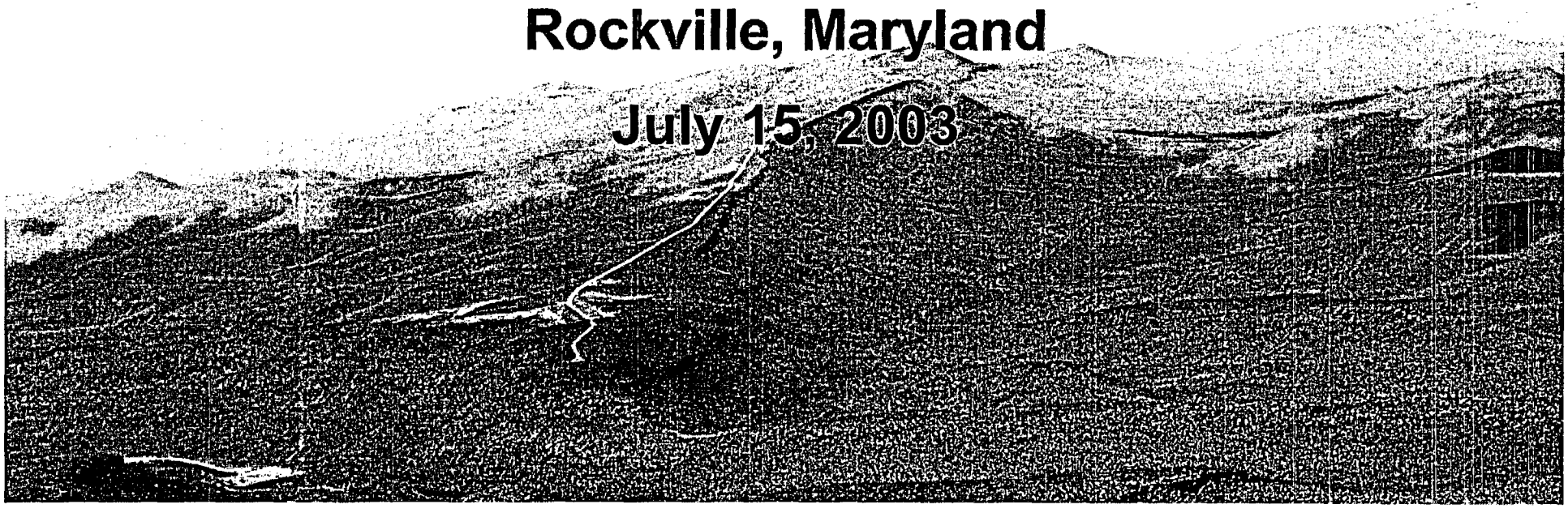
U.S. Department of Energy
Office of Civilian Radioactive Waste Management

YUCCA MOUNTAIN PROJECT

DOE/NRC Quarterly Quality Assurance Meeting

Rockville, Maryland

July 15, 2003



Attachment 2

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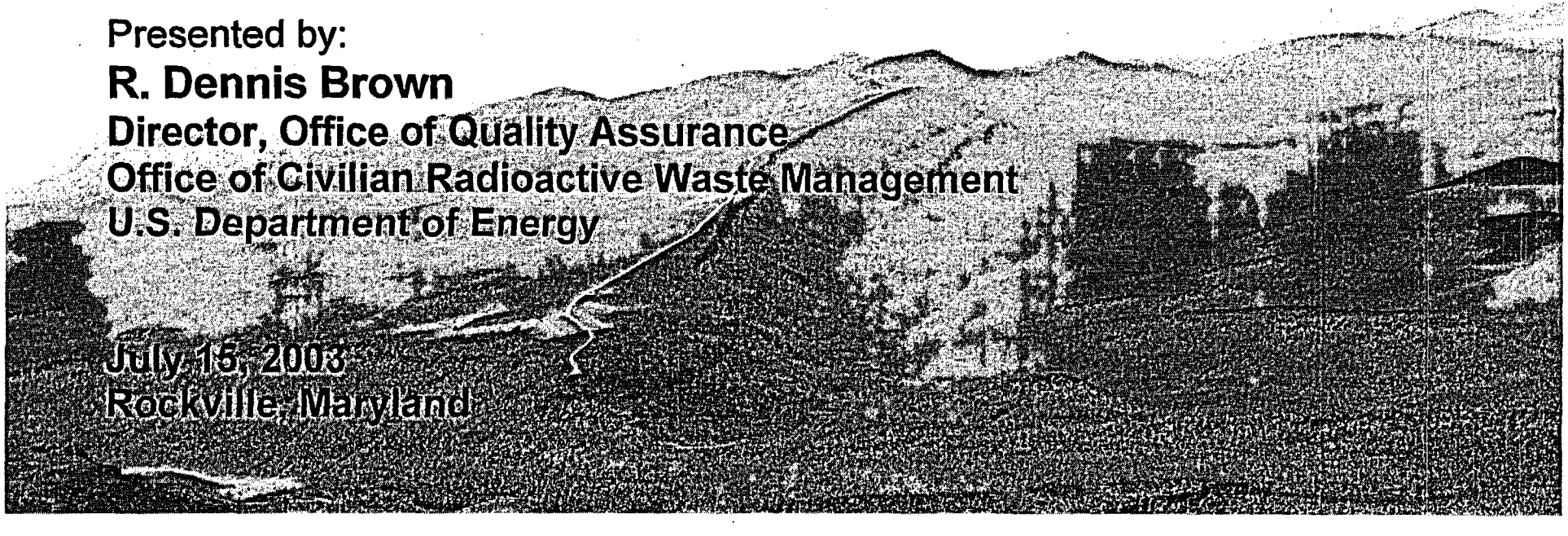
Office of Civilian Radioactive Waste Management

YUCCA MOUNTAIN PROJECT

Quality Assurance Overview

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting



Presented by:
R. Dennis Brown
Director, Office of Quality Assurance
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

July 15, 2003
Rockville, Maryland

Quality Assurance Overview

(Continued)

- Policy and Procedures
  - Quality Assurance Requirements and Description (QARD) status
  - AP-5.1Q review process
  - Organization/interface requirements
    - Procedures (DOE and BSC)

YUCCA MOUNTAIN PROJECT

Quality Assurance Overview

(Continued)

- Assessments - 3rd Quarter
  - Audit BSCP 03-07 of software
    - 8 Deficiency Reports (DRs) issued
    - Marginally effective
  - BSC specific oversight activities
    - 21 internal surveillances - 8 DRs issued
    - 8 external supplier audits - 14 DRs issued
  - Integrated internal audits
    - U.S. Geological Survey (USGS) - BSC Lead Compliance Audit - 1 Quality Observation (QO) issued
    - Los Alamos National Laboratory (LANL) - BSC Lead Compliance Audit - 1 QO issued

YUCCA MOUNTAIN PROJECT

Quality Assurance Overview

(Continued)

- DOE Line Management Accountability
  - Quality focus stand down activities continue
  - Monthly operating review
  - Management interface meetings
  - Quality Engineering integrated with line management
    - Corrective action resolution
    - Weekly Condition/Issue Identification and Reporting/Resolution System (CIRS)/DR/Corrective Action Report (CARs) meetings

YUCCA MOUNTAIN PROJECT

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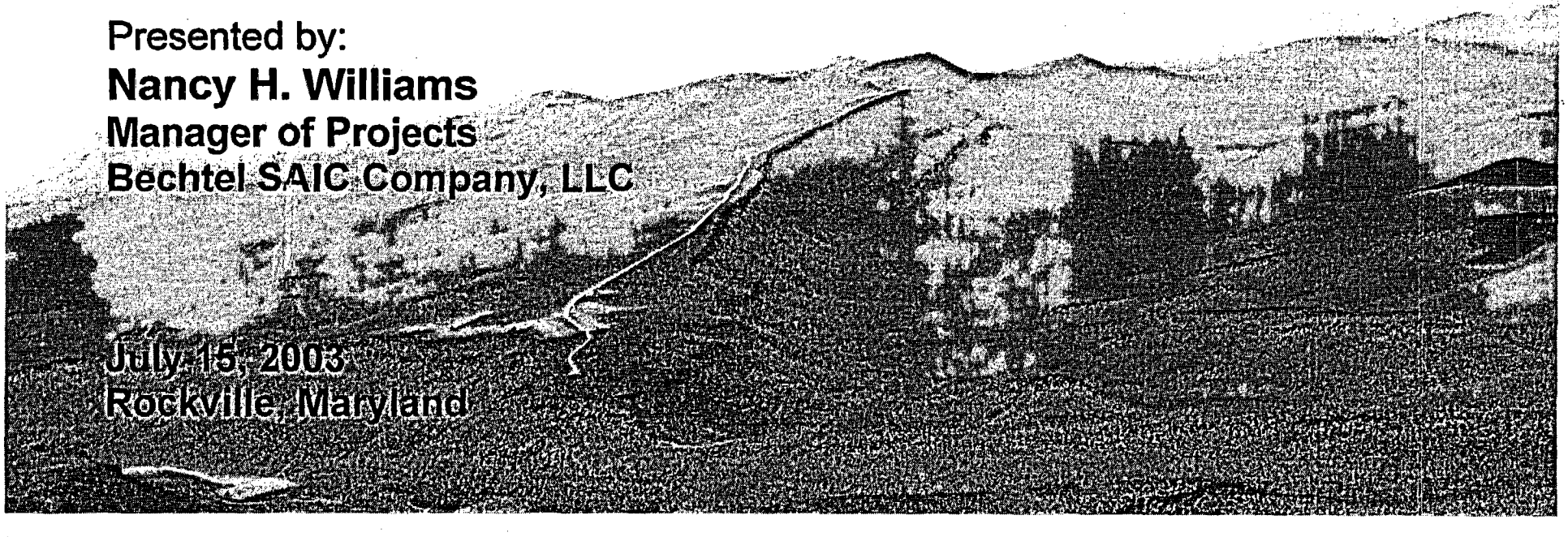
Office of Civilian Radioactive Waste Management

YUCCA MOUNTAIN PROJECT

Model Validation (CAR BSC-01-C-001)

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting

Presented by:
Nancy H. Williams
Manager of Projects
Bechtel SAIC Company, LLC



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Rockville, Maryland

Model Validation Corrective Action Report Actions

- 11 of 11 actions identified in September 24, 2002 response (as modified by amended response) are complete
- One action completed since date of the last Quarterly Quality Assurance (QA) meeting
  - Use of performance indicators to assess the effectiveness of the self-identification process
  - Performance indicators show process of self-identification is effective

Model Validation Corrective Action Report Actions

(Continued)

Status of In-Process Reviews (as of June 30, 2003)

- 65 model reports are being developed under the revised procedure to support the LA
  - Includes models supporting features, events and processes screening and implementation of the criticality methodology
  - Technical Work Plans for each model, including model validation criteria, approved by the Chief Science Officer (CSO)
  - 51 model reports started in-process model validation review
  - 42 model reports approved by CSO during in-process model validation review
  - 22 model reports completed CSO technical review

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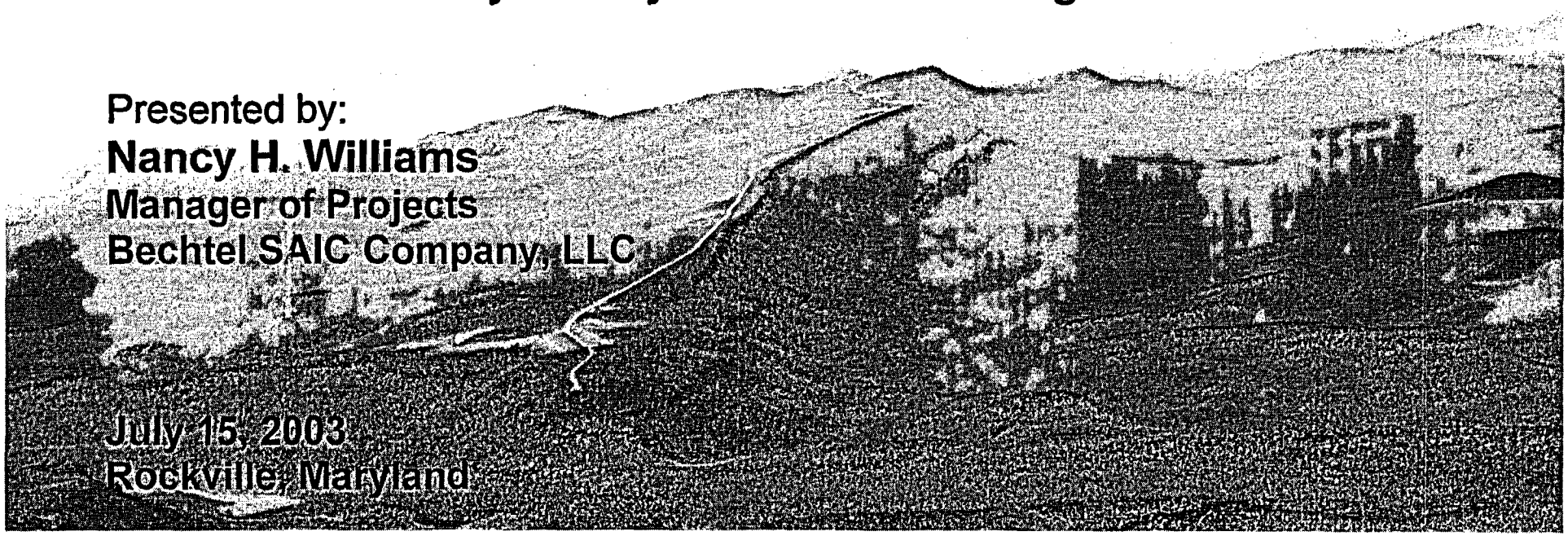
YUCCA MOUNTAIN PROJECT

Software Development (CAR BSC-01-C-002)

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting



Presented by:
Nancy H. Williams
Manager of Projects
Bechtel SAIC Company, LLC

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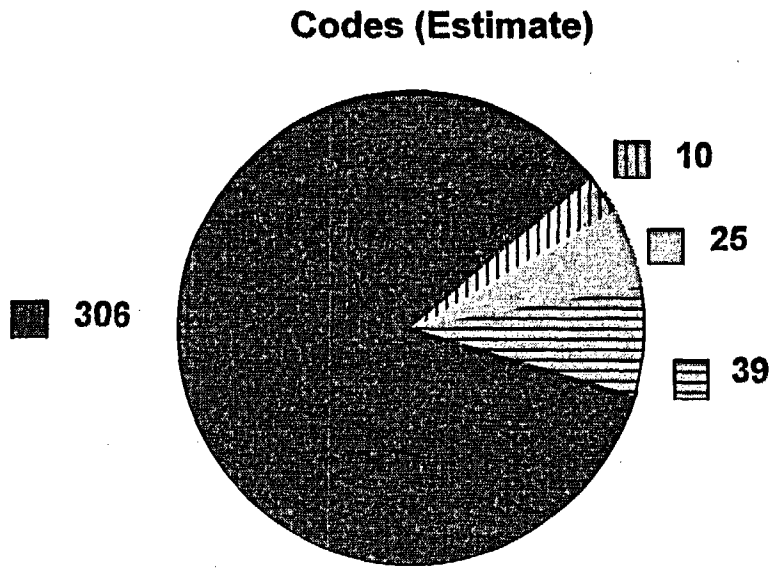
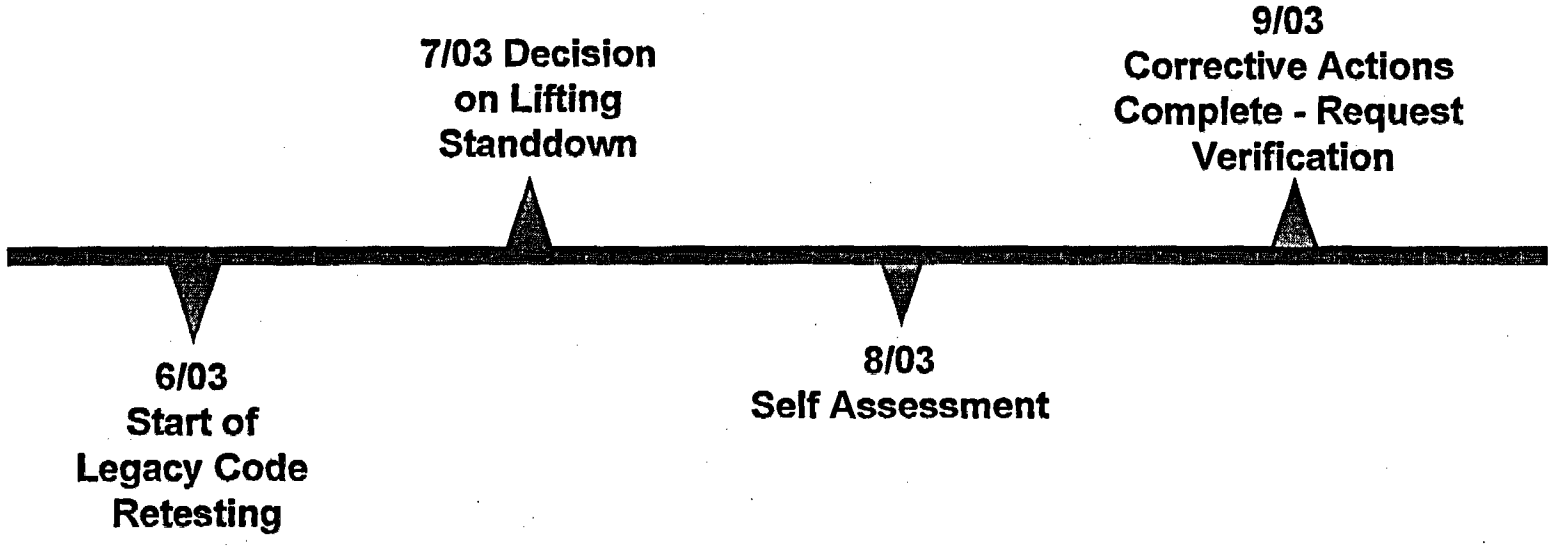
Software Code Status
(Counts as of June 26, 2003)



Total Codes: 380

- Qualified and completed IV&V: 39 (10%)
- Submitted for IV&V: 10 (3%)
- Qualified, Need Re-testing (Legacy Software): 306 (80%) estimated
- Under Development = 25 (7%)

Timeline for Completion



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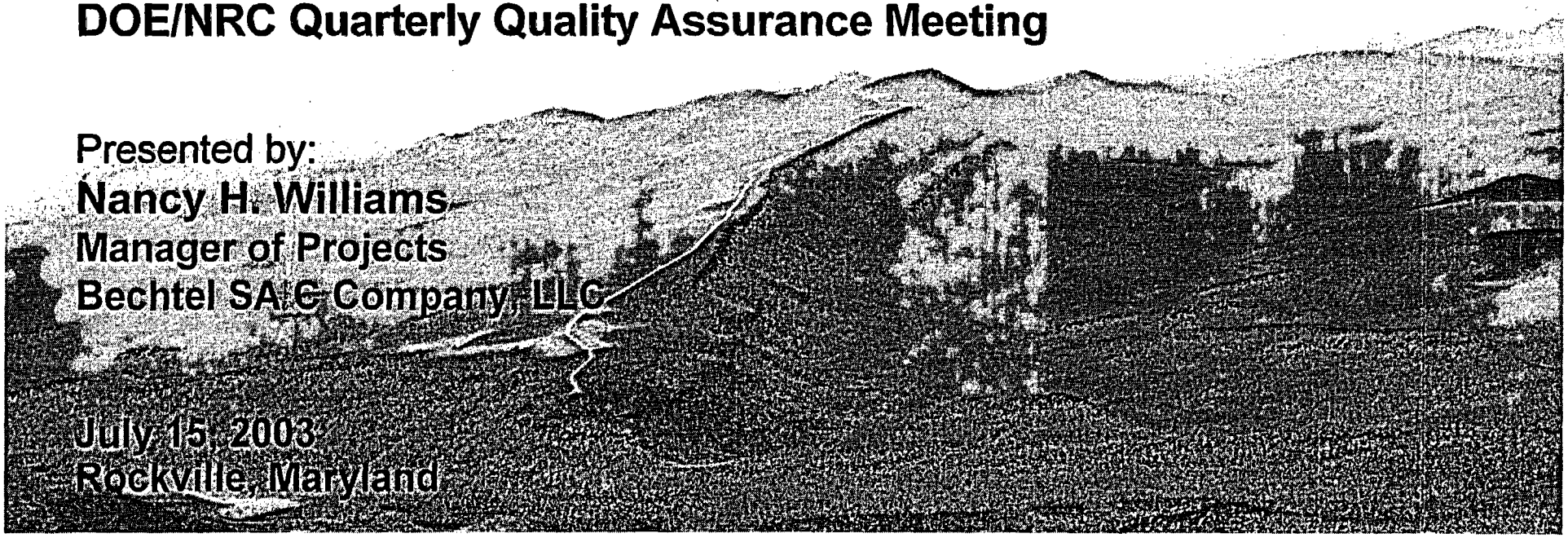
YUCCA MOUNTAIN PROJECT

Management of Data (CAR BSC(B)-03-C-107) and Data Qualification

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting



Presented by:
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Manager of Projects
Bechtel SAIC Company, LLC

July 15, 2003
Rockville, Maryland

Data Confirmation Project

- Incorporated into checking and review functions
- Separate data checklist developed
  - Phase I addresses compliance issues
  - Phase II will address technical adequacy
- Checklist review will document lessons learned for process improvements

Metrics

- Data Confirmation Project
  - Approximately 120 technical products* support LA
    - 35 products have completed Phase I
    - 4 products completed Phase II

*Analysis/model reports (AMRs) and technical reports

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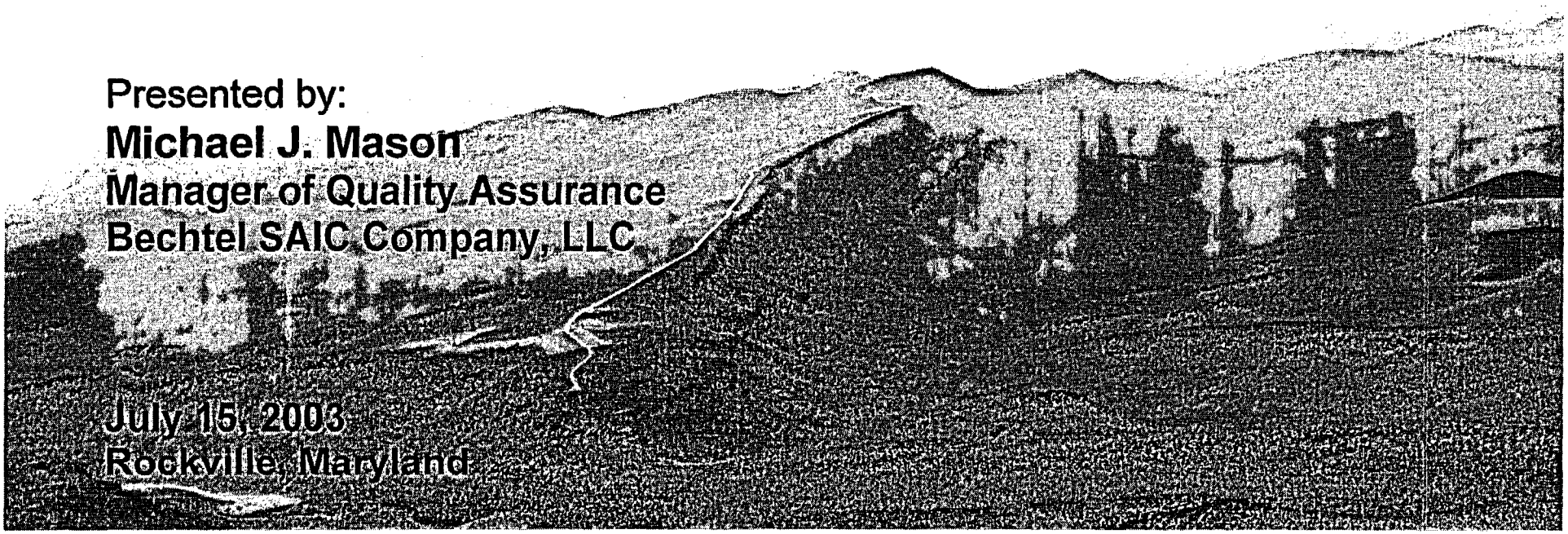
YUCCA MOUNTAIN PROJECT

Procedure Implementation (CAR BSC(O)-03-C-097)

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting



Presented by:
Michael J. Mason
Manager of Quality Assurance
Bechtel SAIC Company, LLC

July 15, 2003
Rockville, Maryland

Procedure Implementation
(CAR BSC(O)-03-C-097)

- OQA Evaluation
  - OQA provided a write-up of concerns to the CAR response and Root Cause Report - June 19, 2003
  - 11 Corrective Action (CA) issues required a response and 21 issues required clarification to the Root Cause Report
  - BSC provided responses to OQA's comments on July 7, 2003

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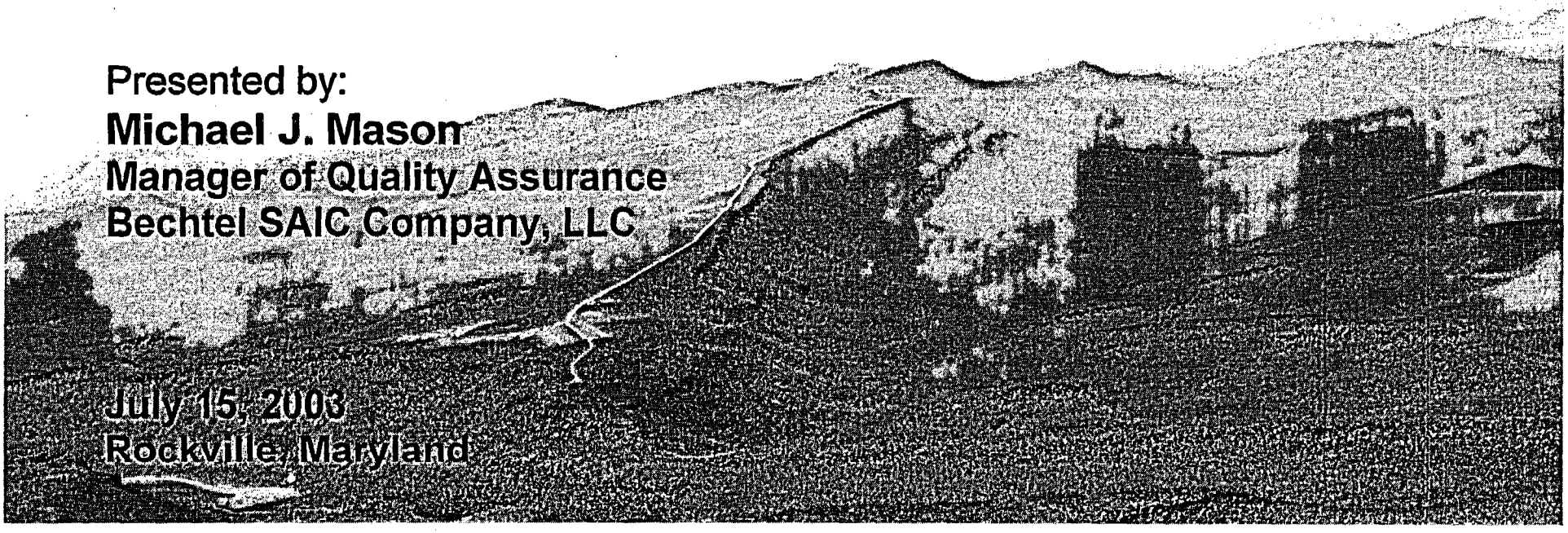
Training and Qualification
CAR BSC-02-C-001

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting



Presented by:
Michael J. Mason
Manager of Quality Assurance
Bechtel SAIC Company, LLC

July 15, 2003
Rockville, Maryland

Corrective Action Report
BSC-02-C-001
(Continued)

- Corrective Action Report (CAR) closure dependent on closer of Deficiency Reports (DRs)
  - DR BSC-01-D-129: Training to procedures not performed within time requirements
    - This DR was closed February 12, 2003
  - DR BSC(B)-02-D-159: VoEE of personnel not located
    - Where required, the VoEE has been documented for all BSC and subcontractor personnel
    - This DR was closed May 14, 2003
  - DR BSC(O)-02-D-176: VoEEs do not meet Position Descriptions, no evidence of Position Descriptions for employees, VoEEs not approved by Functional Manager, and work performed prior to VoEE approval
    - DR is still open with closure scheduled for September 30, 2003

U.S. Department of Energy
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YUCCA MOUNTAIN PROJECT

Design Oversight

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting

Presented by:
Michael J. Mason
Manager of Quality Assurance
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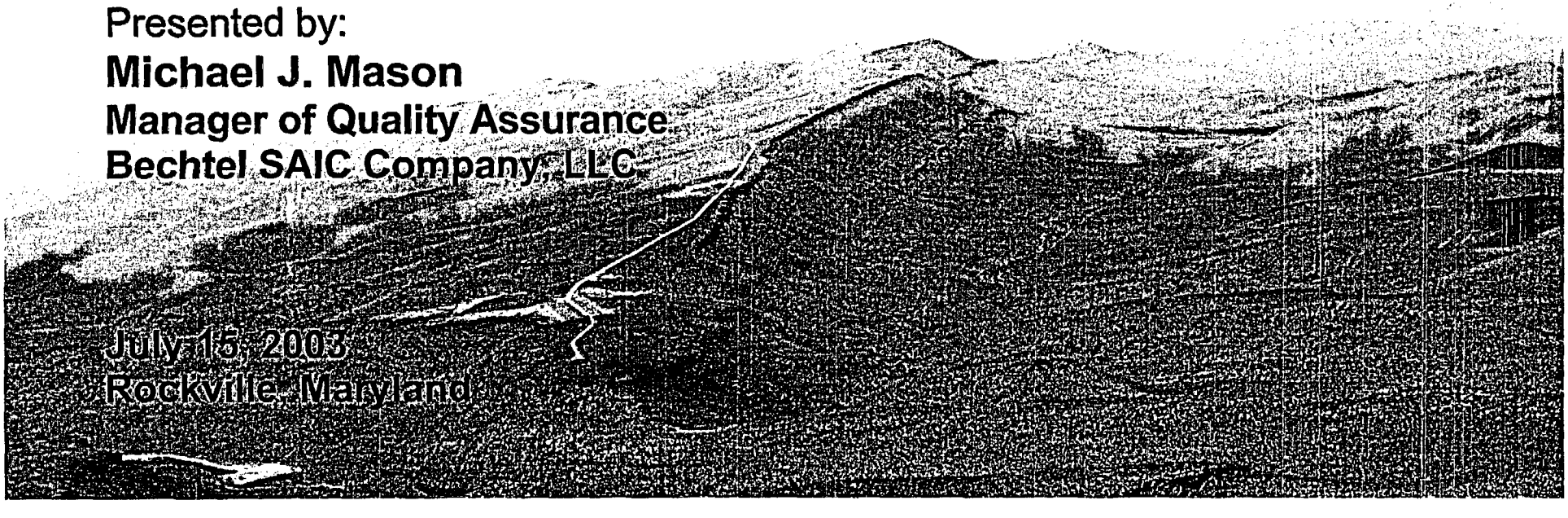

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Design Oversight

Quality Engineering's Reviews Controlled by Checklists

QE Checklists

Engineering Products

- AP-3.11Q, Technical Reports
- AP-3.12Q, Design Calculations and Analyses
- AP-3.15Q, Managing Technical Product Inputs
- AP-3.19Q, Specifications
- AP-3.24Q, Drawings
- AP-3.25Q, Design Criteria
- LP-3.26Q, System Description Documents
- LP-4.5Q, Purchase Requisitions and Procurement Documents
- AP-15.3Q, Control of Technical Product Errors

Science Products

- AP-2.27Q, Planning for Science Activities
- AP-3.11Q, Technical Reports
- AP-15.3Q, Control of Technical Product Errors
- AP-SIII.2Q, Qualification of Unqualified Data
- AP-SIII.7Q, Scientific Investigation Laboratory and Field Testing
- AP-SIII.9Q, Scientific Analyses
- AP-SIII.10Q, Models

General Checklist Content Areas

- General Subjects
- Revision/Change Process
- Document Contents
- Software Use & Control
- Document Input Reference System
- Approval Process

Design Oversight
Quality Engineering Capability Matrix

Engineering
C=Civil
E&IC=Electrical/ Instrumentation & Control
G=General Engineering
M=Mechanical
N=Nuclear

Infrastructure
DC=Document Control
L=Licensing
RM=Records Mgmt.
P=Procurement
S=Software
T=Training

Current Assignment	Capability Matrix											
Name	Engineering					Science	Infrastructure					
Science	C	E&IC	G	M	N		DC	L	RM	P	S	T
Quality Engineer			X									
Quality Engineer						X						
Quality Engineer			X									
Quality Engineer						X						
Quality Engineer						X						
Quality Engineer	X		X									
Quality Engineer												
Quality Engineer				X	X							
Quality Engineer						X						
Engineering												
Quality Engineer				X								
Quality Engineer		X										
Quality Engineer			X									
Quality Engineer				X								
Quality Engineer				X	X							
New Hire		X										
New Hire			X									
New Hire			X									
Infrastructure												
Quality Engineer							X	X	X			X
Quality Engineer				X	X						X	
Quality Engineer							X		X			X
Quality Engineer							X		X			X
Quality Engineer										X		
Quality Engineer							X	X	X			X
Quality Engineer							X	X	X			X
Quality Engineer										X		
Transfer							X		X			

Design Oversight

- Audits and Surveillances
  - Audits
    - Design audit scheduled for August, 2003
  - Surveillances
    - 10 conducted on design activities through 3rd quarter FY2003
    - 10 scheduled for design activities during 4th quarter FY2003

Design Oversight
Summary

- Design is a key program activity that is increasing in importance
  - BSC QA has the skill mix and numbers of Quality Engineers to ensure adequate design oversight based on design schedules
- Science oversight will continue

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YUCCA MOUNTAIN PROJECT

Corrective Action Program

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting

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Director, Office of Quality Assurance
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

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Corrective Action Program

(Continued)

- Quality Assurance involvement in the Corrective Action Program (CAP)
  - Quality Assurance still issues Condition Reports, no loss of independence
  - Quality Assurance Representative:
    - Reviews each Condition Report before issuance
      - » Determines significance
      - » Determines if Stop Work Order needed
    - Approves corrective action plan
    - Verifies corrective actions complete

Corrective Action Program

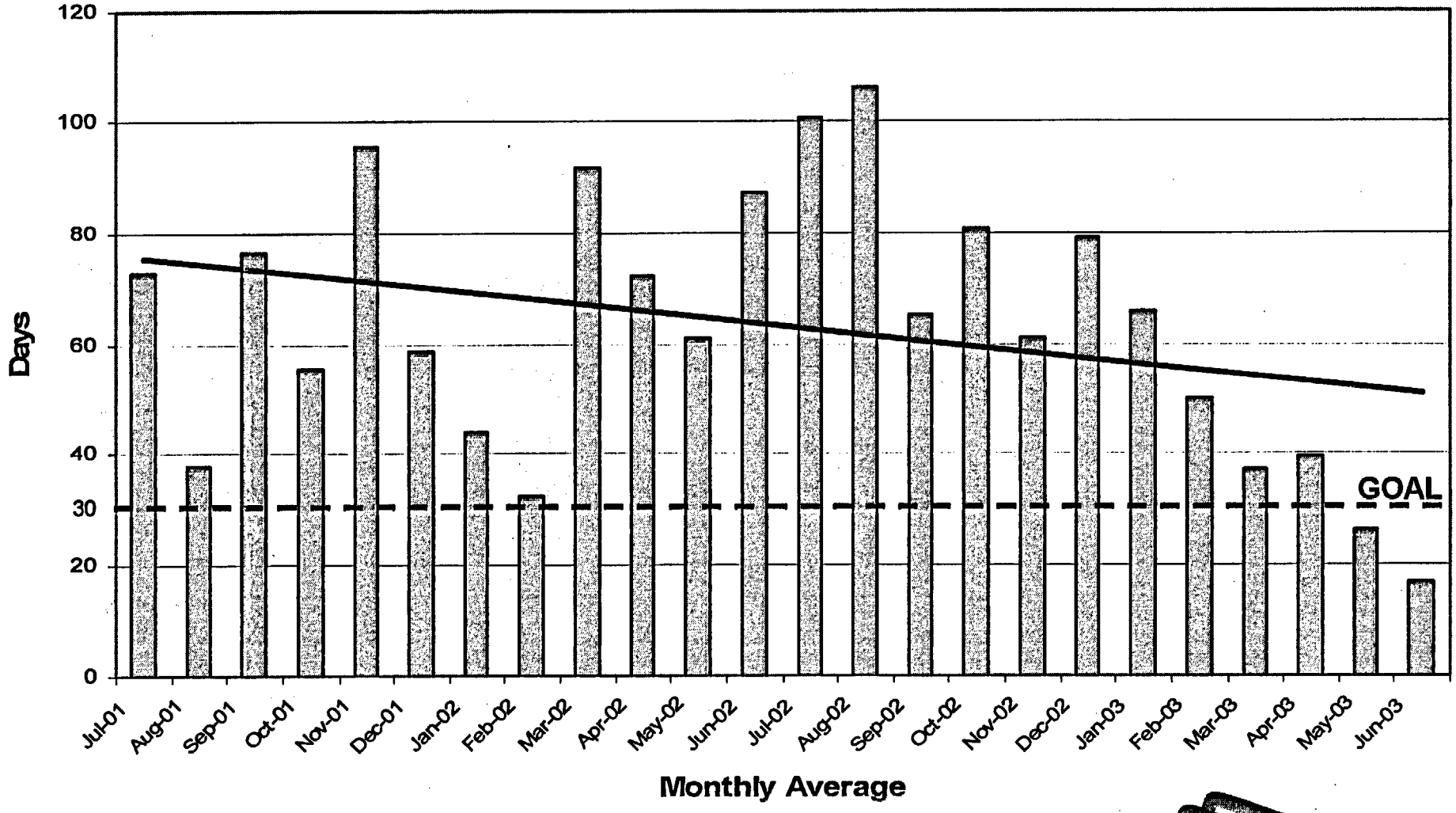
(Continued)

- Improvements (September 30, 2003)
  - Benchmarked program against:
    - Institute of Nuclear Power Operations (INPO's), *Principles for Effective Self-assessment and Corrective Action Programs*
    - Nuclear Energy Institute (NEI), *Corrective Action Program Benchmarking Report* (NEI, LP-0002)
  - Communications plan
  - Training plan

Corrective Action Program

(Continued)

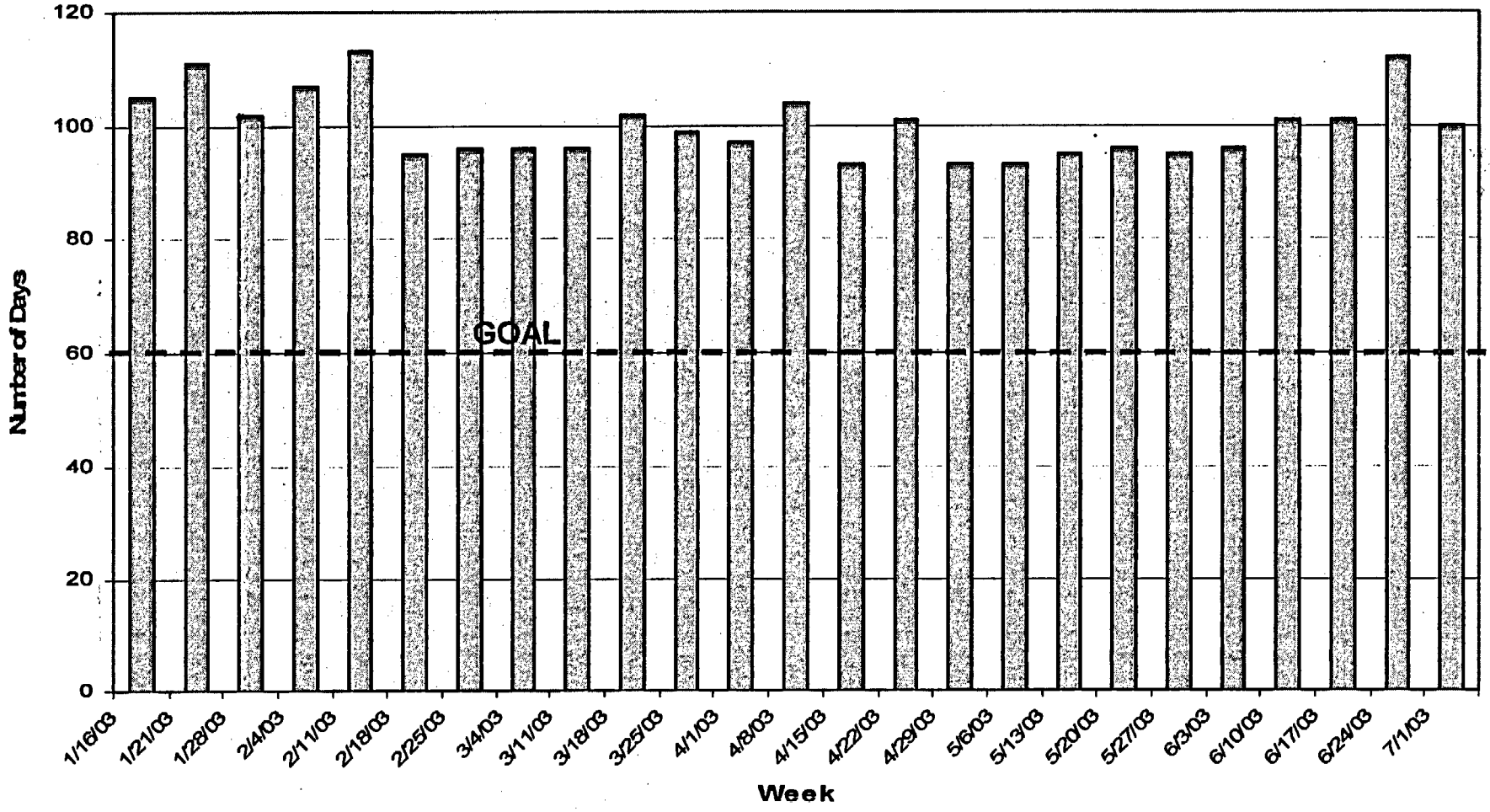
Days to Obtain Acceptable DR Response (as of July 3, 2003)



Corrective Action Program

(Continued)

Average Days Open - DRs (as of July 3, 2003)



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Trending Program Improvements

Presented to:
DOE/NRC Quarterly Quality Assurance Meeting

Presented by:
Kerry Grooms
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

July 15, 2003
Rockville, Maryland

Trending Program Improvements
(Continued)

- Actions Taken
  - Cause codes changed
    - DOE Occurrence Reporting and Processing System (ORPS) cause codes being used
  - Condition Reports from May 2002 to May 2003 recoded
  - New Condition Reports are being coded
  - Open Condition/Issue Identification and Reporting/Resolution System (CIRS) items recoded
  - All CIRS items being recoded
  - New CIRS items are being coded
- Common coding increases population for trending

Trending Program Improvements

(Continued)

Major Contributor	Major Contributing Factor	Root Cause
Management problem (35%)	Management methods LTA* (62%)	Management policy, guidance, expectations not well defined, understood or enforced (73%)
Human performance LTA*(34%)	Skill based error (51%)	Check of work LTA* (48%)
Communications LTA* (21%)	Written communications content LTA* (83%)	Ambiguous instructions or requirements (39%)

*LTA = less than adequate

Trending Program Improvements
(Continued)

- Changing reporting frequency to quarterly
- Transferred trend reporting to BSC
  - BSC collects and analyzes data
  - BSC identifies corrective actions
  - DOE still responsible for issuing quarterly report
- Continue to improve

U.S. Department of Energy
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Quality Assurance Requirements and Description Document Status

Presented to:
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Director, Office of Quality Assurance
Office of Civilian Radioactive Waste Management
U. S. Department of Energy

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Rockville, MD

Quality Assurance Requirements and Description Document Status

(Continued)

- QARD Revision 14 approach
  - 24 integrated teams of DOE Office of Quality Assurance (OQA), DOE Line, and contractor personnel
    - Teams to develop positions on aspects of 10 CFR 63 and the YMRP to assure compliance
  - OQA developed crosswalk checklists of YMRP and Part 63 requirements to assure coverage in the QARD

Quality Assurance Requirements and Description Document Status

(Continued)

- Examples of compliance checklists
  - 10 CFR 63 Subpart G, Quality Assurance
  - NUREG-1804, *Yucca Mountain Review Plan*, final draft, Section 2.5.1, Quality Assurance Program

10 CFR 63-Subpart-G[a] - QARD[b] Compliance Matrix

a– Revised as of January 1, 2003
b- *Quality Assurance Requirements and Description*, Draft Revision 14

Example

Subpart G - Quality Assurance

[SOURCE DOCUMENT]

10 CFR 63 SECTION	10 CFR 63 REQUIREMENTS	QARD SECTION
.141	**Scope**	
	As used in this part, quality assurance comprises all those planned and systematic actions necessary to provide adequate confidence that the geologic repository and its structures, systems, and components will perform satisfactorily in service.	
	Quality assurance includes quality control, which comprises quality assurance actions related to the physical characteristics of a material, structure, component, or system to predetermined requirements.	
.142	**Quality Assurance Criteria**	
(a)	***Introduction and Applicability***	
	DOE is required by 63.21(c)(20) to include in its safety analysis report a description of the quality assurance program to be applied to all structures, systems, and components important to safety, to design and characterization of barriers important to waste isolation, and to related activities.	
	These activities include: site characterization; acquisition, control, and analyses of samples and data; tests and experiments; scientific studies, facility and equipment design and construction; facility operation; performance confirmation; permanent closure; and decontamination and dismantling of surface facilities.	
	The description must indicate how the applicable quality assurance requirements will be satisfied.	
	DOE shall include information pertaining to the managerial and administrative controls to be used to ensure safe operation in its safety analysis report.	

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YUCCA MOUNTAIN PROJECT

Integration and Coordination of Audits

Presented to:
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Presented by:
Kerry Grooms
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

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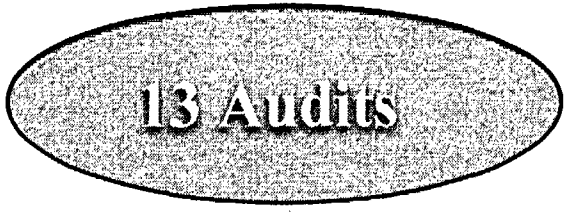
Integration and Coordination of Audits

(Continued)



- **After Integration**
  - 13 audits scheduled for the remainder of FY-2003
    - 10 are joint audits
    - 3 are OQA only audits
      - » Office of Repository Development (scope)
      - » Software (scheduling)
      - » Annual audit of OQA (scope)

Integration and Coordination of Audits

(Continued)

- Data, Software and Modeling audits coordinated by
  - Sample selection overlap
  - Maintaining team dynamics with consistent team membership
  - Conducting audits in sequence