the Waste Emplacement System, the Waste Retrieval System, and the Waste Package Remediation System. Facility interfaces include the Waste Handling Building, and related support systems including electrical power, ventilation, communications and safety.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Package Remediation System

Summary

The waste package remediation system unseals a defective waste or retrieved waste packages for inspection or subsequent repackaging within the Waste Handling Facility. The system performs examination of the disposal container (or waste package) using destructive or non-destructive techniques. During the unsealing and examination operations the system provides protection to personnel from exposure to radiation. The system contains radionuclides while handling breached disposal containers as well as preventing criticality during the operations. The system also prepares the disposal container for testing defined by the performance confirmation operations.

The waste package remediation system unseals defective disposal containers within the time constraints allocated to support the retreival throughput rates. The system controls the unsealing operations with precise accuracy to eliminate the potential for inadvertant damaging of the uncanistered or canistered waste. The examination tests performed by the system will be of a high fidelity to support the determination of DC failures. The system will also limit the release of radionuclides to the accessible environment or to worker personnel to below the safety exposure level established.

The waste package remediation system interfaces with disposal canister handling system by unsealing defective disposal container welds. The system interfaces with the performance confirmation monitoring system by providing Destructive & non-destructive examination tests and data. The system interfaces with the Cask/Cannister Handling System by unsealing the defective disposal container and transfering it to be repackaged.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Facility System

Summary

The Subsurface Facility System encompasses the location, arrangement, size and spacing of the underground openings. This subsurface system includes accesses, alcoves, drifts, and boreholes. This system provides access to the underground, provides for the emplacement of waste, provides a safe and secure work environment, protects from natural environments, and protects the engineered barrier system.

The Subsurface Facility System physical location and general arrangement helps support the long term waste isolation objectives of the repository. The Subsurface Facility System protects the isolation characteristics of the disposal containers by locating the emplacement drifts away from volcanically and seismically active areas, major faults, exposure due to erosion, and proximity to the water table. The location of the facility also avoids areas of known valuable resources. The general arrangement, size, and spacing of the emplacement drifts supports disposal of the entire inventory at the proper thermal loading. The Subsurface Facility System provides access ramps to facilitate development and emplacement operations. The Subsurface Facility System also supports the development and emplacement operations by housing other subsurface system such as, ventilation, utility, safety, monitoring and transportation.

The high level scope of the Subsurface Facility System is such that it interfaces with all subsurface systems and waste packages. The subsurface facility system major interfaces are with the engineered barrier system for the waste package emplacement and support, natural barrier for the geologic setting, performance confirmation system for monitoring of the post emplacement performance, ventilation system for housing equipment and ventilation air flowpaths, and transportation systems for the bedding of railroad track.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Safety & Monitoring System

Summary

The Subsurface Safety and Monitoring System monitors critical safety parameters to ensure a safe workplace for subsurface personnel. This system monitors the subsurface conditions for radioactive conditions, life safety threats, and occupational hazards. Conditions detected by this system are sent to the Central Command & Control Operations System which activates appropriate response measures, such as fire suppression, emergency response, evacuation or changes in equipment operation. The system is located in the subsurface. Some of the data gathered may be used to supplement that gathered by the Performance Confirmation System.

The system detects the presence of radiation and radioactive particulates and gases. The system detects the presence and locations of fires. The system measures the temperature, humidity, and air quality The system is designed to operate in the subsurface environments and gathers data within designated ranges of accuracy and tolerance.

The system interfaces with the Subsurface Facility System for mounting space and location of monitors and equipment. The system interfaces the Subsurface Electrical Distribution System and Site Communications System for power to operate and ability to transmit data to the surface. The system interfaces with the Central Command & Control Operations System and Emergency Response System for data evaluation, corrective actions, and response measures.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Ground Control System

Summary

The Ground Control System supports the safe construction and operation of the subsurface facility (accesses and waste emplacement drifts), and allows the waste isolation system to function relatively undisturbed by rockfall and opening convergence. The Ground Control System consists of the structures installed within the subsurface excavated opening or reinforcements made to the rock surrounding the opening. This system also includes sensors for monitoring. The Ground Control System responds to all related geologic conditions expected at the repository. The Ground Control System controls the configuration and stability of the opening. The Ground Control System also provides protection for all subsurface personnel, equipment, and the engineered barrier system including the waste package against rockfall during the preclosure period.

This Ground Control System limits the size, frequency and extent of rockfall occurring in the underground openings to an acceptable level. The Ground Control System also controls the rate of closure of the opening due to geomechanical, thermomechanical, and excavation effects. The Ground Control System performs its functions during the development, emplacement and caretaker modes of the repository.

The Subsurface Facility System (which includes all subsurface openings) and the Engineered Barrier System are the main interfaces with the Ground Control System. The Ground Control System supports the configuration of the overall subsurface layout through various rock conditions and supports the size, geometry, and environments of alcoves, accesses, and emplacement drifts. The Ground Control System interfaces with the Subsurface Excavation System for its installation. The Ground Control System also interfaces with the Waste Emplacement System and Waste Retrieval System by providing adequate ground control for the conduct of activities. The Ground Control System infaces with the Subsurface Safety and Monitoring System for transmission and evaluation of operational performance data. The Ground Control System interfaces with the Subsurface Compressed Air System to operate the installation equipment. Lastly, the Ground Control System interfaces with the Natural Barrier for the attachment points in the host rock.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Emplacement System

Summary

The Waste Emplacement System transports the loaded and sealed waste package from the surface waste handling facilities to the area of emplacement. This system operates on the surface between the north portal and the surface waste handling facilities, and in the underground accesses and emplacement drifts. This system accepts the waste package, preloaded in the transporter, transports the waste package to the emplacement area, and emplaces the waste package in the emplacement drift. The operation cycle is completed when the transport equipment returns to the surface waste handling facilities to receive another waste package.

This system provides transport and emplacement of the waste package in support of the overall handling throughput rates. This system is able to withstand the weight and handling loads of the WP while not damaging the WP or the WP support. This system also provides shielding such that other operations may be conducted nearby. The system provides the capability to be operated by either local or remote control.

This system interfaces with the Disposal Container Loading and Transfer System in that it receives the loaded and sealed waste package from this system. The system interfaces with all waste package types for handling and positioning. The system interfaces with the Waste Package Supports in that it must position the waste package properly over the waste package support for emplacement. The system interfaces with the Subsurface Facility System for opening size and location of emplacement drifts and underground accesses. The system interfaces with the Subsurface Operational Monitoring System for status of emplacement operations. The system interfaces with the Subsurface Electrical Distribution System for operating power. Lastly, the system interfaces with the Subsurface Emplacement Transportation System for the rail track utilized by the transporter.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Ventilation System

Summary

The Subsurface Ventilation System supports the development and operation of the subsurface repository by providing air to personnel, providing radiological confinement, and controlling the temperature of the underground openings. The system mainly exists in the subsurface with ducting, seals, and electronic controls, and it interfaces with the surface for air intake and exhaust. The system ventilates the underground by providing surface ambient air throughout the subsurface. The system supports the subsurface operations by providing fresh air for a safe work environment. The system supports retrieval operations by controlling drift temperature. The system protects personnel against radioactive particulates and gases. The system also protects the outside environment from radioactive exhaust byproducts and limits ventilation effects on thermal loading.

The subsurface ventilation system provides air which meets OSHA standards for subsurface personnel. Air exhausted from the subsurface is monitored for, and complies with, the limits established by the Clean Air Act and approved air quality permits. The system provides temperature control by reducing drift temperature to support retrieval operations. The subsurface ventilation system is required to control the transport of radioactive particulates and gases within the subsurface facility, control the release of radioactive particulates and gases from the subsurface facility, continue operating during normal and accident conditions, and separate the ventilation of excavation (development side) and waste emplacement areas. The ventilation system has the capability to ventilate selected drifts during emplacement and retrieval operations.

The MGDS Site Layout and the Subsurface Facility System are the main interfaces with the Subsurface Ventilation System. The air intake and exhaust are apart of the overall MGDS Site Layout. The ducting, seals, and electronic controls are located in the Subsurface Facility System. The Subsurface Ventilation System also interfaces with Subsurface Electrical System for power to run the equipment and the Subsurface Safety and Monitoring System to ensure proper and safe operation.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Backfill Emplacement System

Summary

The Backfill Emplacement System supports the Engineered Barrier System by installing performance enhancing backfill (if required) and the closure activities by installing access inhibiting backfill. The Backfill Emplacement System has surface and subsurface components. The Backfill Emplacement System prepares the backfill material, transports it to the area of emplacment, and emplaces the backfill.

The Backfill Emplacement System prepares the backfill to meet performance and compaction requirements. Backfill is transported from the surface to the subsurface emplacement area at a rate sufficient to ensure continuous operation of the emplacement equipment. The backfill emplacement equipment backfills the required areas of the repository within a specified number of years. The backfill emplacement system will measure the compaction and placement of backfill to ensure proper performance.

The Backfill Emplacement System interfaces with the Subsurface Facility System for the size and layout of the underground access openings and drifts. The Backfill Emplacement System interfaces with the Engineered Barrier System for the type of backfill used as the performance enhancement barrier in the emplacement drifts (if required). The Backfill Emplacement System may interface with the Muck Handling System if the muck pile is the source for backfill. The Backfill Emplacement System may also interface with the Subsurface Emplacement Transportation System for the transportation rails and the Subsurface Electrical Distribution System for operating power.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Waste Retrieval System

Summary

The Waste Retrieval System removes some or all of the waste packages from the emplacement drifts and transports them to the surface. This system includes any special equipment, such as for drift remediation or removal of obstructions, necessary to enable retrieval operations to occur in the underground. The Waste Retrieval System prepares the emplacement drift for retrieval and acquires the necessary waste package information. The Waste Retrieval System prepares the waste package for transport and transports the waste package to the surface. The operation cycle is completed when the empty transport equipment returns to the emplacement drift from the surface waste handling facilities. Finally, the Waste Retrieval System restores the emplacement drift condition and inspects and services radiological systems.

The Waste Retrieval System gains access to the waste package by dissembling inhibative barriers, removing drift obstructions (rock or concrete falls) and repairing faulty ground support. The waste package condition is determined by measuring radiation levels and performing breach inspections, if necessary. The Waste Retrieval System removes waste package(s) from the emplacement drift, places the waste package in the transporter, and transports the waste package to the surface. The Waste Retrieval System decontaminates the emplacement drift (as required), closes the access door, and coordinates the shutdown of ventilation through the emplacement drift.

The Waste Retrieval System interfaces with the Subsurface Facility System for the size and layout of the underground openings including access doors to the drift. The system interfaces with the Subsurface Ventilation System for the emplacement drift operating environment. The system is capable of retrieving all types of disposal containers and utilizing existing waste emplacment rail systems. The system interfaces with the Subsurface Safety and Monitoring System for monitoring the condition of waste package(s) and safety of retreival operations. The system interfaces with the ground support system for any repairs that are made. The system interfaces with the Disposal Container Loading and Transfer System when it delivers retrieved waste packages to the surface waste handling facilities. The system interfaces with the Subsurface Electrical Distribution System for operating power and the Subsurface Compressed Air System for drift door operation.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Emplacement Transportation System

Summary

The Subsurface Emplacement Transportation System supports the operation of the repository by providing transportation for personnel and material traveling between the surface and subsurface areas of the emplacement side of the subsurface repository. The system also provides the entire rail system on the emplacement side of the repository. This system includes all non-waste related transport equipment; transport of waste is covered by the Waste Emplacement System. This system operates on the surface and in the subsurface on the rail system which is installed in the emplacement area as part of this system.

This system must be able to withstand the weight and handling required for the payloads it is expected to carry. It must also meet required transportation and handling rates.

This system interfaces with the expected payloads to be transported, the Subsurface Electrical Distribution System for operating power, and the Subsurface Facility System for opening size and location.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Closure & Seal System

Summary

The Subsurface Closure and Seal System provides closure barriers and seals for the underground openings, including surface and subsurface boreholes. The system, which includes of seals and backfill, is located entirely within the subsurface. This system does not include backfill used as a performance enhancement barrier in the emplacement drifts. Equipment to close and seal surface openings are a part of this system. The Subsurface Closure and Seal System controls fluid flow into the engineered barrier and limits human intrusion.

The Subsurface Closure and Seal System controls the amount of fluids flowing through subsurface openings following closure to acceptable levels. The system impedes human access to the subsurface emplacement drifts. The backfill and seal materials meet requirements for degradation, permeability, environmental conditions, chemical content, and pH levels consistent with the results from performance assessment.

The system interfaces with the Subsurface Facility System for the size and locations of ramps, accesses, emplacement drifts and boreholes. The system interfaces with the Muck Handling System as the potential source of backfill material. The system interfaces with the Backfill Emplacement System for the emplacement of backfill. The system interfaces with the MGDS Facility System for the layout of surface borehole locations.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Electrical Distribution System

Summary

The Subsurface Electrical Distribution System distributes electrical power to all subsurface system loads. The system is concentrated in the subsurface although a small portion exists on the surface for connection to the Site Electrical Power System. The Subsurface Electrical Distribution System provides power for the development and emplacement operations. In addition to supplying primary and standby power, the system also supplies emergency and uninterruptible power for personnel safety and critical operations.

The Subsurface Electrical Distribution System provides power of sufficient quantity and quality for end user loads. The Subsurface Electrical Distribution System provides emergency and uninterruptible power for the durations required for personnel safety and critical operations. The Subsurface Electrical Distribution System contains safety features to protect personnel from accidents and/or failures. The Subsurface Electrical Distribution System contains an internal and external monitoring capability to provide status of its operation.

The Subsurface Electrical Distribution System interfaces with all subsurface systems requiring electrical power. The main Subsurface Electrical Distribution System interfaces are with the Subsurface Ventilation System, Subsurface Lighting System, Subsurface Development Transportation System, Subsurface Emplacement Transportation System, Subsurface Excavation System, Muck Handling System, Waste Emplacement System, Safety and Monitoring Systems, and the Subsurface Operational Monitoring System.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Lighting System

Summary

The Subsurface Lighting System provides primary, emergency and security lighting to support subsurface development and emplacement operations. Because of the high temperatures following waste emplacement, this system will be installed in emplacement drifts only during the development phase. All such lighting installed in emplacement drifts during the development phase will be removed before turning these drifts over for emplacement operations. Lighting of emplacement drifts during emplacement will be provided by lights on the mobile equipment that is part of the Waste Emplacement System. The Subsurface Lighting System provides illumination for construction, pedestrian, transportation, security, and emergency egress purposes.

The Subsurface Lighting System illuminates each area commensurate with the activities being performed and OSHA standards. Safety considerations require that portions of the system must remain operable under all conditions. Emergency lighting systems meet requirements for emergency egress. The emplacement drifts lighting subsystem are designed for removal and reinstallation.

The Subsurface Lighting System interfaces with the Subsurface Facility System for physical space and mounting attachments. The Subsurface Lighting System interfaces with the Subsurface Electrical Distribution System for power.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Water Collection/Removal System

Summary

The Subsurface Water Collection/Removal System collects and removes water from the subsurface openings. This system is located in the subsurface openings where water is to be collected and removed, and on the surface where the system disposes of the water. This system removes water resulting from construction activities and unexpected events that result in excess water in subsurface openings. This system also treats the water if necessary in accordance with environemtnal standards before disposing of the water on or near the site.

This system must possess adequate capacity to reduce water depth in subsurface openings to a minimum level in a timely manner. This system must also dispose of the water in an environemntally safe and efficient manner.

This system receives water from the subsurface construction activities as well as any expected or unexpected natural or induced event. This system disposes of the water by expelling it to the surface environment. The system interfaces with the Subsurface Electrical Distribution System for operating power, the Subsurface Operational Monitoring System for status/amounts of water in the subsurface, the Subsurface Facility System for subsurface locations, and the MGDS Site Layout for surface locations.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Fire Suppression System

Summary

The Subsurface Fire Suppression System provides capability to suppress fires throughout the emplacement and development sides of the subsurface wherever there is non-mobile operating equipment (mobile operating equipment carries its own fire suppression system). The system is located entirely within the subsurface repository.

The type of fire suppression system installed at any location must be compatible with the type of fire hazard present and have adequate capacity to suppress those fires. This system must also be compatible with any limitations imposed by performance assessments. --

The system interfaces with the Subsurface Water Distribution System (source of water), Subsurface Safety and Monitoring System (activation of fire suppression system), Subsurface Electrical Distribution System (operating power), and the Emergency Response System.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SS09A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Water Distribution System

Summary

The Subsurface Water Distribution System distributes water to the underground areas to be used by personnel and in construction. Most of the system is located in the subsurface, but a small portion of the system may be located on the surface near points of entry to the subsurface, depending on the location of the interface with the Site Water System. This system must provide appropriately conditioned water for construction and the Subsurface Fire Suppression System, and may provide potable water for personnel use.

This system must provide adequate flow rate, pressure, and control of water flow through the distribution system. This system must ensure excess outflow from the system is identified and controlled. This system must also ensure water is free of contaminants that would adversely affect waste development and possibly treated for personnel use.

This system receives water from the Site Water System and the provides water for subsurface development operations and the Subsurface Fire Protection System. This system interfaces with the Subsurface Operational Monitoring System (flow rates in water lines, total water consumption), Muck Handling System (water for dust control), Subsurface Excavation System (water for dust control), Subsurface Fire Protection System (water for fire sprinkler systems), and Site Water Distribution System (source of water).

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SS08B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Compressed Air System

Summary

The Subsurface Compressed Air System distributes compressed air throughout the subsurface facility. The system is concentrated in the subsurface although a small portion exists on the surface near points of entry to the subsurface. The Subsurface Compressed Air System provides air for the development and emplacement operations.

The system must supply compressed air in sufficient quantity and pressure to meet requirements for the development and emplacement sides of the repository. The Subsurface Compressed Air System contains safety features to protect personnel from accidents and/or failures. The Subsurface Compressed Air System contains an internal and external monitoring capability to provide status of its operation.

The Subsurface Compressed Air System main interface is with the Subsurface Excavation System for equipment operation. The Subsurface Compressed Air System interfaces with the Waste Emplacement System for drift door operation and potentially other equipment not currently identified. The Subsurface Compressed Air System interfaces with the Subsurface Operational Monitoring System for system status. This system also interfaces with the Ground Control System for power to operate ground support installation equipment.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU04.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Radiological Waste Treatment Facility System

Summary

The Radiological Waste Treatment Facility System provides the structures and embedded subsystems which support the collection and disposal of site-generated low level radiological waste. The facility is located on the surface within the radiological protected area of the MGDS site. The facility provides a controlled environment for the site-generated radiological waste handling system and protects the operation from the natural environments. The Radiological Waste Treatment Facilities primary function is to confine contaminants and provide radiological protection to personnel. The facility accommodates space for control, monitoring, and safety systems in addition to the site-generated waste disposal systems. The facility also provides decontamination systems for the safe removal of contaminated equipment and surfaces. This system must provide the civil structure and several subsystems, including compressed air, water distribution, communications, local monitoring and control, local security, and sanitary waste collection

The Radiological Waste Treatment Facility System provides the structures and operational support systems necessary to process the site-generated waste efficiently to meet the site-generated waste disposal throughput rates. The facility radiological protection limits the exposure of radiation to the personnel below established thresholds. The facility protects the site-generated waste disposal operations from natural and induced environmental conditions for the duration of the waste emplacement operation.

The Radiological Waste Treatment Facility interfaces with the Site-Generated Waste Handling System by accommodating space and providing radiation protection. The facility interfaces with the ventilation system by providing space for duct banks, fans, and monitoring systems. The facility interfaces Site-Generated Waste Handling System by providing supporting utilities for the disposal operation.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site-Generated Radiological Waste Handling System

Summary

The Site-Generated Radiological Waste Handling System collects and prepares the site generated low level radiological solid, liquid, and mixed waste for disposal and transport. The system controls the collection of the low level liquid waste and treats it prior to packaging it for disposal. The solid LLW is also collected, condensed and repackaged for disposal. The system handles solid and liquid mixed waste and transports the MW off-site for disposal.

The Site-Generated Radiological Waste Handling System collects the quantities and mixes of waste at a rate necessary to sustain waste preparation throughput rate. The system collects and processes the liquid site-generated waste and reduces the volume required for off-site disposal. The liquid LL waste is also neutralized to chemical properties consistent with recycling criteria. The LL solid waste is collected and compressed such that the volumetric space is reduced to dimensions consistent with disposal criteria. The system confines all radiological gas release during the processing of the LL waste to the limits established by the EPA standards.

The Site-Generated Radiological Waste Handling System interfaces with the Waste Handling Facility, Subsurface Facility, Carrier Staging Shed, and surface areas that have the potential for generating LL waste by providing collection systems for solid LLW, liquid LLW, and mixed waste. The system interfaces with the ventilation system by confining radiological gases to within boundaries that facilitate filtered entrapment. The system interfaces with the off-site transportation system by packaging the LLW in transportation disposal containers.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU24A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Radiological Waste Treatment Facility Ventilation System

Summary

The Radiological Waste Treatment Facility Ventilation System supplies air and controls the environmental conditions to equipment and personnel areas within the facility. The system confines airborne radiological particles within designated safety boundaries during normal and off-normal Radiological Waste Treatment operations. The Radiological Waste Treatment Facility Ventilation System removes the airborne contamination and protects the personnel from radiation exposure. The system maintains air flow away from penetration barriers to create air flow paths that minimizes inadvertent release of radiological particles in populated areas. The system controls the air temperature and flow rates in all ventilated areas to protect against unsafe conditions resulting from natural and induced events such as; seismic events, fires, and power outages. The system detects the presenee of hazardous conditions (such as radiological release, hazardous gas, smoke, etc..) and controls the ventilation in the personnel protection areas.

The Radiological Waste Treatment Facility Ventilation System confines the radioactive and hazardous material within the facility such that the release rates are within the environmental standard limits. The system internally controls the confinement areas such that the radiological releases to the personnel occupancy zones are within the health safety standard limits. The system maintains the minimum required pressure differentials in confinement areas to facilitate controlled air flow within the facility. The system controls the ambient environmental temperature and the rate of change in temperature within the facility to be within prescribed equipment and occupancy safety limits.

The Radiological Waste Treatment Facility Ventilation System interfaces with the Radiological Waste Treatment Facility System by creation of a pressure differential between the facility confinement barriers. The system interfaces with the Site-Generated Radiological Waste Handling System by filtering radiological airborne contaminants from exiting the facility. The system interfaces with the facility electrical system by providing electrical loads consistent with the worst case operating profile.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

ENGINEERED BARRIER SYSTEM

Summary

The Engineered Barrier System (EBS) delays the release and transport of radionuclides to the natural barrier following waste emplacement. Collectively, the EBS consists of the waste package, waste package support hardware, and performance enhancing barriers. Due to the complexity of the EBS and its major components, the waste package configurations are described in separate system description documents. The scope of the EBS system description document is bounded to the system level or collective component performance. Therefore, the EBS SDD limits discussion of the waste package to only a top level. The standalone waste package SDDs will address all aspects of the waste package. The EBS is entirely located within the subsurface portion of the repository. The EBS supports the key MGDS functions of limiting radionuclide release to the natural barrier; limiting natural and induced environment effects and providing waste package support. The limit radionuclide release to natural barrier function controls the movement of radionuclides within the engineered barrier and to the natural barrier. The limit natural and induced environmental effects function controls the external impacts on the engineered system and the engineered system impacts on the natural system. The provide waste package support function provides for the securing of the waste package in place.

The EBS is required to delay the release of radionuclides to the natural barrier for a period of time commensurate with the overall waste isolation system performance. The EBS is also required to emplace the entire waste inventory within depth and boundary constraints of the repository. The EBS supports the thermal loading performance by drift layout and orientation. The EBS protects and supports the waste package for its confinement period. The EBS also provides an environment that aids in enhancing waste package confinement performance. Finally, the EBS maintains accessibility to the waste package to support retrieval (if required) for a specified period of time.

The EBS interfaces with the natural barrier and underground facility for the space and location of emplaced waste and the controlled release of radionuclides. Additionally, the EBS interfaces with the natural barrier by controlling the heat, chemical and physical effects that interact between the two systems. The EBS interfaces with the excavation and muck handling systems for emplacement drift development. The EBS interfaces with the emplacement and retrieval systems for the emplacement and retrieval of waste.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\WP01A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Uncanistered SNF Disposal Container

Summary

The Uncanistered SNF Disposal Container supports the confinement and isolation of waste within the engineered barrier of the MGDS. Disposal containers are loaded with bare SNF assemblies and sealed in the surface waste handling facilities, transported to the underground through the accesses, and emplaced in emplacement drifts. The Uncanistered SNF Disposal Container provides long term confinement of the commercial spent nuclear fuel placed inside, and withstands the loading, transportation, emplacement and retrieval loads and environments.

The Uncanistered SNF Disposal Container provides containment of waste for a designated period of time, with a limited radionuclide release thereafter. The disposal container maintains the waste in a safe configuration, withstands maximum handling and rockfall loads, limits the individual SNF assembly temperatures after emplacement, limits the availability of moderator during the criticality control period, resists corrosion in the expected handling and repository environments, and provides complete or limited containment of waste in the event of an accident.

The Uncanistered SNF Disposal Container interfaces with the waste package external environment and the internal waste by transferring heat from the SNF to the external environment and by protecting the SNF assemblies and their contents from damage/degradation by the external environment. The disposal container also interfaces with the SNF by limiting the moderator and oxidizing agents available.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\WP02A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Canistered SNF Disposal Container

Summary

The Canistered SNF Disposal Container supports the confinement and isolation of waste within the engineered barrier of the MGDS. Disposal Containers are loaded and sealed in the surface waste handling facilities, transported to the underground through the accesses, and emplaced in emplacement drifts. The Canistered SNF Disposal Container provides long term confinement of the commercial spent nuclear fuel placed within a disposable canister, and withstands the loading, transportation, emplacement and retrieval loads and environments.

The Canistered SNF Disposal Container provides containment of waste for a designated period of time, with a limited radionuclide release thereafter. The disposal container maintains the waste in a safe configuration, withstands maximum handling and rockfall loads, limits the disposable canister temperature after emplacement, limits the availability of moderator during the criticality control period, resists corrosion in the expected handling and repository environments, and provides complete or limited containment of waste in the event of an accident.

The Canistered SNF Disposal Container interfaces with the waste package external environment and the internal waste by transferring heat from the disposable canister to the external environment and by protecting the disposable canister and its contents from damage/degradation by the external environment. The disposal container also interfaces with the SNF by limiting the moderator and oxidizing agents available.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\WP03A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

High Level Waste Disposal Container

Summary

The High Level Waste Disposal Container supports the confinement and isolation of waste within the engineered barrier of the MGDS. Disposal Containers are loaded and sealed in the surface waste handling facilities, transported to the underground through the accesses, and emplaced in emplacement drifts. The High Level Waste Disposal Container provides long term confinement of the vitrified high level waste placed within disposable canisters, and withstands the loading, transportation, emplacement and retrieval loads and environments.

The High Level Waste Disposal Container provides containment of waste for a designated period of time, with a limited radionuclide release thereafter. The disposal container maintains the waste in a safe configuration, withstands maximum handling and rockfall loads, limits the individial HLW canister temperatures after emplacement, resists corrosion in the expected handling and repository environments, and provides complete or limited containment of waste in the event of an accident.

The High Level Waste Disposal Container interfaces with the waste package external environment and the internal waste by transferring heat from the disposable canister to the external environment and by protecting the disposable canister and its contents from damage/degradation by the external environment.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\WP04A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

DOE Waste Forms Disposal Container

Summary

The DOE Waste Forms Disposal Container supports the confinement and isolation of waste within the engineered barrier of the MGDS. Disposal Containers are loaded and sealed in the surface waste handling facilities, transported to the underground through the accesses, and emplaced in emplacement drifts. The DOE Waste Forms Disposal Container provides long term confinement of the commercial spent nuclear fuel placed inside; and withstands the loading, transportation, emplacement and retrieval loads and environments; and maintains a non critical fuel geometry for the waste placed inside.

The DOE Waste Forms Disposal Container provides containment of waste for a designated period of time, with a limited radionuclide release thereafter. The disposal container maintains the waste in a safe configuration, withstands maximum handling and rockfall loads, limits the individual spent nuclear fuel assembly temperatures after emplacement, limits the availability of moderator during the criticality control period, resists corrosion in the expected handling and repository environments, and provides complete or limited containment of waste in the event of an accident.

The DOE Waste Forms Disposal Container interfaces with the waste package external environment and the internal waste by transferring heat from the SNF assemblies to the external environment and by protecting the assembliles from damage/degradation by the external environment. The disposal container also interfaces with the SNF by limiting the moderator and oxidizing agents available.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Performance Confirmation System (SS14)

Summary

The Performance Confirmation system acquires pertinent data associated with verifying the performance of the waste isolation system. This system operates in the subsurface repository aquireing data and transmitting it to the surface. This system also operates on the surface aquireing data, conducting field and laboratory experiments, and analyzing the data aquired from the surface and subsurface operations. This system will use the results of the data analyses to validate that the waste isolation system meets established limits, and it will process the results for use in demonstrating licensing compliance.

This system is required to gather and process data within a designated range of accuracy and precision at an appropriate sampling rate. The subsurface portion of this system is required to operate in the hostile environment expected in the subsurface repository after emplacement of waste packages. Analysis of gathered data must used approved analysis methods. The system must be able to confirm one or more of the following for each performance confirmation parameters identified:

1. That spatial interpolations and/or extrapolations of point measurements assumed for the license application are within acceptable bounds of error.

2. That temporal changes in parameter values resulting from repository construction, waste emplacement, and natural events and processes predicted for the license application are within acceptable bounds of error.

3. That compliance with the regulatory postclosure standards of 10 CFR part 60 can still be demonstrated in spite of any changes in parameter values, understanding of natural and engineered barrier processes, and mathematical postclosure performance assessment models and computer codes.

The subsurface portion of the Performance Confirmation System interfaces with the subsurface environment that it is monitoring and operating in and with the portion of the Performance Confirmation System located on the surface.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Excavation System

Summary

The Subsurface Excavation System develops all of the subsurface openings required for the repository. Subsurface openings consist of access ramps and corridors, drifts, shafts and alcoves. The system operates primarily underground except when beginning a new excavation from the surface. The system also includes some support services and temporary facilities at the surface to support the conduct of development operations.

The Subsurface Excavation System reduces the potential for fracturing of the surrounding rock mass during development by utilizing mechanical excavation and controlled drill and blast methods. The system development rates supports the operational needs of emplacement. The system meets underground opening tolerances for maintaining alignment, grade and orientation.

The Subsurface Excavation System interfaces with the Subsurface Facility System, Engineered Barrier System, and Natural barrier for the opening layout, orientation and size. The system interfaces with the Muck Handling System for the removal of excavated rock and the Ground Control System for stabilizing the opening. The system interfaces with the Subsurface Electrical Distribution System and Subsurface Compressed Air System for equipment operation. The system interfaces with the Subsurface Development Transportation System for operating personnel and material supplies. The system interfaces with the Subsurface Ventilation System for the working environment and dust control. Lastly, the system interfaces with the Subsurface Operational Monitoring System for providing operating status.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SS15B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Muck Handling System

Summary

The Muck Handling System provides for the removal of subsurface rock excavated during the development of the subsurface openings. This system places the muck in a storage pile located in the surface. The system operates in both subsurface and surface locations. The Muck Handling System collects, transports, and stores excavated rock.

The Muck Handling System is sized to handle excavated rock at the rates and quantities produced by the Subsurface Excavation System. Dust is controlled during muck transport. The rock in the storage pile needs to be protected for potential use as backfill in the subsurface openings at the time of backfilling and closure, which could occur as long as 150 years after excavation.

The key interfaces are with the Subsurface Excavation System (rate of muck production), MGDS Site Layout (surface muck transportation route and location of muck pile), Subsurface Electrical Distribution System (power source), Subsurface Operational Monitoring System (status of operations), Backfill Emplacement System (muck pile may be source of backfill material), Subsurface Development Transportation System (personnel and supply transport), and surface utilities.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU44A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site Electrical Power System

Summary

The site electrical power system distributes and controls utility and backup power to all site users, and is managed from the central command and control operations system. Backup power is generated by the standby power subsystem. The site electrical power system distribution is located throughout the entire site including distribution to remote areas such as ventilation shaft openings and water well sites. The standby power system consisting of diesel generators and switchgear is located in a separate building on the surface. The site electrical power system provides power for the surface facilities and systems, and for the subsurface repository development and emplacement. In addition to the site electrical power system supplying primary and standby power, it also supplies emergency and uninterruptible power for personnel safety and critical operations.

The site electrical power system generates and distributes power of sufficient quantity and quality for end user loads. The site electrical power system provides emergency and uninterruptible power for the durations required to continue personnel safety and critical operations. The site electrical power system contains safety features to protect personnel from accidents and/or failures. The site electrical power system contains subsystems for local and remote monitoring and control.

The site electrical power system interfaces with surface and subsurface facilities and systems requiring electrical power. The site electrical power system interfaces with the off-site electrical power system and NTS electrical power system for the receipt of power. The site electrical power system interfaces with the subsurface electrical distribution system, facility electrical power systems, remote site systems, and site wide systems such as, lighting, communications, and environmental monitoring stations for the distribution of power.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU43A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site Water System

Summary

The Site Water System supplies potable and non potable water to the surface facilities and to the Subsurface Water Distribution System. This system originates at the NTS wells and is located throughout the surface portion of the repository. This system supplies water for drinking, cooling, construction, fire protection and other purposes.

This system possess adequate pumping, flow, pressure, and reserve capacity for the water distribution networks that this system serves. Potable water meets minimum drinking quality standards through treatment and filtering. This system must also limit the amount of unintended outflow from the system.

This system interfaces with the aquifer that it receives water from and the surface and subsurface water distribution networks that it supplies.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU42A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site Communication System

Summary

The site communication system maintains site-wide and off-site voice, data and video communications. The system maintains public and secure communications as required for all surface and subsurface communications and for connection to off-site waste transportation operations. The system is located throughout the surface and subsurface portions of the repository, and includes the land line, fixed and mobile microwave subsystems required for integrated site/off-site communications. Secure communications are provided for security and safeguards, emergency response, transportation, and other protected information systems.

The site communication system provides a conservative quantity of data and voice lines, maintains communications error checking and correction, and supports data encryption.

The site communication system interfaces with the security and safeguards system, management and administration, maintenance and inventory, safety and environmental monitoring, utilities, facilities, transportation, and waste handling systems. The site communication system has external interfaces with the NTS, satellites, and phone companies.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU53A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Off-Site Utilities System

Summary

The off-site utilities system provides for the transmission of electrical power and the distribution of water to the repository site from off-site Nevada locations. This system consists of a combination of new and upgraded systems to add capacity or capability. The off-site utilities systems are located outside the site boundary and cross parts of the NTS, BLM and the state of Nevada. The off-site utilities system provides additional electrical power capacity, provides addition water capacity, and provides for remote monitoring and control of each system.

The off-site utilities augment the existing NTS capabilities for power and water to meet repository needs. The off-site utilities systems is sized to accommodate repository growth

The off-site utilities system interfaces with the Site Water System for water distribution and the Site Electrical Power System for electrical distribution. The system interfaces with the Central Command and Control Operations System for monitoring and control. The system interface with the Site Communications System for transmission of monitoring and control data.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU45A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site Compressed Air System

Summary

The Site Compressed Air System provides industrial air to the subsurface air distribution system. The Compressed air is used for pneumatic tooling, actuators, and material handling equipment. The system operates automatically and provides shelter for the equipment. The system also provides primary and backup compressed air, provides remote control and monitoring, and conditions the compressed air. This system includes distribution to the subsurface interfaces point.

The Site Compressed Air System generates and supplies compressed air in sufficient quantity and pressure to meet the subsurface user requirements. The utility building provides protection against the expected environments and conditions at the site. The Site Compressed Air System contains safety features to protect personnel from accidents and/or failures. The Site Compressed Air System contains a remote control and monitoring capability. The Site Compressed Air System includes a backup system to provide compressed air to critical systems.

The Site Compressed Air System interfaces with the MGDS Site system for building location. The Site Compressed Air System interfaces with the Site Electrical Power System for power to operate the equipment. The Site Compressed Air System interfaces with the Subsurface Compressed Air System for transition to underground distribution. The system is supported by the Central Command and Control Operations System for monitoring and control.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Security and Safeguards System

Summary

The Security and Safeguards System performs the surveillance and safeguards functions required to protect the Repository from unauthorized intrusion, sabotage, theft and the diversion of nuclear material. The system includes the site security barriers and the automated surveillance, badging and record subsystems required to monitor and control access to all site areas and facilities. Security inspections are performed at the site access points to prevent unauthorized access and theft, and provide timely detection of contraband, including explosives, arms, and hazardous or dangerous substances.

The security patrol extends the defensive capability of the security system to remote and inaccessible areas of the site, and is required to mitigate threats such as armed intrusion. The security office issues badges for specific area access, and maintain continuous monitoring of the site security status including the security stations, patrols, security equipment diagnostics and alarm status. The system maintains accurate personnel and visitor histories, issues, valid badges, and investigates and responds to potential threats in a timely manner.

The Security and Safeguards System interfaces with the MGDS Site Layout, the Subsurface Facility System, and the Site Communications System.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU40A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Emergency Response System

Summary

The Emergency Response System performs the function of responding to accident conditions at or near the Repository, and returning or stabilizing the conditions to as normal as possible. The system maintains the emergency and rescue equipment, facilities, and trained professionals required to respond to fire, radiological, mining, industrial, and general accident events on the surface and subsurface. The system controls evacuation and rescue services and provides medical care to personnel. It coordinates this capability with off-site organizations as required improve or stabilize the accident condition and any injured. The primary emergency response subsystems consistent of the Fire Station, the Medical Facility, Health Physics Facility and the mine rescue equipment stores. These subsystems are operated by trained full time and part time personnel, and are supported by offsite professional medical, fire and rescue organizations.

The effectiveness of the Emergency Response System is determined by it's ability to prevent injury, save lives, rescue personnel, treat the injured in a timely manner, and prevent the possibility of further injury, death, or property damage.

The system interfaces with all site operational areas and facilities, and maintains a full-time interface with the site communications, transportation, and utility systems.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU41.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Health Safety System

Summary

The Health Safety System monitors, tests and manages personnel exposure to hazardous substances and radiation. The system monitors the operational personnel areas for hazardous materials and provides decontamination for personnel. The safety system also provides emergency and maintenance breathing air, and controls the access to radiological controlled areas based on personnel radiation exposure histories. The system performs physical and radiological surveys and provides isolation areas for contaminated personnel. The Health Safety System decontaminates personnel in response to emergency situations involving hazardous material.

The Health Safety System monitors access to the radiological areas such that the personnel entering and leaving are scanned and verified to be below safe exposure thresholds. The system provides sufficient coverage for all radiological areas to protect the workers from exposure and emergency decontamination. The responsiveness of the system for monitoring and tracking personnel health safety records supports the operational needs of waste handling.

The Health Safety System interfaces with the Waste Handling Facility System, Waste Treatment Facility System, and Subsurface Facility System for physical space, hardware mounting and potential decontamination waste products. The system interfaces with the Administration System for the identification, training, and tracking of site personnel data. The system interfaces with the Central Command & Control Operations System for the controlling of work loads and assignments based on exposure limits and quarterly accumulations.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU49A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Surface Environmental Monitoring System

Summary

The Surface Environmental Monitoring System monitors the surface areas and ground waters for radioactive, and hazardous substance release into the environment. The Surface Environmental Monitoring System is located at the surface site area, perimeter, and some off-site locations. The system aids in the protection of air and atmosphere and the protection of personnel and property from hazardous material accident. Specifically, the system monitors for radiation, loss of confinement, and hazardous materials.

The Surface Environmental Monitoring System monitors key areas for airborne particles containing radioactive or hazardous components and alerts the appropriate personnel when established threshold are exceeded. The Surface Environmental Monitoring System monitors selected water wells for particles containing radioactive or hazardous components and alerts the appropriate personnel when established threshold are exceeded.

The Surface Environmental Monitoring System interfaces with the Central Command & Control Operations System by providing data collected from instrumentation monitors. The system also interfaces with the Site Communications Systems for the transmission of data.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Central Command and Control Operations System

Summary

The Central Command and Control System performs the function of monitoring the status of Repository operations and support systems. The system includes the automated data processing equipment and network communications equipment required to automatically acquire status and data from all site facility, utility and subsurface monitoring and control subsystems. The subsystem provides real time display, supervisory control, independent alarm, trending and storage of primary site status data. The system provides for operating messages and advisories to facility monitoring stations via the site communications system. The system is located in the balance of plant area.

The Central Command and Control System is required to maintain effective monitoring of overall site status, control the primary functions associated with critical and safety related equipment, share information with the site operating stations and trend the primary site operating parameters in a way that supports improved operating methods.

The Central Command and Control System interfaces with the surface and subsurface utility and facility monitor and control systems, the site wide safety and security systems, and the administration system. The interface is provided on the site communications system which supports data acquisition and command and control requirements.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Maintenance and Supply System

Summary

The Maintenance and Supply System maintains adequate supplies and repair capability to ensure the surface and subsurface operations are able to operate with a minimum of downtime. The primary repair shops, warehouses, and equipment yards are located on the surface. This system procures, stores, and distributes materiel and maintains the site facilities and equipment in optimum operating condition.

This system must maintain a planned maintenance program, and anticipate the appropriate quantity and type of supplies required for planned and unplanned maintenance operations. The system also responds to maintenance calls within an acceptable period of time.

This system interfaces with all systems that require supplies and maintenance as part of their operations. The system interfaces with the MGDS Facility System and Site Utilities for surface locations and support to operate.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU50B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Administration System

Summary

The Administration System performs the site management and administration services required to plan and direct Repository operations, including Waste Handling, Emplacement, Development, and Transportation Dispatch operations and subcontract management. It is located in the Administration Building stationed in the balance of plant area. The Management and Control segment performs the Repository management and planning functions. The system utilizes automated data processing equipment to generate the integrated plans, optimize operations, minimize operational costs, and maintain adequate inventories. The system tracks Repository performance in a timely manner, determines variances, updates the operational plans, and reports on progress.

The Administration Services segment of the system performs the function required for purchasing, document control, training, payroll, human resources, and food services. The system is required to issue purchase orders as needed to maintain equipment inventories and consumables, maintain accurate employee and project documentation records, and provide the employee services needed for salary administration, career growth, nutrition, and conveniences.

The Administration System interfaces with the Site Communications System, and shares planning, progress and needs data and reports with collateral management, maintenance, inventory, transportation, and fabrication systems at the site and off-site facilities.

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SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Operational Monitoring System

Summary

The Subsurface Operational Monitoring System monitors and reports equipment operational status for development and emplacement systems. The system is located throughout the subsurface repository. This system monitors equipment parameters such as bearing temperatures, air flow rates, and hydraulic pressures. The system reports operational status of fixed and mobile equipment. Examples of operational status include identification of functioning equipment, standby equipment, and down equipment. This system also provides status on major equipment performance.

The Subsurface Operational Monitoring System is capable of operating during normal and off-normal conditions. The system supports the operation of the subsurface repository and helps determine the need for maintenance and/or repair.

The Subsurface Operational Monitoring System interfaces with all non-safety related subsurface systems such as Subsurface Ventilation System, Subsurface Electrical Distribution System, Subsurface Compressed Air System, and Muck Handling System. The system also interfaces with the Subsurface Facility System for the physical location of monitoring equipment. The system interfaces with the Site Communication System for the transmission of data and the Central Command & Control Operations System for use of the data in conducting subsurface operations.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU54A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

General Site Transportation System

Summary

The General Site Transportation System provides transportation of personnel and materials between the various facilities and areas of the surface repository. This system operates in and around the surface repository site where the system is loaded/unloaded. This system will provide the vehicles, parking, and the road/rail subsystem necessary to transport the expected personnel and materials.

This system provides transport of personnel and materials in a certain amount of time. This system must be sized to the weight and handling required for the payloads it is expected to carry.

This system interfaces with the expected payload to be transported. This system interfaces with the Maintenance and Supply System, the Administration System, and other surface facilities for the transport of personnel and materials. This system also delivers and receives personnel and materials from the Subsurface Emplacement Transportation System and the Subsurface Development Transportation System.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU55A.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Off Site Rail and Road System

Summary

The Off Site Rail and Road System facilitates the movement of transportation casks and carriers within Nevada. This system is located in designated transportation corridors between the Nevada state border and the repository site.

This system must provide a safe, stable roadway and/or railway capable of supporting the loads imposed by loaded transportation cask carriers. It must provide for intermodal transfer (i.e., rail to truck or truck to rail).

This system interfaces with existing roadway and/or railway systems at the Nevada state line or within the state, and with transportation systems at the site boundary. This system also interfaces with the type, size, and weight of the casks and carriers to be transported to and from the repository site.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SS16B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Subsurface Development Transportation System

Summary

The Subsurface Development Transportation System supports the development of the repository by providing transportation for personnel and material traveling between the surface and subsurface development areas. This system operates on the surface and in the subsurface on the rail system installed in the development area as part of this system. This system provides transport of personnel and materials.

This system must be able to withstand the weight and handling required for the payloads it is expected to carry. It must also meet required transportation and handling rates.

This system interfaces with the Subsurface Facility System (opening size and location), Engineered Barrier System (opening size and location of emplacement drifts), and the Subsurface Electrical Distribution System (power source, either directly or for battery charging), and with the expected payload to be transported.

O:\SYSREQ\SDD\DEVELOP\SUMMARY\SU47B.WPD
SYSTEM DESIGN DESCRIPTION
January 14, 1997

Site Generated Hazardous & Nonhazardous Waste Disposal System

Summary

The Site Generated Hazardous & Nonhazardous Waste Disposal System collects and handles the hazardous and sanitary wastes generated at the site. Site generated radioactive, and mixed waste are handled by the Site Generated Radiological Waste Handling System. The system collects, and packages solid and liquid hazardous waste at the points of generation throughout the surface and subsurface. The packaged waste is transferred to accumulation sheds to wait for off-site shipment. Sanitary, nonhazardous waste is collected at containers throughout the site, which is periodically collected and transferred to off-site disposal. Sanitary liquid waste is routed via sewer lines to the sanitary waste treatment facility on the surface. Subsurface waste water is pumped to the waste water collection system on the surface.

The Site Generated Hazardous & Nonhazardous Waste Disposal System minimizes the generation of mixed (radioactive and hazardous) wastes and complies with the Resource Conservation and Recovery Act. This system protects the environment and personnel from exposure to hazardous waste during collection, packaging and storage. This system collects, stores, transports and disposes of all site generated hazardous and sanitary wastes in a safe and timely manner, and in accordance with the Clean Water Act, State of Nevada Statutes, and DOE and federal orders for hazardous waste packaging and transportation, and environmental protection standards.

The Site Generated Hazardous & Nonhazardous Waste Disposal System interfaces with all waste generating operations and facilities throughout the site, and is supported by surface and subsurface material transportation systems for the movement of waste.