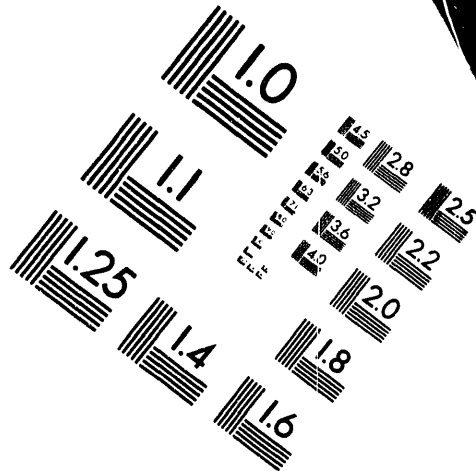
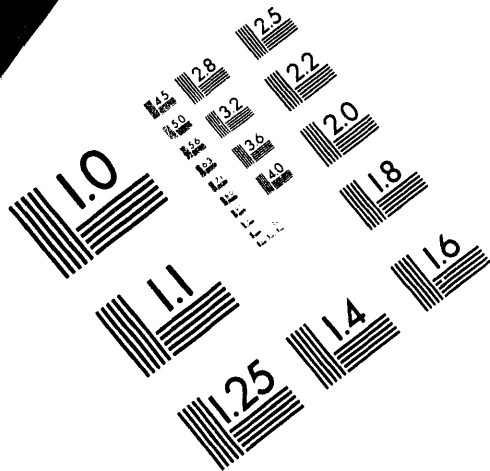




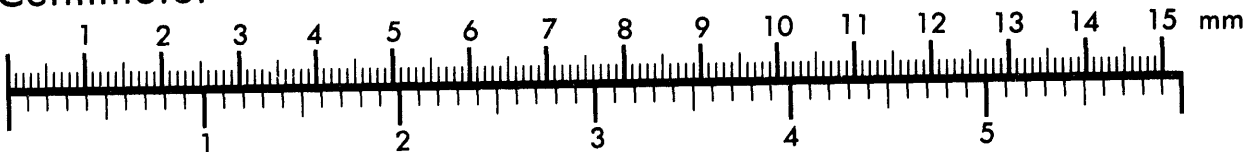
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Association for Information and Image Management

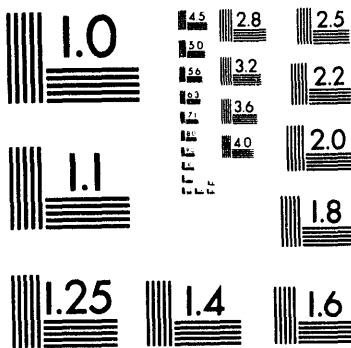
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Silver Spring, Maryland 20910
301/587-8202



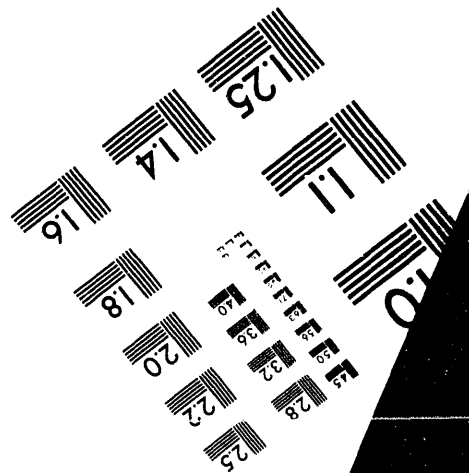
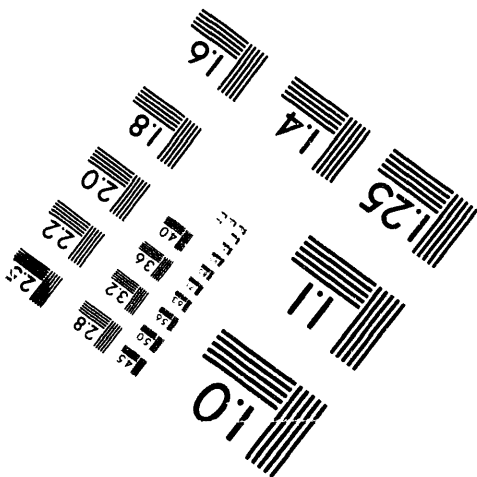
Centimeter



Inches



MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.



1 of 1

DOE/PE/17060--T1

FINAL TECHNICAL REPORT:

Record of Principal Work Activities/Deliverables
for the Period September 28, 1984 to September 27, 1989
under Contract DE-AC01-84PE17060

September 1989

Prepared for

Division of Quality Verification
U.S. Department of Energy
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INTRODUCTION

This report presents a listing of the principal work activities and deliverables associated with Contract DE-AC01-84PE17060 between the U.S. Department of Energy (DOE) and ARINC Research Corporation. The base period of performance was for two years, followed by three consecutive one year option periods that were each exercised at the discretion of the DOE; the total contractual effort covered a five year period.

Over the five year period of performance, thirteen task assignments were issued by the DOE to ARINC Research. During the two year base period seven tasks were assigned. Two task assignments were issued for each of the three consecutive one year option periods. Associated with all task assignments were multiple subtasks, some of which required significant effort. These subtasks are appropriately cited in this report under their respective task assignments as principal work activities or deliverables.

The technical and management support provided to the DOE under this contract focused on two general areas: 1) appraisal activities and 2) non-appraisal activities. Support to appraisals included planning, document review, developing lines-of-inquiry, interviewing, data collection, report writing, and follow-up. Such work was executed both on-site at the DOE facility under review and off-site. Non-appraisal support was varied and included such areas as document review, data base development, technical assessments, statistical analysis, policy analysis, reliability engineering, and workshop and conference planning and execution.

Base Period: September 28, 1984 - August 12, 1986

Task Assignment 1

Participated in a Quality Assurance Appraisal of the Bonneville Power Administration

Task Assignment 2

Provided facilitation and administrative support to a quality assurance workshop held in Augusta, Georgia (November 1984)

Task Assignment 3

Prepared a report entitled "Review of Management Procedures and Practices of the Office of Quality Assurance and Standards"

Task Assignment 4

Provided overall contract and task management

Provided support to Office of Quality Assurance and Standards appraisal schedule development

Provided technical review and comment on DOE Order 1000.3A, "Internal Control Systems"

Task Assignment 5

Participated in Quality Assurance Appraisals of:

- Salt Repository Project Office
- High Flux Isotope Reactor (HFIR) and Oak Ridge Research Reactor
- Los Alamos and Sandia National Laboratories
- Rocky Flats Plant

Participated in Quality Assurance Follow-up Appraisals of:

- San Francisco Operations Office
- Nevada Operation Office
- Strategic Petroleum Reserve

Prepared the Office of Quality Assurance and Standards final Annual Report for fiscal year 1984

Prepared a draft outline for the Office of Quality Assurance and Standards Annual Report for fiscal year 1985

Provided recommendations to the appraisal schedule for fiscal year 1985

Prepared draft material for the Secretary of Energy's Annual Report to Congress relating Office of Quality Assurance and Standards activities for fiscal year 1984

Completed a preliminary design of Office of Quality Assurance and Standards Appraisal Data System

Task Assignment 6

Participated in a Quality Assurance Appraisals of:

- Savannah River Plant F Canyon
- Albuquerque Operations Office
- Brookhaven National Laboratory
- Savannah River Operations Office
- N Reactor
- Naval Petroleum Reserve
- Annular Core Research Reactor

Participated in a Quality Assurance Follow-up Appraisal of Chicago Operations Office

Participated in Special Reviews of:

- Savannah River Plant Reactors
- N Reactor
- General Purpose Heat Source (Radioisotope Thermoelectric Generator Quality Assurance Program)

Participated in a Management Appraisal of the Savannah River Operations Office

Task Assignment 7

Performed an analysis of responsibilities contained in environment, safety, and health orders for purposes of identifying duplicative duties

Prepared a (final) draft Office of Quality Assurance Manual

Provided technical revisions to Draft 5700.6B, "Quality Assurance"

Provided technical recommendations for consideration in an Office of Quality Assurance Strategic Plan

Prepared a report entitled "The Status of Quality Assurance Implementation in the Department of Energy: January 1 to September 30, 1985"

Provided recommendations for the maintainability assurance section of the "SP-100 Ground Engineering System Quality and Reliability Assurance Requirements" document

Prepared draft material for the 1986 Office of Quality Assurance Annual Report

Prepared a summary task report entitled "Accomplishment and Findings in Support of SP-100 Reliability, Maintainability, and Quality Assurance Requirements"

Prepared a Draft User's Manual for the Office of Quality Assurance Data System (ODS)

Conducted a technical review of American Nuclear Society (ANS) Standard 15.8, "Quality Assurance Program Requirements for Research Reactors"

Prepared a position paper entitled "Should Recommendations be Included in Quality Assurance Appraisals"

Option Period One: August 13, 1986 - August 26, 1987

Task Assignment 8

Participated in Quality Assurance Appraisals of:

- Savannah River Plant Reactors
- Morgantown and Pittsburgh Energy Technology Centers
- High Flux Isotope Reactor (HFIR) and Oak Ridge Research Reactor
- Idaho Chemical Processing Plant (ICPP)
- High Flux Beam Reactor (HFBR)
- San Francisco Operations Office

Participated in Special Reviews (i.e., effects of radiation on reactor materials - embrittlement) of:

- Experimental Breeder Reactor (EBR) II
- Savannah River Plant Reactors
- High Flux Beam Reactor (HFBR)

Task Assignment 9

Provided overall contract and task management

Provided draft material for inclusion in the Office of Quality Assurance Program Plan

Prepared a draft outline for revisions to DOE Order 5000.3, "Unusual Occurrence Reporting System"

Provided updates to the Office of Quality Assurance Operations Manual

Prepared an outline of the system architecture for Office of Quality Assurance Management Information Monitoring System (MIMS)

Developed reliability, availability, and maintainability (RAM) criteria

Developed a conceptual outline for a comprehensive order for DOE reporting requirements

Provided technical support to a RAM workshop and prepared an associated video tape

Prepared a report entitled "Investigation of the Applicability of a Quality Assurance Auditor Certification Program to the U.S. Department of Energy"

Proposed revisions to Draft DOE Order 5631, "Human Reliability Program"

Evaluated 1986 NQA-1 updates

Conducted a comparative analysis of DOE and NRC requirements pertaining to the reporting and notification of significant safety and health related information

Conducted a survey of government agencies implementing incident reporting systems

Prepared draft generic quality assurance lines-of-inquiry to support appraisals of quality assurance programs for packaging used to transport radioactive material

Prepared a draft outline for a comprehensive order on U.S. Department of Energy reporting requirements

Option Period Two: August 27, 1987 - July 26, 1988

Task Assignment 10

Participated in Technical Safety Appraisals of:

- EBR II
- Plutonium Finishing Plant (PFP)
- Y-12 Plant

Participated in a Special Review of N Reactor Advanced Safety Enhancement Program (ASEP)

Participated in a Quality Assurance and Reliability Review of the SP-100 Program (Germantown, MD; Pasadena, CA; Valley Forge, PA; San Jose, CA; Hanford, WA; Los Alamos, NM)

Participated in Restart Reviews of:

- High Flux Isotope Reactor (HFIR)
- Plutonium Finishing Plant RMC Line

Task Assignment 11

Provided overall contract and task management

Provided technical support to the development of an Office of Quality Assurance Program Plan

Provided technical recommendations toward the development of a DOE Order for software quality assurance

Conducted a technical review of the Safety Performance Measurement System (SPMS)

Developed a draft data base for a proposed new feature for SPMS, i.e., "Quality Assurance - Data From Experience"

Prepared the Prototype Operations Manual for the Office of Nuclear Safety

Conducted a detailed review and analysis of N Reactor sampling plan

Developed the source selection proposal evaluation criteria for RAM

Prepared a reporting requirements matrix for environment, safety, and health incidents

Conducted a review of the RAM evaluation criteria document

Provided technical support to the (second) DOE RAM working group meeting

Conducted a review of the Richland Operations Office Quality Assurance Manual

Prepared draft guidelines for certifying quality assurance lead auditors

Provided draft material for inclusion in the DOE Office of Quality Assurance Records Management Program

Prepared a criteria for RAM program evaluation

Provided an independent review of the HFIR probabilistic risk assessment

Provided technical support to the review of the N Reactor Accelerated Safety Enhancement Program

Prepared generic RAM and quality assurance requirements for inclusion in requests for proposals

Conducted a review of "Predecisional Draft Action Plan for Resolution of Technical Recommendations, Response to the NAS and NAE Report on Safety Issues at the Defense Production Reactors"

Conducted a review of the National Waste Terminal Storage RAM Guidebook

Prepared a draft approach for performing quality assurance diagnostic appraisals

Prepared a draft approach for performing quality assurance verification appraisals

Provided data management support to the Office of Quality Assurance

Prepared a report entitled "Environment, Safety, and Health Reporting Requirements"

Provided technical support to incorporating quality assurance in DOE orders associated with general design criteria

Conducted a comparative analysis of DOE calibration requirements to military standards

Provided technical recommendations to the Draft DOE Order 548X.X, "Readiness Review System"

Provided technical review and comment to the National Academy of Sciences (NAS) and National Academy of Engineering report entitled "Safety Issues at the Defense Production Reactors"

Option Period Three: July 27, 1988 - September 27, 1989

Task Assignment 12

Participated in Multidiscipline Technical Safety Assurance Appraisals (MTSAA) of:

- Naval Petroleum Reserve
- Strategic Petroleum Reserve

Participated in Technical Safety Appraisals of:

- Rocky Flats Plant
- Hanford Tank Farm

Participated in a Start-up Inspection of the Special Isotope Separator

Participated in an Operational Readiness Review of the Oak Ridge Tower Shielding Reactor

Participated in a Special Review of the Portsmouth Gaseous Diffusion Plant

Task Assignment 13

Provided overall contract and task management

Developed a Performance Indicator Data System (PIDS) concept

Conducted an analysis of the Savannah River Plant Reactor Incident Reports pertaining to control rod drive systems

Conducted an analysis of the Information Sheet/Questionnaire associated with Naval Petroleum Reserve MTSAA

Conducted an analysis of the SP-100 fuel pellet sampling plan

Conducted a review of the N Reactor pressure tube sampling plan and associated analysis

Conducted an analysis of the Information Sheet/Questionnaire associated with Strategic Petroleum Reserve MTSAA

Conducted an assessment of Draft DOE Order 5480.MAINT, "Maintenance"

Provided technical recommendations to Draft DOE Order 5700.6C, "Quality Assurance"

Conducted a review and analysis of guidance and practices for quality assurance sections of Safety Analysis Reports (SARs)

Prepared a draft procedure for reporting and integrating relevant environment, safety, and health activities

Provided technical and administrative support to the Quality Conference

Construction of a Division of Quality Verification data base and management system

Provided management support to the Beryllium Notification Program

Conducted a review of the draft health physics functional appraisal performance objectives and criteria

Conducted an analysis of U.S. Nuclear Regulatory Commission Advance Notice of Proposed Rulemaking (contained in 6 March 1989 Federal Register, Vol. 54, No. 42) regarding interpretation of Title 10, Code of Federal Regulations, Part 50

**DATE
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