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D&D
IE-07

70-36

January 14, 1997

Gary L. Shear, Chief
Fuel Cycle Branch
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Shear:

As promised during our November 16, 1996 meeting, enclosed are copies of the materials presented during this meeting.

Very truly yours,

COMBUSTION ENGINEERING, INC.

Robert W. Sharkey
Director, Regulatory Affairs

RA96/537

28010

ABB CENO Fuel Operations

Combustion Engineering, Inc.
3300 State Road P
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Hematite, MO 63047
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JAN 17 1997

USNRC
Combustion Engineering meeting and plant tour

Hematite, MO

November 16, 1996

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CE- NRC MTG
HEMATITE, MO

ATTENDEE 12/16/96

Gil Page	DIRECTOR ceramic mfg	ABB	
Don Rohde	Project Mgr. Tech. Training	ABB	
MICHAEL F. WEBER	CHIEF, FCLB	U.S. NRC	301-415-7190
WM L ANDERSON	DEP. RGA ADMIN	NRC/RIII	630-829-9550
Gary L. Shear	Chief, Fuel Cycle Branch, NRC/RIII		630-829-9876
Kevin Hayes	Indust. Sfty. Eng. /Emerg Dir.		314-937-4691
BOB TOLAN	Director Assembly		937-4691 ABB
RON LAND	DIRECTOR, INFRASTRUCTURE		314-937-4691
ROBERT S FREEMAN	Nuclear Crit Specialist		860-285-3661
HAROLD E. ESKRIDGE	SR. CONSULTANT		937-4691 x319
MICHAEL R. EASTBURN	Nuclear Crit. Specialist		937-4691 x322
Earl Saito	Health Physicist		x461
Bruce J Kaiser	VP Fuel Operations		x311
Bill Sharkey	Director Regulatory Affairs		x399
ROB KEHOE	SENIOR ENGINEER, APS		602-393-5678
George Dooley	Consultant, DCS (B&E)		860-651-0218
DAVID STOKES	DIRECTOR, QUALITY SYSTEMS		296-5640 x372
KEVIN FUNKE	HP SUPERVISOR		(314)937 4691 x470

USNRC
Combustion Engineering meeting
and plant tour

Hematite, MO
November 16, 1996

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AGENDA

10:00 NRC arrive Hematite, introductions followed by plant tour
12:00 Lunch
13:00 Public meeting
1. CE presentation on status of facility and program improvements

a. Criticality safety	SHARKEY/FREEMAN
b. Clean up program	LAND
c. Facility/process modifications	PAGE/TOLAN
d. Schedule of significant activities in 1997	SHARKEY
e. Licensing activities	SHARKEY
g. Self assessment	SHARKEY
h. Results of radiological monitoring	SAITO
i. Fire safety program	HAYES
j. Other programmatic improvements	ROHDE
k. Closing	KAISER

2. NRC comments regarding recent inspection activities and or other topics of interest

1500 Adjourn

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CRITICALITY SAFETY PROGRAM UPDATE

GOAL

Enhance the programmatic elements of the Hematite Criticality Safety Program and reexamine and update the criticality safety bases for plant processes

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Criticality Safety

- Three qualified criticality specialists
- Make the system simple
- CSPU (Gantt Chart)

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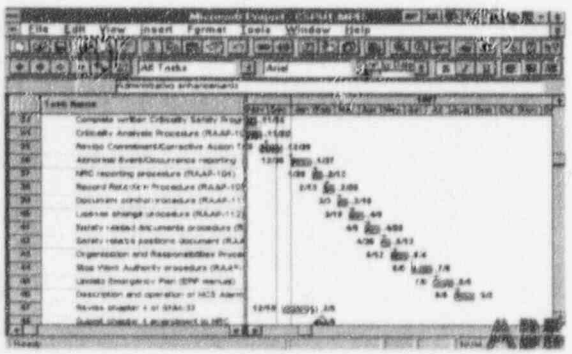
CSPU Schedule



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Clean up program

- Outside storage
- Labeling/postings
- Organization of storage areas
- NH_3 system actions completed
- 40,000 ft^3 disposed or released from the site this yr - last shipment for 1996 sent last week
- Goals for 1996 accomplished

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ANHYDROUS AMMONIA

- PHA complete
- All recommendations complete
- EPA Risk Management Plan Evaluation Required (waiting standard industry guidance)

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Facility/process modifications

- Plant Improvements 1996
  - powder preparation
  - oxide
  - clean rooms
  - erbia lab
  - incinerator
  - plant environment (AC, noise)
  - Filtrate, spent KOH, waste water boildown

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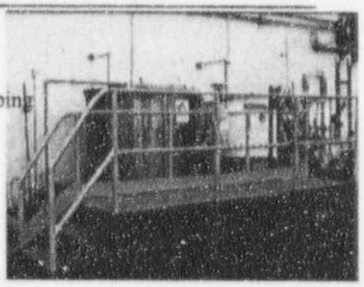
FILTRATE BOILDOWN

- boildown areas separated
- dedicated plumbing



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Waste water and spent KOH boildown

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Facility/Process Modifications

- Plant improvements 1997
  - R-53 presses
  - HF Scrubbers
  - Recycle/Recovery
  - R2/R3 conversion reactors
  - Grinder to PAM with IDMD
  - Gadolinium room
  - BWR assembly

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R-53 pellet presses

- Replace pellet slugging presses with R-53 presses

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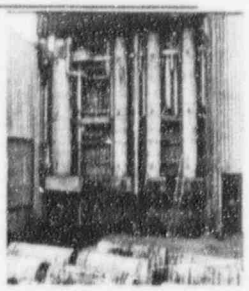
HF Scrubbers

- replace dry scrubbers with wet scrubbers and recover hydrofluoric acid



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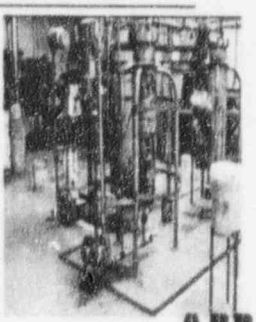
Recycle/Recovery

- Continue removal of obsolete plumbing
- Improve current piping



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Conversion Reactor Replacement

- 1996 replaced R2/3
- Developed leaks
- Reinstalled modified old reactors
- 1997 install new R2/3 reactors

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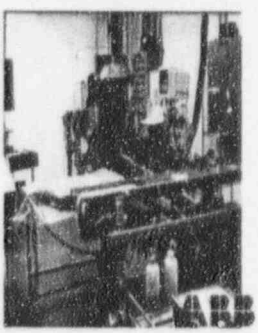
Grinder to PAM with IDMD

- Automated pellet grinding, measuring and alignment
- Significant reduction in operator handling of pellets



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Schedule of significant activities in 1997

- Annual Physical Inventory July
- Plant Shut down July
- State System of Accounting and Control course with LANL and IAEA May

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Licensing Activities

- Chapter 4 (NCS) license amendment 1Q97
- FNMCP 1Q97
- Emergency Plan 2Q97
- Security Plan 1Q97
- QA Program for Shipping Packages for Radioactive material 1Q97
- Inventory schedule amendment 2Q97
- Particle size amendment 2Q97
- Organization amendment 2Q97
- Well#4, retention ponds, 20.304 burial

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Self Assessment

- Program is being formalized RAAP- 110
- License Program
  - Annual Radiological and Criticality Safety
  - Quarterly multi disciplinary team inspection
    - » Radiological, waste, industrial safety, criticality safety
  - Monthly MC&A audits
  - Biennial MC&A assessment
  - Annual transportation audit
- Additional audits/inspections/assessments
  - Security, statistics, shipping

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Results of Radiological Monitoring

- Assessed by Lapel Air Sampling which is conservative
- Highest dose year to date - 23mSv
- Projected highest dose for 1996 - 25mSv
- Number of individuals over 20mSv - 8
- Conservative by factor of two due to 1 micron particle size assumption

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Fire safety program

- Limit on combustible loading in non sprinkled plant areas
- Pre-fire plan jointly developed with local fire department
- Reviewed as part of change management process
- Fire Safety is a key consideration during ISAs
- Fire extinguisher training and routine inspection of extinguishers
- Reviewed daily by HP and covered in quarterly inspections
- Extensive alarm system using smoke and heat detectors
- 200,000g water supply
- 1,500 gpm booster pump

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Other Programmatic Improvements

- Training

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Staffing changes in 1996

- Gil Page to Ceramic Operations
- Bob Tolan hired to run Assembly Operations
- Hired Oxide Plant Engineer
- Hired Senior Manufacturing Engineer
- Added Training/Emergency Preparedness person to Regulatory Affairs
- Hired Criticality Safety Engineer
- Created new training position and hired highly qualified individual

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MC&A Team Conclusion

- Actions 50% Complete
- Team Participation Is Excellent
- Team Owner Is Strong (Dave Harris)
- Team and Improvements Are Ongoing

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How Does it Work for the Criticality Team?

- Team Formed 10/30/96
- Held 2 Meetings
  - Discussed "Self Audits" "Top 10 Lists"
  - Root Cause of Problems - No Storage Locations
  - Training Needs to Be Constantly Reinforced
  - Created 13 Action Items
  - Team Walk Down of Red Room
- Format Change to Get Faster & More "Hands On"

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Criticality Team Conclusions

- Three Sources of Problems
  - Physical Plant
    - Review Criticality Signs and Exclusion Lines
    - House Keeping
  - Operating Strategy
    - Increased Red Room Operation
    - Additional Storage Rings
  - Training - New Training Program

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New Approach to Criticality Training

- Problem Identification - Daily Walk Down of the Entire Plant (sometimes with Bryce Kaiser or Mike Eastburn)
  - Collect Criticality Concerns & Operator Suggestions
  - Maintain Action Item List
- Training - Short Burst Training
  - 15 Min. For Each Shift Twice a Week (Mon. & Fri.)
  - 15 Min. Especially for Red Room Each Wednesday
  - Review Current Criticality Concerns (Feed Back Loop)

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Red Room Procedures

- Red Room Procedures
  - Currently Being Rewritten by Engineering
  - Review Procedure Style and Guidelines
  - Review Operability - Does It Work?
  - Review Labeling in Plant
  - Operator Training on New Procedures

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Where is the TTP Headed?

- Complete Criticality Work ~1/97
- Complete Red Room Review ~2/97
- Develop Lesson Plans for Critical Procedures
- TBD - Maintain Flexibility to Respond.

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j. Other Programmatic Improvements

Technical Training Project

Don Rohde
ABB Combustion Engineering
Hematite , Missouri
December 16, 1996

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What's my Background?

- BSME & MBA
- 2 years Bechtel Power - Plant Construction
- 4 years with ABB at Windsor - Sales, Strategic Planning
- 9 years with ABB at Hematite - Major Capital Projects , Production Scheduling, Team Building Training
- Willing to try new & different approaches to training!

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What is the Technical Training Project?

- TTP Is a Program of Applied Training and Improvement With Emphasis on Operator Participation.
  - In the Plant "Hands on" Training
  - Operator Teams Identify Problems & Provide Solutions
  - Feedback Training to Engineering.
- Driver: NRC Findings Suggesting an Enhancement of the Training Program.

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What is are the goals of the TTP?

- Goals: (in order)
  - Reduce MC&A Discrepancies
  - Assure Compliance With Criticality Procedures
  - Improve Red Room Procedures
  - T.B.D.
- Hidden Agenda: Develop Operator Ownership in the Plants Regulatory & OS System.

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What is the TTP Team approach?

- Operator Team Reviews the Existing Conditions
- Operator Team Identifies Problems
- Operator Team Resolves Problems
- Make Changes to Procedures and Physical Plant
- Train on Changes
- Move On

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How has TTP worked so far?

- MC&A Team Formed 10/16/96
- Held 7 Meetings So Far
- Reviewed 6 Months of Internal Audits
- Meet With NRC MC&A Audit Team
- Generated 32 Action Items

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BWR PROJECT

NRC Review

December 16, 1996

Project Definition

- Develop Hematite and Addison Road capabilities to manufacture BWR fuel pellets, rods and bundles

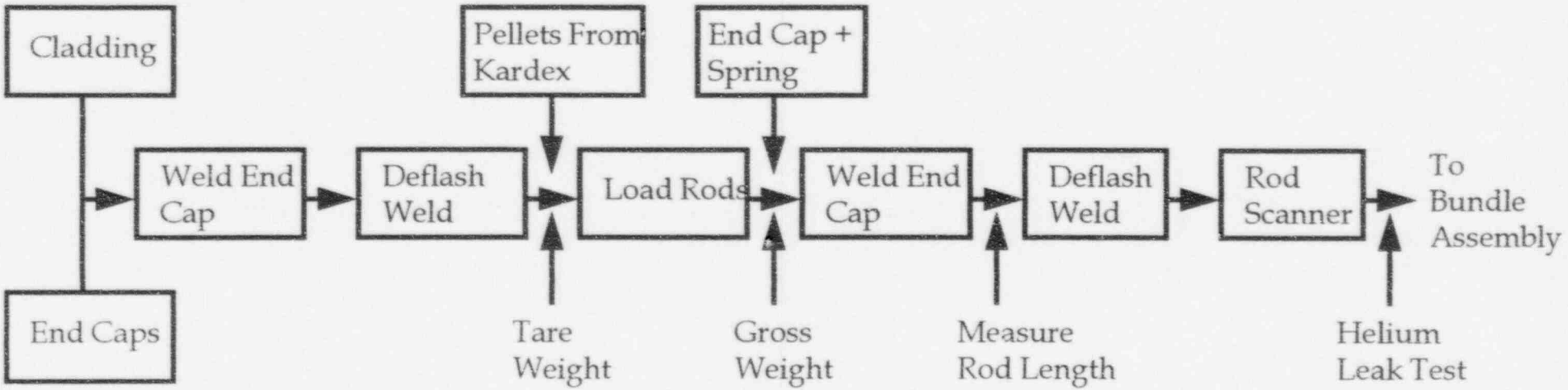
Project Scope

- BWR Shipping Container Procurement
- Pellet Fabrication
- Bundle Assembly
- Mag Force Weld Qualification
- Rod Fabrication
- Scanner Qualification
- Addison Rod Components

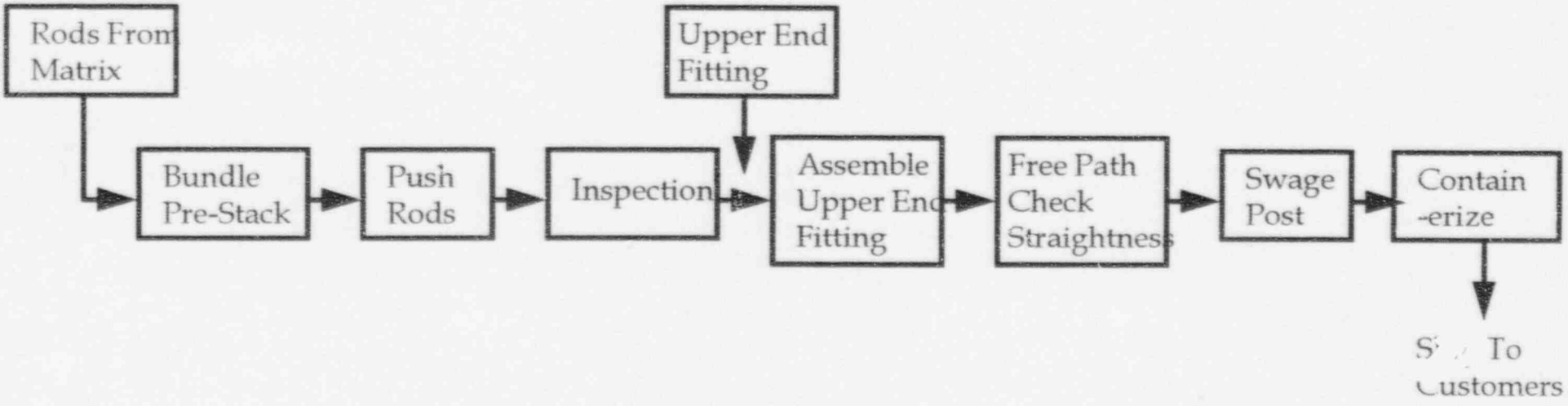
Project Summary

- Make fuel type transparent to operation
- Procure, refurbish and license shipping containers
- Modify existing facilities and equipment where necessary
- Qualify new and existing processes for BWR manufacturing
- Implement LFA program
- Manufacture BWR reloads domestically

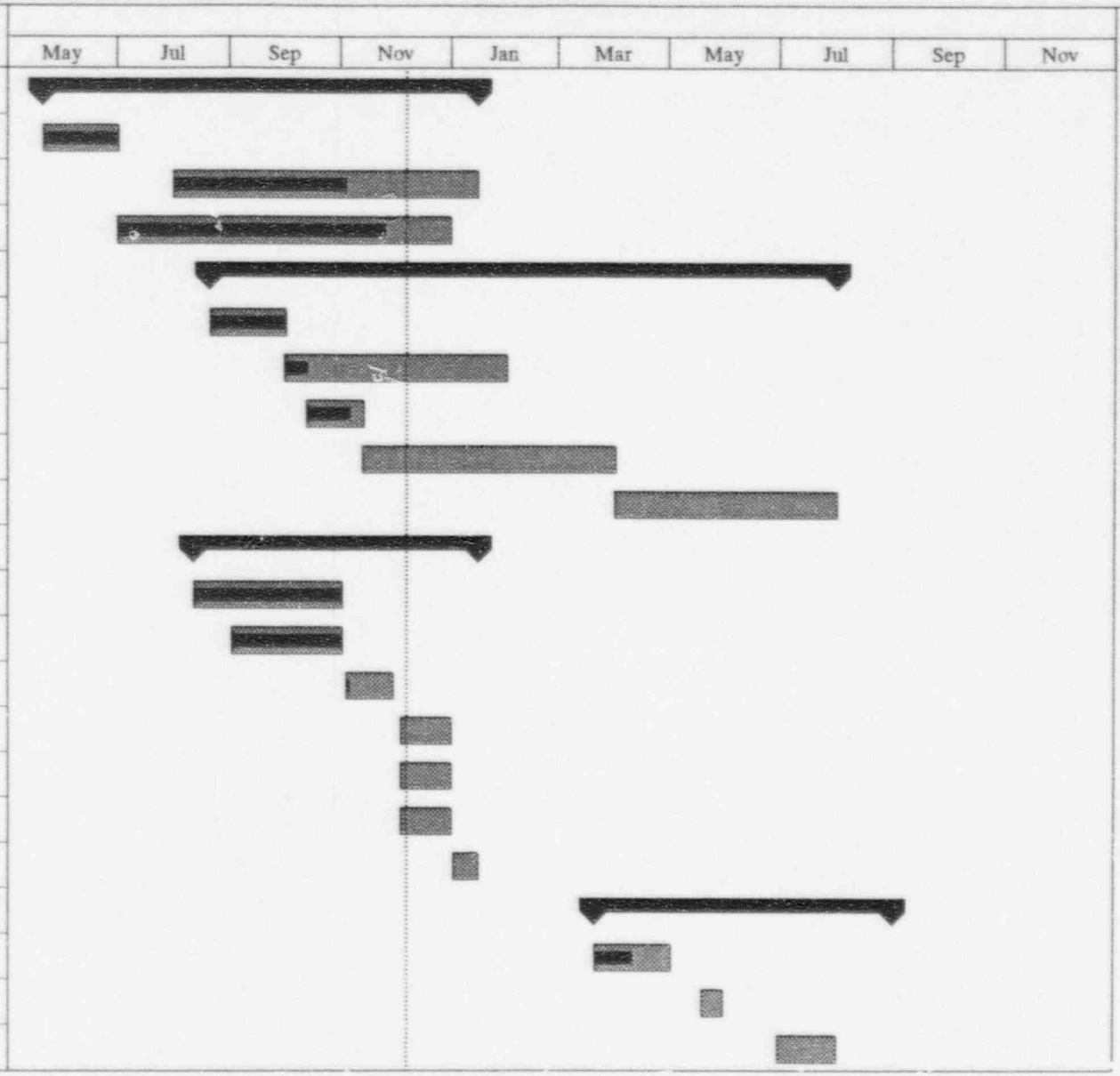
Rod Assembly



Bundle Assembly



ID	Task Name
1	**Shipping Containers**
2	Purchase Containers
3	Refurbish Containers
4	License Containers
5	**Pellet Production**
6	Identify Potential Processes
7	Purchase Necessary Equipment
8	Test Alternate Methods
9	Install Necessary Equipment
10	Qualify Selected Process
11	**Mag Force Weld Qualification (LFA)**
12	Purchase Materials for Weld Samples
13	Modify Tooling
14	Weld Samples
15	Corrosion Test Samples
16	Perform Metalographic Exams
17	Perform Mechanical Tests
18	Prepare Reports
19	**Mag Force Weld Qualification (All welders**
20	Modify Tooling
21	Weld Samples
22	Corrosion Test Samples



Project:
Date: 12/7/96

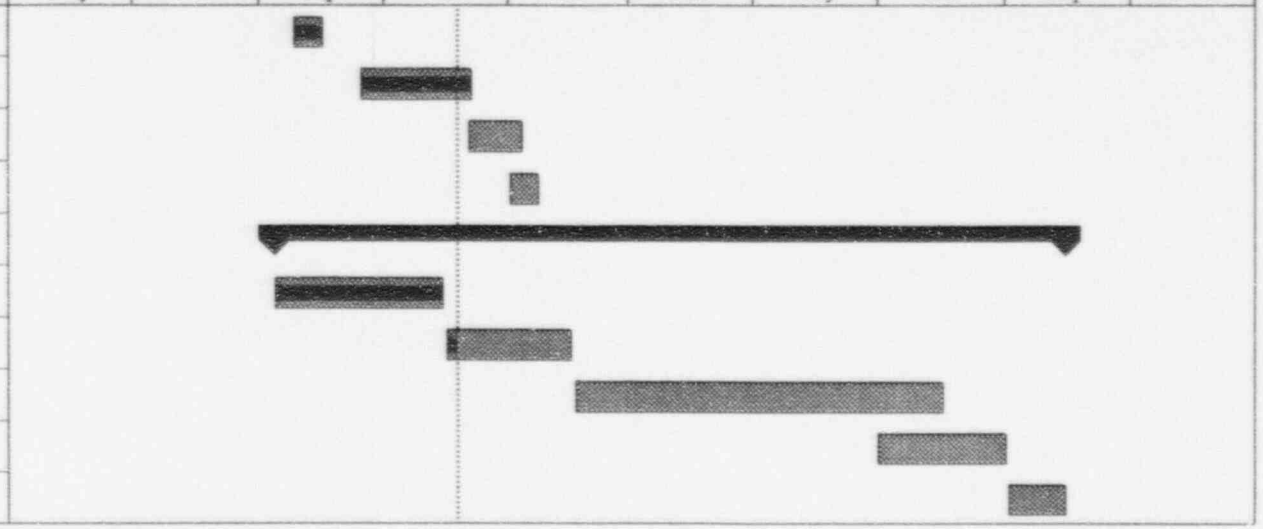
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

ID	Task Name
23	Perform Metalographic Exams
24	Perform Mechanical Tests
25	Prepare Reports
26	**Bundle Assembly**
27	Design Bundle Assembly Fixture
28	Fabricate Fixture
29	Qualify Process with new fixture
30	Design/fabricate Bundle Inspection Fixture
31	Modify Procedures for new process
32	**Rod Fabrication**
33	Identify Tooling needed for LFA
34	Fabricate Tooling for LFA
35	Qualify Processes for LFA Fabrication
36	Identify Tooling needed for Reload
37	Fabricate Tooling for reload
38	Qualify Processes for Reload Fabrication
39	**Spacer Capture Head Welding**
40	Review Atom's Process
41	Purchase Equipment
42	Fabricate Fixtures
43	Qualify Process
44	**Scanner Qualification**

Project:
Date: 12/7/96

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

ID	Task Name
45	Identify Material Needs
46	Purchase Needed Materials
47	Fabricate Test Rods
48	Run Qualification
49	**Addison Road Components**
50	Request Casting Quotes
51	Select Casting Vendor
52	Fabricate Tooling
53	Develop Machining
54	Qualify Machining



Project:
Date: 12/7/96

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

Benefits

- Domestic BWR customers receive fuel from domestic ABB supplier
- Reduced import duties and shipping costs
- Increased Hematite volume

GAD PROJECT

NRC Review

December 16, 1996

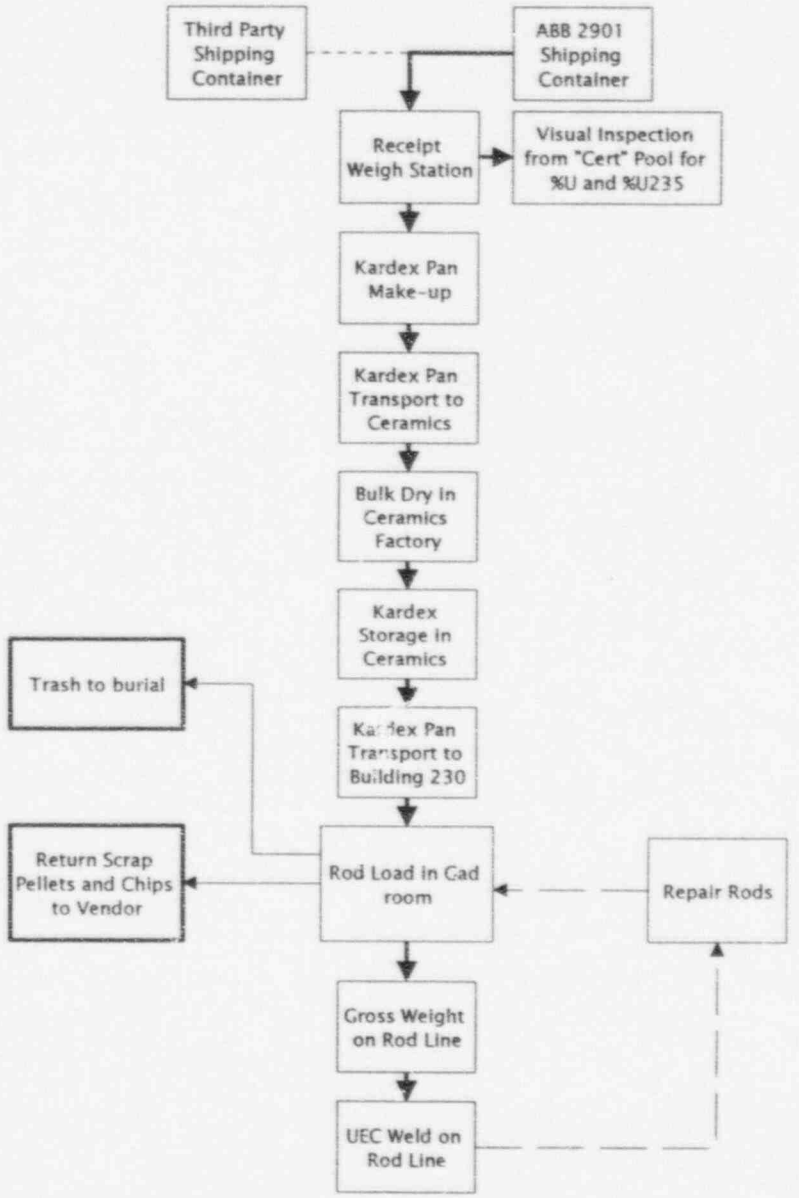
Objective

- To Provide Gadolinium-Uranium Fuel Rod Manufacturing Capability at ABB CENO in Hematite, Missouri.
- To implement controls that prevent cross contamination of the Uranium and Erbium-Uranium Fuel manufacturing facilities.
- To provide capability to do final assembly of all rod types at ABB CENO at Hematite.

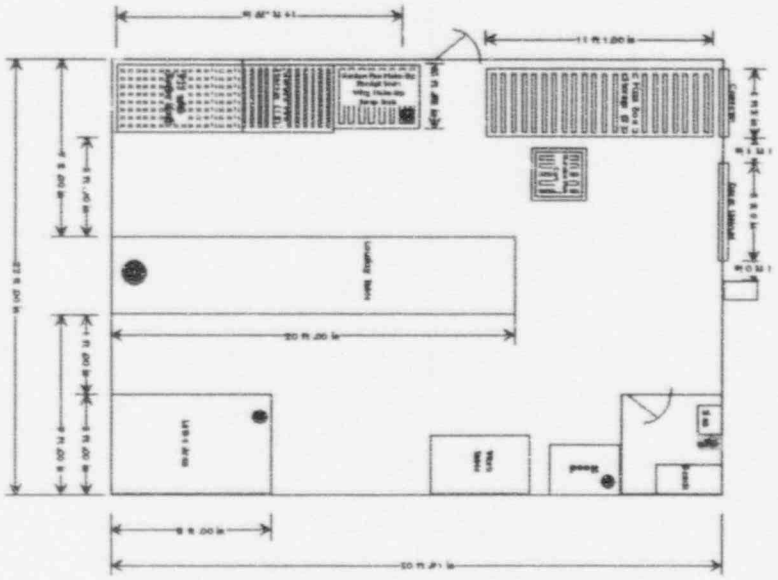
Project Scope

- Gad Pellet Shipping Container Procurement
- Build Gad Processing Facility
- Pellet Receiving Qualification
- Bulk Drying Qualification
- Rod Loading Development & Qualification
- Scanner Qualification

Gadolinium Process Flow Diagram



Gadolinium Room Layout

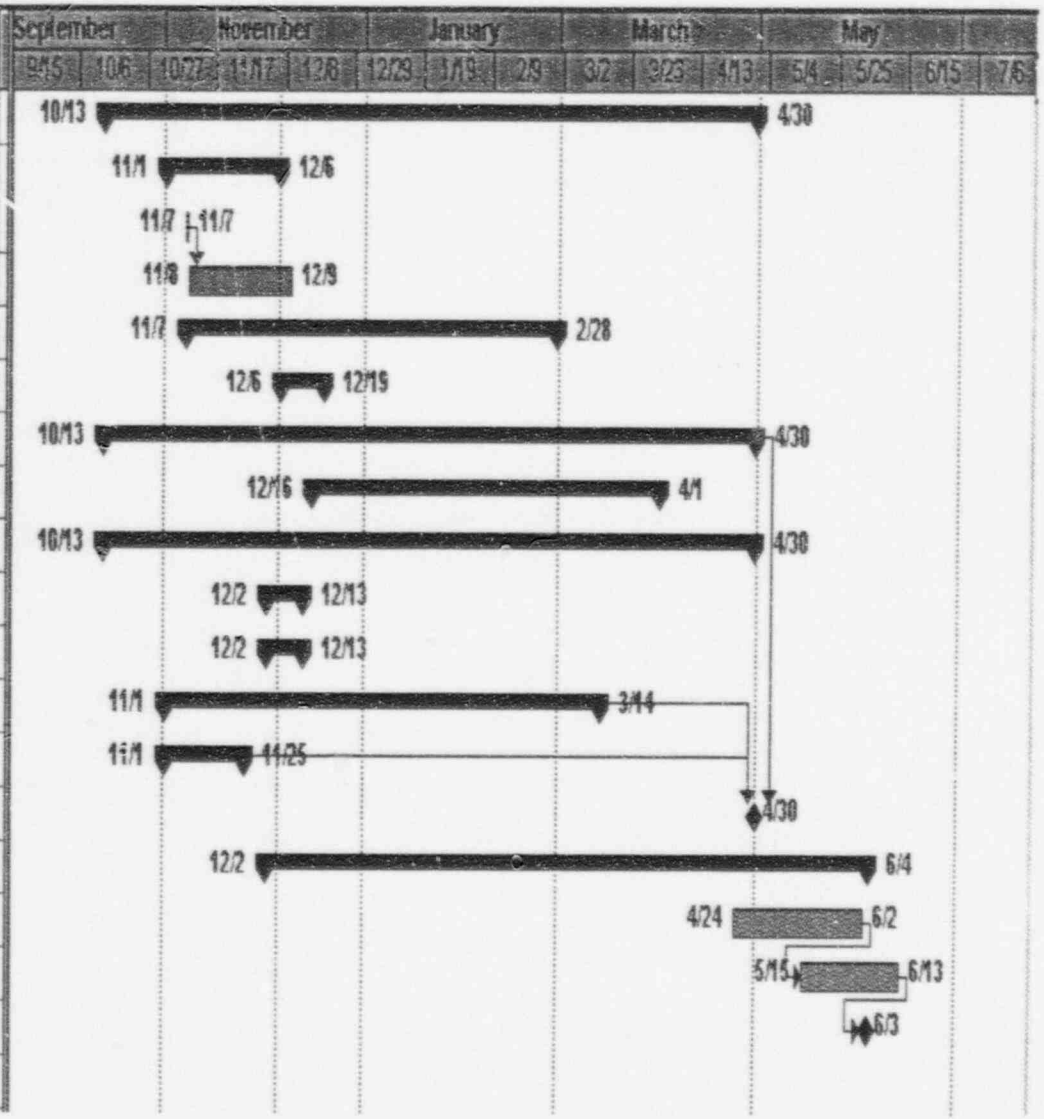


Qualification Summary

- Bulk Drying / Kardex storage of Gadolinium-Uranium Fuel Pellets - Qualification Plan being modified.
- Rod Scanning of Gadolinium-Uranium Fuel Rods - Manufacturing Spec and Qualification Plan being modified.
- Demonstration of Rod Line to assure no damage to Fuel using new equipment.

Gad Rod Project

	Task Name	% Complete
1	Gadolinium Rod Project	8%
2	ABB Green Sheet Submited	3%
8	ABB Issue PO for Gad Room Design	100%
9	Building Permit	0%
10	Build Gad Room	2%
39	Change Specs	0%
42	Qualifications of the Gad Process	24%
43	Bulk Dry/ Kardex Storage	0%
55	Rod Scanner	38%
63	Rod Line	0%
66	Procedures	0%
69	Reviews	1%
75	Requests	4%
83	Ready to Process Rods	0%
84	Schedule for Korean Contract	0%
97	Process Rods for Contract (Schedule)	0%
98	Bundle Assembly for Contract (schedule	0%
99	Scheduled Ship Date	0%
100		



Schedule

Task	Completion Date
Isolation Room Construction	February 24,1997
Pellet Fabrication	March 20, 1997
Bulk Dry Pellets	May 6, 1997
Rod Loading	May 20, 1997
Bundle Assembly	June 4, 1997