

94 1212 0038

CF 50-3257
334

OEAB EVENT TRACKING SHEET

Sorted Assigned To: GREENE T./DENTEL G. & Assigned To & Assigned Date >> 07/27/93 & Assigned Date << 07/27/93 & Event Date >> 07/01

Plant: BRUNSWICK Unit: 1 Engineer: GREENE T./DENTEL G.
 Event: 07/01/93 Morning Report: Briefing: 93-34
 50.72#: 0 LER#: 050000009300000 PN#: 2-93-050
 Other Notification: DIRECTOR'S HIGHLIGHT, PN29367
 System: Component:

OPERATING MODE

- 1 - Operation
- 2 - Startup
- 3 - Hot Standby
- 4 - Hot Shutdown
- 5 - Cold Shutdown
- x 6 - Refueling
- 7 - Other _____

SIGNIFICANCE

- A - Reactor Protection System
- x B - Safety-Related Cooling System
- C - Fuel Cladding
- D - Reactor Coolant Pressure Boundary
- E - Containment
- F - Plant Power
- G - Unexpected Plant Performance
- H - Other:

CAUSE

- 1 - Equipment Failure
- 2 - Design or Installation Error
- 3 - Operating Error
- 4 - Maintenance Error
- 5 - External
- x 6 - Other _____

EVENT TYPE

- SIG - Significant Event
- x EOI - Event of Interest
- TBD - To Be Determined
- OTH - Other

POTENTIAL AO: Criterion: _____

Proposed By: GREENE T./DENTEL G. *Thomas Greene / Dentel* 11/05/94
Engineer

Approved: *RJD* 11/8/94
R. Dennig
Section Leader

A. Chaffee
Branch Chief

KMay 11/23/94
Closure

EVENTS ASSESSMENT PANEL First Screening:

Significance Description:

DURING THE CURRENT REFUELING OUTAGE, CRACKS WERE FOUND AT TWO WELD REGIONS OF THE CORE SHROUD. GE IS EVALUATING THESE CRACKS.

C90121

E-1
DFX2

3MP

(T) #12

EVENTS CLOSEOUT TEXT

Site Name:

Brunswick

Event No.: 0
Event Date: 07/01/93
Closeout Date:

Close Out Text:

CLOSEOUT

During the July 1993 refueling outage at Brunswick Unit 1, Carolina Power and Light Company (CP&L) found both circumferential and axial cracks in the core support shroud. The circumferential cracks were located in the inside shroud surface in the heat-affected zone (HAZ) of weld H-3 and extended 360° around the circumference of the shroud. Weld H-3 is a horizontal weld which fuses the top guide support ring to the lower shroud. Additional inspection revealed axial cracks on the inside surface of weld H-4 as well as cracks at welds H-1, H-2, and H-5 of the shroud. Results from boat samples indicated intergranular stress-corrosion cracking (IGSCC) is the primarily controlling mechanism causing the cracking at the H-3 and H-4 welds. The core shroud was repaired before the unit returned to power using mechanical clamps around the H-2 and H-3 welds. The staff has reviewed the repairs and the structural integrity of the shroud and has found them acceptable. Since the discovery of the cracks, Dresden Unit 3 found 360° circumferential cracks in weld H-5, which is lower than the circumferential cracks found at Brunswick. The discovery of cracks at Brunswick and then at Dresden has resulted in several generic communications, which are listed below. The Dresden Unit 3 event, which mentioned the Brunswick core shroud cracking, was recently closed out as an event of interest (EOI) on September 23, 1994. *(The Dresden closeout also discussed)*

1. Information Notice 93-79, Core Shroud Cracking at Beltline Region Welds in Boiling-Water Reactors, September 30, 1993.
2. Information Notice 94-42, Cracking in the Lower Region of the Core Shroud in Boiling-Water Reactors, June 7, 1994.
3. Information Notice 94-42, Supplement 1, Cracking in the Lower Region of the Core Shroud in Boiling-Water Reactors, June 19, 1994.
4. Generic Letter 94-03, Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors, July 25, 1994.
5. Information Notice Draft, Update on Core Shroud Cracking in Boiling-Water Reactors, Under consideration.

DIRECTOR'S HIGHLIGHTS

PROJECT DIRECTORATE I-4

October 26, 1994

HADDAM NECK

The Haddam Neck Plant is operating at 100% power, with no major problems. The plant has been online for 70 days. The licensee is meeting with the staff to discuss the re-racking of the spent fuel pool scheduled in about 20 months on October 27, 1994. The plant will perform an EP mini-drill on October 25, 1994. This drill is for training purposes.

Contact: Alan B. Wang
504-1445

MILLSTONE UNIT 1

Millstone Unit 1 is currently operating at 100% power with no significant problems. The unit has been online for 132 consecutive days.

On October 26, 1994, the staff will meet with the licensee to discuss their cost beneficial licensing action program. The licensee will discuss past successes, as well as their plans for future submittals. The licensee will also give an update on the commitment management pilot program (Units 1 and 3 are participating).

Contact: James W. Andersen
504-1437

MILLSTONE UNIT 2

Millstone 2 has been shutdown for refueling since October 3. On October 20, 1994, the licensee declared an Unusual Event at 3:22 a.m due to conditions that warrant increased awareness because of a service water leak affecting electrical equipment.

The vital DC bus experienced a ground at approximately 1:32 a.m. Shortly thereafter, a security guard noted water falling from the roof of the lower vital switchgear room. Operators subsequently found water spraying from the vent valve on the upper switchgear room cooler. The valve was immediately shut; however, water had overflowed the coffer dam surrounding the cooler, and covered most of the upper switchgear room floor. Water had also leaked through the floor of the coffer dam to the lower switchgear room, falling on the floor and also on the top of a non-vital 4160 volt bus. Operators de-energized all non-vital 4160 volt and 480 volt busses to isolate any faults from the vital busses. Securing the 480 volt busses de-energized normal lighting to the auxiliary and turbine buildings, and containment, but the operators had evacuated personnel in anticipation of the loss of lighting. The ground on the vital DC bus has been isolated but the cause of the ground is still unknown.

2-3
E-P

A relief evaluation team and a damage assessment team was formed by the licensee to determine the root cause of the event and to evaluate the extent of the water damage to switchgear. Preliminary evaluation determined the root cause to be human error by both management and the plant staff. Plans were initially in place to drain the service water header for work on the service water system. The vent valve was opened to provide for this sequence of drainage. However, the initial plans for draining the system were changed to another method without fully coordinating the change throughout the organization. Inadequate implementation of the revised method of draining the service water header resulted in about 150 gallons of sea water leaking from the vent valve onto the floor and equipment in the upper switchgear room. The licensee is cleaning up and drying out the affected areas. Other outage work has been delayed pending the outcome of the licensee investigation and corrective actions for the event.

Contact: Guy S. Vissing
504-1441

OYSTER CREEK NUCLEAR GENERATING STATION

Oyster Creek is the seventh week of its 15R refueling outage. Major activities in progress include repairs to the core shroud.

GPUM expects to initiate installation of the core repair on October 27, 1994. The installation will continue for 8 to 10 days.

GPUM has not yet submitted the total design documentation package for the core shroud repair to the staff for review and approval. They understand that such approval is required prior to restart. The staff expects 80% of the remaining information (including dynamic seismic analysis) to be submitted by October 26, 1994. The remaining 20% will be submitted by October 31, 1994.

A proprietary meeting with GPUM audits consultant, MPR Associate's, is scheduled for November 4, 1994, to discuss the core shroud design and repair.

Contact: Alexander W. Dromerick
504-3673

SEABROOK STATION, UNIT NO. 1

The station is operating at full power with no significant operational problems. However, epoxy resin, oozing from the shaft of the station generator exciter, potentially could require a plant shutdown if the resin accumulates on the exciter collector rings causing arcing. The licensee is monitoring the situation and is photographing the exciter collector ring-brush assembly area daily to monitor for changes. In September 1993, the failure of the exciter brush rigging caused a plant trip, and rebuilding of the exciter brush rigging was necessary. However, the current problem is not related to that repair.

OYSTER CREEK NUCLEAR GENERATING STATION

Oyster Creek is in the sixth week of its 15R refueling outage. Major activities in progress include repairs to the core shroud. The staff was advised by GPU Nuclear Corporation (GPUN) on October 14, 1994, that the Oyster Creek core shroud inspection indicated that there is significant cracking in weld H4 (a circumferential weld located approximately mid-core in a high fluence area). None of the cracks are believed to be through-wall. GPUN made the decision late the same day to install a repair on the core shroud to compensate for the cracking. The repair has been designed by MPR Associates and is similar to designs being contemplated or installed at other boiling water reactors (i.e., tie bars to hold the shroud together). Preparations are in progress and the work is expected to take approximately 2 weeks.

GPUN has not yet submitted the total design document for the core shroud repair to the staff for review and approval. They understand that such approval is required prior to restart. The staff expects the remaining information (including dynamic seismic analyses) to be submitted by October 28.

Contact: Alexander W. Dromerick
504-3473

SEABROOK STATION, UNIT NO. 1

The station is operating at full power with no significant operational problems. On October 25, 1994, the Region I Administrator will visit the site and meet with the resident inspector staff and senior North Atlantic executives. Mr. John Opeka, Executive Vice President of the Northeast Utilities System Energy Resources Group will be present also.

North Atlantic has completed replacement of the A ocean service water pump with a rebuilt spare pump. All fasteners which were suspected to be sensitized because of inadequate carbide solution heat treatment were replaced on the rebuilt unit. The licensee plans to replace the C ocean service water pump later this week.

Contact: Albert W. De Agazio
504-1443

DIRECTOR'S HIGHLIGHTS

PROJECT DIRECTORATE I-4

NOVEMBER 2, 1994

HADDAM NECK

The licensee met with the staff to discuss the re-racking of the spent fuel pool. The licensee informed the staff that they plan to submit a rerack submittal in January 1995. Fabrication of the racks will begin in February by Holtec and installation is expected to start at the end of the year 1995. This rerack will provide the plant with full core off load during refuelings until the end of life.

The INPO inspection started on October 31, 1994, and will last for two weeks. The SALP meeting with the licensee is scheduled for November 18, 1994.

Contact: Alan B. Wang
504-1445

MILLSTONE UNIT 1

On October 26, 1994, the staff met with the licensee to discuss their cost beneficial licensing action (CBLA) program. The licensee discussed the history of their CBLA program, past successes, and their plans for future submittals. The licensee also gave the staff an update on the commitment management pilot program (Units 1 and 3 are participating). The licensee has completed the internal process and expects to be completed with the pilot program by the end of November.

On November 2, 1994, the Millstone Assessment Panel (MAP) will meet at the site to discuss: (1) Unit 2 inspection efforts needed to support the upcoming senior management meeting, (2) several future major inspection efforts (employee concerns program, operability/reportability, 40500 inspection), (3) future MAP actions, and (4) the direction of the Millstone inspection effort.

Contact: James W. Andersen
504-1437

MILLSTONE UNIT 3

Millstone 3 is in the process of changing from an 18 month to a 24 month fuel cycle. On November 2 the staff met with the licensee at the licensee's request to discuss needed instrumentation Technical Specification changes resulting from the 24-month fuel cycle.

Contact: Vernon L. Rooney
504-3045

D-4

OYSTER CREEK NUCLEAR GENERATING STATION

Oyster is in the eighth week of its refueling outage. The licensee is presently installing the Core Shroud repair. On November 1 representatives of NRR and Region I were at the site witnessing certain portions of the installation.

A proprietary meeting with the licensee regarding the core shroud repair will be held on November 4, 1994.

Contact: Alexander W. Dromerick
504-3473

SEABROOK STATION, UNIT NO. 1

The station is operating at full power but is in a 72-hour action due to the declared inoperability of the two cooling tower service water pumps. North Atlantic has removed the 110A cooling tower pump and has found 60 of 144 pump column flange bolts with severe corrosion. This led North Atlantic to declare the second pump inoperable placing the station in the 72-hour Action Statement. A rebuilt pump was installed and operational by the evening of November 1, 1994. This took the station out of the 72-hour action which reverted to a seven day Action (one pump inoperable vice two pumps inoperable). Work to replace all suspect and corroded bolts on the pump that was removed is in progress and should be completed by November 3. The second cooling tower pump should be operational by November 4.

Based upon preliminary information, the severely corroded column flange bolts and cap screws and impeller cap screws were supplied to the pump manufacturer during initial fabrication by two firms, California Nut and Bolt and Southern Bolt and Screw, neither of which are now in business. All the severely corroded fasteners were found to be sensitized due to inadequate carbide solution heat treatment. Other fasteners showed no corrosion or only minor pitting.

Contact: Albert W. De Agazio
504-1443

DIRECTOR'S HIGHLIGHTS
PROJECT DIRECTORATE I-4

NOVEMBER 9, 1994

HADDAM NECK

The Haddam Neck Plant is operating at 100% power, with no major problems. The plant has been on-line for 77 days. The licensee met with the staff to discuss the re-racking of the spent fuel pool. The licensee informed the staff that they plan to submit a rerack submittal in January 1995. Fabrication of the racks will begin in February by Holtec and installation is expected to start at the end of the year 1995. This rerack will provide the plant with full core off load during refuelings until the end of life.

The INPO inspection started on October 31, 1994, and will last for two weeks. The SALP meeting with the licensee is scheduled for November 18, 1994.

Contact: Alan B. Wang
504-1445

MILLSTONE ASSEMENT PANEL (MAP) MEETING

On November 2, 1994, the Millstone Assessment Panel (MAP) met at the Millstone site. The MAP discussed possible NRC actions given the recent work shutdown by the licensee on Unit 2. The station vice president instituted the work shutdown due to several events involving work control issues (ie. 4160V switchgear washdown and fuel movement problems). The MAP concluded that a meeting should be set up to discuss the licensee's corrective action plan for work control issues and the corrective action program. The MAP also concluded that a second meeting with the licensee prior to restart should be held to discuss the success of the corrective actions. The MAP also discussed: (1) the inspection effort needed at Unit 2 to support the upcoming senior management meeting, (2) the scope and timing of several future major inspection efforts (employee concerns program, operability/reportability, 40500 inspection), and (3) future MAP actions. The MAP tentatively scheduled the next meeting for December 15, 1994.

Contact: James W. Andersen
504-1437

OYSTER CREEK NUCLEAR GENERATING STATION

Oyster Creek is in the ninth week of its refueling outage. GPUN is presently installing the core shroud repair. The licensee has been having some difficulty in installing the shroud tie rods.

Four controlled correspondence (green tickets) have been received from Senators Lautenberg and Bradley concerning inspection of all Oyster Creek reactor internals.

Contact: Alexander W. Dromerick
504-3473

DS

DIRECTOR'S HIGHLIGHTS

PROJECT DIRECTORATE I-4

NOVEMBER 16, 1994

MILLSTONE UNIT NO. 2

Millstone 2 has been shutdown for refueling since October 3. The vessel has been unloaded of all fuel and internals and the 10-year vessel inservice inspection is about half completed. The work control organization has rereviewed all work orders for the outage and has made corrections. The station vice president stop work order on all nonessential work is still in effect. He has indicated that he intends for it to remain this way until the outage plans have been reworked to more carefully proceed in accordance with procedures and approved plans. The licensee will meet with the staff on Thursday, November 17, 1994, in Region I to discuss the refueling outage plans.

Contact: Guy S. Vissing
504-1441

OYSTER CREEK NUCLEAR GENERATING STATION

GPUN completed the installation of the core shroud modification on November 15, 1994.

Contact: Alexander W. Dromerick
504-3473

D-6

DIRECTOR'S HIGHLIGHTS

PROJECT DIRECTORATE I-4

NOVEMBER 23, 1994

MILLSTONE UNIT NO. 2

Millstone 2 has been shutdown for refueling since October 3. The vessel has been unloaded of all fuel and internals and the 10-year vessel inservice inspection is coming to completion. The work control organization has re-reviewed all work orders for the outage and has made modifications. The station vice president stop work order on all non-essential work is still in effect. This stop work order should be lifted within the next few days. The licensee met with the staff on Thursday, November 17, 1994, in Region I to discuss the refueling outage plans. The licensee will docket the comments of the meeting. Prior to restart, the licensee will again meet with the staff to discuss the resolution of issues discussed at the November 17, 1994, meeting.

Contact: Guy S. Vissing
504-1441

MILLSTONE UNIT NO. 3

Millstone 3 has been operating continuously for 63 days and has no major problems. The plant is presently at 100% power.

Recent storms resulted in debris (largely seaweed) being caught up on the intake screens. Because of this, reactor power was reduced to 95% on November 21, screens were backwashed, and the plant returned to 100% power on November 22, 1994.

OYSTER CREEK NUCLEAR GENERATING STATION

GPU Nuclear Corporation expects to restart Oyster Creek from its 15R refueling outage on November 29, 1994.

The staff expects to issue an SE approving the core shroud repair by November 25, 1994.

SEABROOK STATION, UNIT NO. 1

On November 22, 1994, final financial transactions were completed to allow Great Bay Power Corporation (fka EUA Power Corporation) to emerge from under the protection of Chapter 11 of the U.S. Bankruptcy Code. Great Bay is the second largest owner (12.1324%) of the Seabrook Station. EUA Power, a wholly-owned subsidiary of Eastern Utility Associates, entered Chapter 11 bankruptcy on February 28, 1991. Emerging from bankruptcy involved a series

of actions including (a) the transfer of EUA Power's outstanding stock from Eastern Utility Associates to EUA Power, (b) the payment of \$10 million by Eastern Utility Associates to EUA Power in exchange for cancelling certain claims by EUA Power, (c) changing the name of EUA Power to Great Bay Power, (d) exchanging EUA Power bonds held by the creditors for stock (equity) in Great Bay Power, and (e) issuing 66% of Great Bay Power stock to new investors. The completion of the transactions leaves Great Bay Power debt-free. The current equity owners of Great Bay Power are the original bondholders (34%), Omega Advisors and Elliot Associates, L.P. (66%). Stock in Great Bay Power will be listed on an exchange and will be freely traded.

The Station is operating at full power with no significant operational problems.

An Enforcement Conference will be held in Region I offices on December 5, 1994, to discuss the adequacy of undervoltage protection surveillances. The conference will be open to the public.

CONTACT: Albert W. De Agazio
504-1443

April 20, 1985

Conference call between GPO (R. F. A. J. de
Tray Collopy, Scott Jacoby & ^{at Geneva and w. speaker 1/2/85}
and other staff ^{at Geneva} regarding GPO
Committee with E.P. and other ^{committee} members
promise that ^{committee} will be ^{able to} ^{provide}

is a ^{not} ^{to} ^{be} ^{acceptable} ^{also} ^{that}
but ^{not} ^{controlled} ^{at} ^{all} ⁱⁿ ^{the} ^{accepted}
and that the rods would meet the
criteria. A threaded rod over a
Thread sleeve. Perform multiple tests
similar to the original hot rolled
specimens.

Specimens will be exposed to high
temperature and oxygenated water. Standard
Certified Types. Specimens will be
utilized modified to include thread
crease section.

Licenser has an actual material
from tests used in repair of GPO
and NYBB plants.

Licenser will have ^{one} ^{two} ^{three} ^{four} ^{five} ^{six} ^{seven} ^{eight} ^{nine} ^{ten} ^{specimens}.

Specimens prepared by ^{at} ^{Geneva} ^{Atomic}
ABB Atomic (not ^{at} ^{Geneva} ^{Atomic})
annealed and sensitized conductor
GPO will test threaded joint.

Rated at 5×10^{-7} strains inch per inch per second.
Test will be at only one strain rate.

G10 still evaluating what control specimen
be used.

Control specimens shall be tested in
same configuration and with same

Strain rate testing only test they will
be performed.

GPU NUCLEAR CORROSION TEST PROGRAM

Related to Conference Call on April 20, 1987

- * THIS CORROSION TEST PLAN IS BASED ON THE PREMISE THAT XM-19 HAS BEEN SHOWN TO BE AN ACCEPTABLE ALLOY IN BWR ENVIRONMENTS IN THE ANNEALED CONDITION WITH AND WITHOUT CREVICES BASED ON LABORATORY CORROSION TEST AND THROUGH ACTUAL FIELD EXPERIENCE.

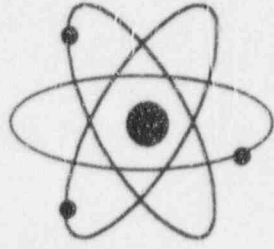
AND XM-19 HAS BEEN SHOWN TO BE AN ACCEPTABLE ALLOY IN BWR ENVIRONMENTS IN THE HOT ROLLED CONDITION THROUGH LABORATORY TESTING CONDUCTED BY GPUN AND NYPA.
- * THE PURPOSE OF THE GPU/NYPA CORROSION TEST PROGRAM IS TO DEMONSTRATE THAT HOT ROLLED XM-19 IS AN ACCEPTABLE ALLOY IN THE THREADED/CREVICED CONDITION.
- * SHORT TERM ACCELERATED CORROSION TESTS WILL BE UTILIZED TO QUALIFY THE MATERIAL.
- * STANDARD CERT TYPE SPECIMENS WILL BE UTILIZED, MODIFIED TO INCLUDE A THREADED/CREVICED SECTION.
- * SPECIMENS WILL BE EXPOSED TO HIGH TEMPERATURE, OXYGENATED WATER.
- * CONTROL SPECIMENS WILL BE UTILIZED AS APPROPRIATE.
- * LOADS WILL BE APPLIED VIA SLOW STRAIN RATE TEST PROTOCOL.

**ALL PROPRIETARY INFORMATION HAS
BEEN REMOVED FROM THIS COPY**

21

PRESENTATION TO NRC

November 4, 1994



Oyster Creek Core Shroud

AGENDA

- | | |
|----------------------|------|
| - INTRODUCTION | GPUN |
| - DESIGN DESCRIPTION | MPR |
| - ANALYSIS | MPR |
| - INSTALLATION | MPR |
| - CONCLUSION | GPUN |

INTRODUCTION

- **GPUN Heavily Involved in Core Shroud Issue Prior to GL 94-03**
- **15R Refueling Outage Background**
- **Results of Shroud Inspection**
- **GPUN's Decision to Install Repair**
- **Project Organization Chart**
- **Documentation**

BWROG VESSEL AND INTERNALS PROJECT (VIP)

GPU NUCLEAR TECHNICAL SUBCOMMITTEE MEMBERSHIP

INTEGRATION (Task 1) - Robert Pinelli (BWROG Chairman)

INSPECTION (Task 2) - Bob Keaten (Executive Lead)
Rick Nademus

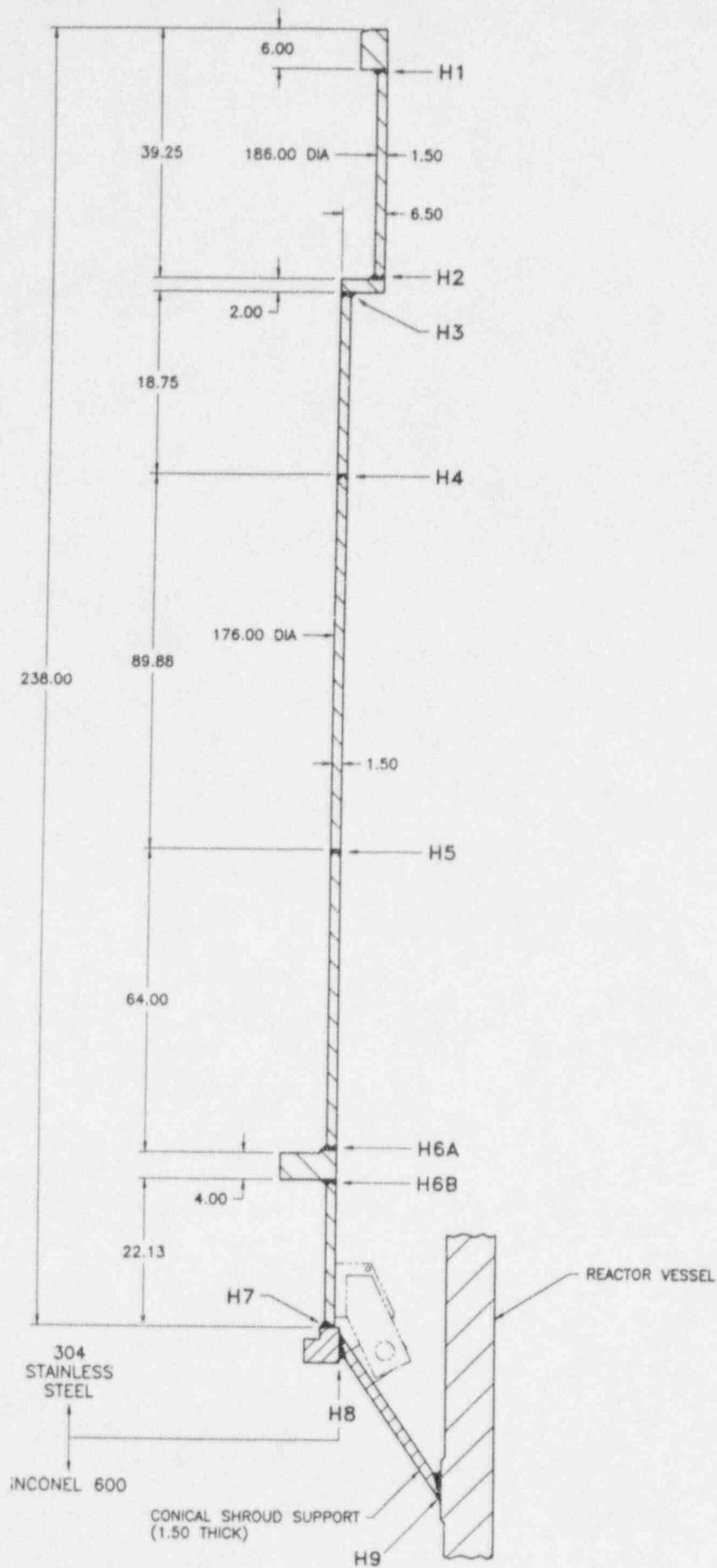
ASSESSMENT (Task 3) - Steve Leshnoff
Nick Trikouros (Resource Specialist)

MITIGATION (Task 4) - Scott Giacobbe

REPAIR (Task 5) - Julian Abramovici
Branch Elam

15R OUTAGE BACKGROUND

- **UT and VT Inspections Performed**
- **Crack Identified at Weld H4
(Final Weld Inspected)**
- **Core Shroud Satisfied All Design
Requirements While In-Service**



OYSTER CREEK SHROUD HORIZONTAL WELDS

DECISION TO REPAIR

OPTIONS CONSIDERED

- (1) - Characterize H4 Cracking and Justify Structural Capability of As-Found Condition for Continued Operation**
 - Expanded Inspection Scope**
 - Core Sample**
 - Additional Analysis (Beyond VIP Criteria)**

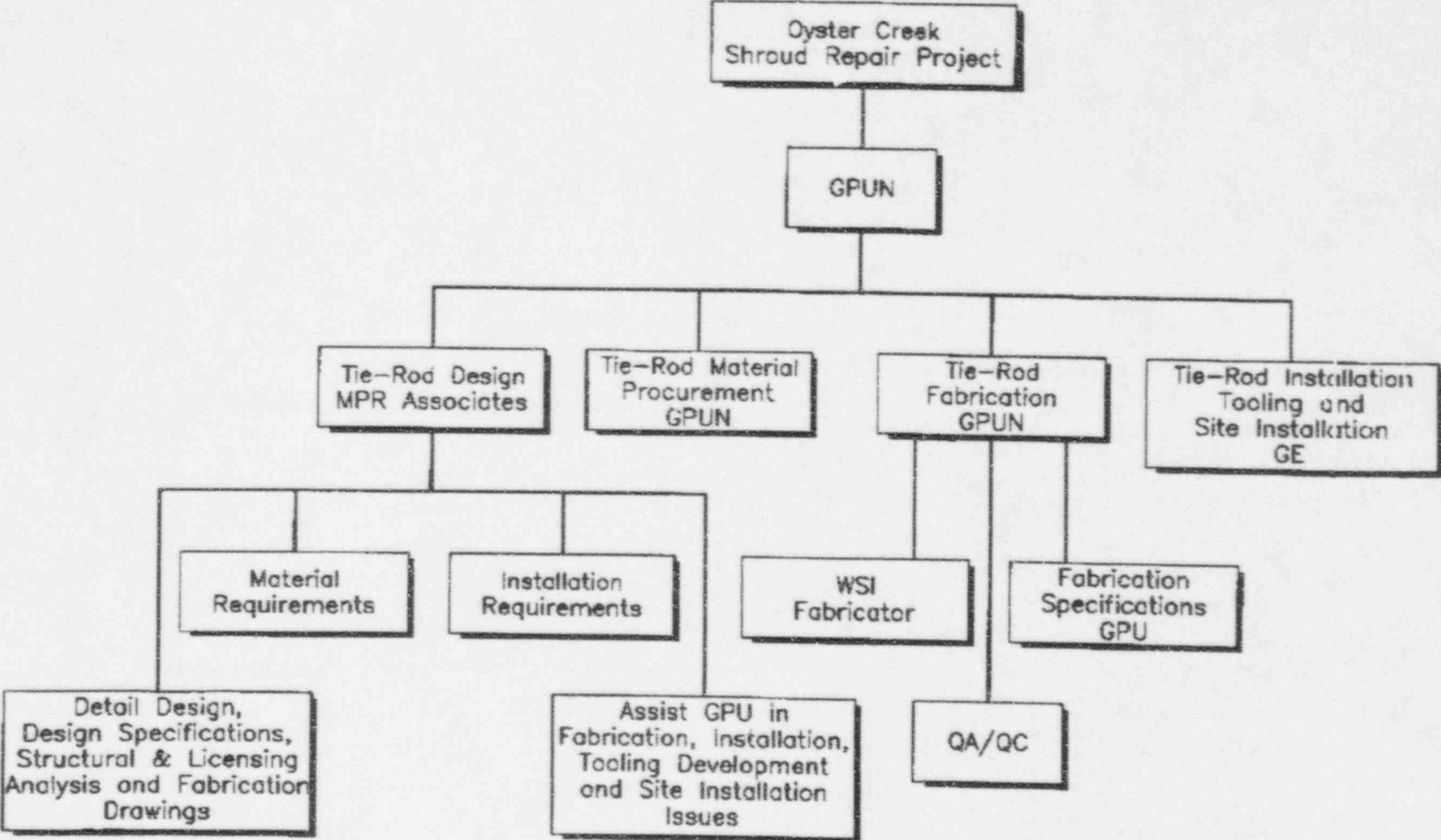
- (2) - Install Tie Rod Stabilizer**
 - 15R Outage Extension**
 - Reduced Future Inspections**
 - Meet VIP Repair Criteria**

DECISION TO REPAIR (con't)

DECISION

On balance, installation of repair was considered to be cost beneficial in view of mitigation of cracking concerns and reduced inspection scope in future outages. Also does not require GPUN to take exception to VIP first level screening approach to resolution of shroud issue.

Project Organization Chart



DOCUMENTATION

- **Repair Design Report/Analysis
(Submitted 11/1/94)**
- **Inspection Results
(Submittal by 11/4/94)**
- **GPUN Safety Evaluation for Operation
(Submittal by 11/9/94)**
- **GPU Nuclear Safety Evaluation
(under 10CFR 50.59) for
Installation is In-Place**
- **NRC SER Required for Restart**

CONCLUSION

- **Current Outage Schedule**

- | | |
|----------------------------------|---------------|
| -- Install 6-7 Tie Rods | 10/19 - 11/5 |
| -- Refueling | 11/5 - 11/11 |
| -- Complete Tie Rod Installation | 11/11 - 11/15 |
| -- Reactor Reassembly | 11/15 - 11/19 |
| -- Initial Criticality | 11/27 |
| -- Turbine On Line | 11/29 |

- **Expedited NRC Review Desired**