



Department of Energy (Return to W.M. 623-SJ)
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

W.M. Project 101.2

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APR 1 1983

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Dr. Robert J. Wright
Senior Technical Advisor
High Level Waste Technical
Development Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Springs, MD 20910

Dear Dr. Wright:

TRANSMITTAL OF BWIP INFORMATION

The H. J. Miller letter to J. H. Anttonen, dated January 13, 1983, requested additional information on the BWIP Exploratory Shaft construction and sealing program. The J. H. Anttonen to H. J. Miller letter dated February 23, 1983, transmitted the documents noted on Attachment II, Item I - Documents Currently Available and Attached (14 items listed). The February 23 letter also stated that a summary report addressing the questions in the enclosure of your January 13 letter, including factors affecting long term sealing of the shaft and consideration of these factors in the design and construction of the shaft, would be prepared and forwarded to you. This summary report, Attachment I, covers both the initial stage of shaft construction which was addressed in the enclosures to the February 23 letter, and will be better understood in subsequent stages of the shaft construction. The summary report also identifies the project documents for the exploratory shaft development and when they will be available for project use. In addition, as noted in Attachment II, Item II - Documents to be Completed and Forwarded Prior to Drilling Surface Hole (three items listed), the following documents are enclosed:

1. Quality Assurance Program Plan-BWIP - with Appendix A, Document No. RHO-QA-PL-3 Rev 1 L, dated March 1983 (Combined 1 and 2)
2. Morrison-Knudsen Company, Inc., Quality Assurance Program for Contract No. DE-AC06-83RL10343 BWIP - Hanford Site, Richland, Washington, dated December 16, 1982.

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Dr. Robert J. Wright

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APR 1 1983

If you have any questions covering this material, please call R. P. Saget of my staff.

Very truly yours,

R. P. Saget for

O. L. Olson, Project Manager
Basalt Waste Isolation Project Office

BWI:DJS

Attachments

cc, w/attachments:
R. Stein, DOE-HQ
David Pentz, Golder
V. Rajaram, Engineers Inter.
E. Corp, US Bureau of Mines

*Enclosure to
4/1/83 memo from
Olson to Wright*

ATTACHMENT I

A. SHAFT CONSTRUCTION AND SEAL DESIGN CONSIDERATIONS

Comment

Provide an analysis of the potential effects of construction of the exploratory shaft on long-term sealing capabilities of the rock mass and identify factors that determine the nature and extent of such effects.

Response

The major effect of shaft construction on long term sealing capabilities of the rock is its creation of a disturbed rock zone (DRZ) around the periphery of the shaft due to redistribution of stresses after completion of the opening. If not properly sealed, the DRZ could provide a pathway for migration of nuclides from the repository. This is eliminated by the installation of seals at several locations along the length of the shaft. These seals will also prevent communication between major aquifers.

The Reference 1 document provides an analysis of the effects on rock mass permeability associated with the excavation of shafts and tunnels in fractured rock. This document relates to the Exploratory Shaft (ES) primarily from the standpoint of redistribution of stresses around the shaft opening resulting in a DRZ. The DRZ resulting from the drilling of the ES is insignificant compared to the effect from redistribution of stresses. Therefore, the controlling features of the shaft that affect long-term sealing are the shaft seal(s) emplaced upon decommissioning and the DRZ. The DRZ will be characterized as a portion of the ES test program and again after the liner is removed for post-closure sealing. These characterization will consist of measurements of permeability and depth of the zone. Details will be included in the ES Test Plan (Reference 2). Seal performance requirements and design criteria are presented in Reference 3 to be released in July 1983. The performance requirements identified in this document were derived from Nuclear Regulatory Commission (NRC), U.S. Department of Energy (DOE), and Environmental Protection Agency (EPA) regulatory documents. In addition, a test plan (Reference 4) is being prepared to investigate the long term stability of proposed grout materials in the repository environment. This test program will determine the bond strength, permeability, and mechanical properties of various grouts and their degradation, if any, with exposure to temperature, clean basalt rock, mud-contaminated basalt rock, and the liner material.

After completion of the Phase II test program in the ES (Reference 2) and receipt of approval to decommission the facility, the shaft will be backfilled and sealed using the same techniques and procedures currently proposed for sealing the repository.

As currently proposed, a minimum of two 15 foot thick annulus seals will be located in the ES. The two primary isolation seals will be located in the competent basalt above and below tunnel openings in the entablature of the basalt flow.

The methodology used for seal emplacement is described below:

- The integrity of the shaft seal around the liner is tested via portholes and core drilling prior to initiation of liner removal.
- The liner is removed at each seal location.
- Grout and debris are removed from the shaft wall.
- The shaft wall is characterized as to depth and permeability of the DRZ at the seal location.
- The disturbed zone is then injection grouted or removed, if necessary, to eliminate any major pathways around the seal.
- After seal emplacement (cement with basalt aggregate) the shaft is backfilled with crushed basalt to the level of the next seal.

The above procedure is repeated for each seal location until the shaft backfilling is completed.

References

- (1) ONWI-411, Topical Report, Preliminary Evaluation of the Rock Mass Disturbance Resulting from Shaft, Tunnel, or Borehole Excavation, D'Appolonia (7/82)
- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (3) SD-BWI-CR-015, Repository Seal Performance Requirements and Preliminary Seal Design Criteria for a NWRB (7/83*)
- (4) No Number Available, Exploratory Shaft Test Plan for Material Quality Control and Long Term Stability Assessment (7/83*)

Comment

Describe how the selected technique and shaft design accounts for limitations and uncertainties in long-term sealing considerations.

Response

This comment is interpreted as applying to the annulus shaft seals emplaced for long term operation and is addressed accordingly. The

*Expected date when document will be available

ES Test Plan (Reference 2) provides for physical examination of the shaft affected zone through the portholes in the liner. The shaft liner is designed for one and one-half times the hydrostatic head of water from the surface and is inspected to ensure that the fabricated liner meets the design requirements. The liner, grout, and seal ring are designed to last the useful life of the shaft but if problems develop, remedial grouting can be accomplished from inside the shaft. The design of the casing installation and casing cementing (References 5 and 6) ensure an appropriate seal between the casing and the rock formation during the operating phase of the ES. Reference 7 describes the past experience achieved with this type of seal. The blind hole boring technique is the least disruptive method of excavating the shaft. Once the shaft is excavated, the redistribution of stresses around the shaft is the most significant effect on the rock adjacent to the shaft. Therefore, the controlling feature that affects long term sealing during operations is the DRZ. The extent of the DRZ will be determined as a portion of the ES test program.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (5) No Number Available, M-K Procedure for Casing Handling, Aligning, and Running (Note: This procedure will be prepared for the 112" casing initially. A separate procedure will then be developed for the 72" casing.) (6/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (7) No Number Available, Dowell letter report on their chemical seal describing available laboratory test data, performance experience in past applications, and recommendations for further testing/development (published)

Comment

Provide design specifications for the shaft construction and show how they deal with the factors affecting sealing.

Response

The potential leak paths which may affect shaft sealing performance are addressed in Reference 12. The design specifications for the ES are described in References 6, 8, 9, and 13. References 5 and 10 deal with emplacement of the shaft liner and grout. The seal test procedures (Reference 11) deal with evaluation of the effectiveness of the shaft seal and Reference 12 documents this

*Expected date when document will be available

evaluation. The documents referenced describe the seal to be placed and utilized during the operating phase of the ES. The performance requirements of the seal to be utilized for terminal isolation are presented in Reference 3.

References

- (3) SD-BWI-CR-015, Repository Seal Performance Requirements and Preliminary Seal Design Criteria for a NWRB (7/83*)
- (5) No Number Available, M-K Procedure for Casing Handling, Aligning and Running (Note: This procedure will be prepared for the 112" casing initially. A separate procedure will then be developed for the 72" casing.) (6/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (9) B-314-C-X28038, Construction Specification for Casing Field Welding Services (12/82)
- (10) No Number Available, M-K Procedure for Cementing (published)
- (11) No Number Available, Seal Test Procedure (9/83*)
- (12) No Number Available, Shaft Seal Report (1985*)
- (13) B-314-P-S28005, Procurement Specification for 72" ID Steel Casing (published)

Comment

Describe the grout and chemical seal design.

Response

The grout and chemical seal design is described in the construction specification for casing cementing (Reference 6). The procedure for cementing (Reference 10) describes the approach used in placing the grout seal.

References

- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (10) No Number Available, M-K Procedure for Cementing (published)

*Expected date when document will be available

Comment

Discuss the selected locations of the portholes. Include discussion of data on sealing characteristics to be gathered through the portholes.

Response

The supporting document (Reference 14) describes the selected locations for the portholes. The ES Test Plan (Reference 2) describes the tests to be conducted through portholes. The rationale for porthole locations is provided in Reference 14. The seal test procedures (Reference 11) describe the acquisition of data to be gathered through the portholes and the seal test report (Reference 12) will describe the test program conducted and present the data collected. This report will assess the suitability of the sealing technique utilized at the ES.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (11) No Number Available, Seal Test Procedure (9/83*)
- (12) No Number Available, Shaft Seal Report (1985*)
- (14) SD-BWI-TI-119, Exploratory Shaft Test Porthole Configuration (6/83*)

Comment

Limitations and uncertainties associated with the (porthole) data.

Response

Data obtained through portholes will consist of geologic and geomechanics data based on extracted core, geochemical data based on water samples, and hydrologic data obtained via packer tests.

The next revision of the Exploratory Test Plan (due in 7/83) (Reference 2) will include additional discussion on the limitations and uncertainties of the hydrologic data obtainable through porthole testing.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)

*Expected date when document will be available

B: CONSTRUCTION PLANS AND PROCEDURES

Comment

Identify the acceptance criteria for construction of the exploratory shaft.

Response

Specific acceptance criteria are contained in the project construction specifications (References, 5, 6, 8, 9, 13, 15, and 16). System acceptance criteria are contained in Reference 17.

References

- (5) No Number Available, M-K Procedure for Casing Handling, Aligning and Running (Note: This procedure will be prepared for the 112" casing initially. A separate procedure will then be developed for the 72" casing.) (6/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (9) B-314-C-X28038, Construction Specification for Casing Field Welding Services (12/82)
- (14) B-314-P-S28005, Procurement Specification for 72" ID Steel Casing (published)
- (15) B-314-P-S28004, Procurement Specification for 112" ID Steel Casing (published)
- (16) B-314-B-X28028, Procurement Specification for Drilling Mud (published)
- (17) No Number Available, ES Acceptance Test Procedure (10/83*)

Comment

Identify procedures used to minimize damage to the rock penetrated.

Response

The blind boring technique has been selected for shaft drilling (References 8 and 18) as the least damaging of the available methods. The cutters, mounted on the bit body, crush and grind the solid rock as the hole is deepened while exerting minimal pressure on the wall of the hole as drilling advances. Alternate methods of

*Expected date when document will be available

shaft sinking all employ explosives to dislodge and break up the solid rock. Blasting damage, even under controlled conditions, extends below and beyond the shaft perimeter. Irregardless of how the shaft is constructed, stress redistribution around the opening results in a DRZ (Reference 1). This DRZ is a function of the in situ state of stress and the shaft diameter. For construction of the shaft station (breakout), the engineering judgment of personnel experienced in underground mining operations will be employed using established (Reference 19) controlled blasting procedures. Detail procedures covering shaft station breakout requirements will be provided prior to breakout. These procedures will cover requirements for pilot boreholes, blasting technique, amount and depth of explosives, hole spacing, shooting sequence, and monitoring during blasting.

References

- (1) ONWI-411, Topical Report, Preliminary Evaluation of the Rock Mass Disturbance Resulting from Shaft, Tunnel, or Borehole Excavation, D'Appolonia (7/82)
- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (18) No Number Available, M-K Drilling Program (6/83*)
- (19) No Number Available, DuPont Blasters Manual (published)

Comment

Identify liner construction and placement technique. Include information on topics such as: liner type, liner material testing, welding of liner, placement of liner. This information needs to be fully considered in application of any permanent sealing program.

Response

It is assumed that this comment refers to the operational ES liner system and is addressed accordingly.

The liner design and materials specifications, shop welding specifications, and shop inspection and testing procedures are detailed in References 13 and 15. Casing handling, field welding and inspecting, aligning, and installation procedures are documented in References 5, 8, and 9.

References

- (5) No Number Available, M-K Procedure for Casing Handling, Aligning and Running (Note: This procedure will be prepared for the 112" casing initially. A separate procedure will then be developed for the 72" casing.) (6/83*)

*Expected date when document will be available

- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (9) B-314-C-X28038, Construction Specification for Casing Field Welding Services (12/82)
- (13) B-314-P-S28005, Procurement Specification for 72" ID Steel Casing (published)
- (15) B-314-P-S28004, Procurement Specification for 112" ID Steel Casing (published)

C. SEAL OR GROUTING PLAN AND PROCEDURES

Comment

Describe how the grouts and chemical seal are expected to perform in sealing the exploratory shaft. Describe tests done, both laboratory and field, to determine their long-term durability and their compatibility, both chemical and physical, to the host rock environment.

Response

The long term durability of the grout will be assessed as described in Reference 4.

Expanding cement (regulated fill cement) in conjunction with a chemical seal ring, a proprietary product of Dow Chemical, will be used to seal the ES from overlying aquifers during the operating phase. The low permeability expanding cement will provide the major barrier to water movement. The chemical seal ring which is activated by water will be used both above and below the shaft station to provide a gasket-like seal to minimize water in-leakage. The sealing subcontractor, Dowell, has provided a letter report discussing past laboratory testing and actual field experience in sealing boreholes and large diameter shafts (Reference 7). The specification for casing cement is described in Reference 6. The seal described for the ES is planned to be used only during the operating phase. If during the operating phase remedial grouting or repairs are required, then these will be performed from inside the shaft. During the isolation phase another seal will be emplaced which may involve removal of portions of the liner and grout. The seal for terminal isolation has not been designed at this time. Refer to Reference 3 for terminal seal development program.

References

- (3) SD-BWI-CR-015, Repository Seal Performance Requirements and Preliminary Seal Design Criteria for a NWRB (7/83*)

*Expected date when document will be available

- (4) No Number Available, Exploratory Shaft Test Plan for Material Quality Control and Long Term Stability Assessment (7/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (7) No Number Available, Dowell letter report on their chemical seal describing available laboratory test data, performance experience in past applications, and recommendations for further testing/development (published)

Comment

Describe the placement methods to be used including the limitations and uncertainties of the methods.

Response

The construction specification for casing cementing (Reference 6), the procedure for grout emplacement (Reference 10), and the Dowell report (Reference 7) describe the grout and seal placement. One of the objectives of the ES and associated test programs (Reference 2) is to determine limitations and uncertainties of the grout placement method which would be used for the repository shafts.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (7) No Number Available, Dowell letter report on their chemical seal describing available laboratory test data, performance experience in past applications, and recommendations for further testing/development (published)
- (10) No Number Available, M-K Procedure for Cementing (published)

Comment

Describe remedial methods to be used if sealing methods are not adequate.

Response

Reference 20 provides guidance for remedial actions which have been effective in other locations and materials similar to those expected to be encountered at the Hanford Site. Reference 21 provides a description of the currently planned remedial actions for those problems most likely to be encountered based upon the information

contained in Reference 20. Data obtained during shaft excavation will allow further refinement of current plans.

References

- (20) No Number Available, Amchitka Mining History, Fenix and Scisson (1973)
- (21) Letter #R83-0283.1, Contingency Plan for Anomaly Detection and Resolution During Exploratory Shaft Construction (1/83)

D. TESTING AND INSPECTION PLANS AND PROCEDURES

Comment

Describe test and inspection procedures to be used during drilling (e.g., plumbness of hole, drill mud loss, drill bit inspection, etc.) to determine acceptability of the shaft as constructed and to obtain adequate information on this construction technique.

Response

The following test and inspection procedures will be used during drilling:

A. Plumbness of Hole

The plumbness of the drilled hole will be checked every 30 feet of drilled hole using a gyroscopic survey. The actual procedure is contained in Morrison-Knudsen Company, Inc. (M-K) Reference 24 submitted to DOE/Rockwell for review on February 24, 1983.

The tolerances of the plumbness of the hole are: The center of the bottom of the hole shall not be displaced from the center of the top of the hole by more than 3 feet in any direction, and no point on the centerline along the length of the hole shall be more than 2.5 feet from a straight line drawn from the center of the top of the hole to the center of the bottom of the hole.

A graph of the hole deviation will be maintained in the M-K site trailer and updated as new surveys are completed.

B. Drill Mud Loss

The mud level in the pits is monitored at each weir by observing the fluid level as indicated on a staff. The mud engineer and drill crew personnel monitor this level at frequent intervals during each shift. A loss of drilling mud would show up as a net drop in level at the final pit.

A float device to monitor the mud level in either the final section of the mixing tank or the last mud pit is in the final design and early procurement stage. This float device will sound an alarm in the drill rig operating floor should the mud level fall below a preset level.

C. Drill Bit Inspection

The drill bits will be inspected each time the drill string is removed from the hole. There is a planned inspection at the end of the first 100 drilling hours as required by Reference 25. The indicated schedule may be revamped following the first inspection if excessive wear conditions are indicated. Additional inspections will be performed whenever the drilling subcontractor or drilling consultant determines that there could be a problem with the bits. Bit problems usually show up as excessive vibration of the drill rig or a substantial decrease in the penetration rate.

The details of the drill bit inspection program (Reference 26) are currently being defined and reviewed in the M-K BWIP organization and will be submitted to DOE/Rockwell by June 1983.

Reference 22 describes the QA procedures for internal M-K activities; included, also, are procedures for exercising control over subcontractors by the CM. This document has been submitted to DOE-RL for approval. M-K has prepared a drilling QA (inspection) plan (Reference 18), which has been submitted to Rockwell for review.

Rockwell QA has prepared surveillance plans for drilling activities (Reference 23). Additional surveillance plans will be available for post-drilling activities by 6/30/83.

QA technical requirements for sealing will be incorporated in Reference 3.

References

- (3) SD-BWI-CR-015, Repository Seal Performance Requirements and Preliminary Seal Design Criteria for a NWRB (7/83*)
- (18) No Number Available, M-K Drilling Program (6/83*)
- (22) No Number Available, M-K QA Plan (4/83*)
- (23) RHO-QA-PL-3, Rev. 1 L, Basalt Waste Isolation Project - QA Program Plan (4/83*)
- (24) No Number Available, Sperry Sun Survey Procedure (2/83)
- (25) SD-BWI-AR-003, M-K/BWIP ES Phase I Drilling Program for 144" Hole
- (26) No Number Available, Drill Bit Inspection Program (6/83)

*Expected date when document will be available

Comment

Describe test and inspection procedures to be used after completion of drilling and during the sealing of the shaft. Include information such as caliper surveys, grout injection rate, grout level sensor, cement bond log, thermal measurements during curing, etc.

Response

The following tests and inspections are planned to be made following the completion of drilling on the 144" surface hole:

1. Caliper surveys
 - a. Mechanical survey
 - b. Sonic survey each foot (tentative)
2. The grout injection rate will be monitored by the grouting subcontractor, the method will be presented in the grouting procedure (Reference 31) to be submitted by June 1983.
3. The grout level sensing will be performed by a density log performed through one of the grout lines.
4. The grout bond logs will be performed by a sonic survey (tentative).
5. There are no current plans to perform thermal measurements downhole during the grout curing on the 144" surface hole.

The procedures for items 1 through 4 are being prepared for the 144" surface hole (Reference 27) and will be published by June 1983 for the 110" diameter hole (Reference 28).

Caliper surveys/loggings are performed in conjunction with the drilling operation (Reference 8). Additional precision alignments will be required by Reference 5 (during liner installation). The testing requirements for grout installation are provided in Reference 6. The procedure to be used for grout emplacement is described in Reference 10. The procedure to determine the grout effectiveness and lab testing of cores of the grout emplaced is described in Reference 11. The details of grout injection, grout level sensors, cement bond log will be provided in a shaft seal report as defined in Reference 12. There will be no thermal measurements conducted during curing as these are inappropriate since the grout will be injected under water. The construction inspection and testing will be in accordance with QA program plans listed as References 22 and 23.

References

- (5) No Number Available, M-K Procedure for Casing Handling, Aligning and Running (Note: This procedure will be prepared for the 112" casing initially. A separate procedure will then be developed for the 72" casing.) (6/83*)
- (6) B-314-C-X28048, Construction Specification for Casing Cementing (published)
- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (10) No Number Available, M-K Procedure for Cementing (published)
- (11) No Number Available, Seal Test Procedure (9/83*)
- (12) No Number Available, Shaft Seal Report (1985*)
- (22) No Number Available, M-K QA Plan (4/83*)
- (23) RHO-QA-PL-3, Rev. 1 L, Basalt Waste Isolation Project - QA Program Plan (4/83*)
- (27) No Number Available, Post Drilling Inspection Procedure for 144" Hole (6/83*)
- (28) No Number Available, Post Drilling Inspection Procedure for 110" Hole (6/83*)

Comment

Describe test and inspection procedures to be used after sealing of the shaft to assess the results of the sealing effort in controlling adverse effects. Include information such as grout strength tests, visual identification of seal conditions, records of water inflow, assessment of seal bond to host rock, physical logging of drill holes, photo or t.v. camera methods in all portholes.

Response

The ES Test Plan (Reference 2) lists requirements for assessing the shaft seal. The techniques to be utilized for shaft seal verification will be developed in the Near-Surface Test Facility and will result in a shaft seal test procedure (Reference 11). The results of the shaft seal testing will be documented in the shaft seal report (Reference 12). Photo or television camera logging of the holes drilled through the portholes is not planned at this time. Testing will be conducted in accordance with QA plans listed as References 22 and 23.

*Expected date when document will be available

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (11) No Number Available, Seal Test Procedure (9/83*)
- (12) No Number Available, Shaft Seal Report (1985*)
- (22) No Number Available, M-K QA Plan (4/83*)
- (23) RHO-QA-PL-3, Rev. 1 L, Basalt Waste Isolation Project - QA Program Plan (4/83*)

E. PLANS AND PROCEDURES FOR GATHERING SPECIFIC INFORMATION RELATED TO SITE CHARACTERIZATION

Comment

Describe test plans and procedures used to obtain adequate data on site characteristics that can be measured either directly or indirectly during construction of the exploratory shaft.

Response

The revised ES Test Plan (Reference 2) will describe the tests which will be conducted to characterize the proposed repository site. The objectives presented in the plan are directly related to the work elements in the Site Characterization Report (SCR). The revised ES Test Plan will describe in detail how each objective will be attained and relate how the test results will resolve the applicable work elements of the SCR.

The ES Test Plan (Reference 2) describes the requirements for a principal borehole which will be used to characterize the site prior to construction of an ES. The borehole test report documenting the results of the principal borehole is currently available (Reference 29). A matrix in the ES Test Plan will identify the relevant work elements in the Site Characterization Report which will be addressed during the ES construction and testing. Hydrologic and geomechanics data to be utilized for site characterization will be collected as described in the ES Test Plan (Reference 2) and will be reported in test reports at the conclusion of the ES testing program (References 30 and 31).

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (29) SD-BWI-TI-113, Principal Borehole Report, Borehole RRL-2 (1/83)

*Expected date when document will be available

(30) No Number Available, Hydrologic Test Report (1985*)

(31) No Number Available, Geomechanics Test Report (1985*)

Comment

Will hydrologic conditions (heads) in nearby drill holes be measured during shaft construction to help understand bulk hydrologic properties?

Response

The hydrologic conditions in borehole RRL-2 will be monitored as the ES is drilled from the Vantage to total depth. The borehole RRL-2 is cased down to the Vantage and is, therefore, not available for testing above that horizon. The test specification for RRL-2 will be revised (Reference 32) to include monitoring the heads from the Vantage interbed to total depth.

References

(32) SD-BWI-TC-001, Rev. 1-0, Test Specification for RRL-2 (6/83*)

Comment

Will the following be monitored: Sampling of drill cuttings, bit thrust, torque, rate of advance, slurry weight, speed of rotation, pumping pressure, water inflow? This information can be used to detect and/or explain anomalies encountered?

Response

The following parameters will be monitored during drilling:

- A. Drill cuttings will be taken from the blowie tube (cuttings discharge line) at selected elevations. Each sample will be about 5 pounds and will be appropriately washed and labeled.
- B. Recorded Drill Rig Information

The following information will be continuously recorded on the Tolco recorder unit on the drill rig:

- 1. Weight of drill assembly hanging from the main hook. From this number, the bit thrust will be calculated and recorded in the Morrison-Knudsen Company, Inc. (M-K) daily log by the shift supervisor each time the thrust changes and each shift in the daily International Association of Drilling Contractors (IADC) report.
- 2. The rotary table torque.
- 3. The rate of bit advance.
- 4. The air pressure.

C. Slurry Weight

The slurry weight will be monitored by the mudding subcontractor and recorded in his daily log as required by the Drilling Mud Program - 144" Surface Hole (Reference 34) released February 11, 1983.

D. IADC Log

The IADC log, kept daily by the drilling subcontractor, records the speed of rotation and the compressed air pressure.

The ES Test Plan (Reference 2) specifies that certain parameters be monitored during drilling operations. Additional parameters identified in this information request will be monitored with the exception of water inflow since the hole is already filled with water. Water inflows have been measured in the RRL-2 borehole (Reference 29). The drilling will be conducted in accordance with the specification (Reference 8) and procedure for drilling (Reference 18). The data from the drilling activity will be presented in the drilling test report (Reference 33) at the conclusion of the drilling program and will provide a complete history of the ES drilling activities.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (8) B-314-C-X28018, Construction Specification for Shaft Boring (published)
- (18) No Number Available, M-K Drilling Program (6/83*)
- (29) SD-BWI-TI-113, Principal Borehole Report, Borehole RRL-2 (1/83)
- (33) No Number Available, Drilling Test Report (1984*)
- (34) SD-BWI-AR-002, M-K/BWIP ES Phase I Drilling Mud Program, 144" Hole

Comment

Identify all parameters to be measured and methods of measurement.

Response

The ES Test Plan (Reference 2) will identify the parameters to be measured to meet the objectives of the test plan. Additional parameters such as rotary table torque, bit load, rate of advance, speed of rotation, will be measured as a normal part of drilling

*Expected date when document will be available

activities (Reference 18). The rig to be used for the ES drilling contains all instrumentation necessary to measure these parameters. The drilling test report (Reference 33) will include the results from the drilling program.

References

- (2) SD-BWI-TP-007, Rev. 1-0, Test Plan for Exploratory Shaft in Basalt, Phase I and Phase II (7/83*)
- (18) No Number Available, M-K Drilling Program (6/83*)
- (33) No Number Available, Drilling Test Report (1984*)

F. QUALITY ASSURANCE (QA) - ADMINISTRATIVE PROCEDURES

Comment

Identify the line of responsibility for implementing QA procedures down to and including the construction contractor.

Response

Line of responsibility for QA is described in the Project Management Plan for the ES-Phase I (Reference 35). The QA Program Plan (Reference 23) further identifies the specific QA requirements for the ES. The construction manager's QA program is described in Reference 22.

References

- (22) No Number Available, M-K QA Plan (4/83*)
- (23) RHO-QA-PL-3, Rev. 1 L, Basalt Waste Isolation Project.- QA Program Plan (4/83*)
- (35) SD-BWI-PMP-002, Project Management Plan for Exploratory Shaft (6/83*)

Comment

Identify the procedures for monitoring and implementing the QA program by the Quality Assurance organization of exploratory shaft design, construction and testing.

Response

The QA Program Index (Appendix A of Reference 23) identifies the specific BWIP operating procedures which are used for auditing and

surveillance of the QA program for the ES. The construction manager QA program plan is identified as Reference 22. Specific test/inspection procedures are listed in Appendix A of Reference 23.

References

- (22) No Number Available, M-K QA Plan (4/83*)
- (23) RHO-QA-PL-3, Rev. 1 L, Basalt Waste Isolation Project - QA Program Plan (4/83*)

*Expected date when document will be available

QUALITY ASSURANCE PROGRAM PLAN
BASALT WASTE ISOLATION PROJECT

M. Nicol

Basalt Waste Isolation Project
Quality Assurance

March 1983

Prepared for the United States
Department of Energy under
Contract DE-AC06-77RL010130

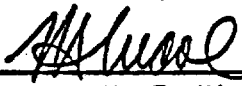
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Issue Approval:



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Concurring Approval R. D. Hammond, Director
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3/23/83⁷⁶

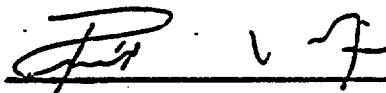
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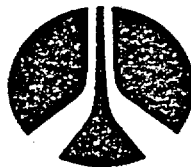
Date



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3/14/83

Date



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PREFACE

U.S. DEPARTMENT OF ENERGY POLICY

The U.S. Department of Energy-Richland Operations Office Basalt Waste Isolation Project Office (BWIPO) management considers quality assurance an essential element of all project activities. The BWIPO has delegated to Rockwell responsibility for establishing the overall Quality Assurance (QA) program for the Basalt Waste Isolation Project (BWIP), but retains responsibility for its content and verification of effective implementation. The BWIPO quality assurance program is applicable to all activities affecting functions that prevent or mitigate the consequences of events that could cause unreasonable risk to the health and safety of the public or that could compromise project success and resulting data. It is the policy of BWIPO and Rockwell that a QA Program Plan (QAPP) and appropriate implementing procedures be used to satisfy the QA criteria of 10 CFR 50 Appendix B.

Quality assurance programs for the BWIP are based upon 10 CFR 50 Appendix B and the ANSI/ASME NQA-1 (NQA-1) standard with the latest addenda. It is recognized that not all elements of these documents are applicable or appropriate in every case, and this will be taken into account in the review and evaluation process.

It is BWIPO policy to apply an approach to quality assurance which acknowledges that even when the public health and safety is not affected that an adequate level of quality is still needed for such things as operational reliability and maintainability. Applicable portions of 10 CFR 50 Appendix B and the more detailed requirements of NQA-1 are utilized as appropriate for all quality-related activities.

Because this project involves research, development, and investigative activities, it is necessary to adapt the criteria to fit the context of this work environment. Such adaptation is the responsibility of each organization preparing a QAPP for BWIP with the principal thrust being the assurance that their activities are properly validated, documented, and available for use as a basis for task-related decision making.



O. L. Olson, Project Manager
Basalt Waste Isolation
Project Office



R. E. Gerton, Director
Safety and Quality -
Assurance Division

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QUALITY ASSURANCE PROGRAM PLAN
BASALT WASTE ISOLATION PROJECT

POLICY

Rockwell Hanford Operations (Rockwell) maintains an effective quality assurance program to assure the requisite level of quality throughout all areas of contract performance. Quality will not be compromised in relation to costs or schedules.

Programmatic quality assurance plans are issued for applicable programs to transmit quality related policies, procedures and criteria, and to identify and describe how applicable quality assurance elements are implemented.

INTRODUCTION

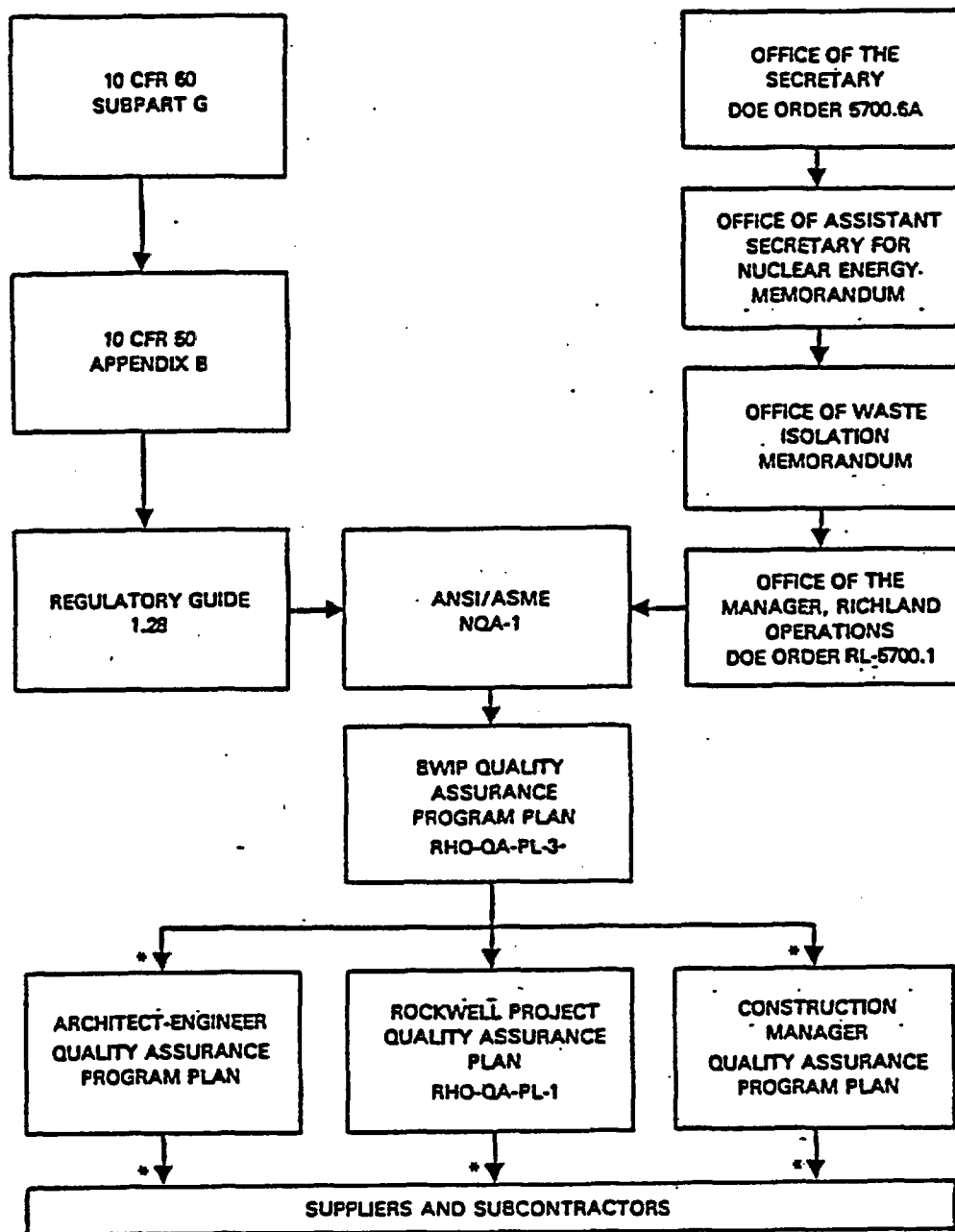
This Quality Assurance Program Plan implements Rockwell policy for activities performed under Contract DE-AC06-77RL01030 for the Basalt Waste Isolation Project (BWIP). The Quality Assurance Program Plan is also based on proposed rules of the Code of Federal Regulations, Title 10, Part 60 (10 CFR 60), "Disposal of High-Level Radioactive Wastes," Subpart G, "Quality Assurance," and satisfies requirements of the U.S. Department of Energy-Richland Operations Office (DOE-RL) Order 5700.1, "Quality Assurance." The flow of these and other quality assurance requirements documents applicable to the BWIP are depicted in Figure 1, "Flow of BWIP Quality Assurance Requirements."

At present, proposed rules established in 10 CFR 60, Subpart G, require a quality assurance program, based on the 18 Criteria in 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to be applied to systems, structures and components important to safety and to activities which would prevent or mitigate events that could cause an undue risk to public health and safety. These activities include: "exploring, site selecting, designing, fabricating, purchasing, handling, shipping, storing, cleaning, erecting, installing, emplacing, inspecting, testing, operating, maintaining, monitoring, repairing, modifying, and decommissioning." The quality assurance program must also include "the program of tests, experiments and analyses essential to achieving adequate confidence that the emplaced wastes will remain isolated from the accessible environment."

Overall responsibility and authority for implementation of DOE Order 5700.6A, Quality Assurance, rests with the program Secretarial Officers. The DOE field organizations and project office managers have overall responsibility and authority for defining and assuring effective implementation of quality assurance requirements by contractors under their direction.

**U.S. NUCLEAR REGULATORY COMMISSION
QUALITY ASSURANCE REQUIREMENTS**

**U.S. DEPARTMENT OF ENERGY
QUALITY ASSURANCE REQUIREMENTS**



* IN ACCORDANCE WITH CONTRACT REQUIREMENTS

RCP8205-130A

FIGURE 1. Flow of BWIP Quality Assurance Requirements.

Accordingly, the Assistant Secretary for Nuclear Energy has issued supplementary memorandum on quality assurance for nuclear energy programs. Likewise, the Director, Office of Waste Isolation under the Secretary for Nuclear Energy has issued supplementary memorandum on quality assurance for National Waste Terminal Storage (NWTS) projects. Both of these memorandums endorse the use of national consensus standard ANSI/ASME NQA-1 (NQA-1). The Director, Office of Waste Isolation, has provided additional guidance on the use of NQA-1 for NWTS projects by delineating exclusions, modifications, and additions to NQA-1 in a memorandum attachment. These exclusions, modifications, and additions to NQA-1 are based on the consensus of DOE and NWTS prime contractor quality assurance management as needed to bridge the gap between the quality assurance needs for a geologic nuclear waste repository and a consensus standard developed to address the quality assurance needs for design, construction, and operation of nuclear powerplants. These exclusions, modifications, and additions to NQA-1 are identified in Appendix B. The Manager, DOE-RL, has endorsed the use of NQA-1 as the basis for developing quality assurance programs under DOE-RL purview in DOE-RL Order 5700.1.

Basalt Waste Isolation Project management plans and controls operations through a Work Breakdown Structure (WBS) which reduces overall project activity into smaller, more manageable elements.

This Quality Assurance Program Plan describes implementation of the 18 Criteria of 10 CFR 50, Appendix B as amplified by NQA-1 and the DOE memorandum for various BWIP end functions during site screening and site characterization phases of the BWIP. A further breakdown on NQA-1 applicability to BWIP WBS activity level is provided in Table 1, "Application of NQA-1 Requirements to the BWIP WBS." Table 1 reflects the selective and judicious application of those administrative requirements defined in NQA-1 which are considered appropriate to plan, organize, and control the technical work as defined in the BWIP Plan and subtiered End Function Technical Plans. Application of these requirements to individual tasks within an activity level of the WBS is established during review of the applicable work authorization document (e.g., purchase requisition, work order, etc.). Applicability of an NQA-1 requirement to a specific activity does not constitute applicability to all tasks within that activity but is determined on a case-by-case basis.

An index of Rockwell policies and procedures which implement the requirements of NQA-1 for the BWIP is provided in Appendix A, "Quality Assurance Program Index." Policy and procedure call-outs within the text of this plan are identified under the respective eighteen requirements in the index.

X - Applies as Written
M - Applies as Modified
By DOE Memorandum
- - Does Not Apply

BMIP WBS
ACTIVITY

S-1 TERMS AND DEFINITIONS

| 1. ORGANIZATION | a. SUPPLEMENT 1S-1 | 2. QA PROGRAM | a. SUPPLEMENT 2S-1 | b. SUPPLEMENT 2S-2 | c. SUPPLEMENT 2S-3 | 3. DESIGN CONTROL | a. SUPPLEMENT 3S-1 | 4. PROCUREMENT DOCUMENT CONTROL | a. SUPPLEMENT 4S-1 | 5. INSTRUCTIONS, PROC. & DRAWINGS | 6. DOCUMENT CONTROL | a. SUPPLEMENT 6S-1 | 7. CONTROL OF PURCHASED ITEMS AND SERVICES | a. SUPPLEMENT 7S-1 | 8. IDENT. & CONTROL OF ITEMS | a. SUPPLEMENT 8S-1 | 9. CONTROL OF PROCESSES | a. SUPPLEMENT 9S-1 | 10. INSPECTION | a. SUPPLEMENT 10S-1 | 11. TEST CONTROL | a. SUPPLEMENT 11S-1 | 12. CONTROL OF MEAS. & TEST EQUIPMENT | a. SUPPLEMENT 12S-1 | 13. HANDLING, STORAGE & SHIPPING | a. SUPPLEMENT 13S-1 | 14. INSPECTION, TEST & OPERATING STATUS | 15. NONCONFORMING ITEMS | a. SUPPLEMENT 15S-1 | 16. CORRECTIVE ACTION | 17. QUALITY ASSURANCE RECORDS | a. SUPPLEMENT 17S-1 | 18. AUDITS | a. SUPPLEMENT 18S-1 |
|-----------------|--------------------|---------------|--------------------|--------------------|--------------------|-------------------|--------------------|---------------------------------|--------------------|-----------------------------------|---------------------|--------------------|--|--------------------|------------------------------|--------------------|-------------------------|--------------------|----------------|---------------------|------------------|---------------------|---------------------------------------|---------------------|----------------------------------|---------------------|---|-------------------------|---------------------|-----------------------|-------------------------------|---------------------|------------|---------------------|
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L-1 SYSTEMS END FUNCTION

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L11 PROGRAM BASELINE | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L12 SYSTEMS ANALYSIS | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L13 SOCIOECONOMIC ASSESSMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L14 ALTERNATE DISPOSAL CONCEPTS | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L15 PERFORMANCE ASSESSMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

L-2 WASTE PACKAGE END FUNCTION

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L21 WASTE PACKAGE BASELINE | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L22 WASTE FORM | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L23 BARRIER MATERIALS | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L24 DESIGN & DEVELOPMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L25 PERFORMANCE EVALUATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

L-3 SITE END FUNCTION

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L31 SITE BASELINE | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L32 EARTH SCIENCES | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L33 GEOLOGIC CHARACTERIZATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L34 HYDROLOGIC CHARACTERIZATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L35 ENVIRONMENTAL CHARACTERIZATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L36 SOCIOECONOMIC EVALUATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L37 PERFORMANCE EVALUATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

L-4 REPOSITORY END FUNCTION

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L41 REPOSITORY BASELINE | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L42 REPOSITORY DATA BASE DEV. | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L43 EQUIPMENT DEVELOPMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L44 INSTRUMENTATION DEVELOPMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L45 REPOSITORY SEAL DEVELOPMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L46 GENERIC REPOSITORY ENGINEERING | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L47 REPOSITORY CONCEPTUAL DESIGN | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L48 REPOSITORY DESIGN AND INSPECTION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L49 REPOSITORY LONG LEAD PROCUREMENT | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L40 REPOSITORY CONSTRUCTION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L4X REPOSITORY OPERATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L4Y REPOSITORY DECOMMISSIONING | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L4Z REPOSITORY MONITORING | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| L4B PERFORMANCE EVALUATION | M | X | X | X | - | M | X | M | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

Table 1 "Application of NQA-1 Requirements"

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L-5 REGULATORY AND INSTITUTIONAL

L-B NSTF PHASE I

L-D SUPPORT FACILITIES

L-E DECOMMISSIONING

L-F PHASE I (ES-I)

L-6 EXPLORATORY SHAFT PHASE II (TBD)

L-J AT DEPTH TEST FACILITY (ADTF)(TBD)

L-7 LAND ACQUISITION

L-8 PROGRAM MANAGEMENT

[illegible]

RHO-QA-PL-3 REV 1

Table 1 "Application of NQA-1 Requirements"

Criterion I - ORGANIZATION

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and the U.S. Department of Energy Organization Act, the DOE is assigned responsibility for development and operation of facilities for long-term storage and disposal of radioactive waste arising from DOE facilities and high-level radioactive wastes arising from commercial facilities. As such, DOE, the future U.S. Nuclear Regulatory Commission (NRC) license applicant, is obligated under requirements of 10 CFR 50, Appendix B to assure a quality assurance program is instituted and implemented. The DOE-RL has designated Rockwell Hanford Operations (Rockwell), Energy Systems Group, Rockwell International, as prime contractor for BWIP activities with responsibility for establishment and execution of an overall BWIP quality assurance program, but retains responsibility for content and implementation. Rockwell is responsible to assure proper integration of the overall BWIP quality assurance program with other principal contractors. This relationship is depicted in Figure 1.

Establishment of the Rockwell quality assurance program for BWIP, to meet legal, contractual, and Company requirements, is the responsibility of the Quality Assurance Director. The authority and duties required to fulfill this mandate are clearly established by Rockwell policies and are reflected in this BWIP Quality Assurance Program Plan. Implementation of the Rockwell quality assurance program is the responsibility of the BWIP Director and other functional directors supporting the BWIP.

The Rockwell Quality Assurance (QA) function supporting the BWIP is organized by "matrix" management. Quality Assurance personnel assigned full time to the BWIP report to the BWIP QA Manager. The BWIP QA Manager reports functionally to the Rockwell QA Director and is responsible to the BWIP Director for establishment, coordination, and maintenance of the BWIP quality assurance program. This relationship is shown in Figure 2. Budget control and cost planning for individuals providing quality assurance support to the BWIP is under the Project Management end function. This organizational structure assures that individuals assigned responsibility for verifying quality are free from the influence or control of those directly responsible for performing the work. The BWIP QA Manager may also obtain support from other QA organizations (Figure 3).

Offsite DOE-RL principal contractors are required to satisfy the organizational requirements of NQA-1 set forth in their contract Statement of Work. Organizational structure, functional responsibilities, levels of authority, and lines of communication are required to be documented and are verified by Rockwell to assure compliance with NQA-1 requirements. Work performed in support of the BWIP by other DOE-RL onsite contractors is authorized by work orders with attachments designating quality assurance involvement. Contractors' quality assurance organizational structures are delineated in their respective quality assurance manuals which are required to comply with DOE Order 5700.1 for organizational requirements.

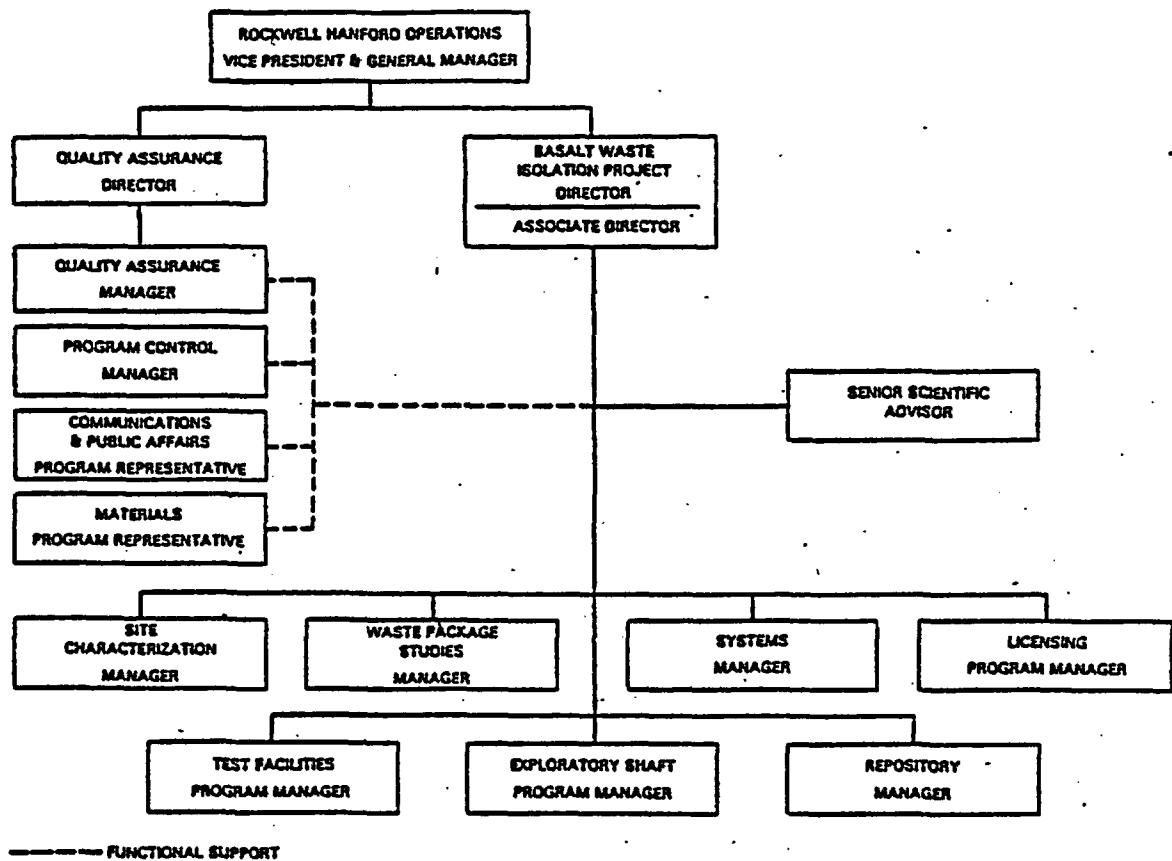


FIGURE 2. Matrix Management Relationships.

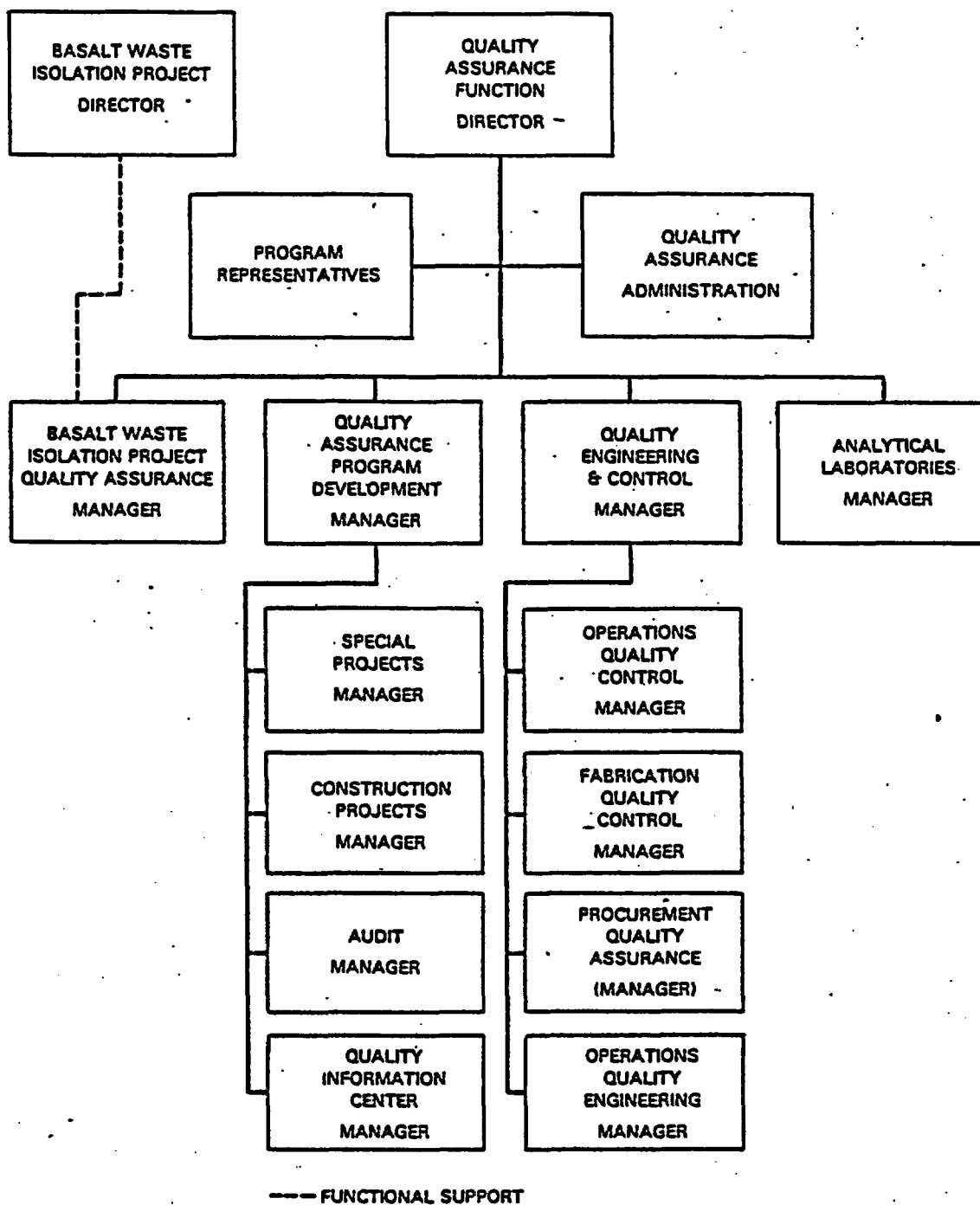


FIGURE 3. Support From Other QA Functions.

Criterion II - QUALITY ASSURANCE PROGRAM

Since inception of the BWIP by Rockwell the quality assurance program has been a continuing evolution to provide control over activities affecting quality. The BWIP QA Program covers research and development, demonstration of technology, and repository engineering activities through each phase of repository development, from site screening through decommissioning. The QA Program Plan is updated annually and in advance of each phase to adequately cover changing quality requirements.

Construction activities managed under DOE Directive Authorization performed by the onsite Architect-Engineer and onsite Construction Contractor are subject to the requirements of a project quality requirements plan containing generic quality criteria. Where offsite DOE-RL Contractors are utilized, documented quality assurance programs based on NQA-1 are required in the contract statement of work.

The Rockwell quality assurance program is documented by written company policy, functional and QA manuals, procedures, and instructions. Elements of the QA system described in this plan are taken from sections of the Rockwell policy and procedure manuals. A QA Program Index (Appendix A) is maintained by Rockwell which identifies those policies and procedures applicable to the BWIP.

Specific requirements for the BWIP are documented in the Basalt Operating Procedures Manual, RHO-BWI-MA-4. These procedures provide for accomplishment of activities affecting quality under suitably controlled conditions, including use of appropriate equipment, suitable environmental conditions, and assurance that prerequisites for given activities have been met. Provisions are made in procedures for special controls, processes, test equipment, tools, and skills necessary to attain the required quality and for verification of quality through inspection, surveillance, audit, or test.

Rockwell assigns quality assurance levels in order to designate quality assurance effort applicable to design and construction of engineered structures, systems, or components. Levels are based on importance of an item to safety and degree of quality effort required. Quality assurance levels are established during conceptual design for construction projects or during planning for nonproject construction effort. Quality assurance requirements for activities not directly associated with physical components, such as service contracts or research and development activities, are developed on a case-by-case basis in accordance with established procedures.

Rockwell company policy requires managers to indoctrinate new employees regarding job requirements, and establish planned formal and on-the-job training to assure personnel are qualified to perform their duties in a safe, efficient, and effective manner. A documented BWIP training program has been established to assure proficiency is achieved and maintained by BWIP personnel in areas of project organization, systems, management, and technical procedures. Training of QA personnel

in procedural familiarization and conduct of critical tasks is the responsibility of Rockwell's QA Director. Internal training requirements for Rockwell QA personnel have been established through a written training program.

Other DOE-RL principal contractors' QA personnel undergo training and indoctrination in accordance with their respective quality assurance programs developed to satisfy NQA-1. Rockwell subcontractors are required to supply personnel qualifications for quality related activities when the scope of work warrants. These personnel qualifications are reviewed by Rockwell QA as part of supplier quality system evaluation.

Managers of organizations implementing the BWIP QA Program Plan regularly assess that part of the program for which they are responsible. Several performance analysis and reporting mechanisms have been established within Rockwell management control systems. Program team meetings, attended by management representatives from each performing functional organization (Quality Assurance, Project Control, Material, etc.) and chaired by the responsible program manager, are scheduled on a monthly basis and results reported to the BWIP Director. Rockwell policy requires both program and functional Directors to present status briefings on programmatic and functional performance to Rockwell management. Briefings are scheduled by the General Manager, Rockwell.

Quarterly as well as mid-year reviews are conducted with DOE-RL to formally evaluate programmatic performance of each of the principal contractors.

Criterion III - DESIGN CONTROL

A technical baseline has been established by Rockwell to identify Project baseline criteria and requirements. Baseline documents are identified and listed in BWIP configuration management documents. Changes to technical baseline documents are subject to the same design control measures applied to original documents, and are approved by the organizations which reviewed and approved the original documents. Criteria documents, upon which the BWIP technical baseline is developed, have been prepared.

The design process followed on DOE-RL construction projects is prescribed in DOE-RL Order 5700.2, "Project Management System." This Order establishes the required sequence of design activities, requirements, and procedures to be followed in management, scheduling, execution, and reporting of design and construction activities.

Applicable design inputs, such as design bases, performance requirements, regulatory requirements, and codes and standards are identified and documented in Project Functional Design Criteria (FDC) documents. The FDC is prepared by Rockwell and is reviewed and approved by Rockwell and DOE-RL. Summaries of current data traceable to documented sources which are used for design, as well as internal studies, modeling

work, and subcontractor studies are combined onto a single data manual. General design criteria for DOE-RL facilities are contained in DOE Order 6430, "General Design Criteria for Department of Energy Facilities." The FDC establishes minimum concepts and requirements forming a basis for more detailed design. A Project Management Plan is prepared by Rockwell and reviewed and approved by Rockwell and DOE-RL. This plan encompasses various aspects of project planning (preliminary and final design, procurement, construction, and inspection). The plan establishes organizational responsibilities and control systems for execution of design by interfacing organizations. Additional interface control procedures have been developed for BWIP by Rockwell.

Rockwell policy requires independent third-party reviews for evaluation and approval of engineering design media for facilities, processes, and equipment, as well as changes to existing design. Construction project design documents undergo design review in accordance with this policy. Design review on Rockwell and Architect-Engineer prepared design media released by Rockwell is also performed and documented. Results of design reviews are documented and comments dispositioned. Rockwell Design Review Team membership includes representatives from Systems and QA to assure applicable regulatory requirements and proper quality standards are specified and correctly translated into design documents. Where design adequacy is to be verified by qualification tests, required testing is documented in accordance with BWIP procedures.

Following resolution of comments, approved design documents are officially released. Changes to design documents are controlled through the Design Field Change (DFC) system during construction, and the Engineering Order (EO) system for design changes made in Rockwell fabrication shops or on design drawings following Rockwell acceptance of project as-builts. Both systems require changes to final designs to be justified and subject to design control measures commensurate with those applied to the original design. This involves approval of the change by the same affected organizations which reviewed and approved the original design documents.

Design documentation and records which provide evidence that design and design verification processes were performed in accordance with specified requirements are required to be collected, stored, and maintained and are archived in the Rockwell Basalt Records Management Center.

Criterion IV - PROCUREMENT DOCUMENT CONTROL

Quality assurance requirements are an integral function in procurement of components, systems, and services for the BWIP. Material procurements for construction activities managed under DOE-RL Order 5700.2 are generally the responsibility of the Construction Manager, and are controlled under their procurement procedures with overchecks performed by Rockwell QA. Procurement of critical items may be delegated by the

Construction Manager to their Suppliers, although the Construction Manager retains ultimate responsibility for adherence to Quality Assurance requirements. The Construction Manager is to obtain Rockwell concurrence on such procurement delegations. Other procurements are controlled under Rockwell's procurement system, Rockwell approved subcontractor's system, or other DOE-RL contractors' system under technical direction of Rockwell.

The purchase requisition form used by the Rockwell Material Function establishes purchasing requirements for procurement of supplies or services. Purchase requisitions are reviewed by QA to ensure inclusion of applicable quality requirements. When necessary, quality assurance requirements for supply (hardware) requisitions are attached to the purchase requisition via a standard quality provisions list. Requisitions for service or consultant agreements have quality assurance requirements specified via an attached Statement of Work and are reviewed for adequacy by Rockwell QA. Drawings, specifications, design reports, and other documents referenced in purchase requisitions are also reviewed. Invitation to Bid Packages require QA review to prevent deviations from established quality provisions.

Following Rockwell procurement source selection, purchase requisition requirements are transferred to a purchase order and transmitted to the supplier. Purchase orders are reviewed by QA to assure no deviations have been made from original requirements. Quality assurance programs are required of suppliers to an extent commensurate with the supplies/services to be provided. The purchase requisition/purchase order cycle is also used to process and control changes and revisions to the contract. Procurement specifications and changes thereto receive BWIP QA review and approval. Procurement documents also include instructions to the supplier for reporting and approving disposition of nonconformances and deviations.

Procurement of services from other onsite DOE-RL contractors is authorized through external work orders. Services required from DOE-RL contractors for construction project work managed under DOE-RL Order 5700.2 is usually limited to the onsite Architect-Engineer and Construction Contractor. Quality requirements for these contractors as well as Rockwell are established in the Project Quality Requirements Plan and Project Management Plan (Ref. Criterion II). Quality requirements for other services, which may involve any contractor, are delineated in attachments to the work order, and are reviewed for adequacy by QA. A standard checklist has been developed for assignment of quality assurance responsibilities on non-project construction work performed by the onsite Construction Contractor.

Quality assurance program requirements for work accomplished by an offsite Architect-Engineer or Construction Manager are established in the DOE-RL contract Statement of Work. These other principal contractors are then required to control procurement documents in accordance with NQA-1 in their subtiered procurements actions.

Criterion V - INSTRUCTIONS, PROCEDURES, AND DRAWINGS

Activities affecting the quality of work performed on the BWIP are prescribed by and performed in accordance with documented instructions, procedures, or drawings of a type appropriate to circumstances. It is the responsibility of each principal contractors' Quality Assurance organization to assure these requirements are satisfied through surveillance and audit activity. Instructions, procedures, and drawings generated by each of the BWIP principal contractors require internal Quality Assurance review and approval to ensure that appropriate qualitative or quantitative acceptance criteria are either directly included or referenced.

Rockwell publishes management policies which are in turn implemented by functional manuals issued under authority of functional/project directors. The BWIP utilizes a multifunctional manual for applicable procedures. This manual is issued under authority of the BWIP Director, with manual maintenance and control assigned to Rockwell QA. Additionally, Rockwell QA assures compliance with BWIP instructions, procedures, and drawings through inspection, surveillance, and auditing techniques.

Criterion VI - DOCUMENT CONTROL

Documents affecting the quality of work performed by the BWIP, such as manuals, supporting documents, operating procedures, instructions, engineering documentation, test plans, and technical reports are controlled by documented procedures. These procedures establish a course of action for document control, review for adequacy of documents by authorized persons, and responsibility for distribution of documents to specified locations.

Technical reports, issued outside of Rockwell, and manuals are controlled through the Document Control Unit, Records Department, of the Finance and Information Services Function. Functional directors are responsible to assure appropriate distribution and maintenance of manuals under their control. These efforts are coordinated through the Document Control Unit by use of route cards and revision receipt forms. Specific instructions for preparation, review, and release of formal and informal reports, internal documents, and consultant reports have also been established.

Technical documents issued within Rockwell, such as engineering documents, supporting documents, and data packages, are controlled by an Engineering Release System through the Data Management Unit of the BWIP. Operating and test procedures are controlled by an operating document control system.

Other principal contractors are required to establish internal procedures for control of document preparation, approval, issue, and revisions. All design documents generated for the BWIP require release through Rockwell's engineering release system to assure configuration control.

Criterion VII - CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

It is Rockwell QA's responsibility to assure that material, equipment, and services purchased for the BWIP by Rockwell conform to procurement document requirements.

Measures have been established for evaluation and selection of supplier capability to provide items or services in accordance with procurement document requirements. Methods of qualifying suppliers have also been provided. When no quality history exists on a proposed source, a supplier survey may be performed depending on the importance of items or services being procured.

Following contract award, supplier performance may be monitored through surveillance as deemed necessary by Rockwell QA or Material. Suppliers who deliver products which require receiving inspection are performance evaluated at least quarterly. Controls for supplier generated documents and vendor data have also been provided.

During purchase requisition review, Rockwell QA determines whether source verification or onsite receiving inspection is required for final acceptance. Source verification and receiving inspection activities are performed in accordance with written procedures. Acceptance of services includes a technical and Quality Assurance review to assure the requirements of the procurement contract have been satisfied. A system for dispositioning and controlling supplier nonconformances has also been implemented.

Procurement of the Exploratory Shaft steel liner, main hoist, and drilling equipment are controlled under Rockwell's Quality Assurance program. Procurement of the headframe, standby generator, grout, and drilling, liner installation, and nondestructive examination services will be controlled under the Construction Manager's quality assurance program. The Construction Manager's quality assurance program is reviewed by Rockwell to assure adequate control over purchased items and services. Quality Assurance verification is performed both internally by the Construction Manager and externally by Rockwell to assure the quality assurance program in this area is effectively implemented.

Criterion VIII - IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

Measures have been established to assure required identity is maintained for control of materials, parts, and components for BWIP. Maintaining identification of heat or lot number on material to provide traceability is provided as required (e.g., Exploratory Shaft liner). Requirements for identification and control of material for other BWIP contractors and subcontractors are established in procurement and construction documents as described under Criterion IV, "Procurement Document Control."

Rockwell policy requires functional organizations to establish implementing procedures for proper identification of any level of unit assembly. This has been accomplished through issue of functional procedures and specifications.

Rockwell QA has responsibility to assure applicable identification requirements are defined during design and procurement document review, and that these requirements are met.

Instructions for identification of rock samples, including field outcrop samples, core and chip samples, and water samples have been established. Sample identity is maintained back to place and time of sampling by markings directly on samples or containers together with associated documentation. Subsequent sampling of field samples for laboratory testing purposes is also traceable to original field sample identification numbers. Material identification is required during laboratory and field testing of borehole plugging and waste package materials.

Provisions for the identification and control of items used on the Exploratory Shaft construction are established by the Architect-Engineer in the design documents. The responsible procuring contractor, Rockwell or the Construction Manager, is responsible to assure the identification and control requirements are implemented. The Construction Manager is responsible to assure maintenance of identification on stored items procured by Rockwell following acceptance and turnover to the Construction Manager as well as items internally procured.

Criterion IX - CONTROL OF PROCESSES

Processes affecting quality of items or services for the BWIP are controlled by instructions, procedures, drawings, checklists, travelers, and other appropriate means (Ref. Criterion V). A special process is defined as "a process, the results of which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or

test of the product" (Ref. NQA-1, Supplement S-1). Special processes that control or verify quality are required to be performed by qualified personnel working to qualified procedures in accordance with specified requirements. Qualification of personnel is achieved through measurement of an individual's education, special training, experience, and ability against established requirements which must be satisfied in order to perform a function. Qualified procedures are approved documents that describe how an activity is to be performed and have been demonstrated to meet specified requirements for the intended purpose. Personnel qualification requirements and qualified procedures for nondestructive examinations performed by Rockwell or the Construction Manager are processed in accordance with written procedures.

Special processes identified for BWIP during the site screening/site characterization include welding, heat treating, nondestructive examination, shotcreting, and hydrostatic testing. These special processes are applied during construction and fabrication activities associated with the Near-Surface Test Facility and Exploratory Shaft Programs.

Criterion X - INSPECTION

Inspection is defined as "examination or measurement to verify whether an item or activity conforms to specified requirements" (Ref. NQA-1, Supplement S-1). The forms of inspection described herein address quality assurance inspection activities applied to the BWIP as part of overall "planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service". (Ref. NQA-1, Supplement S-1).

Personnel performing quality assurance inspection activities report through the QA organization, and not directly to immediate supervisors responsible for performing work being inspected. Each person performing acceptance inspection must also be qualified to perform the assigned inspection task through education, training, or experience.

Inspection activities for the BWIP are planned and documented. Planning identifies characteristics, methods, and acceptance criteria, and provides for recording objective evidence of results. As a minimum inspection results must identify: 1) item inspected, 2) date of inspection, 3) inspector, 4) type of observation, 5) results or acceptability, 6) reference to information on action taken in connection with nonconformances. Inspection planning also identifies any required inspection hold points beyond which work may not proceed without consent of the designated inspection agency.

Inspection and acceptance responsibilities for construction projects are identified in DOE-RL Order 5700.2. Integration of contractor inspection and acceptance is to be performed by Rockwell during project planning and design review activities, and subsequently documented in appropriate project QA plans, Project Management Plans, construction contractor checklists, and inspection plans. Rockwell QA provides surveillance over in-process examination as well as other project quality related activities (e.g., procedures, contract requirements, etc.). Rockwell QA performs final acceptance of completed items prior to installation including an examination of associated documentation and records. Rockwell QA integrates acceptance hold points into the responsible contractor's in-process inspection plans. Surveillance activities are planned on a quarterly basis through management approved surveillance plans.

In-process quality control inspection is the responsibility of the Construction Manager for the Exploratory Shaft onsite construction. Final acceptance of completed items, which includes a records review for adequacy and completeness, is performed by Rockwell. Inspection records are the responsibility of the Construction Manager while items are in process. Rockwell assumes records management responsibility of completed items following acceptance. Rockwell mandatory inspection points are documented and integrated into the Construction Manager's inspection plans and travelers.

The overall Rockwell inspection program for the BWIP also covers procurement, in-house fabrication, site characterization, and operations activities. Procurement inspection has previously been described under Criterion VII. Inspection and surveillance over items fabricated by Rockwell and surveillance over site characterization activities for compliance with procedures, test plans, and other controlling documents is also performed. Surveillance is performed on testing activities performed in the laboratories in support of the Waste Package and Repository Programs to assure compliance with applicable procedures and test plans.

Criterion XI - TEST CONTROL

This Plan divides test control into two categories. First are the controls exercised on testing activities to demonstrate engineered item capabilities to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions. Second are the controls exercised on testing activities used to collect data which will determine feasibility of basalt as a repository medium or provide the design basis for key repository elements. Both categories of testing require establishment of written test plans or instructions to assure prerequisites have been met. These prerequisites include use of adequate equipment, trained personnel, suitable environmental conditions, and provisions for data acquisition prior to initiation of tests. In lieu of specially prepared test procedures, appropriate sections of related

documents, such as ASTM methods, supplier manuals, equipment maintenance instructions, or approved travelers with acceptance criteria, may be used. Control measures established for the two categories of test activities applied to the BWIP are as follows:

Testing activities used to demonstrate the capability of engineered items to meet specified requirements are accomplished through documented test procedures, Acceptance Test Procedures (ATPs), or Operability Test Procedures (OTPs). Test procedures are generally prepared by the Construction Manager or subcontractor. The ATP is prepared by the design organization to demonstrate that systems perform as designed. The OTP is developed by Rockwell (user) for functionally testing a whole system, its components, and interrelationships to other systems. All test procedures are documented and require quality assurance provisions to ensure adequate control.

Testing may also be performed during design where design adequacy requires validation through qualification tests. This process is also applied to control test programs which collect data to determine feasibility of basalt for a repository medium or provide key repository design elements. Examples of such testing include Full Scale Tests 1 and 2 and Block Test 1 at the Near Surface Test Facility, hydrologic testing, and the test program associated with an Exploratory Shaft. These tests require documented test plans which are prepared under Rockwell's control. Procedures are established by Rockwell on format and content requirements for test plans and require implementing test procedures and final test reports.

Criterion XII - CONTROL OF MEASURING AND TEST EQUIPMENT

Tools, gages, instruments and other measuring and testing devices used for acceptance inspection or collection of data are controlled, calibrated, and adjusted at established frequencies in order to maintain accuracy within specified limits. Special calibration or control measures are not required for such devices as rulers, tape measures, levels, or other such devices if normal commercial practices provide adequate accuracy.

Rockwell policy establishes responsibilities and required action for implementation of an overall calibration program. Development and maintenance of a long-range calibration plan for Rockwell is assigned to the QA Function. Procedures have been implemented for identification of equipment requiring periodic calibration along with calibration methods and frequencies for geologic and hydrologic characterization activities performed by BWIP personnel. Requirements for calibration on activities performed by Rockwell subcontractors supporting the BWIP are established in procurement documents.

Control of measuring and test equipment is required of the Construction Manager for the Exploratory Shaft which includes appropriate equipment selection, documented calibration intervals and methods, proper handling, storage, and maintenance, calibration status markups, and calibration records management. Calibration records are required to be submitted to Rockwell for permanent retention or disposition.

Criterion XIII - HANDLING, STORAGE, AND SHIPPING

Handling, storage, and shipping of items for the BWIP is conducted in accordance with established work and inspection documents specified for use in conducting the activity. Handling, storage, and shipping requirements are determined during the design process and are translated into the design and procurement documents.

Handling, shipping, and storage requirements and responsibilities for the Exploratory Shaft project are established in the procurement and construction specifications and drawings and contractor implementing procedures. Contractors (Rockwell, Construction Manager, subcontractors) are responsible for handling, shipping, and storage of items while under their control until turnover to the designated organization.

Rockwell is responsible for receiving and shipping operations for operating contractors at the Hanford Site. Company policy for handling, shipping, and storage of material together with implementing procedures have been established. These procedures include provisions for training operators of special lifting equipment, general requirements for material control, as well as provisions for verification of compliance. Rockwell warehouses, control stations, and manufacturing storage areas are inspected at least quarterly. Results of these inspections are documented.

In addition, procedures have been developed for collection, handling, preservation, shipping, and storage of such items as drilling equipment, field outcrop samples, rock core and chip samples, and groundwater samples used in the site characterization process.

Criterion XIV - INSPECTION, TEST, AND OPERATING STATUS

Where it is necessary to assure items have received required inspections or tests, and items which have failed or not received required inspections or tests are not inadvertently installed, used, or operated, the status of inspections and tests is identified either on the items or in documents traceable to the items. A system for identifying inspection, test, and operating status of material and the related records during receiving inspection, storage, fabrication, testing, and installation has been implemented by Rockwell. These procedures designate responsibility for application and removal of tags, markings, labels, and stamps to the Rockwell QA Function. Rockwell subcontractors and other BWIP principal contractors supporting the BWIP are required to have a system for identifying inspection and test status when the scope of work warrants.

Criterion XV - NONCONFORMING MATERIALS, PARTS, AND COMPONENTS

Items that do not conform to specified requirements are required to be identified as such and segregated, when practical, to prevent their inadvertent use or installation prior to an evaluation and an approved disposition by authorized personnel. Identification is accomplished as outlined under Criterion XIV, "Inspection, Test, and Operating Status."

Nonconformances identified during construction project activity managed under DOE-RL Order 5700.2 are documented by the responsible inspection agency, and are dispositioned by the responsible Architect-Engineer and approved by Rockwell in accordance with requirements of the PQR or Project Management Plan. The responsible inspection agency is then required to reinspect repaired or reworked items for compliance with original or alternate acceptance criteria as applicable.

Nonconformances identified in Rockwell fabrication shops, operations, or shipping and receiving cycles are processed in accordance with Rockwell policy and procedures. All BWIP nonconformance reports require documentation of the final disposition and technical justification for acceptance in space provided on the forms.

Criterion XVI - CORRECTIVE ACTION

Measures have been established for the BWIP to assure conditions adverse to quality are promptly identified and corrected. These measures include performance of inspections, surveillances, and audits performed independently by QA organizations. The above forms of independent verification include provisions for documented corrective action statements where a deficiency in established quality assurance programs is observed.

Additional measures have been developed to assure significant conditions adverse to quality are not only identified and corrected, but also that cause is determined and corrective action is taken to preclude recurrence. Significant conditions adverse to quality are those which differ from those normally identified during course of routine verification activities by virtue of their magnitude or repetition. A Corrective Action Request (CAR) system has been established by which Rockwell assures significant conditions adverse to quality are identified, corrected, and causes are identified and corrective action planned to prevent recurrence. The Rockwell CAR system is applied as appropriate both internally and externally to other principal contractors. This system provides for reporting of significant conditions to appropriate levels of management and for verifying implementation of corrective action. Other principal contractors are required to establish their own internal corrective action systems over conditions adverse to quality.

Criterion XVII - QUALITY ASSURANCE RECORDS

The Rockwell records management program applies to each employee, temporary consultant, subcontractor, or other principal contractor who generates or controls records. Company policy for records management and implementing procedures identify responsibilities of those organizations implementing the BWIP records management system. This system conforms to requirements established by NQA-1 and includes specific requirements for quality assurance record identification, indexing, control, retention, microfilming, traceability, retrievability and storage. In addition to records existing in paper and computer tape forms, the system incorporates control of geologic core samples and other unique one-of-a-kind records. Contractors are responsible for quality assurance records while in their possession prior to turnover to Rockwell.

Criterion XVIII - AUDITS

Detailed methods have been formulated for regular and orderly examination of the BWIP to confirm or substantiate that the quality assurance program has been implemented in accordance with procedures, instructions or drawings. Audits are scheduled and may be performed by the DOE, Rockwell and/or other principal contractors and subcontractors. Audits are required to be conducted in accordance with procedures and written checklists which comply with NQA-1 requirements.

Rockwell internal audits are conducted on BWIP by the QA organization in accordance with policy. These audits are planned and scheduled on an annual basis to verify compliance with all aspects of the BWIP quality assurance program. Evaluation of BWIP suppliers quality assurance programs is conducted in accordance with written procedures prior to contract award.

The qualifications of personnel who organize and direct audits, report findings, evaluate corrective action, or participate in an audit are documented.

APPENDIX A

QUALITY ASSURANCE PROGRAM INDEX

ABBREVIATIONS

I. MANUALS

PM - Policy Manual, RHO-MA-100

BOP - Basalt Operating Procedures Manual, RHO-BWI-MA-4

EPM - Engineering Procedures Manual, RHO-MA-115

GAP - Quality Assurance Manual, RHO-MA-150

SPP - NDE Special Process Procedures, RHO-MA-106

DSM - Drafting Standards Manual, RHO-MA-112

POM - Production Operations Organization and Procedures Manual, RHO-MA-122

MPP - Material Policy and Procedures Manual, RHO-MA-135

PSM - Production Support Manual, RHO-MA-137

GAA - Quality Assurance Administrative Guide, RHO-MA-152

PPR - Personnel and Public Relations Procedures, RHO-MA-155

GPR - Guide for Preparing Purchase Requisitions and Store Orders, RHO-MA-212

GAI - Quality Assurance Instruction Manual, RHO-MA-256

II. FUNCTIONS (PM Suffix-Function Designator)

CC - Committee Charter

CR - Communications and Records

FC - Function Charter

FI - Finance

ML - Material

OM - Organization and Management

OP - Organization Charters

PE - Personnel
 PO - Production Operations
 PR - Program Management
 QA - Quality Assurance
 RE - Research and Engineering

CROSS-INDEX OF NGA-1 QUALITY ASSURANCE PROGRAM REQUIREMENTS AND ROCKWELL FUNCTIONAL POLICIES AND PROCEDURES

NGA-1 SECTION TITLE/IMPLEMENTING POLICY AND/OR PROCEDURE(S)
 SECT.

1 BASIC REQUIREMENTS FOR ORGANIZATION

| | |
|--------------|--|
| PM OP 1-102 | "Organization Charters" |
| PM FC 2-200 | "Basalt Waste Isolation Project" |
| PM FC 2-202 | "Internal Audit" |
| PM FC 2-205 | "Finance and Information Services" |
| PM FC 2-206 | "Health, Safety, and Environment" |
| PM FC 2-214 | "Quality Assurance" |
| PM CC 4-417 | "Audit Coordinating Committee" |
| PM OM 1-100 | "Management Policies and Functional Manuals" |
| PM OM 3-200 | "Delegations of Authority" |
| PM OM 8-100 | "Department of Energy Directives" |
| PM QA 1-100 | "Quality Assurance Program" |
| PM HE 2-001 | "Nuclear Criticality Safety" |
| PM HE 16-200 | "Plant Safety" |
| PM HE 16-201 | "Safety Review Program" |

2 BASIC REQUIREMENTS FOR QUALITY ASSURANCE PROGRAM

| | |
|--------------|---|
| PM QA 1-100 | "Quality Assurance Program" |
| PM OM 6-002 | "Executive Control Meeting Presentations" |
| PM HE 18-300 | "Medical Program" |
| PM OM 1-100 | "Management Policies and Functional Manuals" |
| PM PE 21-400 | "Training and Qualification" |
| PM QA 1-200 | "Quality Assurance Audit" |
| PM PE 21-300 | "New Employee Indoctrination" |
| PM PE 21-400 | "Training and Qualification" |
| PM PE 21-401 | "Procurement of Training Materials, Equipment, and Related Services" |
| PM PE 21-501 | "Seminars and Training Courses" |
| PM QA 1-300 | "Open Audit Action Tracking System" |
| PM QA 2-200 | "Nonconformance Reporting and Control System" |
| PM QA 2-300 | "Readiness Review" |
| PM QA 3-100 | "Calibration and Instrument Control" |
| PM RE 1-001 | "Documentation of Research and Engineering Management" |

System"

- * PROCEDURES AND DRAWINGS *
- * GAP 2-101 "Programmatic Quality Assurance Plans"
- * GAP 1-101 "Quality Assurance Directives"
- * GAP 5-103 "Quality Assurance Responsibilities on Construction Projects"
- * GAI 5-102 "Offsite Architect-Engineer Quality Assurance Programs"
- * GAP 1-501 "Trend Reporting"
- * PPR NEI-1 "Manager's Guide-New Employee Indoctrination"
- * PPR CBO PN 1-100 "Exempt and Non-Exempt Non-Unit Performance Appraisals"
- * PPR TR GE 101 "Training Plan Inventory/Prospectus"
- * PPR TR GE 300 "Training Documentation"
- * PPR TR IT 200 "Instructor Training/Certification Program (ITCP)"
- * GAP 3-201 "Quality Assurance Levels"
- * BOP A-5 "Stop Work Order"

3 BASIC REQUIREMENTS FOR DESIGN CONTROL

- PM RE 1-001 "Documentation of R&E Management Systems"
- PM RE 2-003 "Engineering Drafting Standards"
- PM RE 2-005 "Hanford Plant Standards"
- PM RE 5-001 "Design Reviews and Document Reviews"
- PM RE 7-003 "Configuration Management"
- PM RE 2-002 "Item Identification"
- PM RE 6-001 "Technical Operating Controls"
- PM RE 8-004 "Engineering Data Management"
- PM QA 1-200 "Quality Assurance Audit"
- PM QA 1-100 "Quality Assurance Program"

4 BASIC REQUIREMENTS FOR PROCUREMENT DOCUMENT CONTROL

- PM QA 1-100 "Quality Assurance Program"
- PM ML 1-101 "Procurement Support"
- PM ML 6-100 "Procurement Planning"
- PM PR 8-004 "Services from other Hanford Contractors"
- PM ML 1-100 "Material Operations"
- PM ML 2-100 "Basic Procurement Policies"
- PM QA 1-200 "Quality Assurance Audit"
- PM RE 1-001 "Documentation of Research and Engineering Management Systems"
- PM RE 2-003 "Engineering Drafting Standards"

5 BASIC REQUIREMENTS FOR INSTRUCTIONS, PROCEDURES AND DRAWINGS

PM RE 6-001 "Technical Operating Controls"
 PM QA 1-100 "Quality Assurance Program"
 PM OM 1-100 "Management, Policies and Functional Manuals"
 PM RE 1-001 "Documentation of Research and Engineering Management Systems"
 PM RE 2-003 "Engineering Drafting Standards"

PROCEDURES AND INSTRUCTIONS

* EPM 1-1 "Overall Integrated Engineering Process"
 * EPM 1-2 "Engineering Procedures"
 * DSM 5000 "Types of Engineering Drawings"
 * DSM 7000 "Drawing Revisions"
 * DSM 8000 "Engineering Order System"
 * GAP 1-101 "Quality Assurance Directives"
 * GAP 4-301 "Inspection Planning-Procurement"
 * GAP 4-302 "Procurement Sampling Inspection by Attributes"
 * GAP 5-101 "Inspection Planning-Construction"
 * GAP 7-102 "Inspection Planning-Fabrication"
 * GAI 1-204 "Instruction for use of Koslow Electrospot Alloy Identification"
 * GAI 1-205 "Dimensional Quality Control Instruction"
 * GAI 3-101 "Design Review of Engineering (non-Project) Design Documentation"
 * GAI 4-301 "Government Source Inspection Support"
 * GAI 4-303 "Inspection Planning-Procurement"
 * GAI 4-304 "Inspection and Testing of High Efficiency Particulate (HEPA) Air Filters"
 * GAI 7-102 "Quality Assurance Planning-Fabrication"
 * GAI 7-301 "HEPA Filter Tests and Installation"
 * POM P07-006 "Preparation of Internal Work Orders Within Production Operations"
 * POM PS-0-010 "Procedure to Initiate an Internal Work Order Request of Production Support"
 * POM PS-1-003 "Fabrication Shop Traveler"
 * BOP A-3 "Basalt Operating Procedures Manual Development, Implementation, and Maintenance"
 * BOP C-1.2 "Field Work"
 * BOP C-1.5 "Qualification of Technical Procedures"
 * BOP C-1.6 "Updating Voluntary Standards".

6 BASIC REQUIREMENTS FOR DOCUMENT CONTROL

PM CR 10-100 "Correspondence Control"
 PM CR 10-101 "Correspondence to DOE-RL"
 PM FI 3-100 "Document Accountability"
 PM FI 2-310 "Engineering Files"
 PM RE 8-001 "Engineering Release System"
 PM RE 8-002 "Engineering Order System"
 PM RE 8-003 "Design Document Print Control"

PM RE 11-001 "Engineering Change Management System"
 PM RE 8-004 "Engineering Data Management"
 PM RE 6-001 "Technical Operating Controls"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

7 BASIC REQUIREMENTS FOR CONTROL OF PURCHASED ITEMS AND SERVICES

PM ML 1-100 "Material Operations"
 PM ML 2-100 "Basic Procurement Policies"
 PM ML 2-130 "Consultant Services and Service Agreements"
 PM ML 6-100 "Procurement Planning"
 PM PO 1-100 "Essential Materials"
 PM PR 8-004 "Services From Other Hanford Contractors"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"
 PM ML 1-101 "Procurement Support"
 PM QA 2-200 "Nonconformance Reporting and Control System"

8 BASIC REQUIREMENTS FOR IDENTIFICATION AND CONTROL OF ITEMS

PM RE 2-002 "Item Identification"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

9 BASIC REQUIREMENTS FOR CONTROL OF PROCESSES

PM RE 6-001 "Technical Operating Controls"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

10 BASIC REQUIREMENTS FOR INSPECTION

PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

11 BASIC REQUIREMENTS FOR TEST CONTROL

PM RE 6-001 "Technical Operating Controls"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

12 BASIC REQUIREMENTS FOR CONTROL OF MEASURING AND TEST EQUIPMENT

PM QA 3-100 "Calibration and Instrument Control"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

13 BASIC REQUIREMENTS FOR HANDLING, STORAGE, AND SHIPPING

PM ML 3-100 "Warehouse Operations"
 PM ML 4-100 "Receiving and Shipping Operations"
 PM ML 4-101 "Shipping/Return Orders"
 PM ML 4-102 "Shipment of Radioactive Materials"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"
 PM HE 16-201 "Safety Review Program"
 PM ML 1-100 "Material Operations"
 PM RE 6-001 "Technical Operating Controls"

14 BASIC REQUIREMENTS FOR INSPECTION, TEST, AND OPERATING STATUS

PM QA 1-300 "Open Audit Action Tracking System"
 PM QA 1-100 "Quality Assurance Program"
 PM RE 2-002 "Item Identification"
 PM QA 1-200 "Quality Assurance Audit"

PROCEDURES AND INSTRUCTIONS

- * GAP 1-301 "Stamp Control"
- * GAP 6-101 "Identification and Control of Material"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * GAP 7-401 "Inspection, Test, and Operating Status"
- * GAP 7-402 "Inspection Status Identification"
- * GAI 6-101 "Processing of Certified Quality (CQ) and Purchase Order (PO) Marked Materials"
- * GAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * GAI 7-401 "Inspection Status Tag General Instruction"

15 BASIC REQUIREMENTS FOR CONTROL OF NONCONFORMING ITEMS

PM QA 2-200 "Nonconformance Reporting and Control System"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

16 BASIC REQUIREMENTS FOR CORRECTIVE ACTION

PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

PROCEDURES AND INSTRUCTIONS

- * GAP 1-402 "Quality Assurance Surveillance Program"
- * GAP 1-501 "Trend Reporting"
- * GAP 8-201 "Corrective Action"
- * GAI 1-405 "Surveillance Support-Quality Assurance Program Development-Special Projects and

Quality Information Center"
 * QAI 8-103 "NCR Characterization and Reporting"

17 BASIC REQUIREMENTS FOR QUALITY ASSURANCE RECORDS

PM CR 1-200 "Records Management and Services"
 PM QA 1-100 "Quality Assurance Program"
 PM QA 1-200 "Quality Assurance Audit"

18 BASIC REQUIREMENTS FOR AUDITS

PM QA 1-200 "Quality Assurance Audit"
 PM QA 1-100 "Quality Assurance Program"
 PM PE 21-400 "Training and Qualification"
 PM QA 1-300 "Open Audit Action Tracking System"

PROCEDURES AND INSTRUCTIONS
 * BOP B-10 "Configuration Audits".

19-1 SUPPLEMENTARY REQUIREMENTS FOR ORGANIZATION

1.0 General

* Reference Basic Requirement No. 1

2.0 Responsibility

2.1 Purpose

* PM OP 1-102 "Organization Charters"
 * PM QA 1-100 "Quality Assurance Program"

2.2 Delegation of Work

* PM QA 1-100 "Quality Assurance Program"
 * BOP A-1 "Statement of Authority"

2.3 Nonconforming Items

* PM QA 2-200 "Nonconformance Reporting and Control System"

3.0 Multiple Organizations

3.1 Responsibility

* PM OM 1-102 "Organization Charters"
 * PM OM 1-100 "Management Policies and Functional Manuals"
 * BOP A-1 "Statement of Authority"
 * BOP A-3 "Basalt Operating Procedures Manual,

- Development, Implementation, and Maintenance"
- * BOP A-21 "Project Management Approval Authorities"

3.2 Interface Control

- * BOP A-1 "Statement of Authority"
- * BOP A-18 "Reporting and Coordination of BWIP Interface Coordination Group Activities"
- * BOP B-8 "Interface Control and Documentation"
- * BOP B-2 "Technical Baseline Identification"

2S-1 SUPPLEMENTARY REQUIREMENTS FOR THE QUALIFICATION OF INSPECTION AND TEST PERSONNEL

1.0 General

- * Reference Basic Requirement No. 1

2.0 Certification

2.1 Qualification Requirements

2.2 Personnel Selection

- * PPR CBD PN 1-102 "Job Offer Procedure"

2.3 Indoctrination

- * PPR NEI-1 "Manager's Guide-New Employee Indoctrination"

2.4 Training

- * BOP L-1 "Training Plan"
- * GAA 4-201 "Quality Assurance Minimum Required Training and Internal Training Records"
- * QAP 7-201 "Special Process Control"

2.5 Determination of Initial Capability

2.6 Evaluation of Performance

- * PPR CBD PN 1-100 "Exempt and Non-Exempt Non-Unit Performance Appraisals"

2.7 Certificate of Qualification

2.8 Physical

- * SPP 1.1.0 "Personnel Training Certification"

3.0 Records

3.1 Record Files

- * BOP L-1 "Training Plan"
- * PPR TR GE 300 "Training Documentation"
- * QAA 4-201 "Quality Assurance Minimum Required Training and Internal Training Records"

2S-2 SUPPLEMENTARY REQUIREMENTS FOR THE QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

1.0 General

- * Reference Basic Requirement No. 2 and SPP 1.1.0 "Personnel Training Certification"

2.0 Certification

2.1 Applicable Documents

- * SPP 1.1.0 "Personnel Training Certification"

2.2 Program

- * SPP 1.1.0 "Personnel Training Certification"
- * SPP 1.1.1 "Personnel Training Qualification for Liquid Penetrant Application"

2.3 Records

- * SPP 1.1.0 "Personnel Training Certification"
- * SPP 1.1.1 "Personnel Training Qualification for Liquid Penetrant Application"

2S-3 SUPPLEMENTARY REQUIREMENTS FOR THE QUALIFICATION OF QUALITY ASSURANCE PROGRAM AUDIT PERSONNEL

1.0 General

- * Reference Basic Requirement No. 2

2.0 Qualification of Auditors

2.1 Responsibility of Auditing Organization

- * GAP 1-401 "Audits"
- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

3.0 Qualification of Lead Auditors

3.1 Communication Skills

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

3.2 Training

- * BOP L-1 "Training Plan"
- * GAP 1-401 "Audit"
- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

3.3 Audit Participation

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

3.4 Examination

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

4.0 Maintenance of Qualification

4.1 Maintenance of Proficiency

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

4.2 Requalification

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

5.0 Administration

5.1 Organizational Responsibility

- * GAP 1-401 "Audit"
- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

5.2 Qualification Examination

- * GAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

6.0 Records

6.1 General

- * QAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

6.2 Certification of Qualification

- * QAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

6.3 Updating of Lead Auditor's Records

- * QAI 1-201 "Lead Auditor/Auditor Qualifications Training and Certification"

3S-1 SUPPLEMENTARY REQUIREMENTS FOR DESIGN CONTROL

1.0 General

- * Reference Basic Requirement No. 3

2.0 Design Input

- * BOP B-2 "Technical Baseline Identification"
- * BOP B-12 "Functional Design Criteria"
- * BOP B-15 "Data Packages"
- * QAP 3-201 "Quality Assurance Levels"
- * EPM 2-2 "Engineering Studies"
- * EPM 2-3 "Engineering Design"
- * EPM 2-3.1 "Codes and Standards"

3.0 Design Process

- * BOP B-2 "Technical Baseline Identification"
- * BOP B-8 "Interface Control and Documentation"
- * EPM 2-2 "Engineering Studies"
- * EPM 2-3 "Engineering Design"
- * EPM 2-3.2 "Special Process Specifications"
- * EPM 2-3.5 "Standard Parts"
- * EPM 2-4 "Construction Project Design"
- * EPM 2-4.1 "Conceptual Design Plans"
- * EPM 2-4.2 "Conceptual Design Reports"
- * EPM 2-4.3 "Design and Inspection-Construction Projects"
- * EPM 2-6.4 "Procurement Specifications"

3.1 Design Analyses

* EPM 2-3.3 "Engineering Analysis Checking"

4.0 Design Verification

- * EPM 4-1 "Engineering Documents Review"
- * EPM 3-1 "Development"
- * EPM 2-3.3 "Engineering Analysis Checking"
- * BOP D-6 "Test Program Documentation"

4.1 Extent of Design Verification

- * EPM 4-1 "Engineering Documents Review"
- * EPM 4-1.2 "Formal Design/Document Reviews"
- * EPM 4-1.3 "Informal Design Reviews"
- * EPM 2-3.4 "Design Document Checking"
- * GAP 3-201 "Quality Assurance Levels"

4.2 Methods

4.2.1 Design Reviews

- * BOP C-1.4 "Peer Review"
- * BOP C-3.5 "Geological Map and Drawing Approval and Issue"
- * GAI 3-101 "Document Review of Engineering (Non-Project) Design Media"
- * EPM 4-1 "Engineering Documents Review"
- * EPM 4-1.1 "Criticality Safety Analysis and Review"
- * EPM 4-1.2 "Formal Design/Document Reviews"
- * EPM 4-1.3 "Informal Design Reviews"
- * EPM 4-2 "Construction Project Design Review"
- * EPM 5-8 "Design Document Change System"

4.2.2 Alternate Calculations

- * EPM 2-3.3 "Engineering Analysis Checking"

4.2.3 Qualification Tests

- * EPM 3-1 "Development"
- * EPM 3-1.1 "Prototypes"
- * EPM 3-3 "Format for Test Plans, Procedures, and Reports"
- * BOP D-6 "Test Program Documentation"

5.0 Change Control

- * BOP B-2 "Technical Baseline Identification"
- * BOP B-4 "Change Proposal Processing"
- * BOP B-5 "Expedite Change Proposal Processing"
- * BOP B-6 "Processing Approved Technical Changes"
- * BOP B-18 "Record of Design/Field Change Processing"
- * EPM 5-8 "Design Document Change System"

6.0 Interface Control

- * BOP D-2 "Technical Baseline Identification"
- * BOP B-8 "Interface Control and Documentation"
- * BOP B-23 "Technical Information Control, NWRB, and ES Design"

7.0 Documentation and Records

- * BOP B-2 "Technical Baseline Identification"
- * BOP B-4 "Change Proposal Processing"
- * BOP B-8 "Interface Control and Documentation"
- * BOP B-10 "Configuration Audits"
- * BOP B-18 "Record of Design/Field Change Processing"
- * GAI 3-101 "Document Review of Engineering (Non-project) Design Media"
- * RHO-MA-112 "Drafting Standards Manual"

4S-1 SUPPLEMENTARY REQUIREMENTS FOR PROCUREMENT DOCUMENT CONTROL

1.0 General

- * Reference Basic Requirement No. 4

2.0 Content of the Procurement Documents

2.1 Scope of Work

- * BOP G-3 "Development of BWIP Long Range Procurement Plans"
- * EPM 2-5 "Construction Work Orders"
- * MPP 303 "Purchase Order Forms and Preparation"
- * MPP 724 "Consultant Services"
- * MPP 725 "Professional Service Agreements"
- * RHO-MA-212 "Guide for Preparing Purchase Requisitions and Store Orders"

2.2 Technical Requirements

- * BOP G-2 "Project Procurement Document Review"
- * GAI 4-102 "Purchase Order Document Review"
- * EPM 2-6.4 "Procurement Specifications"
- * EPM 2-5 "Construction Work Orders"
- * MPP 303 "Purchase Order Forms and Preparation"
- * MPP 724 "Consultant Services"
- * MPP 725 "Professional Service Agreements"
- * RHO-MA-212 "Guide for Preparing Purchase Requisitions and Store Orders"

- * MPP 614 "Drawings, Specifications and Standards"
- * GAP 4-102 "Application of Procurement Clauses for Subcontracts and Purchase Orders"

2.3 Quality Assurance Program Requirements

- * BOP A-7 "Quality Assurance Requirements, External Work Orders"
- * BOP G-2 "Project Procurement Document Review"
- * GAP 4-102 "Application of Procurement Clauses for Subcontracts and Purchase Orders"
- * GAI 4-102 "Purchase Order Document Review"
- * MPP 706 "Procurement Quality Assurance"

2.4 Right of Access

- * GAP 4-102 "Application of Procurement Clauses for Subcontracts and Purchase Orders"
- * BOP A-7 "Quality Assurance Requirements, External Work Orders"

2.5 Documentation Requirements

- * BOP G-2 "Project Procurement Document Review"
- * EPM 2-5 "Construction Work Orders"
- * BOP A-7 "Quality Assurance Requirements, External Work Orders"
- * GAP 4-102 "Application of Procurement Clauses for Subcontracts and Purchase Orders"
- * GAI 4-101 "Procurement Quality Assurance Document Control Instruction"
- * GAI 4-102 "Purchase Order Document Review"
- * EPM 2-6.4 "Procurement Specifications"

2.6 Nonconformances

- * GAP 4-201 "Supplier's Deviation Request (SDR)"

3.0 Procurement Document Review

- * BOP G-2 "Project Procurement Document Review"
- * GAP 4-101 "Procurement Document Review"
- * GAI 4-101 "Procurement Quality Assurance Document Control Instruction"
- * GAI 4-102 "Purchase Order Document Review"
- * EPM 2-6.4 "Procurement Specifications"

4.0 Procurement Document Changes

- * BOP G-2 "Project Procurement Document Review"
- * GAP 4-201 "Supplier's Deviation Request (SDR)"
- * GAI 4-101 "Procurement Quality Assurance Document Control Instruction"

* EPM 2-6.4 "Procurement Specifications"

63-1 SUPPLEMENTARY REQUIREMENTS FOR DOCUMENT CONTROL

1.0 General

* Reference Basic Requirement No. 6

2.0 Document Preparation, Approval, and Issue

- * BOP A-3 "Basalt Operating Procedures Manual, Development, Implementation, and Maintenance"
- * BOP A-4 "Project Correspondence Control"
- * BOP A-13 "Trade Study Report"
- * BOP A-14 "System Specification Preparation"
- * BOP A-17 "Forward Planning Document Preparation"
- * BOP A-19 "Trip Reports"
- * BOP A-20 "Recording of Meeting Minutes"
- * BOP B-5 "Expedite Change Proposal Processing"
- * BOP B-6 "Processing Approved Technical Changes"
- * BOP B-12 "Functional Design Criteria"
- * BOP B-18 "Record of Design/Field Change Processing"
- * BOP B-23 "Technical Information Control, NWRB and ES Design"
- * BOP C-1.4 "Peer Review"
- * BOP C-2.5 "Preparation of Shift Report of Operations"
- * BOP C-2.6 "Preparation of Borehole Geologic Log"
- * BOP C-3.5 "Geologic Map and Drawing Approval and Issue"
- * BOP D-6 "Test Program Documentation"
- * BOP E-2 "Operating Document Control System"
- * BOP E-7 "Expedite Clearance of BWIP Documents"
- * BOP A-6 "BWIP Telephone Communications Record"
- * QAP 9-101 "Control of Quality Assurance Manual"
- * QAP 9-102 "Quality Assurance Functional Manuals"
- * QAP 9-201 "Centralized Document Control System for Productive Records"
- * QAI 9-101 "Control of Quality Assurance Instruction Manual"
- * EPM 1-2 "Engineering Procedures"
- * EPM 1-2.1 "Engineering Procedure Format"
- * EPM 5-4 "Design Document Control System"
- * EPM 5-4.1 "Engineering Orders"
- * EPM 5-4.2 "Construction Project Design Document Release"
- * EPM 5-4.5 "Control of Design Document Copies"
- * EPM 5-4.7 "Control of Drawing-Originals"
- * EPM 5-6 "Supporting Document Control System"
- * EPM 5-10.3 "Numbering Supporting Documents"
- * QAA 5-101 "Control of Quality Assurance Administrative Guide"
- * BOP E-8 "Basalt Core Storage and Control"

- * GAP 9-101 "Control of Quality Assurance Manual"
- * GAI 9-101 "Control of Quality Assurance Instruction Manual"

3.0 Document Changes

3.1 Major Changes

- * BOP A-3 "Basalt Operating Procedures Manual, Development, Implementation, and Maintenance"
- * BOP B-15 "Data Package"
- * BOP B-18 "Record of Design/Field Change Processing"
- * EPM 5-6 "Supporting Document Control System"
- * GAP 9-101 "Control of Quality Assurance Manual"
- * GAI 9-101 "Control of Quality Assurance Instruction Manual"
- * EPM 5-4.1 "Engineering Orders"
- * EPM 5-8 "Design Document Change System"

3.2 Minor Changes

- * BOP A-3 "Basalt Operating Procedures Manual, Development, Implementation, and Maintenance"
- * BOP B-15 "Data Package"
- * BOP B-18 "Record of Design/Field Change Processing"
- * GAP 9-101 "Control of Quality Assurance Manual"
- * GAI 9-101 "Control of Quality Assurance Instruction Manual"
- * EPM 5-6 "Supporting Document Control System"
- * EPM 5-4.1 "Engineering Orders"
- * EPM 5-8 "Design Document Change System"

75-1 SUPPLEMENTARY REQUIREMENTS FOR CONTROL OF PURCHASED ITEMS AND SERVICES

1.0 General

- * Reference Basic Requirement No. 7

2.0 Procurement Planning

- * RHO-MA-135 "Material Policy and Procedures Manual"
- * RHO-MA-212 "Guide for Preparing Purchase Requisitions and Store Orders"
- * BOP A-7 "Quality Assurance Requirements, External Work Orders"
- * BOP G-2 "Project Procurement Document Review"
- * BOP G-3 "Development of BWIP Long Range Procurement Plans"
- * GAP 4-102 "Application of Procurement Clauses for

- * GAP 4-204 "Subcontracts and Purchase Orders"
- * GAP 4-205 "Supplier Surveillance and Inspection"
- * GAP 4-205 "Quality Assurance Source Surveillance/ Inspection Hold Point Schedule Matrix"
- * GAP 4-301 "Inspection Planning-Procurement"
- * GAP 4-302 "Procurement Sampling Inspection by Attributes"
- * GAI 4-103 "Invitation for Bid Documents"
- * GAI 4-102 "Purchase Order Document Review"
- * GAI 4-303 "Inspection Planning-Procurement"
- * EPM 2-5 "Construction Work Orders"
- * EPM 2-6 "Procurement and Fabrication Planning/Statusing"
- * MPP 305 "Procurement Planning"
- * MPP 607 "Preprocurement Plans"

3.0 Supplier Selection

3.1 Source Evaluation and Selection

- * GAP 4-202 "Supplier Performance Evaluation"
- * GAP 4-203 "Supplier Quality System Evaluation"
- * GAP 4-206 "Hanford Index of Qualified Suppliers"
- * GAI 4-106 "Preparation of Procurement Quality Assurance Vendor Case Files"
- * MPP 401 "Procurement Source Selection Competition and Sole Source"

4.0 Bid Evaluation

- * GAP 4-202 "Supplier Performance Evaluation"
- * GAP 4-203 "Supplier Quality System Evaluation"
- * GAP 4-206 "Hanford Index of Qualified Suppliers"
- * GAI 4-103 "Invitation for Bid Documents"
- * GAI 4-106 "Preparation of Procurement Quality Assurance Vendor Case Files"
- * MPP 404 "Evaluation of Competitive Bids/Proposals"

5.0 Supplier Performance Evaluation

- * RHO-MA-135 "Material Policy and Procedures Manual"
- * RHO-MA-212 "Guide for Preparing Purchase Requisitions and Store Orders"
- * GAP 4-202 "Supplier Performance Evaluation"
- * GAP 4-203 "Supplier Quality System Evaluation"
- * GAP 4-206 "Hanford Index of Qualified Suppliers"
- * GAI 4-106 "Preparation of Procurement Quality Assurance Vendor Case Files"
- * MPP 405 "Supplier Performance Evaluation"
- * MPP 907 "Case File Procedure"

5.1 Extent of Activities

- * GAP 4-203 "Supplier Quality System Evaluation"

5.2 Records

- * QAP 4-202 "Supplier Performance Evaluation"
- * QAP 4-203 "Supplier Quality System Evaluation"
- * QAI 4-101 "Procurement Quality Assurance Documentation Control Instruction"
- * QAI 4-104 "Maintenance of Procurement Quality Assurance Records"
- * QAI 4-103 "Invitation for Bid Documents"
- * QAI 4-106 "Preparation of Procurement Quality Assurance Vendor Case Files"

6.0 Control of Supplier Generated Documents

- * RHO-MA-135 "Material Policy and Procedure Manual"
- * RHO-MA-212 "Guide for Preparing Purchase Requisitions and Store Orders"
- * BOP B-7 "Subcontractor Change Processing"
- * BOP C-2.10 "Geophysical Well Logging (PNL)"
- * QAI 7-201 "Review of Supplier Submitted Special Process Procedures and Data"

7.0 Control of Changes in Items or Services

- * BOP B-7 "Subcontractor Change Processing"
- * QAP 4-201 "Supplier's Deviation Request (SDR)"

8.0 Acceptance of Item or Service

8.1 General

- * BOP C-2.10 "Geophysical Well Logging (PNL)"
- * QAP 4-103 "Certification Criteria for Procurement of Materials"
- * QAP 4-204 "Supplier Surveillance and Inspection"
- * QAP 4-205 "Procurement Sampling Inspection by Attributes"
- * QAI 4-301 "Government Source Inspection Support"
- * QAI 4-302 "Procurement Quality Assurance Operating Instruction for Procured Material"

8.2 Methods of Acceptance

- * QAP 4-103 "Certification Criteria for Procurement of Materials"
- * QAP 4-204 "Supplier Surveillance and Inspection"
- * QAP 4-205 "Procurement Sampling Inspection by Attributes"
- * QAI 4-301 "Government Source Inspection Support"
- * QAI 4-302 "Procurement Quality Assurance Operating Instruction for Procured Material"
- * QAI 4-305 "First Article Inspection"

8.3 Acceptance of Services Only

- * MPP 701 "Purchase of Seller's Services"
- * MPP 724 "Consultant Services"
- * MPP 725 "Professional Service Agreements"
- * GAP 4-204 "Supplier Surveillance and Inspection"

9.0 Control of Supplier Nonconformances

- * BOP 3-7 "Subcontractor Change Processing"
- * GAP 4-201 "Supplier's Deviation Request (SDR)"
- * GAP 8-103 "Rework and Repair of Nonconforming Procured Articles"
- * GAI 4-302 "Procurement Quality Assurance Operating Instruction for Procured Material"
- * GAI 8-102 "Procurement Material Review Activity"
- * MPP 711 "Discrepant Materials"

85-1 SUPPLEMENTARY REQUIREMENTS FOR IDENTIFICATION AND CONTROL OF ITEMS

1.0 General

- * Reference Basic Requirement No. 8

2.0 Identification Methods

2.1 Item Identification

- * GAP 6-101 "Identification and Control of Productive Material"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * BOP 8-2 "Technical Baseline Identification"
- * BOP C-3.7 "Geologic Sample Shipment"
- * BOP C-2.4 "Groundwater Sampling and Analysis"
- * BOP C-3.2 "Lithologic Sampling and Preparation of Rock Samples for Analysis"
- * BOP C-4.25 "Rock Core Sample"
- * BOP C-3.11 "Geologic Sample Analysis Using EDX-Ray Unit"
- * BOP C-3.10 "Stratigraphic Section Measurement"
- * GAI 6-101 "Processing of CQ and PO Marked Materials"
- * GAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * GAI 7-401 "Inspection Status Tag General Instruction"
- * EPM 5-10 "Numbering Engineering Documents"
- * EPM 5-10.1 "Numbering Design Documents"
- * RHO-MA-112 "Drafting Standards Manual"

2.2 Physical Identification

- * BOP B-2 "Technical Baseline Identification"
- * GAP 6-101 "Identification and Control of Productive Material"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * GAI 6-101 "Processing of CQ and PO Marked Materials"
- * GAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * GAI 7-401 "Inspection Status Tag General Instruction"

2.3 Markings

- * BOP B-2 "Technical Baseline Identification"
- * GAP 6-101 "Identification and Control of Productive Material"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * GAI 6-101 "Processing of CQ and PO Marked Materials"
- * GAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * GAI 7-401 "Inspection Status Tag General Instruction"

3.0 Specific Requirements

3.1 Identification and Traceability of Items

- * BOP B-2 "Technical Baseline Identification"
- * GAP 6-101 "Identification and Control of Productive Material"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * GAP 4-103 "Certification Criteria for Procurement of Materials"
- * GAI 6-101 "Processing of CQ and PO Marked Materials"
- * GAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * GAI 7-401 "Inspection Status Tag General Instruction"
- * EPM 2-6.2 "Material/Parts Substitution"

3.2 Limited Life Items

- * GAP 6-201 "Handling, Storage and Shipping of Productive Materials"

3.3 Maintaining Identification of Stored Items

- * GAP 6-101 "Identification and Control of Productive Material"
- * GAP 6-201 "Handling, Storage and Shipping of Productive Materials"
- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"

- Identification of Material"
- * QAI 6-101 "Processing of CQ and PD Marked Materials"
- * QAI 6-102 "Color-Code Identification of Carbon/Alloy Steel Materials"
- * QAI 7-401 "Inspection Status Tag General Instruction"

9S-1 SUPPLEMENTARY REQUIREMENTS FOR CONTROL OF PROCESSES

1.0 General

- * Reference Basic Requirement No. 9

2.0 Process Control

- * GAP 7-201 "Special Process Control"
- * RHO-MA-137 "Production Support Maintenance Manual"
- * BOP C-1 "Scientific Technologies, General" Section
- * BOP C-2 "Hydrology" Section
- * BOP C-3 "Geosciences" Section
- * BOP C-4 "Waste Package" Section
- * PSM PS-00-001 "Welding Material Handling and Control"
- * PSM PS-00-025 "Welding Procedure and Performance Qualification"
- * PSM PS-00-027 "Weld Repair Control Instruction"
- * RHO-MA-106 "NDE Special Process Procedure Manual"

3.0 Special Processes

- * GAP 7-201 "Special Process Control"
- * RHO-MA-106 "NDE Special Process Procedure Manual"
- * PSM PS-00-001 "Welding Material Handling and Control"
- * PSM PS-00-025 "Welding Procedure and Performance Qualification"
- * PSM PS-00-027 "Weld Repair Control Instruction"
- * RHO-MA-137 "Production Support Maintenance Manual"

3.1 Responsibility

- * GAP 7-201 "Special Process Control"
- * RHO-MA-106 "NDE Special Process Procedure Manual"
- * RHO-MA-137 "Production Support Maintenance Manual"

3.2 Acceptance Criteria

- * GAP 7-201 "Special Process Control"
- * RHO-MA-106 "NDE Special Process Procedure Manual"
- * RHO-MA-137 "Production Support Maintenance Manual"

3.3 Records

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for the control of order entry actions from the initial project activities upon Contract award, prior to project start-up, and including order entry activities regarding Subcontractors and Suppliers of items to be incorporated into the Work after award and prior to their start of Work.

2.0 RESPONSIBILITIES AND AUTHORITIES

2.1 Corporate QA Manager

The Corporate QA Manager upon notice of contract award, conducts an Order Entry Meeting with the assigned Project QA Manager, other applicable Project Personnel, and Client representatives to determine program parameters and administrative interfaces with the Client's personnel and other site contractors regarding QA activities.

2.2 Project QA Manager

The Project QA Manager upon award of a subcontract or purchase order and prior to start of Work, conducts an Order Entry Meeting with the Subcontractor's or Supplier's personnel to define program parameters and interface controls for the Subcontractor's and Supplier's as well as Morrison-Knudsen's committed role in regards to the Project QA Program and that of the respective Subcontractor or Supplier.

2.3 The subjects to be considered during the Order Entry Meetings shall include items (a) through (f) below, as appropriate; to assure there is no misunderstanding of the contract requirements.

- a. The quality requirements, including applicable codes, standards, and practices.
- b. The need for special procedures, work instructions, controls, processes, equipment, tools, or skills required to attain quality.
- c. The review of specifications, drawings, and other working documents to verify that prerequisites have been met and that the activity affecting quality can be accomplished as specified.

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- d. The documentation needed.
- e. The assignment of responsibility for each task.
- f. The method to be used to verify conformance to quality requirements.

3.0 REQUIREMENTS

- 3.1 Meeting minutes, or IOC documentation, are required for each phase of order entry and for each Order Entry Meeting with Subcontractors and Suppliers.
- 3.2 Records are controlled in accordance with Section XVII of this manual.

4.0 PROGRAM APPLICABILITY

- 4.1 This entire section applies to all Quality Assurance Level I Work performed by M-K BWIP and our Subcontractors and Suppliers.
- 4.2 This entire section applies to all Quality Assurance Level II Work performed by M-K BWIP and our Subcontractors and Suppliers.
- 4.3 Specific QA procedures will describe M-K BWIP requirements for Quality Assurance Level III Work performed by M-K BWIP and our Subcontractors and Suppliers. Included in this category is the drilling mud. The need for Level III QA procedures will be identified in the plans and specifications. The procedures will be developed by M-K. *

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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program organizational structure, functional responsibilities, levels of authority, and lines of communication. Chart 1.1 shows the organizational structure and Chart 1.2 shows the responsibilities and internal audit trail of the areas which affect the quality of the work.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 The Corporate Quality Assurance Manager.

The Corporate Quality Assurance Manager, reporting to the Group Vice President - Heavy and Marine, is delegated the responsibility for the Group Quality Assurance programs. He is charged with the responsibility for the administration and the measurement of the overall effectiveness of the Group Quality Assurance Program and will conduct regular reviews and audits of activities affecting the quality of the Work in progress to assure conformance with this Quality Assurance Program and the contract requirements.

2.2 The M-K BWIP QA Manager

The M-K BWIP QA Manager reports administratively to the Corporate Quality Assurance Manager and operationally to the M-K BWIP Project Director. He is responsible for the overall implementation of the M-K BWIP QA Program at the job-site. He will utilize the policies, procedures, and instructions described in this manual to verify and record the quality of installed Work and materials, including that of our Subcontractors and Suppliers, to assure that all Work and materials are in accordance with the contract drawings and specifications. He is responsible for conducting regular reviews and audits of M-K BWIP site activities to assure the adequacy of this Quality Assurance Program.

2.3 The M-K BWIP Project Director

The M-K BWIP Project Director, reporting to the Morrison-Knudsen Waste Isolation Division Manager, is responsible for the project schedule and cost activities. He is responsible for initiating and

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directing the Work and to achieve and maintain quality consistent with this Quality Assurance Program, the contract drawings, and specifications and the applicable standards and codes. He shall also be the job-site arbitrator regarding differences of opinion between the Quality Assurance personnel and the production forces. Arbitration decisions shall not conflict with the design and contract requirements.

2.4 The Waste Isolation Division Manager

Provides DOE/RHO direct access to M-K executives. He also provides M-K corporate resources and informs M-K executives of program status.

2.5 Auditors

Auditors report to the M-K BWIP QA Manager. They are responsible to plan and conduct audits of the job-site M-K BWIP operations including our Subcontractors' and Suppliers' quality assurance functions to assure compliance with this Quality Assurance Manual and the BWIP contract. Lead Auditors shall meet the qualification and certification requirements of NQA-1-1979 Supplement 2S-3 except the qualifying audits need not be of nuclear systems.

2.6 Quality Engineers

The Quality Engineers report to the M-K BWIP QA Manager. They shall meet the qualification requirements of NQA-1-1979 Supplement 2S-1. They monitor the work performed by the M-K BWIP personnel, as well as that of our Subcontractors and Suppliers to assure the Work conforms to the BWIP contract, this QA Program, drawings, specifications, regulatory codes, and standards applicable to the Work at the BWIP site. Furthermore, they inspect and review records provided by M-K BWIP personnel and our Subcontractors and Suppliers for completeness, accuracy, adequacy, and conformity with the contract requirements; assist the M-K BWIP QA Manager and Auditors in conducting QA audits of M-K BWIP job-site departments Subcontractors and Suppliers; conduct training for job-site personnel in matters relating to the Quality Assurance Program.

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2.7 QA Document Control Engineer

The Document Control Engineer reports to the M-K BWIP QA Manager and is responsible for receiving, indexing, filing and distribution of Quality Assurance documents, for compiling Quality records of installed equipment for transmittal to the DOE/RHO by the Engineering Manager. He may be assigned other document control duties related to the project.

2.8 NDE Personnel

NDE Personnel report to the M-K BWIP QA Manager. They shall meet the qualification requirements of NQA-1-1979 supplement 2 S-2. They employ non-destructive examination techniques such as radiography and dye penetration testing to inspect work performed by others for compliance with the contract drawings, specifications, and the referenced codes and standards.

2.9 Welding Inspectors

Welding Inspectors report to the M-K BWIP QA Manager. They shall be qualified in accordance with AWS-D1.1-82. They witness welding procedure and welder qualification tests and visually inspect welds performed by others for compliance with the contract drawings and specifications and the referenced codes and standards.

2.10 M-K BWIP Quality Assurance Department

The M-K BWIP QA Department is responsible for:

- Inspection and test requirements for the Work. RHO engineering, production, and M-K BWIP Subcontractor and Supplier personnel will be used as appropriate to discharge this responsibility.
- The identification of quality problems, recommending solutions, and verifying that the solutions are implemented.
- Performing Quality Assurance audits of job-site M-K BWIP Departments, and our Subcontractors and Suppliers as required.
- Compiling Quality Assurance records of installed materials and equipment for transmittal to DOE/RHO by the M-K BWIP Engineering Manager.

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| SECTION: I ORGANIZATION | PAGE 4 | REVISION 2 |
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- e. Maintaining a system for documenting and controlling non-conforming material, equipment, and construction.
- f. Ensuring that all persons contributing to the construction of the Work are provided training and indoctrination in the Quality Assurance Program, applicable codes and standards, and the contract drawings and specifications commensurate with their duties and responsibilities.
- g. For direction and performance of the quality assurance tests and inspections of Work performed by M-K BWIP and our Subcontractors and Suppliers.

3.0 OTHER M-K BWIP PERSONNEL WITH QUALITY ASSURANCE PROGRAM RESPONSIBILITIES

3.1 Business Administration Manager

The Business Administration Manager is responsible to:

- a. Establish and implement a program to assure that all procurement documents contain appropriate provisions to satisfy the Quality Assurance requirements for the items or services being purchased.
- b. Maintain an Approved Subcontractors and Suppliers List in accordance with the approved levels of quality and to select subcontractors and suppliers from this list to supply materials and services for the Work.
- c. Establish and implement a personnel records system to document the QA Program indoctrination and applicable training received by all M-K BWIP on-site personnel, including our Subcontractor's and Supplier's personnel in Quality related job functions.
- d. Establish and implement a job training program for Business Administration Department personnel to insure an understanding of the Quality related items of each individual's work.

3.2 Engineering Manager

The Engineering Manager is responsible to:

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| SECTION: I ORGANIZATION Project: BWIP | PAGE 5 | REVISION 2 |
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- a. Establish and implement a Constructability Review of drawings and specifications for the Work.
- b. Establish and implement construction instructions and procedures for Work, deriving these instruction procedures from M-K BWIP personnel, and our Subcontractors and Suppliers, as required.
- c. Establish and implement procedures for control of all drawings, specifications, instructions, procedures and documents related to the quality of the Work, including all revisions.
- d. Maintain interface control between DOE/RHO, M-K BWIP construction forces, Subcontractors and Suppliers for items related to the quality of the Work.
- e. Communicate nonconformance reports to DOE/RHO and to obtain approved disposition instructions from DOE/RHO.
- f. Establish and implement a job training program for M-K BWIP Engineering Department personnel to ensure an understanding of the Quality related item of each individual's task assignments. This responsibility includes our Subcontractor's and Supplier's engineering employees.

3.3 Construction Manager

The Construction Manager is responsible to:

- a. Implement Work Procedures, nonconformance dispositions, and corrective action requirements for the installed Work. This responsibility includes Work by M-K BWIP and our Subcontractors and Suppliers.
- b. Observe hold-points and Stop Further Processing Orders. This responsibility includes Work by M-K BWIP and our Subcontractors and Suppliers.
- c. Ensure that special conditions and provisions are carried out and that only workers qualified as required by the contract specifications are used to perform all Quality related tasks on the installed Work. This responsibility includes Work by M-K BWIP and our Subcontractors and Suppliers.

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| SECTION: I ORGANIZATION Project: BWIP | PAGE 6 | REVISION 2 |
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- d. Establish and implement a training and qualification procedure for all personnel working on Quality related items of the Work. This responsibility includes Work by M-K BWIP Subcontractors and Suppliers.

4.0 PROGRAM LEVEL APPLICABILITY

This section applies to all Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.

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| SECTION: II QUALITY ASSURANCE PROGRAM | PAGE ¹ | REVISION 2 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program for the construction of the subsurface facilities and associated surface support facilities for the Basalt Waste Isolation Project (BWIP).

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 The general requirements of the Quality Assurance Program are described in the ensuing sections of this manual. Specific procedures for the implementation of this program are contained in written QA implementation procedures and instructions and are part of the M-K BWIP QA Manual. Chart 2.1 is provided as a matrix of the BWIP Project Quality Assurance criteria and is given for information only. *
- 2.2 Systems, structures, and components of the installed Work shall be classified under Quality Assurance Levels I, II, or III as defined by the contract drawings and specifications.
 - a. Work classified Level I shall be performed to the Quality Assurance requirements of ANSI/ASME NQA-1-1979 as a minimum.
 - b. The remainder of the Work will be performed in accordance with the requirements of appropriate sections of this manual as identified within each section, commensurate with the complexity of the item and its role in BWIP. *
- 2.3 All M-K BWIP Project documented and approved quality policies, manuals, and procedures are mandatory requirements which must be implemented and enforced for work performed by M-K BWIP and our Subcontractors and Suppliers. The procedural hierarchy preference is as follows:
 - a. The M-K BWIP Quality Assurance Manual must prevail in all cases.
 - b. Next in preference are the M-K BWIP Quality Assurance Implementing Procedures and Instructions. *
 - c. Lastly are the M-K BWIP Work Procedures.

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| SECTION: II QUALITY ASSURANCE PROGRAM | PAGE ² | REVISION 2 |
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2.4 The responsibility assignments for the M-K BWIP QA Program are delineated in Section I of this manual. Additional assignments of responsibilities are made in ensuing sections. In addition, responsibilities will be contained in sub-tier procedure manuals including the QA Procedures Manual and the M-K BWIP Work Procedures.

3.0 ISSUE AND CONTROL OF THE M-K BWIP QUALITY ASSURANCE MANUAL

The Quality Assurance Manual is issued and controlled by the M-K BWIP Quality Assurance Manager as detailed in the M-K BWIP QA Procedure for Manual Control, Issue, and Revision.

4.0 QUALITY ASSURANCE IMPLEMENTING PROCEDURES AND INSTRUCTIONS

4.1 Implementing procedures and instructions shall, as a minimum:

- a. Provide administrative controls over activities affecting the quality of the installed Work.
- b. Assure that such activities are accomplished under suitably controlled environmental conditions and employ appropriate equipment.
- c. Address the need for special controls, processes, test equipment, tools, and skills in order to attain the required quality of construction and the required verification of the quality by inspection and test.
- d. Provide for the indoctrination and training of personnel performing activities affecting quality.
- e. Provide for input to the M-K BWIP QA program by DOE/RHO.
- f. Provide for the periodic internal and external audit of quality related activities to determine their progress, status, and trends.

4.2 All QA implementing procedures and instructions shall be reviewed and approved the M-K BWIP QA Manager prior to submittal to DOE/RHO for review and approval as required by the specifications.

- 4.3 All Work Procedures shall be reviewed and accepted by the M-K BWIP QA Manager prior to submittal to DOE/RHO for review and approval prior to commencing the related item of Work.
- 4.4 Changes to the approved procedures and instructions are subjected to the same preparation and approval sequence as the original documents.

5.0 TRAINING AND QUALIFICATION PROGRAMS

5.1 The M-K BWIP Project training and qualification programs shall, as a minimum:

- a. Require that personnel performing work affecting the quality of the Work are instructed in the purpose, scope and implementation of the M-K BWIP QA Program to the extent required to perform their work.
- b. Require that personnel performing work requiring qualification, * be trained and qualified according to the specifications for the Work being performed. Minimum requirements shall generally be those specified in ANSI/ASME NQA-1-1979, supplement-2S.
- c. Training and qualification programs must be completed and documented prior to the performance of work requiring qualification.
- d. The M-K BWIP Managers of each department are responsible for identifying training requirements and providing technical and procedural related training in that department's procedures and instructions which affect quality. This training shall include training in procedure and instruction changes before the changes are implemented.
- e. All training required by the M-K BWIP Project Manuals and Procedures shall also be required for on-site and off-site M-K BWIP Subcontractors and Suppliers directly involved in the Work.
- f. All personnel training in quality related items shall be docu-

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| SECTION: II QUALITY ASSURANCE PROGRAM Project: BWIP | PAGE4 | REVISION 2 |
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mented and made a part of the personnel file system. Qualification cards shall be carried by Welders, NDE, inspection and test personnel showing their current qualification status.

6.0 ACTIVITY INTERFACES

6.1 Major interfaces within the M-K BWIP organization are shown in Charts I-1 and I-2 of this manual. Interface definition for lower tier activities will be defined in individual M-K BWIP QA and Work Procedures.

7.0 STOP FURTHER PROCESSING AUTHORITY

7.1 The M-K BWIP QA Manager has the full authority to stop further processing, delivery, installation, or operation of nonconforming items on the project (M-K, Subcontractor, or Supplier) at any time the quality of the Work being performed, or to be performed, is not in conformance to the codes and standards required by the Contract and this QA Program. This stop further processing action shall be documented by a Stop Further Processing Order hand delivered to the supervisor of the specific item of Work and to the Project Director.

8.0 MANAGEMENT REVIEW AND EVALUATION

8.1 The appropriate M-K BWIP on-site department manager shall regularly review the status and adequacy of the part of the QA Program which they are administering. The frequency of this review shall be not less than 4 times per year. This review shall be in addition to the audits performed by the M-K BWIP QA Department.

8.2 An annual management review shall be conducted by the M-K BWIP Project Director of all phases of the Project involved in the M-K BWIP QA Program.

8.3 The Department Manager's Quarterly Review and the Project Director's Annual Review shall be documented by M-K interoffice correspondence (IOC). Distribution of the IOC shall be the same as that for audits.

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9.0 RESOLUTION OF DIFFERENCES

Resolution of differences of opinion between QA personnel and other department or organization personnel shall be accomplished through discussion and mutual agreement between participants. If mutual agreement cannot be reached, the next higher level of management shall be utilized for resolving the dispute. The ultimate responsibility for resolution rests with the Group Vice President - Heavy and Marine. The Corporate Quality Assurance Manager will provide consultation in such matters as requested.

10.0 APPLICABILITY

This entire section applies to all Quality Assurance Level I, and II Work performed by M-K BWIP and our Subcontractors and Suppliers.

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CHART 2.1
CROSS-REFERENCE MATRIX OF QA REQUIREMENTS

| SECTION NOS. H-K BWIP QA MANUAL | APPENDIX D TO DDCRSO CRITERIA | ANSI/ASME NQA-1-1975 REQUIREMENTS SECTION/SUPPLEMENT | HIL-Q-9060A PARAGRAPH | HIL-1-4520RA PARAGRAPH | USMRC REGULATORY GUIDES |
|---------------------------------------|-------------------------------------|---|--------------------------|---------------------------|-------------------------------|
| I | I | 1/15-1 | 1.2, 1.3, 3.1 | | 1.20 |
| II | II | 2/25-1, 25-2, | 1.1, 1.2, 1.3, 3.1, | N/A | 1.20 |
| III | III | 25-3 | 3.2, 3.3, 6.2 | | 1.64 |
| IV | IV | 3/35-1 | 4.1, 3.2, 8, 6.2 | | 1.123 |
| V | V | 4/45-1 | 6.2 | 3.11.2 | 1.20 |
| VI | VI | 6 | 3.3, 6.2 | 3.2, 6.2, 6.1 | 1.20 |
| VII | VII | 6/65-1 | 4.1 | 3.2.4 | 1.20 |
| VIII | VIII | 7/75-1 | 6.1, 6.2, 6.1, 7.2.1, | 1.2, 1.1, 2.2, 3.1, | 1.144 |
| | | | 3.4 | 3.6, 3.0, 3.12 | 1.123 |
| | | | | | 1.44 |
| VIII | VIII | 8/85-1 | 6.1 | 3.6 | 1.20 |
| IX | IX | 9/95-1 | 6.2 | 3.4 | 1.44 |
| | | | | | 1.37 |
| | | | | | 1.18 |
| | | | | | 1.19 |
| | | | | | 1.71 |
| | | | | | 1.50 |
| | | | | | 1.31 |
| | | | | | 1.30 |
| | | | | | 1.94 |
| | | | | | 1.58 |
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| | | | | | 1.55 |
| | | | | | 1.69 |
| | | | | | 1.30 |
| | | | | | 1.116 |
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| | | | | | 1.30 |
| | | | | | 1.39 |
| | | | | | 1.20 |
| | | | | | 1.20 |
| | | | | | 1.20 |
| | | | | | 1.00 |
| | | | | | 1.144 |
| X | X | 10/105-1 | 3.2, 6.2, 6.3, 6.6, | 1.1, 3.1, 3.2.1, | |
| | | | 3.4 | 3.9, 3.10 | |
| XI | XI | 11/115-1 | 3.2, 6.3, 3.3 | 1.1 | |
| XII | XII | 12/125-1 | 4.5, 4.2, 4.3 | 3.3 | |
| XIII | XIII | 13/135-1 | 6.4 | | |
| XIV | XIV | 14 | 6.7 | 3.5, 3.6 | |
| XV | XV | 15/165-1 | 6.5 | 3.7 | |
| XVI | XVI | 16 | 3.5 | 3.2.3 | |
| XVII | XVII | 17/175-1 | 1.3, 3.4 | 3.2.2 | |
| XVIII | XVIII | 18/185-1 | N/A | N/A | |

* Ref. to applicable document, HIL-Q-46662
as a requirement under this system.

-CHART 2.2

REFERENCE MATRIX OF
BASIC QA REQUIREMENTS FOR
QA LEVELS I, II, AND III

| PROGRAM MANUAL SECTION NO. | QUALITY ASSURANCE LEVELS | | |
|-------------------------------|--------------------------|------------------------------------|---------------------------|
| | I | II | III |
| 0 | A11 | A11 | Specific Procedures |
| I | A11 | A11 | A11 |
| II | A11 | A11 | - * |
| III | A11 | A11 | § 1.1, 2.1, & 3.1 |
| IV | A11 | A11 | Specific Procedures |
| V | A11 | A11 | § 2.4, 2.5, 3.2, 6.0, 7.0 |
| VI | A11 | A11 | Specific Procedures |
| VII | A11 | A11 | A11 |
| VIII | A11 | A11 | A11 |
| IX | A11 | A11 | A11 |
| X | A11 | A11 | A11 |
| XI | A11 | A11 | A11 |
| XII | A11 | A11 | A11 |
| XIII | A11 | A11 | A11 |
| XIV | A11 | A11 | A11 |
| XV | A11 | A11 | A11 |
| XVI | A11 | A11 | A11 |
| XVII | A11 | § 2.0 thru 2.6, 4.0 thru 4.3 & 5.0 | |
| XVIII | A11 | A11 | - * |

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| SECTION: III DESIGN CONTROL Project: BWIP | PAGE ¹ | REVISION ¹ |
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1.0 PURPOSE/SCOPE

- 1.1 This section describes the M-K BWIP QA Program requirements for the design controls that will be implemented on this project. The design of the Work on the M-K BWIP project is performed by others. M-K BWIP responsibility in the design control function is limited to:
 - a. Constructability Reviews of all construction drawings and specifications prior to release for fabrication or construction.
 - b. Initiation and control of field changes to construction drawings and specifications during fabrication or construction. *
 - c. Implementation of all approved engineering and field changes during the term of our contract.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 Constructability Reviews will be conducted by the M-K BWIP Engineering Manager. He will be assisted by applicable departments, Subcontractors, Suppliers, or other groups as required.
- 2.2 Field Changes will be initiated by the Construction Manager, or other M-K BWIP supervision, or our Subcontractors or Suppliers on an as-needed basis. The M-K BWIP Engineering Manager is responsible for the procedural controls of Field Changes and to obtain DOE/RHO approval prior to implementation.
- 2.3 The M-K BWIP QA Manager is responsible to verify proper implementation of the changes, including engineering changes initiated by the Design Engineer and forwarded through DOE/RHO.

3.0 INTERFACE WITH DOE/RHO

- 3.1 The results of Constructability Reviews shall be communicated in writing to DOE/RHO by the M-K BWIP Engineering Manager. *
- 3.2 Field changes must be submitted to DOE/RHO, and approval obtained, prior to implementing the change.

4.0 PROGRAM LEVEL APPLICABILITY

4.1 This entire section applies to all Quality Assurance Level I, II, *
and III Work performed by M-K BWIP and our Subcontractors and
Suppliers.

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| SECTION: IV PROCUREMENT DOCUMENT CONTROL Project: BWIP | PAGE 1 | REVISION 2 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for controlling the procurement of all materials, items, or services affecting the quality of the Work.

- a. Subcontracts are used for Subcontractors.
- b. Purchase orders are used for Suppliers.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 Subcontracts initiated and issued by M-K BWIP shall be accomplished through the utilization of a "Bid Specification Package" and a resulting "Subcontract". These documents are the responsibility of the M-K BWIP Business Administration Manager. The document preparation, review, approval, and control actions are defined in Project Work procedures.

2.2 Purchase Orders initiated and issued by the Project shall be accomplished through the use of a "Purchase Requisition" followed by a "Purchase Order". These documents are the responsibility of the M-K BWIP Business Administration Manager. The document preparation, review, approval, and control actions are defined in Project Work procedures.

2.3 Project procurement documents, whether issued by M-K BWIP or by our Subcontractors and Suppliers, shall identify, as a minimum, the necessary technical, quality assurance, and documentation requirements. These include:

- a. Applicable regulatory code and design requirements;
- b. Quality assurance program requirements;
- c. Requirements for supplier documents such as instructions, procedures, drawings, specifications, inspection and test records, and supplier QA records to be prepared, submitted, or made available for project review or approval;
- d. Requirements for the retention, control, and maintenance of Subcontractor and Supplier QA records;

- e. Provision for M-K BWIP personnel right of access to Subcontractors' and Suppliers' facilities and Work documents for inspection and audit;
 - f. Provision for Subcontractor and Supplier reporting and disposition of non-conformances from procurement requirements.
- 2.4 The M-K BWIP Engineering Manager is responsible for the technical review of purchase requisitions and bid specification packages to assure that design basic technical requirements are met.
- 2.5 The M-K BWIP QA Manager is responsible for the review of bid specification packages and purchase requisitions to assure that appropriate Quality Assurance requirements have been included in the documents.
- 2.6 The M-K BWIP Project Director shall be responsible to review and approve all purchase orders, bid specification packages, and subcontracts.

3.0 PROCUREMENT DOCUMENTS - IMPLEMENTATION

3.1 Purchase Requisitions

- a. Designated project individuals may initiate purchase requisitions. Exact responsibility depends on the type and Quality Assurance level of the item to be purchased.
- b. The M-K BWIP Engineering Manager shall review and approve each purchase requisition from a technical standpoint. He shall indicate his approval by signature and date.
- c. The M-K BWIP QA Manager shall review and approve each purchase requisition from the standpoint of QA program requirements. He shall indicate his approval by signature and date.
- d. The M-K BWIP Project Director shall be responsible to approve the procurement action prior to preparation of the purchase order.

3.2 Purchase Orders

- a. The M-K BWIP Purchasing Agent shall be responsible to assure that purchase orders, as prepared, reflect an exact translation of the approved purchase requisition requirements.

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| SECTION: IV PROCUREMENT DOCUMENT CONTROL Project: BWIP | PAGE 3 | REVISION 2 |
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- b. The purchase order shall be reviewed by the M-K BWIP Engineering Manager and the M-K BWIP QA Manager prior to forwarding the completed purchase order to the M-K BWIP Project Director for approval. This review shall be documented on the transmittal sheet of the Purchase Order.
- c. After final reviews and approval, the purchase order shall be signed by the Project Director.
- d. Copies of the completed purchase orders shall be forwarded to Document Control for filing in accordance with Section XVII of this M-K BWIP QA Program.

3.3 Bid Specification Packages

- a. The M-K BWIP Contracts Administrator is responsible to prepare the bid specification package.
- b. The M-K BWIP Engineering Manager shall review and approve each bid specification package from a technical standpoint. He shall indicate his approval by signature and date.
- c. The M-K BWIP QA Manager shall review and approve each bid specification package from the standpoint of the Quality Assurance Program requirements. He shall indicate his approval by signature and date.
- d. The M-K BWIP Project Director shall review and approve the completed bid specification package prior to release for bidding purposes.
- e. Required changes shall follow the same approval path as the initial bid specification package.
- f. Subcontractors and Suppliers must be included in the Approved Subcontractors and Suppliers Listings for Quality Assurance Levels I and II Work prior to solicitation for quotations.
- g. Bid Evaluation:
 - 1. The M-K BWIP QA Manager shall be responsible to review the proposals for conformance to M-K BWIP QA requirements.
 - 2. Approval of the M-K BWIP Project Director is required for authorization to implement a contract.

- * GAP 7-201 "Special Process Control"
- * RHO-MA-106 "NDE Special Process Procedure Manual"
- * RHO-MA-137 "Production Support Maintenance Manual"

3.4 Special Requirements

- * GAP 7-201 "Special Process Control"
- * BOP C-1.5 "Qualification of Technical Procedures"
- * BOP C-1.6 "Updating Voluntary Standards"

105-1 SUPPLEMENTARY REQUIREMENTS FOR INSPECTION

1.0 General

- * Reference Basic Requirement No. 10

2.0 Personnel

2.1 Reporting Independence

- * PM QA 1-100 "Quality Assurance Program"
- * OP FC 2-214 "Function Charter-Quality Assurance"

2.2 Qualification

- * PPR CBD PN 1-102 "Job Offer Procedure"
- * PPR NEI-1 "Manager's Guide-New Employee Indoctrination"
- * GAA 4-201 "Quality Assurance Minimum Required Training and Internal Training Records"

3.0 Inspection Hold Points

- * GAP 4-205 "Quality Assurance Source Surveillance/ Inspection Hold Point Schedule Matrix"
- * GAP 4-301 "Inspection Planning-Procurement"
- * GAP 7-102 "Inspection Planning-Fabrication"

4.0 Inspection Planning

4.1 Planning

- * BOP D-4 "Quality Assurance Responsibilities-Near Surface Test Facility"
- * GAP 4-301 "Inspection Planning-Procurement"
- * GAP 7-102 "Inspection Planning-Fabrication"
- * GAI 4-101 "Quality Assurance Surveillance Program"
- * GAI 1-406 "Surveillance Activities-Basalt Waste Isolation Project"
- * GAI 5-103 "Architect-Engineer Title III Inspection Plan Review"

- * EPM 2-4.3 "Design and Inspection-Construction Projects"
- * EPM 2-5 "Construction Work Orders"

4.2 Sampling

- * GAP 4-302 "Procurement Sampling Inspection by Attributes"

5.0 In-Process Inspection

5.1 Inspection

- * BOP D-4 "Quality Assurance Responsibilities-Near Surface Test Facility"
- * GAP 7-102 "Inspection Planning-Fabrication"
- * GAP 1-402 "Quality Assurance Surveillance Program"
- * QAI 7-102 "Quality Assurance Planning-Fabrication"

5.2 Combined Inspection and Monitoring

- * GAP 4-101 "Quality Assurance Surveillance Program"
- * QAI 1-406 "Surveillance Activities-Basalt Waste Isolation Project"
- * QAI 7-102 "Quality Assurance Planning-Fabrication"

6.0 Final Inspections

6.1 Resolution of Nonconformances

- * QAI 8-101 "Identification and Control of Nonconforming Conditions-Rockwell Designs"
- * QAI 8-105 "Identification and Control of Nonconforming Conditions-Onsite Architect-Engineer Designs"

6.2 Inspection Requirements

- * QAI 4-305 "First Article Inspection"
- * QAI 5-103 "Architect-Engineer Title III Inspection Plan Review"
- * QAI 7-102 "Quality Assurance Planning-Fabrication"
- * MPP 1110 "Receiving Inspection"
- * QAI 4-302 "Procurement Quality Assurance Operating Instruction for Procured Material"

6.3 Acceptance

- * QAI 4-305 "First Article Inspection"
- * QAI 5-103 "Architect-Engineer Title III Inspection Plan Review"
- * BOP D-5 "Construction Acceptance Testing"
- * QAI 5-107 "Construction Project Closeout"
- * QAI 7-102 "Quality Assurance Planning-Fabrication"
- * EPM 2-4.3 "Design and Inspection-Construction Projects"

6.4 Modifications, Repairs, or Replacements

- * QAI 7-102 "Quality Assurance Planning-Fabrication"

7.0 Inservice Inspection

7.1 Planning and Performance

- * GAP 7-101 "Inspection Planning-Operations"
- * GAP 4-101 "Quality Assurance Surveillance Program"
- * QAI 1-404 "Surveillance Activities-Quality Engineering and Control"
- * PSM PS-D-014 "Third Party Inspection"

7.2 Methods

- * GAP 7-101 "Inspection Planning-Operations"
- * GAP 4-101 "Quality Assurance Surveillance Program"
- * PSM PS-D-014 "Third Party Inspection"

8.0 Records

- * GAP 4-205 "Quality Assurance Source Surveillance/ Inspection Hold Point Schedule Matrix"
- * GAP 4-302 "Procurement Sampling Inspection by Attributes"
- * GAP 7-102 "Inspection Planning-Fabrication"
- * GAP 7-101 "Inspection Planning-Operations"
- * GAP 4-301 "Inspection Planning-Procurement"
- * QAI 4-101 "Quality Assurance Surveillance Program"
- * QAI 1-406 "Surveillance Activities-Basalt Waste Isolation Project"

11S-1 SUPPLEMENTARY REQUIREMENTS FOR TEST CONTROL

1.0 General

- * Reference Basic Requirement No. 11

2.0 Test Requirements

- * BOP C-1 "Scientific Technologies, General" Section
- * BOP C-2 "Hydrology" Section
- * BOP C-3 "Geosciences" Section
- * BOP C-4 "Waste Package" Section
- * BOP D-5 "Construction Acceptance Testing"
- * GAP 7-301 "Test Control"
- * BOP D-6 "Test Program Documentation"

- * GAI 5-104 "Acceptance Test Procedures-Construction"
- * EPM 3-2.2 "Acceptance Testing"

3.0 Test Procedures

- * BOP D-3 "Description and Use of NSTF Operating Procedures"
- * BOP D-6 "Test Program Documentation"
- * BOP C-1 "Scientific Technologies, General" Section
- * BOP C-2 "Hydrology" Section
- * BOP C-3 "Geosciences" Section
- * BOP C-4 "Waste Package" Section
- * BOP D-5 "Construction Acceptance Testing"
- * BOP C-1.5 "Qualification of Technical Procedures"
- * GAI 5-104 "Acceptance Test Procedures-Construction"
- * EPM 3-2.2 "Acceptance Testing"

4.0 Test Results

- * GAP 7-301 "Test Control"
- * BOP C-1 "Scientific Technologies, General" Section
- * BOP C-2 "Hydrology" Section
- * BOP C-3 "Geosciences" Section
- * BOP C-4 "Waste Package" Section
- * BOP D-5 "Construction Acceptance Testing"
- * BOP D-6 "Test Program Documentation"
- * GAI 5-104 "Acceptance Test Procedures-Construction"
- * EPM 3-2.2 "Acceptance Testing"

5.0 Test Records

- * BOP D-6 "Test Program Documentation"
- * GAP 7-301 "Test Control"
- * BOP C-1 "Scientific Technologies, General" Section
- * BOP C-2 "Hydrology" Section
- * BOP C-3 "Geosciences" Section
- * BOP C-4 "Waste Package" Section
- * GAI 5-104 "Acceptance Test Procedures-Construction"

12S-1 SUPPLEMENTARY REQUIREMENTS FOR CONTROL OF MEASURING AND TEST EQUIPMENT

1.0 General

- * Reference Basic Requirement No. 12 and RHO-MA-137, Production Support Maintenance Manual, Division B.

2.0 Selection

- * GAI 7-501 "Quality Control Instrument, Equipment"

- Control Instruction"
- * BOP C-1.3 "Instrument Calibration"
- * PSM PS-O-017 "Maintenance Instrumentation Calibration System (MICS)"

3.0 Calibration and Control

3.1 Calibration

- * GAI 7-501 "Quality Control Instrument, Equipment Control Instruction"
- * BOP C-1.3 "Instrument Calibration"
- * PSM PS-O-017 "Maintenance Instrumentation Calibration System (MICS)"

3.2 Control

- * GAI 7-501 "Quality Control Instrument, Equipment Control Instruction"
- * BOP C-1.3 "Instrument Calibration"
- * PSM PS-O-017 "Maintenance Instrumentation Calibration System (MICS)"
- * PSM PS-O-008 "Maintenance Calibration Labels"

3.3 Commercial Devices

- * BOP C-1.3 "Instrument Calibration"

4.0 Handling and Storage

- * BOP C-1.3 "Instrument Calibration"
- * PSM PS-O-008 "Maintenance Calibration Labels"

5.0 Records

- * GAI 7-501 "Quality Control Instrument, Equipment Control Instruction"
- * BOP C-1.3 "Instrument Calibration"
- * PSM PS-O-008 "Maintenance Calibration Labels"

13S-1 SUPPLEMENTARY REQUIREMENTS FOR HANDLING, STORAGE, AND SHIPPING

1.0 General

- * Reference Basic Requirement No. 13

2.0 Instruction

- * GAP 6-201 "Handling, Storage, and Shipping of

Productive Materials"

- * MPP 1200 "Warehouse"
- * MPP 1100 "Receiving, Distribution, and Shipping"

3.0 Requirements

3.1 General

- * BOP C-2.3 "Geomechanical Logging"
- * BOP C-3.7 "Geological Sample Shippment"
- * BOP C-4.4 "Rare, Special, and Precious Metals Management"
- * QAP 6-201 "Handling, Storage, and Shipping of Productive Materials"
- * GAI 6-201 "Quality Control Verification of Stored Critical Spares"
- * BOP C-2.11 "Drilling Equipment Maintenance"
- * PSM PS-00-006 "Fabrication Material, Handling, and Control"
- * RHO-MA-137 "Production Support Maintenance Manual"

3.2 Procedures

- * BOP C-2.3 "Geomechanical Logging"
- * QAP 6-201 "Handling, Storage, and Shipping of Productive Materials"
- * BOP C-3.7 "Geological Sample Shipment"
- * GAI 6-201 "Quality Control Verification of Stored Critical Spares"
- * BOP C-2.11 "Drilling Equipment Maintenance"
- * MPP 1100 "Receiving, Distribution, and Shipping"
- * MPP 1200 "Warehouse"

3.3 Tools and Equipment

- * BOP C-2.7 "Forecast, Storage, and Inventory Control of Drilling and Testing Materials and Equipment"
- * BOP C-2.11 "Drilling Equipment Maintenance"
- * PSM PS-00-015 "Use of Sky Climber"
- * PSM PS-00-019 "Certifying Chokes, Slings, and other Lifting Devices"
- * MPP 1109 "Forklift Operation Training"

3.4 Operators

- * MPP 1109 "Forklift Operation Training"

4.0 Marking

- * BOP C-2.3 "Geomechanical Logging"
- * QAP 6-101 "Identification and Control of Productive Material"

- * GAP 6-102 "Purchase Order/Certified Quality Identification of Material"
- * GAP 6-201 "Handling, Storage, and Shipping of Productive Materials"

153-1 SUPPLEMENTARY REQUIREMENTS FOR THE CONTROL OF NONCONFORMING ITEMS

1.0 General

- * Reference Basic Requirement No. 15

2.0 Identification

- * GAP 8-101 "Identification and Control of Non-Conforming Conditions-Rockwell Designs"
- * GAP 8-105 "Identification and Control of Non-Conforming Conditions-Onsite A-E Designs"
- * PSM PS-00--13 "Nonconformance Reports"

3.0 Segregation

- * GAP 8-101 "Identification and Control of Non-Conforming Conditions-Rockwell Designs"
- * GAP 8-105 "Identification and Control of Non-Conforming Conditions-Onsite A-E Designs"

4.0 Disposition

4.1 Control

- * GAP 8-101 "Identification and Control of Non-Conforming Conditions-Rockwell Designs"
- * GAP 8-102 "Material Review"
- * GAP 8-103 "Rework and Repair of Nonconforming Procured Articles"
- * GAP 8-105 "Identification and Control of Non-Conforming Conditions-Onsite A-E Designs"

4.2 Responsibility and Authority

- * GAP 8-102 "Material Review"
- * GAP 8-101 "Identification and Control of Non-Conforming Conditions-Rockwell Design"
- * GAP 8-103 "Rework and Repair of Nonconforming Procured Articles"
- * GAP 8-105 "Identification and Control of Non-Conforming Conditions-Onsite A-E Designs"
- * PSM PS-00-013 "Nonconformance Reports"

4.3 Personnel

4.4 Final Disposition

- * QAP 8-101 "Identification and Control of Non-conforming Conditions-Rockwell Designs"
- * QAP 8-102 "Material Review"
- * QAP 8-103 "Rework and Repair of Nonconforming Procured Materials"
- * QAP 8-105 "Identification and Control of Non-conforming Conditions-Onsite A-E Designs"

4.5 Technical Justification

- * QAP 8-102 "Material Review"

4.6 Repaired or Reworked Items

- * QAP 8-103 "Rework and Repair of Nonconforming Procured Articles"

175-1 SUPPLEMENTARY REQUIREMENTS FOR QUALITY ASSURANCE RECORDS

1.0 General

- * Reference Basic Requirement No. 17

2.0 Records Administration

2.1 Records System

- * BOP A-11 "Operation of the BWIP Technical Baseline Index"
- * BOP E-6 "BWIP Records Management System"
- * BOP C-4.37 "Materials Testing Group File"
- * QAP 9-201 "Centralized Document Control System for Productive Records"
- * QAI 9-202 "Fabrication Quality Control-Records"

2.2 Generation of Records

- * BOP A-11 "Operation of the BWIP Technical Baseline Index"
- * BOP C-2.3 "Geomechanical Logging"
- * BOP E-6 "BWIP Records Management System"
- * BOP E-6.4 "One-of-a-Kind Records"
- * BOP E-6.6 "Retrofit of BWIP Records"
- * BOP C-4.37 "Materials Testing Group File"
- * QAP 9-201 "Centralized Document Control System for Productive Records"
- * QAI 9-202 "Fabrication Quality Control-Records"

2.3 Record Validation

2.4 Index

- * BOP A-11 "Operation of the BWIP Technical Baseline Index"
- * BOP E-6.1 "Receipt and Registering of Records"

2.5 Distribution

- * BOP A-11 "Operation of the BWIP Technical Baseline Index"
- * GAI 9-202 "Fabrication Quality Control-Records"
- * GAI 9-204 "Document Transmittal to Quality Information Center"

2.6 Identification

- * BOP A-11 "Operation of the BWIP Technical Baseline Index"
- * BOP C-2.3 "Geomechanical Logging"
- * BOP E-6.1 "Receipt and Registering of Records"
- * BOP E-6.4 "One-of-a-Kind Records"
- * BOP E-6.6 "Retrofit of BWIP Records"

2.7 Classification

2.7.1 Lifetime Records

- * BOP E-6 "BWIP Records Management System"

2.7.2 Nonpermanent Records

- * BOP E-6 "BWIP Records Management System"

2.8 Retention of Records

- * BOP C-2.3 "Geomechanical Logging"
- * BOP E-6.1 "Receipt and Registering of Records"
- * BOP E-6.2 "Microfilming of BWIP Records"
- * BOP E-6.4 "One-of-a-Kind Records"
- * GAP 9-201 "Centralized Document Control System for Productive Records"
- * GAI 9-202 "Fabrication Quality Control-Records"

2.9 Corrected Information in Records

3.0 Receipt

3.1 Responsibility

- * BOP E-6.1 "Receipt and Registering of Records"

- 3.2 Receipt Control
 - * BOP E-6.1 "Receipt and Registering of Records"
- 3.3 Status
 - * BOP E-6.1 "Receipt and Registering of Records"
- 4.0 Storage, Preservation, and Safekeeping
 - 4.1 Storage
 - * BOP C-2.3 "Geomechanical Logging"
 - * BOP E-6.2 "Microfilming of BWIP Records"
 - * QAP 9-201 "Centralized Document Control System for Productive Records"
 - * EPM 5-4.7 "Control of Drawing Originals"
 - 4.2 Preservation
 - * BOP C-2.3 "Geomechanical Logging"
 - * BOP E-6.2 "Microfilming of BWIP Records"
 - 4.3 Safekeeping
 - * BOP C-2.3 "Geomechanical Logging"
 - * BOP E-6.2 "Microfilming of BWIP Records"
 - 4.4 Facility
 - 4.4.1 Single Facility
 - * BOP E-6 "BWIP Records Management System"
 - * BOP E-6.4 "One-of-a-Kind Records"
 - 4.4.2 Dual Facility
- 5.0 Retrieval
 - * BOP E-6 "BWIP Records Management System"
 - * BOP E-6.7 "Impounding and Withdrawal of Radiographs"
- 6.0 Disposition
 - * BOP E-6 "BWIP Records Management System"
 - * BOP E-6.1 "Receipt and Registering of Records"

18S-1 SUPPLEMENTARY REQUIREMENTS FOR AUDITS

1.0 General

- * Reference Basic Requirement No. 1B

2.0 Scheduling

- * GAP 1-401 "Audits"
- * QAI 1-4-1 "Audits"

3.0 Preparation

3.1 Audit Plan

- * GAP 1-401 "Audits"
- * QAI 1-401 "Audits"

3.2 Personnel

- * GAP 1-401 "Audits"

3.3 Selection of Audit Team

- * GAP 1-401 "Audits"

4.0 Performance

- * GAP 1-401 "Audits"
- * QAI 1-401 "Audits"
- * GAP 1-404 "Rockwell Escorts for Customer QA Auditors"

5.0 Reporting

- * GAP 1-401 "Audits"
- * GAP 1-501 "Trend Reporting"
- * QAI 1-401 "Audits"
- * QAI 1-402 "Audit Status and Closing Procedure"

6.0 Response

- * GAP 1-401 "Audits"
- * QAI 1-401 "Audits"

7.0 Follow-up Action

- * GAP 1-401 "Audits"
- * QAI 1-401 "Audits"

8.0 Records

- * GAP 1-401 "Audits"
- * QAI 1-401 "Audits"

APPENDIX B

NATIONAL WASTE TERMINAL STORAGE EXCLUSIONS,
MODIFICATIONS, AND ADDITIONS TO
ANSI/ASME NQA-1

1. Basic Requirement No. 11, "Test Control" is modified to read: "Tests required to verify conformance of an item to specified requirements and to demonstrate that items will perform satisfactorily in service, or to determine functional characteristics shall be planned and executed. Characteristics to be tested and test methods to be employed shall be specified. Test results shall be documented and their conformance with acceptable criteria shall be evaluated. This requirement applies to geologic investigations that produce data, recommendations, or other bases for decision on sites for a potential nuclear waste repository. R&D projects providing design bases for such a repository are also included."
2. Basic Requirement No. 17, "Quality Assurance Records" is modified to read: Records that furnish documentary evidence of quality shall be specified, prepared, and maintained. Records shall be legible, identifiable, and retrievable. Records shall be protected against damage, deterioration, or loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition shall be established and documented. NWTS participants shall prepare and submit a records management plan to the cognizant DOE project office and to DOE/HQ for review and concurrence early in the life of the project or particular siting phase.
3. The following definitions are modified or added to Supplement S-1:

Item - An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, unit, data, sample, geologic environmental, or prototypic hardware.

Design - The act of conceiving and developing design documentation or analyzing the performance of repository structures, systems and components. Design documentation includes, but is not limited to, drawings, specifications, tests plans, design reports, test reports, system design descriptions, configuration status listings, design manuals, and manuals describing computer programs used for design or performance analysis.

Functional Characteristics - Those attributes of a repository or its structures/systems/components that determine its performance with respect to safety, reliability, operability, and other design criteria established in the NWTS Program or other federal regulatory documents.

4. All other supplements of NQA-1-1979 are applicable to the NWTS Program with the following exclusions, modifications, or additions:

2S-1, "Supplementary Requirements for the Qualification of Inspection and Test Personnel"

Applies only to repository site-specific activities.

2S-2, "Supplementary Requirements for the Qualification of Nondestructive Examination Personnel"

Applies only to repository construction and waste package fabrication.

2S-3, "Supplementary Requirements for the Qualification of Quality Assurance Program Audit Personnel"

Omit "nuclear" as a modifier to quality assurance audit in Sections 3.3 and 4.2.

3S-1, "Supplementary Requirements for Design Control"

In Section 4.2.1, after the first sentence on design reviews, add Peer reviews are subject to the requirements of this section.

MORRISON-KNUDSEN COMPANY, INC.:

QUALITY ASSURANCE PROGRAM

FOR

CONTRACT NO. DE-AC06- 83RL10343

BASALT WASTE ISOLATION PROJECT

HANFORD SITE

RICHLAND, WASHINGTON

Issue Approval:

R. D. Kulchak

R. D. Kulchak
Corporate QA Manager

F. C. Larvie

F. Larvie
BWIP Project Director

W. D. Small 16 Dec 1982

W. D. Small
BWIP QA Manager

16 Dec 1982

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INTRODUCTION

Proposed rules established in the Code of Federal Regulations, Title 10, Part 60 (10CFR60), "Disposal of High Level Radioactive Wastes" Sub-Part G "Quality Assurance" require that a quality assurance program based on the 18 criteria in 10CFR50 Appendix 8 "Quality Assurance Criteria For Nuclear Power Plants and Fuel Reprocessing Plants" be established for nuclear waste isolation facilities. This Quality Assurance Program is to be applied to systems, structures, and components important to safety and to activities which would prevent or mitigate events that could cause undue risk to public health and safety. These activities include: "exploring, site selecting, designing, fabricating, purchasing, inspecting, testing, operating, maintaining, monitoring, repairing, modifying, and decommissioning" of the nuclear waste isolation facility. The Quality Assurance Program must also include: "the program of tests, experiments, and analyses essential to achieving adequate confidence that the emplaced wastes will remain isolated from the accessible environment".

The Department of Energy has endorsed the American National Standard ANSI/ASME NQA-1-1979 and Addendums a and b, 1981, as the governing Quality Assurance Standard to be used in the construction of the subsurface support facilities for the Basalt Waste Isolation Project (BWIP) at the Hanford, Washington, site. This endorsement by the Office of the Secretary for Environmental Protection, Safety, and Environmental Preparedness through Order DOE 5700.6A dated 13 August 1981 was further endorsed by a memorandum from the Office of the Assistant Secretary for Nuclear Energy. Further, endorsement for the use of ANSI/ASME NQA-1-1979 and Addendums a and b of 1981, was made by the Office of Waste Isolation through Memorandum NE 330 dated 27 October 1981. The Office of the Manager, Richland Operations, has further defined the quality assurance requirements for BWIP in DOE Order RL-5700.1 dated 26 August 1980. The Morrison-Knudsen Company, Inc. Quality Assurance Program describes implementation of American National Standard ANSI/ASME NQA-1-1979, including Addendums a and b 1981, during the perfor-

mance of our work, including the work of our subcontractors and suppliers, under contract DE-AC06-83RL10343 for "Construction of the Subsurface Facilities and Associated Surface Support Facilities for the Basalt Waste Isolation Project (BWIP) at the Hanford site, Washington".

The Morrison-Knudsen BWIP QA Program meets the requirements and the intent of the RHO Quality Assurance Program Plan BWIP RHO-QA-PL-3 Rev 1 L.

Exclusions:


We have been advised by DOE/RHO that, at the present time, only two components of the exploratory shaft, the shaft liner plate and grout and grouting operations have been designated Quality Assurance Level I, and require the implementation of all elements of this Quality Assurance Program. The remainder of the Work will be performed in accordance with the requirements of appropriate sections of this manual as identified within each section commensurate with the complexity of the item and its role in the Basalt Waste Isolation Project. Additional sections may be applied at the request of DOE/RHO.

December 1, 1981

STATEMENT OF POLICY

Morrison-Knudsen Company, Inc., is committed to the implementation and success of the M-K BWIP Quality Assurance Program described in this manual. We whole-heartedly, and without reservation, support the M-K BWIP Quality Assurance Program and Quality Assurance Procedures set forth within this manual.

All possible measures will be exercised to assure that the work performed by Morrison-Knudsen Company, Inc., including the work of our subcontractors and suppliers, meets the requirements of the contract drawings and specifications and the applicable regulatory codes and standards.


G. W. Gilfillan
Group Vice President - Heavy and Marine

13 DEC. '82


December 1, 1981

STATEMENT OF AUTHORITY

The Corporate Quality Assurance Manager reports to the Group Vice President - Heavy and Marine, and is, therefore, independent of authority from production supervision. The M-K BWIP Quality Assurance Manager reports directly to and receives technical direction and administration from the Corporate Quality Assurance Manager. Operationally he reports to the M-K BWIP Project Director. We have implemented this arrangement to ensure unchallenged authority over administration of the M-K BWIP Quality Assurance Program. Differences of opinion regarding the administration of the M-K BWIP Quality Assurance Program within the M-K BWIP Management team and the M-K BWIP Quality Assurance Manager, shall be referred to the Group Vice President - Heavy and Marine for final resolution. The Corporate Quality Assurance Manager provides consultation in such matters as requested.

This office assures further that M-K BWIP Quality Assurance Personnel will at all times have the authority and organizational freedom to identify Quality Assurance problems, recommend solutions to these problems and to verify implementation of the approved solutions to those problems.

The M-K BWIP Quality Assurance Manager has the authority to stop further processing, delivery, installation, or operation of non-conforming items.

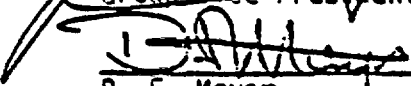

G. W. Gilfillan
Group Vice President - Heavy and Marine

13 DEC '82
Date

Concurrence:


J. H. Lemley
Group Vice President - Heavy and Marine Operations

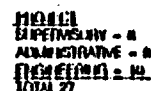
17 Dec 82
Date


D. F. Meyer
Waste Isolation - Division Manager

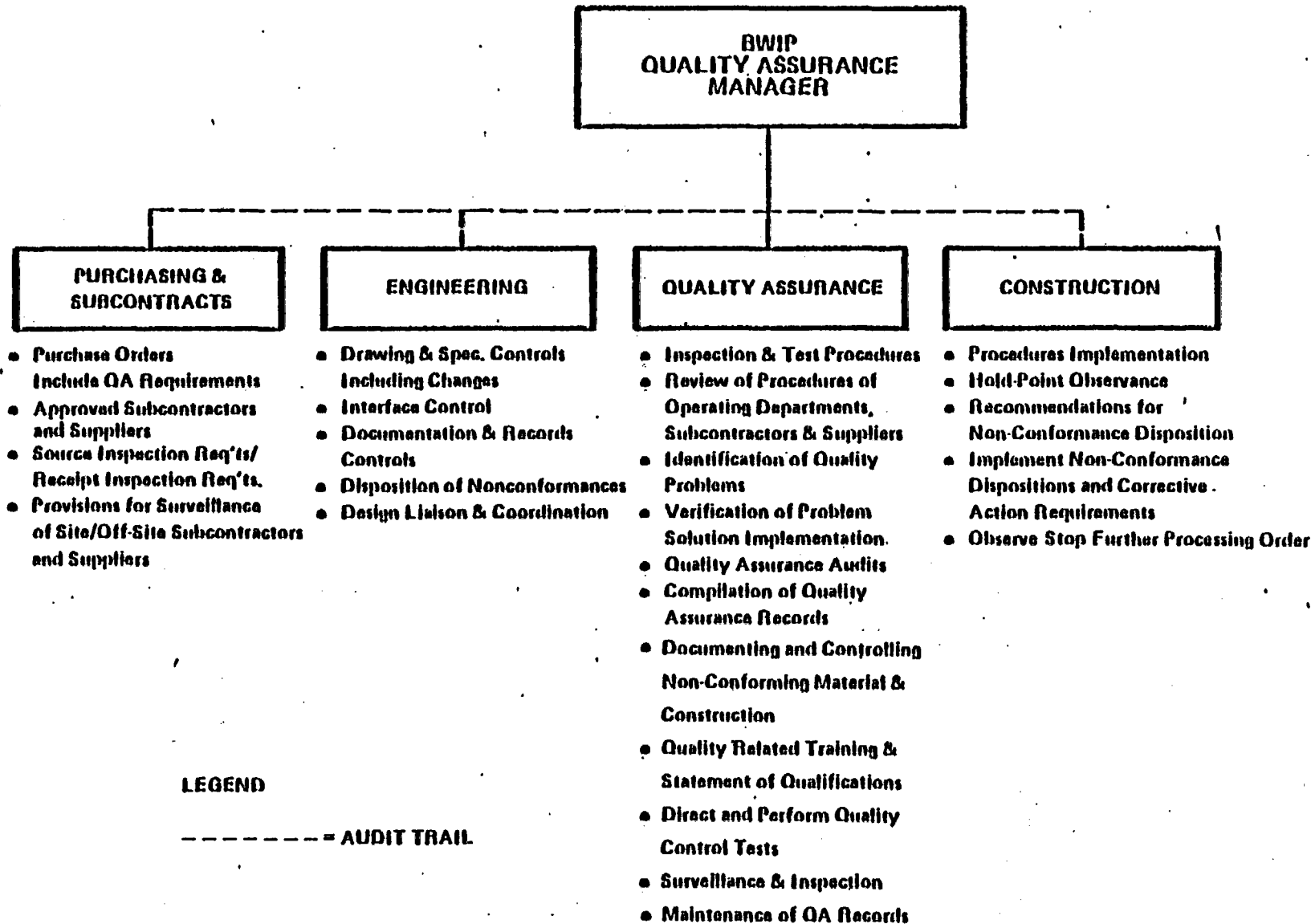
Date


F. C. Larvie
Project Director - BWIP

12/17/82
Date



**CHART NO. 1.2
QA PROGRAM FUNCTIONAL RESPONSIBILITIES
ORGANIZATIONAL VS AUDIT**



VIII

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NOTE 1

DELEGATION OF WORK

The individual(s) or organization(s) responsible for establishing and executing this Quality Assurance Program may delegate any or all work or authority to others but shall retain the responsibility therefore subject to the approval of DOE/RHO.

NOTE 2

SUPPLIER RESPONSIBILITIES

All Subcontractors and Suppliers are responsible to comply with the requirements of this M-K BWIP Quality Assurance Program, to the extent required by their contract documents, using procedures of their own which have been reviewed and approved by the M-K BWIP Quality Assurance Manager or using procedures previously adopted by the M-K BWIP organization. The quality level of the work (I,II, or III) will determine which sections of this manual will be implemented.

NOTE 3

CLARIFICATION OF WORD "HE".

Whenever the word "he" appears in this document, it shall be understood to refer to a person of either gender.

NOTE 4

CLARIFICATION OF TERM "DOE/RHO"

The Department of Energy (DOE) has delegated technical direction, coordination, and QA approval action responsibilities to Rockwell Hanford Operations (RHO).

REVISION CONTROL
(List Of Effective Pages)

| Manual Rev. No. | Revision Date | Involved Section Nos. | Section Rev. Status | Revision Description |
|--------------------|------------------|---|------------------------|---|
| Original | 12/20/82 | All, 0-XVIII | 0 | Developed and Issued Project QA Manual |
| 1 | 2/16/83 | Organizational Charts, Glossary, and All 0-XVIII | 1 | Incorporate RHO Comments |
| 2 | 3/16/83 | Glossary, Sections 0, I, II, IV, V, VII, VIII, IX, X, XII | 2 | Incorporate DOE and RHO Comments |

GLOSSARY
TERMS AND DEFINITIONS
AS USED IN THIS MANUAL

ACCEPTANCE CRITERIA:

Specified limits placed on characteristics of an item, process, or service defined in codes, standards, or other requirement documents.

AUDIT:

A planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation. An audit should not be confused with surveillance or inspection activities performed for the sole purpose of process control or product acceptance.

BWI:

Basalt Waste Isolation. Pertains to the construction and use of a waste isolation facility in basalt to be used for permanent storage of high level nuclear wastes.

BWIP:

The Basalt Waste Isolation Project.

CERTIFICATE OF CONFORMANCE:

A document signed by an authorized individual certifying the degree to which items or services meet specified requirements.

CERTIFICATION:

The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

CERTIFIED MATERIAL TEST REPORT (CMTR):

A document attesting that the material is in accordance with specified requirements, including the actual results of all chemical and physical analysis, tests, and examinations.

CHARACTERISTIC:

Any property or attribute of an item, process, or service that is distinct, describable, and measurable.

CONDITION ADVERSE TO QUALITY:

An all inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and non-conformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety or operability.

CONTRACTOR:

An individual or organization who furnishes services consisting primarily of labor, management or consulting services to the owner of a facility.

CONSULTANT:

An individual or organization who furnishes expert advice on the best way to perform specific operations.

CORRECTIVE ACTION:

Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

DOCUMENT:

Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record as defined in this Glossary.

DOE/RHO:

The Department of Energy (DOE) is the Owner of the installed work at the BWIP site. Technical direction, coordination, and QA approval action for this work is provided by Rockwell Hanford Office (RHO).

ES-1:

The exploratory shaft to be constructed under this contract.

EXTERNAL AUDIT:

An audit of those portions of another organization's quality assurance program not under the direct control or within the organizational structure of the auditing organization.

FINAL DESIGN:

Approved design output documents and approved changes thereto.

GUIDELINE:

A suggested practice that is not mandatory in programs intended to comply with a standard. The word "should" denotes a guideline; the "shall" denotes a requirement.

HOLD POINT:

A designated stopping place during or following a specific activity at which inspection or examination is required before further work can be performed.

INSPECTOR:

A person who performs inspection activities to verify conformance to specific requirements.

INSPECTION:

Examination or measurement to verify whether an item or activity conforms to specified requirements.

INTERNAL AUDIT:

An audit of those portions of an organization's quality assurance program retained under its direct control and within its organizational structure.

INTERNAL OFFICE CORRESPONDENCE (IOC):

A form used to transmit information between M-K BWIP operating groups including the M-K BWIP QA Department and the M-K Corporate Office.

ITEM:

An all inclusive term used in place of any of the following: appearance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit.

MEASURING AND TEST EQUIPMENT (M & TE):

Devices or systems used to calibrate, measure, gage, test, or inspect in order to control or to acquire data to verify conformance to specified requirements.

M-K BWIP:

The Morrison-Knudsen organization responsible to fulfill the requirements of the BWIP contract.

NONCONFORMANCE:

A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

NDE

Non Destructive Examination.

OBJECTIVE EVIDENCE:

Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests which can be verified.

ORDER ENTRY:

A meeting chaired by the M-K BWIP or Corporated QA Manager with the respective client, owner's representative, subcontractor or supplier to assure there are no misunderstandings of the contract requirements prior to the start of work.

OWNER:

The person, group, company, agency, or corporation who has or will have title to the waste isolation facility.

PROCEDURE:

A document that specifies or describes how an activity is to be performed.

PROCUREMENT DOCUMENT:

Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase.

PURCHASER:

The organization responsible for establishment of procurement requirements and for issuance, administration, or both, of procurement documents.

QUALIFICATION (PERSONNEL):

The characteristics or abilities gained through education, training, or experience, as measured against established requirements, such as standards or tests, that qualify an individual to perform a required function.

QUALIFIED PROCEDURES:

An approved procedure that has been demonstrated to meet the specified requirements for its intended purpose.

QUALITY ASSURANCE (QA):

All those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service.

QUALITY ASSURANCE LEVELS:

DOE/RHO have classified systems, structures and components into levels for control of design, procurement, and construction. The levels are defined in BWI-FDC-003 Rev. 0-0 as:

- a. Quality Assurance Level I shall include physical systems, portions of systems, structures, or components, whose failure might cause, or increase the severity of, a release of radioactive, hazardous, or toxic materials to the environs. These systems, structures, and components are vital to the safe shutdown or isolation of the process or system. These are items that directly affect operability, performance, security, or safety of the facility. No radioactive, hazardous, or toxic materials will be involved in ES-I. However, the ES-I may be used in connection with a nuclear waste repository, which will be used to dispose of high-level nuclear waste. Therefore, the shaft liners shall be Quality Assurance Level I.
- b. Quality Assurance Level II shall include physical systems, portions of systems, structures, or components that are important to the operation of the system. Failure of these items may create a serious impact on the operation, performance, security, or safety of the facility. Included in this category shall be the head-frame and hoist system, ventilation system and emergency power generator.
- c. Quality Assurance Level III shall include physical systems, portions of systems, or components that provide a service or function to the facility, but are not essential to the safe operation of the facility. Level III also applies to commercial,

off-the-shelf items for which existing commercial quality control practices are adequate. Included in this category is the drilling mud. The need for Level III procedures will be identified in the specifications. The procedures will be developed by M-K.

QUALITY ASSURANCE RECORD:

A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

RECEIVING:

Taking delivery of an item at a designated location.

REPAIR:

The process of restoring a non-conforming characteristic to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still does not conform to the original requirement.

REWORK:

The process by which an item is made to conform to original requirements by completion or correction.

RIGHT OF ACCESS:

The right of a Purchaser or designated representative to enter the premises of a Supplier for the purpose of inspection, surveillance, or quality assurance audit.

SERVICE:

The performance of activities such as design, fabrication, inspection, nondestructive testing, repair, or installation.

SPECIAL PROCESS:

A process, the results of which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or test of the product.

SUBCONTRACTOR:

Those organizations furnishing items, material, or services for which they provide job-site labor in fulfillment of their obligations.

SUPPLIER:

Those organizations furnishing items, material, or services for which they provide no job-site labor other than delivery.

SURVEILLANCE:

The act of monitoring or observing to verify whether an item or activity conforms to specified requirements.

TESTING:

An element of verification for the determination of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

TRACEABILITY:

The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

USE-AS-IS:

A disposition permitted for a non-conforming item when it can be established that the item is satisfactory for its intended use.

VERIFICATION:

The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

WAIVER:

Documented authorization to depart from specified requirements.

3.4 The M-K BWIP Contract Administrator shall draft subcontracts incorporating the information in the bid specification package and the final accepted proposal.

4.0 REVISIONS

All revisions to subcontracts and purchase orders will require the same review and approvals as the original procurement documents.

5.0 NONCONFORMANCE

All Subcontractors and Suppliers will be required to notify the project immediately upon discovery of their inability to conform to any conditions regarding quality in their subcontract or purchase order. Final disposition of the nonconformance must be documented in accordance with Section XV.

6.0 FILING

A copy of all subcontracts and purchase orders shall be retained on file at the job-site and shall be available during receiving inspection and or inspections as provided in Section VII, Section VIII and Section X of this Quality Assurance Program. All documents indicating review and/or approval will be maintained as required in Section XVII.

7.0 DOE/RHO FURNISHED EQUIPMENT CONTROLS

DOE/RHO shall be responsible to provide the necessary quality related documentation and receiving inspection for all DOE/RHO furnished equipment to be incorporated into the Work.

8.0 SPARE PARTS

Spare parts for purchased equipment shall be subject to the same procurement document controls as the original item.

9.0 SUBCONTRACTOR AND SUPPLIER PROCUREMENT CONTROL

- 9.1 Our Subcontractors and Suppliers shall use the procurement document controls for equipment and services they procure for incorporation into the Work as required by their contract documents.
- 9.2 Subcontractors and Suppliers shall inform the M-K BWIP QA Manager of proposed sub-suppliers prior to making the purchase so that required sub-supplier approvals may be obtained.

10.0 PROGRAM LEVEL APPLICABILITY

- 10.1 This entire section applies to all Quality Assurance Level I Work performed by M-K BWIP and our Subcontractors and Suppliers.
- 10.2 This entire section applies to all Quality Assurance Level II Work performed by M-K BWIP and our Subcontractors and Suppliers.
- 10.3 Specific QA Procedures will describe the M-K BWIP QA requirements for Quality Assurance Level III Work performed by M-K BWIP and our Subcontractors and Suppliers.

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| SECTION: V INSTRUCTIONS, PROCEDURES, AND DRAWINGS | PAGE 1 | REVISION 2 |
| Project: BWIP | OF 4 | DATE 3-83 |

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for preparation and approval of QA Implementation Procedures and Instructions, Work Procedures, and drawings necessary to accomplish construction to the Quality Assurance Levels specified by the BWIP contract documents.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 The requirements of the QA Program for the M-K BWIP project are detailed within this manual in sufficient detail to establish the administrative controls for implementing the M-K BWIP QA Program.

2.2 Quality Assurance Implementing Procedures and Instructions will be used to augment this program by giving qualitative and quantitative criteria for implementing the M-K BWIP QA program and for the inspection, testing, and surveillance of the construction activities.

2.3 Work Procedures developed by M-K BWIP operating departments and Subcontractors and Suppliers will provide detailed instructions for Work actions and identify Quality inspection or test hold points. These shall be consistent with the M-K BWIP QA Program.

2.4 All Work Procedures and QA Implementing Procedures and Instructions developed by M-K BWIP and by our Subcontractors and Suppliers for on-site Work must be reviewed and approved by the M-K BWIP QA Manager and submitted to DOE/RHO for review and approval as required by the contract specifications prior to implementation.

3.0 IMPLEMENTATION

3.1 QA Implementation Procedures and Instructions to implement the M-K BWIP QA Program requirements shall describe specific implementation methods.

a. Quality Assurance Implementing Procedures and Instructions are be contained in this M-K BWIP QA Manual and shall be identified with the M-K BWIP QA Program section number for which the individual procedure or instruction has been written to support. For example:

1. QAP 0.XX - Subcontractor Order Entry Meeting Outlines
 - Supplier Order Entry Meeting Outlines
 - NDT Supplier Entry Order Meeting Outlines
 2. QAP 2.XX - QA Training Procedures(s)
 - QA Trending Procedure(s)
 - QA Stop Work Order Procedure
- b. Each Quality Assurance Implementing Procedure and Instruction shall be reviewed and approved by the M-K BWIP QA Manager prior to forwarding to DOE/RHO for review and approval as required by the specifications. The M-K BWIP QA Manager shall signify approval and acceptance by signing and dating in the appropriate blocks on the first page of each Quality Assurance Procedure. *
- c. The QA Document Control Engineer is responsible for the coordination, control, printing and issue of the Quality Assurance Procedures and subsequent revisions to assure that all controlled copies of the manual are maintained in a current status.
- d. Revisions to the Quality Assurance Implementation Procedures and Instructions shall be reviewed, approved and issued in the same manner as the original. *
- 3.2. Work Procedures shall be used for all work activities at the BWIP site when required by the contract drawings and specification. The Work Procedures shall define the methods and requirements of Work implementation and provide for notification of inspection and test hold-points.
- a. Work Procedures are controlled and maintained in manuals issued by the responsible M-K BWIP Discipline Manager or the respective Subcontractors.
 - b. Work Procedures must be reviewed and accepted by the M-K BWIP QA Manager and submitted to DOE/RHO for review and approval prior to implementation.

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| SECTION: V INSTRUCTIONS, PROCEDURES, AND DRAWINGS | PAGE 3 | REVISION 2 |
| Project: BWIP | OF 4 | DATE 3-83 |

- c. Revisions to the Work Procedures shall be reviewed, approved, and issued in the same manner as the original issues.

4.0 NONCONFORMANCE REPORTS AND CORRECTIVE ACTION REQUESTS

Nonconformance Reports and Corrective Action Requests initiated for the documentation of nonconformances shall be in accordance with the requirements of Section XV and XVI of this QA Program.

5.0 BWIP PROJECT QUALITY ASSURANCE MANUAL

Section II of this QA Program describes the requirements for the initiation, approval, and control of the M-K BWIP QA Manual.

6.0 SUBCONTRACTOR WORK PROCEDURES

The requirements of this section of the QA Program apply to all on-site Subcontractors and Suppliers.

7.0 ENGINEERING DOCUMENTS

Specifications and design drawings which detail final design and technical requirements of structures, systems, and components are supplied to the M-K BWIP Engineering Manager by DOE/RHO through Document Control and are controlled as specified in Section VI of the M-K BWIP QA Program.

8.0 CONTROL OF ISSUE

The control of issue of the documents identified in this Section shall be per the requirements of Section VI of the M-K BWIP QA Program.

9.0 REVISIONS

Revisions to Procedures and Instructions shall be identified by a Star in the right hand column adjacent to the start of the changed or added paragraph or title line.

10.0 LEVELS OF APPLICABILITY

10.1 This entire section applies to all Quality Assurance Level I Work

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| SECTION: V INSTRUCTIONS, PROCEDURES, AND DRAWINGS | PAGE 4 | REVISION 2 |
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- performed by M-K BWIP and our Subcontractors and Suppliers.
- 10.2 This entire section applies to all Quality Assurance Level II Work performed by M-K BWIP and our Subcontractors and Suppliers.
- 10.3 Paragraphs 2.4, 2.5, 3.2, 4.0, 6.0, and 7.0 apply to all Quality Assurance Level III Work by M-K BWIP and our Subcontractors and Suppliers. *

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| SECTION: VI DOCUMENT CONTROL Project: BWIP | PAGE 1 | REVISION 1 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for the control of documents including Engineering Documents which describe quality related activities. It is not the intent of this Section to control correspondence.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 The M-K BWIP QA Manager retains the ultimate responsibility for implementing the M-K BWIP QA Document Control Program.

2.2 The QA Document Control Engineer is responsible for:

- a. Segregation, filing, and distribution of QA documents to assure traceability and retrieveability. He shall be directly responsible for proper interface with other site document control centers.
- b. Assuring a filing retrieval system for Subcontractor, Supplier, and M-K BWIP project quality verification records and maintenance of the QA Records.

2.3 The M-K BWIP Engineering Manager has the overall responsibility for implementing and maintaining the document control activities for the M-K BWIP project with the exception of QA Documents. Documents covered under this section shall include:

- a. Design drawings and specifications
- b. Work Procedures
- c. Shop drawings
- d. As-Built drawings
- e. Other engineering drawings as they pertain to activities of the installed Work.

3.0 IMPLEMENTATION

3.1 The M-K BWIP Project Director shall notify DOE/RHO, and M-K BWIP Consultants, Subcontractors and Suppliers that all instructions, procedures and drawings, including changes there to, shall be sent to the M-K BWIP job-site office at the Hanford Site.

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| SECTION: VI DOCUMENT CONTROL | PAGE2 | REVISION 1 |
| Project: BWIP | OF 3. | DATE 2-83 |

3.2 New or revised project instructions, construction specifications, design drawings and shop drawings shall be date stamped and recorded in the Document Control Log maintained in the M-K BWIP Project Engineering Office.

- a. Distribution of these documents shall be from the M-K BWIP Project Engineering Office.
- b. All design drawings, construction specifications, and shop drawings received from DOE/RHO or from an M-K BWIP Subcontractor or Supplier will be verified against the transmittal letter when they are received. The implementing actions for design documents are contained in Work Procedures.
- c. Discrepancies between the transmittal letter and the documents received will be noted and brought to the attention of the originating organization for corrective action.
- d. A transmittal letter file shall be maintained in the M-K BWIP Project Engineering Office.

3.3 Copies of all Quality Verification Records shall be received, maintained, and controlled in accordance with M-K BWIP QA Document Control Procedures.

3.4 All submittals of supplier QA Programs, Plans or Procedures for procurement items, shall be received, reviewed, and controlled according to Section V of this M-K BWIP QA Program.

4.0 DOCUMENT DISTRIBUTION

4.1 Upon receipt of transmittals of new design documents from DOE/RHO, the M-K BWIP Engineering Manager shall distribute and record the distribution as outlined in Work Procedures. The documents shall be distributed under cover of a transmittal acknowledgement form. Work shall not commence until the necessary documents are available at the location of the work.

4.2 Procedures originated by both M-K BWIP and our Subcontractors and Suppliers shall be controlled and distributed in accordance with Section V of the M-K BWIP QA Program.

5.0 DISPOSITION OF CHANGED OR VOIDED DOCUMENTS

Upon receipt of changed documents, specifications, and work instructions, all superceded documents shall be removed from the document file by the responsible M-K BWIP Department Manager and discarded. One copy of clearly marked voided documentation pertinent to the Work shall be retained by the M-K BWIP Engineering Manager for reference purposes.

6.0 LEVEL OF APPLICABILITY

6.1 This entire section applies to all Quality Assurance Level I Work performed by M-K BWIP and our Subcontractors and Suppliers.

6.2 This entire section applies to all Quality Assurance Level II Work performed by M-K BWIP and our Subcontractors and Suppliers.

6.3 Specific procedures will describe the M-K BWIP QA requirements for Quality Assurance Level III Work performed by M-K BWIP and our Subcontractors and Suppliers. *

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| SECTION: VII CONTROL OF PURCHASED MATERIAL, ITEMS, AND SERVICES Project: BWIP | PAGE 1 | REVISION 2 |
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1.0 PURPOSE/SCOPE

- 1.1 This section describes the M-K BWIP QA Program requirements for controlling the quality of Work performed by M-K BWIP Subcontractors and Suppliers.
- 1.2 Subcontractors are those M-K BWIP organizations furnishing items, materials, or services for which they provide job-site labor in fulfillment of their obligations.
- 1.3 Suppliers are those M-K BWIP organizations furnishing items, material, or services for which they provide no job-site labor other than delivery.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 The M-K BWIP QA Manager has the prime responsibility for assuring that M-K BWIP Subcontractors and Suppliers comply with the M-K BWIP contract quality requirements and the M-K BWIP Quality Assurance Program.
- 2.2 The M-K BWIP QA Manager will perform audits or use surveillance to assess the effectiveness of the control of quality by Subcontractors and Suppliers at intervals consistent with the importance, complexity, and quantity of the item, material, or service. These intervals shall be not less than 4 times per year for on-site Subcontractors and Suppliers, and not less than annually for off-site Subcontractors and Suppliers. M-K BWIP QA may visit off-site Subcontractors and Suppliers (both M-K and others) to assure the procurements meet the purchase document requirements.
- 2.3 The M-K BWIP Business Administration Manager shall maintain an Approved Subcontractors and Suppliers List from which items, materials, and services affecting the quality of the Work will be selected.
 - a. The M-K BWIP QA Manager will evaluate Subcontractors and Suppliers on this list for quality considerations.

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b. The M-K BWIP Project Engineering Manager will evaluate Subcontractors and Suppliers on this list for technical considerations.

Based on these evaluations Subcontractors and Suppliers may be added or deleted from the Approved List.

3.0 IMPLEMENTATION

3.1 The M-K BWIP QA Manager shall be responsible for the preparation of the Quality Assurance requirements to be incorporated into purchase orders and bid specification packages.

3.2 The QA Program audits of Subcontractors and Suppliers will be conducted as detailed in Quality Assurance Procedures and in compliance with Section XVIII of the M-K BWIP Quality Assurance Manual.

3.3 Materials, items, and services will be requisitioned and procured using the documents described in Section IV of the M-K BWIP Quality Assurance Manual.

3.4 A Subcontractor or Supplier shall be evaluated prior to placement on an Approved Subcontractors and Suppliers List. The evaluation method shall consist of one of the following methods:

- a. Facility and QA Program Evaluation;
- b. Evaluation of past performance; or,
- c. Designation by DOE/RHO as Subcontractors and Suppliers acceptable under the DOE/RHO procurement program for BWIP.

This evaluation shall be documented by an IOC prepared by the evaluator which includes the method of evaluation and the results.

3.5 The potential Subcontractor or Supplier shall be notified in writing of any unsatisfactory evaluation. Upon an individual review basis, a letter certifying Supplier or Subcontractor willingness to correct noted deficiencies of the evaluation may be sufficient to allow award of a Subcontract or Purchase Order.

3.6 Audits at the off-site Subcontractor's or Supplier's facility shall be conducted by M-K BWIP QA Engineers as identified on an external audit schedule maintained by the M-K BWIP QA Manager. External

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| SECTION: VII CONTROL OF PURCHASED MATERIAL, ITEMS, AND SERVICES Project: BWIP | PAGE 3 OF 5 | REVISION 2 DATE 3-83 |
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audits will be performed in accordance with Quality Assurance Procedures and Section XVIII of the M-K BWIP Quality Assurance Manual.

- 3.7 Surveillance of on-site Subcontractors and Suppliers will be performed by M-K BWIP Quality Engineers on a continuing basis.
- 3.8 Scheduled audits of on-site Subcontractors and Suppliers will be performed by the M-K BWIP QA Manager according to Quality Assurance Procedures and Section XVIII of the M-K BWIP Quality Assurance Manual.
- 3.9 Surveillance personnel will be M-K BWIP Quality Engineers who, as a minimum, have been certified as defined in Supplement 2S-1 of ANSI/ASME NQA-1-1979.
- 3.10 Inspection and documentation requirements, critical items, and points to be inspected shall be established by the M-K BWIP QA Manager prior to the start of inspection of each phase of the Work.
- 3.11 All surveillance, audits, and inspections shall be documented using appropriate forms. Copies of these reports shall be maintained as a Quality Verification Record by the M-K BWIP QA Document Control Engineer as required in Section XVII of the M-K BWIP Quality Assurance Manual.

4.0 RECEIPT INSPECTION

- 4.1 Materials, items, and equipment purchased by M-K BWIP shall receive on-site receipt inspection to verify conformance with drawings, specifications or procurement documents.
- 4.2 Quality Assurance Procedures shall be established for on-site receiving inspection. On-site receiving inspections will be coordinated with designated M-K BWIP personnel, M-K BWIP Materials Engineer, and the M-K BWIP Quality Assurance Organization.
- 4.3 On-site receiving inspections shall be documented by the use of reports and checklists as defined in the Quality Assurance Procedures.
- 4.4 Responsibility for receipt inspection documentation shall be as outlined in the Quality Assurance Procedures.

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| SECTION: VII CONTROL OF PURCHASED MATERIAL, ITEMS, AND SERVICES Project: BWIP | PAGE 4 | REVISION 2 |
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- 4.5 QA personnel shall document nonconformance and determine if the shipment is to be rejected or placed in hold status. They will be responsible for identifying, tagging and segregating nonconforming items. M-K BWIP Management, our Subcontractors, Suppliers and DOE/RHO, as applicable, shall be notified promptly of any nonconforming items. Disposition of nonconforming items is the responsibility of the M-K BWIP Engineering Manager. Nonconformance shall be controlled in accordance with Section XV of the M-K BWIP Quality Assurance Manual.
- 4.6 Material or equipment subject to receiving inspection will be considered acceptable unless tagged "Hold for QC Clearance" and removed to a designated hold area.
- 4.7 The procurement documents shall require that Quality Verification Records such as Certificates of Conformance, Certified Material Test Reports, test reports and other verification records precede and accompany the shipment. These verification documents will be reviewed and accepted by qualified M-K BWIP QA Personnel.
- 4.8 Suppliers will be required to furnish, with the shipment, and separately in advance of the shipment, a detailed shipping list including Quality verification documentation to allow accurate checking of materials and equipment received. These Documents will be reviewed and accepted by qualified M-K BWIP QA personnel.
- 4.9 Material or equipment which arrives without proper documentation or identification will be tagged Hold and withheld from use until the specified documentation is received.
- 4.10 DOE/RHO furnished materials, and/or equipment to be incorporated into the work will be receipt inspected by DOE/RHO at the BWIP site or other receiving point designated by DOE/RHO. M-K BWIP receipt inspection of DOE/RHO furnished equipment will be for quantity, identification, and shipping damage only. Once received, M-K will treat this material the same as M-K procured material. *
- 4.11 M-K BWIP Subcontractor furnished materials, and/or equipment to be incorporated into the work will be receipt inspected by the Subcon- *

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| SECTION: VII CONTROL OF PURCHASED MATERIAL, ITEMS, AND SERVICES Project: BWIP | PAGE. 5 OF 5 | REVISION 2 DATE 3-83 |
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tractor and M-K BWIP QA personnel jointly, following specific procedures developed by the Subcontractor as required. —

5.0 STATUS INDICATORS

Inspection status indicators in the forms of "Hold for QC Clearance" Tags shall be in accordance with Section XIV of the Quality Assurance Program.

6.0 LEVEL OF APPLICABILITY

This section applies to all Quality Assurance Levels I, II, and III work by M-K BWIP and our Subcontractors and Suppliers.

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for the identification and control of items to be incorporated into the Work.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 All Quality Assurance Level I, II, and III items to be incorporated *
into the Work shall be identified and controlled from receipt through issue and to incorporation into the Work, to the extent required by the specifications. Identity of incorporated items shall be, to the extent possible, traceable and permanent. Items such as weld rod, nuts and bolts shall be identified to the time of incorporation into the Work. Major Quality Assurance Level I items, such as the shaft liner plate, shall be permanently identified.
- 2.2 The M-K BWIP Materials Engineer is responsible for performing over, short, identification, and damage inspections of all items received for incorporation into the Work. The Material Engineer shall be qualified in accordance with the requirements of NQA-1 Supplement 2S-1.
- 2.3 The M-K BWIP QA Manager is responsible for determining the inspection status of all items received for incorporation into the Work. Nonconforming items shall be tagged and the reasons documented.
- 2.4 The M-K BWIP Materials Engineer is responsible to establish suitable storage facilities for all items to be incorporated into the Work as directed by the M-K BWIP Engineering Manager.
- 2.5 The M-K BWIP Materials Engineer is responsible to provide for segregated "hold" areas for nonconforming items.
- 2.6 The M-K BWIP Engineering Manager is responsible to recommend disposition requirements for nonconforming items in accordance with Section XV of this QA Program.

3.0 TAGGING AND FLAGGING

- 3.1 An inspection status tagging system, to the extent required by the *
specifications, will be used to show the inspection status of items

to be incorporated into the Work. Alternate means of marking and segregation may be used when tagging is not practical.

3.2 Quality Assurance Level I items shall be identifiable by means of markings to enable tracing to the batch number, certified material test report, component, part or assembly. Items such as the steel liner shall have the identity affixed such as to be visible before, during, and after incorporation into the Work. Other items such as the dewatering lines, ventilation lines, grout guides and support plates, welding rod, and grout shall have markings, assuring traceability to the point of incorporation into the Work.

3.3 Quality Assurance Level II items shall be items which have been tested and approved, to the extent required by the specifications, for use and maintain their identification to the point of incorporation into the Work. *

3.4 Quality Assurance Level III items (such as drilling mud) shall be process and inspection controlled, to the extent required by the specifications, to insure that only proper materials are incorporated into the Work. *

3.5 Requirements for on-site material storage will be established by the M-K BWIP Engineering Manager, the supplier, or by DOE/RHO as appropriate. *

3.6 Segregation shall be used to prevent co-mingling of acceptable and nonconforming materials in addition to the tagging system.

4.0 SEGREGATION

4.1 Bulk items, such as grout and welding electrodes, shall retain proper identity by being appropriately segregated and identified in factory sealed containers. Segregation shall be used to prevent co-mingling of items of different quality levels, types, or grades.

4.2 Newly received items for each level of quality shall be segregated until all necessary receiving inspection actions are completed. *

4.3 Segregation shall be used to prevent co-mingling of acceptable and nonconforming items. Rejected material shall be identified and segregated until removed from the construction site.

- 4.4 Warehousing and storage areas shall be controlled in such a manner as to insure that correct materials are issued only to authorized personnel and to prevent use of incorrect, untested, or defective items.
- 4.5 Labels or signs shall be used to designate segregated storage areas including areas for storage of materials or equipment which have been tagged "Hold" or "Rejected".
- 4.6 The M-K BWIP QA Manager shall perform surveillance of Subcontractors and Suppliers, as required, to assure that control and identification of materials in their control after issue is being maintained.

5.0 MATERIAL AND ITEM RELEASE

- 5.1 The M-K BWIP Warehouse Manager is responsible for verifying the acceptability of items prior to release to M-K BWIP or Subcontractor personnel for fabrication, assembly, storage, or incorporation into the Work.

6.0 PROGRAM LEVEL APPLICABILITY

- 6.1 This section applies to all Quality Level I, Level II, and Level III Work performed by M-K BWIP and our Subcontractors and Suppliers.

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for the control of special processes. Special processes are identified to include welding, weld preparation, heat treating, non-destructive testing, cement grouting and material testing.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 M-K BWIP Engineering and QA Departments shall prepare procedures for special processes for Morrison-Knudsen work on Quality Assurance Levels I and II activities. These procedures shall be transmitted to DOE/RHO for review and approval prior to implementation.

2.2 M-K BWIP Subcontractors and Suppliers shall provide M-K BWIP with procedures for special processes in their work activities for Quality Assurance Levels I and II activities. These procedures shall be accepted by cognizant M-K BWIP Management and sent to DOE/RHO for approval. Approved Subcontractor and Supplier procedures shall be incorporated into the Morrison-Knudsen QA Implementation Procedures and Instructions or Work Procedures. *

2.3 The M-K BWIP QA Manager is responsible to assure that all non-destructive testing is performed by certified personnel. This certification may be performed to Morrison-Knudsen procedures or to outside agency procedures accepted by Morrison-Knudsen and meeting the requirements of SNT-TC1A, 1975 edition or the specification requirements. *

2.4 The M-K BWIP QA Manager is responsible to assure that all material testing is performed by certified personnel. This certification may be performed to Morrison-Knudsen procedures or to outside agency procedures accepted by Morrison-Knudsen and meeting the requirements of ANSI/ASME NQA-1-1979 addenda a and b 1981 or the specification requirements. *

2.5 The M-K BWIP Construction Manager and appropriate Subcontractors and Suppliers are responsible to assure that welding is performed by qualified welders and welder operators following approved qualified welding procedures. Welder, welder operators, and procedure

qualifications may be accomplished by Morrison-Knudsen or by the respective Subcontractors or Suppliers.

- 2.6 All qualification records shall be maintained in accordance with Section XVII of this Quality Assurance Program.

3.0 IMPLEMENTATION

- 3.1 The M-K BWIP QA Manager shall direct or conduct tests or review special process test results for implemented special process procedures, qualifications and/or certifications of personnel, and equipment in accordance with the M-K BWIP contract requirements and this QA program.
- 3.2 Each M-K BWIP Subcontractor or Supplier performing on-site or off-site Work shall, as part of their required procedures, describe in detail the requirements for qualification and control of procedures, equipment, and personnel used in special process work, in accordance with all applicable codes, standards, specifications, criteria, and other special requirements. These procedures shall be submitted for approval to the M-K BWIP Engineering Manager.

4.0 QUALIFICATION OF PERSONNEL AND EQUIPMENT

- 4.1 Personnel performing or controlling special processes shall be certified by the M-K BWIP Quality Assurance Organization, or an approved commercial laboratory, prior to assignment and will be recertified at the interval specified for the given special process (i.e., AWS-D1.1 welders and welding operators will be recertified when they change welding processes, when they have not used the welding process for 90 days, or when it is determined that the quality of their welding is unacceptable.)
- 4.2 Processes or equipment used in performing special processes shall be reviewed and qualified in accordance with applicable codes, standards, and the M-K BWIP contract drawings and specifications.

5.0 DOCUMENTATION

All records documenting special process procedures, certification and qualification of personnel, equipment, and test results shall be maintained in accordance with Section XVII of this Quality Assurance Program. *

6.0 PROGRAM LEVEL APPLICABILITY

This section applies to Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for the control of inspection activities for Work performed by M-K BWIP and our Subcontractors and Suppliers.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 The M-K BWIP Project Construction Manager, and our Subcontractors and Suppliers are responsible for quality of the Work.

2.2 The M-K BWIP Project QA Manager is responsible for:

- a. Inspection and surveillance activities.
- b. Assuring that Quality Engineers and other Quality Personnel are trained, qualified, and certified to perform their intended function.
- c. For maintaining certifications of Quality Engineers, and other quality personnel, current.
- d. For the preparation and issuance of Quality Assurance Procedures in accordance with Section V of this Quality Assurance Manual. Procedures, instructions and checklists utilized for inspection activities shall contain the following as a minimum:
 1. Identification of characteristics to be inspected.
 2. Identification of the individuals or groups responsible for performing the inspection operation.
 3. Acceptance and rejection criteria determined from appropriate drawings, specifications, codes, and standards.
 4. A description of the method of inspection.
 5. Verification of completion and certification of inspection.
 6. A record of the results of the inspection operation.
 7. Sampling by a recognized technique.

2.3 Repair or rework of items shall be inspected by methods which are equivalent to the original inspection method.

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2.4 All of the work of M-K BWIP on-site Subcontractors and Suppliers shall be inspected in accordance with the M-K BWIP Quality Assurance Program by M-K BWIP Quality Engineers or an approved agency.

2.5 Mandatory inspection Hold Points which require witnessing or inspection by M-K BWIP Project Quality Assurance personnel, and beyond which work shall not proceed, shall be indicated in appropriate Work Procedures or other documentation.

3.0 IMPLEMENTATION

3.1 The M-K BWIP QA Manager is responsible for:

- a. The planning and overall adequacy of quality surveillance and inspection activities of the construction program. He is also responsible for the follow-up statusing of surveillance findings.
- b. Assignment and scheduling of construction surveillance and inspection.

3.2 The M-K BWIP Construction Manager is responsible for providing the M-K BWIP QA Manager with schedules and work procedures, including those of our Subcontractors' and Suppliers' activities as necessary, that require surveillance and inspection by the M-K BWIP QA Personnel.

3.3 The assigned Quality Engineers shall be responsible for surveillance of construction activities in accordance with appropriate procedures or checklists. Reports of these surveillances shall be transmitted to responsible project management.

3.4 Personnel supervising an activity shall be notified of surveillance findings at the completion of the surveillance.

3.5 When the Quality Engineer determines that an activity is being conducted in a manner which is adverse to the quality required, he shall notify the personnel supervising the activity so that they may immediately correct the condition. If the condition cannot be immediately corrected, the Quality Engineer shall notify the M-K BWIP QA Manager to initiate a Stop Further Processing action as

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required by Section II of this Quality Assurance Manual until the condition can be corrected.

- 3.6 Test and inspection points which require witnessing, inspection, or testing shall be established in the appropriate work procedures or documents. Hold-Points shall be included at the point where the activity must be stopped to allow for verification when continuation of the activity or process will render the condition or measurement inaccessible or uninspectable.
- 3.7 It is the responsibility of the person supervising the activity to notify the responsible Quality Engineer personally or in writing of an impending mandatory Hold-Point. The activity shall not proceed past the mandatory Hold-Point until the Quality Engineer:
 - a. Indicates completion and acceptance of the step or inspection point, by signing or stamping and dating; or
 - b. Specifically states to the notifying person at the time of notification that the activity may proceed through the mandatory hold point in his absence. In this case, the Quality Engineer shall document the waiver of the required mandatory hold point in writing and sign or stamp and date the test or inspection point.
- 3.8 Prior to the commencement of an activity which requires Quality surveillance or sign-off, the responsible organization shall notify the cognizant Quality Engineer sufficiently in advance to allow sufficient time to properly prepare for the mandatory hold point or the quality surveillance.

4.0 QUALIFICATION OF SURVEILLANCE, INSPECTION, TEST, OR EXAMINATION PERSONNEL.

- 4.1 Inspection and test personnel shall be qualified in accordance with Supplement 2S-1 of ANSI/ASME NQA-1-1979. This qualification shall be documented and records retained as required in Section XVII of this Quality Assurance Manual or the specification requirements.

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- 4.2 The qualification of non-destructive examination personnel shall be in accordance with Supplement 2S-2 of ANSI/ASME NQA-1-1979 and SNT-TC-1A-1975 or in accordance with the specification requirements. M-K personnel performing NDE shall be qualified and certified by the M-K Level III individual. The M-K Level III has been certified by M-K. Subcontractor personnel performing NDE shall be qualified and certified by an individual certified to Level III in accordance with ASNT-TC-1A-1975. The M-K Level III will review and approve the qualifications of the subcontractors NDE personnel and their NDE procedures.
- 4.3 Personnel who are assigned the responsibility and authority to perform project Quality Assurance test and inspection functions shall have as a minimum the level of capability required by ANSI/ASME NQA-1-1979 Supplement 2S-1. When inspection and tests are implemented by teams or groups of individuals, the person responsible for the inspection and test must participate and shall meet the minimum qualifications.
- 4.4 The on-the-job performance of inspection, examination, and testing personnel shall be evaluated initially and at periodic intervals not to exceed two years, and the results of each evaluation shall be reviewed to determine the capability of the individual. If it is determined that the capabilities of an individual are not in accordance with the qualifications specified for the job, that person shall be removed from operations until such time as he has been trained in the needed skill and has been recertified as being qualified to perform the work.
- 4.5 All certified inspection and test personnel shall be provided with a "wallet-size" certification record to identify their certification and discipline of certification.

5.0 PROGRAM LEVEL APPLICABILITY

This section applies to all Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.

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| SECTION: XI Test Control | PAGE 1 | REVISION 1 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for test control to assure that design and performance criteria have been satisfied. The program consists of the testing of the completed Work for compliance with the design specifications. This includes the test and examination steps leading up to the completed item of Work.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 Test and inspection procedures shall be prepared by the cognizant M-K BWIP Department Managers and by our Subcontractors and Suppliers as required by the contract drawings and specifications. *

2.2 All test procedures prepared by M-K BWIP, and our Subcontractors and Suppliers, shall be accepted by the M-K BWIP QA Manager and other cognizant managers and sent to DOE/RHO for review and approval prior to implementation.

3.0 IMPLEMENTATION

3.1 All testing shall be accomplished in accordance with approved written test procedures.

3.2 Test procedures shall include appropriate requirements of the contract drawings and specifications. *

3.3 Test procedures shall:

- a. Incorporate the requirements and acceptance limits contained in the contract drawings and specifications. *
- b. Specify all prerequisite conditions.
- c. Specify special conditions to prevail during the testing.
- d. Establish the test boundaries.
- e. Define the required test equipment.
- f. Define the required data to be taken.

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| SECTION: XI Test Control Project: BWIP | PAGE2 | REVISION 1 |
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| <p>3.4 All testing shall be supervised by qualified personnel using approved equipment calibrated in accordance with Section XII.</p> <p>3.5 All test results shall be transmitted to DOE/RHO for evaluation after review and evaluation by the M-K BWIP Engineering Manager. *</p> <p>4.0 RECORDS</p> <p>All test documents will be controlled as specified in Section XVII of this QA program.</p> <p>5.0 PROGRAM LEVEL APPLICABILITY</p> <p>This section applies to Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.</p> | | |

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| SECTION: XII CONTROL OF MEASURING AND, TEST EQUIPMENT | PAGE 1 | REVISION 2 |
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Project: SWIP

1.0 This section describes the M-K BWIP QA Program requirements for the control of measuring and test equipment.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

The M-K BWIP QA Manager shall approve procedures for the calibration, storage and control of measuring and test equipment to be used for the Work.

3.0 IMPLEMENTATION

3.1 An equipment calibration log shall be prepared for each item of controlled test or measuring equipment to be used on the Work. The log shall indicate the type of instrument, serial number, calibration frequency, calibration date, and other information.

3.2 Measuring and test equipment shall be calibrated by an approved commercial laboratory to certified measurement standards as they relate to those established by the National Bureau of Standards (NBS). Where standards do not exist, the basis of calibration shall be documented.

3.3 Calibration method and frequency shall be as specified by the equipment manufacturer. Where not specified by the manufacturer, the method and frequency shall be as agreed upon between M-K BWIP and DOE/RHO.

3.4 Equipment which is within calibration at the time of the measurement or tests shall be used for Quality Acceptance of the work.

3.5 Calibration stickers will be attached to measuring and test equipment. These stickers will indicate the date of calibration and date of next required calibration.

3.6 All items used for inspection and test shall have a serial number. *
Items such as tape measures, rules, hand levels, etc., which do not normally have a manufacturer's serial number, need not be calibrated.

4.0 PROGRAM LEVEL APPLICABILITY

This section applies to all Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for handling, storing, and shipping materials and items intended for incorporation into the Work.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 The need for, and requirements of, special handling, preservation, storage, cleaning, packaging, and shipping instructions will be determined by the contract drawings and specifications, or by DOE/RHO, and transmitted to the M-K BWIP Engineering Manager. *
- 2.2 The M-K BWIP Business Administration Manager is responsible to assure these special instructions are included in appropriate purchase orders and subcontracts.
- 2.3 The M-K BWIP QA Manager is responsible to review the purchase order to assure these special instructions are included for use during receiving inspection. This review will be documented on the transmittal sheet of the Purchase Order. *
- 2.4 The M-K BWIP QA Manager is responsible for surveillance of the M-K BWIP (including job-site Subcontractors and Suppliers) controlled site storage and handling activities to assure that all instructions relating to special handling, preservation, storage, cleaning, packaging, and shipping are being implemented.
- 2.5 The M-K BWIP QA Manager shall review and approve all instructions for special handling, preservation, storage, cleaning, packaging, and shipping which originate with M-K BWIP or our Subcontractors and Suppliers.
- 2.6 The M-K BWIP Construction Manager is responsible to implement special handling, preservation, storage, cleaning, packaging, and shipping instructions by DOE/RHO, and by M-K BWIP and our on-site Subcontractors and Suppliers.

3.0 IMPLEMENTATION

- 3.1 "Hold" areas for nonconforming items, or for items awaiting receipt inspection, in laydown and warehouse areas shall be identified by

Hold signs and roped off with flagging. Quality Assurance Level I and Level II areas shall be segregated and identified.

3.2 Items which have been accepted during receipt inspection shall be placed in the appropriate storage area.

3.3 Access control to warehouse and laydown storage areas shall be provided and monitored by the M-K BWIP Materials Engineer. He will permit entrance to only authorized persons. *

3.4 Temporary preservatives shall be left intact during storage. Should reapplication be required, approved preservatives shall be used.

3.5 Items pressurized with inert gas shall be monitored daily by the Materials Engineer to ensure that the gas pressure is maintained within specified limits during storage. Desiccant humidity indicators shall also be monitored and desiccants shall be changed as recommended by the manufacturer and/or supplier. *

3.6 All maintenance requirements specified by the respective manufacturer's storage instruction; and as may be additionally required by DOE/RHO, shall be performed and documented in the Equipment Maintenance Log. *

3.7 Good housekeeping practices shall be employed at all times. Materials will be stacked in a manner that is compatible with required safety practices and prevention of deterioration or damage. Fire, safety and security instructions shall be followed by all concerned.

3.8 Material and/or equipment requiring special handling, preservation, storage, cleaning, packaging, and shipping shall have these provisions incorporated in the purchase documents and into approved work procedure(s).

3.9 Issuance of Quality Assurance Level I and Level II items and materials will be accomplished in accordance with approved work procedures.

4.0 PROGRAM LEVEL APPLICABILITY

This section applies to all Quality Assurance Levels I, II, and III items furnished by M-K BWIP, our Subcontractors, Suppliers and DOE/RHO. *

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| SECTION: XIV INSPECTION, TEST, AND OPERATING STATUS Project: BWIP | PAGE1 | REVISION 1 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for identifying the inspection status of material, equipment, and items of Work thru the use of inspection status indicators.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 M-K BWIP and our Subcontractors and Suppliers, are responsible for the identification and inspection status of material, items, and equipment from the time it is received and accepted on the job-site until it is incorporated into to Work.

2.2 The M-K BWIP QA Manager shall be responsible for assuring that a controlled system for stamping, tagging, marking, labeling, and segregating material, items, and equipment is implemented.

2.3 The M-K BWIP Materials Engineer shall be responsible for the implementation of warehouse procedures to ensure that only acceptable material, items, and equipment are released for incorporation into the Work. *

3.0 IMPLEMENTATION

3.1 On-site identification of material inspection status shall be as required by Sections VII, VIII, X, XII, XIII and XV of this QA program.

3.2 QA personnel only shall have the authority to change or remove inspection status indicator tags.

3.3 Material inspection status is primarily identified by "Hold" tags. *

3.4 The calibration status of measuring and test equipment shall be identified on a calibration sticker as defined in Section 12 of this QA Program.

3.5 The requirements of this section apply to M-K BWIP, and our Subcontractors and Suppliers, on-site.

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| SECTION: XIV INSPECTION, TEST, AND OPERATING STATUS Project: BWIP | PAGE2 OF 2 | REVISION 1 DATE 2-83 |
| <p>4.0 NONCONFORMANCE REPORTS AND CORRECTIVE ACTION REQUESTS</p> <p>The M-K BWIP QA Manager is responsible for the issue, control, follow-up, and closure of Nonconformance Reports and Corrective Action Requests as required by Sections XV and XVI of this QA Program.</p> <p>5.0 PROGRAM LEVEL APPLICABILITY</p> <p>This section applies to all Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.</p> | | |

1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for control of nonconforming items.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 Nonconforming items shall be reviewed and accepted for use-as-is, rejected, repaired, or reworked in accordance with documented procedures.
- 2.2 M-K BWIP QA personnel, and others including M-K BWIP Subcontractor and Supplier personnel, shall be responsible to report conditions adverse to quality to the M-K BWIP QA Department whenever they are observed.
- 2.3 The ultimate responsibility for quality assessment shall rest with the M-K BWIP QA Manager.
- 2.4 The M-K BWIP Engineering Manager will forward details of nonconformance, with recommended corrective action, to DOE/RHO for disposition.
- 2.5 Nonconforming items shall be segregated from acceptable items and identified as nonconforming as described in Section VIII. When because of bulk, size and weight, physical segregation is not possible, tagging or roped off areas are an acceptable substitute for segregation.
- 2.6 M-K BWIP Subcontractor and Supplier items that do not conform to the requirements of Procurement Documents and dispositioned "Use-As-Is" or "Repair" shall be required to be formally reported to the M-K BWIP Project Director as specified in procurement documents.
- 2.7 A periodic analysis of Nonconformance Reports shall be provided by a trending program developed and maintained by the M-K BWIP QA Manager. This program shall provide information relative to quality trends to management and shall provide a log to be used as a record and to assure all Nonconformance Reports are closed.

3.0 IMPLEMENTATION -

3.1 Nonconformance Reports shall be initiated as follows:

- a. The Quality Engineer shall initiate a Nonconformance Report *
when he determines that a Nonconformance exists. He shall assure that the item is properly segregated and identified with a hold tag as specified in Section VIII of this M-K BWIP QA Program.
- b. The originator shall provide a full description of the nonconformance and sign the form.
- c. The M-K BWIP QA Manager shall review the Nonconformance Report for completeness.

3.2 All dispositions for Nonconformance Reports shall be made by DOE/RHO. The M-K BWIP Engineering Manager shall make recommendations regarding the disposition and corrective action to DOE/RHO.

3.3 The responsible M-K BWIP Department, Subcontractor or Supplier, shall be responsible to fully implement dispositions of Nonconformance Reports.

3.4 When repair or rework is required, the M-K BWIP Quality Engineer shall assure that retests, reinspections, and reexaminations of the items meet the applicable requirements. Upon verification, the Quality Engineer shall also sign off the Nonconformance Report.

- a. The Quality Engineer shall verify that the only work performed was that contained in the disposition of the Nonconformance Report.
- b. After completion and acceptance of the disposition, the cognizant Quality Engineer shall remove the "Hold for QC Clearance Tag" from the item as required by Section VIII of this QA Program. The Nonconformance Report with the Hold for QC Clearance showing completion of the repair or rework, shall be forwarded to the M-K BWIP QA Manager. *

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| SECTION: XV CONTROL OF NONCONFORMING ITEMS | PAGE 3 | REVISION 1 |
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| <p data-bbox="261 319 449 355">4.0 RECORDS</p> <p data-bbox="338 366 1549 506">The Document Control Engineer shall assign NCR numbers and maintain the Nonconformance Report log, report all outstanding Nonconformance Reports to the QA Manager on a weekly, or more frequent, basis. *</p> <p data-bbox="261 556 685 592">5.0 LEVEL OF APPLICABILITY</p> <p data-bbox="338 603 1549 743">5.1 This entire section applies to all Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.</p> | | |

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| SECTION: XVI CORRECTIVE ACTION Project: BWIP | PAGE1 | REVISION 1 |
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| 1.0 This section describes the M-K BWIP QA Program requirements for corrective action of significant conditions adverse to quality. | | |
| 2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES | | |
| 2.1 M-K BWIP QA personnel, and others including our Subcontractors and Suppliers, shall be responsible to report conditions adverse to quality to the M-K BWIP QA Manager whenever they are observed. | | |
| 2.2 The evaluation of nonconformance and determination of need for formal corrective action shall be the responsibility of the M-K BWIP Engineering Manager and M-K BWIP QA Manager. | | |
| 2.3 Action to prevent recurrence of nonconformance shall be initiated as required. Follow-up reviews shall be performed to verify proper implementation and documentation of preventive actions. | | |
| 3.0 IMPLEMENTATION | | |
| 3.1 Nonconformance identified on Nonconformance Reports (Section XV) and not treated as single occurrences, shall be documented by the M-K BWIP QA Manager on a Corrective Action Request (CAR) and entered in the CAR Log as described in QA implementing procedures. The Document Control Engineer will assign the CAR Number. | | |
| 3.2 The responsible M-K BWIP Department, Subcontractor, or Supplier shall be required to respond to Corrective Action Requests within ten working days. Responses shall include actions on items affected prior to the discovery of the adverse condition if required. | | |
| 3.3 Corrective Action Requests shall not be closed out until an effective corrective action statement has been received and implemented, as well as the associated Nonconformance Reports closed out. Implementation of the corrective action shall be initiated prior to resuming an activity that will result in a recurrence of the nonconformance. | | |
| 4.0 TRENDING PROGRAM | | |
| 4.1 A trending program shall be developed to provide a monthly activity | | |

report for management analysis and trending. The program shall provide for an overdue notice of Corrective Action Requests.

- 4.2 The M-K BWIP QA Manager shall conduct a quarterly trend analysis review of Nonconformance Reports of M-K BWIP and our Subcontractor's and Supplier's Work. He shall report the results of this review to the M-K BWIP Project Director with copies to other cognizant M-K BWIP department managers.

5.0 PROGRAM LEVEL APPLICABILITY

This entire section applies to Quality Assurance Level I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers.

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| SECTION: XVII QUALITY ASSURANCE RECORDS Project: BWIP | PAGE1 OF 4 | REVISION 1 DATE 2-83 |
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1.0 PURPOSE/SCOPE

This section describes the M-K BWIP QA Program requirements for Quality Assurance Records. Methods and responsibilities are established for controlling Quality Assurance records at the M-K BWIP site office including QA Records generated by our Subcontractors and Suppliers.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

2.1 This section applies to all QA documents developed and maintained by M-K BWIP to substantiate the acceptability of Work performed by M-K BWIP and our Subcontractors and Suppliers.

2.2 M-K BWIP and our Subcontractors and Suppliers shall prepare and maintain QA records as required by the BWIP contract and other applicable specifications, procedures, codes, and standards. These records shall include, as a minimum; material analysis reports, inspection reports, test data, operations logs, surveillance reports, audit reports, personnel qualification records, and construction/ installation records. Other documents which shall be maintained include, as a minimum; process procedures, procedural revision records, equipment and material documentation packages, vendor manuals, specifications, drawings, corrective action reports, and changes thereto.

2.3 The M-K BWIP QA Manager retains ultimate responsibility for the implementation of the QA records program. Specific responsibilities include:

- a. Review, approval, and preparation for transmittal of QA records to DOE/RHO.
- b. Preparation of a QA Record file index system that includes record retention time, and location of the record within the record system.
- c. Assurance that all records are suitable for microfilming.

2.4 The QA Document Control Engineer shall be responsible for the segregation and filing of QA documents to assure traceability and retrievability. He shall maintain and control access to all QA Records through a sign in/sign out record log.

2.5 The off-site M-K BWIP Subcontractors' and Suppliers' QA Departments shall be responsible for the control of their own records, subject to audit by M-K BWIP QA Auditors. They shall submit originals or copies, as required by the respective subcontract or purchase order QA requirements, to M-K BWIP.

2.6 Test laboratories are responsible to furnish test and inspection reports to M-K BWIP as required to complete data requirements.

3.0 IMPLEMENTATION

3.1 Quality Assurance Records will be identified by DOE/RHO and classified as "Lifetime" or "Non-Permanent".

a. Lifetime records may meet one or more of the following criteria:

1. Records which would be of significant value in demonstrating capability for safe operation of the facility.
2. Records which would be of significant value in maintaining, reworking, repairing, replacing, or modifying items within the facility.
3. Records which would be of significant value in determining the cause of an accident or malfunction of an item within the facility.
4. Records which provide baseline data for in-service inspection.

b. Non-permanent records may meet none of the above criteria but shall be submitted to DOE/RHO to show evidence that an activity was performed in accordance with applicable requirements. *

c. All M-K BWIP QA Records shall be completed in black ink or typed. *

d. Only the originator or the M-K QA Record and the M-K BWIP QA Manager are authorized to correct M-K BWIP QA records. Corrections to records shall be made by drawing a black line through the incorrect entry and printing or typing the correct entry on the record, and signing the corrected entry. *

- 3.2 The following document types will be maintained for transmittal to DOE/RHO, if directed, as Quality Assurance Records for retention:
- a. Procurement Data Packages--documents received from M-K BWIP suppliers reflecting procurement quality.
 - b. Construction Data Packages--documents which reflect the in-process and final quality verification of the Work.
 - c. Supplier Manuals and Instructions--includes operations and maintenance manuals, trouble shooting instructions, catalog cuts, etc.
 - d. Nonconformance Reports and Corrective Action Requests.
 - e. Certificates of Conformance--documents signed by an authorized individual certifying the degree to which items or services meet specified requirements. *
 - f. Certified Material Test Reports (CMTR) from the manufacturer for materials to be incorporated into the work.
 - g. Inspection reports, surveillance reports, and audit reports.
- 3.3 The QA Document Control Engineer reviews each QA record to assure it is completed, signed, dated, and is legible. Acceptable QA Records are then distributed and filed in accordance with the QA Record Index. *
- 3.4 The QA Document Control Engineer shall control and file QA Records as detailed in the Quality Assurance Procedure.
- 3.5 Distribution of completed data packages shall be as directed by DOE/RHO using DOE/RHO transmittal procedures and forms.
- 3.6 Personnel responsible for the activities of this section shall be trained in accordance with approved procedures.

4.0 RECORDS STORAGE

- 4.1 QA Records shall be stored in two (2) separate locations sufficiently remote from each other to eliminate the chance of exposure to a simultaneous hazard. *
- 4.2 Micro film quality copies of the M-K BWIP QA Records shall be transmitted to DOE/RHO on a weekly basis. *

4.3 The M-K BWIP QA Records shall be stored in lockable file cabinets which are access controlled by the QA Document Control Engineer. *

4.4 The QA Document Control Engineer shall maintain an in/out Entry Log. *

4.5 QA Records

a. Records retained for QA verification requirements shall be originals or first-generation copies of documents, tapes, microfilms, and unique one-of-a-kind records.

b. Records shall be grouped and identified to specific work plans under the contract Work Breakdown Structure (WBS) coding. *

c. The records storage system shall provide for retrieval of information in accordance with planned retrieval times based upon the record type.

4.6 File Access

a. A list shall be maintained designating personnel who shall have access to the files.

b. QA Records maintained by a Subcontractor on-site or by Subcontractors and Suppliers off-site at their facilities shall be accessible to M-K BWIP and DOE/RHO.

5.0 PROCEDURES

Specific QA Records procedures will be developed based upon the direction for "Lifetime" vs "Non-permanent" records classification, turnover requirements, and retention periods received from DOE/RHO.

6.0 PROGRAM LEVEL APPLICABILITY

6.1 This entire section applies to Quality Assurance Level I Work performed by M-K BWIP and our suppliers.

6.2 Paragraphs 2.0 through 2.6, 4.0 through 4.3, and 5.0 apply to Quality Assurance Level II and III Work performed by M-K BWIP and our suppliers. Additional paragraphs of this section may be determined applicable by DOE/RHO.

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1.0 SCOPE/PURPOSE

This section describes the M-K BWIP QA Program requirements for an auditing system to verify the effective implementation of the QA Program throughout the M-K BWIP departments, our subcontractors, and suppliers.

2.0 GENERAL REQUIREMENTS AND RESPONSIBILITIES

- 2.1 The M-K BWIP QA Manager is responsible for planning, scheduling, and performing all audits of M-K BWIP QA activities and those of our Subcontractors and Suppliers.
- 2.2 The Corporate QA Manager is responsible for planning, scheduling, and performing audits of the M-K BWIP QA department.
- 2.3 The DOE/RHO will audit the M-K BWIP QA department. These audits may necessitate reviews of other departments, as well as our Subcontractor and Supplier activities in order to be complete.
- 2.4 Each M-K BWIP Department Manager and Subcontractor and Supplier with M-K BWIP QA Program responsibilities is responsible to conduct regular reviews of his department, Subcontractor or Supplier, M-K BWIP QA Program responsibilities and activities.

3.0 IMPLEMENTATION

- 3.1 Audit procedures related to specific activities shall be developed to assure that:
 - a. Audits are planned, scheduled, and conducted systematically.
 - b. All audits performed by M-K BWIP are performed by qualified auditors.
 - c. Audit checklists are generated to assure that each quality related program function is evaluated.
 - d. Deficiencies found are identified and documented with due dates specified for completion of corrective action.
 - e. Audit reports are distributed to the responsible management of the organization audited and to the M-K BWIP Project Director.
 - f. Follow-up actions are completed and reported to verify implementation of corrective actions.

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4.0 RECORDS

Records of audits of quality activities, including follow-up actions, shall be controlled as required by Section XVII of the M-K BWIP QA Program.

5.0 PROGRAM LEVEL APPLICABILITY

This section applies to Quality Assurance Levels I, II, and III Work performed by M-K BWIP and our Subcontractors and Suppliers. *

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- I Organization
- II Quality Assurance Program
 - QAP 2.01 Manual Control, Issue, Revision
 - QAP 2.02 Project Training and Training Records
 - QAP 2.03 Stop Further Processing
 - QAP 2.04 Management Training in Quality Assurance Functions
 - QAP 2.05 Training Program for Quality Engineers
- III Design Control
- IV Procurement Document Control
 - QAP 4.01 Procurement Document Review
- V Instructions, Procedures, and Drawings
 - QAP 5.1 Preparation and Control of Procedures
- VI Document Control
- VII Control of Purchase Material, Items, and Services
 - QAP 7.01 Receiving Inspection Procedure
- VIII Identification and Control of Materials, Parts, and Components
- IX Control of Special Processes
 - QAP 9.01 Qualification of Welders, Welding Operators, and Welding Procedures
 - QAP 9.02 Welding
- X Inspection
 - QAP 10.1 Quality Surveillance
 - QAP 10.2 Training and Qualification
- XI Test Control
- XII Control of Measuring and Test Equipment
 - QAP 12.1 Test Equipment
- XIII Handling, Storage, and Shipping
- XIV Inspection, Test, and Operating Status
- XV Control of Nonconforming Items
 - QAP 15.01 Control of Nonconforming Items

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- XVI Corrective Action
- XVII Quality Assurance Records
 - QAP 17.01 Operation of QA Document Control Center
 - QAP 17.02 Completion of Quality Assurance Forms
- XVIII Audits
 - QAP 18.01 Audits Procedures

BWIP EXPLORATORY SHAFT CONSTRUCTION REFERENCE DOCUMENTS

I. Documents Currently Available and Attached

*Enclosures to
4/1/82 etc.
to Wright from
Olson*

1. B-314-C-X28018 (BWIP 7490)
Construction Specification for Shaft Drilling and Rig Services
2. (No number available)
Dowell letter report on their chemical seal describing available laboratory test data, performance experience in past applications, and recommendations for further testing/development.
3. B-314-P-S28005 (BWIP 7473)
Procurement Specification for 72" ID Steel Casing
4. B-314-P-S28004
Procurement Specification for the 112" ID Steel Casing
5. B-314-B-X28028
Procurement Specification for Drilling Mud
6. (No number available)
Amchitka Mining History, Fenix and Scisson (1972)
7. Letter #R83-0283.1
Contingency Plan for Anomaly Detection and Resolution During Exploratory Shaft Construction
8. NM 79-137
Topical Report, "Preliminary Evaluation of the Rock Mass Disturbance Resulting from Shaft, Tunnel, or Borehole Excavation," D'Appolonia, July 1982.
9. QAP 9.03
Sperry Sun Survey Procedure
10. SD-BWI-TI-113
Principal Borehole Report
11. SD-BWI-AR-003
M-K Drilling Program (144" Hole)
12. SD-BWI-AR-002
M-K Mud Program (114" Hole)
13. M-K Q.A. Plan for drilling 144" Hole (including mud)

14. Rockwell Q.A. Inspection Plan for drilling 114" Hole
(including mud)

II. Documents to be Completed and Forwarded Prior to Drilling Surface Hole

1. RHO-QA-PL-3, Rev. 1 L
"Basalt Waste Isolation Project - QA Program Plan"
2. RHO-QA-PL-3, Rev. 1 L
Appendix A, "QA Program Index"
3. (No number available)
M-K QA Plan

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