Docket File
DPB-016

September 30, 1986

MEMORANDUM FOR: John Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

FROM: John Thoma, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

SUBJECT: MEETING SUMMARY OF OTSG SELECTION CRITERIA

On Monday, September 22, 1986, GPUN met with the NRC staff to discuss criteria for selecting OTSG tubes to be pulled during the Cycle 6 outage. Meeting attendees are provided in enclosure (1). Enclosure (2) contains the handouts provided by GPUN. At the end of the meeting, GPUN was asked to provide specific ECT history data on nine tubes from which at least three will be selected for pulling and laboratory analysis.

ORIGINAL SIGNED BY

John Thoma, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosures:
As stated

cc w/enclosures:
See next page

PBD-6	PBD-6	PBD-6
JThoma;jak	TRoss	RWeller
9/29/86	9/29/86	9/30/86

MEETING SUMMARY DISTRIBUTION

Licensee: GPU Nuclear Corporation

*Copies also sent to those people on service (cc) list for subject plant(s).

Docket File
NRC PDR
L PDR
PBD-6 Rdg
JStolz
JThoma
TRoss
RWeller
OGC-MNBB 9604
EJordan
BGrimes
ACRS-10
NRC Participants
RWright
LMarsh
KWichman
CYCheng
DCrutchfield
JRajan

09/22/86 OTSG Tube Selection Criteria

NAME	ORGANIZATION
John O. Thoma	NRC/NRR/PWR-6
Thierry Ross	NRC/NRR/PWR-6
Julien Abramovici	GPUN
Rick McGoey	GPUN LICENSING
Shelley Kowkabany	GPUN LICENSING
Scott Giacobbe	GPUN - MATERIALS ENGINEERING
Robert Wright	NRR/PWR-B/EB
L. B. Marsh	NRR/PWR-B/EB
Keith Wichman	NRR/PWR-B/EB
C. Y. Cheng	NRR/PWR-B/EB
Dennis Crutchfield	NRR/PWR-B
Jai Rajan	NRR/PWR-B/EB

LABORATORY ANALYSIS

OF TMI-1

OTSG TUBES

GPU NUCLEAR CORPORATION

SEPTEMBER 22, 1986

TUBE PULL PROCESS

1. TUBE RELAXATION (TIG)

2. TUBE CUT (WHIP CUTTER)

3. SEAL WELD REMOVAL

4. TUBE PULL AND SECTION AS NECESSARY

TUBE SELECTION

CANDIDATE IDENTIFICATION:

1. IN SERVICE -OTSG A
2. GOOD SIGNALS (20-50% TW)

CANDIDATE EVALUATION:

1. IGA POTENTIAL - MULTIPLE INDICATIONS IN CLOSE PROXIMITY
2. "GRAIN DROPOUT"- DECREASE IN T.W. CALL WITH INCREASED SIGNAL AMPLITUDE
3. T.W. EXTENT APPROACHING PLUGGING LIMIT
4. REMOVAL CAPABILITY - ADEQUATE SAMPLE LENGTH
5. SCREENED INDICATIONS - UNCONFIRMED BY 8 X 1

CANDIDATES IN ORDER OF PREFERENCE*:

A-141-3 (1, 2, 5)

A-8-45 (1)

A-35-83 (3, 4)

*SUBJECT TO REVISION BASED ON 6R EDDY CURRENT EXAMINATION

LABORATORY ANALYSIS - 3 TUBES

OBJECTIVES:

1. CORRELATE FIELD EDDY CURRENT DATA WITH DESTRUCTIVE ANALYSIS RESULTS

2. FURTHER EVALUATE EDDY CURRENT SENSITIVITY AND ACCURACY

3. DETERMINE EXTENT AND TYPE OF DEGRADATION IN EACH TUBE

4. CHARACTERIZE SURFACE FILM OXIDE BY MICROANALYTICAL TECHNIQUE

LABORATORY ANALYSIS - 3 TUBES
GENERAL REQUIREMENTS

GPUN: (ONSITE)

1. PERFORM IN GENERATOR EDDY CURRENT INSPECTION

2. PERFORM OUT OF GENERATOR EDDY CURRENT INSPECTION EITHER ONSITE OR AT LABORATORY

LABORATORY: (OFFSITE)

1. ANALYZE AT LEAST THREE (3) EC INDICATIONS AS IDENTIFIED BY GPUN.

2. DOCUMENT THE AS-RECEIVED CONDITION OF THE TUBE SAMPLE BY PHOTOGRAPHY.

3. PERFORM EDDY CURRENT TESTING OF TUBE SAMPLES IN ACCORDANCE WITH GPUN PROCEDURES.

4. MACROSCOPICALLY CHARACTERIZE THE SURFACE TOPOGRAPHY AND MORPHOLOGY IN THE IMMEDIATE VICINITY OF EACH EDDY CURRENT (EC) INDICATION.

5. MEASURE CIRCUMFERENTIAL AND/OR AXIAL EXTENT OF EACH CRACK, PIT OR OTHER DEFECTS ON TUBE SECTIONS IDENTIFIED BY GPUN FOR METALLURGICAL EVALUATION.

6. ANALYZE CRACK FACES AND CORRODED AREAS FOR CONTAMINANTS BY ESCA AND AUGER.

SAMPLE SECTIONING

1. SECTIONING SHALL BE DONE TO LIMIT DISTURBANCE OR CONTAMINATION OF THE EDDY CURRENT INDICATION. CARE SHALL BE TAKEN SO AS NOT TO CUT THROUGH ANY EC INDICATION.

2. INITIALLY, SELECTED TUBE SAMPLES SHALL BE SLIT LENGTHWISE TO EXAMINE THEIR ID SURFACES. PHOTOGRAPHS SHALL BE TAKEN WITH A HIGH-QUALITY CAMERA TO RECORD THE GENERAL CONDITION OF INTERNAL SURFACES. CLOSE UPS SHALL BE TAKEN OF ALL EC INDICATIONS, AS WELL AS CORROSION DAMAGE NOT DETECTED BY ECT.

3. THE INSIDE SURFACE OF EACH TUBE SHALL BE EXAMINED FOR CORROSION DAMAGE (CRACKS AND PITS) USING A STEREO MICROSCOPE. PARTICULAR ATTENTION SHALL BE GIVEN TO THE AREA OF THE SUSPECT DEFECT.

4. THE CIRCUMFERENTIAL/AXIAL EXTENT OF EACH EC DEFECT SHALL BE MEASURED UNDER A STEREO MICROSCOPE WITH A RECTICLE MARKED OFF IN MILLIMETER OR MIL UNITS AND RECORDED. FOR THOSE INDICATIONS WHICH ARE NOT GOING TO BE ANALYZED BY MICROCHEMICAL METHODS FLUORESCENT DYE PENETRANT TESTING MAY BE USED TO HIGHLIGHT THE DEFECT FOR DIMENSIONING PURPOSE.

METALLOGRAPHY

1. METALLOGRAPHY SHALL BE PERFORMED ON at least THREE EC INDICATIONS TO DETERMINE THE SIZE AND CHARACTERISTICS OF EACH INDICATION.

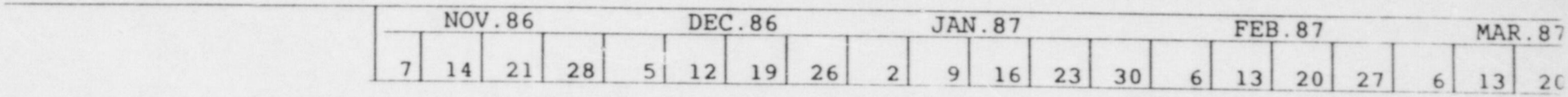
2. METALLOGRAPHIC SPECIMENS SHALL BE GROUND, POLISHED IN SMALL INCREMENTS OF ABOUT 10 MILS OR AS DIRECTED BY GPUN OVER THE ENTIRE LENGTH OF THE DEFECT. MAXIMUM AXIAL AND RADIAL DIMENSIONS SHALL BE RECORDED FOR EACH INCREMENT. MEASUREMENTS SHALL BE MADE WITH A RECTICLE MARKED OFF IN MILLIMETER OR MIL UNITS.

SEM/MICROCHEMICAL ANALYSES

1. ONE EC DEFECT SHALL BE EXAMINED IN THE SCANNING ELECTRON MICROSCOPE.

2. MICRO-CHEMICAL ANALYSES SHALL BE PERFORMED ON THE SURFACE SCALE AND THE MECHANICALLY OPENED IGA FACES. TECHNIQUES SHALL INCLUDE ENERGY DISPERSE X-RAY ANALYSIS (EDX) FOR ELEMENTAL COMPOSITION OF SURFACE SCALE AND DEPOSITS, AND ELECTRON SPECTROSCOPY (ESCA) FOR IDENTIFICATION OF CHEMICAL FORM OF ELEMENTS IN SURFACE FILMS ON THE TUBE INSIDE DIAMETER AND IGA FACES.

PRELIMINARY SCHEDULE - 6R EDDY CURRENT
INSPECTION AND TUBE PULL ACTIVITIES



PLANT SHUTDOWN/ COOLDOWN — 1 NOV. to 5 NOV.

EDDY CURRENT TESTING/ EVALUATION — 13 NOV. to 17 DEC.

SUBMIT TSCR INCLUDING PRELIMINARY ECT RESULTS — 17 DEC. to 19 DEC.

FUEL SHUFFLE COMPLETION (SUCCESS ORIENTED SCHEDULE) — JAN. 17

PULL TUBES — 20 NOV. to 22 NOV.

PACKAGE/TRANSPORT — 22 NOV. to 26 NOV.

LABORATORY ANALYSIS — 26 NOV. to 17 DEC.

PREPARE SUBMITTAL WITH PRELIMINARY RESULTS — 17 DEC. to 7 JAN.