Docket File
TSC3
50-454/456

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 7, 1997

LICENSEE: Commonwealth Edison Company (ComEd)

FACILITIES: Byron Station, Unit 1 and Braidwood Station, Unit 1

SUMMARY: SUMMARY OF STEAM GENERATOR REPLACEMENT MEETING - JANUARY 22, 1997

On January 22, 1997, the staff met with ComEd to discuss its program for replacement of the steam generators (SG) at Byron 1 and Braidwood 1. This meeting was the fourth in the series initiated by ComEd to keep the staff informed of the status of its SG replacement program. A list of attendees is provided as Enclosure 1. A copy of the licensee's presentation is included as Enclosure 2.

The objectives of the meeting were to: (1) update the schedules for the Byron SG replacement; (2) provide the conclusions and results of their licensing evaluation; (3) provide an update on open items related to the containment opening; and (4) discuss the plans for the removal of the old SGs and installation of the new ones.

With regard to the schedule, ComEd informed the staff that construction of the SGs is progressing ahead of schedule to the extent that the Byron SG replacement outage will begin on November 7, 1997. The plant will not take a full outage prior to November, but will have a short outage in the summer to remove grease from selected tendons (pending staff approval) and complete a few critical pre-outage activities. The Braidwood SG replacement outage is still scheduled to begin in September 1998. The licensee has identified 10 issues that require NRC review. The last one will be submitted for staff review by May 2, 1997. Three have already been submitted and are under review.

Several followup items from the previous SG replacement meeting (August 21, 1996) were addressed. Work is continuing using the 3-D containment model for predicting containment behavior for the various containment configurations to be encountered during the project (e.g., detensioning tendons, cutting the hole in the side of containment, etc.). The work is expected to be completed and available for a followup audit by the staff in May 1997. The initial audit and discussions were held on November 18, 1996. The licensee clarified its plan for defueling during the outage by stating that all fuel would be removed from the reactor vessel and placed into the spent fuel pool before removal of containment concrete is started.

DF01

100048

NRC FILE CENTER COPY

9702110008 970207
PDR ADOCK 05000454
P PDR

Planning for removal of the old SGs, and receiving, handling and installing of the new SGs appear to have considered the major areas of interest to the staff. The staff informed the licensee that inspectors will be monitoring the SG replacement activities, and auditing selected 10 CFR 50.59 evaluations.

Original signed by:

George F. Dick, Jr., Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-456

Enclosures: 1. List of Attendees
2. Licensee's Presentation

cc w/encls: see next page

DISTRIBUTION w/encl 1 & 2:
Docket
PUBLIC
PD3-2 r/f
OGC 015-B18
ACRS T2-E26
G. Dick (GFD)
R. Lanksbury (RDL)

E-Mail w/encl 1:
F. Miraglia/A. Thadani
R. Zimmerman
J. Roe (JWR)
R. Capra (RAC1)
B. McCabe (BCM)
C. Moore (ACM)
D. Ross (e-mail to SAM)
E. McKenna (EMM)
Lee Banic (MJB)
Robert Rothman (RLR)
John Ma (JSM1)
Chu-yu Liang (CYL)
Jai Rajan (JRR)
Melvin Holmberg (MSH)
Mohammed Shuaibi (MAS4)
Ramin Assa (RRA)
M. David Lynch (MDL)

G:\CMNTJR\BRAID-BY\01229730.SUM

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

OFC	PM:PD3-2	E	LA:PD3-2	C	D:PD3-2	E
NAME	GDICK		CMOORE		RCAPRA	
DATE	2/06/97		2/5/97		2/7/97	

OFFICIAL RECORD COPY

cc:

Ms. I. Johnson
Acting Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, Illinois 60515

Mr. William P. Poirier, Director
Westinghouse Electric Corporation
Energy Systems Business Unit
Post Office Box 355, Bay 236 West
Pittsburgh, Pennsylvania 15230

Joseph Gallo
Gallo & Ross
1250 Eye St., N.W.
Suite 302
Washington, DC 20005

Michael I. Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60603

Howard A. Learner
Environmental law and Policy
Center of the Midwest
203 North LaSalle Street
Suite 1390
Chicago, Illinois 60601

U.S. Nuclear Regulatory Commission
Byron Resident Inspectors Office
4448 North German Church Road
Byron, Illinois 61010-9750

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Ms. Lorraine Creek
Rt. 1, Box 182
Manteno, Illinois 60950

Chairman, Ogle County Board
Post Office Box 357
Oregon, Illinois 61061

Mrs. Phillip B. Johnson
1907 Stratford Lane
Rockford, Illinois 61107

George L. Edgar
Morgan, Lewis and Bochius
1800 M Street, N.W.
Washington, DC 20036

Ms. Bridget Little Rorem
Appleseed Coordinator
117 North Linden Street
Essex, Illinois 60935

Attorney General
500 South Second Street
Springfield, Illinois 62701

EIS Review Coordinator
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, Illinois 60604-3590

Illinois Department of
Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Commonwealth Edison Company
Byron Station Manager
4450 North German Church Road
Byron, Illinois 61010

Kenneth Graesser, Site Vice President
Byron Station
Commonwealth Edison Station
4450 N. German Church Road
Byron, Illinois 61010

U.S. Nuclear Regulatory Commission
Braidwood Resident Inspectors Office
Rural Route #1, Box 79
Braceville, Illinois 60407

Mr. Ron Stephens
Illinois Emergency Services
and Disaster Agency
110 East Adams Street
Springfield, Illinois 62706

Chairman
Will County Board of Supervisors
Will County Board Courthouse
Joliet, Illinois 60434

Commonwealth Edison Company
Braidwood Station Manager
Rt. 1, Box 84
Braceville, Illinois 60407

Document Control Desk-Licensing
Commonwealth Edison Company
1400 Opus Place, Suite 400
Downers Grove, Illinois 60515

Mr. H. G. Stanley
Site Vice President
Braidwood Station
Commonwealth Edison Company
RR 1, Box 84
Bracemille, IL 60407

LIST OF MEETING ATTENDEES
JANUARY 22, 1997

NRC
Robert Capra
Eileen McKenna
Lee Banic
Robert Rothman
John Ma
Chu-yu Liang
Jai Rajan
Melvin Holmberg
Mohammed Shuaibi
Ramin Assa
M. David Lynch
George Dick

Commonwealth Edison
Daniel Shamblin
David Rogowski
David Lippard
Sam Mullins
Jerald Wagner
Gerald Groth
Mark Leutloff
Robert Moravec
Marcia Lesniak
Denise Saccomando

Bechtel
Charles Weaver
Andrew Matyas
Frank Wilks
Brian Reilly
Cal Reid
Kenneth Clough
Eugene Thomas
Dave Drulard
Farhad Farzam

McGraw-Hill
David Stellfox

STS, Inc.
Deann Raleigh

Baltimore Gas & Electric
Getachew Tesfaye

Enclosure 1

ComEd

Byron/Braidwood Steam Generator Replacement Project

Presentation to the Nuclear Regulatory Commission

January 22, 1997

Enclosure 2

ComEd

Byron/Braidwood Steam Generator Replacement Project

Presentation to the Nuclear Regulatory Commission

January 22, 1997

Byron/Braidwood
Steam Generator Replacement Project

Introduction

Dan Shamblin
SGR Project Manager

Objectives

- Update NRC on Project Schedule - Byron Outage Acceleration
- Provide the conclusions and results of our licensing determination process
- Provide an update on August 21, 1996, meeting open items related to the reactor containment opening
- Review the steam generator handling and removal engineering and installation work

Agenda

1. Introduction/Objectives — D. Shamblin
2. Project Schedule - Byron Outage Acceleration — D. Shamblin
3. Licensing Determination Process Conclusions and Results — D. Rogowski
4. Open Items - Containment Opening
   - A. Opening/Closure Schedule Development — J. Groth
   - B. Containment Opening Analysis/Restoration — F. Farzam

Agenda (cont.)

5. S/G Handling and Removal Activities

A. RSG Receipt and Preparation Work	B. Moravec
B. OSG Removal Preparation	D. Drulard
C. OSG Removal and Transport On-Site	K. Clough
D. RSG Installation, Welding and NDE	D. Drulard
E. Design Considerations	M. Leutloff

6. Closing Remarks — D. Shamblin

Conclusion

"SGRP continues to maintain its focus on nuclear safety in their engineering, licensing, and installation planning activities."

Byron/Braidwood
Steam Generator Replacement Project

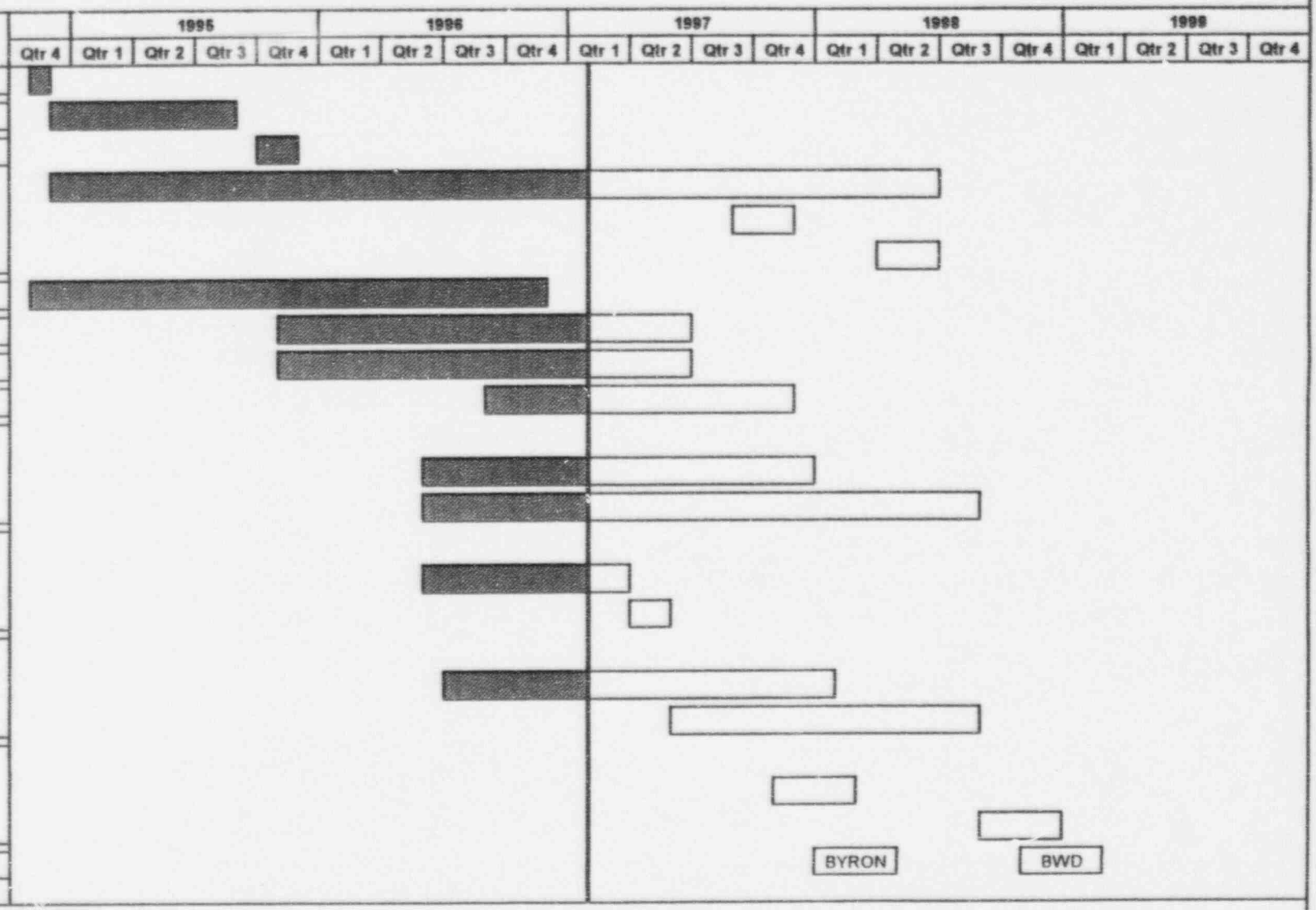
Project Schedule
Byron Outage Acceleration

Dan Shamblin
SGR Project Manager

BYRON/BRAIDWOOD STEAM GENERATOR REPLACEMENT PROJECT

PROJECT SCHEDULE - LEVEL 0

ID	TASK NAME
01	FABRICATION RELEASE
02	BASELINE STUDY
03	OPTICAL TEMPLATING B/B
04	RSG FABRICATION
05	- BYRON DELIVERIES
06	- BWD DELIVERIES
07	RSG ANALYSIS WORK
08	DETAILED DESIGN WORK
09	CONSTRUCTION ENGINEERING
10	LICENSING ACTIVITY
11	SITE PREP ACTIVITY
12	- BYRON
13	- BWD
14	N-1 OUTAGE
15	- BWD MOBILIZATION
16	- BWD N-1
17	MOBILIZE - SGR OUTAGE
18	- BYRON
19	- BWD
20	SGR OUTAGE
21	- BYRON
22	- BWD
23	PLANT DEMOBILIZATION



DATA DATE: 1/16/1997

EARLY DATE BAR:

PROGRESS BAR:

Byron/Braidwood
Steam Generator Replacement Project

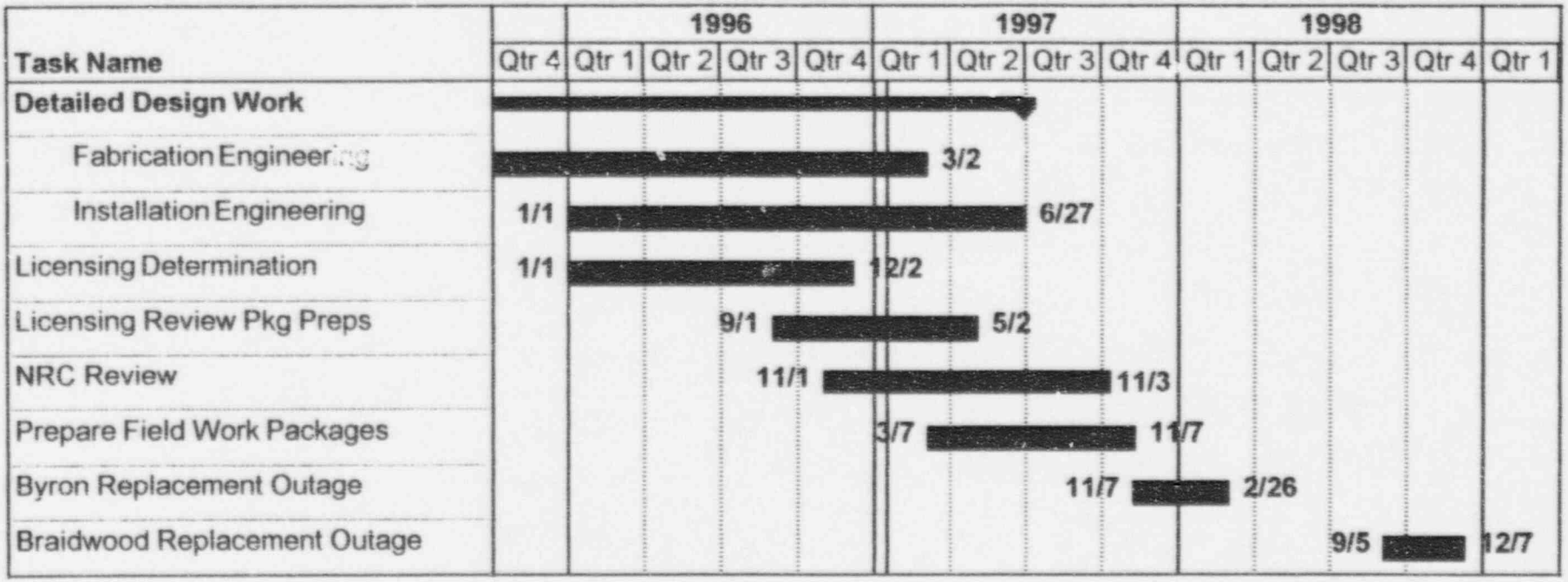
Licensing Determination Process
Conclusions and Results

Dave Rogowski
SGR Project Engineer

SGR Engineering and Licensing

- Current schedule
- Summarize activities since August 1996 presentation
- Discuss conclusions reached

SGR Engineering Schedule



Licensing Determination Effort - Completed Rigorous Review

- Preliminary Safety Evaluations
- Licensing issues summary documents
- Calculations and analysis reviewed for methods/approaches
- Review of design and licensing basis documents
- Independent technical experts

Conclusions

- No unreviewed safety questions identified
- Safety Evaluation process remains appropriate for the SGR project
- Licensing packages have been identified
- Licensing packages prepared to high quality standards

Results of Licensing Determination Process

Required Licensing Reviews	Units	Submittal Date	Request Date
Containment Tendon Grease Removal	By 1/Bwd 1	11/4/96A	5/1/97
S/G Tube Rupture - Topical Report	By 1,2/Bwd 1,2	11/13/96A	4/1/97
Code Case Relief 2142/2143	By 1/Bwd 1	12/20/96A	5/15/97
Containment Peak Pressure Change	By 1/Bwd 1	1/31/97	11/3/97
Containment Isolation Valves	By 1/Bwd 1	1/31/97	11/3/97
S/G Water Level Optimization	By 1/Bwd 1	2/14/97	11/3/97
Revision of TS due to Degraded S/Gs	By 1/Bwd 1	2/28/97	11/3/97
Relief Request for Rebar Weld Repair	By 1/Bwd 1	3/21/97	11/3/97
Pressure Temperature Limit Reports	By 1, 2/Bwd 1, 2	3/27/97	11/3/97
Ultimate Heat Sink	By 1, 2	5/2/97	11/3/97

Byron/Braidwood
Steam Generator Replacement Project

Opening/Closure Schedule Development

Jerry Groth
Braidwood Site Project Manager

Opening/Closure Schedule Development

- Explain challenges faced in schedule development
- Review first 15 days of the replacement outage schedule

Opening/Closure Schedule Development

GOALS

1ST PRIORITY

- Maintain high degree of safety

2ND PRIORITY

- Optimize production efficiency and overall outage duration

Opening/Closure Schedule Development

CHALLENGES

- Erection of outside lift system
- Tendon removal
- Installation of containment opening
- Closure of containment opening

Erection of Outside Lift System

CHALLENGE

- Interaction of outside lift system with adjacent safety related structures

APPROACH

- Erect runway beam support structure and outside lift system support columns during pre-outage Mode 1 power operation
- Complete erection of outside lift system once unit has reached Mode 5 cold shutdown

Tendon Removal

CHALLENGE

- Potential tendon damage due to cold weather stiffening tendon grease

APPROACH

- Remove tendon grease during summer power operation

Tendon Removal

APPROACH

- Develop new tendon gripper to improve removal without damaging tendon wires
- Perform test of new gripper at Midland
- Procure spare tendon wire as contingency

Containment Opening Installation

CHALLENGE

- Maintain required containment integrity prior to completion of core off-load

APPROACH

- Detension tendons once unit is in Mode 5 cold shutdown
- Start concrete chipping after core off-load is complete

Closure of Containment Opening

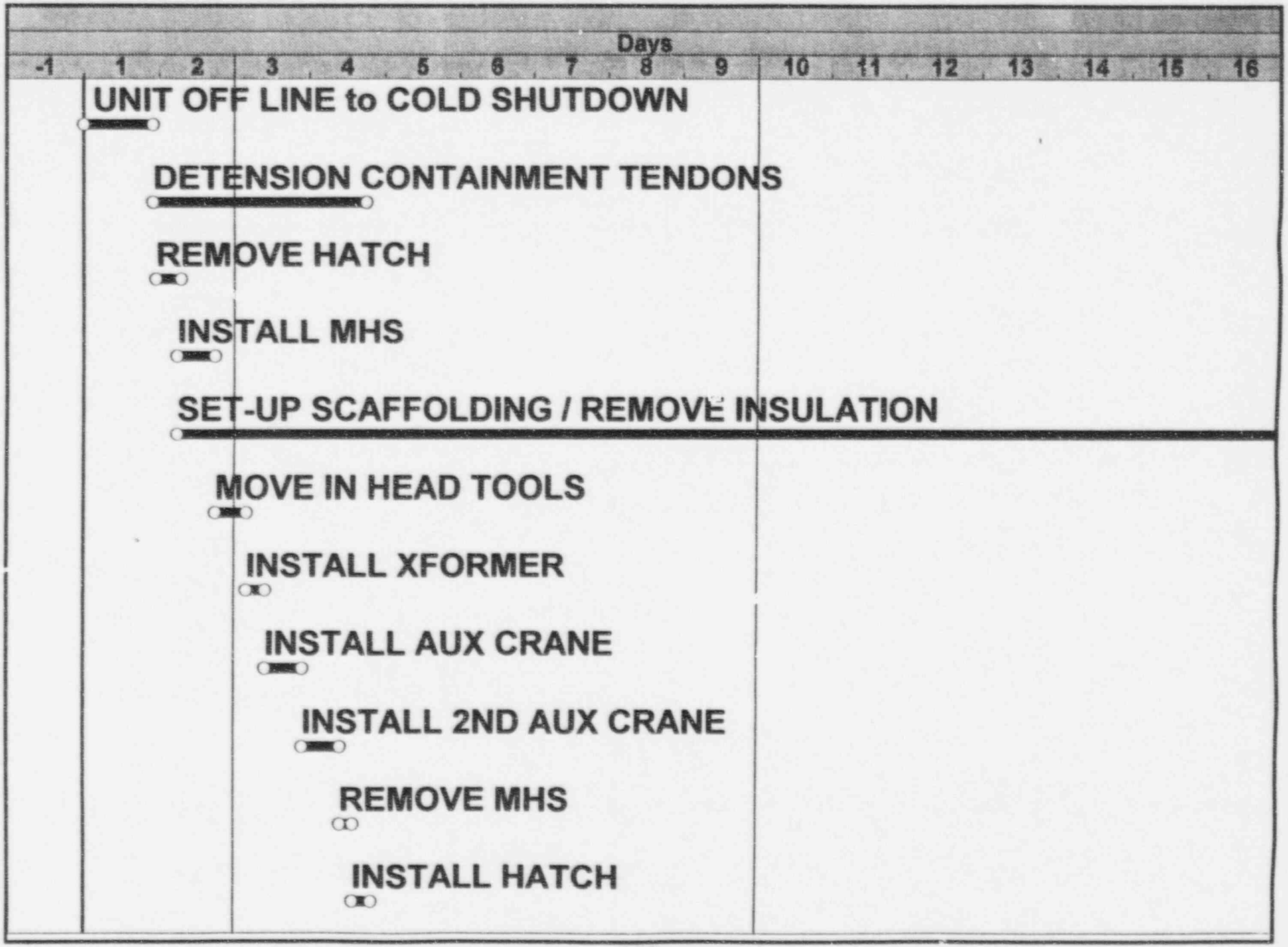
CHALLENGE

- Restore required containment integrity prior to core reload

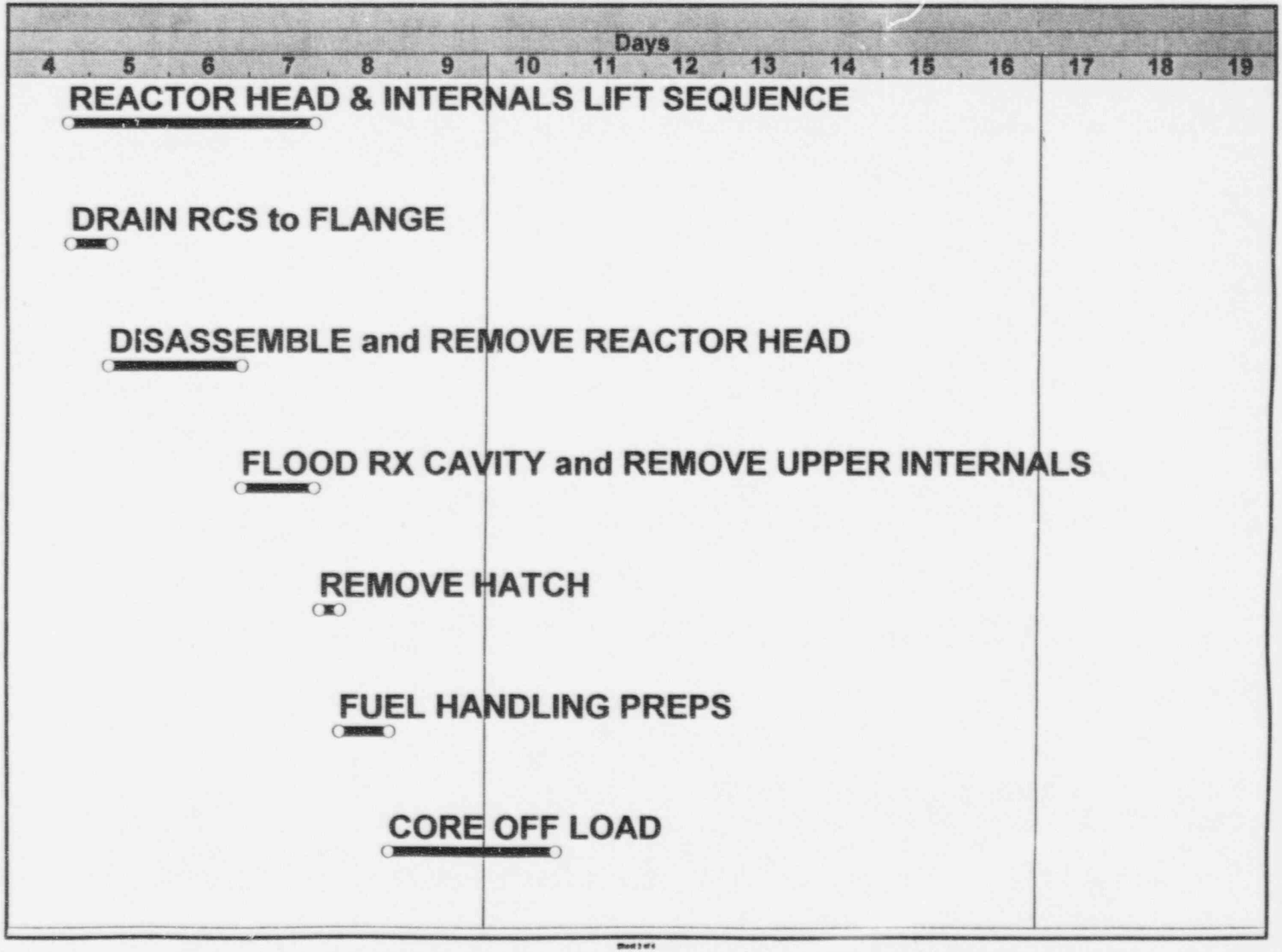
APPROACH

- Reinstall liner to support ventilation requirements
- Provide tornado missile protection

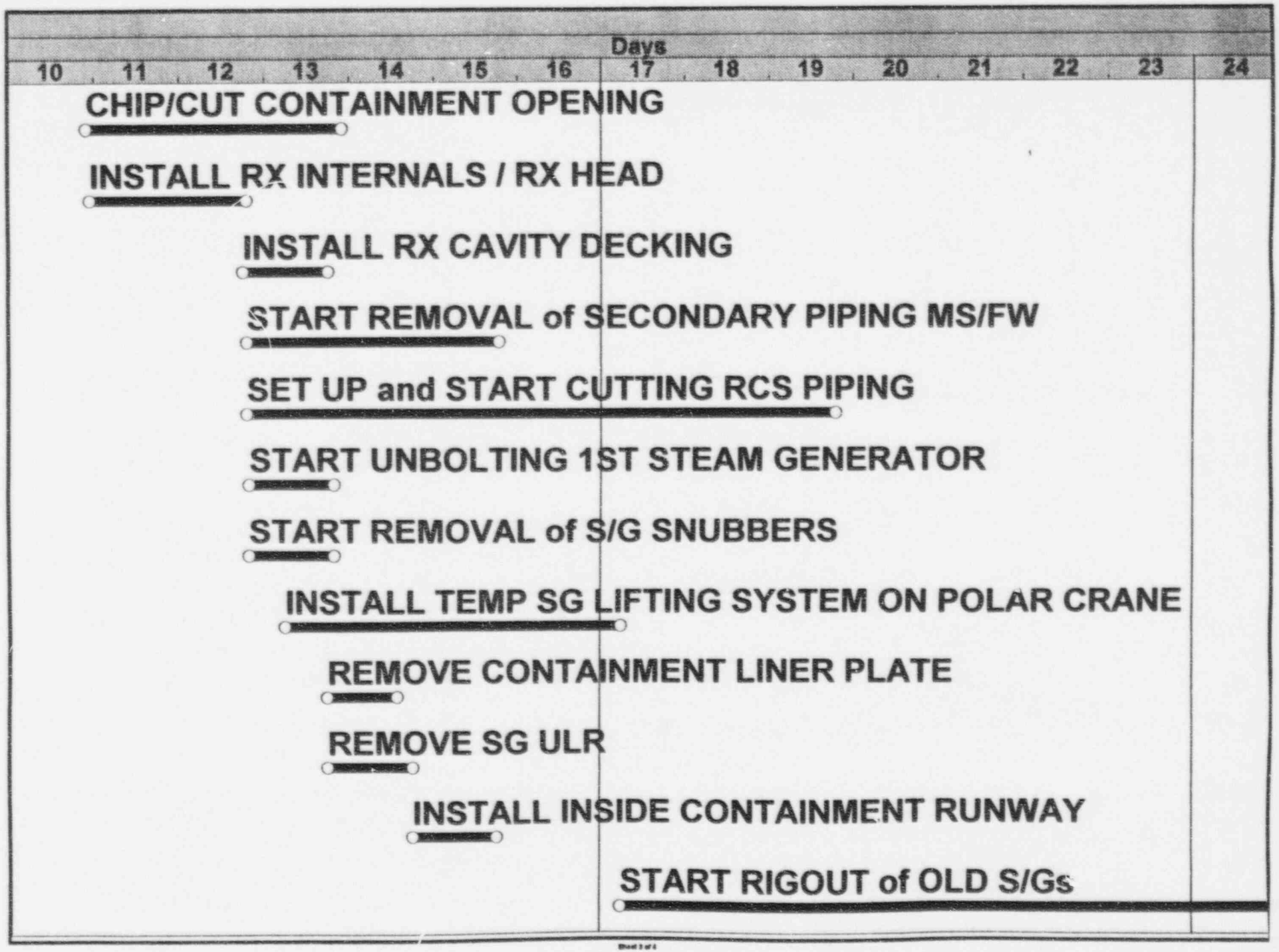
Byron/ Braidwood SGR Outage Schedule



Byron/ Braidwood SGR Outage Schedule



Byron/ Braidwood SGR Outage Schedule



Opening/Closure Schedule Development

SUMMARY

- Approach to challenges meets our schedule development goals
- High degree of safety maintained
- Outage duration and production efficiency optimized

Byron/Braidwood
Steam Generator Replacement Project

Containment Opening Analysis/Restoration

Farhad Farzam
Civil Structural Senior Engineer

Topics of Discussion

- Containment analysis follow-up issues
- Containment opening restoration

Containment Analysis Follow-Up Issues

Issues Discussed:

- BSAP verification
- Review of 3-D finite element model
- Review of analysis results

Status:

- SGRP believes BSAP verification and 3-D model issues are resolved
- Review of analysis results in May 1997

Restoration - New Concrete

- Original Concrete: 5500 psi at 91 days
- New Concrete: 5500 psi at 7 days
  - ✓ Low creep concrete mix
  - ✓ Creep testing performed per ASTM C-512
- Effects of concrete creep are taken into account in the containment analysis by introducing an effective modulus of elasticity for new and old concrete

Restoration - Rebar Cadwelding

- General Background
  - ✓ ASTM A 615 (Grade 60), same material as original construction
  - ✓ Cadweld splice between new and existing rebar
  - ✓ Rebar plays secondary role

Restoration - Rebar Cadwelding (cont.)

- Cadweld qualification
  - ✓ Consistent with original design/construction requirements
  - ✓ Participation of manufacturer's representative to train Cadweld operators
  - ✓ Cadweld operator qualification
  - ✓ Visual inspection

Restoration - Rebar Cadwelding (cont.)

- Splice Testing
  - ✓ Sister splice testing in accordance with ASME Section III, Division 2
  - ✓ Previous SGR projects used sister splice testing

Restoration - Rebar Repair

- Concrete removal may nick rebar - perform base metal repair by welding
- Weld repair of rebar nicks has been used in previous SGR projects
- 10CFR50.55a invokes ASME Section XI for containment repair activities
- Existing rebar has a carbon equivalent in excess of 0.55% - cannot comply with ASME Section III, Division 2
- SGRP will ask relief per 10 CFR 50.55a(a)(3) to use AWS D1.4-92
- SGRP believes use of AWS D1.4-92 provides an acceptable level of quality and safety

Restoration - Tendon Retensioning

- Measure lift-off prior to detensioning
- Tendons will be re-tensioned to the required level of prestressing to maintain their design basis 40-year minimum prestressing force

Byron/Braidwood
Steam Generator Replacement Project

RSG Receipt and Preparation Work

Bob Moravec
Byron Site Project Manager

Topics of Discussion

- SG Receipt and Inspection
- SG Storage and Care While in Storage
- SG On-Site Preparation Work

SG Receipt and Inspection

- Pre-delivery receipt inspection by ComEd at BWI shop prior to transport
  - ✓ Physical inspection
  - ✓ Documentation review and acceptance
- Post-delivery receipt inspection on site
  - ✓ Physical inspection - shipping damage
  - ✓ Eddy current testing of selected tubes end to end
    - Loose p[illegible] shipping damage
  - ✓ ANI review and acceptance

Storage and Care While in Storage

- SG Delivery
  - ✓ Transport to site on bolstered rail cars
  - ✓ Hydraulic gantry offload from rail cars
  - ✓ Move to NSGSF on hydraulic platform trailers

Storage and Care While in Storage

- Establish FME controls
  - ✓ Cleanliness zones at points of entry
  - ✓ Tube sheet protection
  - ✓ Debris dams
- Release nitrogen purge and remove manway covers
- Maintain shipping braces in-place until SG is set in containment

SG On-Site Preparation Work

- Establish RCS nozzle rough cut lines and remove hydro caps
- Prepare RCS nozzles for welding based upon templating data
- Prepare secondary side nozzles for welding
- Remove miscellaneous instrument and process line nozzle caps or plugs and prepare for field attachments

SG On-Site Preparation Work

- Weld FW elbows and pipe spools to SG nozzles
- Perform preinstallation verification
  - ✓ Upper lateral support restraint ring
  - ✓ SG support feet bolt hole pattern
- Install SG rigging attachments
  - ✓ Two lifting trunions bolted to SG sides
  - ✓ Pivot trunions bolted to SG support feet
- Electropolish SG primary bowls

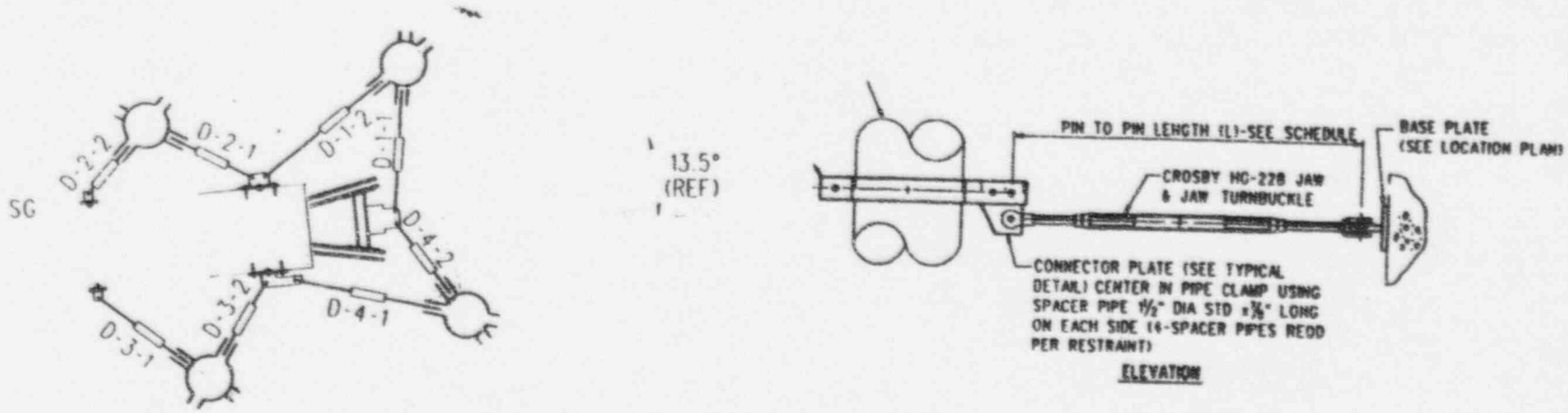
Byron/Braidwood
Steam Generator Replacement Project

OSG Removal Preparation

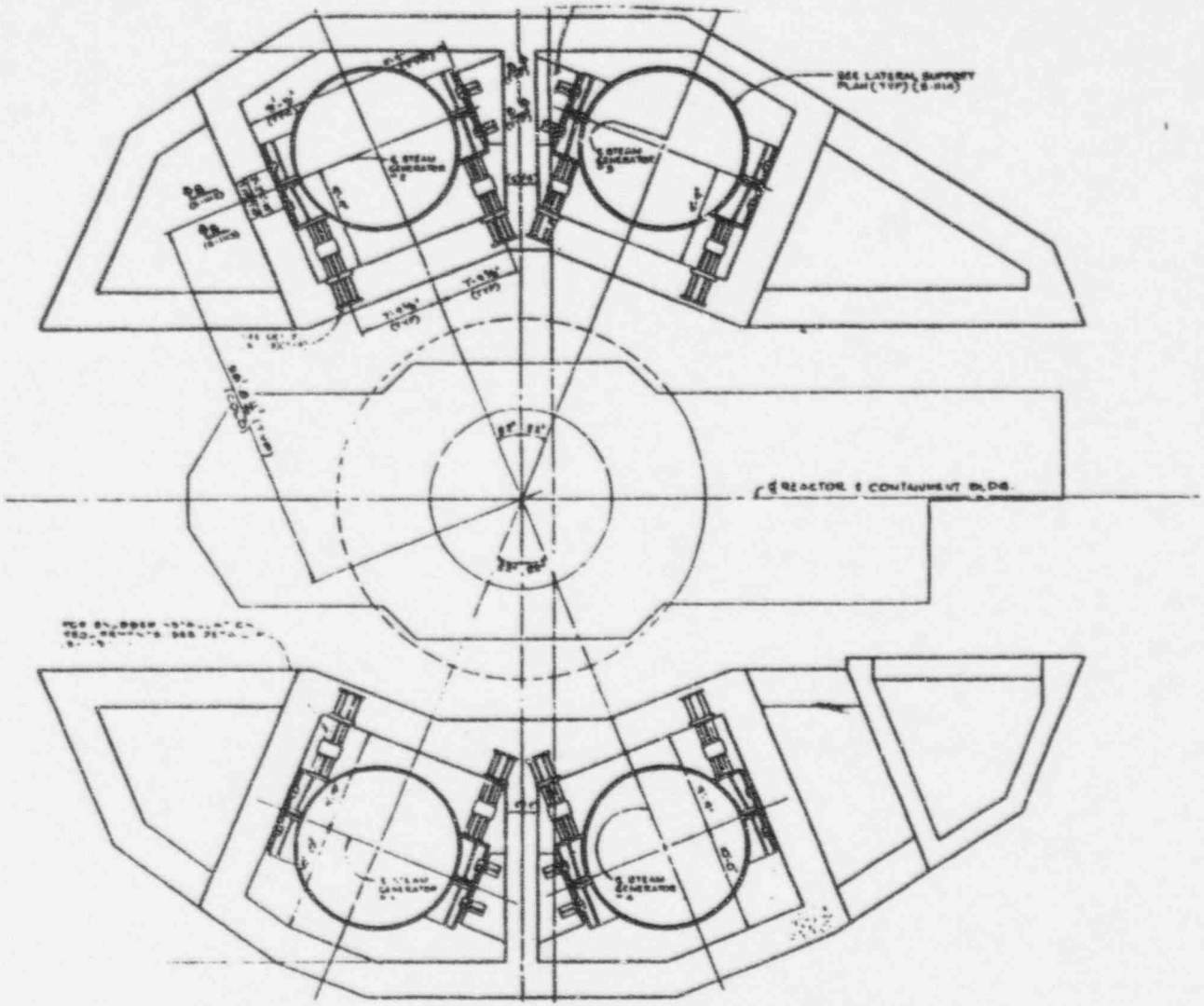
Dave Drulard
Site Services Manager

OSG Preparation

- Insulation removal and sealing OSG surface
- Temporary lateral support of SG support columns
- Temporary lateral restraint of OSGs
- Interference removal
  - ✓ Main steam whip restraints
  - ✓ Platform galleries
  - ✓ Steam generator upper lateral restraints/snubbers
- RCS cutting
- Secondary piping cutting and nozzle coverplating



SG Vertical Support Column Temporary Lateral Restraints



Steam Generator Upper Lateral Restraints

Byron/Braidwood
Steam Generator Replacement Project

OSG Removal and Transport On Site

Ken Clough
Civil Structural Senior Engineer

OSG Removal

- **Outside SG Rigging Features**
  - ✓ Outside Lift System (OLS)
  - ✓ Outside Runway System
  - ✓ Hydraulic Platform Trailers
  - ✓ Heavy Haul Route

OSG Removal

- **Outside Lift System (OLS)**
  - ✓ Designed to rig SGs between the runway system and platform trailers
  - ✓ Load-tested two leg gantry with a hydraulic chain jack lift system
  - ✓ Anchored to a concrete foundation

OSG Removal

- **Outside Runway System**
  - ✓ Designed to transfer SGs from containment opening to OLS
  - ✓ Components
    - Runway beam support structure (RBSS)
    - Outside runway beams and decking

OSG Removal

- **Heavy Haul Route**
  - ✓ Established for roadway transport of OSGs to storage facility
  - ✓ Also used to transport RSGs
  - ✓ Primarily uses original plant construction haul routes

OSG Removal

- **Inside SG Rigging Equipment**
  - ✓ Material Handling System (MHS)
  - ✓ Auxiliary cranes
  - ✓ Inside runway system
  - ✓ Temporary lift device (TLD)
  - ✓ TLD hydraulic lifter

OSG Removal

- **Material Handling System (MHS)**
  - ✓ Designed to move equipment and materials into containment through the fuel handling building, auxiliary building, and equipment hatch

OSG Removal

- **MHS Components**
  - ✓ Existing fuel handling building crane
  - ✓ Existing rail system along side spent fuel pool
  - ✓ Material handling cart with turntable
  - ✓ Temporary raised track system through equipment hatch
  - ✓ Spent fuel pool FME barrier

11.9
12.8
15
17
18
℄ RAIL
TOC EL 407'-0"
TOC EL 426'-0"
Z
6"Wx4" H
CONC CURB
Y
℄ RAIL
SHIPPING CASK
AREA
SPENT FUEL STORA
BOTTOM/POOL EL
X
12.7
℄ RAIL
FUEL TRANSFER CANAL
℄ RAIL
℄ CABLE TRENCH
TOC EL 426'-0"

OSG Removal

- **Auxiliary Cranes**
  - ✓ Designed to handle miscellaneous loads
  - ✓ Mounted on top of the SG cubicles
  - ✓ Load tested

OSG Removal

- **Inside Runway System**
  - ✓ Designed to support downending and transfer through containment opening
  - ✓ Runway beams and decking installed on top of SG cubicles spanning across reactor cavity and through the containment opening

OSG Removal

- **Temporary Lift Device (TLD)**
  - ✓ Designed to rig SGs from cubicles to inside runway system
  - ✓ Installed on polar crane bridge girders
  - ✓ Similar to system used during plant construction
  - ✓ Load-tested two-leg gantry with hydraulic chain jack system

OSG Removal

- **TLD Hydraulic Lifter**
  - ✓ Designed to lift and set TLD on the polar crane bridge girders
  - ✓ Truss tower base anchored to operating floor
  - ✓ Hydraulic extend unit mounted in truss tower used to raise and lower TLD

OSG Removal

- **OSG Rigging Activities Inside Containment**
  - ✓ Lift from cubicle
  - ✓ Downend onto runway system transfer carts
  - ✓ Install primary nozzle cover plates
  - ✓ Transfer through containment opening

OSG Removal

- **OSG Rigging Outside Containment**

  - ✓ Transfer from containment opening to OLS
  - ✓ Rig to platform trailer at ground level using OLS
  - ✓ Transport on site along approved haul route

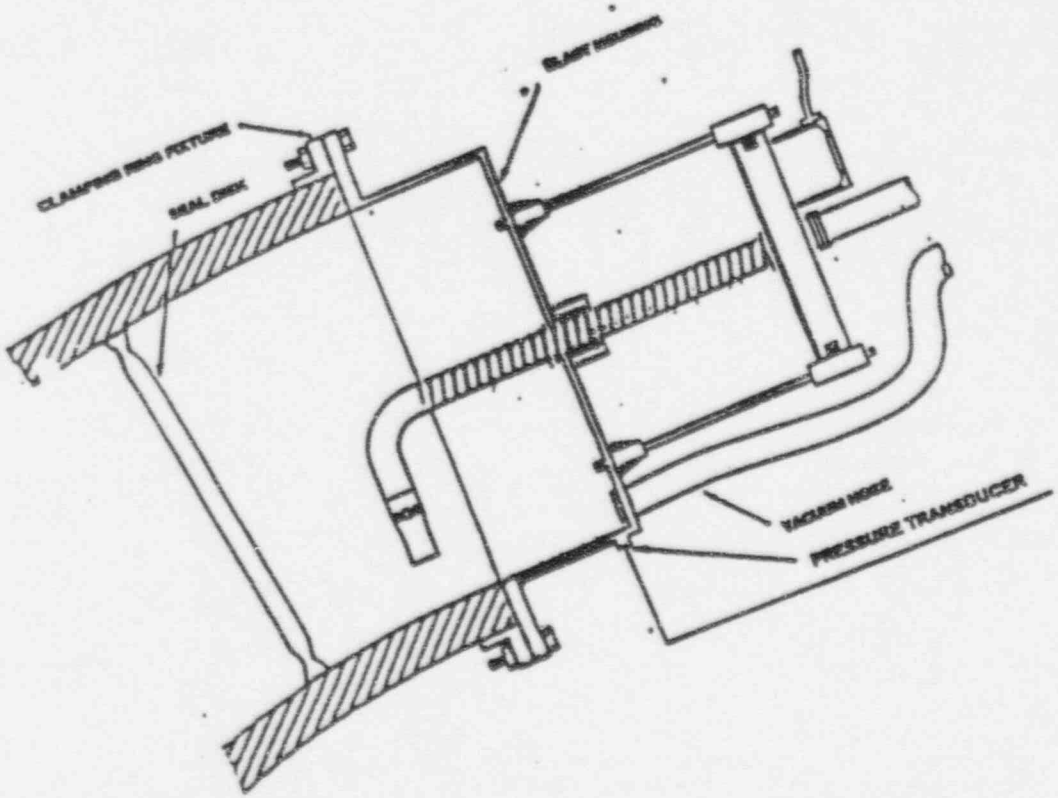
Byron/Braidwood
Steam Generator Replacement Project

RSG Installation, Welding, and NDE

Dave Drulard
Site Services Manager

RSG Installation

- RCS pipe end preparation
  - ✓ RCS pipe end decontamination
  - ✓ RCS shielding
  - ✓ Final end preparation



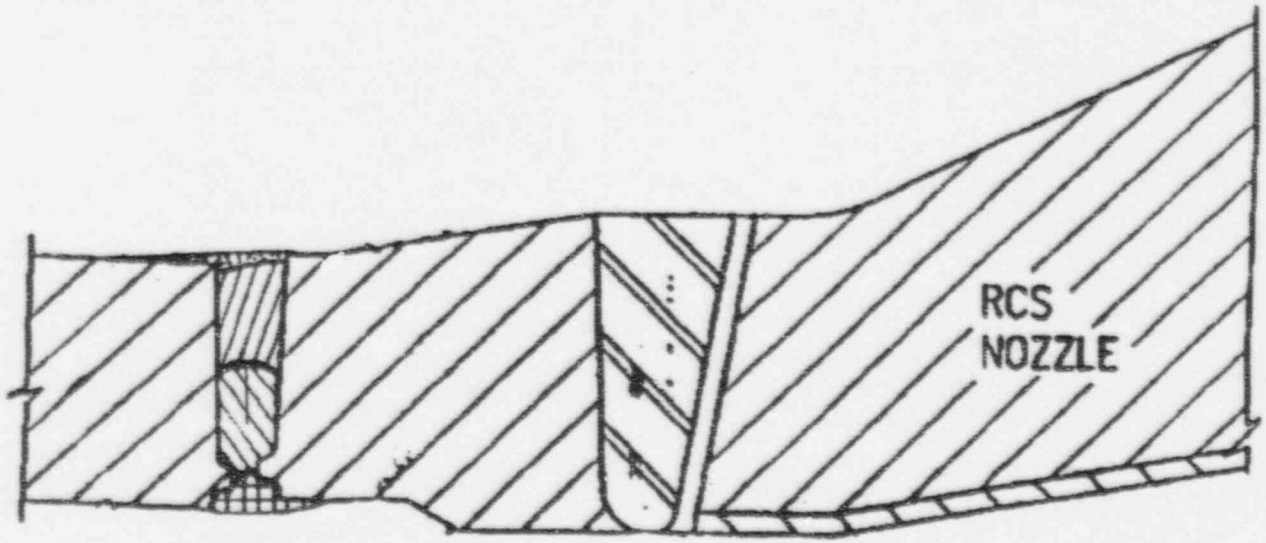
Pipe End Decontamination

RSG Installation

- Rig in RSG
- Shim to best fit on RCS
- Install temporary lateral support
- Verify vertical alignment

RSG Installation

- RCS Welding
  - ✓ Weld OD to 1/3
  - ✓ Grind ID and PT
  - ✓ Perform info RT
  - ✓ Weld to flush, RT
  - ✓ Complete ISI profile, PT
  - ✓ Perform code RT
  - ✓ Perform UT inspections



RCS Weld Joint Configuration

RSG Installation

- Remove tube sheet and bowl protection
  - ✓ Perform cleanliness inspection
- Remove shielding and FME barrier
- "Perform foreign object search and retrieval"
- Install primary manways

Byron/Braidwood Steam Generator Replacement Project

Engineering Issues Associated with Steam Generator

Mark Leutloff
Byron SGR Project Engineer

Design Considerations Introduction

- General discussion of protection measures
- Manitowoc crane
- RBSS and OLS
- Material handling system
- Auxiliary crane
- Polar crane/TLD
- SG removal/reinstallation
- Haul routes

General Approach To Protect Safety Related SSC's

- Observe accepted industry load handling standards
- Comply With NUREG 0612 commitments
- Comply with Bulletin 96-02 response
- Perform lift equipment load tests and inspections
- Use physical separation to preclude interactions
- Use administrative controls and schedule adjustments to preclude interactions

General Approach To Protect Safety Related SSC's (cont.)

- Design and analyze lift equipment to preclude failure under seismic loading conditions to preclude interactions
- Design lift equipment fail safe to preclude interactions
- Operations contingency measures
- Evaluate potential interactions

Manitowoc Crane

- Crane erection will be performed in a remote area
- Crane use will be controlled administratively
- Crane will be used during modes 1-6 and while defueled to erect OLS and RBSS
- Prohibit Manitowoc load handling over safety-related SSC's
- Load lift heights will be minimized

Manitowoc Crane (cont.)

- Evaluating loads and lifting sequences including seismic and tornado considerations
- In the event of high wind or tornado watch suspend crane operations, lower boom and park safely
- Protection strategies identified for adjacent safety-related SSC'S for each plant mode
- Position crane to provide physical separation from SSC's
- Evaluating interactions With SSC's

Outside Lift System (OLS) and Runway Beam Support System (RBSS)

- Erection and use will be controlled administratively
- Evaluating RBSS and OLS erection sequence including seismic and tornado considerations
- RBSS and OLS members will be guy wired and anchored during erection as a fail safe mechanism to preclude SSC interactions
- Completed RBSS will be seismically evaluated and guy wires will remain in place

RBSS and OLS (cont.)

- OLS support columns will be seismically evaluated prior to OLS header beam installation
- OLS header beams will be installed during Mode 5, 6 or defueled to preclude MSV room interaction During Modes 1-4
- Guy wires will remain in place on completed OLS
- OLS will be load-tested per ANSI B30.2

Material Handling System (MHS)

- Erection of MHS complies with NUREG 0612 commitments
- Complies with Tech Spec 3/4.9.7 which prohibits load handling over spent fuel assemblies
- Fuel At Unit 1 end of SFP adjacent to MHS will be moved prior to placement of FME barrier
- FME barrier placement will be controlled administratively

MHS (cont.)

- FME barrier lift height will be minimized
- FME barrier and SFP wall structural integrity maintained in the event of drop
- FME barrier will be seismically evaluated to prevent barrier from entering pool
- Loads will not be handled on or above FME barrier

MHS (cont.)

- Material handling cart will travel on rails and loads will be secured to cart
- Cart loads will be tethered
- Raised track designed for disassembly in the event containment closure needs to be established
- OEM will perform inspection of FHB crane prior to SGRO

Auxiliary Cranes

- Install during Mode 5 with polar crane
- Auxiliary crane components will be held by polar crane until securely anchored
- Auxiliary crane erection and use will comply with NUREG 0612 commitments
- Load test auxiliary cranes in accordance with ANSI B30.2
- Use of auxiliary cranes will be controlled administratively

Auxiliary Cranes (cont.)

- Auxiliary cranes will be seismically evaluated with load and lift configuration limitations for Modes 5 and 6
- During defueled conditions, shared safety-related systems in unit 1 containment will be isolated

Polar Crane/TLD

- OEM performed polar crane inspections for an engineered lift
- Polar crane end truck wheel bearing replacements
- TLD will be assembled and load tested outside containment at Byron
- TLD installation and use only while defueled

SG Removal/Reinstallation

- Temporary RCS dead load support and SG column restraints will be installed and removed while defueled
- RCS pipe severence and rewelding will be performed while defueled
- Secondary piping severence and rewelding on B&C SG's will be performed while defueled

RSG Rail Loading/OSG Haul Route

- Evaluating buried essential service water makeup piping and control cables for impact
- Test haul route
- Evaluated postulated release from OSG drop/rupture at OLS
- Evaluating OSG's remain intact in the event of a drop from the transporter along the haul route