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Systematic Regulatory Analysis for RR0080: Structures, Systems, and Components Important to Safety-Compliance With Mining Regulations (10 CFR 60.131 (b)(9))

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SYSTEMATIC REGULATORY ANALYSIS FOR RR0080: STRUCTURES, SYSTEMS, AND COMPONENTS IMPORTANT TO SAFETY - COMPLIANCE WITH MINING REGULATIONS (10 CFR 60.131(b)(9))

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Systematic Regulatory Analysis for RR0080: Structures, Systems, and Components Important to Safety - Compliance With Mining Regulations (10 CFR 60.131(b)(9))

Introduction

This Systematic Regulatory Analysis (SRA) of the regulations of the Mine Safety and Health Administration (MSHA), Department of Labor which were incorporated into the NRC's regulations at 10 CFR 60.131(b)(9), has examined both the current regulations and those that existed on June 21, 1983, when the NRC's Part 60 was published. The following is a chronology of changes which have occurred since the incorporation by reference.

The original incorporation was of "...relevant design requirements of 30 CFR, Chapter I, Subchapters D, E, and N... ." This form of incorporation provided the broadest application of the regulation with the fewest citations, as opposed to citing individual Parts. Subchapter N, which consisted of Parts 55, 56, and 57, was revised in 1985. Parts 55 and 56 were merged into 56 and the text of new 56 and 57 were revised, (50 FR 4035, 4054). Parts 5 thru 36 were merged into Subchapter B and the designations of Subchapter C (Parts 15-17), Subchapter D (Parts 18-29), and Subchapter E (Parts 31-36) were removed and the regulatory text was revised effective October 1, 1987 (52 FR 17516). None of the above changes to text or designation of the MSHA regulations were either noted or reflected in the regulations of the NRC, which continue to reflect the original reference.

This Intermediate Milestone reports the SRA on 10 CFR 60.131(b)(9) through technical review components development following the Program Architecture Process Diagram. The technical review components have been constructed around "relevant design requirements" of Subchapters B and N of current MSHA regulations (July 1, 1990).

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REGULATORY REQUIREMENT SYNOPSIS

STRUCTURES, SYSTEMS, AND COMPONENTS IMPORTANT TO SAFETY - COMPLIANCE WITH MINING REGULATIONS (10 CFR 60.131(b)(9))

REQUIREMENTS

Regulatory Requirement Citations

Primary Regulatory Text Citation

10CFR60 131 (b) (9) January 1, 1990

Potential Uncertainties

PASS Identification Number: RR0080/UN0001
Topic: Secondary Effects from Non-Radiological Accidents

PASS Identification Number: RR0080/UN0004
Topic: Inconsistent Reference in 10 CFR 60.131(b)(9)

Associated Regulatory Text Citations

10CFR60 21 (c) (1) (ii) (E) January 1, 1990

10CFR60 130 January 1, 1990

Referenced Regulatory Text Citations

30CFR, Chapter I, Subchapter B July 1, 1990

30CFR, Chapter I, Subchapter N (Includes 30CFR56 and 30CFR57) July 1, 1990

The full texts of the above listed Regulatory Texts are included in the Section entitled "Regulatory Requirement Texts and Rationales."

The full texts and rationales for the above listed Potential Uncertainties are included in the Section entitled "Potential Uncertainties."

Regulatory Elements of Proof and Technical Review Components
RR0080/PS0001 -- Important to Safety - Mining Regulations

DOE SHALL DEMONSTRATE THAT:

EP0100 -- Compliance with Mining Regulations

TO THE EXTENT THAT DOE IS NOT SUBJECT TO THE FEDERAL MINE SAFETY AND HEALTH ACT OF 1977, AS TO THE CONSTRUCTION AND OPERATION OF THE GEOLOGIC REPOSITORY OPERATIONS AREA, THE DESIGN OF THE GEOLOGIC REPOSITORY OPERATIONS AREA INCLUDES SUCH PROVISIONS FOR WORKER PROTECTION AS MAY BE NECESSARY TO PROVIDE REASONABLE ASSURANCE THAT ALL STRUCTURES, SYSTEMS, AND COMPONENTS IMPORTANT TO SAFETY CAN PERFORM THEIR INTENDED FUNCTIONS. ANY DEVIATION FROM RELEVANT DESIGN REQUIREMENTS IN 30 CFR, CHAPTER I, SUBCHAPTERS D, E, AND N HAS BEEN JUSTIFIED IN ORDER TO REBUT THE PRESUMPTION THAT THIS REQUIREMENT HAS NOT BEEN MET. {10 CFR 60.131(b)(9)}

EP0200 -- Performance Analysis of Major Design Structures, Systems, and Components

AN ANALYSIS OF THE PERFORMANCE OF THE MAJOR DESIGN STRUCTURES, SYSTEMS, AND COMPONENTS, BOTH SURFACE AND SUBSURFACE, TO IDENTIFY THOSE THAT ARE IMPORTANT TO SAFETY HAS BEEN CONDUCTED. FOR THE PURPOSES OF THIS ANALYSIS,IT ASSUMES THAT OPERATIONS AT THE GEOLOGIC REPOSITORY OPERATIONS AREA WILL BE CARRIED OUT AT THE MAXIMUM CAPACITY AND RATE OF RECEIPT OF RADIOACTIVE WASTE STATED IN THE APPLICATION. {10 CFR 60.21(c)(1)(ii)(E)}

Technical Review Components for EP0200

TS0200 -- Performance Analysis of Major Design Structures, Systems, and Components

DOE SHALL PROVIDE:

RC0210 -- Identification of the Major Design Structures, Systems and Components

Documentation identifying the major design structures, systems, and components, both surface and underground at the Geologic Repository Operations Area (GROA). (TECHNICAL REVIEW COMPONENT)

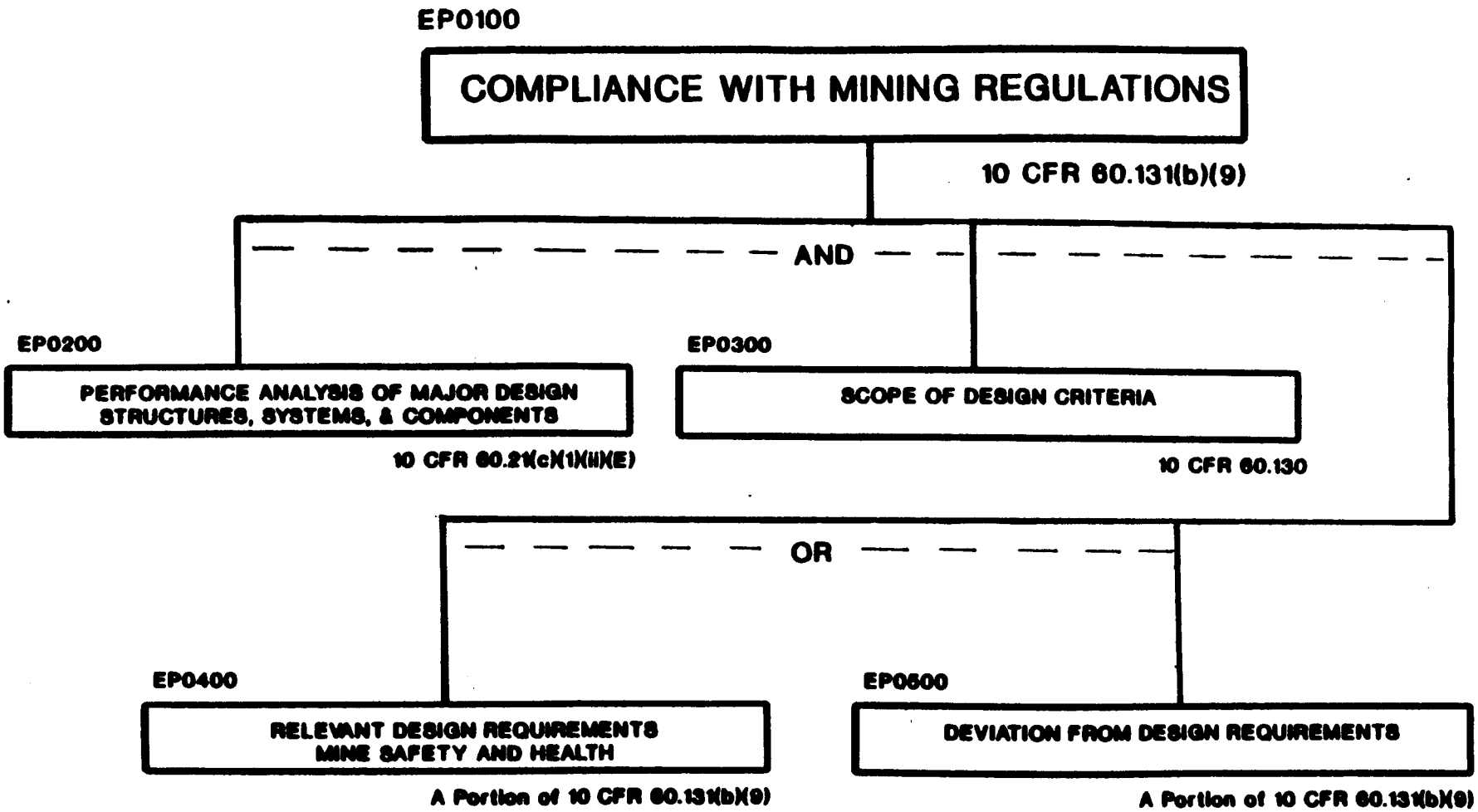

Figure 1. Regulatory Elements of Proof Logic Structure
RR0080/PS0001 -- IMPORTANT TO SAFETY
MINING REGULATIONS

RC0220 -- Performance Analysis of the Major Design Structures, Systems, and Components

Results of performance analyses on the proposed design of the major structures, systems, and components at the GROA regarding "important to safety" criteria. (TECHNICAL REVIEW COMPONENT)

RC0230 -- Identification of Items Important to Safety

Identification of the Major Design Structures, Systems, and Components that are to be classified as important to safety. (TECHNICAL REVIEW COMPONENT)

RC0240 -- Analytical and Investigative Methods

Description and documentation of the analytical and/or the investigative methods used to develop each Technical Review Component, rationale for use of each of these methods, and evidence to support the contention that each of these methods is applicable. (TECHNICAL REVIEW COMPONENT)

RC0250 -- Verification of Data

Verification that data have been collected and/or qualified in accordance with an approved quality assurance program meeting the requirements of 10 CFR Part 50, Appendix B. (TECHNICAL REVIEW COMPONENT)

EP0300 -- Scope of Design Criteria

THE DESIGN OF THE GEOLOGIC REPOSITORY OPERATIONS AREA PROVIDES SUCH SAFETY FEATURES IN THE SPECIFIC FACILITY NEEDED TO ACHIEVE THE PERFORMANCE OBJECTIVES. SECTION 60.131 SPECIFY MINIMUM CRITERIA FOR THE DESIGN OF THE GEOLOGIC REPOSITORY OPERATIONS AREA. THESE DESIGN CRITERIA ARE NOT INTENDED TO BE EXHAUSTIVE, HOWEVER. OMISSIONS IN §§ 60.131 THROUGH 60.134 DO NOT RELIEVE DOE FROM ANY OBLIGATION TO PROVIDE SUCH SAFETY FEATURES. ALL DESIGN BASES MUST BE CONSISTENT WITH THE RESULTS OF SITE CHARACTERIZATION ACTIVITIES. (10 CFR 60.130)

Technical Review Components for EP0300

TS0300 -- None

EP0400 -- Relevant Design Requirements - Mine Safety and Health

THE DESIGN OF THE GEOLOGIC REPOSITORY OPERATIONS AREA INCLUDES SUCH PROVISIONS FROM 30 CFR, CHAPTER I, SUBCHAPTERS D, E AND N FOR WORKER PROTECTION AS MAY BE NECESSARY TO PROVIDE REASONABLE ASSURANCE THAT ALL STRUCTURES, SYSTEMS, AND

COMPONENTS IMPORTANT TO SAFETY CAN PERFORM THEIR INTENDED FUNCTIONS. {A Portion of 10 CFR 60.131(b)(9)}

Technical Review Components for EP0400

TS0400 -- Mine Safety and Health

DOE SHALL PROVIDE:

RC0401 -- General Provisions for Respirators and Gas Masks

Documentation showing that respirators and gas masks meet the Safety and Health Standards set forth in 30 CFR 11, specifically 11.2 and 11.2-1 to the extent applicable for the geologic repository operations area (GROA). (TECHNICAL REVIEW COMPONENT)

RC0402 -- Approval and Disapproval of Respirators and Gas Masks

Documentation showing that respirators and gas masks to be used at the GROA have certificates of approval as denoted in the Safety and Health Standards set forth in 30 CFR 11, 11.30. (TECHNICAL REVIEW COMPONENT)

RC0403 -- Classification of Approved Respirators

Documentation showing that the respirators are type classified and approved to the extent applicable according to the Safety and Health Standards set forth in 30 CFR 11, 11.50. (TECHNICAL REVIEW COMPONENT)

RC0404 -- Electric Cap Lamps

Documentation showing that electric cap lamps meet the Safety and Health Standards set forth in 30 CFR 19, specifically 19.1 through 19.13 to the extent applicable for the GROA. (TECHNICAL REVIEW COMPONENT)

RC0405 -- Electric Mine Lamps Other Than Standard Cap Lamps

Documentation showing that the electric mine lamps other than the standard cap lamps meet the Safety and Health Standards set forth in 30 CFR 20, specifically 20.0 through 20.14 to the extent applicable for the geologic repository operations area. (TECHNICAL REVIEW COMPONENT)

RC0406 -- Traffic Safety

Documentation showing that operating procedures for self-propelled mobile equipment and rail equipment meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.9100 through 57.9104, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0407 -- Transportation of Persons and Materials

Documentation showing that transportation of persons and materials meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.9200 through 57.9261, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0408 -- Safety Devices, Provisions and Procedures for Roadways

Documentation showing the devices and procedures for the safety of personnel along roadways, railroads, and material transfer sites meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.9300 through 57.9362, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0409 -- Travelways and Escapeways - Surface and Underground

Documentation showing that travelways and escapeways on the surface and in the underground facility meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.11001 through 57.11017, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0410 -- Travelways - Surface Only

Documentation showing that surface travelways meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.11025 through 57.11027, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0411 -- Travelways - Underground Only

Documentation showing that underground travelways meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.11036 through 57.11041, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0412 -- Escapeways - Underground Only

Documentation showing that underground escapeways meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.11050 through 57.11059, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0413 -- Personal Protection

Documentation showing that personal protective equipment meets the Safety and Health Standards set forth in 30 CFR 57, SUBPART N, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

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RC0414 -- Safety Programs - Surface and Underground

Documentation showing the safety programs for surface and underground facilities meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.18002 through 57.18014, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0415 -- Safety Programs - Surface Only

Documentation showing that the safety programs for surface facilities meet the Safety and Health Standards set forth in 30 CFR 57, 57.18020, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0416 -- Safety Programs - Underground Only

Documentation showing that the safety programs for underground facilities meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.18025 and 57.18028, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0417 -- Intoxicating Beverages and Narcotics

Documentation showing that intoxicating beverages and narcotics regulations meet the Safety and Health Standard set forth in 30 CFR 57, 57.20001, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0418 -- Potable Water

Documentation showing that the potable water supply at the GROA meets the Safety and Health Standard set forth in 30 CFR 57, 57.20002, to the extent applicable. (TECHNICAL REVIEW COMPONENT)

RC0419 -- Housekeeping

Documentation showing that housekeeping at the GROA meets the Safety and Health Standard set forth in 30 CFR 57, 57.20003, to the extent applicable. (TECHNICAL REVIEW COMPONENT)

RC0420 -- Prohibited Areas for Food and Beverages

Documentation showing that consumption and storage of food and beverages will be regulated to meet the Safety and Health Standards set forth in 30 CFR 57, 57.20014, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0421 -- Requirements for Approval of Explosives

Documentation showing that explosives and sheathed explosive units used at the GROA meet the Safety and Health Standards set forth in 30 CFR 15, specifically 15.6 through 15.11. (TECHNICAL REVIEW COMPONENT)

RC0422 -- Explosive Storage - Surface and Underground

Documentation showing that the storage of explosives on the surface and underground meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6001 through 57.6012, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0423 -- Explosive Storage - Surface Only

Documentation showing that the storage of explosives on the surface meets the Safety and Health Standards set forth in 30 CFR 57, 57.6020, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0424 -- Explosive Storage - Underground Only

Documentation showing that the underground storage of explosives meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6027 through 57.6030, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0425 -- Explosives: Transportation - Surface and Underground

Documentation showing that the transportation of explosives on the surface and in the underground facility meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6040 through 57.6057, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0426 -- Explosives: Transportation - Surface Only

Documentation showing that the surface transportation of explosives meet the Safety and Health Standards set forth in 30 CFR 57, 57.6065, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0427 -- Explosives: Transportation - Underground Only

Documentation showing the underground transportation of explosives meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6075 through 57.6077, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0428 -- Explosives: Use - Surface and Underground

Documentation showing that the use of explosives on both the surface and underground meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6090 through 57.6168, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0429 -- Explosives: Use - Underground

Documentation showing that the use of explosives underground meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6175 through 57.6182, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0430 -- Explosives: Sensitized Ammonium Nitrate Blasting Agents - Surface and Underground

Documentation showing that the use of sensitized nitrate blasting agents meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.6193 through 57.6200, to the extent applicable on the surface and underground at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0431 -- Sensitized Ammonium Nitrate Blasting Agents - Underground Only

Documentation showing that the use of sensitized nitrate blasting agents underground meet the Safety and Health Standards set forth in 30 CFR 57, 57.6220, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0432 -- Miscellaneous: Surface and Underground Explosive Precautions

Documentation showing that the smoking and open flame restriction on the surface and underground where explosives are present meet the Safety and Health Standards set forth in 30 CFR 57, 57.6250, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0433 -- Blasting Underground in Hazardous Areas

Documentation showing all blasting underground in hazardous areas meet the Safety and Health Standards set forth in 30 CFR 57, 57.20031, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0434 -- Explosives

Documentation showing that the use of explosives in the presence of methane meet the Safety and Health Standards

set forth in 30 CFR 57, specifically 57.22601 through 57.22608, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0435 -- Electric Motor-Driven Mine Equipment and Accessories

Documentation showing that electric motor-driven equipment and accessories meet the Safety and Health Standards set forth in 30 CFR 18, specifically 18.4 and 18.13 to the extent applicable for the GROA. (TECHNICAL REVIEW COMPONENT)

RC0436 -- Diesel Mine Locomotives

Documentation showing that diesel mine locomotives meet the Safety and Health Standards set forth in 30 CFR 31, 31.1, 31.3(d) and 31.6(c), to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0437 -- Mobile Diesel-Powered Equipment for Noncoal Mines

Documentation showing that the mobile diesel-powered equipment meets the Safety and Health Standards set forth in 30 CFR 32, 32.1, 32.3(d) and 32.6(c), to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0438 -- Mobile Diesel-Powered Transportation Equipment

Documentation showing that mobile diesel-powered transportation equipment meets the Safety and Health Standards set forth in 30 CFR PART 36 to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0439 -- Compressed Air and Boilers

Documentation showing that all pressure vessels and boilers meet the Safety and Health Standards set forth in 30 CFR 57, Subpart L, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0440 -- Machinery and Equipment, Safety Devices and Maintenance Requirements

Documentation showing that the design, installation, and maintenance of safety devices installed on equipment meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.14100 through 57.14162, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0441 -- Safety Practices and Operational Procedures

Documentation showing that safety practices and operational procedures for equipment meet the Safety and

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Health Standards set forth in 30 CFR 57, specifically 57.14200 through 57.14219, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0442 -- Equipment

Documentation showing that all methane monitoring and control equipment requirements meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.22301 through 57.22315, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0445 -- Telephones and Signaling Devices

Documentation showing that all telephones and signaling devices meet to the extent applicable, the Safety and Health Standards set forth in 30 CFR 23, specifically 23.1 through 23.14. (TECHNICAL REVIEW COMPONENT)

RC0446 -- Methane Monitoring Systems

Documentation showing that all methane monitoring systems meet the Safety and Health Standards set forth in 30 CFR 27, specifically 27.1 through 27.41. to the extent applicable for the underground facility at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0447 -- Signaling

Documentation showing signaling procedures used in personnel hoisting systems meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19090 through 57.19096, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0448 -- Two-way Communication Equipment for Underground Operations

Documentation showing that all two way communications equipment for underground operations meet the Safety and Health Standards set forth in 30 CFR 57, 57.20032, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0450 -- Ground Control - Scaling and Support - Surface and Underground

Documentation showing that ground control, scaling and support both for the surface facilities and underground meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.3200 through 57.3203, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0451 -- Ground Control - Scaling and Support - Underground Only

Documentation showing that ground control, scaling and support for the underground facility meets the Safety and Health Standards set forth in 30 CFR 57, 57.3360 to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0452 -- Ground Control - Precautions - Surface and Underground

Documentation showing that the precautionary methods for ground control meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.3400 through 57.3401 to the extent applicable for the surface and underground facilities at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0453 -- Ground Control - Precautions - Surface only

Documentation showing that the precautionary methods for ground control in the surface facilities meet the Safety and Health Standards set forth in 30 CFR 57, 57.3430, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0454 -- Ground Control - Precautions - Underground Only

Documentation showing that the precautionary methods for ground control in the underground facilities meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.3460 through 57.3461, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0455 -- Appendix I for Subpart M - National Consensus Standards

Documentation showing that the falling object protection meets the Safety and Health Standards set forth in 30 CFR 57, SUBPART M, APPENDIX I, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0456 -- Retaining Dams

Documentation showing that retaining dams meet the Safety and Health Standards set forth in 30 CFR 57, 57.20010, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0457 -- Unattended Mine Openings

Documentation showing that unattended mine openings meet

the Safety and Health Standards set forth in 30 CFR 57, 57.20020, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0458 -- Abandoned Mine Openings

Documentation showing that abandoned mine openings meet the Safety and Health Standards set forth in 30 CFR 57, 57.20021, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0460 -- Fire Prevention and Control - Electrical

Documentation showing that all electrical cables and circuitry meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4011 and 57.4057, to the extent applicable for both surface and underground facilities at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0461 -- Fire Prevention and Control - Prohibitions/Precautions/Housekeeping

Documentation showing that to the extent applicable, fire prevention controls meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4100 through 57.4161, for both surface and underground facilities at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0462 -- Firefighting Equipment

Documentation showing that all firefighting equipment for surface and underground areas meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4200 through 57.4263, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0463 -- Firefighting Procedures/Alarms/Drills

Documentation showing that the firefighting procedures, alarms, and drills meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4330 through 57.4363, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0464 -- Flammable and Combustible Liquids and Gases

Documentation showing that storage and use of flammable and combustible gases meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4400 through 57.4463, to the extent applicable on the surface and underground at the GROA. (TECHNICAL REVIEW COMPONENT)

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RC0465 -- Fire Prevention - Installation/Construction/Maintenance

Documentation showing that all equipment installation and maintenance that can be classified as a potential fire hazards meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4500 through 57.4561, to the extent applicable in both the surface and underground facilities at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0466 -- Fire Prevention - Welding/Cutting/Compressed Gases

Documentation showing that all welding, cutting, and the use of compressed gases meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.4600 through 57.4660, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0467 -- Fire Prevention - Ventilation Control Measures

Documentation showing that ventilation measures for the underground facility meets the Safety and Health Standards set forth in 30 CFR 57, 57.4760 and 57.4761, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0468 -- Fire Prevention and Control

Documentation showing that smoking and the presence of open flames in the presence of Methane meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.22101 through 57.22105, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0470 -- Air Quality - Surface and Underground

Documentation showing that surface and underground air quality meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.5001 through 57.5006, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0471 -- Air Quality - Surface Only

Documentation showing that surface air quality meets the Safety and Health Standards set forth in 30 CFR 57, 57.5010 to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0472 -- Air Quality - Underground Only

Documentation showing that underground air quality meets the Safety and Health Standards set forth in 30 CFR 57,

57.5015 and 57.5016, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0473 -- Radiation - Underground Only

Documentation showing that the Radon gas monitoring provisions for the underground facility meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.5037 through 57.5046, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0474 -- Physical Agents - Surface and Underground

Documentation showing that the noise exposure limits for the surface and underground facilities meets the Safety and Health Standards set forth in 30 CFR 57, 57.5050, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0475 -- Ventilation - Surface and Underground

Documentation showing that the surface and underground ventilation systems meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.8518 through 57.8519, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0476 -- Ventilation - Underground Only

Documentation showing that the underground ventilation system meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.8520 through 57.8535, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0477 -- Ventilation

Documentation showing that ventilation requirements in the presence of methane at the GROA meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.22201 through 57.22241, to the extent applicable. (TECHNICAL REVIEW COMPONENT)

RC0480 -- Aerial Tramways

Documentation showing that the construction, operation, and maintenance of aerial tramways meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.10001 through 57.10010, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0481 -- Hoists

Documentation showing that the personnel hoists meet

the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19001 through 57.19018, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0482 -- Wire Ropes

Documentation showing that wire ropes used for personnel hoisting meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19019 through 57.19030, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0483 -- Headframes and Sheaves

Documentation showing that the headframes and sheaves used for personnel hoisting meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19035 through 57.19038, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0484 -- Conveyances

Documentation showing that all conveyances used for personnel hoisting meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19045 through 57.19054, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0485 -- Hoisting Procedures

Documentation showing the procedures employed to hoist personnel meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19055 through 57.19083, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0486 -- Shafts

Documentation showing that the shaft systems, equipment and procedures used for personnel hoisting meet the Safety and Health Standards set forth in 30 CFR 57, 57.19100 through 57.19111, to the extent possible at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0487 -- Inspection and Maintenance

Documentation showing that inspection and maintenance equipment and procedures used for personnel hoisting meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.19120 through 57.19135, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

20

RC0488 -- Electricity - Surface and Underground

Documentation showing that the surface and underground electrical service meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.12001 through 57.12053, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0489 -- Electricity - Surface Only

Documentation showing that the surface electrical service meets the Safety and Health Standards set forth in 30 CFR specifically 57, 57.12065 through 57.12071, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0490 -- Electricity - Underground Only

Documentation showing that the underground electrical service meets the Safety and Health Standards set forth in 30 CFR 57, specifically 57.12080 through 57.12088, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0491 -- Illumination

Documentation showing that illumination systems on the surface and underground meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.17001 and 57.17010, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0492 -- Illumination - Methane Standard

Documentation showing that personal illumination lamps in the presence of methane meet the Safety and Health Standards set forth in 30 CFR 57, 57.22501, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0493 -- Materials Storage and Handling

Documentation showing that the storage and handling of materials meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.16001 through 57.16017, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0494 -- Carbon Tetrachloride

Documentation showing that Carbon Tetrachloride will not be used at the GROA in accordance with the Safety and Health Standard set forth in 30 CFR 57, 57.20005. (TECHNICAL REVIEW COMPONENT)

21

RC0495 -- Barricades and Warning Signs

Documentation showing that barricades and warning signs be incorporated at the GROA to meet the Safety and Health Standards set forth in 30 CFR 57, 57.20011, to the extent applicable. (TECHNICAL REVIEW COMPONENT)

RC0496 -- Labeling of Toxic Materials

Documentation showing that toxic materials are labeled as such to meet the Safety and Health Standards set forth in 30 CFR 57, 57.20012, to the extent applicable. (TECHNICAL REVIEW COMPONENT)

RC0497 -- Mine Categorization

Documentation showing that mine characterization requirements meet the Safety and Health Standards set forth in 30 CFR 57, specifically 57.22003 through 57.22005, to the extent applicable at the GROA. (TECHNICAL REVIEW COMPONENT)

RC0498 -- Analytical and Investigative Methods

Description and documentation of the analytical and/or the investigative methods used to develop each Technical Review Component, rationale for use of each of these methods, and evidence to support the contention that each of these methods is applicable. (TECHNICAL REVIEW COMPONENT)

RC0499 -- Verification of Data

Verification that data have been collected and/or qualified in accordance with an approved quality assurance program meeting the requirements of 10 CFR Part 50, Appendix B. (TECHNICAL REVIEW COMPONENT)

EP0500 -- Deviation from Design Requirements

ANY DEVIATION FROM RELEVANT DESIGN REQUIREMENTS IN 30 CFR, CHAPTER I, SUBCHAPTERS D, E, AND N HAS BEEN JUSTIFIED IN ORDER TO REBUT THE PRESUMPTION THAT THIS REQUIREMENT HAS NOT BEEN MET. {A Portion of 10 CFR 60.131(b)(9)}

Technical Review Components for EP0500

TS0500 -- None

Rationale for Logical Relationships of Regulatory Elements of Proof Sets

10 CFR 60.131(b)(9) is the primary Regulatory Requirement of RR0080. This text has a logical "AND" relationship with 10 CFR 60.21 (c)(1)(ii)(E). Both of these citations address "Important to Safety" and 10 CFR 60.131(b)(9) references mining safety (Reference 10). These two regulations are in turn supplemented by the regulation 10 CFR 60.130 which denotes DOE responsibilities for omissions of specific items that are important to safety. Therefore, these Regulatory Elements of Proof are all in a logical "AND" relationship. The referenced mining regulations from 30 CFR, Chapter I, Subchapters B and N have a logical "OR" relationship with the deviation from design requirements element of proof, EP0500. The referenced mining regulations appear as Technical Review Components and are associated with EP0400. R.L. Wilbur, 11 October 1990

References for PS Logical Relationships Rationale

(10) 30 CFR, Chapter I -- Mine Safety and Health Administration, Department of Labor, Subchapters B and N, Code of Federal Regulations, July 1, 1990.

Rationales for Logical Relationships of Technical Review Components Set

Three TRCs appear under EP0200 requesting information on the identification and analysis of the major design structures, systems, and components of the geologic repository operations area. Once analyzed, a list of structures, systems, and components important to safety will be identified. This is generated in the design phase and the evaluation is included in Safety Analysis Report. R.L. Wilbur, 3 October 1990

No TRCs are listed for EP0300 at this time. This element of proof states that DOE is responsible for any omissions in safety features for the repository. If during the license review, omissions are found, they will be noted and referenced to the appropriate Regulatory Requirement. R.L. Wilbur, 11 October 1990

The TRC set of referenced mining regulations appear under EP0400 and apply to design, construction, operations, and personnel health and safety. The Center has taken the position that construction is not a function of the repository. However, construction will be ongoing during operations, and personnel safety can affect the performance of systems that relate to radiological safety. It is important to include the relationship between design, operation and performance with personnel safety to ensure that the performance objectives will be met.

For a complete assessment of the performance of structures, systems, and components important to safety, the design of the GROA must include an analysis of the design considering the operating environment, worker safety, and the performance of the system under normal and accident conditions. 10 CFR 60.131(b)(9) references 30 CFR for the necessary worker safety regulations that will complete the design evaluation process. R.L. Wilbur, 11 October 1990

The referenced mining regulations that appear in TRC0401 through TRC0499 are all listed in a logical "AND" configuration at this time. The actual logic and applicability of each of these TRCs will become apparent at the time of the license application. The TRCs are grouped logically under the following topics:

RC0401 through RC0420 -- Personnel Protection
RC0421 through RC0434 -- Explosives
RC0435 through RC0442 -- Equipment & Locomotion
RC0445 through RC0448 -- Telephone & Signaling Devices
RC0450 through RC0458 -- Ground Control
RC0460 through RC0468 -- Fire Protection
RC0470 through RC0477 -- Air Quality & Ventilation
RC0480 through RC0487 -- Personnel Hoists
RC0488 through RC0492 -- Electrical & Illumination
RC0493 through RC0499 -- Miscellaneous.

The applicant would not be required to provide the information with any particular TRC in this set if (1) the structure, system, or component which is affected can be shown not to be important to safety; or (2) the lack of worker protection can be shown to have no deleterious effect on the structure, system, or component important to safety; or (3) the structure, system, or component does not exist in the design presented in the license application. R.L. Wilbur, 3 October 1990

No TRCs are listed for EP0500 at this time. This requires a justification for any deviation in relevant design requirements. Nothing needs to be added to strengthen this statement in the way of technical data or analysis. Therefore this end point has no TRCs. R.L. Wilbur, 11 October 1990

Rationales for Individual Technical Review Components of TS0200

RC0210 -- Identification of the Major Design Structures, Systems and Components

The major structures, systems, and components of the GROA must be identified prior to being analyzed. This may be iterative as some systems may not be initially identified but become so when an ancillary system is being analyzed. R.L.Wilbur, 3 October 1990

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RC0220 -- Performance Analysis of the major design structures, systems, and components

The performance of each major structure, system, and component must be analyzed to determine if it is important to safety. If so, it must be listed and correlated to the appropriate regulatory text. R.L. Wilbur, 3 October 1990

RC0230 -- Identification of Items Important to Safety

The structures, systems, and components important to safety must be clearly identified for design purposes and personnel safety. R.L. Wilbur, 11 October 1990

RC0240 -- Analytical and Investigative Methods

The technical results presented to satisfy the Technical Review Components can be no stronger than the analytical methods, calculations and assumptions made to arrive at the results. It is important to describe and document the methods to assure their applicability. R. L. Wilbur, 11 October 1990

RC0250 -- Verification of Data

Data acquired through investigations, experiments, and analytical calculations must be verified to substantiate the technical results. When the data has been verified, the methods documented, the technical results are on much firmer ground. R.L. Wilbur, 11 October 1990

Rationales for Individual Technical Review Components of TS0400

RC0401 -- General Provisions for Respirators and Gas Masks

Respirators and gas masks used at the GROA must be approved for use in hazardous atmospheres. While the hazards are not defined at present, NRC will not have a regulatory position over their acquisition, so therefore, it is important that they be approved for use to ensure personnel safety. R.L. Wilbur, 11 October 1990

RC0402 -- Approval and Disapproval of Respirators and Gas Masks

To ensure that the respirators and gas masks used at the GROA have been properly selected, certification of approval for each of the regulators must accompany the units and be filed at the GROA. R.L. Wilbur, 11 October 1990

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RC0403 -- Classification of Approved Respirators

Respirators and gas masks must be type-approved and installed in the appropriate location to ensure that the respirator or mask is proper for the environment. R.L. Wilbur, 3 October 1990

RC0404 -- Electric Cap Lamps

Electric cap lamps must be of the approved type for use at the GROA. This may include units that are acceptable for use in the presence of methane. R.L. Wilbur, 3 October 1990

RC0405 -- Electric Mine Lamps other Than Standard Cap Lamps

Mine lamps must be of the approved type for use at the GROA. This includes parameters such as intensity, directivity, capacity, and may include units that are acceptable for use in the presence of methane. R.L. Wilbur, 11 October 1990

RC0406 -- Traffic Safety

Documentation, posting and warnings appropriate to the operating procedures for self-propelled equipment are necessary to create an established safe environment in and around this equipment during operation. R.L. Wilbur, 11 October 1990

RC0407 -- Transportation of Persons and Materials

This regulatory texts denotes how persons and materials will be moved on the surface and underground to prevent accidents and loss of materials. These mandatory safety rules have been in use for years in and around mines and should be observed at the GROA. R.L. Wilbur, 11 October 1990

RC0408 -- Safety Devices, Provisions & Procedures for Roadways

These regulatory texts include the necessary roadside safety regulations that are necessary to protect equipment and personnel from industrial accidents. R.L. Wilbur, 11 October 1990

RC0409 -- Travelways and Escapeways - Surface and Underground

These regulations denote safe means of access where required for personnel safety. Walkways, ladders, and stairs must be provided wherever personnel are working. Their ability to move safely and rapidly may be vital to their well being. R.L. Wilbur, 11 October 1990

RC0410 -- Travelways - Surface Only

These texts denote the safety requirements for hand and guardrails on ladders, scaffolds, and stairs in the surface facility for personnel safety. R.L. Wilbur, 11 October 1990

RC0411 -- Travelways - Underground Only

General established safety features for underground ladderways, manways, and trapdoors are included for personnel protection, particularly around openings. R.L. Wilbur, 11 October 1990

RC0412 -- Escapeways - Underground Only

Means of safe egress from the underground facility are denoted for escapeways, refuges, escape routes. These are important for both radiological and non-radiological accident conditions. R.L. Wilbur, 3 October 1990

RC0413 -- Personal Protection

This section of regulatory text details the personal equipment necessary to work safely on the surface and underground at mines. There are no provisions for the NRC to regulate the inclusion of hardhats, safety shoes, and other protective equipment, so the regulation is included here. R.L. Wilbur, 11 October 1990

RC0414 -- Safety Programs - Surface and Underground

Indoctrination of workers in the general and specific safety rules and work procedures in and around equipment in a mine environment is important for personnel safety. R.L. Wilbur, 11 October 1990

RC0415 -- Safety Programs - Surface Only

This regulation states that working alone in a hazardous location is prohibited. This is a general safety regulation and would most likely be regulated by OSHA. R.L. Wilbur, 11 October 1990

RC0416 -- Safety Programs - Underground Only

This regulatory text prohibits working alone underground and that all underground workers be trained for mine emergencies. While the underground facility is not a mine, the training would be identical. Additional radiological safety for underground workers would supplement this training. R.L. Wilbur, 3 October 1990

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RC0417 -- Intoxicating Beverages and Narcotics

This regulation bans the use of, or being under the influence of, either drugs or alcohol on the job. This is obvious for personnel safety particularly in a minelike environment and a high-level waste repository. R.L. Wilbur, 11 October 1990

RC0418 -- Potable Water

This regulation states that all drinking water and ice for workers be potable for the well-being of the workers. R.L. Wilbur, 3 October 1990

RC0419 -- Housekeeping

General industrially accepted housekeeping methods and practices will remove many of the incidental accidents and hazards to workers. R.L. Wilbur, 11 October 1990

RC0420 -- Prohibited Areas for Food and Beverages

This regulation prohibits eating in restrooms and areas where toxic materials exist to prevent contamination of food or drink for obvious safety reasons. R.L. Wilbur, 11 October 1990

RC0421 -- Requirements for Approval of Explosives

This requirement will ensure that the licensee will purchase approved explosives for blasting in a mining environment. R.L. Wilbur, 11 October 1990

RC0422 -- Explosive Storage - Surface and underground

This text denotes that all explosives and detonators will be stored in magazines for obvious safety reasons. R.L. Wilbur, 3 October 1990

RC0423 -- Explosive Storage - Surface Only

This regulatory text gives the safety requirements for constructing, locating, and the application of warnings to the explosive storage magazines located on the surface. R.L. Wilbur, 3 October 1990

RC00424 --Explosive Storage - Underground Only

This text denotes additional requirements for the magazines that are used in the underground facility. In the underground facility, explosives and detonators must be stored in widely separated magazines for worker safety. R.L. Wilbur, 3 October 1990

RC0425 -- Explosives: Transportation - Surface and Underground

These regulatory texts list the long established safety rules for transporting explosives and detonators both on the surface and underground to protect equipment and more importantly personnel. R.L. Wilbur, 12 October 1990

RC0426 -- Explosives: Transportation - Surface Only

Vehicles containing explosives/detonators shall not be left unattended on the surface except in the blasting areas. This rule has both security and safety ramifications. R.L. Wilbur, 12 October 1990

RC0427 -- Explosives: Transportation - Underground Only

This text denotes the safety procedures for the transportation of explosives on hoists and underground vehicles. R.L. Wilbur, 4 October 1990

RC0428 -- Explosives: Use - Surface and Underground

These regulatory texts are nearly a step-by-step instruction set for training, supervision of, care of explosives in preparation for use, and blasting to ensure personnel safety in the mine environment. R.L. Wilbur, 12 October 1990

RC0429 -- Explosives: Use - Underground

Warnings, handling of misfires, and blasting in shafts are safety procedures covered that are specific to the underground environment and supplement the safety rules discussed in TRC0428. R.L. Wilbur, 12 October 1990

RC0430 -- Explosives: Ammonium Nitrate Blasting Agents - Surface and Underground

These regulatory texts cover the safety procedures that must be observed, particularly those dealing with static electricity when handling, storing, and using these specialized blasting agents. R.L. Wilbur, 12 October 1990

RC0431 -- Explosives: Ammonium Nitrate Blasting Agents - Underground Only

This text prohibits "formulating" this blasting agent underground for personnel safety. R.L. Wilbur, 12 October 1990

RC0432 -- Miscellaneous: Surface and Underground Explosive Precautions

Smoking, heating devices, and open flames restrictions are denoted to prevent inadvertent ignition of explosives or fuses which could kill or injure personnel. R.L. Wilbur, 12 October 1990

RC0433 -- Blasting Underground in Hazardous Areas

In hazardous underground areas, where an accumulation of loose material or hazardous atmospheres exist, people must be moved to a safe area prior to blasting. R.L. Wilbur, 12 October 1990

RC0434 -- Explosives

These regulatory texts denote the safety rules that apply to blasting in the presence of methane gas. These safety rules supplement the general safety rules for explosives that are covered in TRC0428. R.L. Wilbur, 12 October 1990

RC0435 -- Electric Motor-Driven Mine Equipment and Accessories

These regulatory texts mandate that the electric motor-driven equipment be either explosion-proof or include intrinsically safe circuits for use in a mining atmosphere for personnel safety. R.L. Wilbur, 12 October 1990

RC0436 -- Diesel Mine Locomotives

This text denotes that for safe operation of diesel powered locomotives underground, the units must be type approved for the environment anticipated. This leaves some latitude between the requirements for mines with and without methane gas. R.L. Wilbur, 12 October 1990

RC0437 -- Mobile Diesel-Powered Equipment for Noncoal Mines

This text denotes the safety regulations for use in noncoal mines where the hazards differ from gassy mines. The equipment used should be approved for use at the GROA both on the surface and underground. R.L. Wilbur, 12 October 1990

RC0438 -- Mobile Diesel-Powered Transportation Equipment

Safety provisions for transportation equipment used in a gassy noncoal mine to transport excavation materials , and supplies in the underground facility should be approved for this use. R.L. Wilbur, 12 October 1990

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RC0439 -- Compressed Air and Boilers

All pressure vessels used for compressors and boilers must meet the ASME pressure vessel code for use on the surface and underground. Additional safety procedures regarding use are included for safety. R.L. Wilbur, 4 October 1990

RC0440 -- Machinery and Equipment, Safety Devices and Maintenance Requirements

This text denotes the required safety equipment (e.g. brakes, safety glass, guard shields) that must be installed on machinery to ensure worker safety. R.L. Wilbur, 12 October 1990

RC0441 -- Safety Practices and Operational Procedures

This text denotes the safety procedures that must be followed around the equipment both on the surface and underground to ensure the safety of workers. R.L. Wilbur, 4 October 1990

RC0442 -- Equipment

This text describes the necessary safety equipment that must be in place to monitor and control equipment in an underground facility in the presence of methane to protect personnel. R.L. Wilbur, 12 October 1990

RC0445 -- Telephones and Signaling Devices

This text denotes the necessary requirements for approval of telephones and signaling devices to be used in a mining environment for personnel safety. This includes units that are rugged, easy to use and explosion proof. R.L. Wilbur, 12 October 1990

RC0446 -- Methane Monitoring Systems

These texts denote the necessary design requirements for approval of methane monitoring equipment to be used in a mining environment for safety of personnel. R.L. Wilbur, 12 October 1990

RC0447 -- Signaling

Safety provisions for signaling in the personnel hoisting systems are denoted in this regulatory text. This text also describes the training of hoist operators in the use of the signaling equipment and procedures for personnel safety. R.L. Wilbur, 4 October 1990

RC0448 -- Two-way Communication Equipment for Underground Operators

This text denotes that two-way telephones will be used for underground to surface communication and that the equipment comes with the appropriate instructions for use. This two-way link is important not only for normal operations, but is extremely important in accident or emergency situations. R.L. Wilbur, 12 October 1990

RC0450 -- Ground Control - Scaling and Support - Surface and Underground

This text denotes the equipment and safety procedures that must be utilized to reduce the hazards of falling materials in the underground facility for personnel safety. R.L. Wilbur, 12 October 1990

RC0451 -- Ground Control - Scaling and Support - Underground Only

Safety procedures for the control of shifting ground where personnel work and travel are denoted in this text. Support systems must be installed to compensate for the shifting ground and maintained to eliminate hazards caused by wear and tear. R.L. Wilbur, 12 October 1990

RC0452 -- Ground Control - Precautions - Surface and Underground

This text covers the safety regulations that must be followed in the corrective action of removing hazardous material in the underground facility for personnel safety. R.L. Wilbur, 4 October 1990

RC0453 -- Ground Control - Precautions - Surface Only

This text covers the safety procedures for workers and equipment operators in the vicinity of highwalls or banks to prevent crushing or otherwise injuring workers. R.L. Wilbur, 4 October 1990

RC0454 -- Ground Control - Precautions - Underground Only

Underground maintenance of equipment and procedures to reduce rock bursts are the topics of this regulatory text. Personnel safety underground after a rock burst may be compromised if a rock burst control plan is not in effect. R.L. Wilbur, 12 October 1990

RC0455 -- Appendix I for Subpart M - National Consensus Standards

This appendix references SAE and ANSI standards for falling object protection on machinery and equipment for personnel safety. Most of these personnel safety features, such as roll over bars, backup horns, etc. are standard OSHA approved safety devices to ensure that personnel are protected. R.L. Wilbur, 12 October 1990

RC0456 -- Retaining Dams

When retaining dams are used, substantial construction must be used to prevent a hazardous situation from forming endangering equipment and personnel. R.L. Wilbur, 12 October 1990

RC0457 -- Unattended Mine Openings

This text denotes all access to unattended mine openings shall be restricted for personnel safety. R.L. Wilbur, 4 October 1990

RC0458 -- Abandoned Mine Openings

This text states that abandoned mine openings be closed or fenced off to prevent personnel from falling in, an obvious safety precaution. R.L. Wilbur, 12 October 1990

RC0460 -- Fire Prevention and Control - Electrical

This text addresses the safety requirements for abandoned electrical circuits and underground cables to prevent inadvertent contact with personnel. R.L. Wilbur, 12 October 1990

RC0461 -- Fire Prevention and Control - Prohibitions/Precautions/Housekeeping

This text denotes the safety measures required regarding smoking, open flames, refueling vehicles, accumulation of wastes around electric substations and fan assemblies. General housekeeping for safety reasons, reduces the potential for hazards, and this promotes personnel safety. R.L. Wilbur, 12 October 1990

RC0462 -- Firefighting Equipment

Firefighting equipment that must be in place to fight fires that endanger equipment and personnel are denoted in these regulatory texts. The timely response to a fire situation is mandatory for personnel safety, particularly underground. R.L. Wilbur, 12 October 1990

RC0463 -- Firefighting Procedures/Alarms/Drills

Fire alarms, drills, and procedures to warn and protect personnel all enhance personnel safety by instructing them how to react and where to move in an emergency. R.L. Wilbur, 12 October 1990

RC0464 -- Flammable and Combustible Liquids and Gases

This regulatory text describes the requirements for storage and use of flammable liquids and gases on the surface and in the underground facility for personnel safety. R.L. Wilbur, 4 October 1990

RC0465 -- Fire Prevention - Installation/Construction/Maintenance

This text denotes the restrictions on heat sources, fuel lines, conveyors, fan installations for fire prevention on equipment and enhancing personnel safety. R.L. Wilbur, 12 October 1990

RC0466 -- Fire Prevention - Welding Cutting/Compressed Gases

This text lists the restrictions on the storage and use of welding equipment in and around a mine. Arcs, open flames, and bottled gases are all safety hazards that must be controlled particularly underground. R.L. Wilbur, 12 October 1990

RC0467 -- Fire Prevention - Ventilation Control Measures

This text denotes the ventilation requirements including doors and suppression systems to prevent the spread of fires in the underground facility. Fire spread in the underground facility can potentially endanger all workers underground. Proper ventilation plans will enhance personnel safety. R.L. Wilbur, 12 October 1990

RC0468 -- Fire Prevention and Control

Smoking and the presence of open flames restrictions pertaining to the presence of methane in mines is the topic of this text. Additional restrictions for safety include banning smoking materials, and lighters underground. R.L. Wilbur, 12 October 1990

RC0470 -- Air Quality - Surface and Underground

The personnel exposure limits to airborne contaminants on the surface and in the underground facility are described in the regulatory text to define safe limits for personnel safety. R.L. Wilbur, 12 October 1990

RC0471 -- Air Quality - Surface Only

This text limits the concentration of silica in abrasive blasting in the surface facilities. Long term medical problems can occur to workers if airborne silica is not properly controlled. R.L. Wilbur, 12 October 1990

RC0472 -- Air Quality - Underground Only

This text sets the limits on the concentration of silica in abrasive blasting and also denotes the minimum oxygen concentration underground to ensure personnel safety. Airborne silica can cause serious long term medical problems. R.L. Wilbur, 12 October 1990

RC0473 -- Radiation - Underground Only

This text denotes the exposure monitoring, exposure records, and possible use of respirators in underground facilities where radon daughters exist. The presence of Radon and inhalation of Radon daughters are a radiological problem in mines and NRC must have this data to include with their HLW radiation exposure data to ensure that personnel safety is maintained and the performance objectives are met. R.L. Wilbur, 12 October 1990

RC0474 -- Physical Agents - Surface and Underground

This text limits the sound level exposure to workers on the surface and in the underground facility to safe acceptable levels. R.L. Wilbur, 4 October 1990

RC0475 -- Ventilation - Surface and Underground

This text denotes the ventilation requirements used to ventilate the underground facility. All fans must operate continuously and air quality monitored for personnel safety. R.L. Wilbur, 4 October 1990

RC0476 -- Ventilation - Underground Only

This regulatory text describes the ventilation plan requirements for the underground facility. These plans are the basis for the development of personnel safety plans. The ventilation plans for the GROA are important in that the operations area and the construction area are separate systems and both must meet the fire protection safety plans. R.L. Wilbur, 12 October 1990

RC0477 -- Ventilation

This regulatory text describes the ventilation requirements for various classification of mines in which

methane is present. This regulation will subsequently affect the design of the ventilation systems for personnel safety, particularly if Methane is present. R.L. Wilbur, 12 October 1990

RC0480 -- Aerial Tramways

Regulatory text is included to denote the equipment necessary and safety procedures required for the use of aerial tramways. The utilization of aerial tramways will be limited to the surface facility but still remain a safety problem for personnel and should be addressed. R.L. Wilbur, 12 October 1990

RC0481 -- Hoists

These regulatory texts denote the required equipment and attached safety devices required for use in personnel hoisting to ensure personnel safety. R.L. Wilbur, 12 October 1990

RC0482 -- Wire Ropes

Wire rope specifications used on hoists for personnel hoisting are denoted for the design and safe operation of hoists used to carry workers. R.L. Wilbur, 12 October 1990

RC0483 -- Headframes and Sheaves

Headframes and sheaves used in conjunction with the personnel hoists must have suitable design, suitable clearance and safety features for personnel protection. R.L. Wilbur, 4 October 1990

RC0484 -- Conveyances

This requirement limits the use of personnel travel in buckets to the initial shaft sinking, inspection, maintenance, and repairs. Safe transport of personnel during construction and operations are important to radiological safety as well as general personnel safety. R.L. Wilbur, 12 October 1990

RC0485 -- Hoisting Procedures

These texts denote the equipment requirements, hoist speed limits, and mandatory safety features as well as qualifications for hoist operators, on hoist cages to ensure personnel safety at all times. R.L. Wilbur, 12 October 1990

RC0486 -- Shafts

Safety requirements for the use of, the maintenance on, and shift inspection requirements for the shafts used in personnel hoisting are detailed in this requirement to ensure worker safety. R.L. Wilbur, 12 October 1990

RC0487 -- Inspection and Maintenance

This text outlines the requirements for an inspection, testing and maintenance schedule of the shafts used for personnel hoisting. Inspection and maintenance of the shafts is very important to proper operation of the hoists and ensures personnel safety. R.L. Wilbur, 12 October 1990

RC0488 -- Electricity - Surface and Underground

The text gives the general basic electrical requirements for both the surface and underground facility. References are made to the National Electrical Code for specifics regarding personnel safety. R.L. Wilbur, 4 October 1990

RC0489 -- Electricity - Surface Only

Electrical distribution requirements for the surface facility are denoted to ensure that personnel safety is preserved. R.L. Wilbur, 4 October 1990

RC0490 -- Electricity - Underground Only

Safety of personnel and equipment in the underground facility is the topic of this regulatory text. Insulation, isolation, and proper grounding regulations are given to insure the maximum amount of protection to workers in the underground facility. R.L. Wilbur, 12 October 1990

RC0491 -- Illumination

The illumination requirements for the surface facility and that all personnel must carry individual lamps underground are safety features to protect workers during normal operations and emergency conditions. R.L. Wilbur, 12 October 1990

RC0492 -- Illumination - Methane Standard

All personnel illumination devices underground must be MSHA approved for use in methane environments if methane is present. R.L. Wilbur, 4 October 1990

RC0493 -- Materials Storage and Handling

Safety procedures for the handling and storage of materials, both general and hazardous are denoted by this regulatory text to prevent industrial accidents. R.L. Wilbur, 12 October 1990

RC0494 -- Carbon Tetrachloride

This regulation ensures that Carbon Tetrachloride will not be used at or in a mine. R.L. Wilbur, 4 October 1990

RC0495 -- Barricades and Warning Signs

This regulatory text is included to ensure that barricades and/or warning signs will be utilized in all areas deemed hazardous to ensure worker protection. R.L. Wilbur, 12 October 1990

RC0496 -- Labeling of Toxic Materials

All toxic materials used in the construction and operation of the facility must be clearly marked for personnel safety. R.L. Wilbur, 4 October 1990

RC0497 -- Mine Categorization

Mine categorization is included to assist DOE in determining what design criteria may apply to this and any future repository. R.L. Wilbur, 4 October 1990

RC0498 -- Analytical and Investigative Methods

The technical results presented to satisfy the Technical Review Components can be no stronger than the analytical methods, calculations and assumptions made to arrive at the results. It is important to describe and document the methods to assure their applicability. R. L. Wilbur, 11 October 1990

RC0499 -- Verification of Data

Data acquired through investigations, experiments, and analytical calculations must be verified to substantiate the technical results. When the data has been verified, the methods documented, the technical results are on much firmer ground. R.L. Wilbur, 11 October 1990

References for TS Logical Relationships Rationale and Individual RC Rationales for TS0200 and TS0400

None

Overall Comments/Observations

The last sentence of 10 CFR 60.131(b)(9) was changed from the present wording to the form shown in EP0500 . This portion originally reads as follows:

> "Any deviation from relevant design requirements in 30 CFR, Chapter I, Subchapters D, E, and N will give rise to a rebuttable presumption that this requirement has not been met." R.L. Wilbur, 25 September 1990

POTENTIAL UNCERTAINTIES

Included Potential Uncertainties

UN0001 -- Secondary Effects from Non-Radiological Accidents

Parent Record: 10 CFR 60.131(b)(9)

Uncertainty Type: Regulatory

Text of the Potential Uncertainty

Clarification of the respective roles and areas of regulatory responsibility of the NRC and the OSHA is necessary with regard to non-radiological underground designs, construction, and operations. Such clarification seems especially significant relative to those designs and operations in which a non-radiological failure or accident has, as a potential secondary effect, a radiological exposure or release of radioactive material in the subsurface facility.

This division of responsibility needs to be clearly established to ensure adequate oversight of all potential sources of radiological accidents as well as worker health and safety in the subsurface facility.

Rationale for Inclusion

In 10 CFR 60.131(b)(9), the NRC has chosen to apply to the geologic repository the safety and health standards of the MSHA underground mine regulation, 30 CFR Chapter I, Part 57. Because the repository does not fit the legal definition of a "mine" (Reference 10), those requirements must be enforced by the NRC and/or another agency other than MSHA. This does not present any unusual problems for the NRC with respect to those standards that have to do with the design and operation of underground facilities and equipment important to radiological safety. However, a substantial number of the standards have to do with designs, construction, and operations (including maintenance) that are not directly related to radiological health and safety. This gives rise to questions as to the oversight and regulation of adherence to those non-radiological standards (1) during the evaluation of the license application, (2) during the evaluations of the various applications for amendment, and (3) during the repository construction and operational phases. Those questions include, but are not limited to, the following:

- To what degree is OSHA responsible for the regulation of the non-radiological design, construction, and operational safety of a non-mine underground facility?

- To the extent that OSHA may be responsible, will they recognize and regulate the MSHA standards or only their own standards?

- Will the NRC evaluate, oversee, and regulate non-radiological design, construction, and operational safety to any MSHA standards not regulated by OSHA? If not, what regulatory oversight will be provided and by what agency?

- Which agency (NRC, OSHA or other) will be responsible for the evaluation, oversight, and regulation of non-radiological designs and operations whose failure or whose accident scenarios could produce as a secondary effect, a condition that threatens radiological health and safety?
  D.T. Romine, 26 September 1990

UN0004 -- Inconsistent Reference in 10 CFR 60.131(b)(9)

Parent Record: 10 CFR 60.131(b)(9)

Uncertainty Type: Regulatory

Text of the Potential Uncertainty

10 CFR 60.131(b)(9) references 30 CFR, Chapter I, Subchapters D,E, and N regarding the mining regulations that are necessary to provide worker protection so that performance objectives can be met.

The information located in Subchapters D and E of 30 CFR was moved to Subchapter B at an earlier date. Subchapters D and E are now reserved.

NRC needs to amend 10 CFR 60.131(b)(9) to correctly reference the proper Subchapters in 30 CFR, Chapter I, so that the material covered under the original reference can be located.

Rationale for Inclusion

Compliance with the appropriate mining regulations that include provisions for worker protection is a performance objective and important to safety. The location of these regulations in 30 CFR, Chapter I must be accurate. The fact that 30 CFR was rearranged at an earlier date does

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not necessarily mean that the content was changed, but the reference in 10 CFR 60.131(b)(9) must redirect the reader to the proper location to find the regulatory text from the previous reference. The resolution of this uncertainty will make the reference in 10 CFR 60.131(b)(9) consistent with the text location in 30 CFR, Chapter I. R.L. Wilbur, 12 October 1990

References for Uncertainty Texts and Inclusion Rationales

(10) Memorandum to Robert M. Bernero, ONMSS, from W.C. Parler, OGC; "10 CFR 60.131(b)(9): Compliance with Mining Regulations", NRC, 16 November 1989, pages 1 & 2.

Excluded Uncertainties

UN0002 -- Reference Clarification of 30 CFR Part 57

Parent Record: 10 CFR 60.131(b)(9)

Excluded Uncertainty Text

It is uncertain to what level the inclusion of the referenced 30 CFR 57 is to be invoked. The NRC policy regarding such "subreferences" needs to be made clear. Criteria are needed to determine the lowest level of referenced regulations which are to be incorporated in order to determine the extent of applicability of referenced regulations. NRC must determine if compliance to 10 CFR 60.131(b)(9) and the referenced 30 CFR 57 will include compliance to the subreference to 30 CFR 56.

Rationale for Exclusion

10 CFR 60.131(b)(9) references 30 CFR, Chapter I, Subchapters D, E, & N. Subchapter N invokes 30 CFR 56, "Surface Mining Regulations". This is not as inclusive as 30 CFR 57, "Deep Surface Mining Regulations" (References 10 & 20). The inclusion of 30 CFR 56 which is embedded in 30 CFR 57 as a reference creates an uncertainty as to the level of compliance determination. However, further review indicates that since (1) nothing envisioned at a geologic repository would resemble a surface mine and (2) 30 CFR 57 is a referenced regulation for design purposes only, this uncertainty does not exist in this regulatory requirement. R.L. Wilbur, 23 February 1990

It should be noted that the NRC policy that is the subject of this uncertainty would also apply to referenced regulations in 10 CFR 20, 10 CFR 51, and any EPA standards to be cited (e.g., the revised 40 CFR 191). See RR0004/UN0003. R. L. Wilbur, 13 December 1989

UN0003 -- Scope of Regulation 10 CFR 60.131(b)(9)

Parent Record: 10 CFR 60.131(b)(9)

Excluded Regulatory Text

It is uncertain whether or not the word "design" in 10 CFR 60.131 (b)(9) is intended to imply the inclusion of the word "procedures" that appears in the referenced text of 30 CFR, Chapter I, Subchapter N, Part 57.

NRC needs to clarify whether the parent requirement which specifies design requirements for worker safety is also intended to include the procedural activities that are important to safety.

This uncertainty needs to be clarified so that the appropriate Technical Review Components and Compliance Determination Methods can be formulated to provide the proper and necessary guidance to DOE and planning base for NRC.

Rationale for Exclusion

The text of 10 CFR 60.131(b)(9) denotes that the "design" of the GROA shall include such provisions for worker protection as may be necessary to provide reasonable assurance that all structures, systems, and components can perform their intended functions. It also states that any deviation from design requirements in 30 CFR 57 will give rise to a rebuttable presumption that this requirement has not been met. 30 CFR 57 also includes "procedures" regarding activities in the underground facility that must be met to protect the workers (References 30 & 40). The uncertainty arises in the global definition of design. The designing of the GROA so that structures, systems, and components can perform their intended functions implies that the operations area will be designed for worker protection as well as for operation. Because worker protection is an integral part of the design process, that process must include the appropriate procedures for safe operations in the GROA for all systems important to safety. Therefore, this uncertainty is excluded. R.L. Wilbur, 25 September 1990

Reference for Uncertainty Texts and Exclusion Rationales

(10) Analysis and Evaluation of Regulatory Uncertainties in 10 CFR 60 Subparts B and E, report to NRC by Center for Nuclear Waste Regulatory Analyses, May 1989, Weiner & Patrick, Appendix B, Uncertainty # 76. TDI # T199008200001

(20) Identification and Evaluation of Regulatory and Institutional Uncertainties in 10 CFR Part 60, Volume 2 -- Identification, report to NRC by Center for Nuclear Waste Regulatory Analyses, February 1990, Weiner, Patrick, & Romine, Appendix B, pages B-149 & 150. TDI # T199008200002

(30) Analysis and Evaluation of Regulatory Uncertainties in 10 CFR 60 Subparts B and E, report to NRC by Center for Nuclear Waste Regulatory Analyses, May 1989, Weiner & Patrick, Appendix B, Uncertainty # 75. TDI # T199008200001

(40) Identification and Evaluation of Regulatory and Institutional Uncertainties in 10 CFR Part 60, Volume 2 -- Identification, report to NRC by Center for Nuclear Waste Regulatory Analyses, February 1990, Weiner, Patrick, & Romine, Appendix B, pages B-151 & 152. TDI # T199008200001

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APPENDIX -- REGULATORY REQUIREMENT TEXTS AND RATIONALES

Included Regulatory Text

Primary Regulatory Text

10CFR60 131 (b) (9) January 1, 1990

To the extent that DOE is not subject to the Federal Mine Safety and Health Act of 1977, as to the construction and operation of the geologic repository operations area, the design of the geologic repository operations area shall nevertheless include such provisions for worker protection as may be necessary to provide reasonable assurance that all structures, systems, and components important to safety can perform their intended functions. Any deviation from relevant design requirements in 30 CFR, Chapter I, Subchapters D, E, and N will give rise to a rebuttable presumption that this requirement has not been met.

Rationale for Selection as Primary

This is the stand-alone regulation that addresses "Compliance with mining regulations" in the design criteria for the geologic repository operations area and specifically addresses those structures, systems, and components deemed "important to safety." R.L. Wilbur, 16 August 1990

Associated Regulatory Texts

10CFR60 21 (c) (1) (ii) (E) January 1, 1990

An analysis of the performance of the major design structures, systems, and components, both surface and subsurface, to identify those that are important to safety. For the purposes of this analysis, it shall be assumed that operations at the geologic repository operations area will be carried out at the maximum capacity and rate of receipt of radioactive waste stated in the application.

Rationale for Inclusion

This regulation is associated with this Regulatory Requirement because it addresses structures, systems, and components important to safety and the requirement that an analysis of the above appear in the Safety Analysis Report (SAR) in the License Application. R.L. Wilbur 16 August 1990

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10CFR60 130 January 1, 1990

Sections 60.131 through 60.134 specify minimum criteria for the design of the geologic repository operations area. These design criteria are not intended to be exhaustive, however. Omissions in §§ 60.131 through 60.134 do not relieve DOE from any obligation to provide such safety features in a specific facility needed to achieve the performance objectives. All design bases must be consistent with the results of site characterization activities.

Rationale for Inclusion

Since the design criteria for compliance with mining regulations outlined in 10 CFR 60.131(b)(9) are considered to be minimum requirements, it is important to include 10 CFR 60.130 as associated text to ensure that the scope of the DOE design criteria is sufficient to achieve the performance objectives. R. L. Wilbur, 16 August 1990

Referenced Regulatory Text

30CFR, Chapter I, Subchapter B, July 1, 1989

Rationale for Inclusion

Subchapters D and E are now reserved and the previous regulatory text from these subchapters are now in Subchapter B. Those provisions for worker safety identified in Subchapter B (formerly D & E) appear as referenced to Subchapter B. R.L. Wilbur, 4 September 1990

The regulatory text incorporated by reference in 30 CFR Chapter I, Subchapter B includes provisions for worker protection. This worker protection may be necessary to ensure a safe workplace, particularly underground, so that performance objectives of those items important to safety can be met at the geologic repository operations area.

The items identified which include provisions for worker protection and ensure that structures, systems, and components important to safety can perform their intended functions are briefly discussed below.

1) Respirators and gas masks, Part 11, are not specifically addressed in 10 CFR 60 but they are identified as provisions for worker safety and, therefore, are included here. R.L. Wilbur, 25 September 1990

2) Electric motor-driven mine equipment and accessories, Part 18, represent both a source of combustible products and a source of ignition in a gassy environment.

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Therefore, it is important to include only approved equipment in the geologic repository operations area. R.L. Wilbur, 25 September 1990

3) Electric cap lamps and electric mine lamps, Parts 19, and 20 are not specifically addressed in 10 CFR 60 but they are clearly identified as provisions for worker safety and therefore are included here. R.L. Wilbur, 25 September 1990

4) Telephones and signaling devices, Part 23, are clearly identified as provisions for worker safety. They are not specifically addressed in 10 CFR 60 but the incorporation of type-approved communication equipment is necessary so that the performance objectives can be met. R.L. Wilbur, 25 September 1990

5) Diesel powered equipment such as mine locomotives, mobile equipment, and mobile transportation equipment, Parts 31, 32, and 36, all represent potential hazards to repository workers by virtue of the fuel and ignition sources associated with engine operation. The worker protection afforded by the use of approved equipment may be necessary to provide reasonable assurance that the structures, systems, and components important to safety can perform their intended function. J.M. Burkes, 25 September 1990

The applicant would not be required to demonstrate compliance with the associated Element of Proof if (1) the structure/system/component which is affected can be shown not to be important to safety; or (2) the lack of worker protection can be shown to have no deleterious effect on the structure/system/component important to safety; or (3) the structure/system/component does not exist in the design presented in the license application. R.L. Wilbur, 25 September 1990

30CFR Chapter I, Subchapter N July 1, 1989

Rationale for Inclusion

Subchapter N includes both 30 CFR 56 entitled "Safety and Health Standards - Surface Metal and Nonmetal Mines" and 30 CFR 57 entitled "Safety and Health Standards - Underground Metal and Nonmetal Mines". The regulatory text most applicable and clearly identifiable is 30 CFR 57. R.L. Wilbur, 16 August 1990

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The regulatory text incorporated by reference in 30 CFR Chapter I, Subchapter N includes provisions for worker protection. This worker protection may be necessary to provide reasonable assurance that the identified topics are included in the design criteria of the geologic repository operations area.

The items identified in 30 CFR 57 which include provisions for worker protection and ensure that structures, systems, and components important to safety can perform their intended functions are briefly discussed below.

1) Ground control, scaling and supports, Subpart B, includes provisions for worker safety. It is included here to ensure that any regulatory requirements for worker safety not addressed in RR0003, entitled "Underground Openings", will be included as part of this referenced text. R.L. Wilbur, 25 September 1990

2) Fire prevention and control, Subpart C, is clearly identified as provisions for worker safety. It is included here to ensure that any regulatory requirements for worker safety not addressed in RR0088 entitled "Important to Safety - Fires and Explosions" will be included as part of this referenced text. R.L. Wilbur, 25 September 1990

3) Air Quality, Radiation, and Physical Agents, Subpart D, include provisions for worker safety. Air quality and noise exposure are not specifically addressed in 10 CFR 60 and are included here. Radiation monitoring of Radon gas appearing in this regulatory text may also be addressed in RR0004, entitled "Radiation Exposures and Releases". The worker protection afforded by both of these cited regulations may be necessary to provide reasonable assurance that the structures, systems, and components important to safety can perform their intended functions. R.L. Wilbur, 25 September 1990

4) Explosives, Subpart E, include provisions for worker safety by denoting the regulations for storage, transportation and use of the explosive agents on the repository premises. Since 10 CFR 60 does not address explosives in a mining environment, they appear here as referenced text. E. Tschoepe, 25 September 1990

5) Ventilation, Subpart G, includes provisions for worker safety particularly underground. Additionally, underground facility ventilation requirements are addressed in Regulatory Requirements RR0086, RR0094, and RR0096. The primary regulatory text, 10 CFR 60.133(g), addresses the design of required ventilation functions that must be performed under normal and accident

conditions. The worker protection afforded by these cited regulations may be necessary to provide reasonable assurance that the structures, systems, and components important to safety can perform their intended functions. R.L. Wilbur, 25 September 1990

6) Loading, hauling, and dumping, Subpart H, clearly includes provisions for worker safety. Since 10 CFR 60 does not address these topics, they are included here as referenced text. R.L. Wilbur, 25 September 1990

7) Aerial tramways, Subpart I, is included because it contains equipment design and operating procedures for aerial tramways that may be used to move materials within the repository premises. As such, the safety of the worker could be compromised if the regulations are not observed. It is included here as referenced text. J.M. Burkes, 25 September 1990

8) Travelways and Escapeways, Subpart J, includes provisions for worker protection. These are not discussed in 10 CFR 60 and appear here as referenced text. E. Tschoepe, 25 September 1990

9) Electricity, Subpart K, includes provisions for worker protection. Additionally, RR0090, entitled "Important to Safety - Utility Services", denotes that those utilities must operate under normal and accident conditions. The worker protection afforded by both of these cited regulations may be necessary to provide reasonable assurance that the structures, systems, and components important to safety can perform their intended functions. R.L. Wilbur, 25 September 1990

10) Compressed Air and Boilers, Subpart L, includes provisions for worker protection with respect to the design and used of compressed air and boilers. These topics are not covered in 10 CFR 60 and appear here as referenced text. R.L. Wilbur, 25 September 1990

11) Machinery and equipment, Subpart M, was incorporated because it contains specifications for safety devices and structures that must be installed on equipment for worker safety. As the topic is not addressed in 10 CFR 60, it appears here as referenced text. E. Tschoepe, 25 September 1990

12) Personal Protection, Subpart N, includes provisions for worker safety and protection. While these appear to be industrially related and not nuclear safety directed, the workplace must include all safety features necessary to ensure that a nuclear accident does not occur because of the lack of personal protection. R.L. Wilbur, 25 September 1990

13) Materials storage and handling, Subpart O, includes provisions for worker protection. This topic has no direct counterpart in 10 CFR 60 and is, therefore, addressed here. E. Tschoepe, 25 September 1990

14) Illumination, Subpart P, contains provisions for worker protection. Additionally, RR0090, entitled "Important to Safety - Utility Services", denotes that those utilities must operate under normal and accident conditions. The worker protection afforded by both of these cited regulations may be necessary to provide reasonable assurance that the structures, systems, and components important to safety can perform their intended functions. R.L. Wilbur, 25 September 1990

15) Safety Programs, Subpart Q, was incorporated by reference because it includes provisions for worker protection. Safety programs have no direct counterpart in 10 CFR 60 and are, therefore, addressed here. R.L. Wilbur, 25 September 1990

16) Personnel Hoisting, Subpart R, includes provisions for worker protection. Additionally, shaft conveyances used in radioactive waste handling that are identified as important to safety are the topic of Regulatory Requirement RR0081. The primary regulatory text, 10 CFR 60.131(b)(10), addresses the design of the shaft conveyances used in waste handling to ensure that required safety functions can be performed. It is not overtly apparent that worker safety for personnel hoisting will be adequately covered in RR0081, therefore Subpart R is included in the elements of proof for this RR. R.L. Wilbur, 25 September 1990

17) Miscellaneous, Subpart S, include various provisions for worker safety that do not fit into any of the listed categories in 30 CFR 57. Each is important to worker safety and are not addressed in 10 CFR 60. A list of the titles and section numbers included in the TRCs are shown below.

a) 57.20001 Intoxicating Beverages & Narcotics
b) 57.20002 Potable water
c) 57.20003 Housekeeping
d) 57.20005 Carbon Tetrachloride
e) 57.20010 Retaining dams

f) 57.20011 Barricades and warning signs
g) 57.20012 Labeling of toxic materials
h) 57.20014 Prohibited areas for food & beverages
i) 57.20020 Unattended mine openings
j) 57.20021 Abandoned mine openings
k) 57.20031 Blasting underground in hazardous areas
l) 57.20032 Two-way communications equipment for underground operations.

18) Safety standards for methane in metal and nonmetal mines, Subpart T, includes provisions for worker protection. Safety standards for Methane as identified in Subpart T have no direct counterpart in 10 CFR 60 and are, therefore, addressed here. R.L. Wilbur, 25 September 1990

Specifically, any scenario in which one of the mining regulations may be important to worker safety in the transport, emplacement, or retrieval of high-level waste, the texts which regulate various aspects of personal protection are appropriately included. R.L. Wilbur, 25 September 1990

The applicant would not be required to demonstrate compliance with the associated Element of Proof if (1) the structure/system/component which is affected can be shown not to be important to safety; or (2) the lack of worker protection can be shown to have no deleterious effect on the structure/system/component important to safety; or (3) the structure/system/component does not exist in the design presented in the license application. R.L. Wilbur, 25 September 1990

References for Inclusion Rationales

None

Excluded Regulatory Texts

30 CFR Part 26 July 1, 1989

Rationale for Exclusion

This regulatory text entitled "Lighting Equipment for Illuminating Underground Workings" was considered and excluded from the regulatory requirement because it is specific to coal mines and the provisions therein would not apply to the geologic repository. R.L. Wilbur, 29 August 1990

30 CFR Part 56 July 1, 1989

Rationale for Exclusion

This regulation, 30 CFR Part 56, is embedded in 30 CFR Subchapter N and addresses only surface mining considerations. See RR0080/UN0002, Rationale for Exclusion. R.L. Wilbur, 16 August 1990

References for Exclusion Rationales

None

Included Related Regulatory Texts

None

Excluded Related Regulatory Texts

None