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EG&G MOUND APPLIED TECHNOLOGIES

JUNE 1991

ENVIRONMENTAL, SAFETY AND HEALTH
UPGRADES, PHASE II
FOR
QUALITY ASSURANCE PLAN

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MLM-MU-91-66-0001

QUALITY ASSURANCE PLAN
for
ES&H Phase II Line Item

Issue of May 21, 1991
Prepared by: C. K. Ohler

EG&G Mound Applied Technologies
Miamisburg, Ohio

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Approvals:

Michael R. Hunter Michael R. Hunter Date 23 May 91
Project Manager

Charles S. Friedman C. S. Friedman Date 5/30/91
Project Sponsor

R. C. Herman R. C. Herman Date 6-4-91
Engineering Supervisor

Fredrick G. Krach Fredrick G. Krach Date 5/23/91
Loss Prevention and Environmental Control (LP&EC) Representative

Trudy E. Prugh Trudy E. Prugh Date 6/5/91
Quality Assurance Representative

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QA Plan for ES&H Phase II Line Item

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Appendix A. Quality Assurance Element Matrix

Appendix B. Project Quality Assurance Review

1. Description and Scope of Project

The ES&H Phase II Line Item Project consists of the following independent subprojects: the New Potable Water System; the Explosives Safety Upgrades and the Fuel Oil Storage System.

Part A - New Potable Water System:

There are over 100 buildings at Mound. Most have potable water service. The potable water flows to each building through the domestic water distribution main from wells on plant site. This domestic water serves not only as the potable water but also as the supply for process equipment and fire protection.

A survey of a portion of the site has identified a number of cases where process equipment and fire lines have been connected to the domestic water system without backflow protection. In the event of failure of process equipment or in the event of a plant fire, this lack of protection could result in contamination of the potable water supply.

The scope of the subproject is to eliminate the hazard created by the unprotected cross connections. This will be accomplished by modifications to completely separate the current potable water system from all processes not associated with drinking water.

Part B. - Explosives Safety Upgrades:

The scope of this subproject is to design and construct the following:

- 1.) Eight (8) single cell earth covered magazines each designed for storage of 199 pounds of UNO Class 1 Division 1.1 explosives.
- 2.) A three (3) cell service magazine for Building 27 with each cell rated for 13 pounds of TNT equivalent explosives.
- 3.) A four (4) cell service magazine provided with interior environmental conditioning for Building 48. Each cell shall be rated for 13 pounds of TNT equivalent explosives.
- 4.) A single cell service magazine to house Pantex non-propagating cabinets for DS Building. The magazine shall be designed for 1.3 pounds of TNT equivalent explosive.
- 5.) Explosive fragment barricades for magazines #7 and #11 and for Buildings 27 and 49.

- 6.) Modifications to Magazine 20 for conversion into an explosive inspection and transfer building.

Part C. - Fuel Oil Storage System:

The scope of the subproject is to upgrade the fuel oil storage and delivery system at Mound by making improvements at both the day tank site near the Powerhouse and the main tank site as follows:

- 1.) Four (4) 25,000 gallon underground storage tanks located east of the powerhouse will be removed and replaced with one (1) 50,000 gallon above ground oil storage tank. As an integral part of the tank installation will be the construction of a concrete containment basin and an automatic foam fire suppression system. In addition, a truck loading station and spill containment sump will be installed in the vicinity of the new tank.
- 2.) The 300,000 gallon above ground main fuel oil storage tank is to be removed along with the piping from the pumphouse to the tank and the fuel transfer pump. The tank will then be replaced with two (2) 225,000 gallon fuel oil storage tanks. As an integral part, the installation will include a secondary containment basin and automatic foam fire suppression systems with nozzles for each tank. In addition, a fuel oil transfer sump along with a truck unloading station and containment sump will be provided.

2. Purpose of QA Plan

The purpose of this Quality Assurance Plan (QA Plan) is to assure that the objectives of the United States Department of Energy (D.O.E.) and EG&G Mound Applied Technologies, Miamisburg, Ohio (Mound) are met for this non-weapons project relative to health and safety, protection of the environment, reliability and continuity of operations, and documentation of quality efforts. This QA Plan identifies the activities and responsibilities which are necessary in the design, procurement, fabrication, installation, and start up of this project in order to meet these objectives.

3. Applicable Documents

The D.O.E. requirements for quality assurance for projects such as this one are set forth in AL Order 5700.6B, Revision 2, dated July 7, 1989. That AL Order directs contractors such as Mound

to develop non-weapons quality assurance programs through application of appropriate requirements of the consensus standard of the American Society of Mechanical Engineers (ASME) titled "Quality Assurance Program Requirements for Nuclear Facilities". That standard is designated as ASME NQA-1-1989 Edition and is commonly called "NQA-1". A set of 1989 addenda have been issued.

The Mound non-weapons quality assurance program, reflecting the D.O.E. guidance cited above, is presented in Mound Technical Manual MD-10165. The implementation of that program within the Engineering Department is set forth in Mound Technical Manual MD-10241, Issue 10, titled "5700.6B Quality Plans for Engineering Department" (Manual MD-10241).

Other Documents and Forms:

Mound Manual MD-10286, titled "Safety and Hygiene Manual".

Mound Manual MD-10129, titled "General Safety Procedures for Handling Pyrotechnic Materials and Components".

Mound Systems Manual 804, titled "Mound Project Management Manual 804", (Manual 804) provides procedures for major or construction capital projects.

Mound System Manual 808, titled "Plant Engineering Manual 808", (Manual 808) provides A/E design guidance and general work requirements.

Mound Systems Manual No. 811, titled "Mound Engineering Department AES System Manual", (AES Manual) provides procedures for managing and documenting expense, capital equipment, productivity capital, and reimbursable projects.

Mound SPA-891214, titled "Drawing Control Procedures", describes the Mound drawing control system.

Mound Form ML-8440, titled "Project Quality Assurance Review".

Mound Form ML-7588, titled "Engineering Review Transmittal Sheet".

Mound Form ML-8816, titled "Engineering Department Nonconformance Report".

Mound Manual MLM-MU-91-63-0027, titled "Quality Assurance Plan for New Potable Water System".

Mound Manual MLM-MU-91-63-0001, titled "Quality Assurance Plan for Explosive Safety Upgrades".

Mound Manual MLM-MU-91-63-0002, titled "Quality Assurance Plan for the Fuel Oil Storage System".

4. Analysis of Consequence of Failure

Subproject Quality Assurance Reviews were completed and approved on November 28, 1989 for the Potable Water System, December 6, 1990 for the Explosive Safety Upgrades and February 28, 1991 for the Fuel Oil Storage System Upgrade. The Project Manager, together with the Subproject Sponsors, the Engineering Supervisor, the LP&EC Representative, and the QA Representative participated in the analysis of the potential failure modes and associated consequences. The most severe QA Level as defined in Section 1.3 of Manual MD-10241, was Level 1. Manual MD-10241 requires a written QA Plan for any AES project assessed as QA Level 1 or 2.

The major considerations in determining the QA Level are defined in the subproject QA Plans. Refer to the QA plan for each subproject as identified in Section 3. of this document.

5. Quality Elements and Quality Assurance Efforts

The quality assurance efforts planned for this project are summarized in the following sections (5.1 through 5.19) and are discussed in detail in the associated MLM Subproject Documents. The first 18 section headings are the same as those of the basic requirements, or elements, of both ASME NQA-1-1989 Edition and D.O.E Order AL 5700.6B, Revision 2. The 19th section is for software.

5.1 Organization

Responsibility for the non-weapons quality assurance program at Mound is vested with the Director of the Quality Department. Overall administration of the program is delegated to a staff individual reporting to the Manager of Non-weapons Quality Assurance. Implementation of the program is conducted by a "matrix" organization involving Department Coordinators from the various departments.

Within the Engineering Department, the Department Coordinator manages the NWQA program. The Department Coordinator reports to the Manager of Engineering Systems and Design, who in turn reports to the Director of Engineering. A staff of Section NWQA Representatives report directly to the Department Coordinator and implement the program in their Section. Thus the NWQA staff is administratively independent of all other direct supervision.

Those persons prominently associated with implementation of this QA Plan for the ES&H Phase II Line Item Project are listed below together with their functional title and general responsibilities.

Project Sponsor. Charles S. Friedman - Responsible for identifying the need and justification for the project and for review of the project scope and design to ensure that the needs are met.

Construction Manager. (Identified in Subproject QA Plan) - Responsible for project management, design and specification, control of construction, administration of inspections, resolution of nonconformances, control of nonconforming items, and maintenance of QA records. Responsible for execution of this QA Plan.

Project Manager. Michael R. Hunter - Responsible for project management. Responsible for overall administration of this QA Plan.

Subproject Engineers. Responsible for subproject management including oversight of design and specification, control of construction, administration of inspections, resolution of nonconformances, control of nonconforming items, and maintenance of QA records for assigned portions of the project. Refer to subproject QA Plans for detailed list of engineering assignments.

Design Engineers. Responsible for design and specification for assigned portions of the project. Refer to subproject QA Plans for detailed list of engineering assignments

Design Reviewers. Technical peer review of design. Detailed list is defined in the subproject QA Plans.

LP&EC Representative. Fredrick G. Krach - Representative of Loss Prevention and Environmental Control (LP&EC) with review and advisory role.

Drawing Control Supervisor. Arthur Keller - Responsible for policy and administration of drawing control.

Material Coordinator. Donald H. Nooks - Responsible for control of items in the material staging area.

QA Representative. Trudy E. Prugh - Representative of Non-weapon Quality Assurance. Responsible for review of this QA Plan and any internal Engineering audit of this project.

5.2. Quality Assurance Program

The non-weapons quality program plan for the Engineering Department at Mound is described in Mound Technical Manual MD-10241, Issue 10, titled "5700.6B Quality Plans for

Engineering Department". (Refer to Section 3 above for a discussion of the relation of Manual MD-10241 to Manual MD-10165, to D.O.E. Order Al 5700.6B, Revision 2, and to ASME NQA-1-1989 Edition.) This QA Plan for the ES&H Phase II Line Item Project describes the specific implementation for this project of the guidance in Manual MD-10241, Issue 10.

This Quality Assurance Plan is an "umbrella" plan to cover the subprojects identified in Section 1. The list of subproject QA Plans are as follows:

- * MLM-MU-91-63-0027 - New Potable Water System.
- * MLM-MU-91-63-0001 - Explosive Safety Upgrades.
- * MLM-MU-91-63-0002 - Fuel Oil Storage System Upgrades.

In addition, each subproject QA Plan will be in a format compatible with the "Umbrella" Plan.

5.3. Design Control

Explicit design criteria will be developed. Design information will be documented in the form of specifications and drawings. These documents will be used as communication tools to assure that items can be constructed, fabricated, inspected and tested according to definite design intent.

All issues of drawings will be checked by Drafting for accuracy and proper format. In accordance with Section 1800, titled "Project Review", of Manual 804, specifications and drawings will be circulated by the Design Engineer for review and comment. Design documents will be reviewed independently by a peer Design Reviewer to assure the technical adequacy and safety of the design. Design documents will be reviewed by the Sponsor to confirm that the design criteria are satisfied, and by the LP&EC Representative to assure the safety of the design. Reviews and comments designated by the reviewer as requiring response will be documented by completed Engineering Review Transmittal Sheets. The Design Engineer is responsible for resolving any review comments.

Engineering flow diagrams and wiring schematics will be checked against finished systems and changed, if necessary, so that the latest issue shows the system as constructed. Any such changes will take "field" changes into account.

Changes in the design documents will be controlled as described in Section 5.6 below.

Prior to transfer of the system to the Environmental, Safety and Health Department, a list of the design drawings and other documentation will be compiled. This list will show the latest issue of each drawing.

5.4. Procurement Document Control

Procurement documents will be controlled in accordance with the Contracting and Procurement Systems Manual 701. Purchase requisitions for Procurement Level 1 items will be controlled in accordance with Section 1.5.4 of Manual MD-10241. In order to verify conformance of critical purchased material as defined in the subproject QA plans, with specifications, explicit requirements for testing and evaluation will be included in the purchase contract{s}. Purchase contract{s} for critical material or services will explicitly require delivery of written certifications from the suppliers. Purchase contracts for critical material or services will contain explicit requirements for the supplier to have a quality assurance program consistent with specific requirements of NQA-1. As defined in the purchase contracts, Mound representatives will have the right of access to vendor's shops for witness, inspection, or testing of critical material or services.

Level 1 procurement items and material are identified in the subproject Quality Assurance Plans as listed in Section 3 of this document.

5.5. Instructions, Procedures, and Drawings

Work packages will be prepared as per Procedure No. 500, titled "Guidelines for Preparation and Transmittal of AES Work Packages", of the Mound Engineering Department AES System Manual in order to authorize in-house fabrication and installation. In accordance with this procedure, work packages will be sufficiently complete (approved drawings, specifications, job description, MSR, material list, list of required permits, Health Physics requirements, specific known hazards or conditions, requirements for coordination, etc.) to provide the information needed for doing the work properly. Prior to submission, the suitability of work packages will be reviewed by the Design Engineer's supervisor. Approval will be indicated by the supervisor's signature on the bottom of the completed AES Work Package Check List. Work packages will be submitted in a timely manner to allow the work described therein to be scheduled.

Design documentation will be prepared in accordance with the requirements defined in Plant Engineering Manual 808, "General Requirements for A-E Work", Volumes I & II, and the subproject Design Criteria. The documentation will be reviewed to ensure that the scope of work is adequately communicated. The A-E Project Manager will recommend the documentation for approval at the completion of Title II review. The drawings are approved by the Construction Manager and the Project Manager and each drawing is signed.

Preliminary drawings will not be used for construction.

"Field" changes during construction will be controlled in accordance with Section 1500, titled "Project Change control and configuration Review", of the Mound Project Management Manual 804.

An up-to-date set of red line drawings will be maintained by the contractor as required in the procurement documentation. All changes will be incorporated into the "as-built" drawings.

With technical input to be provided as necessary by the project team, complete written operating and maintenance instructions for the Potable Water System and for the Fuel Oil Storage System will be provided. These instructions will include operation of the system, alarm systems and emergency procedures, material transfer procedures, material accountability, spare parts list, and any special requirements for inspection or test of replacement parts.

5.6. Document Control

In order to allow unambiguous identification, the date of issue will appear on specifications and drawings. Drawings will be cataloged, handled, and filed in accordance with Mound specification SPA-891214, titled "Drawing Control Procedures".

Drawing issues will be of two types, preliminary and approved. Preliminary issues will be indicated by 0, 1, 2, etc. and approved issues will be indicated by A, B, C, etc. Preliminary issues will be controlled, but will not require approvals other than the initials of the Design Draftsman or Design Engineer. Preliminary issues will be prominently marked as such. Approval of "original" issue A of drawings will be signified by dated signatures or initials of the A-E Project Manager, A-E Design Engineer, A-E Designer, the EG&G Construction Managers, EG&G Project Manager and others as appropriate in the Title blocks. Approval of changes to previously approved drawings (ie. issue B or above) will be signified by date signatures or initials of the same functional representatives in revision blocks.

Changes in the design documents will be controlled, documented, and incorporated at the earliest practical time into a new and distinctly labeled issue of the document. The label will facilitate easy recognition of the latest issue of the document. The Design Engineer will initiate any such changes. Drawings will be changed in accordance with SPA-891214.

5.7. Control of Purchased Items and Services

Potential suppliers of critical purchased materials or services as outlined in the subproject QA Plans will be evaluated to ascertain their capability to provide adequate quality. This evaluation will be done by either examination of written documentation or by site visits and will be documented by written communication to Procurement and Contracting.

If written certifications of methods, composition of materials, inspection, or test results for purchased material or services, as outlined in the subproject Quality Assurance Plan, are required by the purchase contract, then a check will be made to verify that such documents have been received. Any such documents will be reviewed for completeness and adequacy.

Refer to subproject Quality Assurance Plans for detailed requirements.

5.8. Identification and Control of Items

Purchased items will be identified by purchase order number and receiving item number.

In order to maintain individual identity of items, identification markings will be used as required by the subproject QA Plans.

5.9. Control of Processes

Refer to the applicable Quality Assurance Plan, as identified in Section 3 of this manual, for a detailed description of the subproject process control requirements.

Note: As a minimum, process control will be required for welding of all blast doors and storage tanks.

5.10. Inspection

In order to assure good workmanship and conformance to the design specifications and drawings, field construction in progress will be regularly inspected by the Project Engineer responsible for the work package installation or by a designated inspector. A daily construction logbook will be maintained as a diary of this inspection effort. The logbook will be used for notes on the progress of installation, notes on special inspections and tests, and documentation of concerns or items to be resolved.

The results of these and any other inspections will be documented. Departures from specified requirements will be controlled in accordance with Section 5.15 of this QA Plan.

Requirements for detailed inspections are included in the applicable Quality Assurance Plans as identified in Section 3 of this manual.

5.11. Test Control

Tests will comply with the subproject QA Plans in order to demonstrate satisfactory performance for service. Refer to the appropriate subproject QA Plan for detailed definition of testing requirements.

The test results will be documented. Such documentation will include explicit identification of the item(s) tested, the date of the test, the test set up or conditions, the test result (quantitative if applicable), the signature of the person(s) performing the test, reference to the acceptance criteria, a statement of acceptance or rejection, and the signature of the person responsible for evaluating the test result.

Note: As a minimum, testing will be required for fire protection systems, lightning protection systems and concrete.

5.12. Control of Measuring and Test Equipment

The accuracy and suitability of measuring and test equipment used at Mound will be assured through use of the services of the Mound Standards group in accordance with the procedures in Manual MD-10096, titled "Mound Metrology Systems". Vendor certifications will be obtained to assure the accuracy and suitability of measuring and testing equipment used by suppliers of critical materials and services.

Mound's Construction Managers will verify that measuring and testing equipment is properly utilized and is adequate to meet all testing requirements.

Mound's Standards group will act as a consultant if certification, control, or utilization of measuring and test equipment is in question.

5.13. Handling, Storage, and Shipping

Receiving and delivery of incoming materials will be handled through Mound's Material Control System or by the Prime Contractor. Delivery will be made to the location indicated on the material list and purchase order form.

EG&G Material Coordinator:

The material coordinator will perform a receiving inspection to confirm the identity of materials, confirm the presence of specified certifications, store and control the materials, and maintain a log of materials in and out of the staging area. The foreman or planner will control materials being installed.

Prime Contractor:

The Contractor Superintendent will perform a receiving inspection to confirm the identity of material, confirm the presence of specified certifications, store and control the material.

5.14. Inspection, Test, and Operating Status

All critical equipment as identified in the subproject QA Plans will be visually inspected prior to installation. Any damage observed will be recorded by Mound's Project Inspector in the daily log. Installation of the equipment will be halted until an assessment of the damage by the manufacturer or a designated representative can be made. Written documentation of this assessment will be maintained by the construction manager.

All inspection and testing certifications for critical equipment will be reviewed and verified by the project inspector prior to installation.

5.15. Control of Nonconforming Items

In accordance with Section 1.5.15 of Manual MD-10241, instances

of items or activities that are judged by the Project Engineer as departures from specified requirements (eg. drawings or specifications) will be designated by the Project Engineer as "deviations". The Project Engineer will immediately mark or physically segregate any deviating items so as to prevent inadvertant use prior to disposition. Using an Engineering Department Nonconformance Report form, the Project Engineer will provisionally classify such deviations as "major" or "minor". A major deviation will be defined as a deviation which is likely to result in an unsafe condition or prevent intended use or result. A minor deviation will be defined as a deviation which is not likely to result in an unsafe condition or to prevent intended use or result. On the Report form, the Project Engineer will also describe the deviation, state the apparent cause, and state and justify a recommended disposition. Disposition may include "scrap", "repair" or "rework", or "use as is".

The Project Engineer will then convene a Review Committee to evaluate the situation. If a major deviation is involved, then the Review Committee will consist of at least the Sponsor, the Project Engineer, the Design Engineer (if different than the Project Engineer), the LP&EC Representative, and the QA Representative. If a minor deviation is involved, then the Review Committee will consist of at least the Project Engineer and the QA Representative. In either case, other specialists may be added to the Review Committee as required. The Project Engineer will be the chairperson of the Review Committee.

The Committee will review the provisional report and disposition recommended by the Project Engineer, making any agreed changes. For major deviations, the Committee will also determine and state on the Report form the root cause and any corrective action to be taken. For minor deviations, statement of root cause and corrective action will be optional. The Committee will reach a consensus, and each member will sign the Report form.

The Project Engineer will implement the corrective action indicated by the Committee, describe the action on the Report form, and certify on the Report form that the action was taken. The QA Representative will then review the Report form and, when satisfied, will also sign the form to "close out" the deviation. As a minimum, copies of the Report will be distributed to the project file and to the QA Representative. All deviations will be so resolved prior to closeout of the project.

5.16. Corrective Action

The Project Engineer will monitor the project for conditions

adverse to quality. This will be performed by noting discussions at project meetings, periodic review of the project logbook, and review of Nonconformance Reports. If adverse trends are identified or a potential exists for repetition of a major deviation, the Project Engineer will initiate corrective action. The Project Engineer will follow through to verify that the action is effective, and document any such actions and the results by use of the Engineering Department Nonconformance Report form and the procedure described in Section 5.15. The corrective action Review Committee will consist of at least the Sponsor, the Project Engineer, the Design Engineer (if different than the Project Engineer), the LP&EC Representative, and the QA Representative. Other specialists may be added to this Committee as required.

5.17. Quality Assurance Records

Project records will be maintained during the project execution. After drafting or editing work is completed, design drawings and controlled specifications will be stored in Drawing Control in accordance with SPA-891214, titled "Drawing Control Procedures". These procedures include storage of microfilm copies of all issues of drawings. A drawing list showing latest issues and any operating and maintenance manuals for equipment and components will be transferred to the Sponsor after completion of the project. The following list shows other project records which will be transferred to the Engineering Systems and Design section for storage after completion of the project.

I. Project management information

- a. AES, statement of scope of project, AES Cost Estimate Summary, and AES Cost Estimate Detail.
- b. MSRs.
- c. Work package information including scope of package, special instructions, and material list. As stated above, drawings will be stored separately in Drawing Control.
- d. Project schedule, including target schedule and revisions.
- e. Completed Project Quality Assurance Review and QA Plan. Audit report if project audited.
- f. Monthly progress reports and other major reports.
- g. Meeting minutes, important correspondence and telecon notes.
- h. Project closing information, including cost summary, and reports of any preoperational readiness review, etc.
- i. Any PSAR or FSAR.
- j. Any Engineering Bulletins or records of Configuration Board actions.

II. Design information

- a. Design Criteria.
- b. Design Calculations.
- c. Specifications.
- d. Completed Engineering Review Transmittal Sheets.
- e. List of drawings and controlled specifications.

III. Procurement records

- a. Any supplier evaluation reports.
- b. Purchase Orders, any associated specifications, important correspondence, and any bid evaluation reports.
- c. Supplier shop drawings if not to be stored in Drawing Control.
- d. Any supplier material certifications and inspection or test reports.

VI. Fabrication and installation records

- a. Project logbook.
- b. Inspection reports, test results, and calibration records.
- c. Any nonconformance reports.

5.18. Audits

This project is subject to independent audit at any time by the Section QA Representative. The purpose of such audit would be to determine the degree of compliance with the provisions of this QA Plan and the adequacy of documentation of quality assurance efforts. In particular, the project hardware and files may be audited prior to transfer of the project to the Sponsor's organization.

In addition, this project is subject to independent audit by auditors from the Performance Assurance Group at Mound. Such audit would be in accordance with Manual MD-10181, titled "Mound Quality Audit Program". The procedures required by this Manual include audit reports to responsible management and provision for any necessary follow-up action. The purpose of such audit would be to determine both the degree of compliance with this QA Plan, and the adequacy and effectiveness of the QA Plan itself.

5.19. Software

All software used for this project will be proven, commercially available packages. Therefore, software quality assurance will not be required for this project.

APPENDIX A

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MATRIX.DRW

QUALITY ASSURANCE ELEMENT MATRIX

PROJECT TITLE: FUEL OIL STORAGE SYSTEM

PROJECT ENGINEER / MANAGER: R. K. WISE

DATE: 2/20/91

PROJECT ENGINEER / MANAGER: <u>R. K. WISE</u>		GENERAL QUALITY ACTIVITIES																			
MAJOR AREAS AND EQUIPMENT ITEMS		CONSEQUENCE OF FAILURE CLASS	ORGANIZATION	QUALITY ASSURANCE PROGRAM	DESIGN CONTROL	PROCUREMENT DOCUMENT CONTROL	INSTRUCTIONS & PROCEDURES	DOCUMENT CONTROL	CONTROL OF PURCHASED ITEMS AND SERVICES	IDENTIFICATION & CONTROL OF ITEMS	CONTROL OF PROCESSES	INSPECTION	TEST CONTROL	CONTROL OF MEASURING AND TEST EQUIPMENT	HANDLING, STORAGE AND SHIPPING	INSPECTION, TEST, AND OPERATING STATUS	CONTROL OF NONCONFORMING ITEMS	CORRECTIVE ACTION	QUALITY ASSURANCE RECORDS	AUDITS	SOFTWARE QUALITY ASSURANCE
MAIN TANK																					
Ext. Tank Demolition.	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Oil Delivery Piping	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Oil Transfer Pump	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Siting	II	X	X	X	X	X	X											X	X	X	X
Oil Storage Tanks	II	X	X	X	X	X	X						X					X	X	X	X
Containment Dike	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Fire Suppression System	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Utilities	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								
Electrical	III			STANDARD ENGINEERING									PRACTICES WILL BE UTILIZED								

QUALITY ASSURANCE ELEMENT MATRIX

PROJECT TITLE: Explosive Safety Upgrades

DATE 12/17/90

PROJECT ENGINEER / MANAGER: R. K. Wise

MAJOR AREAS AND EQUIPMENT ITEMS		GENERAL QUALITY ACTIVITIES																		
		CONSEQUENCE OF FAILURE CLASS	ORGANIZATION	QUALITY ASSURANCE PROGRAM	DESIGN CONTROL	PROCUREMENT CONTROL	INSTRUCTIONS PROCEDURES & DRAWINGS	DOCUMENT CONTROL	CONTROL OF PURCHASED ITEMS AND SERVICES	IDENTIFICATION & CONTROL OF ITEMS	CONTROL OF PROCESSES	INSPECTION	TEST CONTROL	CONTROL OF MEASURING AND TEST EQUIPMENT	HANDLING, STORAGE AND SHIPPING	INSPECTION, TEST, AND OPERATING STATUS AND CONTROL OF NONCONFORMING ITEMS	CORRECTIVE ACTION RECORDS	AUDITS	SOFTWARE QUALITY ASSURANCE	
EARTH COVERED MAGAZINES																				
- Structural/Siting	I	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		
- Blast Doors	I	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		
- Lightning Prot. Sys..	II	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X		
- Interior Electrical	II	X	X	X		X	X	X	X		X		X	X	X	X	X	X		
- Ventilation System	II	X	X	X		X	X	X	X		X		X	X	X	X	X	X		
- Exterior Electrical	III				STANDARD PRACTICES WILL BE UTILIZED															
- Road/Drainage	III				STANDARD PRACTICES WILL BE UTILIZED															

QUALITY ASSURANCE ELEMENT MATRIX

PROJECT TITLE: NEW POTABLE WATER SYSTEM

DATE 12/7/89

PROJECT ENGINEER/MANAGER: Gary L. Coons

MAJOR AREAS AND EQUIPMENT ITEMS	GENERAL QUALITY ACTIVITIES																			
	CONSEQUENCE OF FAILURE CLASS	ORGANIZATION	QUALITY ASSURANCE PROGRAM	DESIGN CONTROL	PROCUREMENT DOCUMENT CONTROL	INSTRUCTIONS, PROCEDURES, & DRAWINGS	DOCUMENT CONTROL	CONTROL OF PURCHASED ITEMS AND SERVICES	IDENTIFICATION & CONTROL OF ITEMS	CONTROL OF PROCESSES	INSPECTION	TEST CONTROL	CONTROL OF MEASURING & TEST EQUIPMENT	HANDLING, STORAGE, AND SHIPPING	INSPECTION, TEST, AND OPERATING STATUS	CONTROL OF NONCONFORMING ITEMS	CORRECTIVE ACTION	QUALITY ASSURANCE RECORDS	AUDITS	SOFTWARE QUALITY ASSURANCE
New Potable Water System	II																			
Design		X	X																	
Title I					X	X												X	X	
Title II			X																	
EG&G Engineering																			X	
Construction																				
Title III								X									X			
Specifications																				
Submittals																				
Installation							X													
Asbestos Abatement	II	X	X						X											

APPENDIX B

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QUALITY ASSURANCE REVIEW

TITLE: NEW POTABLE WATER SYSTEMS, ES&H PHASE II	
AES: J01071	LOCATION:
SPONSOR: John Hussmann	C/C: 881
ENGINEER: Gary L. Coons	HP NO.: 3945
QA MEETING DATE: November 28, 1989	

PROJECT/FUNCTION ANALYSIS

DESCRIPTION/SCOPE:

This project consists of upgrading the existing water distribution system to eliminate all cross connections between process, fire, and potable water lines. This includes the installation of backflow preventers.

TASK RISK REVIEW, MAJOR CONCERNS, & JUSTIFICATION FOR LEVEL ASSIGNMENT:

- 1) Backflow prevention procurement and installation is critical and must be controlled. This involves selecting and specifying the correct type and monitoring the installation and testing.
- 2) Pipeing system material, installation, and testing is a concern and must be monitored.
- 3) Design/construction change control, as-builts, and code requirements must be documented.

If these system features fail, it could result with serious health concerns.

OTHER CONSIDERATIONS/SPECIAL PLANS:

During construction, asbestos will be encountered associated with pipe insulation. Procedures to deal with asbestos must be addressed and documented. A plan must be prepared during Title I design.

ANTICIPATED QA REQUIREMENT	
LEVEL 1	☐
LEVEL 2	☒
LEVEL 3	☐

APPROVALS	DATE
SPONSOR: <i>John Hussmann</i>	1/10/90
PROJ. ENG.: <i>Gary L. Coons</i>	12/7/89
SUPERVISOR: <i>W. L. Williams</i>	1/24/90
LP&EC: <i>Mark</i>	1/10/90
QA ENGINEER: <i>Andy P. Hughes</i>	1/9/90

PROJECT QUALITY ASSURANCE REVIEW

Title: ES&H IIB: Explosives Safety Upgrades

AES: J01072

Location: Site

Sponsor: George Ball III

CC: L00

Engineer: Robert K. Wise

HP NO.: 5362

QA Meeting Date: December 6, 1990

Project Description/Scope:

The scope of the project is to design and construct the following:

1. 8 single cell earth covered storage magazines sited for storage of 199 pounds of UNO Class/Division 1.1 explosives.
2. A 3 cell service magazine for building 27 each cell rated for 13 pounds TNT equivalent explosives and sited accordingly.
3. A 4 cell magazine for building 48 each cell rated for 13 pounds of TNT equivalent explosives and sited accordingly. This magazine will also be provided with environmental conditioning of it's interior.
4. A single cell service magazine for DS building. This magazine will house Pantex non-propagating cabinets. The magazine will be designed and sited for 1.3 pounds TNT equivalent explosives.
5. Explosive fragment barricades for magazines 7 and 11 and for buildings 27 and 49.
6. Modifications of Magazine 20 to convert it into an explosives inspection and transfer building.

All items on the project will have interior and exterior electrical systems and lighting as required. In addition they will also have lightning protection as required.

Title: ES&H IIB: Explosives Safety Upgrades

AES: J01072

Location: Site

Sponsor: George Ball III

CC: L00

Engineer: Robert K. Wise

HP NO.: 5362

QA Meeting Date: December 6, 1990

TASK RISK REVIEW, MAJOR CONCERNS, & JUSTIFICATION FOR LEVEL ASSIGNMENT

Most of the concerns for the project are with the design and construction of the earth covered magazines and service magazines. Standard magazine design practices include certain safety systems intended to mitigate risk. The lightning protection system is intended to reduce the risk of an accidental detonation of magazine contents by a lightning strike. The explosion proof electrical fixtures in the interior of a magazine reduce the risk of an accidental detonation from sparks. The blast doors, structural design and siting are intended to prevent propagation of explosions between magazines should an accidental detonation occur. The siting of the magazine relative to surrounding buildings and other magazines is also intended to minimize the risk of severe damage to surrounding buildings and injury or death to people outside the magazine area.

The concerns are that the blast doors, structural, siting, electrical systems and lightning protection systems are all properly designed and that these designs are constructed according to the drawings and specifications including the materials of construction.

The project is considered a Level 1 because these safety systems must function properly in order to minimize the risk of severe injury or death and/or the loss of raw material which could adversely affect our mission.

OTHER CONSIDERATIONS/SPECIAL PLANS: None required QA Level 1

Assignment of Consequence of Failure:

Level 1 X

Sponsor:

George L. Ball

12/14/90

Level 2

Proj. Eng.:

Robert K. Wise

12/14/90

Level 3

Supervisor:

Robert J. Gentry

12/14/90

LP&EC

Ronald E. French

12/14/90

QA Eng.:

Jamdy E. French

12/14/90

PROJECT QUALITY ASSURANCE REVIEW

Title: ES&H IIc: Fuel Oil Storage System

AES: J01073 & J01076

Location: Site

Sponsor: Charles Friedman

CC: LOO

Engineer: R. K. Wise

HP NO.: 5362

Project Description/Scope:

The project is intended to upgrade the fuel oil storage and delivery system at Mound by making improvements at both the Day tank site near the power house and the main tank site.

DAY TANK

Demolition

The four 25,000 gallon Underground Storage Tanks located east of the powerhouse will be decommissioned and removed.

Installation

A 50,000 gallon above ground oil storage tank will be installed as a replacement. Integral to the tank installation will be the construction of a concrete containment basin and an automatic foam fire suppression system. In addition, a truck unloading station and it's containment sump will be installed with the new tank.

MAIN TANK

Demolition

The 300,000 gallon above ground fuel oil storage tank is to be removed including the piping from the pump house to the tank.

The fuel transfer pump will also be removed.

Installation

The 300,000 gallon tank will be replaced by two 225,000 gallon fuel oil storage tanks. The fuel tanks will be provided secondary containment through the installation of a concrete containment basin. Integral to the installation is an automatic foam fire suppression system with nozzles for each tank. A truck unloading station and it's containment sump will be installed with the new tanks. A fuel oil transfer pump and containment sump will also be installed with the new main storage tanks.

The 225,000 gallon tanks are planned for installation in the area east of the building 19 storage bins and south of WD building. Consequently, the fuel transfer piping will be extended. The piping will be overhead and will require the installation of a number of pipe stanchions.

Title: ES&H IIC: Fuel Oil Storage System

AES: J01073 & J01076

Location : Site

Sponsor: Charles Friedman

CC : L00

Engineer: Robert K. Wise

HP NO. : 5362

TASK RISK REVIEW, MAJOR CONCERNS, & JUSTIFICATION FOR LEVEL ASSIGNMENT

The main concerns for this project are the consequences of an oil spill resulting from a leaking oil tank and the risk and consequences of an oil tank fire. Therefore, the main concern for this project is the design and installation of the above ground storage tanks. Because the tank itself is the primary containment for the fuel oil it will receive greater emphasis than the containment basin. If the tank does not fail, the secondary containment basin is not needed. In addition the appurtenances associated with the tanks must be properly designed and installed in order to minimize the risk and consequences of a tank fire.

The close proximity of buildings at the day tank site places emphasis on the foam fire suppression system for this tank.

The removal of the Underground Storage Tanks at the power house and the remediation of this site are also emphasis areas.

Other Considerations and Special Plans:

None required QA Level #2

Assignment of Consequence of Failure:

Level 1 Level 2 X Level 3

	Approvals	Dates
Sponsor:	<u>C. S. Friedman</u>	<u>4/22/91</u>
Construction Manager:	<u>Robert K. Wise</u>	<u>3/27/91</u>
Supervisor:	<u>Robert F. Stanley</u>	<u>02/28/91</u>
LP&EC:	<u>Justin K. K...</u>	<u>4/22/91</u>
QA Engineer:	<u>Trudy Spr...</u>	<u>2/28/91</u>