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# Nevada Transportation Requirements Document

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## ACRONYMS

| | |
|---|---|
| AAR | Association of American Railroads |
| ANSI | American National Standards Institute |
| ASTM | American Society for Testing and Materials |
| AREMA | American Railway Engineering and Maintenance-of-Way Association |
| BSC | Bechtel SAIC Company, LLC |
| CFR | Code of Federal Regulations |
| CRD | Civilian Radioactive Waste Management System Requirements Document |
| CRWMS | Civilian Radioactive Waste Management System |
| DOE | Department of Energy |
| DOT | United States Department of Transportation |
| EIS | Environmental Impact Statement |
| EM | Office of Environmental Management |
| EPA | U.S. Environmental Protection Agency |
| ES&H | Environmental, Safety, and Health |
| FRA | Federal Railroad Administration |
| GROA | Geologic Repository Operations Area |
| HLW | high-level radioactive waste |
| IICD | Integrated Interface Control Document |
| IMT | Intermodal Transfer Station |
| MTHM | Metric Tons of Heavy Metal |
| NAC | Nevada Administrative Code |
| NEPA | National Environmental Policy Act |
| NNPP | Naval Nuclear Propulsion Program |
| NRC | Nuclear Regulatory Commission |
| NRS | Nevada Revised Statute(s) |
| NRL | Nevada Rail Line |
| NVT | Nevada Transportation |
| NVTRD | Nevada Transportation Requirements Document |
| NWPA | Nuclear Waste Policy Act |
| OMB | Office of Management and Budget |
| PL | Public Law |
| QAP | quality assurance program |
| QARD | Quality Assurance Requirements and Description |

| | |
|---|---|
| SNF | spent nuclear fuel |
| STB | Surface Transportation Board |
| TBD | to be determined |
| TSRD | Transportation System Requirements Document |
| UPRR | Union Pacific Railroad |
| U.S.C | United States Code |
| WASRD | Waste Acceptance System Requirements Document |

# 1. INTRODUCTION

The Nevada Transportation (NVT) Organization is part of the Bechtel SAIC (BSC) Transportation Organization. NVT is responsible for developing the capability to move full and empty spent nuclear fuel (SNF) and high-level radioactive waste (HLW) cask cars as well as equipment and supplies between the mainline railroad near Caliente, Nevada, and the geologic repository at Yucca Mountain.

## 1.1 SCOPE OF WORK

This Nevada Transportation Requirements Document (NVTRD) establishes the requirements for the NVT organization (programmatic requirements) and the Nevada rail (NRL) line (programmatic and technical requirements). This requirement set includes:

- Requirements derived from upper tier source documents that apply to the NVT Organization and to the NRL System (see Figure 1-1)
- NRL system performance requirements and identified industry codes and standards to support the NRL conceptual design process.

### 1.1.1 Assumptions

In developing the NVTRD the following assumptions are used:

- The NRL will be operated and maintained by a contractor.
- In the case of a shared use scenario, Surface Transportation Board (STB) regulations apply to the construction and operation of the NRL.
- Federal Railroad Administration (FRA) regulations apply to the NRL.
- Those Nevada Revised Statutes (NRS) and Nevada Administrative Codes (NAC) consistent with 49 CFR 213.2 [DIRS 169825] and 49 CFR 234.4 [DIRS 161189] will be used as requirements for the NRL.
- NRL design requirements will accommodate Union Pacific Railroad (UPRR) standards, which meet or exceed American Railway Engineering and Maintenance-of-Way Association (AREMA) standards, consistent with common industry practice for a branch line railroad.
- The requirements that apply to the Fleet Management Facility (FMF) are not included in this document.
- Intermodal Transfer Station (IMT) requirements are not included in this document.
- The Department of Energy (DOE) Office of National Transportation (ONT) will own and maintain rolling stock associated with SNF and HLW shipments (i.e., requirements are not included in the NVTRD).

- The Nevada Rail line will be available to support repository operations in 2010.
- Permitting Requirements will be documented in a Permitting Plan.
- Planning considerations contained in DOE Levels 1 and 2 requirements documents are included as requirements in the NVTRD.
- Upon completion of construction and commissioning of the NRL, the NRL will be operated as a short line railroad and operation will be conducted under the Office of National Transportation.

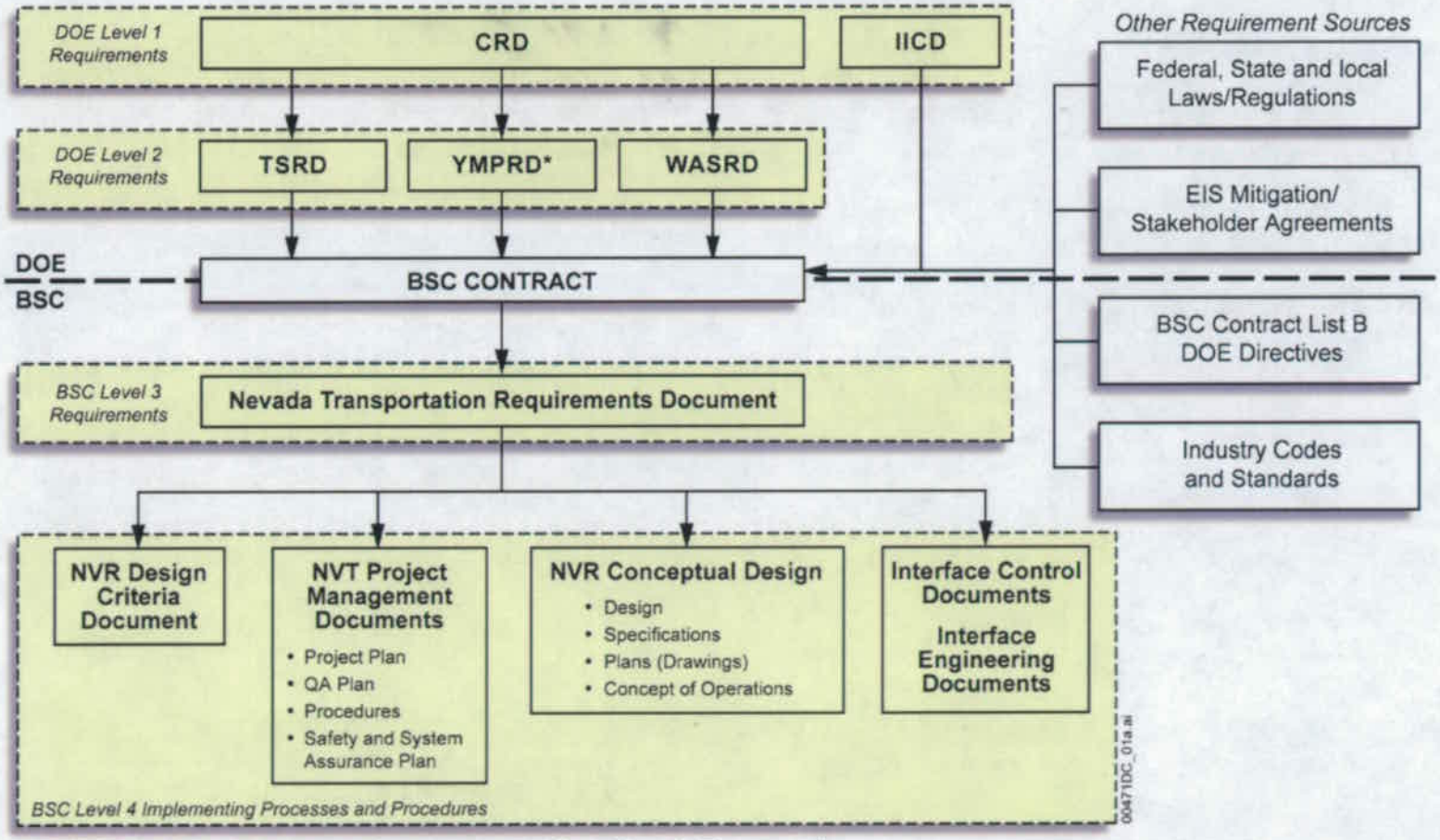
## 1.2 QUALITY ASSURANCE

The NVTRD is prepared in accordance with LP-3.11Q, *Technical Reports* [DIRS 171737]. Quality assurance requirements contained in DOE O 414.1B, *Quality Assurance* [DIRS 172492] apply to work performed by the NVT organization.

NOTE: The *Quality Assurance Requirements and Description* (QARD) [DIRS 171539] is applicable to structures, systems, and components identified in the *Q-List* [DIRS 168361] (see QARD Section 2.2). The *Q-List* does not identify the NRL system as an applicable structure, system, or component. Therefore, the NVTRD does not contain requirements from the QARD.

## 1.3 NEVADA TRANSPORTATION REQUIREMENTS AND HIERARCHY

The NVTRD requirement analysis uses a top-down requirement decomposition as shown in Figure 1-1.




* YMPRD does not have any requirements applicable to Nevada Transportation

Figure 1-1. NVTRD Requirements Flow Down

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# 2. REQUIREMENTS DEVELOPMENT AND METHODOLOGY

A phased approach is used to manage requirements in the NVTRD. The NVTRD identifies requirements for the current phase (Phase I) of the NVT organization mission, which are contained in Sections 3 through 9 of the document. The NVTRD also identifies requirements for future phases (in a higher level of detail), which are contained in Tables C-2, D-2, and E-2. The requirements for future phases have been identified to support development of Environmental Impact Statement (EIS) documentation (e.g., concept of operations and maintenance, concept of construction, etc.). The Phases are defined as:

- Phase I, Conceptual Design Development and Rail Alignment EIS Support
- Phase II, Contracting, Detailed Design, and Construction
- Phase III, Pre-Operational Testing, Operations, and Maintenance
- Phase IV, Railway Disposition.

A detailed explanation of the document development process and the methodology used for requirements analysis is contained below:

**NVTRD Development**–The NVTRD contains derived requirements from:

- DOE Level 1 and 2 requirements documents; for example:
  - Civilian Radioactive Waste Management System Requirements Document (CRD) [DIRS 171945]
  - Integrated Interface Control Document (IICD) [DIRS 158398]
  - Transportation System Requirements Document (TSRD) [DIRS 172491]
  - Yucca Mountain Site Characterization Project Requirements Document [DIRS 156713]
  - Waste Acceptance System Requirements Document (WASRD) [DIRS 158873]
- Legal and contractual requirements; for example:
  - Federal regulations and laws
  - State of Nevada Revised Statutes
  - Nevada Administrative Codes
  - DOE directives identified in the BSC Prime Contract [DIRS 169920]
  - Standalone requirements selected to support Nevada Transportation Phase I activities.

**Analysis of Identified Requirements**–Each of the legal and contractual requirements was reduced into manageable parts, sections, or chapters for analysis to determine its applicability to the NRL. The requirements were then categorized as technical (specifying the performance or composition of equipment or hardware systems) or programmatic (having to do with the process by which an output must be produced or documented). See the "Category" column in the tables in the Appendices. The tables identify the function (i.e., design, construction, testing, operation, or maintenance) to which each requirement applies. See the "Function" column. The tables identify the phase to which the requirement applies (i.e., Phase I, Phase II, Phase III). See the "Applicable Phase" column. The requirement was quoted or paraphrased in the tables. See the "Requirements/Remarks" column.

**Section Content and Layout**–The NVTRD has been divided into the following sections and appendices as described below.

- **Section 1 Introduction**–This section provides a context and scope for the document.
- **Section 2 Requirements Development and Methodology**–Provides an explanation of the method that was used to develop the document and select requirements.
- **Section 3 Overall Project Requirements**–Provides the overall requirements for the Project:
  - Contains derived requirements from Level 1 (CRD, IICD) and Level 2 documents (WASRD, TSRD)
  - Contains standalone requirements necessary to support the scope of work
  - Supplemented by detailed requirement traceability and standalone requirement rationale in Appendix A.
- **Section 4 System Performance and Configuration Requirements**–This section contains performance and configuration requirements derived from UPRR standards and input from railroad experts:
  - Contains derived requirements from Level 1 (CRD, IICD) and Level 2 documents (WASRD, TSRD)
  - Contains standalone requirements necessary to support the scope of work
  - Supplemented by detailed requirement traceability and standalone requirement rationale in Appendix B.
- **Section 5 Federal Regulatory Requirements**–This section contains design-related requirements-derived federal regulations, laws, and statutes applicable to the NRL:
  - Focuses on requirements that affect conceptual design activities (Phase I)

- Supplemented by detailed design-related requirements traceability in Appendix, Table C-1, and construction, operation and maintenance requirements in Table C-2.

- **Section 6 Nevada State Code and Statute Requirements**–This section contains requirements derived from NRS and NACs:

  - Focuses on requirements that affect conceptual design activities (Phase I)

  - Supplemented by detailed design-related requirements traceability in Appendix D, Table D-1, and construction, operation and maintenance requirements in Table D-2.

- **Section 7 DOE Directive (Contractual) Requirements**–This section contains requirements derived from DOE directives (orders, manuals, and notices) that have been incorporated into the BSC Prime Contract [DIRS 169920]:

  - Focuses on requirements that affect conceptual design activities (Phase I)

  - Supplemented by detailed design-related requirements traceability in Appendix E, Table E-1; and construction, operation, and maintenance requirements in Table E-2.

- **Section 8 Industry Codes and Standards**–This section contains industry codes and standards that support conceptual design activities (Phase I). There was no need for a corresponding appendix.

- **Section 9 Interface Requirements**–This section contains interface requirements for the NRL with a focus on interfaces necessary for Phase I activities. This section is supplemented by detailed requirement traceability and rationale in Appendix F.

- **Section 10 References**–This section contains references for the document.

- **Appendix A: Overall Project Requirements**–This appendix provides traceability to sources for the requirements in Section 3. Table A-1 documents the Section 3 requirement and identifies the source document (e.g., CRD, TSRD, federal law, regulation, statute, or Federal Register Notice) source title, and the source text and rationale for including a standalone requirement in Table A-1.

- **Appendix B: System Performance and Configuration Requirements**–This appendix provides traceability to sources for the requirements in Section 4. Table B-1 documents the Section 4 requirement and identifies the source document (e.g., CRD, TSRD, federal regulation, or industry standard) source title, and the source text and rationale for including a standalone requirement in Table B-1.

- **Appendix C: Federal Regulation Requirements**–This appendix provides traceability to sources for the requirements in Section 5. Table C-1 documents the Section 5 requirement and identifies the design-related requirement from federal regulations (i.e., CFRs), source title, and a summary of the source requirement. Construction, operations, and maintenance requirements from CFRs are in Table C-2.

- **Appendix D: State of Nevada Statute and Code Regulations**–This appendix provides traceability to sources for the requirements in Section 6. Table D-1 documents the Section 6 requirement and identifies the design-related requirements from NRS and NAC, source title, and a summary of the source requirement. Construction, operations, and maintenance requirements from NRS and NAC are in Table D-2.

- **Appendix E: DOE Directive (Contractual) Requirements**–This appendix provides traceability to sources for the requirements in Section 7. Table E-1 documents the Section 7 requirement and identifies the design-related requirement from DOE directives (orders, manuals, and notices that are included in List B of the BSC Prime Contract), source title, and source text. Construction, operations, and maintenance requirements from DOE orders are in Table E-2.

- **Appendix F: Interface Requirements**–This appendix provides traceability to sources for the requirements in Section 9. Table F-1 documents the Section 9 requirement and identifies the TSRD source, source title, and source text.

**Responsibility and Implementation**–The NVT Manager is responsible for the implementation of requirements contained in this document. The NVT organization intends to transfer NVTRD requirements into a BSC requirements management system to comply with the *Management Description* [DIRS 169889]. In the requirements management system, each approved requirement will be linked to an implementing document, and responsibility for implementation will be assigned, to complete the requirements flowdown process.

# 3. OVERALL PROJECT REQUIREMENTS

Section 3 requirements govern technical and programmatic elements of the overall Nevada Transportation project. This set of requirements is a flowdown of requirements from the CRD, IICD, and TSRD. In addition, standalone requirements are added, as needed, to support the NVT activities. Appendix A shows the rationale and traceability for this set of requirements.

A. Mission. The NRL shall be designed, constructed, and operated to transport railcars between a mainline railroad junction near Caliente, Nevada, and the geologic repository in a safe, secure, and efficient manner that both protects the health and safety of the public and of workers and maintains the quality of the environment. [TSRD 2.G] [TSRD 2.O] [TSRD 3.2.3.A.2] [TSRD 3.8.1.A] [TSRD 3.8.1.B] [CRD 1.3.1] [CRD 1.3.2]

B. System Concept. The NRL shall:

- Move loaded rail casks, buffer cars, and escort cars from the mainline railroad to the geological repository
- Move unloaded rail casks from the repository to the FMF, and the unloaded rail casks, buffer cars, and escort cars from the FMF to the mainline railroad for delivery to a shipping site
- Move equipment and other commodities to the FMF and the repository. [TSRD 2.O] [TSRD 3.8] [CRD 1.3.2]

C. Design/Construct/Operate Nevada Rail. The design, construction, operation, and maintenance of the NRL and facilities shall be performed to the appropriate standards and/or requirements of the FRA, the AREMA/UPRR, and the Association of American Railroads (AAR). All such work shall also be in accordance with other appropriate industry codes, standards, engineering principles, and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. [TSRD 3.2.2.B.1] [TSRD 3.2.2.B.2] [TSRD 3.2.2.C.4] [TSRD 3.2.2.C.5] [TSRD 3.2.9.C] [TSRD 3.8.3.1.B] [TSRD 3.8.3.1.C] [CRD 3.2.1.J] [CRD 3.3.2.C] [CRD 3.3.2.D]

D. Receipt Rates. NRL shall support the initial target receipt rates identified in Table 3-1. The NRL shall be designed, constructed, operated, and maintained to accommodate the projected traffic levels given in Section 4.P. [TSRD 1.3] [TSRD 2.I] [TSRD 3.2.1.C] [TSRD 3.2.1.D] [CRD 3.2.1.B Table 1] [CRD 3.2.1.C Table 2]

Table 3-1. Receipt Rates [1,2,3] (in MTHM or Equivalent/Year (nominal))

| Year | Commercial SNF and HLW Received Annually at Repository | Government-managed Nuclear Materials Received Annually at Repository |
|---|---|---|
| 2010 | 400 | Naval SNF – 3 canisters<br>DOE SNF and DHLW[4] |
| 2011 | 600 | Naval SNF – 3 canisters<br>DOE SNF and DHLW[4] |
| 2012 | 1,200 | Naval SNF – 6 canisters<br>DOE SNF and DHLW[4] |
| 2013 | 2,000 | Naval SNF – 6 canisters<br>DOE SNF and DHLW[4] |
| 2014 | 3,000 | Naval SNF – 12 canisters<br>DOE SNF and DHLW[4] |
| 2015-2032 | 3,000 | [Balance of naval SNF, DOE SNF, and DHLW within planning allocation] |
| 2033 | 1,800 | |
| TOTAL | 63,000 | 7,000 |

[1] The actual operational load is a function of the numbers, types, and sizes of casks and canisters in which the SNF and HLW are accepted from the points of origin. Since these specific numbers will not be determined until Purchaser/Producer/Custodian agreements are reached and schedules are established, the receipt rates are estimated in terms of desired systems-level MTHM acceptance rates.

[2] The receipt schedule of Government-managed nuclear materials will be provided by the DOE Office of Environmental Management (EM) and the Naval Nuclear Propulsion Program (NNPP), in accordance with memorandums of agreement, five years prior to acceptance. For planning purposes, naval SNF is to be included among the earliest shipments to the repository.

[3] The rates in this schedule are targets only and do not create any binding legal obligation on the DOE.

[4] Target receipt rates for these wastes will be further defined in the Integrated Acceptance Schedule developed in accordance with the RW/NNPP and RW/EM memorandums of agreement. [Source CRD 3.2.1.B Table 1]

E. Shared Use. The NRL shall be planned, designed, constructed, operated, and maintained so that shared use shall not be precluded. [TSRD 2.H]

F. Dedicated Trains. Rail shipments of loaded casks on the NRL shall be by use of dedicated trains (no other materials or commodities will be shipped with cask shipments). [TSRD 2.F]

G. Integrated Planning. The design, construction, operation, and maintenance of the NRL shall make provision for non-normal and peaking effects in the movements of loaded and empty casks. [TSRD 3.8.2.B] [CRD 3.2.1.A] [CRD 3.2.1.B] [CRD 3.2.1.C]

H. Land Acquisition. Land acquisition for the NRL and facilities shall be accomplished in a manner consistent with applicable federal regulations including requirements associated with land withdrawal processing in accordance with 43 CFR 2300 [DIRS 146511]. [TSRD 3.2.2.A.1] [68 FR 74965 [DIRS 169909]]

I. Regulatory Requirements–Federal. The NRL shall be designed, constructed, operated and maintained in accordance with the following federal regulations and statutes:

1. Applicable provisions of 42 U.S.C. 10101 et seq., "Nuclear Waste Policy Act of 1982" as amended [DIRS 101681]. [CRD 3.1.2.A]

2. Applicable provisions of 42 U.S.C. 4321 et seq., "National Environmental Policy Act of 1969" as amended [DIRS 160261]. [TSRD 3.2.3.B.1] [CRD 3.3.2.A]

3. Applicable provisions of 29 CFR Part 1910 "Occupational Safety and Health Standards" [DIRS 103642] and 29 CFR Part 1926, "Safety and Health Regulations for Construction" [DIRS 103643]. [TSRD 3.2.3.A.3] [TSRD 3.2.3.A.5] [CRD 3.1.2 D]

4. Applicable regulations of the U.S. Department of Transportation (DOT) (as detailed in Code of Federal Regulations Title 49). [TSRD 3.6.1.2.C.1] [TSRD 3.6.1.2.C.2] [TSRD 3.8.1.C] [CRD 3.3.2.C]

J. Regulatory Requirements–State, Tribal and Local. The NRL shall be designed, constructed, operated, and maintained to meet applicable legal, regulatory, and operational requirements of state, tribal, and local government agencies for transportation of SNF and HLW. [TSRD 3.6.1.1.B] [TSRD 3.8.1.C] [TSRD 3.1.1]

K. Regulatory Requirements–Precedence. The order of precedence to be applied to external sources of regulatory requirements shall be as follows:

1. Federal laws, treaties, and Executive Orders

2. Requirements of federal agencies and departments (e.g., DOE, NRC, Environmental Protection Agency (EPA), and DOT)

3. State and Tribal laws

4. Local ordinances

5. National and international standards. [TSRD 3.1.1]

L. DOE Directives. The NVT Organization shall comply with all applicable DOE directives as defined in the current BSC Prime Contract. DOE directives that have been superseded or expired will continue to be used as a requirement source until a revision is incorporated into the BSC Prime Contract. [CRD 3.3.2.D] [BSC Prime Contract]

M. Use of Private Industry. The NRL shall use private industry to the extent practical in its design, construction, operation, and maintenance and shall encourage the use of vendors and suppliers located within close proximity to planned facilities. [TSRD 3.2.1.J] [CRD 3.1.1.E] [NWPA Section 137(a)2]

N. Cask Movements To and From the Repository. The NRL operations shall be coordinated with repository operations to provide for the movement of railcars carrying loaded casks to the Geologic Repository Operations Area (GROA), and for the movement of railcars from the GROA. Any movement, considered extra-dimensional or "wide-load" (anything over 12-feet wide), shall be protected against other opposing wide-load movements and shall meet and pass at locations known to be wide enough to accommodate the meet/pass. [CRD 3.2.1.G.2] [CRD 3.2.1.H]

O. Inspection Standards. Applicable sections of the FRA policy for inspections prior to the movement of SNF or HLW, as described in *Safety Compliance Oversight Plan for Rail Transportation of High Level Radioactive Waste and Spent Nuclear Fuel* [DIRS 156703], will apply to the operation of the NRL. [Repository FEIS, M.3.2.2.2 [DIRS 155970]]

P. EIS Contractor Integration. The NVT Organization shall implement a process to transfer necessary data to and from the EIS contractor while maintaining configuration control and documentation for activities supporting the EIS. [DOE O 413.3 [DIRS 152047], Contractor Requirements Document Section 9].

Q. Subcontractor Integration. The NVT Organization shall implement a process to transfer necessary data to and from its subcontractors while maintaining configuration control and documentation for activities supporting the conceptual design and EIS. [DOE O 413.3 [DIRS 152047], Contractor Requirements Document Section 9]

R. Quality Assurance. The NVT Organization shall implement a quality management system in a manner appropriate to achieve protection of workers, the public, and the environment, taking into account the work to be performed, the associated hazards, and the quality assurance criteria in DOE O 414.1B, *Quality Assurance* [DIRS 172492]. The NVT quality management system shall use a graded or phased approach and focus on quality affecting work for Phase I including subcontractor oversight, review of subcontractor work products, development and implementation of interface requirements, record management, and training. [TSRD 3.2.8] [CRD 3.3.2.D] [DOE O 414.1B, Contractor Requirements Document Sections 2.a.1, 2.a.2, 2.a.3 & 2.a.4, Sections 2.b.1, 2.b.2, 2.b.3 & 2.b.5, Section 2.c & Section 3] [DOE O 413.3 Contractor Requirements Document Section 11 [DIRS 152047]].

# 4. SYSTEM PERFORMANCE AND CONFIGURATION REQUIREMENTS

Section 4 contains NRL Phase I system performance requirements. This set of requirements is derived from railroad standard practices. Requirements are identified as "standalone" requirements if flowdown from a higher-level requirement could not be made. Appendix B shows the rationale and traceability for this set of requirements.

A. Corridor and Alignment Selection. The Caliente Corridor and alternatives identified for analysis in the EIS shall be used to locate a railroad alignment and profile. [TSRD 3.8.1.A]

B. Shipment Transit Times. The NRL route alignments and profiles, track, and infrastructure shall be designed to accommodate transportation of loaded maximum dimension cask train consists, from the mainline railroad junction to the repository, within 12 continuous hours for a single train operating crew (including the time necessary to perform activities prior to and at the end of shipment that are considered part of the hours of service under 49 CFR 228[DIRS 161184]). The same transit time shall apply to empty cask trains from the repository to the mainline railroad junction. If an alignment, due to length beyond 319 miles, cannot be accommodated within the continuous 12-hour operating period for train crews, provisions for a crew change facility at an intermediate point must be made and overall train transit time shall be reasonably minimized. [Standalone Requirement]

C. Maximum Operating Speed. Shipments of loaded casks on the NRL shall be limited to the maximum recommended operating speed specified by AAR's *Recommended Railroad Operating Practices for Transportation of Hazardous Materials* [DIRS 172489]. [TSRD 3.2.2.C.4] [CRD 3.2.1.J] [AAR OT-55]

D. Maximum Design Speed. The NRL shall be planned, designed, and constructed to accommodate a maximum train speed of 60 mph, the maximum speed allowed under 49 CFR 213.9 [DIRS 169825] for class four track. Yards and associated end of line facilities shall be designed to accommodate train speeds not to exceed those established for yard operations in 49 CFR 218.35 [DIRS 161175]. [TSRD 3.8.3.1.A] [49 CFR 213.9] [49 CFR 218.35]

E. Train Operation. Railcar movements on the NRL and at its facilities shall be under motive control at all times. [Standalone Requirement]

F. Siding Length. Siding clear lengths shall accommodate a 4,000-foot train fully in the clear of the mainline. [Standalone Requirement]

G. Design Life. The NRL shall be planned, designed, constructed, operated, and maintained to ensure a 50-year life cycle. [Standalone Requirement]

H. Train Configuration. The NRL shall have:

1. At least two diesel-electric powered locomotives with motive power at the head end of all trains transporting casks. The NRL shall operate cask hauling trains

with one additional power locomotive more than that which is necessary to meet the required horsepower to tonnage ratio for normal operations. [Standalone Requirement]

2. At least two buffer cars and one escort car per train. Buffer cars will be used to separate the loaded cars from the locomotives and the escort cars. [49 CFR 174.85]

I. Operating Environment. The NRL shall be operated within the environmental thresholds established locally by the connecting mainline railroad. Monitoring equipment, placed at critical locations along the NRL, shall continuously measure these environmental parameters and convey this information to the operator of the train so that the movement of the train can be regulated based on this information. Outside this range, degraded operation, including line closure, will be allowed. [TSRD 3.2.2.C.4] [CRD 3.2.1.J]

J. System Envelope. NRL clearances shall be planned, designed, and constructed to accommodate all railcar types and loads that the mainline railroad can deliver to the NRL junction near Caliente, Nevada [DIRS 170826]. [TSRD 3.8.2.A] [CRD 3.2.1.E] [CRD 3.3.2.E]

K. Maintenance of Way. The NRL shall be planned, designed, and constructed on the basis that track and wayside maintenance shall be accomplished using on-track equipment in lieu of road equipment using a parallel service road. [TSRD 3.8.2.C] [CRD 3.2.1.J]

L. Grade Separation. All federal and state designated highways shall be grade separated from the NRL. [Standalone Requirement]

M. Rail Operations. The NRL shall adopt and operate under a general code of operating rules, taking into consideration the general code of operating rules adopted by the UPRR [DIRS 170825]. [49 CFR 217.7]

N. Fleet Management Facility. The NRL shall be designed, constructed, operated, and maintained such that NRL and Yucca Mountain rail yard shall be integrated with the design, layout, and operating modes of the Fleet Management Facility should such be located adjacent to the NRL. [TSRD 2.L] [TSRD 3.6.2.2.D] [TSRD 3.6.2.2.E] [TSRD 3.6.2.2.F]

O. Rail Line Facilities. NVT shall provide an integrated design for all facilities related to the NRL including maintenance-of-way facilities, end of line facilities, IMT, crew change facilities, and any other necessary facilities specified in the conceptual design. [TSRD 3.6.2.2.I]

P. Rail System Traffic Projections. The NRL shall be designed, constructed, operated, and maintained to accommodate the projected rail traffic levels shown in Tables 4-1 through 4-4. (Tables modified from DIRS 169961.) [Standalone Requirement]

Table 4-1. Projected and Postulated Nevada Rail Traffic Levels – 2012

| Basic Shipments | Trains Per Year (one way) | Maximum Trains Per Month (one way) | Train Consist Assumptions |
|---|---|---|---|
| Basic Shipments | | | |
| SNF/HLW | 55 | 7[1] | Various Train Lengths |
| NRL Maintenance | | | |
| Maintenance-of-Way Trains | 52 | 5 | Various Train Lengths |
| Additional DOE Uses - Repository | | | |
| Repository Construction | 16 | 2 | 10 car train |
| Repository Fuel Oil | 16 | 3[2] | 10 car train |
| Waste Disposal Containers | 26 | 2 | 5 car train |
| Site Specific Casks[3] | 40 | 4 | 5 car train |
| *Subtotal* | 98 | 11 | |
| Additional DOE Use - NTS | | | |
| Nevada Test Site Shipments | 21 | 2 | 10 car trains |
| Shared Use | | | |
| Commercial Shipments (P) | 24 | 2 | 20 car train |
| *Total* | 250 | 27 | |
| | | | |
| NORMAL TRAINS/WEEKDAY[4] | 1 Each direction | | |
| PEAK TRAINS/WEEKDAY[5] | 2 Each direction | | |

Source: Modified from *Possible Nevada Rail Shared Use Options and Analysis* [DIRS 169961] & [DIRS 172552]

NOTE: (P) = Postulated Estimates.

[1] Assumes 20% purchaser and producer/custodian (PPC) exercised shipping overage plus 15% monthly peaking factor.
[2] Assumes all fuel oil delivered in October - March timeframe.
[3] Repository site-specific casks are for the planned 21,000 MTHM facility. [DIRS 172552]
[4] Rounded up to next whole train.
[5] Assumes 100% daily peaking factor for train movements.

Table 4-2. Projected and Postulated Nevada Rail Traffic Levels – 2018

| Nevada Rail Use | Trains Per Year (one way) | Maximum Trains Per Month (one way) | Train Consist Assumptions |
|---|---|---|---|
| Basic Shipments | | | |
| SNF/HLW | 140 | 16[1] | Various Train Lengths |
| NRL Maintenance | | | |
| Maintenance-of-Way Trains | 52 | 5 | Various Train Lengths |
| Additional DOE Uses - Repository | | | |
| Repository Construction | 17 | 2 | 10 car train |
| Repository Fuel Oil | 16 | 3[2] | 10 car train |
| Waste Disposal Containers | 50 | 4 | 5 car train |
| Site Specific Casks[3] | 20 | 4 | 5 car train |
| *Subtotal* | 103 | 13 | |
| Additional DOE Use - NTS | | | |
| Nevada Test Site Shipments | 23 | 2 | 10 car trains |
| Shared Use | | | |
| Commercial Shipments (P) | 72 | 6 | 20 car train |
| *Total* | 390 | 42 | |
| | | | |
| NORMAL TRAINS/WEEKDAY[3] | 2 Each direction | | |
| PEAK TRAINS/WEEKDAY[4] | 4 Each direction | | |

Source: Modified from Possible Nevada Rail Shared Use Options and Analysis [DIRS 169961] and [DIRS 72552]

NOTE: (P) = Postulated Estimates.

[1] Assumes 20% PPC exercised shipping overage plus 15% monthly peaking factor.
[2] Assumes all fuel oil delivered in October - March timeframe.
[3] Repository site-specific casks are for the planned 21,000 MTHM facility. [DIRS 172552]
[4] Rounded up to next whole train.
[5] Assumes 100% daily peaking factor for train movements.

Table 4-3. Projected and Postulated Nevada Rail Traffic Levels – 2024

| Nevada Rail Use | Trains Per Year (one way) | Maximum Trains Per Month (one way) | Train Consist Assumptions |
|---|---|---|---|
| Basic Shipments | | | |
| SNF/HLW | 137 | 16[1] | Various Train Lengths |
| NRL Maintenance | | | |
| Maintenance-of-Way Trains | 52 | 5 | Various Train Lengths |
| Additional DOE Uses - Repository | | | |
| Repository Construction | 11 | 1 | |
| Repository Fuel Oil | 16 | 3[2] | 10 car train |
| Waste Disposal Containers | 59 | 4 | 5 car train |
| Site Specific Casks[3] | 10 | 1 | 5 car train |
| *Subtotal* | 96 | 9 | |
| Additional DOE Use - NTS | | | |
| Nevada Test Site Shipments | 3 | <1 | 10 car trains |
| Shared Use | | | |
| Commercial Shipments (P) | 96 | 8 | 20 car train |
| *Total* | 384 | 39 | |
| | | | |
| NORMAL TRAINS/WEEKDAY[4] | 2 Each direction | | |
| PEAK TRAINS/WEEKDAY[5] | 4 Each direction | | |

Source: Modified from *Possible Nevada Rail Shared Use Options and Analysis* [DIRS 169961] & [DIRS 172552]

NOTE: (P) = Postulated Estimates.

[1] Assumes 20% PPC exercised shipping overage plus 15% monthly peaking factor.
[2] Assumes all fuel oil delivered in October - March timeframe.
[3] Repository site-specific casks are for the planned 21,000 MTHM facility. [DIRS 172552]
[4] Rounded up to next whole train.
[5] Assumes 100% daily peaking factor for train movements.

Table 4-4. Projected and Postulated Nevada Rail Traffic Levels – 2030

| Nevada Rail Use | Trains Per Year (one way) | Maximum Trains Per Month (one way) | Train Consist Assumptions |
|---|---|---|---|
| Basic Shipments | | | |
| SNF/HLW | 130 | 15[1] | Various Train Lengths |
| NRL Maintenance | | | |
| Maintenance-of-Way Trains | 52 | 5 | Various Train Lengths |
| Additional DOE Uses - Repository | | | |
| Repository Construction | 3 | <1 | |
| Repository Fuel Oil | 16 | 3[2] | 10 car train |
| Waste Disposal Containers | 48 | 4 | 5 car train |
| Site Specific Casks[3] | 0 | 0 | |
| *Subtotal* | 67 | 8 | |
| Additional DOE Use - NTS | | | |
| Nevada Test Site Shipments | N/A | N/A | 10 car trains |
| Shared Use | | | |
| Commercial Shipments (P) | 144 | 12 | 20 car train |
| *Total* | 393 | 40 | |
| | | | |
| NORMAL TRAINS/WEEKDAY[4] | 2 Each direction | | |
| PEAK TRAINS/WEEKDAY[5] | 4 Each direction | | |

Source: Modified from *Possible Nevada Rail Shared Use Options and Analysis* [DIRS 169961] and [DIRS 172552]

NOTE: (P) = Postulated Estimates.

[1] Assumes 20% PPC exercised shipping overage plus 15% monthly peaking factor.
[2] Assumes all fuel oil delivered in October - March timeframe.
[3] Repository site-specific casks are for the planned 21,000 MTHM facility. [DIRS 172552]
[4] Rounded up to next whole train.
[5] Assumes 100% daily peaking factor for train movements.

Q. Intermodal Transfer Station. In the event the NRL is not available to support repository operations, an IMT may be designed, constructed and operated until the NRL is operational. An IMT system should provide intermodal transfer of truck transportation casks between rail and road conveyances. If the IMT site were co-located with an NRL facility, then the requirements for both facilities should be integrated, if practical. The IMT system shall have a normal transfer throughput rate of to be determined (TBD) truck casks per week and a surge transfer rate of TBD casks per week. [TSRD 2.J] [69 FR 18565 [DIRS 169912]

# 5. FEDERAL REGULATORY REQUIREMENTS

Section 5 contains design-related requirements; derived from federal statutes and regulations. Table C-1 provides the source traceability for the requirements in Section 5. Also, Table C-2 provides construction, operations, and maintenance requirements not discussed in Section 5.

A. Floodplain and Wetlands. NRL shall consider floodplain/wetlands factors in planning and decision-making in accordance with applicable requirements of 10 CFR 1022 [DIRS 103984].

B. Yard and Facilities. The NRL yards and facilities shall be designed to meet the separation and spacing requirements of 49 CFR 174 [DIRS 158718].

C. Noise Emissions. The design of the NRL shall consider the compliance regulations contained in applicable sections of 49 CFR 210 [DIRS 169824] for noise emissions during railroad operation.

D. Operating Speed Limits. The NRL shall be designed for operating speeds, within the limitations of 49 CFR 213.9 [DIRS 169825], corresponding to the class of track.

E. Roadbed. The NRL shall be designed to meet the requirements contained in Subpart B of 49 CFR 213 [DIRS 169825] for roadbed and areas immediately adjacent to the roadbed.

F. Track Geometry. The NRL shall be designed to meet the requirements contained in Subpart C of 49 CFR 213 [DIRS 169825] for gauge, alignment, surface of track, elevation of outer rails, and speed limitations for curved track.

G. Track Structure. The NRL shall be designed to meet the requirements contained in Subpart D of 49 CFR 213 [DIRS 169825] for ballast, crossties, and track assembly fittings.

H. Track Appliances and Track-Related Devices. The NRL shall be designed to meet the requirements contained in Subpart E of 49 CFR 213 [DIRS 169825] for track appliances and track-related devices.

I. Yard and Facilities. Pre-departure inspections required by 49 CFR 215 [DIRS 161173] shall be considered in the design of NRL yards and facilities at locations where freight cars are placed in trains.

J. Safety Devices. The requirements contained in Subparts C and D of 49 CFR 218 [DIRS 161175] for deactivation of safety devices and protection of trains and locomotives shall be considered in the design of the NRL.

K. Blue Signal Protection. The design of the NRL and its facilities shall incorporate engineered barriers in place of administrative controls to meet the requirements contained in Subpart B of 49 CFR 218 [DIRS 161175] for blue signal protection of workers, in areas where worker safety will be enhanced.

L. Communications. The NRL shall be designed to provide redundant wireless communications as required by 49 CFR 220.9. [DIRS 161177].

M. Hours of Service. The requirements contained in 49 CFR 228 [DIRS 161184] for hours of service of railroad employees shall be considered in the design of the NRL to avoid the need to change rail crews at intermediate points along the NRL.

N. Highway Grade Crossings. The design of any highway grade crossing signal and warning systems for the NRL shall meet the requirements of Subpart D of 49 CFR 234 [DIRS 161189].

O. Train Control Systems, Devices and Components. All train control systems, devices, and components for the NRL shall be designed to meet the requirements of Subpart A of 49 CFR 236 [DIRS 161190].

P. Automatic Block Signal System. The design of an automatic block signal system, if necessary, for the NRL shall meet the requirements of Subpart B of 49 CFR 236 [DIRS 161190].

Q. Interlocks. Interlocking systems and devices for the NRL shall be designed to meet the requirements of Subpart C of 49 CFR 236 [DIRS 161190].

R. Traffic Control System. The traffic control system for the NRL shall be designed to meet the requirements of Subpart D of 49 CFR 236 [DIRS 161190].

S. Slide Detectors and Other Detection Devices. Slide detectors and other similar detection equipment for the NRL shall be designed to meet the requirements of Subpart F of 49 CFR 236 [DIRS 161190].

T. Certificate of Public Convenience and Necessity. So as to not preclude shared use of the NRL, the design and documentation for the NRL shall consider the informational and design requirements of 49 CFR 1104 [DIRS 169827] for document specifications and filing with the STB, 49 CFR 1105 [DIRS 169828] for procedures for implementation of environmental laws for the STB, and 49 CFR 1150 [DIRS 169829] for a certificate of public convenience and necessity from the STB.

# 6. NEVADA STATE CODE AND STATUTE REQUIREMENTS

Section 6 contains State of Nevada Code and Statute requirements that apply to the design of the NRL and its facilities. Table D-1 provides the source traceability for the requirements in Section 6, and Table D-2 provides the construction, operations, and maintenance requirements not discussed in Section 6.

A. Sewage Disposal Systems. Design of NRL facilities that utilize sewage disposal systems shall comply with the applicable sections of NAC 445A.228 through 445A.263 [DIRS 104040].

B. Runoff Control. The NRL shall be designed using established best practices and applicable requirements contained in NAC 445A.305 through 445A.340 [DIRS 104040], for the control of run off from "diffuse sources" (e.g., railroads).

C. Drinking Water Systems. The design of drinking water systems at NRL facilities shall meet the applicable requirements of NAC 445A.591 through 445A.6731 [DIRS 104040].

D. Air Pollution Control. Design of the NRL shall consider the requirements for control of emissions (e.g., fugitive dust) contained in NAC 445B.001 through 445B.899 [DIRS 104041].

E. Storage Tanks. Any underground storage tanks for hazardous materials (e.g., locomotive fuel) at NRL facilities shall be designed to meet the applicable permitting requirements of NAC 459.9921 through 459.999 [DIRS 104042].

F. Roofing Materials. The design of NRL facilities shall incorporate the applicable requirements for fire-retardant roofing materials in areas designated by NAC 472 [DIRS 169742].

G. Hazardous Material Storage. NRL facilities that require storage of hazardous materials in excess of the limits set forth in *Uniform Fire Code* [DIRS 126496], as adopted pursuant to NAC 477.281 [DIRS 104051], shall be designed to meet the permitting requirements set in NAC 477.323.

H. Fire Suppression Systems. NRL facilities situated in rural areas shall be designed to meet the applicable requirements contained in NAC 477.920 [DIRS 104051] for fire suppression systems.

I. Wildlife Management Areas. In areas of wildlife management, the design and planning of the NRL shall consider the requirements contained in NAC 504.115 and 504.520 [DIRS 169744] for alteration of stream systems or watersheds and vehicular travel.

J. Overhead Clearances. The design of overhead clearances for the NRL shall satisfy the applicable minimum clearance requirements in NAC 705.020 and NAC 705.050 [DIRS 169745].

K. Side Clearances. The design and construction of side clearances for the NRL shall satisfy the applicable minimum clearance requirements in NAC 705.030 and NAC 705.050 [DIRS 169745].

L. Parallel Track Clearances. The design and construction of any parallel tracks for the NRL shall satisfy the applicable parallel track clearance requirements in NAC 705.060 [DIRS 169745].

M. Rail Above Road Crossing Clearances. The design and construction of any rail crossings above roads for the NRL shall satisfy the minimum structural clearance requirements in NAC 705.064 [DIRS 169745].

N. Overhead Road Crossing Clearances. The design of overhead road crossings for the NRL shall meet the structural clearance requirements in NAC 705.066 [DIRS 169745].

O. Electrical Construction Clearances. The design of electrical systems for NRL facilities and utility relocations shall meet the required clearance requirements specified in the *National Electrical Safety Code* [DIRS 117477] as required by NAC 705.070 [DIRS 169745].

P. Rail Bridges. The design of bridges for the NRL shall consider the inspection requirements contained in NAC 705.145 [DIRS 169745].

Q. Walkways. The design of walkways on bridges, trestles, alongside tracks, etc., shall meet the design standards specified in NAC 705.150 through 705.181 [DIRS 169745].

R. Emergency Response. The design and planning of the NRL shall consider the emergency response planning requirements of NAC 705.331 [DIRS 169745] to address NRL shipments other than SNF and HLW.

S. Fencing. The design of the NRL shall consider the requirements of NRS 705.120 [DIRS 169746] and 705.130 and 705.170 for fencing, gates, cattle guards, etc., for rural areas. The design of the NRL shall adhere to the applicable requirements for fencing gates, cattle guards, etc., defined by NRS 266.295 [DIRS 169747], within city limits.

T. Hours on Duty. The design of the NRL shall consider the limitation contained in NRS 705.210 [DIRS 169746] for the hours on duty of rail employees

# 7. DOE DIRECTIVE (CONTRACTUAL) REQUIREMENTS

Section 7 contains Phase I requirements from DOE directives on the BSC prime contract "B list" [DIRS 169920]. Table E-1 provides traceability to design-related DOE requirements in Section 7. Table E-2 provides traceability to construction, operations, and maintenance requirements, not discussed in Section 7.

A. Technical Standards. Appropriate voluntary consensus standards (codes and standards), consistent with Public Law (PL) 104-113 [DIRS 159251] and Office of Management and Budget (OMB) A-119 [DIRS 159250], should be selected, used, and adhered to for the design, testing, etc., of the NRL in the absence of specified standards. [TSRD 3.2.2.C.5] [DOE O 252.1, Contractor Requirements Document, Section (1) [DIRS 159139]]

B. Project Management. Nevada Transportation shall support the development of documentation for the Critical Decision process in DOE O 413.3 [DIRS 152047]. Documents that are required to be developed to support Critical Decision-2 typically include:

- Design documentation
- Contractor Project Management System
- Final Project Execution Plan
- Final Project Performance Baseline
- NEPA documentation
- Independent Cost Estimate
- Project Data Sheet for construction
- Draft Preliminary Safety Analysis Report
- External Independent Review of the Performance Baseline.

NOTE: DOE will determine the list of documents and their contents as Nevada Transportation progresses through Phase I. [TSRD 3.2.9.A] [DOE O 413.3, Contractor Requirements Document, Attachment 4]

C. Sustainable Design. The siting, design, and construction of NRL facilities shall apply sustainable design principles. [DOE O 413.3, Contractor Requirements Document, Section 13] [DOE O 430.2A, Contractor Requirements Document, Section 2.d.5] [DIRS 158913]

D. Value Engineering. The design of the NRL and its facilities shall use a value engineering process that identifies high-cost project activities to realize a maximum return on investment through the use of system engineering tradeoffs and functional analyses that identify alternative means of achieving the same function at a lower life-cycle cost. [DOE O 413.3, Contractor Requirements Document, Section 10] [DIRS 152047] [DOE O 430.1A [DIRS 158235], Contractor Requirements Document, Section 1.a] [TSRD 3.2.9]

E. Quality Assurance Requirements. A NVT quality assurance program (QAP) shall be developed and implemented for the NVT Phase I work in compliance with DOE O 414.1B, *Quality Assurance* [DIRS 172492]. The NVT QAP shall assign responsibilities and authority for quality, define policy and requirements, and provide appropriate controls for the performance and assessment of work commensurate with the degree of risk involved. [TSRD 3.2.8] [DOE O 414.1B, Contractor Requirements Document, Sections 2&3] [DOE O 413.3, Contractor Requirements Document, Section 11] [DIRS 152047]

F. Configuration Management. A configuration management process shall be established that controls changes to the physical configuration of NVT facilities, structures, systems, and components in compliance with ANSI/EIA-649, *National Consensus Standard for Configuration Management* [DIRS 161114]. This process must also ensure that the configuration is in agreement with the performance objectives in the technical baseline. [DOE O 413.3, Contractor Requirements Document, Section 9]

G. Natural Phenomena Hazard Mitigation. Where no specific requirements are specified concerning natural phenomena hazard mitigation in DOE O 420.1A [DIRS 159450], model building codes or national consensus industry standards shall be used in the design of NRL facilities. [TSRD 3.2.2.B.3] [DOE O 420.1A, Contractor Requirements Document Section 4.4]

H. Natural Phenomena Hazard Design Requirements. NRL facilities shall be designed to withstand the effects of natural phenomena as necessary to ensure the confinement of hazardous materials, the operation of essential facilities, the protection of government property, and the protection of life safety for occupants of buildings. The design shall consider the potential damage and failure due to both direct and indirect natural phenomena effects, including common cause effects and interactions from failures from other structures systems or components. [TSRD 3.2.2.B.3] [DOE O 420.1A, Contractor Requirements Document Section 4.4.2]

I. Facility Seismic Design Requirements. The design of facilities for the NRL shall address the requirements of Executive Order 12699, "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction" [DIRS 170700] as applicable. [TSRD 3.2.2.B.3] [DOE O 420.1A, Contractor Requirements Document, Section 4.4.2]

J. Natural Phenomena Hazards Assessment. The hazards mitigations used in the design and site planning of facilities for the NRL shall be based on a hazards assessment conducted in accordance with DOE O 420.1A, using a graded approach considering the consequences of all types of natural phenomena hazard. [TSRD 3.2.2.B.3] [DOE O 420.1A, Contractor Requirements Document Section 4.4.4]

K. Seismic Detection. Facilities for the NRL with hazardous materials shall provide instrumentation or other means to detect and record occurrence and severity of seismic events. [TSRD 3.2.2.B.3] [DOE O 420.1A, Contractor Requirements Document Section 4.4.5]

L. Building Codes. The appropriate state, regional, or National building codes shall be specified for NRL design and construction. [DOE O 430.1A [DIRS 158235], Contractor Requirements Document Section 1.b]

M. Asset Life-Cycle Considerations. The design and acquisitions of the NRL shall consider maintainability, operability, disposition, life-cycle costs, and configuration integrity. [DOE O 430.1A [DIRS 158235], Contractor Requirements Document Section 1.c]

N. Energy Management. Designs for the NRL shall be consistent with the energy management plan required by DOE O 430.2A, *Departmental Energy and Utilities Management* [DIRS 158913] which must exhibit and explain the application of: [DOE O 430.2A, Contractor Requirements Document Section 2.a, 2.b. 2.c, 2.d.1, 2.d.2, 2.d.3, 2.d.4 & Attachment 3]

1. Compliance with 10 CFR 434 [DIRS 158912], Energy Conservation Voluntary Performance Standards for New Buildings, from conceptual design through commissioning [DOE O 430.2A Contractor Requirements Document Section 2.d.5],

2. Selection of DOE/EPA Energy Star® products into guide specification and acquisition systems. Where Energy Star® products are not available, selection of products that are in the upper 25 percent of energy efficiency [DOE O 430.2A Contractor Requirements Document Section 2.d.7],

3. Minimization of the use of petroleum-based fuels in buildings and facilities by switching to non-petroleum based source, when life cycle cost effective. And for facilities that use petroleum based fuel systems, provide dual-fuel capability where cost effective [DOE O 430.2A Contractor Requirements Document Section 2.d.10],

4. Use of off-grid generation systems (e.g., solar, wind turbine, etc.), when such systems are life-cycle cost effective and offer other benefits [DOE O 430.2A Contractor Requirements Document Section 2.d.13],

5. Control of electric, gas, and water loads to minimize utilities costs and mitigate the impact of sudden disruptions in the energy supply. [DOE O 430.2A Contractor Requirements Document Section 2.d.14].

O. Fire Protection. NRL facility designs shall:

1. Comply with applicable sections of the NFPA 70, *National Electric Code* [DIRS 157764] and NFPA 70E, *Electrical Safety Requirements for Employee Workplaces* [DIRS 118096]. [DOE O 440.1A [DIRS 102288], Contractor Requirements Document Section 12.k]

2. Meet the requirements of DOE O 420.1A, including a reliable water supply for fire suppression, use of noncombustible or fire-resistive construction where

appropriate, use of fire extinguishing systems where appropriate, use of redundant fire protection systems where appropriate, a means to summon the fire department (e.g., fire alarm signaling system), a means to notify and evacuate building employees, and physical access and appropriate equipment to aid the fire department. [TSRD 3.2.3.A.4] [DOE O 420.1A, Contractor Requirements Document Section 4.2.2 #1-10]

P. Safeguards and Security Standardization. The design of the NRL safeguards and securities equipment and systems shall be selected on the basis of cost savings or other benefit to the DOE such as worker safety, compliance with life safety codes, enhancing mission capability, and facilitating contingency efforts. The NRL facility designs shall incorporate the use of standardized safeguards and security equipment and systems, where possible without compromising the design's flexibility or adherence to performance criteria. [DOE O 470.1 [DIRS 145476], Contractor Requirements Document, Sections 5.a & 5.b]

Q. Safeguards and Security System Design. The design of the NRL facilities shall provide site-specific safeguards and security protection or tailor the physical protection elements, including: security areas, intrusion detection capability, alarm management and control systems, closed circuit television, video recording, barriers, secure storage, and communications all based on the physical protection measures developed in accordance with DOE O 473.1 [DIRS 166279]. [TSRD 3.2.5] [DOE O 473.1, Contractor Requirements Document Sections 5.a, 5.b.1, 5.b.4, 5.c.2, 5.c.3, 5.c.4, 5.e, 5.f & 5.h]

R. Road Crossings. The NRL shall be designed to meet the applicable sections of the *MUTCD 2000 Manual on Uniform Traffic Control Devices* [DIRS 164546] and *Policy on Geometric Design of Rural Highways*, [DIRS 169942] for road crossings. [DOE O 5480.4 [DIRS 162022], Contractor Requirements Document, Sections 2.g.2.c and 2.g.2.f]

S. Environmental Protection. The design, construction, operation and maintenance of the NRL shall provide for (1) public health and environmental protection, (2) pollution prevention and recycling efforts, and (3) compliance with applicable environmental protection requirements in accordance with DOE O 450.1, *Environmental Protection Program* [DIRS 161567]. [DOE O 450.1 Contractor Requirements Document, Sections 1.a, 1.c and Section 6] [TSRD 3.2.3.B] [CRD 3.2.1.I]

T. Waste Prevention and Recycling. The NRL shall be designed, constructed, operated, and maintained to support appropriate aspects of:

- Executive Order 13101, Greening the Government Through Waste Prevention, Recycling and Federal Acquisition [DIRS 104024],
- Executive Order 13221, "Energy Efficiency Standby Power Devices" [DIRS 159949],

- Executive Order 13123, Greening the Government Through Efficiency Energy Management" [DIRS 104026]

- Executive Order 13148, Greening the Government Through Leadership in Environmental Management," [DIRS 154538]

- Executive Order 13149, *Greening the Government Through Federal Fleet and Transportation Efficiency* [DIRS 159948]. [DOE O 450.1, Contractor Requirements Document, Section 4] [TSRD 3.2.3.B] [CRD 3.1.2.G] [CRD 3.2.1.I]

U. Environmentally Preferable Purchasing. The design and construction of the NRL shall consider requirements of DEAR 970.5223-2, *Acquisition and Use of Environmentally Preferable Products and Services* [DIRS 169920], to comply with purchasing requirements as required in Section 6002 of the Resource Conservation and Recovery Act of 1976 [DIRS 103936]. [DOE O 450.1 Section 1.c & Section 8] [BSC Prime Contract Clause Section I, Part II]

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# 8. INDUSTRY CODES AND STANDARDS

A preliminary list of industry codes and standards is included in Section 8 and this list will be updated as the conceptual design develops. These industry codes and standards are used to develop the NRL design criteria, NRL specifications, and to prepare procurement documents. Section 8 fulfills requirements from DOE O 252.1 [DIRS 159139], TSRD Section 3.2.2.C.5 and TSRD Section 3.2.2.C.4.

A. American Railway Engineering and Maintenance-of-Way Association. The NRL shall be designed and maintained in accordance with appropriate sections of the:

- *2001 Manual for Railway Engineering* [DIRS 162040]

  - Chapter 1 Roadway and Ballast
  - Chapter 2 Track Measuring Systems
  - Chapter 4 Rail
  - Chapter 5 Track
  - Chapter 6 Buildings and Support Facilities
  - Chapter 7 Timber Structures
  - Chapter 8 Concrete Structures and Foundations
  - Chapter 9 Seismic Design for Railway Structures
  - Chapter 14 Yards and Terminals
  - Chapter 15 Steel Structures
  - Chapter 16 Economics of Railway Engineering and Operations
  - Chapter 18 Light Density and Short Line Railways
  - Chapter 19 Bridge Bearings
  - Chapter 27 Maintenance-Of-Way Work
  - Chapter 28 Clearances
  - Chapter 29 Waterproofing
  - Chapter 30 Ties.

B. Mainline Railroad Standards. The NRL shall be designed and constructed to meet UPRR design criteria in place of criteria contained in the AREMA *2001 Manual for Railway Engineering* [DIRS 162040], in areas where system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection can be shown to be cost effectively improved. Documented justification shall be made of areas where UPRR design criteria are used in place of AREMA standards. [TSRD 3.2.2.C.4]

C. Association of American Railroads. The NRL shall be designed to allow for interchange in accordance with appropriate sections of:

- *1998 Field Manual of the A.A.R. Interchange Rules* [DIRS 102592]

- *Office Manual of the Interchange Rules, Adopted by the Association of American Railroads, Operations and Maintenance Department, Technical Services Division* [DIRS 169914]

- AAR Circular OT-55-F, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials* [DIRS 172489]

- AAR *Manual of Standards and Recommended Practices* [DIRS 169910]

  RP-5503, *Locomotive Fueling Interface*
  M-590, *Locomotive System Integration Architecture*
  S-5507, *Remote Control Locomotives*
  RP-548, *Locomotive Rating Train/Track Resistance*
  S-5700, *Railroad Electronics Standards Configuration Management*
  S-5702, *Railroad Electronics Environmental Requirements*
  S-918, *Standard for Automatic Equipment Identification*
  S-918A, *AEI Site-to-Host Consist Report Format*
  S-5800, *Communication System Architecture*
  S-5810, *Mobile Communications Package*
  S-5820, *Front End processor*
  S-5825, *Cluster Control*
  S-5830, *Base Communications Package*
  M-1003, *Specification for Quality Assurance.*

D. American Association of State Highway and Transportation Officials. The NRL shall be designed to meet AASHTO Specifications M 36 [DIRS 169916] and M 218 [DIRS 169979] for corrugated metal culverts in areas where applicable.

E. American Concrete Institute. The NRL structures and facilities shall be designed to meet the appropriate American Concrete Institute standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional American Concrete Institute standards identified as appropriate by the designing engineer.

F. American Institute of Steel Construction. The NRL structures and facilities shall be designed to meet the appropriate American Institute of Steel Construction standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional American Institute of Steel Construction standards identified as appropriate by the designing engineer.

G. American National Standards Institute (ANSI). The NRL structures and facilities shall be designed to meet the appropriate ANSI standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional ANSI standards identified as appropriate by the designing engineer. In addition, NRL structures and facilities shall be designed to meet the appropriate ANSI standards including:

ANSI N14.6-1993, *American National Standard for Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More.* [DIRS 102016]

H. American Water Works Association Standards. The NRL facilities shall be designed to meet the appropriate American Water Works Association Standards standards including:

- ANSI/AWWA C652-02, *AWWA Standard for Disinfection of Water-Storage Facilities* [DIRS 164242]
- ANSI/AWWA D100-96, *Welded Steel Tanks for Water Storage* [DIRS 160122]
- *Recommended Practice for Backflow Prevention and Cross-Connection Control* [DIRS 150790]

I. American Petroleum Institute. The NRL facilities shall be designed to meet the appropriate American Petroleum Institute standards including:

- API RP 651, *Cathodic Protection of Aboveground Petroleum Storage Tanks* [DIRS 166749]
- API Std 610, *Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries* [DIRS 164219]
- API Std 619, *Rotary Type Positive Displacement Compressors for Petroleum, Chemical, and Gas Industry Services* [DIRS 166788]
- API Std 650, *Welded Steel Tanks for Oil Storage, with Addend 1 and 2.* [DIRS 164288]

J. American Society of Civil Engineers. The NRL facilities shall be designed to meet the appropriate American Society of Civil Engineers standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional American Society of Civil Engineers standards identified as appropriate by the designer.

K. American Society of Heating, Refrigeration, and Air-Conditioning Engineers. The NRL facilities shall be designed to meet the appropriate American Society of Heating, Refrigeration, and Air-Conditioning Engineers standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and

any additional American Society of Heating, Refrigeration, and Air-Conditioning Engineers standards identified as appropriate by the designer.

L. American Society of Mechanical Engineers (ASME). The NRL facilities shall be designed to meet the appropriate ASME standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional ASME standards identified as appropriate by the designer.

M. American Society for Testing and Materials (ASTM). The NRL facilities shall be designed to meet the appropriate ASTM standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional ASTM standards identified as appropriate by the designer.

N. American Welding Society (AWS). The NRL structures and facilities shall be designed to meet the appropriate AWS standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional AWS standards identified as appropriate by the designer.

O. Institute of Electrical and Electronics Engineers (IEEE). The NRL facilities shall be designed to meet the appropriate IEEE standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional IEEE standards identified as appropriate by the designer.

P. National Association of Corrosion Engineers (NACE). The NRL facilities shall be designed to meet the appropriate NACE standards including:

NACE Standard RP0169-2002 *Standard Recommended Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems* [DIRS 165132]

Q. National Fire Protection Association. The NRL facilities shall be designed to meet the appropriate NFPA standards referenced in the appropriate sections of the AREMA *2001 Manual for Railway Engineering* [DIRS 162040] and any additional NFPA standards identified as appropriate by the designing engineer. Specifically, the NRL shall be design in accordance with appropriate sections of:

- NFPA 70, *National Electric Code* (NEC) [DIRS 157764] [DOE O 440.1A Contractor Requirements Document, Section 12. k]
- NFPA 70E, *Electrical Safety Requirements for Employee Workplaces* [DIRS 118096] [DOE O 440.1A Contractor Requirements Document, Section 12. k.1]
- NFPA 1, *Fire Prevention Code* [DIRS 152371] used in areas designated as applicable by NAC 477.281 [DIRS 104951].

R. International Council of Building Officials. The NRL facilities shall be designed in accordance with appropriate sections of:

- *International Building Code 2000* [DIRS 159179]
- *Uniform Mechanical Code*™ [DIRS 169738]

S. International Association of Plumbing and Mechanical Officials. The NRL facilities shall be designed in accordance with appropriate sections of:

*Uniform Plumbing Code* [DIRS 117491]

T. International Code Council (ICC). The NRL facilities shall be designed in accordance with appropriate sections of:

*2003 International Energy Conservation Code* ®. [DIRS 169918]

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# 9. INTERFACE REQUIREMENTS

Section 9 contains interface requirements from the TSRD. As the project progresses and specific interfaces are identified, the interfaces will be documented and controlled using Interface Control Documents/Information Exchange Drawings.

A. Queuing Areas. NRL facility queuing areas for loaded and unloaded casks shall be consistent with the expected cask receipt and shipment rates and each cask type's spatial requirements while awaiting access or shipment. [TSRD 3.6.2.2.A]

B. Inspections. NRL shall provide access to enable receipt inspections of rail casks arriving at the GROA, FMF, and the mainline railroad junction to determine external radiation levels and surface contamination level. [TSRD 3.6.2.2.B]

C. Compatibility with Site Features. NRL facilities and equipment collocated with other CRWMS facilities shall be compatible with the site features (drainage, acreage, roads, etc.). [TSRD 3.6.2.2.D]

D. Compatibility with Site Utilities. NRL facilities and equipment (including service and maintenance support) collocated with other CRWMS facilities shall be compatible with the site utilities hardware and services. [TSRD 3.6.2.2.E]

E. Compatibility with Security Systems. NRL facilities shall incorporate integral security systems into building design that are compatible with the systems, equipment, and policies of any collocated facilities which control access to all site locations. [TSRD 3.6.2.2.F]

F. Communications. The NRL equipment and facilities shall have compatible communication systems for direct interactions with all CRWMS facilities and operations. [TSRD 3.6.2.2.G] [TSRD 3.6.2.2.H]

G. Functional Compatibility. The NRL and its facilities and equipment shall be functionally compatible with the mainline railroad, the FMF, and the repository, including the site improvements, utility services, security facilities, site vehicles, and administrative and warehouse facilities. [TSRD 3.6.2.2.I]

H. Emergency and Campaign Support Vehicles. The design, construction, maintenance, and operation of the NRL and its facilities shall assure the compatibility of access roads and railways with Transportation Operations' emergency and campaign support vehicles. [TSRD 3.6.2.2.J]

I. Transportation Interfaces. Design and operational interfaces within the Transportation system element shall be identified, controlled, and coordinated among participating organizations, including writing procedures for review, approval, release, distribution, and revision of documents involving design and operational interfaces. [TSRD 3.2.1.I]

J. Institutional Requirements-Interface and Communication. NVT shall establish address design, construction, and operations requirements addressing interfaces between Transportation and Federal agencies, State and local governments, Indian Tribes, law enforcement agencies, emergency response organizations, and private industry. Such requirements will be consistent with memoranda of agreement such as the Memorandum of Agreement between DOT/RW or similar project documentation establishing interface agreements. [TSRD 3.7.1.A]

K. Shipments in Nevada Interfaces shall be developed and maintained to support shipment tracking, security monitoring, and emergency response functions. This interfacing shall address communications systems, equipment, procedures, and resources. [TSRD 3.6.1.3.A]

## 10. REFERENCES

### DOCUMENTS CITED


101681 Nuclear Waste Policy Act of 1982. 42 U.S.C. 10101 et seq. Readily available.

102016 ANSI N14.6-1993. American National Standard for Radioactive Materials - Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More. New York, New York: American National Standards Institute. TIC: 236261.

102288 DOE O 440.1A. 1998. Worker Protection Management for DOE Federal and Contractor Employees. Washington, D.C.: U.S. Department of Energy. Readily available.

102592 Association of American Railroads. 1998. 1998 Field Manual of the A.A.R. Interchange Rules. Washington, D.C.: Association of American Railroads. TIC: 241724.

103642 29 CFR 1910. Labor: Occupational Safety and Health Standards. Readily available.

103643 29 CFR 1926. Labor: Safety and Health Regulations for Construction. Readily available.

103936 Resource Conservation and Recovery Act of 1976. 42 U.S.C. 6901 et seq. Readily available.

103984 10 CFR 1022. Energy: Compliance with Floodplain/Wetlands Environmental Review Requirements. Readily available.

104024 63 FR 49643. Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition. Executive Order 13101. Readily available.

104026 64 FR 30851. Greening the Government Through Efficient Energy Management. Executive Order 13123. Readily available.

104040 NAC (Nevada Administrative Code) 445A. Water Controls. Readily available.

104041 NAC (Nevada Administrative Code) 445B. Air Controls. Readily available.

104042 NAC (Nevada Administrative Code) 459. Hazardous Materials. Readily available.

104051 NAC (Nevada Administrative Code) 477. State Fire Marshal. Readily available.

117477 IEEE C2-1997. 1996. National Electrical Safety Code. New York, New York: The Institute of Electrical and Electronics Engineers. TIC: 240358.

117491 International Association of Plumbing and Mechanical Officials. 1997. Uniform Plumbing Code. Walnut, California: International Association of Plumbing and Mechanical Officials. TIC: 235862.

118096 NFPA 70E. 1995. Electrical Safety Requirements for Employee Workplaces. Quincy, Massachusetts: National Fire Protection Association. TIC: 240292.

126496 ICBO (International Conference of Building Officials) 1997. Administrative, Fire-and Life-Safety, and Field Inspection Provisions. Volume 1 of 1997 Uniform Building Code. Whittier, California: International Conference of Building Officials. TIC: 233817.

145476 DOE O 470.1 Change 1. 1996. Safeguards and Security Program. Washington, D.C.: U.S. Department of Energy. Readily available.

146511 43 CFR 2300. Public Lands: Interior: Land Withdrawals. Readily available.

150790 AWWA (American Water Works Association). 1990. Recommended Practice for Backflow Prevention and Cross-Connection Control. 2nd Edition. AWWA Manual M14. Denver, Colorado: American Water Works Association. TIC: 248200.

152047 DOE O 413.3. 2000. Program and Project Management for the Acquisition of Capital Assets. Washington, D.C.: U.S. Department of Energy. Readily available.

152371 NFPA 1. 2000. Fire Prevention Code. 2000 Edition. Quincy, Massachusetts: National Fire Protection Association. TIC: 248642.

154538 65 FR 24595. Greening the Government Through Leadership in Environmental Management. Executive Order 13148. Readily available.

155970 DOE (U.S. Department of Energy) 2002. Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada. DOE/EIS-0250. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOL.20020524.0314; MOL.20020524.0315; MOL.20020524.0316; MOL.20020524.0317; MOL.20020524.0318; MOL.20020524.0319; MOL.20020524.0320.

156703 DOT (U.S. Department of Transportation) 1998. Safety Compliance Oversight Plan for Rail Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel, Ensuring the Safe, Routine Rail Transportation of Foreign Research Reactor Spent Nuclear Fuel. [Washington, D.C.]: U.S. Department of Transportation, Federal Railroad Administration. ACC: MOL.20011212.0115.

156713 YMP (Yucca Mountain Site Characterization Project) 2001. Yucca Mountain Site Characterization Project Requirements Document (YMP-RD). YMP/CM-0025, Rev. 4, DCN 02. Las Vegas, Nevada: Yucca Mountain Site Characterization Office. ACC: MOL.20010322.0491; MOL.20011107.0002.

157764 NFPA 70. 2002. National Electrical Code, with errata. 2002 Edition. Quincy, Massachusetts: National Fire Protection Association. TIC: 252084.

158235 DOE O 430.1A. 1998. Life Cycle Asset Management. Washington, D.C.: U.S. Department of Energy. Readily available.

158398 DOE (U.S. Department of Energy) 2002. U.S. Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste to the Monitored Geologic Repository. Volume 1 of Integrated Interface Control Document. DOE/RW-0511 Rev. 01. Las Vegas, Nevada: U.S. Department of Energy. ACC: MOL.20020614.0342.

158718 49 CFR 174. Transportation: Carriage by Rail. Readily available.

158873 DOE (U.S. Department of Energy) 2002. Waste Acceptance System Requirements Document. DOE/RW-0351, Rev. 4. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOL.20020326.0056.

158912 10 CFR 434. 2002. Energy: Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings. Readily available.

158913 DOE O 430.2A. 2002. Departmental Energy and Utilities Management. Washington, D.C.: U.S. Department of Energy. Readily available.

159139 DOE O 252.1. 1999. Technical Standards Program. Washington, D.C.: U.S. Department of Energy. Readily available.

159179 ICC (International Code Council) 2000. International Building Code 2000. Falls Church, Virginia: International Code Council. TIC: 251054.

159250 OMB Circular No. A-119. 1998. Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities. [Washington, D.C.]: Office of Management and Budget. Readily available.

159251 National Technology Transfer and Advancement Act of 1995. Public Law No. 104 113, 110 Stat. 775. Readily available.

159450 DOE O 420.1A. 2002. Facility Safety. Washington, D.C.: U.S. Department of Energy. Readily available.

159948 65 FR 24607. Greening the Government Through Federal Fleet and Transportation Efficiency. Executive Order 13149. Readily available.

159949 66 FR 40571. Energy Efficient Standby Power Devices. Executive Order 13221. Readily available.

160122 ANSI/AWWA D100-96. 1997. Welded Steel Tanks for Water Storage. Denver, Colorado: American Water Works Association. TIC: 253090.

160261 National Environmental Policy Act of 1969. 42 U.S.C. 4321 et seq. Readily available.

161114 ANSI/EIA-649-1998. National Consensus Standard for Configuration Management. Arlington, Virginia: Electronic Industries Alliance. TIC: 250244.

161173 49 CFR 215. Transportation: Railroad Freight Car Safety Standards. Readily available.

161174 49 CFR 217. Transportation: Railroad Operating Rules. Readily available.

161175 49 CFR 218. Transportation: Railroad Operating Practices. Readily available.

161177 49 CFR 220. Transportation: Railroad Communications. Readily available.

161184 49 CFR 228. Transportation: Hours of Service of Railroad Employees. Readily available.

161189 49 CFR 234. Transportation: Grade Crossing Signal System Safety. Readily available.

161190 49 CFR 236. Transportation: Rules, Standards, and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances. Readily available.

161567 DOE O 450.1. 2003. Environmental Protection Program. Washington, D.C.: U.S. Department of Energy. Readily available.

162022 DOE O 5480.4. 1984. Environmental Protection, Safety, and Health Protection Standards. Washington, D.C.: U.S. Department of Energy. ACC: NNA.19870407.0311.

162040 AREMA (American Railway Engineering and Maintenance-of-Way Association) 2001. *2001 Manual for Railway Engineering*. Four volumes. Landover, Maryland: American Railway Engineering and Maintenance-of-Way Association. TIC: 250280.

164219 API Std 610. 2003. Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries. 9th Edition. Washington, D.C.: American Petroleum Institute. TIC: 254105.

164242 ANSI/AWWA C652-02. 2002. AWWA Standard for Disinfection of Water-Storage Facilities. Denver, Colorado: American Water Works Association. TIC: 254108.

164288 API Std 650. 2001. Welded Steel Tanks for Oil Storage, with Addenda 1 and 2. Washington, D.C.: American Petroleum Institute. TIC: 254089.

164546 DOT (U.S. Department of Transportation) 2001. MUTCD 2000 Manual on Uniform Traffic Control Devices. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration. TIC: 254179.

165132 NACE Standard RP0169-2002. Standard Recommended Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems. Houston, Texas: National Association of Corrosion Engineers. TIC: 254895.

166279 DOE O 473.1. 2002. Physical Protection Program. Washington, D.C.: U.S. Department of Energy. Readily available.

166749 API RP 651. 1997. Cathodic Protection of Aboveground Petroleum Storage Tanks. 2nd Edition. Washington, D.C.: American Petroleum Institute. TIC: 255138.

166788 API Std 619. 1997. Rotary Type Positive Displacement Compressors for Petroleum, Chemical, and Gas Industry Services. 3rd Edition. Washington, D.C.: American Petroleum Institute. TIC: 255360.

168361 BSC (Bechtel SAIC Company) 2004. Q-List. 000-30R-MGR0-00500-000-000 REV 00. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040721.0007.

169738 International Conference of Building Officials. 1988. Uniform Mechanical Code™. 1988 Edition. Whittier, California: International Conference of Building Officials. TIC: 232340.

169742 NAC (Nevada Administrative Code) 472. State Forester Firewarden. 216531.

169744 NAC (Nevada Administrative Code) 504. Wildlife Management and Propagation. 216531.

169745 NAC (Nevada Administrative Code) 705. Railroads. Readily available.

169746 NRS (Nevada Revised Statute) 705. Railroads and Monorails. Readily available.

169747 NRS (Nevada Revised Statute) 266. General Law for Incorporation of Cities and Towns. Readily available.

169824 49 CFR 210. Transportation: Railroad Noise Emission Compliance Regulations. Readily available.

169825 49 CFR 213. Transportation: Track Safety Standards. Readily available.

169827 49 CFR 1104. Transportation: Filing with the Board-Copies-Verification-Service-Pleadings, Generally. Readily available.

169828 49 CFR 1105. Transportation: Procedures for Implementation of Environmental Laws. Readily available.

169829 49 CFR 1150. Transportation: Certificate to Construct, Acquire, or Operate Railroad Lines. Readily available.

169889 BSC (Bechtel SAIC Company) 2004. Management Description. GM-1.00, Rev. 0. Las Vegas, Nevada: Bechtel SAIC Company. ACC: DOC.20040219.0010.

169909 68 FR 74965. Notice of Proposed Withdrawal and Opportunity for Public Meeting; Nevada. Readily available.

169910 AAR (Association of American Railroads) 2004. Manual of Standards and Recommended Practices. Washington, D.C.: Association of American Railroads. TIC: 256289.

169912 69 FR 18565. Notice of Intent to Prepare an Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, NV. Readily available.

169914 Association of American Railroads. 1998. Office Manual of the Interchange Rules, Adopted by the Association of American Railroads, Operations and Maintenance Department, Technical Services Division. Washington, D.C.: Association of American Railroads. TIC: 247551.

169916 AASHTO M 36M-98. 1998. Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains. Washington, D.C.: American Association of State Highway and Transportation Officials. TIC: 247927.

169918 ICC (International Code Council) 2003. 2003 International Energy Conservation Code®. [Falls Church, Virginia]: International Code Council. TIC: 256172.

169920 Clemensen, K.M. 2004. "Contract Number DE-AC28-01RW12101, Modification M066." Letter from K.M. Clemensen (DOE/ORD) to D.J. Schlismann (BSC), October 22, 2004, 1025043731, OBS:KMC-0124, with enclosure. ACC: MOL.20041110.0375.

169942 AASHTO (American Association of State Highway and Transportation Officials) 1977. Policy on Geometric Design of Rural Highways. Washington, D.C.: American Association of State Highway and Transportation Officials. TIC: 256384.

169961 Garfield, W.L. 2003. "Contract No. DE-AC28-01RW12101 - Possible Nevada Rail Branch Line Shared Use Options and Analysis (Pre-Decisional Study)." Letter from W.L. Garfield (BSC) to G. Lanthrum (DOE/OCRWM), September 30, 2003, PG:sf-0930038964, with enclosure. ACC: MOL.20031029.0076; MOL.20030828.0011.

169979 AASHTO M 218M-96. 1996. Standard Specification for Steel Sheet, Zinc-Coated (Galvanized), for Corrugated Steel Pipe. Washington, D.C.: American Association of State Highway and Transportation Officials. TIC: 247927.

170700 Executive Order EO-12699. 1990. Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction. Washington, D.C.: United States of America, Office of the President. Readily available.

170825 General Code of Operating Rules Committee 2004. General Code of Operating Rules. 4th Edition. [Omaha, Nebraska]: Union Pacific Railroad. TIC: 256779.

170826 Grimes, C.R. 2004. "Caliente Clearances." E-mail from C.R. Grimes to S. Kelderhouse, June 9, 2004. ACC: MOL.20040727.0252.

171539 DOE (U.S. Department of Energy) 2004. Quality Assurance Requirements and Description. DOE/RW-0333P, Rev. 16. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: DOC.20040907.0002.

171737 LP-3.11Q-BSC, Rev. 0, ICN 1. Technical Reports. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: DOC.20040915.0003.

171945 DOE (U.S. Department of Energy) 2004. Civilian Radioactive Waste Management System Requirements Document. DOE/RW-0406, Rev. 06. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: DOC.20040929.0001.

172489 AAR (Association of American Railroads) 2004. Recommended Railroad Operating Practices for Transportation of Hazardous Materials. Circular No. OT-55-F. Washington, D.C.: Association of American Railroads. TIC: 256392.

172491 DOE (U.S. Department of Energy) 2004. Transportation System Requirements Document. DOE/RW-0425, Rev. 3. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: DOC.20041222.0001.

172492 DOE O 414.1B. 2004. Quality Assurance. Washington, D.C.: U.S. Department of Energy. Readily available.

172552 McDaniel, P. 2005. "Re: Site Specific Cask Deliveries." E-mail from P. McDaniel to P. Gehner, January 5, 2005. ACC: MOL.20050104.0079.

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# APPENDIX A

# OVERALL PROJECT REQUIREMENTS

Table A-1. Overall Project Requirements

This table identifies requirements from Section 3 and the verbatim text from the CRD and TSRD. Source text is included verbatim.

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.A* | *Mission. The NRL shall be designed, constructed and operated to transport railcars between a mainline railroad junction near Caliente, Nevada and a geologic repository in a safe, secure, and efficient manner that both protects the health and safety of the public and of workers and maintains the quality of the environment.* | Programmatic | Design/ Construction/ Operation | CRD 1.3.1 | Civilian Radioactive Waste Management System (CRWMS) Mission | The mission of the CRWMS is to manage and disposal of SNF and HLW in a manner that protects the health, safety and the environment; enhances national and energy security; and merits public confidence. | Phase I |
| | | Programmatic | Design/ Construction/ Operation | CRD 1.3.2 | Waste Management System Concept | The Transportation element is responsible for designing, acquiring, constructing, operating, and maintaining the infrastructure necessary to transport SNF and HLW from Purchaser/ Custodian/Producer sites to the monitored geological repository. This element is also responsible for establishing the institutional relations with industry, States, tribes, and local governments needed to support the Transportation mission | Phase I |
| | | Programmatic | Design/ Construction/ Operation | TSRD 2.G | Planning Considerations | A branch line along the Caliente corridor will be constructed in Nevada to connect a mainline railroad with the repository. | Phase I |
| | | Programmatic | Design/ Construction/ Operation | TSRD 2.O | Planning Considerations | Shipments of SNF and HLW will be made by rail to the maximum extent practicable. | Phase I |
| | | Programmatic | Design/ Construction/ Operation | TSRD 3.2.3.A.2 | Safety and Environmental Protection | SNF and HLW shall be transported in a manner that protects the health and safety of the public and the environment. | Phase III |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operation | TSRD 3.8.1 A | General | The Caliente Corridor and any variations outside the corridor identified during environmental analysis shall be used to examine potential Nevada rail alignments and profiles for construction of a rail line. | Phase I |
| | | Programmatic | Design/ Construction/ Operation | TSRD 3.8.1 B | General | The Nevada rail line shall be deigned, constructed, and operated to transport railcars between a mainline junction near Caliente, Nevada and the geological repository in a safe, secure, and efficient manner that both protects the health and safety of the public and of workers and maintains the quality of the environment. | Phase I |
| | | Programmatic | Design/ Operation | TSRD 2.O | Planning Considerations | Shipments of SNF and HLW will be made by rail to the maximum extent practicable | Phase I |
| *NVTRD 3.B* | *System Concept. The NRL shall move loaded rail casks, buffer cars, and escort cars from the mainline railroad to the geologic repository and Fleet Management Facility (FMF); move unloaded rail casks from the repository to the FMF; and the unloaded rail casks, buffer cars, and escort cars from* | Programmatic | Design/ Construction/ Operation | CRD 1.3.2 | Waste Management System Concept | The Transportation element is responsible for designing, acquiring, constructing, operating, and maintaining the infrastructure necessary to transport SNF and HLW from Purchaser/ Custodian/Producer sites to the monitored geological repository. This element is also responsible for establishing the institutional relations with industry, States, tribes, and local governments needed to support the Transportation mission | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | *the FMF to the mainline railroad for delivery to a shipping site; and move equipment and other commodities to the FMF and the repository.* | Programmatic | Design/ Construction/ Operation | TSRD 3.8 | Nevada Rail Requirements | The functions of the Nevada rail line will be to:<br>• Move loaded rail casks, buffer cars, and escort cars from the mainline railroad to the repository and FMF;<br>• Move unloaded rail casks from the repository to the FMF; and the unloaded rail casks, buffer cars, and escort cars from the FMF to the mainline railroad for delivery to a shipping site; and<br>• Move equipment and other commodities to the FMF and the repository. | Phase I |
| | | Programmatic | Design/ Construction/ Operation | TSRD 2.O | Planning Considerations | Shipments of SNF and HLW will be made by rail to the maximum extent practicable | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.C* | *Design/Construct/ Operate Nevada Rail. Nevada Transportation shall design, construct, operate and maintain (or cause to be designed, constructed, operated and maintained), the entire NRL.*<br>*Such design, construction, operation and maintenance shall be to the applicable standards and/or requirements of the FRA, the AREMA, and the AAR. All such work shall be in accordance with appropriate industry codes, standards, engineering principles, and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection.* | Technical | Design | CRD 3.2.1.J | Overall System Performance | All CRWMS element structures, systems, and components shall be designed and fabricated in accordance with appropriate industry codes, standards, engineering principles and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. | Phase I |
| | | Technical | Design/ Construction/ Operation | CRD 3.3.2.C | Transportation Element Requirements | The Transportation Element shall comply with the applicable provisions of DOT regulations as documented in Title 49 of the Code of Federal Regulations. | Phase I |
| | | Technical/ Programmatic | Design/ Construction/ Operation | CRD 3.3.2.D | Transportation Element Requirements | The Transportation Element shall comply with applicable DOE orders and directives, including those in the areas of radiation protection, safeguards and security, physical protection, material control and accounting, contingency, and quality assurance | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Construction/ Maintenance/ Operation | TSRD 3.2.2.B.1 | Design Criteria - Facilities | National Standards (e.g., ASME, ANSI, ATSM), NRC guidance (e.g., NUREGs, Regulatory Guides), and other DOE accepted documents, identified as sufficient or more appropriate for the support of design shall be used at the discretion of the designers, provided there are no conflicts with the identified requirements of Transportation or CRWMS. | Phase I |
| | | Technical | Design/ Construction | TSRD 3.2.2.B.2 | Design Criteria - Facilities | Design and construction of all Transportation facilities shall be accomplished using industry codes, standards, and engineering principles and practices considering the guidance in the appropriate sections of DOE HDBK-1132-99. Each DOE organization shall select, use and adhere to appropriate voluntary consensus standards (VCSs), consistent with PL 104-113 and OMB Circular A-119 (i.e., use suitable existing VCSs in lieu of developing new DOE Technical Standards), when choosing technical standards to support assigned DOE missions and functions, including the design, construction, testing, modification, operation, decommissioning, decontamination, and remediation of DOE's facilities and activities. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Construction | TSRD 3.2.2.C.4 | Design Criteria – Systems and Equipment | Design and construction of systems and equipment shall be accomplished using industry codes, standards, engineering principles, and practices; with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection; and considering the guidance in the appropriate sections of DOE HDBK-1132-99. | Phase I |
| | | Technical | Construction | TSRD 3.2.2. C.5. | Design Criteria-Systems and Equipment | The workmanship criteria shall reflect the currently applicable codes, standards, and engineering principles and practices… | Phase I |
| | | Technical/ Programmatic | Design/ Maintenance | TSRD 3.2.9.C | Program and Project Management | Transportation shall establish logistics support systems to include ensuring the availability of sufficient spares to support the maintenance concept and the design availability factors used in the design. | Phase I |
| | | Technical | Design/ Maintenance | TSRD 3.8.3.1.B | Overall Design Requirements | The Nevada rail line shall be designed and maintained in accordance with appropriate sections of the AREMA *2001 Manual for Railway Engineering.* | Phase I |
| | | Technical | Design/ Operation/ Maintenance | TSRD 3.8.3.1.C | Overall Design Requirements | The Nevada rail lines shall be designed and constructed in accordance with appropriate AAR standards including:<br>• Field Manual of the AAR Interchange Rules,<br>• Office Manual of the AAR Interchange Rules, and<br>• AR Manual of Standards and Recommended Practices. | Phase I |
| *NVTRD 3.D* | *Receipt Rates. NRL shall support the initial target receipt rates identified in* | Technical | Design/ Operations | CRD 3.2.1.B Table 1 | Overall System Performance | The CRWMS shall be capable of receiving SNF and HLW at the annual receipt rates as specified in Table 1. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | *Table 3-1. The NRL shall be designed, constructed, operated and maintained to accommodate the projected traffic levels given in Section 4.R.* | Technical | Design/ Operations | CRD 3.2.1C Table 2 | Overall System Performance | The CRWMS shall accept 70,000 MTHM or equivalent of SNF/HLW for disposal in the first repository as authorized by the NWPA, Section 114(d). The allocation, by waste type, is specified in Table 2.<br>Commercial SNF and HLW 63,000<br>Defense HLW 4,667<br>DOE and naval SNF 2,333<br>Total 70,000 | Phase I |
| | | Technical | Design/ Operations | TSRD 1.3 | System Definition. | The Transportation element is to provide capabilities and the supporting operational and maintenance infrastructure necessary to ship 70,000 metric ton of SNF and HLW to the geologic repository at Yucca Mountain. Transportation will also provide capabilities to transport additional quantities of SNF and HLW beyond 70,000 metric tons, as required | Phase I |
| | | Programmatic | Design/ Operations | TSRD 2.I | Planning Considerations | The branch line will be operational in time to support repository operations in 2010. | Phase I |
| | | Technical | Design/ Operations | TSRD 3.2.1.C | Transportation Programmatic Requirements | Transportation shall accommodate approximate waste types and quantities as follows:<br>63,000 MTHM of commercial SNF<br>2,268 MTHM of DOE SNF (does not include naval SNF)<br>4,667 MTHM equivalent of defense and commercial HLW Note that Navy will be responsible for the delivery of its fuel to the repository | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Operations | TSRD 3.2.1.D | Transportation Programmatic Requirements | Transportation shall be capable of transporting waste at the following minimum annual rates:<br>400 MTHM in calendar year 2010<br>600 MTHM in calendar year 2011<br>1,200 MTHM in calendar year 2012<br>2,000 MTHM in calendar year 2013, and<br>3,000 MTHM per year by 2014 | Phase I |
| *NVTRD 3.E* | *Shared Use. The NRL shall be planned, designed, constructed, operated, and maintained so that shared use shall not be precluded.* | Programmatic | Design/ Construction/ Operations | TSRD 2.H | Planning Considerations | The Nevada rail line will be designed, constructed, operated, and maintained so that shared use of the Nevada rail line shall not be precluded. | Phase I |
| *NVTRD 3.F* | *Dedicated Trains. Rail shipments of loaded casks on the NRL shall be by use of dedicated trains (no other materials or commodities will be shipped with cask shipments).* | Programmatic | Design/ Operations | TSRD 2.F | Planning Considerations | The Office of Civilian Radioactive Waste Management's rail shipments of SNF and HLW will be made using dedicated trains. Unloaded/empty casks may be shipped by dedicated train or by general freight service. | Phase I |
| *NVTRD 3.G* | *Integrated Planning. The design, construction, operation and maintenance of the NRL shall make provision for non-normal and peaking* | Technical | Design/ Operations | CRD 3.2.1.A | Overall System Performance | The CRWMS shall be designed to accept, transport, and dispose of commercial SNF, DOE SNF, vitrified defense HLW, and vitrified commercial HLW, in accordance with the NWPA and implementing regulations. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Operation | CRD 3.2.1.B | Overall System Performance | The CRWMS shall be capable of receiving SNF and HLW at the annual receipt rates as specified in Table 1. | Phase I |
| | | Technical | Design/ Operation | CRD 3.2.1.C | Overall System Performance | The CRWMS shall accept 70,000 MTHM or equivalent of SNF/HLW for disposal in the first repository as authorized by the NWPA, Section 114(d). The allocation, by waste type, is specified in Table 2. | Phase I |
| | | Technical | Design/ Construction/ Operation | TSRD 3.8.2.B | Nevada Rail Performance Requirements | The design, construction, operation and maintenance of the Nevada rail line shall make provisions for non-normal and peaking effects in the movements of loaded and empty casks. | Phase I |
| *NVTRD 3.H* | *Land Acquisition. Land acquisition for the NRL and facilities shall be accomplished in a manner consistent with applicable Federal regulations including requirements associated with land withdrawal processing in accordance with 43 CFR 2300.* | Programmatic | Design/ Construction | 68 FR 74965 | Notice of Proposed Withdrawal and Opportunity for Public Meeting | "The Bureau of Land Management has received a request from the Department of Energy to withdraw 308,600 acres of public land from surface entry and mining for a period of 20 years to evaluate the land for the potential construction, operation, and maintenance of a branch rail line… The application will be processed in accordance with the regulations set forth in 43 CFR Part 2300." | Phase I |
| | | Programmatic | Design/ Construction | TSRD 3.2.2.A.1 | Design and Construction | Land acquisition for Transportation shall be accomplished in a manner consistent with appropriate Federal regulations including requirements associated with land withdrawal processing in accordance with 43 CFR 2300. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.I* | *Regulatory Requirements – Federal. The NRL shall be designed, constructed, operated and maintained in accordance with the following Federal Regulations and Statutes.*<br>*1. Applicable provisions of 42 U.S.C. 10101 et seq., "The Nuclear Waste Policy Act of 1982," as amended)* | Programmatic | Design | CRD 3.1.2.A | Primary Regulatory Requirements | All CRWMS elements shall comply with the applicable provisions of 42 U.S.C. 10101 et seq., "The Nuclear Waste Policy Act of 1982" as amended. | Phase I |
| | *2. Applicable provisions of 42 U.S.C. 4321 et seq., "The National Environmental Policy Act of 1969" as amended* | Programmatic | Design/ Construction/ Operation/ Maintenance | CRD 3.3.2.A | Transportation Element Requirements | The Transportation Element shall comply with the applicable provisions 42 U.S.C. 4321 et seq., "The National Environmental Policy Act of 1969" as amended | Phase I |
| | | Programmatic | Design/ Construction/ Operation/ Maintenance | TSRD 3.2.3.B.1 | Environmental Protection | An environmental management program that meets the requirements of DOE Order 450.1 shall be developed and implemented for Transportation design, construction; and operation of facilities ad equipment. The program shall include:<br>1. The systematic planning, integrated execution, and evaluation of programs for (a) public health and environmental protection as stated in the National environmental Policy Act of 1969 (NEPA), (b) pollution prevention, and (c) compliance with applicable environmental protection and permitting requirements including the applicable requirements of Comprehensive Environmental response, Compensation and Liability Act. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | *3. Applicable provisions of 29 CFR Part 1910, "Occupational Safety and Health Standards' and 29 CFR Part 1926, "Safety and Health Regulations for Construction".* | Technical/ Programmatic | Construction | CRD 3.1.2.D | Primary Regulatory Requirements | All CRWMS shall comply with the applicable provisions of 29 CFR Part 1910 "Occupational Safety and Health Standards" and 29 CFR Part 1926, "Safety and Health Regulations for Construction." | Phase II |
| | | Technical/ Programmatic | Construction | TSRD 3.2.3.A.3 | Safety and Environmental Protection | In compliance with occupational safety and health standards promulgated under 29 U.S.C. 651 et seq., Transportation work places shall be free from recognized hazards that are causing or likely to cause death or serious physical harm to employees. Free from recognized hazards means that hazards are eliminated or mitigated to the point that they no longer pose a serious threat. | Phase II |
| | | Technical/ Programmatic | Construction | TSRD 3.2.3.A.5 | Safety and Environmental Protection | Transportation shall adhere to the applicable safety and health requirements for construction contained in 29 CFR 1926. | Phase II |
| | *4. Applicable regulations of the DOT (as detailed in the Code of Federal Regulations Title 49)* | Technical | Design/ Operation/ Maintenance | CRD 3.3.2.C | Transportation Element Requirements | The Transportation Element shall comply with the applicable provisions of DOT regulations as documented in Title 49 of the Code of Federal Regulations. | Phase I |
| | | Technical | Design/ Operation/ Maintenance | TSRD 3.6.1.2.C.1 | Radiological Protection - Transportation Protection | Transportation Operations shall comply with the regulatory requirements for the packaging and transportation of radioactive material contained in 10 CFR 71 and 49 CFR 173. | Phase I |
| | | Technical | Design/ Operation/ Maintenance | TSRD 3.6.1.2.C.2 | Transportation Protection | Transport of SNF and HLW shall be in compliance with applicable DOT regulations. | Phase I |
| | | Technical | Design/ Operation/ Maintenance | TSRD 3.8.1.C | General | The Nevada rail line shall be designed and constructed in accordance with appropriate regulatory, State, regional, or national codes including 49 CFR Subtitle B, Chapter II and NAC 705. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.J* | *Regulatory Requirements – State, Tribal and Local. The NRL shall be designed, constructed, operated and maintained to meet applicable legal, regulatory and operational requirements of state, tribal, and local government agencies for transportation of SNF and HLW.* | Technical | Design | TSRD 3.8.1.C | General | The Nevada rail line shall be designed and constructed in accordance with appropriate regulatory, State, regional, or national codes including 49 CFR Subtitle B, Chapter II and NAC 705 | Phase I |
| | | Technical | Design | TSRD 3.6.1.1.B | Operations Requirements, Characteristics, Normal Operations | Transportation cask systems (cask and transporter) and their motive support equipment shall conform to Federal, State and local laws, regulations, and ordinances and approved rail carrier operating rules relating to weight and size limitations. | Phase I |
| | | Technical | Design | TSRD 3.1.1 | Precedence of Requirements | Regulatory Requirements – Precedence. The order of precedence to be applied to external sources of regulatory requirements shall be as follows:<br>Federal laws treaties, and Executive Orders;<br>Requirements of Federal agencies and departments (e.g., DOE, NRC, Environmental Protection Agency (EPA), and DOT);<br>State and Tribal laws;<br>Local ordinances; and<br>National and international standards | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.K* | *Regulatory Requirements – Precedence. The order of precedence to be applied to external sources of regulatory requirements shall be as follows:*<br>*1. Federal laws treaties, and Executive Orders.*<br>*2. Requirements of Federal agencies and departments (e.g., DOE, NRC, EPA, and DOT).*<br>*3. State and Tribal laws.*<br>*4. Local ordinances; and*<br>*5. National and international standards.* | Programmatic | Design/ Construction/ Operation/ Maintenance | TSRD 3.1.1 | Precedence of Requirements | Regulatory Requirements – Precedence. The order of precedence to be applied to external sources of regulatory requirements shall be as follows:<br>Federal laws treaties, and Executive Orders;<br>Requirements of Federal agencies and departments (e.g., DOE, NRC, EPA, and DOT);<br>State and Tribal laws;<br>Local ordinances; and<br>National and international standards | Phase I |
| *NVTRD 3.L* | *DOE Directives. The NVT Organization shall comply with all applicable DOE directives as defined in the current BSC Prime Contract. DOE directives that have been superseded or expired will continue to be used as a requirement source until a revision is incorporated into the BSC Prime Contract.* | Technical/ Programmatic | Design/ Construction/ Operation/ Maintenance | TSRD 3.2.5 | Safeguards and Security | Transportation shall incorporate physical protection and security systems in facilities and coordinate equipment and personnel to ensure compatibility and facilitate compliance with the security requirements of 10 CFR Part 75 and applicable DOE orders. | Phase I |
| | | Technical/ Programmatic | Design/ Construction/ Operation/ Maintenance | Contract DE-AC08-01RW12101 | BSC Prime Contract, Appendix E, Applicable Directives (List B) | Entire | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Construction/ Operation | CRD 3.3.2.D | Transportation Element Requirements | The Transportation Element shall comply with applicable DOE orders and directives, including those in the areas of radiation protection, safeguards and security, physical protection, material control and accounting, contingency, and quality assurance. | Phase I |
| *NVTRD 3.M* | *Use of Private Industry. The NRL shall use private industry to the extent practical in its design, construction, operation and maintenance and shall encourage the use of vendors and suppliers located within close proximity to planned facilities.* | Programmatic | Design/ Construction/ Operation | CDR 3.1.1.E | Programmatic Requirements | All CRWMS elements shall encourage the use of vendors and suppliers located within close proximity to planned facilities. | Phase I |
| | | Programmatic | Design/ Operation | Nuclear Waste Policy Act Section 137. (a) 2 | Transportation | The Secretary, in providing for the transportation of spent nuclear fuel under this act [42 USC 10101 et seq.], shall utilize by contract private industry to the fullest extent possible in each aspect of such transportation. | Phase I |
| | | Programmatic | Design/ Operation | TSRD 3.2.1.J | Transportation Programmatic Requirements | Transportation shall use private industry to the maximum extent practicable for the transport of SNF and HLW to the geologic repository and shall encourage the use of vendors and suppliers located within close proximity to planned facilities. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.N* | *Cask Movements To and From the Repository. The NRL operations shall be coordinated with repository operations to provide for the movement of railcars carrying loaded casks to the GROA, and for the movement of railcars from the GROA*<br>*Any movement, considered extra-dimensional or "wide-load" (anything over 12 feet wide), shall be protected against other opposing wide-load movements and shall meet and pass at locations known to be wide enough to accommodate the meet/pass.* | Technical | Design/ Operations | CRD 3.2.1.G.2 | Overall System Performance | The CRWMS design shall comply with the agreements established under the Integrated Interface Control Document (DOE/RW-0511) to ensure:<br>1. compatibility of DOE-owned SNF and HLW waste forms with repository surface facility interfaces, including canister handling interfaces, and<br>2. compatibility between transportation equipment (e.g., transporters) and transported items (e.g., casks and canisters) with mechanical and envelop interfaces. | Phase II |
| | | Technical | Design/ Operations | CRD 3.2.1.H | Overall System Performance | The CRWMS is responsible for the transport of DOE SNF and HLW in casks certified by the NRC. NNPP is responsible for canistering and transporting naval SNF to the repository. | Phase I |
| *NVTRD 3.O* | *Inspection Standards. Applicable sections of the FRA policy for inspections prior to the movement of SNF or HLW as described in Safety Compliance Oversight Plan for Rail Transportation of High Level Radioactive Waste and Spent Nuclear Fuel [DIRS 156703]*, will apply to the operation of the NRL. | Technical/ Programmatic | Operations | TSRD 3.2.2.C.4 | Design Criteria – Systems and Equipment | Design and construction of systems and equipment shall be accomplished using industry codes, standards, engineering principles and practices; with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection; and considering the guidance in the appropriate section of DOE HDBK-1132-99. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Operations | CRD 3.2.1.J | Overall System Performance | All CRWMS element structures, systems, and components shall be designed and fabricated in accordance with appropriate industry codes, standards, and engineering principles and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. | Phase I |
| | | Technical/ Programmatic | Operations | Repository FEIS, M.3.2.2.2 | Inspections | Rail shipments would be inspected in accordance with 49 CFR 174.9and the Federal Railroad Administration's High-Level Nuclear Waste Rail Transportation Inspection Policy. | Phase III |
| *NVTRD 3.P* | *EIS Contractor Integration. The NVT Organization shall implement a process to transfer necessary data to and from the EIS contractor while maintaining configuration control and documentation for activities supporting the EIS.* | Technical/ Programmatic | Design | DOE O 413.3 Contractor Requirements Document Project Management for the Acquisition of Capital Assets | Section 9 | A configuration management process must be established that controls changes to the physical configuration of NVT facilities, structures, systems, and components in compliance with ANSI/AIA-649, *National Consensus Standard for Configuration Management*. This process must also ensure that the configuration is in agreement with the performance objectives in the technical baseline | Phase I |
| *NVTRD 3.Q* | *Subcontractor Integration. The NVT Organization shall implement a process to transfer necessary data to and from its subcontractors while maintaining configuration control and documentation for activities supporting the conceptual design and EIS.* | Technical/ Programmatic | Design | DOE O 413.3 Contractor Requirements Document Project Management for the Acquisition of Capital Assets | Section 9 | A configuration management process must be established that controls changes to the physical configuration of NVT facilities, structures, systems, and components in compliance with ANSI/AIA-649, *National Consensus Standard for Configuration Management*. This process must also ensure that the configuration is in agreement with the performance objectives in the technical baseline | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 3.R* | *Quality Assurance. The NVT Organization shall implement a quality management system in a manner appropriate to achieve protection of workers, the public, and the environment, taking into account the work to be performed, the associated hazards, and the quality assurance criteria in DOE O 414.1B, Quality Assurance. The NVT quality management system shall use a graded or phased approach and focus on quality affecting work for Phase I including subcontractor oversight, review of subcontractor work products, development and implementation of interface requirements, record management, and training.* | Programmatic | Design/ Construction/ Operations/ Maintenance | TSRD 3.2.8 | Quality Assurance | A quality assurance (QA) program shall be developed and maintained to ensure delivered products and services meet prescribed requirements. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.a.1 General Quality Requirements | a. Quality Assurance Program Development and Implementation. A contractor must assign and identify a senior management position responsible for the development, implementation, assessment, and improvement of a QAP that-<br>(1) Implements QA criteria as defined in paragraph 3 of this Contractor Requirements Document and suspect/counterfeit items (S/CI) prevention requirements as defined in paragraph 4 using a graded approach and describing how QA criteria and graded approach are applied. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.a.2 General Quality Requirements | (2) Uses the appropriate voluntary national or international consensus standard where practicable and consistent with contractual or regulatory requirements. And identifies the standard used. Appropriate standards include the following:<br>(b) ANSI/ISO/ASQ Q 9001-2000, *Quality Management System Requirements* (for non-nuclear activities) | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.a.3 General Quality Requirements | (3) Applies additional standards, where practicable and consistent with contractual or regulatory requirements and as necessary to address unique/specific work activities (e.g., development and use of safety software or establishing the competence of a testing and calibration laboratory). | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.a.4 General Quality Requirements | (4) Integrates quality or management system requirements as defined in this Contract Requirements Document with DOE directives and similar external requirements. Similar requirements include the following.<br>(a) DOE P 450.4, Safety Management System Policy, dated 10-15-96;<br>(b) DOE P 450.5, Line Environment, Safety and Health Oversight, dated 06-26-97 | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.b.1, 2.b.2, 2.b.3 & 2.b.5 General Quality Requirements | b. Quality Assurance Program Approvals and Changes. The contractor must-<br>(1) Submit a QAP to DOE for approval before beginning work under a DOE contract.<br>(2) Implement the QAP as approved and modified by DOE<br>(3) Indicate in the submittal any third-party certification affecting the QAP.<br>(5) Regard a QAP as approved by DOE 90 days after DOE receipt, unless approved or rejected by DOE at an earlier date, and include any modification made or directed by DOE | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 2.c General Quality Requirements | c. Quality Guidance Usage. The contractor must consider QA guidance in developing and implementing a QAP. The following guidance documents<br>(1) DOE G 414.1-2<br>(2) DOE G 414.1-1A<br>(3) DOE G 440.1-6 | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Quality Assurance, Contractor Requirements Document | Section 3, Quality Assurance Criteria | The QAP must address the following management, performance, and assessment criteria:<br>a. Management/Criterion 1 - Program<br>b. Management/Criterion 2 – Personnel Training and Qualification<br>c. Management/Criterion 3 – Quality Improvement<br>d. Management/Criterion 4 – Documents and Records<br>e. Performance/Criterion 5 – Work Processes<br>f. Performance/Criterion 6 – Design.<br>g. Performance/Criterion 7 – Procurement<br>h. Performance/Criterion 8 – Inspection and Acceptance Testing<br>i. Assessment/Criterion 9 – Management Assessment<br>j. Assessment/Criterion 10 – Independent Assessment | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | CRD 3.3.2.D | Transportation Element requirements | The Transportation Element shall comply with all applicable DOE orders and directives, including those in the areas of radiation protection, safeguards and security, physical protection, material control and accounting, contingency, and quality assurance. | Phase I |

Table A-1. Overall Project Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/Requirement Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 413.3 Contractor Requirements Document, Section 11 | Project Management for the Acquisition of Capital Assets | A QAP must be developed and implemented for the contract scope of work in compliance with DOE O 414.1A, QUALITY ASSURANCE, at the beginning of the project and maintained over the project life. This program must assign responsibilities and authority for quality, define policy and requirements, and provide for the performance and assessment of work. | Phase I |

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# APPENDIX B

# SYSTEM PERFORMANCE AND CONFIGURATION REQUIREMENTS

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Table B-1. System Performance and Configuration Requirements

NOTE: This table identifies Section 4 requirements and the source driver for the requirement.

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.A.* | *Corridor and Alignment Selection. The Caliente Corridor and alternatives identified for analysis in the EIS shall be used to locate a railroad alignment and profile.* | Programmatic/ Technical | Design/ Construction | TSRD 3.8.1.A | Planning Considerations | The Caliente Corridor and any variations outside the corridor identified during the environmental analysis shall be used to examine potential Nevada rail alignments and profiles for construction of a rail line. | Phase I |
| *NVTRD 4.B* | Shipment Transportation Times. The NRL route alignments and profiles, track, and infrastructure shall be designed to accommodate transportation of loaded maximum dimension cask train consists, from the mainline railroad junction to the geologic repository, within 12 continuous hours for a single train operating crew(including the time necessary to perform activities prior to and at the end of shipment that are considered part of the hours of service under 49 CFR 228)i The same transit time shall apply to empty cask trains from the repository to the mainline railroad junction. If an alignment, due to length beyond 319 miles, cannot be accommodated within the continuous 12-hour | Technical/ Programmatic | Design/ Operations | Standalone Requirement | Overall Design Requirements | Based upon 49 CFR 228, Limitation of Hours, that restricts employee to no more than twelve consecutive hours. The Nevada rail track geometry needs to accommodate, to the maximum reasonable extent, the maximum recommended speed specified by AAR's Recommended Railroad Operating Practices for Transportation of Hazardous Materials, OT-55-D, to expedite transportation of loaded and unloaded casks between the mainline railroad near Caliente, Nevada and the geologic repository. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | operating period for train crews, provisions for a crew change facility at an intermediate point must be made and overall train transit time shall be reasonably minimized. [Standalone Requirement – (Derived from TSRD 3.8.3.1.A & 49 CFR 228 Appendix A [DIRS 161184)]. | | | | | | |
| *NVTRD 4.C* | *Maximum Operating Speed. Shipments of loaded casks on the NRL shall be limited to the maximum recommended operating speed specified by AAR's "Recommended Railroad Operating Practices for Transportation of Hazardous Materials," OT-55.* | Technical/ Programmatic | Design/ Operations | CRD 3.2.1.J | Overall System Performance | All CRWMS element structures, systems, and components shall be designed and fabricated in accordance with appropriate industry codes, standards, and engineering principles and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Operations | TSRD 3.2.2.C.4 | Design Criteria – Systems and Equipment | Design and construction of systems and equipment shall be accomplished using industry codes, standards, engineering principles and practices; with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection; and considering the guidance in the appropriate section of DOE HDBK-1132-99. | Phase I |
| | | Technical/ Programmatic | Design/ Operations | AAR OT-55-F | Recommended Railroad Operating Practices for Transportation of Hazardous Materials | Circular provides recommended road and yard operating practices, designation of key routes, proposed separations from hazmat storage areas, training of transportation employees, and implementation of TRANSCAER, a national community outreach program to improve community awareness, emergency planning and incident response for the transportation of hazardous materials. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.D* | *Maximum Design Speed. The NRL shall be planned, designed and constructed to accommodate a maximum train speed of 60 mph, the maximum speed allowed under 49 CFR 213.9 for class four track. Yards and associated end of line facilities shall be designed to accommodate train speeds not to exceed those established for yard operations in 49 CFR 218.35.* | Technical/ Programmatic | Design/ Operations | TSRD 3.8.3.1.A | Overall Design | Nevada rail track geometry shall be designed to accommodate, to the maximum reasonable extent, the maximum recommended speed specified by AAR's Recommended Railroad Operating Practices for Transportation of Hazardous Materials, OT-55-D, to expedite transportation of loaded and unloaded casks between the mainline railroad near Caliente, Nevada and the geologic repository. | Phase I |
| | | Technical/ Programmatic | Design/ Operations | 49 CFR 213.9 Track Safety Standards | Classes of track: operating speed limits | 213.9 Class 4 Track - Maximum allowable operating speed for freight train is 60 mph | Phase I |
| | | Technical/ Programmatic | Design/ Operations | 49 CFR 218.35 | Yard limits | 218.35 (b) (2) Trains and engines, except designated class trains, within yard limits must move prepared to stop within one half the range of vision but not exceeding 20 m.p.h. unless the main track is known to be clear by block signal indications. | Phase I |
| NVTRD 4.E | *Train Operation. Railcar movement on the NRL and at its facilities shall be under motive control at all times.* | Programmatic/ Technical | Design/ Operations | Standalone Requirement | | In order to provide improved safety during switching and train makeup, movements will be made under the control of a locomotive at all times. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.F* | *Siding Length. Siding clear lengths shall accommodate a 4,000 foot train fully in the clear of the mainline.* | Technical | Design | Standalone Requirement | | The 4,000 foot length is based on a 20 car train plus two locomotives that Could occur if the branch line was available for shared use. Each rail car is slightly less than 100 feet long. See table 11D from the "Possible Nevada Rail Branch Line Shared Use Options and Analysis (Pre-decisional Study), August 2003 | Phase I |
| *NVTRD 4.G* | *Design Life. The NRL shall be planned, designed, constructed, operated and maintained to ensure a 50-year life cycle.* | Programmatic/ Technical | Design/ Operations/ Maintenance | Standalone Requirement | | The 50 year life cycle will support the repository operations requirement of 50 years maintainable life of the surface facility. | Phase I |
| *NVTRD 4.H* | *Train Configuration. The NRL shall have:*<br>*1) at least two diesel electric powered locomotives with motive power at the head end of all trains transporting casks. The NRL shall operate cask hauling trains with one additional power locomotive more than that which is necessary to meet the required horsepower to tonnage ratio for normal operations* | Programmatic/ Technical | Design/ Operations | Standalone Requirement | | Use of dual locomotives at the front of the rail line will comply with the General Code of Operating Rules, Fourth Edition, effective April 2, 2000. The rail operator will adopt a similar code of operating rules. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | *2) at least two buffer cars and one escort car per train. Buffer cars will be used to separate the loaded cars from the locomotives and the escort cars.* | Programmatic/ Technical | Design/ Operations | 49 CFR 174.85 | Position in train of placarded cars, transport vehicles, freight containers, and bulk packagings. | (b) A car placarded ``RADIOACTIVE" must comply with train positioning requirements of paragraph (d) of this section and must be separated from a locomotive, occupied caboose, or carload of undeveloped film by at least one non-placarded car. | Phase I |
| *NVTRD 4.I* | *Operating Environment. The NRL shall be operated within the environmental thresholds established locally by the connecting mainline railroad. Monitoring equipment, placed at critical locations along the NRL shall continuously measure these environmental parameters and convey this information to the operator of the train so that the movement of the train can be regulated based on this information. Outside this range, degraded operation, including line closure, will be allowed.* | Programmatic/ Technical | Design/ Operations | CRD 3.2.1.J | Overall System Performance | All CRWMS element structures, systems, and components shall be designed and fabricated in accordance with appropriate industry codes, standards, and engineering principles and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Operations | TSRD 3.2.2.C.4 | Design Criteria – Systems and Equipment | Design and construction of systems and equipment shall be accomplished using industry codes, standards, engineering principles and practices; with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection; and considering the guidance in the appropriate section of DOE HDBK-1132-99. | Phase I |
| *NVTRD 4.J* | *System Envelope. NRL clearances shall be planned, designed and constructed to accommodate all rail-car types and loads that the mainline railroad can deliver to the NRL junction near Caliente, NV.* | Technical | Design/ Operations | CRD 3.3.2.E | Transportation Element Requirements | The Transportation Element shall be capable of transporting NRC-certified transportation casks (defined in Appendix A), including the following general types:<br>• Single-Purpose Casks<br>• Canister Casks (Multipurpose Canister (MPC) and Dual-Purpose Canister (DPC)<br>• Transportable Storage Casks (TSCs)<br>• Specialty Casks | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Operations | CRD 3.2.1.E | Overall System Performance | CRWMS elements and facilities shall be capable of accommodating a range of storage and transportation technologies, including multipurpose, dual purpose, and single-purpose canisters, as well as bare SNF assemblies. | Phase I |
| | | Technical | Design/ Operations | TSRD 3.8.2.A | Nevada Rail Performance Requirements | Nevada rail line clearances shall be planned, designed, and constructed to accommodate all rail car types and loads that the mainline railroad can deliver to the Nevada rail line junction near Caliente, Nevada | Phase I |
| *NVTRD 4.K* | *Maintenance of Way. The NRL shall be planned, designed and constructed on the basis that track and wayside maintenance will be accomplished using on-track equipment in lieu of road equipment using a parallel service road.* | Technical | Design/ Construction/ Maintenance | TSRD 3.8.2.C | Nevada Rail Performance Requirements | The Nevada rail line shall be planned, designed, and constructed on the basis that maintenance-of-way will be accomplished using on-track equipment in lieu of road equipment using a parallel service road. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design | CRD 3.2.1.J | Overall System Performance | All CRWMS element structures, systems, and components shall be designed and fabricated in accordance with appropriate industry codes, standards, and engineering principles and practices with particular attention to those which incorporate system safety, human factors, reliability, availability, maintainability, habitability standards, and environmental protection. | Phase I |
| *NVTRD 4.L* | *Grade Separation. All federal and state designated highways shall be grade separated from the NRL.* | Technical | Design | Standalone Requirement | | This requirement was suggested by Morrison-Knudsen in 1997 as a bounding condition for cost estimating and environmental impacts. Some paved roads do not have the traffic volume to warrant a grade separation. Additional analysis may change this requirement for final design | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.M* | *Rail Operations. The NRL shall adopt and operate under a general code of operating rules taking into consideration the general code of operating rules adopted by the UPRR.* | Programmatic | Design/ Operations | 49 CFR 217.7 | Operating rules; filing and recordkeeping. | (c) On or after November 21, 1994, each Class III railroad and any other railroad subject to this part but not subject to paragraphs (a) and (b) of this section shall keep one copy of its current code of operating rules, timetables, and timetable special instructions and one copy of each subsequent amendment to its code of operating rules, each new timetable, and each new timetable special instruction, at its system headquarters, and shall make such records available to representatives of the Federal Railroad Administration for inspection and copying during normal business hours. | Phase I |
| *NVTRD 4.N* | *Fleet Maintenance Facility. The NRL shall be designed, constructed, operated and maintained such that NRL and Yucca Mountain rail yard shall be integrated with the design, layout, and operating modes of the Fleet Management Facility should such be located adjacent to the NRL.* | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 2.L | Planning Considerations | The Transportation system will be designed to allow collocation of the FMF. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 3.6.2.2.D | Equipment and Facility Interfaces | Transportation facilities and equipment collocated with other CRWMS facilities shall be compatible with the site features (drainage, acreage, roads, etc.) | Phase I |
| | | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 3.6.2.2.E | Equipment and Facility Interfaces | Transportation facilities and equipment (including service and maintenance support) collocated with other CRWMS facilities shall be compatible with the site utilities hardware and services. | Phase I |
| | | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 3.6.2.2.F | Equipment and Facility Interfaces | Transportation facilities shall incorporate integral security systems into building design that are compatible with systems, equipment, and policies of any collocated facilities which control access to all site locations. | Phase I |
| *NVTRD 4.O* | *Rail Line Facilities. The NVT shall provide an integrated design for all facilities related to the NRL including maintenance-of-way facilities, end of line facilities, IMT, crew change facilities, and any other necessary facilities specified in the conceptual design.* | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 3.6.2.2.I | Equipment and Facility Interfaces | The Transportation facilities and equipment shall be functionally compatible with facilities serviced, including the site improvements, utility services. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.P* | *Rail System Traffic Projections. The NRL shall be designed, constructed, operated, and maintained to accommodate the projected rail traffic levels shown in Tables 4-1 through 4-4.* | Technical | Design | Standalone Requirement | | Input from repository design, construction, and operations groups have been analyzed regarding projected construction and operations freight by rail transport. In addition, estimates have been made for the potential of low-level waste quantities for the Nevada Test Site, and other potential users-including commercial or shared use of the branch rail line. This information is necessary to find cost effective design solutions and to support development of the Concept of Operations and Maintenance. | Phase I |

Table B-1. System Performance and Configuration Requirements (Continued)

| NVTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Source Text/ Requirement Rational | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 4.Q* | *Intermodal Transfer Station. In the event the NRL is not available to support repository operations, an IMT may be designed, constructed and operated until the NRL is operational. An IMT system should provide intermodal transfer of truck transportation casks between rail and road conveyances. If the IMT site were collocated with an NRL facility, then the requirements for both facilities should be integrated, if practical. The IMT system shall have a normal transfer throughput rate of TBD truck casks per week and a surge transfer rate of TBD casks per week.* | Technical/ Programmatic | Design/ Construction/ Operation | TSRD 2.J | Planning Considerations | In the event the Nevada rail line will not be available to support receipt of SNF and HLW at the repository in 2010, and IMT may be designed, constructed, and operated until the Nevada rail line is operational. | Phase I |

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# APPENDIX C

# FEDERAL REGULATION REQUIREMENTS

The following table contains requirements from the Code of Federal Regulations that apply to conceptual design of the Nevada Rail System. Requirements from Section 5 are identified in this table and the applicable CFR is identified. The CFR requirement is summarized and interpreted in the "Requirements/Rationale" column. Requirements applicable to other than Phase I, "Conceptual Design and EIS support" have been included In Table C-2 to aid in the future preparation of a Concept of Operation and Maintenance for NVT.

Table C-1. Federal Regulation Requirements – Design Affecting

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.A* | *Floodplain and Wetlands. NRL shall consider floodplain/wetlands factors in planning and decision making in accordance with applicable requirements of 10 CFR 1022.* | Technical/ Programmatic | Design/ Construction | 10 CFR 1022 | Compliance with Floodplain/ Wetlands Environmental Review Requirements | Establishes policy and procedures for DOE's responsibilities under E.O. 11988 and E.O. 11990. DOE must consider floodplain/wetlands factors in DOE planning and decision making, and develop procedures for identifying proposed actions located in floodplain/wetlands, providing opportunity for early public review of such proposed actions, preparing floodplain/wetlands assessments, and issuing statements of findings for actions in a floodplain. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.B* | *Yard and Facilities. The NRL yards and facilities shall be designed to meet the separation and r spacing requirements of 49 CFR 174.* | Programmatic | Design/ Operations | 49 CFR 174 | Carriage by Rail | Sec. 174.700 (c) "Special handling requirements for Class 7 (radioactive) materials" - Limits the spacing of Class 7 (radioactive) material relative to an area which may be continuously occupied by any passenger, rail employee, or shipment of one or more animals, nor to any package containing undeveloped film (if so marked). If more than one package of Class 7 (radioactive) materials is present, the distance must be computed from the enclosed table on the basis of the total transport index number of packages in the rail car or storage area: Limits the number of packages of Class 7 (radioactive) materials that may be transported by rail car or stored at any single location is limited to a total transport index number (as defined in Sec. 173.403 of this subchapter) of not more than 50. This provision does not apply to exclusive use shipments as described in Secs. 173.403, 173.427, 173.441, and 173.457 of this subchapter. | Phase I |
| *NVTRD 5.C* | *Noise Emissions.* The design of the NRL shall consider the compliance regulations contained in applicable sections of 49 CFR 210 [DIRS 169824] for noise emissions during railroad operation. | Programmatic/ Technical | Operations | 49 CFR 210 | Railroad noise emission compliance regulations | Subpart A "General Provisions" - Prescribes minimum compliance regulations for enforcement of the Railroad Noise Emission Standards established by the Environmental Protection Agency in 40 CFR Part 201. | Phase I |
| *NVTRD 5.D* | *Operating Speed Limits. The NRL shall be designed for operating speeds, within the limitations of 49 CFR 213.9, corresponding to the class of track.* | Programmatic/ Technical | Operations/ Design | 49 CFR 213 | Track Safety Standards | Sec. 213.9 Class 4 Track – Maximum operating speed for Freight Train is 60 mph. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.E* | *Roadbed*. The NRL shall be designed to meet the requirements contained in Subpart B of 49 CFR 213 [DIRS 169825] for roadbed and areas immediately adjacent to the roadbed. | Programmatic/ Technical | Maintenance / Design | 49 CFR 213 | Track Safety Standards | Subpart B "Roadbed" - Prescribes minimum requirements for roadbed and areas immediately adjacent to roadbed. | Phase I |
| *NVTRD 5.F* | *Track Geometry*. The NRL shall be designed to meet the requirements contained in Subpart C of 49 CFR 213 [DIRS 169825].for gauge, alignment, surface of track, elevation of outer rails, and speed limitations for curved track. | Programmatic/ Technical | Maintenance / Design | 49 CFR 213 | Track Safety Standards | Subpart C "Track Geometry" - Prescribes requirements for the gage, alignment, and surface of track, and the elevation of outer rails and speed limitations for curved track. | Phase I |
| *NVTRD 5.G* | *Track Structure*. The NRL shall be designed to meet the requirements contained in Subpart D of 49 CFR 213 [DIRS 169825] for ballast, crossties, and track assembly fittings. | Programmatic/ Technical | Maintenance / Design | 49 CFR 213 | Track Safety Standards | Subpart D "Track Structure" - Prescribes minimum requirements for ballast, crossties, track assembly fittings, and the physical conditions of rails. | Phase I |
| *NVTRD 5.H* | *Track Appliances and Track-Related Devices*. The NRL shall be designed to meet the requirements contained in Subpart E of 49 CFR 213 [DIRS 169825] for track appliances and track-related devices. | Programmatic/ Technical | Maintenance / Design | 49 CFR 213 | Track Safety Standards | Subpart E "Track Appliances and Track-Related Devices" - Prescribes minimum requirements for certain track appliances and track-related devices. | Phase I |
| *NVTRD 5.I* | *Yard and Facilities. Pre-departure inspections required by 49 CFR 215 shall be considered in the design of NRL yards and facilities at locations where freight cars are placed in trains.* | Programmatic | Operations/ Design | 49 CFR 215 | Railroad Freight Car Safety Standards | Sec. 215.13 "Pre-departure inspection" - Requires a designated inspector to inspect rail cars for compliance with this part at each location where a freight car is placed in a train, the freight car shall be inspected before the train departs. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.J* | *Safety Devices*. The requirements contained in Subparts C and D of 49 CFR 218 [DIRS 161175] for deactivation of safety devices and protection of trains and locomotives shall be considered in the design of the NRL. | Programmatic/ Technical | Operations/ Design | 49 CFR 218 | Railroad Operating Practices | Subpart C "Protection of Trains and Locomotives" - Prescribes minimum operating rule requirements for the protection of railroad employees engaged in the operation of trains, locomotives and other rolling equipment. | Phase I |
| | | Programmatic/ Technical | Operations/ Design | 49 CFR 218 | Railroad Operating Practices | Subpart D "Prohibition Against Tampering With Safety Devices" - Describes the requirements for deactivation of safety devices. | Phase I |
| *NVTRD 5.K* | *Blue Signal Protection*. The design of the NRL and its facilities shall incorporate engineered barriers in place of administrative controls to meet the requirements contained in Subpart B of 49 CFR 218 [DIRS 161175] for blue signal protection of workers, in areas where worker safety will be enhanced. | Programmatic/ Technical | Operations/ Design | 49 CFR 218 | Railroad Operating Practices | Subpart B "Blue Signal Protection of Workers" - Prescribes requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subject them to the danger of personal injury posed by any movement of such equipment. | Phase I |
| *NVTRD 5.L* | *Communications. The NRL shall be designed to provide redundant wireless communications as required by 49 CFR 220.9.* | Programmatic/ Technical | Operations/ Design | 49 CFR 220 | Railroad Communications | Sec. 220.9 "Requirements for trains" - Requires redundant wireless communications systems within each occupied controlling locomotive in a train. | Phase I |
| *NVTRD 5.M* | *Hours of Service*. The requirements contained in 49 CFR 228 [DIRS 161184] for hours of service of railroad employees shall be considered in the design of the NRL to avoid the need to change rail crews at intermediate points along the NRL. | Programmatic/ Technical | Operations/ Design | 49 CFR 228 | Hours of service of railroad employees | Appendix A to Part 228 "Requirements of the Hours of Service Act: Statement of Agency Policy and Interpretation" - Prescribes requirements for hours of service for rail employees. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.N* | *Highway Grade Crossings. The design of any highway grade crossing signal and warning systems for the NRL shall meet the requirements of Subpart D of 49 CFR 234.* | Programmatic/ Technical | Operations/ Design | 49 CFR 234 | Grade Crossing Signal System Safety | Subpart D "Maintenance Inspection and Testing" -Prescribes maintenance, inspection, and testing standards for highway-rail grade crossing warning systems. | Phase I |
| *NVTRD 5.O* | *Train Control Systems, Devices and Components. All train control systems, devices and components for the NRL shall be designed to meet the requirements of Subpart A of 49 CFR 236.* | Programmatic/ Technical | Operations/ Maintenance /Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Sec. 236.0 "Applicability, minimum requirements, and civil penalties" - Requires a block signal system complying with the provisions of this part to be installed or a manual block system to be placed permanently in effect where a passenger train is operated at a speed of 60 or more miles per hour, or a freight train is operated at a speed of 50 or more miles per hour. | Phase I |
| | | Programmatic/ Technical | Operations/ Maintenance / Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Subpart A "Rules and Instructions: All Systems" - Prescribes the requirements for installation, maintenance, repair, and testing of all systems. | Phase I |
| *NVTRD 5.P* | *Automatic Block Signal System. The design of an automatic block signal system, if necessary, for the NRL shall meet the requirements of Subpart B of 49 CFR 236.* | Programmatic/ Technical | Operations/ Maintenance / Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Subpart B "Automatic Block Signal Systems" - Prescribes the requirements for installation, maintenance, repair, and testing of automatic block systems. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.Q* | *Interlocks. Interlocking systems and devices for the NRL shall be designed to meet the requirements of Subpart C of 49 CFR 236.* | Programmatic/ Technical | Operations/ Maintenance / Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Subpart C "Interlocking" - Prescribes the requirements for installation, maintenance, repair, and testing of interlocking systems. | Phase I |
| *NVTRD 5.R* | *Traffic Control System. The traffic control system for the NRL shall be designed to meet the requirements of Subpart D of 49 CFR 236.* | Programmatic/ Technical | Operations/ Maintenance /Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Subpart D "Traffic Control Systems" - Prescribes the requirements for installation, maintenance, repair, and testing of train control systems. | Phase I |
| *NVTRD 5.S* | *Slide Detectors and Other Detection Devices. Slide detectors and other similar detection equipment for the NRL shall be designed to meet the requirements of Subpart F of 49 CFR 236.* | Programmatic/ Technical | Operations/ Maintenance /Design | 49 CFR 236 | Rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances | Subpart F, "Dragging Equipment and Slide Detectors and Other Similar Protective Devices" - Prescribes the requirements for installation, maintenance, repair, and testing of dragging equipment, slide detectors and other similar protective devices. | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 5.T* | *Certificate of Public Convenience and Necessity. So as to not preclude shared use of the NRL, the design and documentation for the NRL shall consider the informational and design requirements of: 49 CFR 1104 for document specifications and filing with the STB, 49 CFR 1105 for procedures for implementation of environmental laws for the STB, and 49 CFR 1150 for a certificate of public convenience and necessity from the STB.* | Programmatic | Construction /Operations | 49 CFR 1104 | Filing with the board-copies-verification-service-pleadings, generally | Contains document specifications and copy requirements for documents filled with the STB. | Phase I |
| | | Programmatic | Design | 49 CFR 1105 | Procedures for Implementation of Environmental Laws | Specifies the STB's requirements for Environmental Reports, Historical Reports, Coastal Zone Management Act requirements, and the boards procedures and timing requirements. | Phase I |
| | | Technical/ Programmatic | Design | 49 CFR 1150 | Certificate to Construct, Acquire, or Operate Railroad Lines | Sec. 1150.1 "Introduction" - Requires consultation with the Board's Section of Environmental Analysis at least 6 months prior to filing an application, to begin the scoping process to identify environmental issues and outline procedures for an environmental analysis required under 49 CFR Parts 1106 and 1105 (Applicable if Nevada rail line is shared use). | Phase I |

Table C-1. Federal Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Construction | 49 CFR 1150 | Certificate to Construct, Acquire, or Operate Railroad Lines | Subpart A "Applications Under 49 USC 10901" - Sets the requirements for an application for a certificate of public convenience and necessity authorizing the construction, acquisition or operation of railroad lines. Includes requirements for information about the proposal, operational data, financial information, environmental and energy data, and the procedures for application submittal. Applicable in a shared use case. | Phase I |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 10 CFR | 34 | Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations | Programmatic and Technical | Construction, Operation, Maintenance | Industrial radiography will be necessary for evaluating track, welds, and other components of the NV rail system, but these devices will probably be owned and operated by contractors. Procurement of these services should therefore specify compliance. | Phase II |
| 10 CFR | 73 | PART 73 -Physical Protection of Plants and Materials<br>Sec.26-Transportation physical protection systems, subsystems, components, and procedures | Programmatic | Construction, Operations | Sec. 26(b) Planning and scheduling.<br>(1) Shipments shall be scheduled to avoid regular patterns and preplanned to avoid areas of natural disaster or civil disorders, such as strikes or riots. Such shipments shall be planned in order to avoid storage times in excess of 24 hours and to assure that deliveries occur at a time when the receiver at the final delivery point is present to accept the shipments<br>(4) Hand-to-hand receipts shall be completed at origin and destination and al all points enroute where there is a transfer of custody. | Phase III |
| 10 CFR | 835 | Occupational Radiation Protection | Programmatic | Operations | Sec. 835.1(c) Occupational doses received as a result of excluded activities and radioactive material transportation, as listed in paragraphs (b)(1) through (b)(5) of this section, shall be considered when determining compliance with the occupational dose limits at Secs. 835.202 and 835.207, and with the limits for the embryo/fetus at Sec. 835.206. Occupational doses resulting from authorized emergency exposures and planned special exposures shall not be considered when determining compliance with the dose limits at Secs. 835.202 and 835.207.<br>Sec. 835.202 Occupational dose limits for general employees. – Limits annual doses to general employees.<br>Sec. 835.207 Occupational dose limits for minors. – Limits the annual dose to minors. | Phase III |
| 10 CFR | 860 | Trespassing on Department of Energy property | Programmatic | Operations | Sec. 860.6 Posting. Notices stating the pertinent prohibitions of Secs. 860.3 and 860.4 and penalties of Sec. 860.5 will be | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| | | | | | conspicuously posted at all entrances of each designated facility, installation or parcel of real property and at such intervals along the perimeter as will provide reasonable assurance of notice to persons about to enter. | |
| 10 CFR | 1009 | Conduct of Employees | Programmatic | Operations | This part establishes Department of Energy policy for establishing prices and charges for Department materials and services sold to organizations and persons outside the Federal Government.<br>Would be applicable in a shared use scenario. | Phase III |
| 29 CFR | 1910 | Occupational Safety and Health Standards | Programmatic | Construction/ Operations | This section contains occupational safety and health standards for construction of the rail line and facilities and operation of facilities. | Phase II |
| 29 CFR | 1926 | Safety and Health Regulations for Construction | Programmatic | Construction | This Part sets forth the safety and health standards promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act. | Phase II |
| 33 CFR | 153 | Control of Pollution by Oil and Hazardous Substances, Discharge Removal | Programmatic | Construction/ Operation | Establishes the process for the notice of the discharge of oil or a hazardous substance in waters of the United States and the removal of the discharged oil. | Phase II |
| 33 CFR | 320-331 | These are the Corps of Engineers' regulations for protecting and maintaining the nation's waters and waterways | Technical/ Programmatic | Construction | Prescribes policies, practices, and procedures to be followed by the Corps of Engineers in the review of applications for permits to discharge dredge or fill materials into waters of the United States pursuant to Section 404 of the Clean Water Act (33 USC 1344). Waters of the United States is defined in 33 CFR Part 328.<br>A Nationwide 404 Permit is a type of general permit designed to regulate--with little delay or paperwork--certain activities having minimal impacts. Rail construction through waters of the United States would likely be allowed by the Corps through this type of 404 permit. The Corps is also authorized to issue conditioned permits (Part 325.4) and to modify, suspend, or revoke them (Part 325.7), or issue alternate types of permits such as letters of permission and regional general permits (Part 325.2). If work along the rail line does not fall within the constraints of a Nationwide Permit (e.g., because the acreage disturbed would exceed | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| | | | | | the limits of a nationwide permit), other regulations Title 33 of Code of Federal Regulations would apply and the time needed to acquire these permits would increase. | |
| 36 CFR | 79 | Curation of Federally-Owned and Administered Archaeological Collections | Technical/ Programmatic | Construction | The regulations in this Part establish definitions, standards, procedures and guidelines to be followed by Federal agencies to preserve collections of prehistoric and historic material remains, and associated records, recovered during prehistoric or historic resource survey, excavations or other studies conducted in connection with a Federal action, assistance, license or permit. | Phase II |
| 36 CFR | 296 | Protection of Archaeological Resources: Uniform Regulations | Technical/ Programmatic | Construction | The regulations in this Part implement provisions of the Archaeological Resources Protection Act of 1979, as amended (16 USC 470aa-mm) by establishing the uniform definitions, standards, and procedures to be followed by all Federal land managers in providing protection for archaeological resources, located on public lands and Indian lands of the United States. These regulations enable Federal land managers to protect archaeological resources, taking into consideration provisions of the American Indian Religious Freedom Act (92 Stat. 469; 42 USC 1996), through permits authorizing excavation and/or removal of archaeological resources, through civil penalties for unauthorized excavation and/or removal, through provisions for the preservation of archaeological resource collections and data, and through provisions for ensuring confidentiality of information about archaeological resources when disclosure would threaten the archaeological resources. | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 36 CFR | 800 | Protection of Historic Properties | Technical/ Programmatic | Construction | Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings. The procedures in this Part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. | Phase II |
| 40 CFR | 112 | Oil Pollution Prevention | Technical/ Programmatic | Construction/ Operation | A Spill Prevention, Control, and Countermeasures Plan is required to address a facility's design, operation, and maintenance procedures established to prevent oil discharges from occurring, as well as countermeasures to control, contain, clean up, and mitigate the effects of an oil spill that could affect navigable waters. | Phase II |
| 43 CFR | 3 | Preservation Of American Antiquities | Technical/ Programmatic | Construction | Each application for a permit should be filed with the Secretary having jurisdiction (e.g., Interior for public lands), and must be accompanied by a definite outline of the proposed work, indicating the name of the institution making the request, the date proposed for beginning the field work, the length of time proposed to be devoted to it, and the person who will have immediate charge of the work.<br><br>The application must also contain an exact statement of the character of the work, whether examination, excavation, or gathering, and the public museum in which the collections made under the permit are to be permanently | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| | | | | | preserved. The application must be accompanied by a sketch plan or description of the particular site or area to be examined, excavated, or searched, so definite that it can be located on the map with reasonable accuracy. | |
| 43 CFR | 7 | Protection of Archaeological Resources | Technical/ Programmatic | Construction | Any person proposing to excavate and/or remove archaeological resources from public lands or Indian lands, and to carry out activities associated with such excavation and/or removal, shall apply to the Federal land manager for a permit for the proposed work, and shall not begin the proposed work until a permit has been issued. | Phase II |
| 43 CFR | 2300 | Land Withdrawals | Technical/ Programmatic | Pre-construction | An applicant should contact the Nevada State Office of the Bureau of Land Management well in advance of the anticipated submission date of a withdrawal application. Early consultation can familiarize the applicant with the responsibilities of an applicant, the authorized officer and the Secretary. Early consultation also will assist in determining the scheduling of various investigations, studies, analyses, public meetings and negotiations that may be required for a withdrawal. Studies and analyses should be programmed to ensure their completion in sufficient time to allow the Secretary or the Congress adequate time to act on the application before the expiration of the segregation period. Applications for a new land withdrawal shall be submitted for filing, in duplicate, to the Nevada State Office of the Bureau of Land Management. The withdrawal can be made for a period not to exceed 20 years from the date the order is signed.<br>Withdrawals shall be reviewed by the Secretary of the Interior for possible extension commencing at least 2 years before the expiration date of the withdrawal. When requested, the Department benefiting from the withdrawal shall provide the Secretary with the information specified in this Part in the form of a withdrawal extension application with supplemental information. | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 43 CFR | 2800 | Rights-of-Way, Principles and Procedures | Programmatic | Pre-construction | The Secretary of the Interior can grant rights-of-way and temporary use permits to any governmental entity and to regulate, control and direct the use of said rights-of-way on public land. If the DOE believes that a right-of-way grant is required for construction assess to the rail alignment, the DOE should establish early contact with the Bureau of Land Management office responsible for management of the affected public lands so that potential constraints may be identified, the proposal may be considered in land use plans, and processing of an application may be tentatively scheduled. Applications for a right-of-way grant shall be filed with either the Area Manager, the District Manager or the Nevada State Director of the Bureau of Land Management. When a grant provides that it may be renewed, the authorized officer shall renew the grant so long as the project or facility is still being used for purposes authorized in the original grant and is being operated and maintained in accordance with all the provisions of the grant and pursuant to the regulations of this title. | Phase II |
| 43 CFR | 3600 | Mineral Materials Disposal | Programmatic | Construction | A government entity may apply to the BLM for a free-use permit to extract and use common varieties of sand, stone, gravel, and other materials. BLM may issue free-use permits to a government entity without limitation as to the number of permits or as to the value of the mineral materials to be extracted or removed, provided that the government entity shows that it will not use these materials for commercial or industrial purposes. | Phase II |
| 49 CFR | 107 | Hazardous Materials Program Procedures | Programmatic | Operations | Subpart G "Registration of Persons Who Offer or Transport Hazardous Materials" - Shortline operator must be registered in accordance with Part G. | Phase III |
| 49 CFR | 171 | General information, regulations, and definitions | Programmatic | Operations | Sec. 171.15 "Immediate notice of certain hazardous materials incidents" - A rail or highway carrier will provide a means for notification of incidences in accordance with 49 CFR 171.15. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 171 | General information, regulations, and definitions | Programmatic | Operations | Sec. 171.16 "Detailed hazardous materials incident reports" - A shortline or highway carrier will prepare or assist DOE in the preparation of a hazardous materials incident report in the event of an incident. | Phase III |
| 49 CFR | 172 | Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements | Programmatic | Operations | Sec. 172.508 (b) "Placarding and affixing placards: Rail" - Prohibits rail carrier from accepting a rail car containing a hazardous material for transportation unless the placards for the hazardous material are affixed thereto--hence requires inspection. | Phase III |
| 49 CFR | 172 | Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements | Programmatic | Operations | Subpart G "Emergency Response Information" - Prescribes requirements for providing and maintaining emergency response information during transportation and at facilities where hazardous materials are loaded for transportation, stored incidental to transportation or otherwise handled during any phase of transportation - applicable to a rail carrier. | Phase III |
| 49 CFR | 172 | Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements | Programmatic | Operations | Subpart H "Training" - Prescribes non mode specific hazmat training requirements for rail carrier employees. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.3 "Unacceptable hazardous materials shipments" - Prohibits rail carrier from accepting any shipment of hazardous material that is not in conformance with the requirements of this subchapter. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.9 "Inspection and acceptance" - Requires the rail carrier to inspect each rail car containing hazardous materials, at each location where a hazardous material is accepted for transportation or placed in a train, the carrier must inspect each rail car containing the hazardous material, at ground level, for required markings, labels, placards, securement of closures and leakage. This inspection may be performed in conjunction with inspections required under Title 49 Parts 215 and 232. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.14 "Movements to be expedited" - Requires a rail carrier to forward each shipment of hazardous materials promptly and within 48 hours (Saturdays, Sundays, and holidays excluded), after acceptance at the originating point or receipt at any yard, transfer station, or interchange point, except that where biweekly or weekly service only is performed, a shipment of hazardous materials must be forwarded on the first available train. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.24 "Shipping papers" - Requires the initial rail carrier to receive shipping papers prepared in accordance with this subpart prior to transport and to retain a copy of the shipping papers for 375 days from the acceptance of the shipment. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.26 "Notice to train crews" - Requires the train crew to have a document that reflects the current position in the train of each rail car containing a hazardous material. And requires member of the crew of a train transporting a hazardous material to have a copy of a document for the hazardous material being transported showing the information required by part 172 of this subchapter. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.55 "General requirements" - Requires that each package containing a hazardous material being transported by rail in a freight container or transport vehicle must be loaded so that it cannot fall or slide and must be safeguarded in such a manner that other freight cannot fall onto or slide into it under conditions normally incident to transportation. When this protection cannot be provided by using other freight, it must be provided by blocking and bracing. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.59 "Marking and placarding of rail cars" - Prohibits a rail carrier from transporting a rail car carrying hazardous materials unless it is marked and placarded as required by this subchapter. Placards and car certificates lost in transit must be replaced at the next inspection point. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.81 (d) "Segregation of hazardous materials" - Requires a rail carrier to segregate rail cars containing hazardous materials in accordance with the table contained in this section. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.83 "Switching placarded rail cars, transport vehicles, freight containers, and bulk packagings" - Prescribes allowable switching requirements for rail cars containing hazardous materials. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.85 (b) "Position in train of placarded cars, transport vehicles, freight containers, and bulk packagings" - Prescribes the allowable position of class 7 (radioactive) placarded rail cars in a train. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.102 "Forbidden mixed loading and storage" - Prohibits storage of division 1.1 or 1.2 (explosive) materials from being stored on carrier property with charged electric storage batteries or with any hazardous material for which a NONFLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE LIQUID, FLAMMABLE SOLID, OXIDIZER, ORGANIC PEROXIDE, RADIOACTIVE or CORROSIVE label is required. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.700 (b) "Special handling requirements for Class 7 (radioactive) materials" - Limits the number of packages of Class 7 (radioactive) materials that may be transported by rail car or stored at any single location is limited to a total transport index number (as defined in Sec. 173.403 of this subchapter) of not more than 50. This provision does not apply to exclusive use shipments as described in Secs. 173.403, 173.427, 173.441, and 173.457 of this subchapter. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.700 (e) "Special handling requirements for Class 7 (radioactive) materials" - Prohibits a person from remaining unnecessarily in, on or near a transport vehicle containing Class 7 (radioactive) materials. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.700 (f) "Special handling requirements for Class 7 (radioactive) materials" - Specifies, in the case of packages shipped under the exclusive use provisions of Sec. 173.441(b) of this subchapter for packages with external radiation levels in excess of 2 mSv per hour (200 mrem per hour) at the package surface, that: (1) The transport vehicle must meet the requirements for a closed transport vehicle (Sec. 173.403 of this subchapter); (2) Each package must be secured so that its position within the transport vehicle remains fixed under conditions normally incident to transportation; and (3) The radiation level may not exceed 0.02 mSv per hour (2 mrem per hour) in any normally occupied position in the transport vehicle or adjacent rail car. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.715 Cleanliness of transport vehicles after use – Sets the requirements for cleaning transport vehicles after use. | Phase III |
| 49 CFR | 174 | Carriage by Rail | Programmatic | Operations | Sec. 174.750 "Incidents involving leakage" - Requires a rail carrier to notify the offerer of a hazardous shipment in the event of an incident. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations | Sec. 210.23 "Authorization" - Prescribes the allowable inspections for the part and the railroad requirements. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations | Sec. 210.25 "Measurement criteria and procedures" - Prescribes the measurement criteria and procedures that must be followed by the railroad. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations/ Testing/ Commissioning | Sec. 210.27 "New locomotive certification" - Requires railroads to have locomotives certified prior to use. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations | Sec. 210.29 "Operation standards (moving locomotives and rail cars)" - Prescribes noise standards for the operation of moving locomotives and rail cars. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Technical | Operations | Sec. 210.31 "Operation standards (stationary locomotives at 30 meters)" - Prescribes noise standards for stationary locomotives. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations | Sec. 210.33 "Operation standards (switcher locomotives, load cell test stands, car coupling operations, and retarders)" - Prescribes noise standards for switcher locomotives, load cell test stands, car coupling operations, and retarders. | Phase III |
| 49 CFR | 210 | Railroad Noise Emission Compliance Regulations | Programmatic/ Technical | Operations | Appendix B to Part 210 "Switcher Locomotive Enforcement Policy." | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic/ Technical | Operations | Sec. 213.5 (a) "Responsibility for compliance" - Requires that any owner of track to which this part applies who knows or has notice that the track does not comply with the requirements of this part, shall bring the track into compliance; halt operations over that track; or operate under authority of a person designated under Sec. 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, subject to conditions set forth in this part. This does not apply to "excepted track" as provided in Sec. 213.4. | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic/ Technical | Operations | Sec. 213.5 (f) "Responsibility for compliance" - Requires a contractor for a railroad or track owner performing any function required by this part to perform that function in accordance with this part. | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic | Operations | Sec. 213.7 "Designation of qualified persons to supervise certain renewals and inspect track" - Specifies requirements for employee qualifications, who supervise certain track repair and inspections. | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic/ Technical | Operations/ Maintenance | Sec. 213.11 "Restoration or renewal of track under traffic conditions" - Requires the presence of qualified supervisor during repair or maintenance of track under traffic conditions. | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic/ Technical | Operations | Sec. 213.13 "Measuring track not under load" - Specifies requirements for compliance testing. | Phase III |
| 49 CFR | 213 | Track Safety Standards | Programmatic/ Technical | Operations/ Maintenance | Subpart F "Inspection" - Prescribes requirements for the frequency and manner of inspecting track to detect deviations from the standards prescribed in this part. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 214 | Railroad Workplace Safety | Programmatic/ Technical | Operations/ Maintenance/ Design | Prescribes minimum Federal safety standards for the railroad workplace safety subjects addressed therein. Requires adoption and implementation of an on-track safety program. | Phase III |
| 49 CFR | 215 | Railroad Freight Car Safety Standards | Programmatic | Operations | Sec. 215.9 "Movement of defective cars for repair" - Defines the requirements for movement of a defective rail car. | Phase III |
| 49 CFR | 215 | Railroad Freight Car Safety Standards | Programmatic | Operations | Sec. 215.11 "Designated inspectors" - Requires railroads to designate persons qualified to inspect railroad freight cars for compliance with this part and to make the determinations required by Sec. 215.9 of this part. Also requires documentation of designation and the basis for designation. | Phase III |
| 49 CFR | 215 | Railroad Freight Car Safety Standards | Programmatic | Operations | Subpart B "Freight Car Components" - This subpart contains safety requirements prohibiting a railroad from placing or continuing in service a freight car that has certain defective components. | Phase III |
| 49 CFR | 215 | Railroad Freight Car Safety Standards | Programmatic/ Technical | Operations/ Maintenance | Subpart D "Stenciling" - Specifies requirements for stenciling of railcars (restricted cars) and maintenance-of-way equipment. | Phase III |
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.7 "Operating rules; filing and record keeping" - Requires each railroad to keep a copy of its code of operating rules, timetables, and timetable special instructions, and amendments there to. For class I and II railroads these documents must be submitted to the FRA before it commences operations. Also requires submittal of amendments thereto for class I and II. | Phase III |
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.9 (a) "Program of operational tests and inspections; record keeping" - Requirement to conduct operational tests and inspections. | Phase III |
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.9 (b) "Program of operational tests and inspections; record keeping" - Requires written program of operational tests and inspections. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.9 (c) "Program of operational tests and inspections; record keeping" - Requires railroads to keep records of individual tests and inspections. | Phase III |
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.9 (d) "Program of operational tests and inspections; record keeping" - Requires preparation of annual summary on operational tests and inspections. | Phase III |
| 49 CFR | 217 | Railroad Operating Rules | Programmatic | Operations | Sec. 217.11 "Program of instruction on operating rules; record keeping; electronic record keeping" - Requires initial and periodic training of railroad employees on the code of operating rules and records retention of employee training. | Phase III |
| 49 CFR | 218 | Railroad Operating Practices | Programmatic/ Technical | Operations/ Design | Subpart B "Blue Signal Protection of Workers" - Describes the blue signal protection requirements for a railroad. | Phase III |
| 49 CFR | 218 | Railroad Operating Practices | Programmatic/ Technical | Operations/ Procurement | Subpart E "Protection of Occupied Camp Cars" - Prescribes minimum requirements governing protection of camp cars that house railroad employees. | Phase II |
| 49 CFR | 219 | Control of Alcohol and Drug Use | Programmatic | Operations/ Maintenance | Purpose of this part is to prevent accidents and casualties in railroad operations that result from impairment of employees by alcohol or drugs. This part prescribes minimum Federal safety standards for control of alcohol and drug use. | Phase III |
| 49 CFR | 220 | Railroad Communications | Programmatic | Operations/ Maintenance | Sec. 220.11 "Requirements for roadway workers" - Requires workers to maintain immediate access to a working radio. | Phase III |
| 49 CFR | 220 | Railroad Communications | Programmatic | Operations/ Maintenance | Sec. 220.13 "Reporting emergencies" - Prescribes the requirements for reporting emergencies. | Phase III |
| 49 CFR | 220 | Railroad Communications | Programmatic | Operations/ Maintenance | Subpart B "Radio and Wireless Communication Procedures" - Prescribes the requirements for wireless and radio communications. | Phase III |
| 49 CFR | 221 | Rear end marking device– passenger, commuter and freight trains | Programmatic/ Technical | Operations/ Procurement | Subpart B "Marking Devices" - Prescribes minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger, commuter and freight trains. Also prescribes inspection prior to operation. | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 223 | Safety glazing standards– locomotives, passenger cars and cabooses | Technical | Procurement | Prescribes minimum requirements for glazing materials to protect railroad employees and railroad passengers from injury as a result of objects striking the windows of locomotives, caboose and passenger cars. | Phase II |
| 49 CFR | 225 | Railroad accidents/incidents: Reports classification, and investigations | Programmatic | Operations | Prescribes the requirements for reporting accident/incidents to the FRA. | Phase III |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations/ Procurement | Sec. 229.7 "Prohibited acts" - Prohibits use of locomotive and its appurtenances on a line unless they are in proper condition and safe to operate in the service to which they are put, without unnecessary peril to life or limb; and have been inspected and tested as required by this part. | Phase II |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations/ Procurement Design | Sec. 229.11 "Locomotive identification" - Prescribes locomotive identification requirements. | Phase II |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations/ Procurement Design | Sec. 229.13 "Control of locomotives" - Prescribes requirements for coupled locomotives. | Phase II |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations/ Procurement Design | Sec. 229.17 "Accident reports" - Prescribes requirements for reporting accidents involving locomotives and preservation of evidence. | Phase II |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations | Subpart B "Inspections and Tests" - Prescribes requirements for testing and inspection of locomotives including daily, periodic, biannual, and annual inspections. | Phase III |
| 49 CFR | 229 | Railroad Locomotive Safety Standards | Programmatic/ Technical | Operations/ Procurement Design | Subpart C "Safety Requirements" - Prescribes safety requirements for locomotives (large number of sections each with specific locomotive specifications). | Phase II |
| 49 CFR | 231 | Railroad Safety Appliance Standards | Programmatic/ Technical | Operations/ Procurement | Prescribes railroad safety appliance standards (large number of sections each with specific railcar specifications). | Phase II |
| 49 CFR | 228 | Hours of service of railroad employees | Programmatic | Operations | Subpart B "Records and Reporting" - Prescribes the requirements for hours of service and dispatcher record keeping. | Phase III |
| 49 CFR | 228 | Hours of service of railroad employees | Programmatic/ Technical | Procurement | Subpart C "Construction of Employee Sleeping Quarters" - Prescribes the requirements for employee sleeping quarters. | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 228 | Hours of service of railroad employees | Programmatic/ Technical | Operations/ Procurement Design | Appendix C to Part 228 "Guidelines for Clean, Safe, and Sanitary Railroad Provided Camp Cars" - Prescribes requirements for camp cars. | Phase II |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic | Operations/ Procurement | Sec. 232.15 "Movement of defective equipment" - Prescribed the requirements for movement of equipment not in compliance with the requirements of this section. | Phase II |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic/ Technical | Operations/ Procurement | Sec. 232.17 "Special approval procedure" - Specifies the procedure for preparation of a plan for designated brake repair location under section Sec. 232.15(g) and an alternative standard under Sec. 232.305. | Phase II |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic/ Technical | Operations/ Maintenance/ Procurement Design | Subpart B "General Requirements" - Contains general operating, performance, and design requirements for each railroad that operates freight or other non-passenger trains and for specific equipment used in those operations. | Phase II |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic | Operations/ Maintenance | Subpart C "Inspection and Testing Requirements" - Contains the inspection and testing requirements for brake systems used in freight and other non-passenger trains. This subpart also contains general training requirements for railroad and contract personnel used to perform the required inspections and tests. | Phase III |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic/ Technical | Operations/ Maintenance/ Procurement Design | Subpart D "Periodic Maintenance and Testing Requirements" - Contains the periodic brake system maintenance and testing requirements for equipment used in freight and other non-passenger trains. | Phase II |
| 49 CFR | 232 | Brake system safety standards for freight and other non-passenger trains and equipment; end-of-train devices | Programmatic/ Technical | Operations/ Procurement Design | Subpart E "End-of-Train Devices" - Contains the requirements related to the performance, operation, and testing of end-of-train devices. | Phase II |
| 49 CFR | 233 | Signal Systems Reporting Requirements | Programmatic | Operations | Prescribes the reporting requirements with respect to methods of train operation, block signal systems, interlockings, traffic control systems, automatic train stop, train control, and cab signal systems, or other similar appliances, methods, and systems in the event of an accident or failure of the system. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 234 | Grade Crossing Signal System Safety | Programmatic | Operations | Subpart B "Reports" - Prescribes the reporting requirements for accidents involving grade crossing signal failure. | Phase III |
| 49 CFR | 234 | Grade Crossing Signal System Safety | Programmatic | Operations/ Maintenance | Subpart C "Response to Reports of Warning System Malfunction" - Prescribes the response requirements to grade crossing system malfunctions including the requirements for intermediate means of remediation. | Phase III |
| 49 CFR | 234 | Grade Crossing Signal System Safety | Programmatic/ Technical | Operations/ Maintenance | Subpart D "Maintenance, Inspection, and Testing" - Prescribes the requirements for maintenance, inspection, and testing of highway rail crossings. | Phase III |
| 49 CFR | 235 | Instructions governing applications for approval of a discontinuance or material modification of a signal system or relief from the requirements of part 236 | Programmatic | Maintenance/ Procurement Design | Defines the requirements for filing an application for modification of a signal system. | Phase III |
| 49 CFR | 240 | Qualification and Certification of Locomotive Engineers | Programmatic | Operations | Prescribes minimum Federal safety standards for the eligibility, training, testing, certification and monitoring of all locomotive engineers. | Phase III |
| 49 CFR | 1005 | Principles and practices for the investigation and voluntary disposition of loss and damage claims and processing salvage | Programmatic | Operations | Prescribes the requirements for processing of claims for loss, damage, injury, or delay to property transported or accepted for transportation by a carrier - would apply in the case of shared use. | Phase III |
| 49 CFR | 1033 | Car Service | Programmatic | Operations | Prescribes the regulations for car hire rates - Could be applicable to general use cars to support operations and the repository if they are hired out. | Phase III |
| 49 CFR | 1035 | Bills of Lading | Programmatic | Operations | Requires all common carriers engaged in the transportation of property other than livestock and wild animals, by rail or by water subject to the Interstate Commerce Act are required to use straight bills of lading as prescribed in Appendix A and B to this part, or order bills of lading as prescribed in Appendix A and B to this Part - Applicable in a shared use scenario. | Phase III |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 49 CFR | 1150 | Certificate to Construct, Acquire, or Operate Railroad Lines | Programmatic/ Technical | Operations | Subpart B "Designated Operators" - Prescribes the requirements for a certificate of designated operator will be issued to an operator providing service pursuant to a rail service continuation agreement under section 304 of the Regional Rail Reorganization Act of 1973, as amended by the Railroad Revitalization and Regulatory Reform Act of 1976. | Phase III |
| 50 CFR | 17 | Endangered and Threatened Wildlife and Plants | Programmatic | Construction and Operations | Implements Endangered Species Act of 1973. Except as otherwise provided in the Act, it is unlawful to: import or export; take within the U.S. or on the seas; possess, sell, deliver, carry, transport or ship any taken species; deliver, receive, carry, transport, shop, sell or offer to sell these species in interstate or foreign commerce; violate any regulation pertaining to a threatened or endangered fish or wildlife species. Except as provided, with respect to endangered species of plants, it is unlawful to: import or export; remove the species from areas under federal jurisdiction or maliciously damage or destroy it in those areas; remove, cut, dig up, damage or destroy the species in any other area in violation of state law or in the course of criminal trespass; deliver, receive, carry, transport, ship, sell or offer for sale in interstate or foreign commerce; violate any regulation pertaining to a threatened or endangered plant species." | Phase II |

Table C-2. Federal Regulation Requirements – Construction, Operation, and Maintenance Affecting (Continued)

| Regulation/ Law | Part No. | Part Title | Category | Function | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|
| 50 CFR | 21 | Migratory Bird Permits | Programmatic | Construction and Operation | Implements the prohibitions of the Migratory Bird Treaty Act against the taking, killing or possessing migratory birds. The Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Sec. 11 *General permit requirements* of Part 21, states that no person may take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such bird except as may be permitted under the terms of a valid permit issued pursuant to the provisions of this part and part 13 of this chapter, or as permitted by regulations in this part, or part 20 of this subchapter (the hunting regulations). | Phase II |
| 50 CFR | 402 | Interagency Cooperation — Endangered Species Act of 1973, as Amended | Programmatic | Construction and Operation | Interprets and implements sections 7(a)-(d) [16 USC 1536(a)-(d)] of the Endangered Species Act of 1973, as amended. Section 7(a)(2) of the Act requires every Federal agency, in consultation with and with the assistance of the Secretary of the Interior, to insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or results in the destruction or adverse modification of critical habitat. Section 7 consultation between the DOE and the U.S. Fish and Wildlife Service will be required for rail construction through any habitat that supports listed species (including the desert tortoise). | Phase II |

# APPENDIX D
# STATE OF NEVADA STATUTE AND CODE REGULATIONS

The following table contains requirements from State of Nevada Statute and Code Regulations that apply to conceptual design of the Nevada Rail System. Requirements from Section 6 are identified in this table and the applicable NAC or NRS is identified. The NAC or NRS requirement is summarized and interpreted in the "Requirements/Rationale" column. Requirements applicable to other than Phase I, "Conceptual Design and EIS Support" have been included in Table E-2 to aid in the future preparation of Concept of Operation and Maintenance for NVT.

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.A* | *Sewage Disposal Systems. Design of NRL facilities that utilize sewage disposal systems shall comply with the applicable sections of NAC 445A.228 through 445A.263.* | Programmatic/ Technical | Construction/ Operation/ Maintenance | NAC 445A.228-445A.263 | Water Pollution Control: Discharge Permits | Establishes permitting requirements for discharges into Nevada waters. Exemptions provided for "[p]ersons utilizing an individual sewage disposal system or other sewage disposal system that uses a soil absorption system for the treatment and disposal of domestic wastes, with accumulative flows of less than 5,000 gallons per day, providing the system is approved and is installed, operated and maintained in accordance with the rules and regulations and other requirements of the district health departments or the State Board of Health. This exemption does not preclude the possibility that health authorities will require permits." | Phase I |
| *NVTRD 6.B* | *Runoff Control. The NRL shall be designed using established best practices and applicable requirements contained in NAC 445A.305 through 445A.340, for the control of run off from "diffuse sources" (e.g., railroads).* | Programmatic/ Technical | Construction/ Operation/ Maintenance | NAC 445A.305-445A.340 | Water Pollution Control: Diffuse *Sources* | Establishes best practices, permit requirements for construction or grading to control runoff from "diffuse sources," defined to include runoff from construction activities and "roads, streets, and railroads." | Phase I |
| *NVTRD 6.C* | *Drinking Water Systems. The design of drinking water systems at NRL facilities shall meet the applicable requirements of NAC 445A.591 through 445A.6731.* | Programmatic/ Technical | Construction/ Operation/ Maintenance | NAC 445A.591-445A.6731 | Water Pollution Control: Operation of Community Water System or Nontransient Water System | Establishes requirements for permitting, operation, and operator certification for "non-transient" privately-owned drinking water systems, defined to serve at least 25 of the same persons for more than 6 months a year. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.D* | *Air Pollution Control. Design of the NRL shall consider the requirements for control of emissions (e.g., fugitive dust) contained in NAC 445B.001 through 445B.899.* | Programmatic/ Technical | Construction/ Operation/ Maintenance | NAC 445B.001-445B.899 | Air Pollution | Establishes requirements for control of emissions (e.g., fugitive dust). | Phase I |
| *NVTRD 6.E* | *Storage Tanks. Any underground storage tanks for hazardous materials (e.g., locomotive fuel) at NRL facilities shall be designed to meet the applicable permitting requirements of NAC 459.9921 through 459.999.* | Programmatic/ Technical | Construction and Operation | NAC 459.9921-999 | Hazardous Materials: Storage Tanks | These regulations pertain to the management of underground storage tanks and the management of releases from these tanks. The use of underground storage tanks is not allowed for YMP-related work; hence, these regulations are not applicable at the site but would be applicable to any underground storage tanks at the facilities at Caliente.<br>Establishes requirements (e.g., financial responsibility, groundwater monitoring, reporting, assessment, and corrective action) for owners and operators of underground storage tanks (e.g., for locomotive fuel). | Phase I |
| *NVTRD 6.F* | *Roofing Materials. The design of NRL facilities shall incorporate the applicable requirements for fire-retardant roofing materials in areas designated by NAC Chapter 472.* | Technical | Design/ Construction/ Maintenance | NAC 472 [DIRS 169742] | State Forester Fire Warden | Requires fire-retardant roofing materials in new buildings in designated areas. | Phase I |
| *NVTRD 6.G* | *Hazardous Material Storage. NRL facilities that require storage of hazardous materials in excess of the limits set forth in Uniform Fire Code, as adopted pursuant to NAC 477.281, shall be designed to meet the permitting requirements set in NAC 477.323.* | Technical/ Programmatic | Design/ Construction | NAC 477.281 | State Fire Marshal: Codes adopted by reference; applicability. | 1. The state fire marshal hereby adopts by reference the following nationally recognized codes with additions and deletions as noted in NAC 477.283:<br>(a) *Uniform Fire Code*, 1997 edition, Volume 1…<br>(e) *Uniform Fire Code Standards*, 1997 edition, Volume 2. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design/ Construction | NAC 477.323 | State Fire Marshal: Licenses and Certificates of Registration | A permit is required from the Nevada State Fire Marshal to store hazardous materials in excess of the amounts set forth in the *Uniform Fire Code (NAC 477.281)*. The permit must be renewed annually. | Phase I |
| *NVTRD 6.H* | *Fire Suppression Systems.* Fire Suppression Systems. NRL facilities situated in rural areas shall be designed to meet the applicable requirements contained in NAC 477.920 for fire suppression systems. | Technical | Construction | NAC 477.920 | State Fire Marshal: Commercial buildings in rural regions. (NRS 477.030) | 1. Unless otherwise required by state code, local code or ordinance, a new commercial building that has more than 5,000 square feet of floor space must be equipped with an automatic fire suppression system if:<br>(a) The community or area where the building is located is not served by a water system or utility and cannot produce the required fire flow;<br>(b) The community or area is not served by an organized fire department that is capable of responding to the report of an alarm at the building within 10 minutes; or<br>(c) The building is not served by an all-weather access road. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.I* | *Wildlife Management Areas.* Wildlife Management Areas. In areas of wildlife management, the design and planning of the NRL shall consider the requirements contained in NAC 504.115 and 504.520 for alteration of stream systems or watersheds and vehicular travel. | Programmatic | Construction Maintenance | NAC 504.115 | Wildlife Management and Propagation: Control of vehicular travel. (NRS 501.105, 501.181, 504.143) | 1. Vehicular travel within a wildlife management area may be controlled for operation of the area, for public use and to benefit the public and wildlife resources. Such control may include specifying parking areas, closing interior roads or trails to vehicular travel and prohibiting travel beyond designated points.<br>2. Except as otherwise provided in subsection 3, it is prohibited, within a wildlife management area, to operate a motor vehicle:<br>(a) Off an interior road or trail that is designated for vehicular travel; or<br>(b) On an interior road or trail that is marked as closed to vehicular travel.<br>3. The provisions of subsections 1 and 2 do not apply to authorized personnel in the performance of their official duties. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Construction | NAC 504.520 | Wildlife Management and Propagation: Approval of division required to alter stream system or watershed to detriment of wildlife habitat; application for approval | 1. Except with the written consent of the division [of wildlife of the state department of conservation and natural resources] as provided in subsection 2, a person shall not substantially:<br>(a) Obstruct, damage, diminish, destroy, change, modify or vary the natural shape and form of a stream system or its banks by any type of construction or other activity that is detrimental to the wildlife habitat. Such activity includes channelization, thermal pollution and diversion.<br>(b) Destroy, change, modify or vary the natural shape, form or vegetational cover of any watershed by any type of construction or other activity that is detrimental to the wildlife habitat. Such activity includes reseeding, chaining, removing brush and burning.<br>2. An applicant must submit an application to the division for approval before commencing planned construction or other activity under subsection 1. The application must include detailed plans and specifications of the portions of the project that may affect the wildlife habitat. | Phase II |
| *NVTRD 6.J* | *Overhead Clearances. The design of overhead clearances for the NRL shall satisfy the applicable minimum clearance requirements in NAC 705.020 and NAC 705.050.* | Technical | Design | NAC 705.020 | Railroads: Overhead clearances | Prescribes the minimum overhead clearances required for rail cars within Nevada. | Phase I |
| | | Technical | Design | NAC 705.050 | Railroads: Center line of track: Overhead and side clearances | Prescribes method for calculating decreases in required Nevada minimum overhead and side clearances based on a point above the track centerline | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.K* | *Side Clearances. The design and construction of side clearances for the NRL shall satisfy the applicable minimum clearance requirements in NAC 705.030 and NAC 705.050.* | Technical | Design | NAC 705.030 | Railroads: Side clearances | Prescribes the minimum side clearances required for rail cars within Nevada. | Phase I |
| | | Technical | Design | NAC 705.050 | Railroads: Center line of track: Overhead and side clearances | Prescribes method for calculating decreases in required Nevada minimum overhead and side clearances based on a point above the track centerline. | Phase I |
| *NVTRD 6.L* | *Parallel Track Clearances. The design and construction of any parallel tracks for the NRL shall satisfy the applicable parallel track clearance requirements in NAC 705.060.* | Technical | Design | NAC 705.060 | Railroads: Clearance between parallel tracks | Prescribes required minimum clearances between parallel tracks in Nevada. | Phase I |
| *NVTRD 6.M* | *Rail Above Road Crossing Clearances. The design and construction of any rail crossings above roads for the NRL shall satisfy the minimum structural clearance requirements in NAC 705.064.* | Technical | Design | NAC 705.064 | Railroads: Tracks above public roads, highways and streets | Prescribes minimum structural clearances for design of Nevada overhead rail crossings. | Phase I |
| *NVTRD 6.N* | *Overhead Road Crossing Clearances. The design of any overhead road crossings for the NRL shall meet the structural clearance requirements in NAC 705.066.* | Technical | Design/ Construction | NAC 705.066 | Railroads: Public roads, highways and streets over tracks | Prescribes minimum structural clearances for design of Nevada overhead road crossings and clearances above the rail during installation. | Phase I |
| *NVTRD 6.O* | *Electrical Construction Clearances. The design of electrical systems for NRL facilities and utility relocations shall meet the required clearance requirements specified in the National Electrical Safety Code as required by NAC 705.070.* | Technical | Design | NAC 705.070 | Railroads: Clearances of electrical construction | Prescribes Nevada DOT clearances for electrical construction to follow the requirements specified in the *National Electrical Safety Code* as adopted by the commission pursuant to NAC 704.450. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.P* | *Rail Bridges. The design of bridges for the NRL shall consider the inspection requirements contained in NAC 705.145.* | Technical | Maintenance | NAC 705.145 | Railroads: Inspection and reports | Prescribes requirements for inspections of rail bridges in Nevada. | Phase I |
| *NVTRD 6.Q* | *Walkways. The design of walkways on bridges, trestles, alongside tracks, etc., shall meet the design standards specified in NAC 705.150 through 705.181.* | Technical | Design | NAC 705.150 | Railroads: On bridges and trestles | Prescribes requirements for walkways on bridges and trestles in Nevada. | Phase I |
| | | Technical | Design/ Maintenance | NAC 705.160 | Railroads: Alongside track: General standards | Prescribes general design and maintenance standards for walkways alongside tracks in Nevada. | Phase I |
| | | Technical | Design | NAC 705.164 | Railroads: Alongside main-line track | Prescribes design standards for walkways alongside mail-line tracks. | Phase I |
| | | Technical | Design | NAC 705.167 | Railroads: Alongside main-line and branch-line track at siding locations | Prescribes standards for walkways alongside branch lines at sidings in Nevada. | Phase I |
| | | Technical | Design | NAC 705.171 | Railroads: Alongside track in yards and certain industry turnouts and spotting areas | Prescribes standards for walkways alongside track in Nevada yards. | Phase I |
| | | Technical | Design | NAC 705.174 | Railroads: Alongside track at main-line turnouts entering yards or serving industry tracks | Prescribes standards for walkways alongside turnouts from the main line entering yards in Nevada. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design | NAC 705.177 | Railroads: Alongside tracks at short-line and branch-line turnouts and certain power-operated turnouts | Prescribes standards for walkways alongside turnouts from a branch-line or short line in Nevada. | Phase I |
| | | Technical | Design | NAC 705.181 | Railroads: Alongside main-line track at turnouts used frequently for switching cars | Prescribes standards for walkways along side turnouts from the main line used for switching cars in Nevada. | Phase I |
| *NVTRD 6.R* | *Emergency Response. The design and planning of the NRL shall consider the emergency response planning requirements of NAC 705.331 to address NRL shipments other than SNF and HLW.* | Programmatic | Operations | NAC 705.331 | Railroads: Emergency planning and response procedures | Prescribes the emergency response planning required for railroads. | Phase I |
| | | Technical/ Programmatic | Design/ Construction | NRS 266.295.6 | General Law for Incorporation of Cities and Towns: Railroads and railways | 6. Require railroad companies to fence their tracks and to construct cattle guards and crossings and to keep them in repair | |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.S* | *Fencing. The design of the NRL shall consider the requirements of NRS 705.120 and 705.130 and 705.170 for fencing, gates, cattle guards, etc., and shall adhere to the applicable requirements for fencing gates, cattle guards, etc., defined by NRS 266.295.* | Technical/ Programmatic | Design, Construction, and Operation | NRS 705.120 | Railroads and Monorails: Fences and Guards for Livestock; Duty of maintaining fences; liability for killing livestock | 1. Railroad corporations must make and maintain a good and sufficient fence on both sides of their track and right of way. In case they do not make and maintain such fence, if their engines or cars shall kill or maim any cattle or other domestic animals upon their line of road, they must pay to the owner of such cattle or other domestic animals a fair market price for the same, unless it occurred through the neglect or fault of the owner of the animal so killed or maimed.<br>2. Nothing in this section shall require any railroad company to fence its right of way through any town or city.<br>NOTE: NRS 266.295 allows a city to require fencing/ cattleguards. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical/ Programmatic | Design, Construction, and Operation | NRS 705.130 | Railroads and Monorails: Fences and Guards for Livestock; Duty of constructing barriers where public road crosses fenced in right-of - way; liability for killing livestock | 1. Every person, lessee, receiver, firm, copartnership or corporation owning, leasing or operating any railroad in, or through any part of, the State of Nevada shall, wherever a public road or highway crosses the fenced-in right of way of such railroad, construct such barriers, guards or other devices as will effectually prevent the entrance from such public road or highway onto the right of way of cattle, horses, mules and burros. Such barriers, guards, or other devices shall not be placed across, or in any wise obstruct, such public road or highway.<br>2. If any person, lessee, receiver, firm, copartnership or corporation owning, leasing or operating any railroad in, or through any part of, the State of Nevada shall fail to construct such barriers, guards or other devices specified in subsection 1, and any cattle, horses, mules or burros shall be killed, maimed or injured on any part of such unprotected right of way, the person, lessee, receiver, firm, copartnership or corporation so offending shall pay to the owner, or agent of the owner, of any such cattle, horses, mules or burros the full market value of such animals as it was before such injury occurred. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Operation | NRS 705.170 | Railroads and Monorails: Fenced right of way to be equipped with passageways and gates; responsibility of railroad | 1. Every railroad corporation or company, in fencing its right of way, shall provide and maintain suitable passageways equipped with gates, except at watering holes, where openings with proper safeguards will be maintained.<br>2. Responsibility for measures toward prevention of unnecessary loss or injury to livestock upon railroad tracks or rights of way through construction and proper maintenance of suitable barriers, such as right of way fences and livestock guards or cattle guards at all openings or crossings through the right of way or track fences, or at each end of open cuts, shall lie with the owners of such railroads. | Phase I |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 6.T* | *Hours on Duty*. The design of the NRL shall consider the limitation contained in NRS 705.210 [DIRS 169746].for the hours on duty of rail employees. | Programmatic | Operation | NRS 705.210 | Railroads and Monorails: Employees' hours of employment limited; penalties | 1. As used in this section:<br>(a) "Employees" means persons actually engaged in or connected with the movement of any train.<br>(b) "Railroad" includes all bridges and ferries used or operated in connection with any railroad, and also all the road in use by any common carrier operating a railroad, whether owned or operated under a contract agreement or lease.<br>2. The provisions of this section apply to any common carrier or carriers, their officers, agents and employees engaged in the transportation of passengers or property by railroad in the State of Nevada.<br>3. It is unlawful for any common carrier, its officers or agents, subject to this section, to require or permit any employee subject to this section to be or remain on duty for a longer period than 16 consecutive hours, and whenever any such employee of such common carrier has been continuously on duty for 16 hours he must be relieved and not required or permitted again to go on duty until he has had at least 10 consecutive hours off duty. No such employee who has been on duty 16 hours in the aggregate in any 24-hour period must be required or permitted to continue or again go on duty without having had at least 8 consecutive hours off duty. | Phase III |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Operation | NRS 705.210 | Railroads and Monorails: Employees' hours of employment limited; penalties (cont'd) | 4. No employee who, by the use of the telegraph or telephone or other electrical device, dispatches, reports, transmits, receives or delivers orders or who from towers, offices, places and stations operates signals or switches or similar mechanical devices controlling, pertaining to, or affecting the movement of trains of more than two cars must be required or permitted to be or remain on duty in any 24-hour period for a longer period than 8 hours, which must be wholly within the limits of a continuous shift and upon the completion of that period the employee must not be required or permitted again to go on duty until the expiration of 16 hours. This subsection does not apply to employees who, in case of emergency, use the telephone to obtain orders or information governing the movement of trains. In case of emergency, such employees may be permitted to be and remain on duty for 4 additional hours in a 24-hour period of not exceeding 3 days in any week. | Phase III |

Table D-1. State of Nevada Statute and Code Regulations – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Operation | NRS 705.210 | Railroads and Monorails: Employees' hours of employment limited; penalties (cont'd) | 5. Any common carrier, or any officer or agent thereof, requiring or permitting any employee to go, be or remain on duty in violation of subsections 3 and 4 shall be punished by a fine of not more than $500.<br>6. In all prosecutions under this section the common carrier shall be deemed to have had knowledge of all acts of its officers and agents.<br>7. The provisions of this section do not apply:<br>(a) In any case of casualty or unavoidable accident or the act of God.<br>(b) Where the delay was the result of a cause not known to the carrier or its officers or agents in charge of such employee at the time the employee left the terminal and which could not have been foreseen.<br>(c) To the crews of wrecking or relief trains.<br>(d) To railroads not maintaining a regular night train schedule.<br>8. The public utilities commission of Nevada shall:<br>(a) Execute and enforce the provisions of this section, and all powers granted by law to the public utilities commission of Nevada are hereby extended to it in the execution of this section.<br>(b) Lodge with the proper district attorneys information of any violations of this section which may come to its knowledge. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 444.550-444.566 | Sanitation: *Labor Camps* | Programmatic/ Technical | Construction | Establishes sanitation standards for living and sleeping quarters, cooking and eating facilities, sanitary and laundry facilities, lighting, and permitting of operation of labor camps. | Phase II |
| NAC 445C.010-445C.120 | Environmental Requirements | Programmatic/ Technical | Construction, Operation, Maintenance | Establishes requirements for environmental audits by regulated persons and facilities. | Phase III |
| NAC 459.118-950 | Hazardous Materials: *Radiation Control* | Programmatic/ Technical | Construction or Operation | As stated in NAC 459.118, these regulations are not applicable because the transport and disposal of spent nuclear fuel or high-level radioactive waste are subject to regulation by the Nuclear Regulatory Commission. | Phase II |
| NAC 459.737 | Hazardous Materials: Radiation Safety Requirements for Use of Sealed Source for Industrial Radiography Adoption by reference of certain provisions of Code of Federal Regulations; revision of certain terms. (NRS 459.030) | Programmatic/ Technical | Construction, Operation Maintenance | "1. In addition to any applicable requirement of NAC 459.010 to 459.794, inclusive, a person registered with the Division to use a sealed source to engage in industrial radiography shall comply with all applicable requirements of, and may rely on all applicable exclusions or exemptions included in, the provisions of Part 34 of Title 10 of the Code of Federal Regulations, as adopted by reference in this section." | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 459.738 | Hazardous Materials: Radiation Safety Requirements for Use of Sealed Source for Industrial Radiography<br>Compliance with certain provisions of Code of Federal Regulations regarding program for inspecting and maintaining transport containers. (NRS 459.030) | Programmatic/ Technical | Construction, Operation Maintenance | A program for inspecting and maintaining transport containers that complies with the provisions of 10 CFR § 34.31(b), as those provisions existed on January 1, 2001, shall be deemed to comply with the applicable provisions of Part 71 of Title 10 of the Code of Federal Regulations, as those provisions existed on January 1, 2001. | Phase II |
| NAC 459.952-95528. | Hazardous Materials: *Regulation of Highly Hazardous Substances and Explosives* | Programmatic/ Technical | Construction and Operation | These regulations establish the planning, notification, permitting, and reporting requirements for highly hazardous substances and explosives that are produced, used, stored, handled, transported, or released.<br>Requires registration, development of Chemical Accident Prevention Program, and emergency management program for facilities (defined to include buildings, equipment, and contiguous areas) where listed hazardous substances, including explosives, solvents, and gasoline, are produced, used, stored, or handled. | Phase III |
| NAC 459.975-459.991 | Transportation Of Hazardous Materials On Public Highways | Programmatic/ Technical | Construction, Operation Maintenance | Establishes requirements for registration, permitting vehicle inspection, reporting of spills and incidents, reimbursement of expenses for responses to spills or accidents, and disciplinary action concerning transportation of hazardous materials. | Phase II |
| NAC 459.9912-459.9919 | Fees Established By State Emergency Response Commission | Programmatic/ Technical | Construction, Operation Maintenance | Establishes fees for regulatory activity or service, storage, and manufacture for transport of hazardous materials. | Phase II |
| NAC 459.975-459.991 | Transportation Of Hazardous Materials On Public Highways | Programmatic/ Technical | Construction, Operation Maintenance | Establishes requirements for registration, permitting vehicle inspection, reporting of spills and incidents, reimbursement of expenses for responses to spills or accidents, and disciplinary action concerning transportation of hazardous materials. | Phase II |
| NAC 459.9912-459.9919 | Fees Established By State Emergency Response Commission | Programmatic/ Technical | Construction, Operation Maintenance | Establishes fees for regulatory activity or service, storage, and manufacture for transport of hazardous materials. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 459.993 | Hazardous Materials<br>Federal regulations: Adoption by reference of certain provisions; compliance required | Programmatic/ Technical | Construction, Operation Maintenance | 1. The State Environmental Commission hereby adopts by reference the provisions of 40 CFR §§ 280.10 to 280.116, inclusive, as they existed on July 1, 1995. A copy of the volume containing these provisions may be obtained at a cost of $40 from the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402.<br>2. Each owner and operator of a storage tank shall comply with the requirements of 40 CFR §§ 280.10 to 280.116, inclusive.<br>3. For the purposes of this section, any reference to "implementing agency" in 40 CFR §§ 280.10 to 280.116, inclusive, shall be deemed to mean the Division." | Phase III |
| NAC 477.710 | State Fire Marshal:<br>Use Of Explosives In Blasting NAC Certificate required; qualifications of applicant; exemptions; renewal of certificate; fees. (NRS 477.030, 477.033) | Technical | Construction | "Except as provided in subsection 3, no person may use explosives in blasting operations for commercial construction unless he has a certificate of registration for blasting issued by the state fire marshal or is under the direct supervision of a person holding such a certificate. ..." | Phase II |
| NAC 503.093 | Hunting, Fishing And Trapping; Miscellaneous Protective Measures<br>*Classification and Taking of Wildlife* | Programmatic | Construction | A permit is required from the State of Nevada to hunt or take any wildlife that is classified as protected, or possess any part thereof. | Phase II |
| NAC 527.250 | Protection and Preservation of Timbered Lands, Trees, and Flora:<br>Activities requiring permit. (NRS 527.050, 527.300) | Programmatic | Construction Maintenance | Except as otherwise provided for state lands under the jurisdiction of the division of state parks of the department by NRS 527.050, a person must obtain a permit from the division and pay all fees, if any, required pursuant to NAC 527.270 before engaging in any activities that may:<br>1. Result in the removal or destruction of any plant on the list of fully protected species of native flora; or<br>2. Disturb any management area established for any such plant. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 527.270 | Protection and Preservation of Timbered Lands, Trees, and Flora:<br>Application: Requirements; fee; waiver of fee; assistance from division. (NRS 527.050, 527.300) | Programmatic | Construction Maintenance | 1. The state forester may issue a permit to a person, firm or other organization which authorizes the person, firm or other organization to conduct a project that may involve the taking of a plant on the list of fully protected species of native flora under such conditions as the state forester deems necessary or practicable, including, without limitation, an agreement for establishing a management area, only if the applicant submits a completed application on a form designated by the state forester that contains a detailed plan of the proposed project which satisfies the requirements set forth in NAC 527.280 and 527.290 or, if the project is to be conducted in whole or in part on public land, which satisfies the requirements of NAC 527.300, and specifies:<br>(a) The impact that will likely result from the taking;<br>(b) That such taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild;<br>(c) The best management practices and mitigation activities that will be used to avoid, minimize and mitigate the impacts from such a taking during the implementation of the proposed project; and<br>(d) That the applicant has funds sufficient to complete the proposed project plan and mitigation activities. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 527.270 | Protection and Preservation of Timbered Lands, Trees, and Flora: Application: Requirements NRS 527.050, 527.300) (cont'd) | Programmatic | Construction Maintenance | 2. An application must also include a certification by the applicant that:<br>(a) The applicant assumes complete responsibility for the proposed project plan, mitigation activities and any resulting impacts on plants on the list of fully protected species of native flora or the habitat of such plants;<br>(b) The information submitted on the application is complete and accurate to the best of the knowledge and belief of the applicant;<br>(c) The applicant understands that any false statement in the application may result in the suspension or revocation of a permit; and<br>(d) The applicant has read and is familiar with the provisions of chapter 527 of NRS and any regulations adopted pursuant thereto, and that violation of or noncompliance with applicable laws may subject the applicant to criminal penalties and revocation of a permit. | Phase II |
| NAC 527.270 | Protection and Preservation of Timbered Lands, Trees, and Flora: Application: fee; waiver of fee; assistance from division. (NRS 527.050, 527.300) (cont'd) | Programmatic | Construction Maintenance | 3. Except as otherwise provided in subsection 6, the fee for processing an application is $150 for each acre of the proposed project which contains any plant on the list of fully protected species of native flora or which constitutes the habitat of such a species.<br>4. Except as otherwise provided in subsection 6, the minimum fee for processing an application is $150.<br>5. The fee for processing an application is due when the application is approved and a permit is issued.<br>6. The state forester may, in his sole discretion, waive the fee for processing an application if a proposed project will be conducted:<br>(a) For the purpose of research;<br>(b) For a scientific purpose; or<br>(c) In the public interest.<br>7. Upon request, the division shall assist the applicant in assessment of the proposed project site and identification of necessary elements to be addressed in the application. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 527.290 | Protection and Preservation of Timbered Lands, Trees, and Flora: Project plan. (NRS 527.050, 527.300) | Programmatic | Construction Maintenance | 1. The project plan submitted with an application for a permit must contain:<br>(a) A topographic map of the area of the project and any off-site mitigation activities that identifies:<br>(1) The boundaries of the area of the proposed project;<br>(2) The ownership of the surface rights of the land within the project area;<br>(3) The plants on the list of fully protected species of native flora, designated by species, within the project area;<br>(4) The existing habitat of all plants, designated by species, on the list of fully protected species of native flora within the project area;<br>(5) All other vegetation by community;<br>(6) Existing soils to the extent the information is available;<br>(7) The areas to be affected by the project in sufficient detail so that the areas can be located from the ground; and<br>(8) The existing man-made features and disturbances, including, without limitation, surface facilities, wells, roads, drainage ways, fill material and fencing. | Phase II |
| NAC 527.290 | Protection and Preservation of Timbered Lands, Trees, and Flora: Project plan. (NRS 527.050, 527.300) (cont'd) | Programmatic | Construction Maintenance | 1. The project plan submitted with an application for a permit must contain: ...<br>(b) An estimate of the number of acres or square feet of plants on the list of fully protected species of native flora and the habitat of such plants that are affected by each type of man-made feature and disturbance.<br>(c) A statement describing the predisturbance and postdisturbance use of the land within the project area.<br>(d) A statement describing the best management practices and measures that will be used to minimize soil erosion and negative impacts to the surface and air during implementation of the proposed project plan and mitigation activities. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 527.290 | Protection and Preservation of Timbered Lands, Trees, and Flora: Project plan. (NRS 527.050, 527.300) (cont'd) | Programmatic | Construction Maintenance | 1. The project plan submitted with an application for a permit must contain: ...<br>(e) A plan for mitigation activities that includes, without limitation: ...<br>(6) The specific mitigation activities proposed to mitigate and minimize the taking of a plant on the list of fully protected species of native flora, including, without limitation:<br>(I)A plan for the management of topsoil and growth medium.<br>(II)A plan for transplantation or regeneration, including, without limitation, details concerning methodologies, locations, schedules, monitoring and reporting.<br>(III)A plan for site protection, including, without limitation, signs and fencing.<br>(IV)A plan for educating employees, contractors and subcontractors.<br>(V)The research and monitoring activities that will be conducted.<br>(VI) Other strategies to be employed, including, without limitation, a conservation easement, a land exchange or an agreement with the state forester for a management area. | Phase II |
| NAC 586.018 | Pesticides: *Restricted-use pesticides* | Programmatic/ Technical | Operations | If pest control requires the use of a "restricted use pesticide," DOE must either obtain the services of a certified applicator or use a person under the direct supervision of a certified applicator who holds the appropriate certification to use the restricted-use pesticide. | Phase III |
| NAC 705.080 | Railroads: Open-top cars: Excessive height or width | Technical | Operations | Sets requirements for operation of cars with excessive height or width. | Phase III |
| NAC 705.090 | Railroads: Exemption for cars of excessive width; placarding required | Technical | Operations | Sets requirements for placarding exempted rail cars in Nevada. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NAC 705.140 | Railroads:<br>Material for construction or operation of system | Technical | Construction/ Operations/ Maintenance | "Nothing in this chapter prevents the movement of material which is necessary in the construction or operation of the railroad system over railroad tracks which are not used or proposed to be used for transporting freight cars, nor in the movement of special work equipment used in the construction or operation of that system, if the operation is carried on in a safe manner." | Phase III |
| NAC 705.200 | Railroads:<br>Emergency first-aid kit | Technical | Operations | Prescribes the contents of the first aid kit required by NRS 705.370. | Phase III |
| NAC 705.210 | Railroads:<br>Drinking water | Technical | Operations | Prescribes requirements for drinking water. | Phase III |
| NAC 705.220 | Railroads:<br>Drinking water | Technical | Operations | Prescribes requirements for wash basins in the locomotive and caboose. | Phase III |
| NAC 705.230 | Railroads:<br>Toilet facilities | Technical | Operations | Prescribes the requirements for toilet facilities in the locomotive and caboose. | Phase III |
| NAC 705.321 | Railroads:<br>Reporting requirements; exemption | Programmatic | Operations | Prescribes incident reporting requirements pursuant to 49 CFR § 171.16. | Phase III |
| NRS 533.325-435 | Adjudication of Vested Water Rights; Appropriation of Public Waters<br>*Appropriation Of Public Waters* | Programmatic/ Technical | Construction | A permit must be obtained from the Nevada State Engineer to appropriate public waters and to change the point of diversion, manner of use, or place of use of water already appropriated. | Phase II |
| NRS 705.010 | Railroads and Monorails:<br>Foreign Corporations; Construction and operation of railroad by foreign corporation; qualification to do business | Programmatic | Construction and Operation | 1. Subject to the provisions of subsection 2, any railroad corporation organized under the laws of any other state or territory, or under any Act of Congress, may construct, own and operate a line of railroad and extensions and branches thereof in this state, and for that purpose may exercise the power of eminent domain, and do any other business in connection therewith, as fully and effectually, to all intents and purposes, as if such corporation were organized under the laws of this state.<br>2. Before any corporation, incorporated or organized otherwise than under the laws of this state, shall acquire or construct any railroad in this state by virtue of this section, it shall comply with the provisions of chapter 80 ["Foreign Corporations"] of NRS. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.020 | Railroads and Monorails: County, city or town may grant use of street by railroad to reach depot or pass through; limitations | Programmatic/ Technical | Construction | Routing of the rail line through a city or town jurisdiction is possible with the Caliente Option and possible near Panaca, dependent upon the stretch of the town limits. | Phase II |
| NRS 705.030 through 705.070 | Railroads and Monorails: Conditional Sale of Equipment | Programmatic | Operation | Provides statutes governing the sale of railroad equipment and rolling stock. | Phase III |
| NRS 705.090 through 705.110 | Railroads and Monorails: Transportation of Livestock | Programmatic | Operations | In a shared use scenario transportation of livestock is possible. | Phase III |
| NRS 705.140 | Railroads and Monorails: Penalty for allowing animal to stray on enclosed right of way | Programmatic | Operation | Penalty for allowing animal to stray on enclosed right of way. Every person who shall willfully and maliciously suffer any animal to go upon the enclosed right of way of any railway company, or leave open any gate or bars so that an animal might stray upon such right of way, shall be guilty of a misdemeanor. | Phase III |
| NRS 705.150 | Liability for negligent killing or injuring livestock; prima facie evidence of negligence | Programmatic | Operation | Every railroad corporation or company, operating any railroad or branch thereof within the limits of this state, which negligently injures or kills any animal of the equine, bovine, ovine or porcine species, or the goat kind, by running any engine or engines, car or cars, over or against any such animal shall be liable to the owner of such animal for the damages sustained by such owner by reason thereof, unless it be shown on the trial of any action instituted for the recovery of such damages as provided in NRS 705.160 that the owner of such animal or animals immediately contributed to such killing or injury; provided:<br>1. That the mere straying of such animal or animals upon or along the railroad track or tracks concerned shall not be held upon such trial to be any evidence of contributory negligence on the part of the owner of such animal or animals, nor shall the grazing of the same unattended by a herder be so considered; and<br>2. That the killing or injury in such actions shall be prima facie evidence of negligence on the part of such railroad corporation or company. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.160 | Railroads and Monorails: Settlement of Claim within 90 days; assignment of claim | Programmatic | Operation | 1. If any railway company or corporation, or owner or operator of a railroad in this state, fails, within 90 days after receipt of the same, to effect settlement of claims received for damages arising from the injury or killing of livestock upon its track or right of way by the running of engines or cars over or against such animals in this state as provided in NRS 705.150 to 705.200, inclusive, then the owner of such injured or killed animals may sue and recover damages for such injury or killing from any such railway company or corporation or the owner or operator of such railroad in any court of competent jurisdiction in the county in which such animal or animals was or were killed or injured, together with 7 percent interest per annum on the value of the animal or animals so injured or killed as established in such action, from the date such animal or animals was or were killed or injured until paid. | Phase III |
| NRS 705.160 | Railroads and Monorails: Settlement of Claim within 90 days; assignment of claim (cont'd) | Programmatic | Operation | 2. Any person having a claim arising under the provisions of NRS 705.150 to 705.200, inclusive, may assign the same in writing to any other claimant or person for value, or for the purpose of suit, who shall thereupon have all the rights and remedies of the assignor. | Phase III |
| NRS 705.160 | Railroads and Monorails: Settlement of Claim within 90 days; assignment of claim (cont'd) | Programmatic | Operation | 3. In case it becomes necessary on the part of the owner or owners to establish a claim for any animal or animals so killed or injured in any such action, he shall have the right to establish the actual and market value of such animal or animals or the actual damage so sustained. | Phase III |
| NRS 705.180 | Railroads and Monorails: Employee to report killing or injuring of livestock | Programmatic | Operation | Every conductor, engineer, section foreman, or other employee of any owner of a railroad in this state, who has personal knowledge of the injury or killing of any livestock of any description by the running of any engine or engines, car or cars over or against any such livestock on the track or tracks or right of way of such railroad shall immediately report the same by notice in writing to the general superintendent or division superintendent of the railroad by which he is employed, unless he has personal knowledge that such notice as herein provided for has already been given by some other employee of such railroad. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.190 | Railroads and Monorails: Owner or operator of railroad to provide notice upon injuring or killing livestock; notice to be posted at stations and forwarded to state department of agriculture; contents of notice | Programmatic | Operation | 1. Every owner or operator of a railroad in this state who injures or kills any livestock of any description by running an engine or car over or against the livestock shall:<br>(a) Within 5 days thereafter post for at least 30 days, at the first railroad station in each direction from the place of the injury or killing, notices in writing in a conspicuous place on the outside of the stations; and<br>(b) Within 10 days after injuring or killing the livestock, forward by registered or certified mail a duplicate of each notice to the state department of agriculture.<br>2. The notice must:<br>(a) Contain the number and kind of the animals injured or killed, with a full description of the animals, including brands and marks and sex.<br>(b) Give the time and place, as near as possible, of the injury or killing.<br>(c) Be dated and signed by an officer or agent of the owner or operator of the railroad concerned. | Phase III |
| NRS 705.200 | Railroads and Monorails: Penalties | Programmatic | Operation | 1. Any person falsely making an affidavit of ownership of any animal killed or injured under the terms of NRS 705.150 to 705.200, inclusive, is guilty of a gross misdemeanor.<br>2. Every person described in NRS 705.180 who fails or neglects to comply with the provisions of NRS 705.180 is guilty of a misdemeanor.<br>3. Every corporation, company, receiver, association or person who fails, neglects or refuses to comply with the provisions of NRS 705.190 is guilty of a misdemeanor.<br>4. Any person who attempts in any manner to conceal the evidence of the killing or injury of any animal or animals described in NRS 705.150 by any railroad train, engine or cars on any railroad in this state, or who in any way destroys or covers up the evidence that may lead to the identification of any animal or animals so killed or injured, is guilty of a misdemeanor. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.220 | Railroads and Monorails: Railroad police: Appointment; responsibility for actions; wearing of badge | Programmatic | Operation | 1. The governor may, upon the application of any railroad company, appoint and commission one or more persons, designated by the company, to serve as railroad policemen. The persons so appointed must serve at the sole expense of the company. The company designating such persons is responsible civilly for any abuse of their authority.<br>2. Every such policeman shall, when on duty, wear in plain view a star bearing the words "Railroad Police," and the name of the company for which he is commissioned. | Phase III |
| NRS 705.230 | Railroads and Monorails: Unlawful compulsion or requirement of purchase of uniform or apparel as condition of continued employment; penalty | Programmatic | Operation | 1. It shall be unlawful for any railroad doing business in the State of Nevada, or any officer, agent or servant of such railroad, to require any conductor, engineer, brakeman, fireman or any other employee, as a condition of his continued employment, or otherwise to require or compel or attempt to require or compel any such employee to purchase of any such railroad, or of any particular person, firm or corporation, or at any particular place or places, any uniform or other clothing or apparel, required by any such railroad to be used by any such employee in the performance of his duty. Any such railroad, or any officer, agent or servant thereof, who shall order or require any conductor, engineer, brakeman, fireman, or any other person in its employ to purchase any uniform or other clothing or apparel as aforesaid shall be deemed to have required such purchase as a condition of such employee's continued employment.<br>2. Any railroad doing business in the State of Nevada, or any officer, agent or servant thereof, violating any of the provisions of this section shall be guilty of a misdemeanor. | Phase III |
| NRS 705.240 | Railroads and Monorails: Engineer required to be able to read timetables and ordinary handwriting; penalty | Programmatic | Operation | 1. It shall be unlawful for any person, as an officer of a corporation or otherwise, knowingly to employ an engineer or engine driver to run a locomotive or train on any railway if such engineer or engine driver cannot read timetables and ordinary handwriting.<br>2. It shall be unlawful for any person who cannot read timetables and ordinary handwriting to act as an engineer or run a locomotive or train on any railway.<br>3. Any person who violates any provision of this section shall be guilty of a gross misdemeanor. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.250 | Railroads and Monorails: Intoxication and other violations of duties; penalties | Programmatic | Operation | 1. Any person employed upon any railway as engineer, motorman, gripman, conductor, switch tender, fireman, bridge tender, flagman or signalman, or having charge of stations, starting, regulating or running trains upon a railway, who shall be intoxicated while engaged in the discharge of any such duties, shall be guilty of a gross misdemeanor.<br>2. Every engineer, motorman, gripman, conductor, brakeman, switch tender, train dispatcher or other officer, agent or servant of any railway company, who shall be guilty of any willful violation or omission of his duty as such officer, agent or servant, by which human life or safety shall be endangered, for which no punishment is specially prescribed, shall be guilty of a misdemeanor. | Phase III |
| NRS 705.360 | Railroads and Monorails: Headlights on locomotive; penalty | Programmatic/ Technical | Procurement Design/ Operation | 1. Every company, corporation lessee, manager or receiver, owning or operating a railroad in this state, shall equip, maintain, use and display at night upon each locomotive being operated in road service in this state an electric or other headlight of at least 1,500 candle power, measured without the aid of a reflector. Any electric headlight which will pick up and distinguish a man dressed in dark clothes upon a dark, clear night at a distance of 1,000 feet is deemed the equivalent of a 1,500 candle power headlight measured without the aid of a reflector.<br>2. This section does not apply to:<br>(a) Locomotive engines regularly used in switching cars or trains.<br>(b) Railroads not maintaining regular night train schedules.<br>(c) Locomotives going to or returning from repair shops when ordered in for repairs.<br>3. Any railroad company, or the receiver or lessee thereof, which violates the provisions of this section is liable to the public utilities commission of Nevada for a penalty of not more than $1,000 for each violation. | Phase II |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.370 | Railroads and Monorails: Emergency first-aid kits: Contents prescribed by commission; reports when used or missing; penalties | Programmatic | Operation | 1. Each railroad company or corporation or its receiver, owning or operating any railroad within this state, shall equip and maintain in each of its passenger trains, cabooses, locomotives, motors or diesel engines used in the propelling of trains or switching of cars an emergency first-aid kit whose contents must be those prescribed by the public utilities commission of Nevada. Each passenger train and each caboose must be equipped with at least one stretcher. All of the contents of the emergency first-aid kits, except the stretchers, must be stored on each passenger train, caboose, locomotive, motor or diesel engine, in a clean, sanitary and sterile container and in an accessible place at all times, which places, including the storage places of stretchers, must be plainly designated.<br>2. The employee of any railroad company or corporation or its receiver, having charge of any passenger train, caboose, locomotive, motor or diesel engine, shall as soon as possible report in writing to the office or officer designated by the company, corporation or receiver for the purpose, whenever any of the emergency first-aid kit has been used or has been found missing. The emergency first-aid kit must only be used to render first medical or surgical aid to injured passengers, employees or other injured persons requiring first aid.<br>3. Any railroad company or corporation or its receiver, which refuses, neglects or fails to comply with the provisions of this section is liable for a penalty to the public utilities commission of Nevada of $25 for each failure to equip a passenger train, caboose, locomotive or motor or diesel engine with the emergency first-aid kit specified in subsection 1.<br>4. Any person who removes, carries away from its proper place or uses any emergency first-aid kit provided in this section, except for the purpose of administering first aid in the event of injury to any passenger, employee or other person shall be fined not more than $500. | Phase III |

Table D-2. State of Nevada Statute and Code Regulations – Construction, Operations and Maintenance Affecting (Continued)

| Source | Source Title | Category | Function | Summary of Source Text | Phase |
|---|---|---|---|---|---|
| NRS 705.380 | Railroads and Monorails: Windshield made of safety glass, electric head lamps, wiper and other equipment required on motor car used for transporting employees; penalty | Technical/ Programmatic | Procurement Design/ Operation | 1. It shall be unlawful for any owner or operator of a railroad running through or within the boundaries of the State of Nevada and engaged in the business of common carrier to operate for or transport its employees in a motorcar which is not equipped with a transparent safety glass windshield sufficient in width and height reasonably to protect such employees. Such car shall also be equipped with an electric head lamp of sufficient candle power as to make any obstruction, landmark, warning sign or grade crossing on such railroad visible at a distance of 300 feet in advance of such car under ordinary atmospheric conditions. Such car shall also be equipped with two electric lights on the rear end thereof with sufficient candle power as to be visible at a distance of 300 feet under ordinary atmospheric conditions. Such car shall also be equipped with a suitable device that will remove rain, snow and sleet from the windshield while the car is moving, and the windshield shall be so devised that the driver or operator of the car can start or stop the windshield wiper while he is driving the car.<br>2. Any owner or operator of a railroad running through or within this state as a common carrier of persons or property or both, for compensation, who either operates for its employees, or who furnishes to its employees, for their transportation to or from the place or places where they are required to labor, a rail track motorcar that has not been fully equipped as required by subsection 1 shall be fined not more than $500 for each offense. Each day or part of a day it operates or furnishes each of such rail track motorcars not so equipped as provided in subsection 1 to its employees for operation to or from the place or places where they are required to work shall constitute a separate offense. | Phase II |
| NRS 705.430 | Railroads and Monorails: Penalty for unlawful failure to ring bell or sound whistle at crossing | Programmatic | Operation | Every engineer driving a locomotive on any railway who shall fail to ring the bell or sound the whistle upon such locomotive, or cause the same to be rung or sounded, at least 80 rods from any place where such railway crosses a traveled road or street, where such road or street is customarily used by the public for the purpose of travel (except in cities where other regulations are required), or to continue the ringing of such bell or sounding of such whistle until such locomotive shall have crossed such road or street, shall be guilty of a misdemeanor. | Phase III |

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# APPENDIX E

# DOE DIRECTIVE (CONTRACTUAL) REQUIREMENTS

The following table contains requirements from DOE directive (contractual) requirements that apply to conceptual design of the Nevada Rail System. Requirements from Section 7 are identified in this table and the applicable DOE order is identified. Requirements applicable to other than Phase I, Conceptual Design and EIS support" have been In Table E-2 to aid in the preparation of a Concept of Operation and Maintenance for NVT.

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.A* | *Technical Standards. Appropriate voluntary consensus standards (codes and standards), consistent with PL 104-113 and OMB A-119, should be selected, used, and adhered to for the design, testing, etc., of the NRL in the absence of specified standards.* | Programmatic | Design/ Construction/ Testing/ Operation/ Maintenance | DOE O 252.1 | Technical Standards Program | Requires the contractor to:<br>(1) Select, use, and adhere to appropriate voluntary consensus standards (VCSs), consistent with PL 104-113 and OMB A-119 (i.e., use suitable existing VCSs in lieu of developing new DOE Technical Standards), when choosing technical standards to support assigned DOE missions and functions, including the design, construction, testing, modification, operation, decommissioning, decontamination, and remediation of DOE's facilities and activities. | Phase I |
| | | Technical | Construction | TSRD 3.2.2. C.5. | Design Criteria-Systems and Equipment | The workmanship criteria shall reflect the currently applicable codes, standards, and engineering principles and practices... | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.B* | *Project Management. Nevada Transportation shall support the development of documentation for the Critical Decision process in DOE O 413.3. Documents that are required to be developed to support Critical Decision-2 typically include*<br>• *Design documentation*<br>• *Contractor Project Management System*<br>• *Final Project Execution Plan*<br>• *Final Project Performance Baseline*<br>• *NEPA documentation*<br>• *Independent Cost Estimate*<br>• *Project Data Sheet for construction*<br>• *Draft Preliminary Safety Analysis Report*<br>• *External Independent Review of the Performance Baseline*<br>*DOE will determine the list of documents and their contents as Nevada Transportation progresses through Phase I.* | Programmatic | Design/ Construction/ Testing/ Operation/ Maintenance | DOE O 413.3, Project Management for the Acquisition of Capital Assets Contractor Requirements Document | Attachment 4 Project Acquisition Process and Critical Decisions | Critical Decision-2 Prerequisites<br>• Preliminary Design<br>• Review of contractor project management system<br>• Final Project Execution Plan and performance baseline<br>• Independent cost estimate<br>• National Environmental Policy Act documentation<br>• Project Data Sheet for construction<br>• Draft Preliminary Safety Analysis Report<br>• Performance Baseline External Independent Review | Phase I |
| | | Programmatic | Design/ Construction | TSRD 3.2.9.A | Program and Project Management | A. The acquisition of capital assets shall be managed as specified in DOE Order 413.3. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.C* | *Sustainable Design. The siting, design, and construction of NRL facilities shall apply sustainable design principles.* | Technical | Design/ Construction | DOE O 413.3 Contractor Requirements Document | Program and Project Management for the Acquisition of Capital Assets, Section 13 | 13. Sustainable building design principles must be applied to the siting, design, and construction of new facilities. | Phase I |
| | | Technical | Design/ Construction | DOE O 430.2A Contractor Requirements Document | Departmental Energy and Utilities Management, Section 2.d.5 | 2. Energy Management Plan<br>d. The energy management plan must exhibit and explain the application of the following requirements:<br>(5) Application of sustainable design principles to new buildings and building alterations. Compliance with 10 CFR 434, Energy Conservation Voluntary Performance Standards for New Buildings; Mandatory for Federal buildings, from conceptual design through commissioning. | Phase I |
| | | Technical | Design | DOE O 430.2A Attachment 3 | Energy Efficiency/ Sustainable Design | This attachment is used to implement sustainable design principles. | Phase I |
| NVTRD 7.D | Value Engineering. The design of the NRL and its facilities shall use a value engineering process that identifies high-cost project activities to realize a maximum return on investment through the use of system engineering tradeoffs and functional analyses that identify alternative means of achieving the same function at a lower life-cycle cost | Programmatic | Design/ Construction/ Testing/ Operation/ Maintenance | DOE O 413.3 Contractor Requirements Document | Project Management for the Acquisition of Capital Assets | 10. A value engineering process must be used that identifies high-cost project activities to realize a maximum return on investment through the use of systems engineering trade-offs and functional analyses that identify alternate means of achieving the same function at a lower life-cycle cost. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/O peration/ Maintenance | DOE O 430.1A, Contractor Requirements Document | Life Cycle Asset Management Section 1.a | 1 The Contractor shall use a process for physical asset acquisition that is an integrated systematic approach that shall ensure, but shall not be limited to, the following:<br>a. Use of a process tool, such as value engineering, to improve efficiency and cost-effectiveness when analyzing physical asset acquisition. | Phase I |
| | | Programmatic | Design/ Construction/O peration/ Maintenance | TSRD 3.2.9.D | Program and Project Management | D. Transportation shall adopt initiatives and practices (e.g., value engineering) that ensure cost reduction and savings during its planning, design, construction, and operational phases consistent with DOE Order 413.1, Management Control Program. Transportation shall participate in annual management reviews of cost reduction goals, including science and technology initiatives. In addition, Transportation shall conduct periodic independent cost estimating reviews to assess the effectiveness of cost reduction goals and develop approaches to integrate science, technology, and operational advancements into cost savings. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| NVTRD 7.E | Quality Assurance Requirements. A NVT QAP shall be developed and implemented for the NVT scope of work in compliance with DOE O 414.1B, Quality Assurance. The NVT QAP shall assign responsibilities and authority for quality, define policy and requirements, and provide appropriate controls for the performance and assessment of work commensurate with the degree of risk | Programmatic | Design/ Construction/ Operation/ Maintenance | DOE O 414.1B Contractor Requirements Document | General Quality Requirements Section 2.a.1 | a. Quality Assurance Program Development and Implementation. A contractor must assign and identify a senior management position responsible for the development, implementation, assessment, and improvement of a QAP that-<br>(1) Implements QA criteria as defined in paragraph 3 of this Contractor Requirements Document and suspect/counterfeit items (S/CI) prevention requirements as defined in paragraph 4 using a graded approach and describing how QA criteria and graded approach are applied. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | General Quality Requirements Section 2.a.2 | (2) Uses the appropriate voluntary national or international consensus standard where practicable and consistent with contractual or regulatory requirements. And identifies the standard used. Appropriate standards include the following:<br>(b) ANSI/ISO/ASQ Q 9001-2000, *Quality Management System Requirements* (for non-nuclear activities) | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | General Quality Requirements Section 2.a.3 | (3) Applies additional standards, where practicable and consistent with contractual or regulatory requirements and as necessary to address unique/specific work activities (e.g., development and use of safety software or establishing the competence of a testing and calibration laboratory). | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | General Quality Requirements Sections 2.a.4 (a) & (b) | (4) Integrates quality or management system requirements as defined in this Contract Requirements Document with DOE directives and similar external requirements. Similar requirements include the following.<br>(a) DOE P 450.4, Safety Management System Policy, dated 10-15-96;<br>(b) DOE P 450.5, Line Environment, Safety and Health Oversight, dated 06-26-97. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document, | General Quality Requirements Section 2.b.1, 2.b.2, 2.b.3 & 2.b.5 | b. Quality Assurance Program Approvals and Changes. The contractor must-<br>(1) Submit a QAP to DOE for approval before beginning work under a DOE contract.<br>(2) Implement the QAP as approved and modified by DOE<br>(3) Indicate in the submittal any third-party certification affecting the QAP.<br>(5) Regard a QAP as approved by DOE 90 days after DOE receipt, unless approved or rejected by DOE at an earlier date, and include any modification made or directed by DOE | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document, | General Quality Requirements Section 2.c | c. Quality Guidance Usage. The contractor must consider QA guidance in developing and implementing a QAP. Use the following guidance documents:<br>(1) DOE G 414.1-2<br>(2) DOE G 414.1-1A<br>(3) DOE G 440.1-6 | |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria Section 3.a | 3. Quality Assurance Criteria. The QAP must address the following management, performance, and assessment criteria.<br>a. Management/Criterion 1 - Program<br>(1) Establish an organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing work.<br>(2) Establish management processes, including planning, scheduling, and providing resources for work. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria Section 3.b | b. Management/Criterion 2 – Personnel Training and Qualification.<br>(1) Train and qualify personnel to be capable of performing assigned work.<br>(2) Provide continuing training to personnel to maintain job proficiency. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.c | c. Management/Criterion3 – Quality Improvement.<br>(1) Establish and implement processes to detect and prevent quality problems.<br>(2) Identify, control and correct items, services, and processes that do not meet established requirements.<br>(3) Identify the causes of problems and include prevention of recurrence as a part of corrective action planning.<br>(4) Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.d | d. Management/Criterion 4 – Documents and Records.<br>(1) Prepare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements, or establish design.<br>(2) Specify, prepare, review, approve, and maintain records. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.e | e. Performance/Criterion 5 – Work Processes.<br>(1) Perform work consistent with technical standards, administrative controls, and hazard controls adopted to meet regulatory or contract requirements using approved instructions, procedures, etc.<br>(2) Identify and control items to ensure proper use.<br>(3) Maintain items to prevent damage, loss, or deterioration.<br>(4) Calibrate and maintain equipment used for process monitoring or data collection. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.f | f. Performance/Criterion 6 – Design.<br>(1) Design items and processes using sound engineering/scientific principles and appropriate standards<br>(2) Incorporate applicable requirements and design bases in design work and design changes.<br>(3) Identify and control design interfaces.<br>(4) Verify/validate the adequacy of design products through individuals or groups other than those who performed the work.<br>(5) Verify/validate work before approval and implementation of a design. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.g | g. Performance/Criterion 7 – Procurement.<br>(1) Procure items and services that meet established requirements and perform as specified.<br>(2) Evaluate and select prospective suppliers on the basis of specified criteria.<br>(3) Establish and implement processes to ensure that approved suppliers continue to provide acceptable items and services. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.h | h. Performance/Criterion 8 – Inspection and Acceptance Testing.<br>(1) Inspect and test specified items, services, and processes using established acceptance and performance criteria.<br>(2) Calibrate and maintain equipment used for inspections and tests. | Phase I |
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.i | i. Assessment/Criterion 9 – Management Assessment.<br>Ensure that managers assess their management processes and identify and correct problems that hinder the organization from achieving its objectives. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic | Design/ Construction/ Operations/ Maintenance | DOE O 414.1B, Contractor Requirements Document | Quality Assurance Criteria, Section 3.j | j. Assessment/Criterion 10 – Independent Assessment.<br>(1) Plan and conduct independent assessments to measure item and service quality, to measure the adequacy of work performance, and to promote improvement.<br>(2) Establish sufficient authority and freedom from line management for independent assessment teams.<br>(3) Ensure that persons conducting independent assessments are technically qualified and knowledgeable in the areas to be assessed. | Phase I |
| | | Programmatic | Design/ Construction/ Testing/ Operation/ Maintenance | DOE O 413.3 Contractor Requirements Document | Project Management for the Acquisition of Capital Assets | 11. A QAP must be developed and implemented for the contract scope of work in compliance with DOE O 414.1A, QUALITY ASSURANCE, at the beginning of the project and maintained over the project life. This program must assign responsibilities and authority for quality, define policy and requirements, and provide for the performance and assessment of work. | Phase I |
| | | Programmatic | Design/ Construction/ Testing/ Operation/ Maintenance | TSRD 3.2.8 | Quality Assurance | A QAP shall be developed and maintained to ensure delivered products and services meet prescribed requirements. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| NVTRD 7.F | Configuration Management. A configuration management process must be established that controls changes to the physical configuration of NVT facilities, structures, systems, and components in compliance with ANSI/AIA-649, National Consensus Standard for Configuration Management. This process must also ensure that the configuration is in agreement with the performance objectives in the technical baseline | Technical | Design/ Construction/ Operation | DOE O 413.3 Contractor Requirements Document | Project Management for the Acquisition of Capital Assets Section 9 | 9. A configuration management process must be established that controls changes to the physical configuration of NVT facilities, structures, systems, and components in compliance with ANSI/AIA-649, National Consensus Standard for Configuration Management. This process must also ensure that the configuration is in agreement with the performance objectives in the technical baseline | Phase I |
| NVTRD 7.G | Natural Phenomena Hazard Mitigation. Where no specific requirements are specified concerning natural phenomena hazard mitigation in DOE O 420.1A, model building codes or national consensus industry standards shall be used in the design of NRL facilities. | Technical | Design/ Construction/ Operation | DOE O 420.1A Facility Safety Contractor Requirements Document | Section 4.4, Natural Phenomena Hazards Mitigation for DOE Facilities | The contractor is required to design, construct, and/or operate the facility as specified in the contract so that the general public, the workers, and the environment are protected from the impact of all Natural Phenomena Hazards (NPHs). Where no specific requirements are specified, model building codes or national consensus industry standards shall be used. | Phase I |
| | | Technical | Design/ Construction/ Operation | TSRD 3.2.2.B.3 | Design Criteria - Facilities | Transportation facilities shall be designed and constructed to withstand the effects of natural phenomena hazards, and to reflect appropriate combinations of the most severe of the natural phenomena reported for the area, and normal and accident conditions. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.H* | *Natural Phenomena Hazard Design Requirements. NRL facilities shall be designed to withstand the effects of natural phenomena as necessary to ensure the confinement of hazardous materials, the operation of essential facilities, the protection of government property, and the protection of life safety for occupants of buildings. The design shall consider the potential damage and failure due to both direct and indirect natural phenomena effects, including common cause effects and interactions from failures from other structures systems or components.* | Technical | Design/ Construction | DOE O 420.1A, Contractor Requirements Document | Section 4.4.2, Natural Phenomena Mitigation Design Requirements | The contractor shall:<br>1. Design, construct, and/or operate, the facility as specified in the contract so that SSCs will withstand the effects of natural phenomena as necessary to ensure the confinement of hazardous material, the operation of essential facilities, the protection of government property, and the protection of life safety for occupants of DOE buildings.<br>2. Consider potential damage and failure of SSCs due to both direct and indirect natural phenomena effects, including common cause effects and interactions from failures of other SSCs. | Phase I |
| | | Technical | Design/ Construction/ Operation | TSRD 3.2.2.B.3 | Design Criteria - Facilities | Transportation facilities shall be designed and constructed to withstand the effects of natural phenomena hazards, and to reflect appropriate combinations of the most severe of the natural phenomena reported for the area, and normal and accident conditions. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.I* | *Facility Seismic Design Requirements. The design of facilities for the NRL shall address the requirements of Executive Order 12699, "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction," as applicable.* | Technical | Design | DOE O 420.1A Facility Safety Contractor Requirements Document | Section 4.4.2, Natural Phenomena Hazards Mitigation Design Requirements | The contractor shall:<br>1. Design, construct, and/or operate, the facility as specified in the contract so that SSCs will withstand the effects of natural phenomena as necessary to ensure the confinement of hazardous material, the operation of essential facilities, the protection of government property, and the protection of life safety for occupants of DOE buildings.<br>2. Consider potential damage and failure of SSCs due to both direct and indirect natural phenomena effects, including common cause effects and interactions from failures of other SSCs.<br>3. Address seismic requirements of Executive Order 12699. | Phase I |
| | | Technical | Design/ Construction/ Operation | TSRD 3.2.2.B.3 | Design Criteria - Facilities | Transportation facilities shall be designed and constructed to withstand the effects of natural phenomena hazards, and to reflect appropriate combinations of the most severe of the natural phenomena reported for the area, and normal and accident conditions. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.J* | *Natural Phenomena Hazards Assessment. The hazards mitigations used in the design and site planning of facilities for the NRL shall be based on a hazards assessment conducted in accordance with DOE O 420.1A, using a graded approach considering the consequences of all types of natural phenomena hazard.* | Technical | Design | DOE O 420.1A Facility Safety Contractor Requirements Document | Section 4.4.4, Natural Phenomena Hazards Assessment | The contractor/operator shall:<br>Base the design and evaluation of facilities to withstand natural phenomena on an assessment of the likelihood of future natural phenomena occurrences. The natural phenomena hazards assessment shall be conducted commensurate with a graded approach and commensurate with the potential hazard of the facility.<br>For new sites, the contractor/operator shall:<br>1. Conduct a natural phenomena hazards assessment commensurate with a graded approach to the facility.<br>2. Consider the consequences of all types of natural phenomena hazards in site planning. | Phase I |
| | | Technical | Design/ Construction/ Operation | TSRD 3.2.2.B.3 | Design Criteria - Facilities | Transportation facilities shall be designed and constructed to withstand the effects of natural phenomena hazards, and to reflect appropriate combinations of the most severe of the natural phenomena reported for the area, and normal and accident conditions. | Phase I |
| *NVTRD 7.K* | *Seismic Detection. Facilities for the NRL with hazardous materials shall provide instrumentation or other means to detect and record occurrence and severity of seismic events.* | Technical | Design | DOE O 420.1A Facility Safety Contractor Requirements Document | Section 4.4.5, Natural Phenomena Detection | For facilities or sites with hazardous materials, the contractor/operator shall provide instrumentation or other means to detect and record the occurrence and severity of seismic events. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Technical | Design/ Construction/ Operation | TSRD 3.2.2.B.3 | Design Criteria - Facilities | Transportation facilities shall be designed and constructed to withstand the effects of natural phenomena hazards, and to reflect appropriate combinations of the most severe of the natural phenomena reported for the area, and normal and accident conditions. | Phase I |
| *NVTRD 7.L* | *Building Codes. The appropriate state, regional, or National building codes shall be specified for NRL design and construction.* | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 430.1A Contractor Requirements Document | Life-Cycle Asset Management Contractors Requirements Document | 1.The Contractor shall use a process for physical asset acquisition that is an integrated, systematic approach that shall ensure, but shall not be limited to, the following:<br>b. Specification of the appropriate state, regional, or national building codes to which physical assets shall be designed and constructed. | Phase I |
| *NVTRD 7.M* | *Asset Life-Cycle Considerations. The design and acquisitions of the NRL shall consider maintainability, operability, disposition, life-cycle costs, and configuration integrity.* | Programmatic | Design/ Operation/ Maintenance | DOE O 430.1A Contractor Requirements Document | Life-Cycle Asset Management Contractors Requirements Document | 1. The Contractor shall use a process for physical asset acquisition that is an integrated, systematic approach that shall ensure, but shall not be limited to, the following:<br>c. Consideration of maintainability, operability, disposition, life-cycle costs, and configuration integrity in designs and acquisitions. | Phase I |
| NVTRD 7.N | Energy Management. Designs for the NRL shall be consistent with the energy management plan required by DOE O 430.2A, Departmental Energy and Utilities Management, which must exhibit and explain the application of: | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.a Energy Management Plan | 2. Energy Management Plan.<br>a. The energy management plan must contain short-range (year 2005) and long-range (year 2010) goals commensurate with DOE's energy efficiency leadership goals. | Phase III |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.b Energy Management Plan | b. The energy management plan must contain an emergency conservation component to mitigate the effects of a sudden disruption in the supply of fuel oil, natural gas, electricity, and other critical energy supplies. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.c Energy Management Plan | c. The energy management plan must be updated annually to contain priority actions scheduled for implementation over the next 2 years. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d Energy Management Plan | d. The energy management plan must exhibit and explain the application of the following requirements.<br>(1) Continuous life cycle cost-effective improvement on an annual basis toward reducing— | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.1.a Energy Management Plan | (a) Greenhouse gas emissions attributed to facility energy use by 30 percent by 2010 compared to such emissions levels in 1990. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.1.b Energy Management Plan | (b) Energy consumption per gross square foot by 30 percent by 2005 and 35 percent by 2010 relative to 1985 for those facilities included within the Buildings energy reporting category. | Phase III |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.1.c Energy Management Plan | (c) Energy consumption per gross square foot by 20 percent by 2005 and 25 percent by 2010 relative to 1990 for those facilities included within the Industrial and Laboratory Facilities energy | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.1.d Energy Management Plan | (d) Water consumption through water efficiency programs and plans to contribute to the Department's objective of accomplishing 80 percent of identified life cycle cost-effective water conservation actions by 2010 using the best management practices published by the Federal Energy Management Program as a guide. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.2 Energy Management Plan | (2) Annual progress of at least 10 percent toward completing energy and water audits of all facilities, either through energy savings performance contracts or utilities energy efficiency service contracts or other means. Include the Energy Star® Building label rating tool in facility audits of office buildings to support applications for the Energy Star Building® label. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.3 Energy Management Plan | (3) Annual progress toward installing, by January 1, 2005, in DOE-owned buildings, all life cycle cost-effective energy and water conservation measures identified by facility audits. | Phase III |
| | | Programmatic/ Technical | Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.4 Energy Management Plan | (4) Annual progress toward qualifying office buildings for the Energy Star® Building label by December 31, 2002. | Phase III |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | *1) Compliance with 10 CFR 434, Energy Conservation Voluntary Performance Standards for New Buildings, from conceptual design through commissioning* | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 430.2A Departmental Energy and Utilities Management Contractor Requirements Document | Section 2, Energy Management Program | 2. Energy Management Program.<br>d. The energy management plan must exhibit and explain the application of the following requirements.<br>(5) Application of sustainable design principles to new buildings and building alterations. Compliance with 10 CFR 434, Energy Conservation Voluntary Performance Standards for New Buildings; Mandatory for Federal buildings, from conceptual design through commissioning. | Phase I |
| | *2) Selection of DOE/EPA Energy Star® products into guide specification and acquisition systems. Where Energy Star® products are not available, selection of products that are in the upper 25 percent of energy efficiency.* | Programmatic/ Technical | Design/ Construction/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.7 Energy Management Program | (7) Selection of DOE/EPA Energy Star® products into guide specification and acquisition systems. Where Energy Star® products are not available, selection of products that are in the upper 25 percent of energy efficiency | Phase I |
| | *3) Minimization of the use of petroleum-based fuels in buildings and facilities by switching to non-petroleum based source, when life cycle cost effective. And for facilities that use petroleum based fuel systems, provide dual-fuel capability where cost effective.* | Technical | Design/ Construction | DOE O 430.2A Contractor Requirements Document | Section 2.d.10 Energy Management Program | (10) Minimization of the use of petroleum-based fuels in buildings and facilities by switching to non-petroleum based source, when life cycle cost effective. And for facilities that use petroleum based fuel systems, provide dual-fuel capability where cost effective | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | 4) Use of off-grid generation systems (e.g., solar, wind turbine, etc.), when such systems are life-cycle cost effective and offer other benefits. | Technical | Design/ Construction/ Operation/ Maintenance | DOE O 430.2A Contractor Requirements Document | Section 2.d.13 Energy Management Program | (13) Use of off-grid generation systems, including hot water and solar electric supporting the Million Solar Roofs initiative, solar outdoor lighting, small wind turbines, fuel cells and other technologies, when such systems are life-cycle cost effective and offer other benefits. | Phase I |
| | 5) Control of electric, gas, and water loads to minimize utilities costs and mitigate the impact of sudden disruptions in the energy supply. | Programmatic/ Technical | Design/ Construction Operation | DOE O 430.2A Contractor Requirements Document | Section 2.d.14 Energy Management Program | (14) Control of electric, gas, and water loads to minimize utilities costs and mitigate the impact of sudden disruptions in the energy supply. Adopt a charge program internal to the site for specific customers when needed to curb unnecessary energy consumption or provide usage information. | Phase I |
| NVTRD 7.0 | Fire Protection. NRL facility designs shall:<br>1) comply with applicable sections of NFPA 70, National Electric Code, and NFPA 70E. Electrical Safety Requirements for Employee Workplaces. | Programmatic/ Technical | Design/ Construction Maintenance | DOE O 440.1A Contractor Requirements Document | Worker Protection Management for DOE Federal and Contractor Employees | 12. Comply with the following worker protection requirements:<br>k. NFPA 70, National Electrical Code. | Phase I |
| | 2) meet the requirements of DOE O 420.1A including a reliable water supply for fire suppression, use of non combustible or fire-resistive construction where appropriate, use of fire extinguishing systems where appropriate, use of redundant fire protection systems where appropriate, a means to summon the fire department (e.g., fire alarm signaling system), a means to notify and evacuate building employees, and physical access and | Technical | Design | DOE O 420.1A Contractor Requirements Document | Section 4.2.2.1 Fire Protection Design Requirements | DOE elements and contractors shall develop, implement, and maintain a comprehensive fire protection program for facilities that includes:<br>1. A reliable water supply of adequate capacity for fire suppression.<br>2. Noncombustible or fire-resistive construction, where appropriate. Complete fire-rated barriers that are commensurate with the fire hazard to isolate hazardous occupancies and to minimize fire spread and loss potential consistent with defined limits as [illegible] | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | appropriate equipment to aid the fire department. | | | | | established by DOE.<br>3. Automatic fire extinguishing systems throughout all significant facilities and in all areas subject to loss of safety class systems, significant life safety hazards, unacceptable program interruption, or fire loss potential in excess of defined limits.<br>4. Redundant fire protection systems in areas where safety class systems are vulnerable to fire damage and where no redundant safety capability exists outside of the fire area. In new facilities, redundant safety class systems shall be in separate fire areas. Redundant fire protection systems shall also be provided in areas where the maximum possible fire loss (MPFL) exceeds limits established by DOE.<br>5. A means to summon the fire department in the event of a fire, such as a fire alarm signaling system.<br>6. A means to notify and evacuate building occupants in the event of a fire, such as a fire detection or fire alarm system and illuminated, protected egress paths.<br>7. Physical access and appropriate equipment to facilitate effective intervention by the fire department, such as an interior standpipe system(s) in multi-story or large facilities with complex configurations. | |
| | | Technical | Design | TSRD 3.2.3.A.4 | Safety and Environmental Protection-Safety | 4. Transportation facilities shall be provided fire protection in accordance with DOE Order 420.1 or 41 CFR 102-80.45 as applicable. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.P* | *Safeguards and Security Standardization. The design of the NRL safeguards and securities equipment and systems that shall be selected on the basis of cost savings or other benefit to the DOE such as worker safety, compliance with life safety codes, enhancing mission capability, and facilitate contingency efforts. The NRL facility designs shall incorporate the use of standardized safeguards and security equipment and systems, where possible without compromising the design's flexibility or adherence to performance criteria.* | Technical/ Programmatic | Design | DOE O 470.1-1, Contractor Requirements Document Safeguards and Security Program | Section 5. Standardization | 5. Standardization<br>a. Safeguards and security equipment and systems shall be selected on the basis of cost savings or other benefit to DOE such as worker safety, compliance with life safety codes, enhancing mission capability, and facilitating contingency efforts.<br>b. New facility designs shall incorporate the use of standardized safeguards and security equipment and systems, where possible without compromising design flexibility or adherence to performance criteria. | Phase I |
| *NVTRD 7.Q* | *Safeguards and Security System Design. The design of the NRL facilities shall provide site-specific safeguards and security protection or tailor the physical protection elements, including: security areas, intrusion detection capability, alarm management and control systems, closed circuit television, video recording, barriers, secure storage, and communications all based on the physical protection measures developed in accordance with DOE O 473.1.* | Programmatic | Design/ Operation | DOE O 473.1 Physical Protection Program<br>Contractor Requirements Document | Section 4 | Develop physical protection measures based on a protection strategy that specifically addresses the S&S interests identified.<br>a. Graded Protection. Provide a graded physical protection program to S&S interests in a cost-effective manner consistent with potential threats.<br>b. SNM Roll-Up. Protect special nuclear material (SNM) at the higher level if a roll-up situation could develop within a single security area unless the facility has conducted a vulnerability assessment that determined the failure or defeat of protection measures will not increase the risk.<br>c. Risk Management. Rely on risk management principles as the | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | underlying basis for making security related decisions for an enduring protection program.<br>Accordingly, ensure that asset valuations, threat analyses, and vulnerability assessments are considered in determining risk.<br>d. Outside Agency Protection Support. Describe support provided by outside agencies for DOE S&S incidents in the SSSP or security plan.<br>NOTE: The elements of the physical protection strategy and program that include Nevada Rail will likely be incorporated into the overall Strategy and Program for the repository. These elements will however govern the requirements contained the following requirements. | |
| | | Programmatic | Design/ Operation | DOE O 473.1<br>Physical Protection Program<br>Contractor Requirements Document | Section 5 | Provide site-specific S&S protection or tailor the physical protection elements, including the following.<br>a. Security Areas. Establish security areas to protect S&S interests.<br>b. Intrusion Detection Capability. Use intrusion detection systems (IDSs) and/or visual observations by protective force personnel to detect unauthorized entry and/or presence in security areas that require protection.<br>(1) Ensure breaches in the security area boundaries for those S&S interests under IDS protection are detected and alarms are annunciated.<br>(4) Ensure all IDSs and access control alarms are effectively | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | assessed to determine the cause of alarms.<br>c. Alarm Management and Control Systems.<br>(2) Ensure all tamper and supervisory alarms are assessed by the protective force. Technical/Maintenance support personnel must conduct follow-up assessment of tamper and supervisory alarms.<br>(3) Ensure closed circuit television used as the primary assessment tool uses fixed cameras and provides a clear image for assessment.<br>(4) Ensure video recorded from assessment cameras capture information necessary for alarm assessment.<br>e. Barriers. Install permanent physical barriers to control, deny, impede, or delay unauthorized access into all security areas. Delineate DOE-designated security areas by means of separate and distinct permanent barriers. The requirement for barriers at property protection areas must be locally implemented and included in security plans.<br>f. Secure Storage. S&S interests requiring secure storage must be placed in vaults, vault-type rooms, vault-type-room complexes, and/or General Services Administration—approved security containers.<br>h. Communications.<br>(1) Ensure voice communications systems used for security purposes are operable and provide intelligible voice | |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | communications in all security areas for all modes of operation.<br>(2) Ensure security system data transmission lines and data are protected in a graded manner from tampering and substitution. | |
| | | Technical/ Programmatic | Design/ Construction/ Operation/ Maintenance | TSRD 3.2.5 | Safeguards and Security | Transportation shall incorporate physical protection and security systems in facilities and coordinate equipment and personnel to ensure compatibility and facilitate compliance with the security requirements of 10 CFR Part 75 and applicable DOE orders. | Phase I |
| *NVTRD 7.R* | *Road Crossings.* The NRL shall be designed to meet the applicable sections of the *MUTCD 2000 Manual on Uniform Traffic Control Devices* [DIRS 164546] and *Policy on Geometric Design of Rural Highways*, [DIRS 169942] for road crossings. [DOE O 5480.4 [DIRS 162022], Contractor Requirements Document, Sections 2.g.2.c and 2.g.2.f] | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 5480.4 Chg 4 Environmental Protection, Safety, And Health Protection Standards | Attachment 2 Mandatory ES&H Standards Policy Requirements)<br>Section 2.g Transportation Safety | 2. g Transportation Safety<br>(2) Motor Vehicle and Traffic Safety<br>(c) "Manual on Uniform Traffic Control Devices for Streets and Highways," Bureau of Public Roads (DOT).<br>(f) *Policy on Geometric Design on Rural Highways.*<br>NOTE: This assumes that these mandatory standards would be used in the design of road crossings. | Phase I |
| *NVTRD 7.S* | *Environmental Protection. The design, construction, operation and maintenance of the NRV shall provide for; 1) public health and environmental protection, 2) pollution prevention and recycling efforts, and 3) compliance with applicable environmental protection requirements in accordance with DOE O 450.1, Environmental Protection Program* | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1<br>Environmental Protection Program<br>Contractor Requirements Document | Section 1.a | 1. General Requirements. Ensure their integrated safety management systems include environmental management systems that do the following.<br>(a) Provide for the systematic planning, integrated execution, and evaluation of programs for-<br>(1) public health and environmental protection,<br>(2) pollution prevention (P2), and<br>(3) compliance with applicable environmental protection requirements. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1 Environmental Protection Program Contractor Requirements Document | Section 1.c | (c) Include measurable environmental goals, objectives, and targets that are reviewed annually and updated when appropriate. | |
| | | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1 Environmental Protection Program Contractor Requirements Document | Section 6 | Incorporate, where appropriate, environmentally and economically beneficial landscape practices into all new landscaping programs, policies, and practices for facilities. [See requirements placed on Federal agencies in Executive Order 13148, "Greening the Government Through Leadership in Environmental Management." | Phase I |
| | | Programmatic/ Technical | Design/ Construction/ Operation/ Maintenance | TSRD 3.2.3.B | Environmental Protection | Environmental Protection<br>An environmental management program that meets the requirements of DOE Order 450.1 shall be developed and implemented for Transportation design, construction, and operation of facilities and equipment. This program shall include:<br>1. The systematic planning, integrated execution, and evaluation of programs for (a) public health and environmental protection as stated in the National Environmental Policy Act of 1969 (NEPA), (b) pollution prevention, and (c) compliance with applicable environmental protection and permitting requirements including the applicable requirements of Comprehensive Environmental Response, Compensation and Liability Act.<br>2. Policies, procedures, and | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | training to identify activities with significant environmental impacts, to manage, control, and mitigate the impacts of these activities, and to assess performance and implement corrective actions where needed.<br>3. Measurable environmental goals, objectives, and targets that are reviewed annually and updated when appropriate.<br>4. Consideration of the following for inclusion as applicable:<br>Conformity of DOE proposed actions with State Implementation Plans to attain and maintain national ambient air quality standards,<br>Implementation of a watershed approach for surface water protection,<br>Implementation of a site-wide approach to groundwater protection,<br>Protection of other natural resources including biota,<br>Protection of site resources from wildland and operational fires, and<br>Protection of cultural resources.<br>5. The promotion of the long-term stewardship of a site's natural and cultural resources throughout its operational, closure, and post-closure life cycle.<br>6. The reduction or elimination the generation of waste, the release of pollutants to the environment, and the use of Class I ozone-depleting substances through source reduction, re-use, segregation, and recycling and by procuring recycled-content materials and | |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | environmentally preferable products and services.<br>7. Ensuring the early identification of, and appropriate response to, potential adverse environmental impacts associated with DOE operations, including, as appropriate, pre-operational characterization and assessment, and effluent and surveillance monitoring. | |
| | | Programmatic/ Technical | Design/ Construction/ Operation/ Maintenance | CRD 3.2.1.I | Overall System Performance | CRWMS facilities shall manage hazardous, non hazardous, and mixed radioactive wastes in a cost effective manner that meets or exceeds compliance with applicable regulations and protects the health and safety of the public, workers, and the environment consistent with DOE Order 450.1, *Environmental Protection Program.* | Phase I |
| *NVTRD 7.T* | *Waste Prevention and Recycling. The design, construction, and operation of the NRL shall support, as appropriate, aspects of:*<br>*Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition,"*<br>*Executive Order 13221, "Energy Efficiency Standby Power Devices,"*<br>*Executive Order 13123, Greening the Government Through Efficiency Energy Management,"*<br>*Executive Order 13148, Greening the Government Through Leadership in Environmental* | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1<br>Environmental Protection Program<br>Contractor Requirements Document | Section 4 | Assist the Department in meeting its requirements and in its efforts to obtain, as appropriate, local community advice relevant to aspects of Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition;" Executive Order 13221, "Energy Efficiency Standby Power Devices;" Executive Order 13123, Greening the Government Through Efficiency Energy Management;" Executive Order 13148, Greening the Government Through Leadership in Environmental Management;" and Executive Order 13149, Greening the Government Through Federal Fleet and Transportation Efficiency." | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | *Management," and Executive Order 13149, Greening the Government Through Federal Fleet and Transportation Efficiency."* | | | | | | |
| | | Programmatic/ Technical | Design/ Operation/ Maintenance | CRD 3.1.2.G | Primary Regulatory Requirements | G. All CRWMS elements shall comply with Executive Order 13123 of June 3, 1999, "Greening the Government through Efficient Energy Management (64 FR 30851) | Phase I |
| | | Programmatic/ Technical | Design/ Construction/ Operation/ Maintenance | CRD 3.2.1.I | Overall System Performance | CRWMS facilities shall manage hazardous, non hazardous and mixed radioactive wastes in a cost effective manner that meets or exceeds compliance with applicable regulations and protects the health and safety of the public, workers, and the environment consistent with DOE Order 450.1, *Environmental Protection Program.* | Phase I |
| | | Programmatic/ Technical | Design/ Construction/ Operation/ Maintenance | TSRD 3.2.3.B | Environmental Protection | Environmental Protection<br>An environmental management program that meets the requirements of DOE Order 450.1 shall be developed and implemented for Transportation design, construction, and operation of facilities and equipment. This program shall include:<br>1. The systematic planning, integrated execution, and evaluation of programs for (a) public health and environmental protection as stated in the National Environmental Policy Act of 1969 (NEPA), (b) pollution prevention, and (c) compliance with applicable environmental protection and permitting requirements including the applicable requirements of | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | Comprehensive Environmental Response, Compensation and Liability Act.<br>2. Policies, procedures, and training to identify activities with significant environmental impacts, to manage, control, and mitigate the impacts of these activities, and to assess performance and implement corrective actions where needed.<br>3. Measurable environmental goals, objectives, and targets that are reviewed annually and updated when appropriate.<br>4. Consideration of the following for inclusion as applicable:<br>Conformity of DOE proposed actions with State Implementation Plans to attain and maintain national ambient air quality standards,<br>Implementation of a watershed approach for surface water protection,<br>Implementation of a site-wide approach to groundwater protection,<br>Protection of other natural resources including biota,<br>Protection of site resources from wildland and operational fires, and<br>Protection of cultural resources.<br>5. The promotion of the long-term stewardship of a site's natural and cultural resources throughout its operational, closure, and post-closure life cycle.<br>6. The reduction or elimination the generation of waste, the release of pollutants to the environment, and | |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | | | | | the use of Class I ozone-depleting substances through source reduction, re-use, segregation, and recycling and by procuring recycled-content materials and environmentally preferable products and services.<br>7. Ensuring the early identification of, and appropriate response to, potential adverse environmental impacts associated with DOE operations, including, as appropriate, pre-operational characterization and assessment, and effluent and surveillance monitoring. | |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 7.U* | Environmentally Preferable Purchasing. The design and construction of the NRL shall consider requirements of Contract Clause Section I, Part II Contract Clauses, Subsection I.39, DEAR 970.5223-2 *Acquisition and Use of Environmentally Preferable Products and Services* to comply with purchasing requirements as required in Section 6002 of the Resource Conservation and Recovery Act of 1976. | Programmatic/ Technical | Design/ Operation/ Maintenance | Contract Clause Section I, Part II | DEAR 970.5223-2 Acquisition and Use of Environmentally Preferable Produces and Services | (a) In the performance of this contract, the Contractor shall comply with the requirements of the following issuances:<br>(1) Executive Order 13101 of September 14, 1998, entitled "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition."<br>(2) Section 6002 of the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6962, Pub. L. 94-580, 90 Stat. 2822),<br>(3) Title 40 of the Code of Federal Regulations, Subpart I, Part 247 (Comprehensive Guidelines for the Procurement of Products Containing Recovered Materials) and such other Subchapter I Parts or Comprehensive Procurement Guidelines as the Environmental Protection Agency may issue from time to tome as guidelines for the procurement of products that contain recovered/recycled materials,<br>(4) "U.S. Department of Energy Affirmative Procurement Program for Products Containing Recovered Materials" and related guidance document(s), as they are identified in writing by the Department. | Phase I |

Table E-1. DOE Directive (Contractual) Requirements – Design Affecting (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| | | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1 | Section 1.c | (c) reduce or eliminate the generation of waste, the release of pollutants to the environment, and the use of Class I ozone-depleting substances (ODS) through source reduction, re-use, segregation, and recycling, and by procuring recycled-content materials and environmentally preferable products and services. | Phase I |
| | | Programmatic/ Technical | Design/ Operation/ Maintenance | DOE O 450.1 Environmental Protection Program Contractor Requirements Document | Section 8 | Consider P2 in the specification and acquisition of supplies to cost effectively maximize procurement of environmentally preferable products. As appropriate, all acquisitions must be coordinated with the DOE operations/ field/ site office "Green Acquisition Advocate." [See Acquisition Letter AL-2000-03, dated 05/16/00] | Phase I |

Table E-2. DOE Directive (Contractual) Requirements – Construction, Operation and Maintenance

| Directive No. | Directive Title | Category | Function | Requirements/Remarks | Applicable Phase |
|---|---|---|---|---|---|
| TSRD 3.6.9.A.1 | Quality Assurance | Programmatic | Operations/Testing/ Maintenance | A. In addition to the QA requirements specified in Section 3.2.8, the following requirements apply to Transportation operations:<br>1. Tools, gauges, instruments, and other measuring and test devices used in activities affecting quality shall be properly controlled, calibrated, and adjusted in accordance with applicable portions of the QA program, the manufacturer's standards/ requirements, and industry standards to maintain accuracy within necessary limits. | Phase III |
| TSRD 3.2.2.B.4 | Design Criteria - Facilities | Programmatic | Maintenance | Facilities and equipment shall consider a maintenance concept that minimizes the likelihood of, and mitigates the effects of systems, structures, and components (SSC) failures, using preventive maintenance and inspection. SSCs shall be designed to permit periodic testing, inspection, and maintenance as necessary, to ensure their continued functioning and readiness | Phase III |
| DOE O 420.1A | Facility Safety<br>Contractor Requirements Document<br>4.4.6 – Post-Natural Phenomena Procedures | Programmatic | Operations | For facilities or sites with hazardous materials contractor/operator shall provide and use procedures that include, inspecting the facility for damage caused by severe natural phenomena, and placing the facility into a safe configuration when such damage has occurred. | Phase III |
| DOE O 420.1A | Facility Safety<br>Contractor Requirements Document<br>5 – Implementation Plan | Programmatic | Construction/ Operation/ Maintenance | Contractors shall submit an Implementation Plan to DOE to implement the above requirements. The Implementation Plan shall be submitted after the requirements are incorporated into the applicable contract and shall be developed with an integrated safety review process commensurate with the hazards. | Phase III |
| TSRD 3.2.9.C | Program and Project Management | Programmatic | Construction/ Operation/ Maintenance | Transportation shall establish logistics support systems to include ensuring the availability of sufficient spares to support the maintenance concept and the design availability factors used in the design. | Phase III |
| DOE O 430.1A | Life-Cycle Asset Management<br>Contractors Requirements Document | Programmatic/ Technical | Operation/ Maintenance/ Decommissioning | The Contractor shall use a process for the operation and maintenance of physical assets that shall ensure, as a minimum, the following:<br>a. The identification, inventory, and periodic assessment of the condition of physical assets in the maintenance program.<br>b. The establishment of requirements, budgets, and a work management system to maintain physical assets in a condition suitable for their intended use.<br>c. The preventive, predictive, and corrective maintenance to | Phase III |

Table E-2. DOE Directive (Contractual) Requirements – Construction, Operation and Maintenance (Continued)

| Directive No. | Directive Title | Category | Function | Requirements/Remarks | Applicable Phase |
|---|---|---|---|---|---|
| | | | | ensure physical asset availability for planned use and/or proper disposition.<br>d. A configuration management process to ensure the integrity of physical assets and system.<br>e. The efficient and effective management and use of energy and utilities.<br>f. A method for the prioritization of infrastructure requirements.<br>g. The management of backlogs associated with maintenance, repair, and capital improvements. | |
| DOE O 430.1A | Life-Cycle Asset Management<br>Contractors Requirements Document | Programmatic/ Technical | Operation/ Maintenance/ Decommissioning | h. A method to ensure that prior to the completion of mission activities (e.g., production, research, etc.) actions are implemented to place the facility, systems and materials in stable and known conditions and to ensure hazards are identified and known pending transfer or disposition. For facilities that have already completed mission activities and are awaiting transfer or disposition, ensure that actions are taken to eliminate or mitigate hazards and provide adequate protection to workers, the public and the environment. In both cases, actions shall be based on an assessment of the remaining hazards at the time when mission activities are completed, or prior to transfer or disposition for facilities that have already completed mission activities. These actions shall include but not be limited to:<br>(1) Identifying and characterizing hazardous and radioactive materials and wastes remaining in systems/facilities and providing for their stabilization (if necessary), adequate storage until they are removed from the facility, and (unless otherwise agreed to prior to facility transfer) removal.<br>(2) Assessment and adjustment (if necessary) of the facility authorization basis to ensure it continues to reflect conditions in the facility pending disposition.<br>(3) Conducting surveillance and maintenance activities required to maintain the facility and remaining hazardous/radioactive materials and wastes in a stable and known condition pending facility disposition.<br>(4) Identifying and allocating resources needed to maintain stable and known conditions pending disposition. | Phase III |
| DOE O 430.1A | Life-Cycle Asset Management<br>Contractors Requirements Document | Programmatic/ Technical | Decommissioning | The Contractor shall use a process for the disposition of physical assets that shall ensure, as a minimum, an application, as appropriate, of guidelines contained or referenced in DOE-STD-1120-98, Integration of Environment, Safety and Health into Facility Disposition Activities. | Phase IV |

Table E-2. DOE Directive (Contractual) Requirements – Construction, Operation and Maintenance (Continued)

| Directive No. | Directive Title | Category | Function | Requirements/Remarks | Applicable Phase |
|---|---|---|---|---|---|
| DOE O 430.2A | Departmental Energy and Utilities Management<br>Contractor Requirements Document | Programmatic | Operation/ Maintenance | Major facilities contractors managing and operating DOE, facilities or subcontracting the operation and maintenance of DOE facilities must have a documented energy management program and an energy management plan. Major facilities contractors are responsible for (1) compliance with the requirements of this CRD regardless of the performer of the work and (2) flowing down the requirements of the CRD of this Order to subcontracts to the extent necessary to ensure contractors' compliance with the requirements. The following items are required of the contractor organization using a graded approach. | Phase III |
| DOE 440.1A | Attachment 2 Contractor Requirements Document<br>Worker Protection Management For DOE Federal and Contractor Employees | Programmatic | Construction/ Operation/ Maintenance | 12. Comply with the following worker protection requirements<br>a 29 CFR Part 1910, "Occupational Safety and Health"<br>e 29 CFR, Part 1926, "Safety and Health Regulations for Construction"<br>k. NFPA 70, *National Electrical Code*<br>l. NFPA 70E, *Electrical Safety Requirements for Employee Workplaces* | Phase II |
| DOE O 450.1 | Attachment 2<br>Contractor Requirements Document<br>Environmental Protection Program | Programmatic | Construction/ Operation/ Maintenance | 4. Assist the Department in meeting its requirements and in its efforts to obtain, as appropriate, local community advice relevant to aspects of Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition;" Executive Order 13221, "Energy Efficiency Standby Power Devices;" Executive Order 13123, "Greening the Government Through Efficient Energy Management;" Executive Order 13148, "Greening the Government Through Leadership in Environmental Management;" and Executive Order 13149; "Greening the Government Through Federal Fleet and Transportation Efficiency." | Phase II |
| DOE O 450.1 | Attachment 2 Environmental Protection Program | Programmatic | Construction/ Operation/ Maintenance | 6. Incorporate, where appropriate, environmentally and economically beneficial landscape practices into all new landscaping programs, policies, and practices for facilities. [See requirements placed on Federal agencies in Executive Order 13148, "Greening the Government Through Leadership in Environmental Management." | Phase II |
| DOE O 450.1 | Attachment 2 Environmental Protection Program | Programmatic | Construction/ Operation/ Maintenance | 8. Consider Pollution Prevention in the specification and acquisition of supplies to cost effectively maximize procurement of environmentally preferable products. As appropriate, all acquisitions must be coordinated with the DOE operations/field/site office "Green Acquisition Advocate." [See Acquisition Letter AL-2000-03, dated 05/16/00] | Phase II |

Table E-2. DOE Directive (Contractual) Requirements – Construction, Operation and Maintenance (Continued)

| Directive No. | Directive Title | Category | Function | Requirements/Remarks | Applicable Phase |
|---|---|---|---|---|---|
| DOE O 473.1 | Physical Protection Program Contractor Requirements Document Section 5.g | Programmatic | Operations | g. Protective Personnel. Protective personnel include the protective force personnel designated as security officers; security police officers (SPOs); federal officers/special agents; and persons who have administrative responsibilities or who are assigned other security duties. (See DOE O 472.2, Protective Force Program, dated 6-30-00 and DOE M 473.2-2, Protective Force Program Manual, dated 6-30-00.) | Phase III |
| DOE O 473.1 | Physical Protection Program Contractor Requirements Document Section 5.i | Programmatic | Operations | i. Testing and Maintenance.<br>(1) Performance test physical protection systems and programs to measure effectiveness. The performance assurance program must identify critical subsystems, components, and time intervals between tests.<br>(2) Implement a program of scheduled testing and maintenance to ensure an effective, operable security system. | Phase III |

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# APPENDIX F

# INTERFACE REQUIREMENTS

The following table contains interface requirements derived from Level 1 & 2 requirements documents that apply to conceptual design of the Nevada Rail System. Requirements from Section 9 are identified in this table and the applicable flowdown requirement is identified.

Table F-1. Interface Requirements Flowdown

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 9.A* | *Queuing Areas. NRL facility queuing areas for loaded and unloaded casks shall be consistent with the expected cask receipt and shipment rates and each cask type's spatial requirements while awaiting access or shipment.* | Technical | Design | TSRD 3.6.2.2.A | Equipment and Facility Interfaces | Transportation equipment shall be compatible with the queuing areas for loaded and unloaded casks, consistent with the expected cask receipt and shipment rates to include each cask type's spatial requirements while awaiting access or shipment. | Phase I |
| *NVTRD 9.B* | *Inspections. NRL shall provide access to enable receipt inspections of rail casks arriving at the GROA, FMF, and the mainline railroad junction to determine external radiation levels and surface contamination level.* | Technical | Design/ Construction/ Operation | TSRD 3.6.2.2.B | Equipment and Facility Interfaces | *Access shall be provided to enable receipt inspections of transportation cask systems at the CRWMS facilities to determine external radiation levels and surface contamination levels.* | Phase I |
| *NVTRD 9.C* | *Compatibility with Site Features. NRL facilities and equipment collocated with other CRWMS facilities shall be compatible with the site features (drainage, acreage, roads, etc.)* | Programmatic | Operation | TSRD 3.6.2.2.D | Equipment and Facility Interfaces | Transportation facilities and equipment collocated with other CRWMS facilities shall be compatible with the site features (drainage, acreage, roads, etc.) | Phase III |
| *NVTRD 9.D* | *Compatibility with Site Utilities. NRL facilities and equipment (including service and maintenance support) collocated with other CRWMS facilities shall be compatible with the site utilities hardware and services.* | Programmatic | Operation | TSRD 3.6.2.2.E | Equipment and Facility Interfaces | Transportation facilities and equipment (including service and maintenance support) collocated with other CRWMS facilities shall be compatible with the site utilities hardware and services. | Phase III |

Table F-1. Interface Requirements Flowdown (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 9.E* | *Compatibility with Security Systems. NRL facilities shall incorporate integral security systems into building design that are compatible with the systems, equipment, and policies of any collocated facilities which control access to all site locations.* | Technical | Design/ Operation | TSRD 3.6.2.2.F | Equipment and Facility | Transportation facilities shall incorporate integral security systems into building design that are compatible with systems, equipment, and policies of any collocated facilities which control access to all site locations. | Phase I |
| *NVTRD 9.F* | *Communications. NRL equipment and facilities shall have compatible communication systems for direct interactions with all CRWMS facilities and operations* | Technical | Operation | TSRD 3.6.2.2.G | Equipment and Facility | Transportation shall have compatible communications to direct interaction with al Civilian Radioactive Waste Management System facilities and operations. | Phase III |
| | | Technical | Operation | TSRD 3.6.2.2.H | Equipment and Facility | Transportation equipment and facilities shall be equipped with communication equipment to ensure compatibility with other CRWMS facilities | Phase I |
| *NVTRD 9.G* | *Functional Compatibility. The NRL, and it's facilities and equipment, shall be functionally compatible with the mainline railroad, the FMF, and the repository, including the site improvements, utility services, security facilities, site vehicles, and administrative and warehouse facilities.* | Technical | Operation | TSRD 3.6.2.2.I | Equipment and Facility | The transportation facilities and equipment shall be functionally compatible with facilities serviced, including the site improvements, utility services, security facilities, cask handling and site-generated radioactive waste systems, site vehicles, and administrative and warehouse facilities. | Phase I |

Table F-1. Interface Requirements Flowdown (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 9.H* | *Emergency and Campaign Support Vehicles. The design, construction, maintenance and operation of the NRL and its facilities shall ensure the compatibility of access roads and railways with Transportation Operations' emergency and campaign support vehicles.* | Programmatic | Operation | TSRD 3.6.2.2.J | Equipment and Facility | Transportation Operations emergency and campaign support vehicles shall be compatible for use with the access roads and railways provided at CRWMS sites serviced. | Phase III |
| *NVTRD 9.I* | *Transportation Interfaces. Design and operational interfaces within the Transportation system element shall be identified, controlled, and coordinated among participating organizations, including writing procedures for review, approval, release, distribution, and revision of documents involving design and operational interfaces.* | Programmatic | Design/ Operation | TSRD 3.2.1.I | Transportation Programmatic Requirements-General | Design and operational interfaces within each system element shall be identified, controlled, and coordinated among participating organizations, including writing procedures for review, approval, release, distribution, and revision of documents involving design and operational interfaces. | Phase I |
| *NVTRD 9.J* | *Institutional Requirements-Interface and Communication. NVT shall establish address design, construction, and operations requirements addressing interfaces between Transportation and Federal agencies, State and local governments, Indian Tribes, law enforcement agencies, emergency response organizations, and private industry. Such requirements will be consistent with memoranda of agreement such as the MOU between DOT/RW or similar project documentation establishing interface agreements* | Programmatic | Design/ Construction/ Operation | TSRD 3.7.1.A | Institutional Requirements-Interface and Communication | A. Design, construction, and operations requirements addressing interfaces between Transportation and Federal agencies, State and local governments, Indian Tribes, law enforcement agencies, emergency response organizations, and private industry will be established by the responsible project offices. Such requirements will be consistent with memoranda of agreement such as the MOU between DOT/RW or similar project documentation establishing interface agreements. | Phase I |

Table F-1. Interface Requirements Flowdown (Continued)

| NTRD Requirement | Requirement Text | Category | Function | Source | Source Title | Requirements/Rationale | Phase |
|---|---|---|---|---|---|---|---|
| *NVTRD 9.K* | *Shipments in Nevada Interfaces shall be developed and maintained to support shipment tracking, security monitoring, and emergency response functions. This interfacing shall address communications systems, equipment, procedures, and resources.* | Programmatic | Design/ Construction/ Operation | TSRD 3.6.1.3 .A | Functional Interfaces | Interfaces shall be developed and maintained to support shipment tracking, security, monitoring, and emergency response functions. This interfacing shall address communications systems, equipment, procedures, and resources | Phase I |

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