

FORM NIS-1 OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

REPORT ON THE 1995
EDDY CURRENT EXAMINATIONS OF THE
TMI-1 OTSG TUBING

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I.

INTRODUCTION

On September 8, 1995, TMI-1 was shut down for Refueling Outage 11R. During this refueling outage, GPUN performed Eddy Current (ECT) examinations of the Once Through Steam Generators (OTSGs). The scope of the examinations included tubing and sleeves. The examinations were required by TMI-1 Technical Specification 4.19 (Reference 1), commitments to NRC Generic Letter 95-03 "Circumferential Cracking of Steam Generator Tubes" (References 2 and 3) and GPUN engineering requirements. The sleeve examinations were performed in response to Generic Letter 95-03 and to obtain baseline information with the plus point probe.

During Outage 11R 3791 examinations were performed on 3671 tubes and 232 examinations were performed on 128 sleeves in OTSG-A. In OTSG-B, 3783 examinations were performed on 3665 tubes and 256 examinations were performed on 128 sleeves. As a result of eddy current indications evaluated during these examinations one (1) tube in OTSG A and five (5) tubes in OTSG B were plugged. These tubes included:

OTSG/ROW/TUBE	Reason Plugged
A-66-1	This previously identified (ISI) degraded tube (which had been previously sleeved) had an inside diameter (I.D.) indication that increased from 37% through wall (T.W.) in Outage 10R to 43% T.W. in Outage 11R. The location of the indication was 27.5 inches above the 4th support plate (which is outside the installed sleeve area).
B-7-42	This previously identified (ISI) tube had an I.D. indication that increased from 37% T.W. to 40% T.W. between Outages 10R and 11R. The location of the indication was 11.4 inches above the 13th support plate.
B-45-118	This tube was identified during a bounding examination in the 12% Technical Specification Sample Set. A 44% T.W. defect from tube to tube support plate wear was found at the 14th support plate.
B-46-117	This tube was identified during the 12% Technical Specification Sample Set. A 42% T.W. defect from tube to tube support plate wear was found at the 12th support plate.
B-120-42	This previously identified (ISI) degraded tube had an outside diameter (O.D.) volumetric type indication that increased from 35% T.W. in Outage 10R to 44% T.W. in Outage 11R. The location of the indication was 14.5 inches above the 4th support plate.
B-126-58	This tube was identified during the 12% Technical Specification Sample Set. A 43% T.W. I.D. defect was found at a location 29 inches above the 15th support plate.

This brings the total number of tubes plugged in OTSG-A to 1269 and the total number of plugged tubes in OTSG-B is now 378.

Prior to Outage 11R all lower tubesheet active B&W Mark-3 explosive plugs were scheduled to be removed from service during Outage 11R. These plugs were all removed from service by welded plugs. Drip tests performed during the outage identified additional lower tubesheet plugs which required repair. No unplugged tubes leaked on these leakage tests. In OTSG-A one B&W Mark-1 explosive plug was repaired by installing a RWP behind it. In OTSG-B one B&W rolled plug was replaced with a RWP and a Westinghouse plug was replaced with a B&W Inconel 690 rolled plug.

II.

METHODS

A. DATA ACQUISITION

The Eddy Current (ECT) Examinations were performed using the Zetec Miz-30-4 Digital Multi-Frequency Eddy Current System with Eddynet 95 Software. The data was directly recorded to hard disks located in the site analysis area and then spooled to the Benicia, California and Lynchburg, Virginia off-site analysis locations for primary and secondary analysis, respectively. The ECT raw data and analysis were then transferred to optical disks for site storage.

Data acquisition was performed remotely using the B&W "ROGER" in head manipulators and Zetec Model 10D probe pushers. Dual guide tubes were used to the extent practical, however, they were not as productive as had been planned. Noise introduced while running two probes simultaneously prevented consistent use of the two probe system in order to maintain the high data quality standards desired. The dual guide tube also experienced snorkel problems in the upper head similar to those encountered with single guide tubes. Examinations were performed from all four (two simultaneously) heads in order to support required examinations. The bulk of examinations were performed from the upper heads so as to not interfere with plug repairs being simultaneously performed in the lower heads.

The ECT examinations were performed using a variety of techniques and probes which were tailored to address the specific area of interest being examined. The examinations were performed under GPUN surveillance procedure 1300-4B (Reference 4) and are further discussed in the following sections. The specific probe models used are listed on Table II-1.

A.1 Tube Bobbin Coil Examinations

The general tube examination of tubing material was performed from the inside diameter of the tube using a bobbin coil probe. This probe is the most durable and efficient probe available and, when used with the proper ECT instrument, allows examination speeds in excess of 40 inches per second. The data from this probe was used to detect tube wall degradation from such mechanisms as Intergranular Attack (IGA), Intergranular Stress Corrosion Cracking (IGSCC), tube to tube support plate wear and other general degradation. The data was also used to measure tubesheet profiles of tubes which were shop rolled after stress relief and tubes which were known to have gaps (areas of exposed carbon steel tubesheet ligament) in the upper tubesheet above the load bearing portion of the tube in the kinetic expansion. All bobbin coil examinations were full length unless otherwise noted. For the purpose of this report, full length is from the kinetic expansion transition in the upper tubesheet to the roll expansion transition in the lower tubesheet.

All examinations were performed with a speed not to exceed 42.6" per second. The .540" diameter probe was used to examine previously degraded tubes while the .510" probe was used for initial examination of all other tubes. A .490" diameter probe was used to examine areas of two tubes in OTSG-B which would not pass a .510" probe.

Tubes with indications screened during the bobbin coil examinations were re-examined using the logic shown on Figures II-1 and II-2. In summary, this evaluation process ensured that each previously unidentified indication was examined using both a bobbin coil and pancake coil probe (3 Coil MRPC) to characterize the extent of degradation. The basis for this process has been previously documented in References 5,6,7,8 and 9. For previously identified indications, previous 8x1 or MRPC examinations are considered valid unless the bobbin coil indication had changed significantly or a tube to tube support plate wear indication was being evaluated. For ID indications, a change was considered a change in indication classification (i.e., change from

BVC to assigned percent through wall, change from degraded tube to a defective tube, etc.). For OD indications, a change was considered to be an increase of $\geq 10\%$ through wall or an increase of ≥ 1 volt. All flaw like "I" code indications were also examined with the MRPC probe unless side by side comparison of bobbin coil signals with past indications indicated that the signal had not changed. The combined information from these probes was then factored into the disposition of the tube.

A.2 Sleeve Bobbin Coil Examinations

The unexpanded portion of sleeves and underlying parent tube were examined with a .400" bobbin coil probe to detect degradation mechanisms such as IGA, IGSCC, tube to tube support plate wear and other general degradation. This probe was used for examinations because of its durability and higher examination speed. The examinations were performed at a speed not to exceed 12" per second because of the probe's tight fit in the sleeves. All examinations were performed from the lower sleeve end to the upper sleeve end unless otherwise noted.

A.3 Motorized Rotating Pancake Coil (MRPC) Tube Examinations

MRPC examinations of tubes were performed as diagnostic examinations following bobbin coil examinations or for detection of specific degradation types in areas where the higher sensitivity and additional information were desired. Due to the much slower examination speed of the MRPC probe the examinations were limited to specific areas of the tube (such as the 15th support plate, upper tubesheet secondary face, and kinetic expansion transition for lane/wedge tubes, or a specific support for follow-up examinations due to bobbin coil examination results).

A.4 Plus Point Examination of Sleeves

The expansions (including expansion transitions) of sleeves were examined using a Plus Point rotating probe. The examinations were generally performed from the lower sleeve end to the 15th support plate (which includes the two lower expansions) and an area in the upper tubesheet which included the upper expansion. This technique is required for examination of the lower sleeve end and roll expansion regions only however, all acquired data was evaluated by the data analysts. See Figure II-3 for sleeve configuration.

A.5 8 Coil Profilometry Examinations

Several tubes were examined with 8 coil profilometry to provide additional information on lower tubesheet dents detected during bobbin coil examinations. This examination was performed using the tubesheet profile bobbin coil calibration standard, which somewhat limited diameter measurement accuracy, but provided excellent information about the profile of the dents

B. DATA ANALYSIS PROCESS

The eddy current data analysis was performed using GPUN Procedure 5361-NDE-7209.63, Revision 0 (Reference 10). This procedure is based on the recommendations of the EPRI PWR Steam Generator Inspection Guidelines (Reference 11) and also meets the requirements of the TMI-1 Technical Specifications (Reference 1) and the ASME Boiler and Pressure Vessel Code (Reference 12).

B.1 Data Analyst Qualifications

The data analysis process was performed by Rockridge Technologies and BWNT personnel qualified and certified to at least Level IIA, in accordance with their approved program. In addition, these personnel were recognized as Qualified Data Analysts (QDA) as defined in the EPRI PWR Steam Generator Inspection Guidelines, Appendix G. As a supplement to these qualifications, site specific indoctrination and training was attended by all data analyst personnel. The program included both classroom lectures and hands on practice using eddy current data and experience from both TMI and another B&W designed plant. The training covered generic OTSG degradation mechanisms and examination methods and also specifically addressed both the bobbin coil and rotating probe methods used at TMI.

The total indoctrination process encompassed approximately 16 hours and was conducted by a GPUN Authorized analyst. At the completion of the indoctrination, each data analyst was required to pass a performance demonstration prior to analyzing bobbin coil or rotating probe data. The bobbin coil probe and MRPC tests were considered separate tests and a satisfactory score was required for both methods. Appendix I is an outline of the program.

B.2 Data Analysis Sequence

The data analysis process was performed in accordance with the same procedures used for the data analyst indoctrination and training. The process was performed in three (3) parts with at least two (2) separate data analysts evaluating 100% of the data for each examination. The only exception to this was the "profilometry" portion of the examinations (provided for engineering information only). This portion of the data received only a single analysis with graphic printouts provided. The data analysis process included:

1. Primary Analysis: The primary analysis included a 100% evaluation of the ECT data (for tubes, 100% length is the unexpanded portion of tube from the lower tubesheet roll expansion transition to the upper tubesheet kinetic expansion transition) and the recording of all attributes identified in Appendix II. For rotating probes, such as MRPC, this included evaluation of the examined area using strip chart displays, lissajous displays and terrain plots. This analysis included recording the phase angle, percent through wall, voltage, circumferential extent and location of any indications.
2. Secondary Analysis: This analysis was performed in the same manner as the primary analysis.
3. Resolution Analysis: To complete the analysis process, the results of both the primary and secondary analyses are reviewed by the designated lead analyst. This review combines the primary and secondary analyses results and also resolves any discrepancies. For this outage this function was performed by a Level III QDA. In the case of indications which are reported as pluggable by at least one analyst, but resolved as being non-pluggable, a Level III QDA from both Rockridge Technologies and BWNT were required to concur that the indication was not pluggable in nature. This concurrence is documented using a "Overruling Pluggable Indication" report form.

B.3 Data Analysis Software

The data for all examinations was evaluated using Zetec Eddynet Analysis software, Version 27, for primary and secondary analysis because it was most familiar to the production analysts and provided all the required routines necessary for production analysis. Resolution analysis was performed using Zetec Eddynet 95 software, Version 1 because it provided the potential for

additional data evaluation routines on indications of interest. The data saved by either version is unaffected and is considered identical for data management purposes.

B.4 Recording of Indications

Eddy current indications were recorded to permit dispositioning the examination results and to facilitate monitoring the tubes during future examinations. The recorded indications fall into two basic groups, "indications from Tube Wall Degradation" (indications assigned a percent through wall, "BVC" code or an "I" code) and "indications from Possible Damage Precursors" (indications assigned other three letter codes). The specific criteria used to record the indications is dependent upon the type of probe being used. A complete list of all abbreviations and definitions used to classify indications is included as Appendix II.

Indications from Tube Wall Degradation

Generally indications of tube wall degradation are initially recorded during the analysis of the bobbin coil data. When practical, the indications are assigned a "percent through wall" value based on the phase angle of the indications. When the indication cannot be accurately assigned a through wall value, it is assigned a three letter code such as BVC, DNI, DSI, DRI, DTI or NQI which indicates the presence of a possible flaw. In either case, the indication's location, amplitude, signal phase angle and "percent through wall" or three letter code are recorded to permit further evaluation of the tube.

Once the initial screening of the indications is completed, supplemental examinations are performed using the pancake coil probes (3-coil MRPC) if previous data is not available or if the indications have changed. For ID indications, a change was considered a change in indication classification (i.e., change from BVC to assigned percent through wall, change from degraded tube to a defective tube, etc.). For OD indications, a change was considered to be an increase of $\geq 10\%$ through wall or an increase of ≥ 1 volt. All bobbin coil flaw like "I" code indications were also examined with the MRPC probe unless side by side comparison of bobbin coil signals with past indications indicated that the signal had not changed. The data from examinations is analyzed and indications are recorded using three letter codes which indicate the approximate geometry of degradation or, for tube to tube support plate wear indications only, a percent through wall is assigned. In general, indications are recorded as SAI, SCI, MCI, MAI, SVI, or MVI. These codes indicate whether the indication is single (S) or multiple (M), circumferential (C) or axial (A), and whether or not a volumetric (V) condition is present. Like the bobbin coil indications, these codes are recorded along with the locations, amplitude and phase angle of the signal.

An exception to the above flow can occur when only a MRPC examination is scheduled for a tube and an indication is identified by this examination. A bobbin coil examination is then scheduled for those areas where degradation history indicates an accurate through wall measurement can be made with the bobbin coil probe. The actual analysis process is performed in the same manner as described above.

Indications from Possible Damage Precursors

The analysis of eddy current data also identifies indications which are not attributed to tube wall degradation. These indications may be the result of irregularities in the tube wall profile (IDC), changes in the magnetic permeability (PVN), denting (DNT), or other changes in the electrical impedance of the tube not related to tube wall degradation. These indications are recorded for information only and do not necessarily require follow-up examinations.

Indications Recorded During Specialized Examinations

The data analysis for specialized examinations such as MRPC probes requires a process which is different than the bobbin coil examinations. In the case of many of these examinations, the data is evaluated to confirm a previously recorded indication. As such, the data is recorded to support dispositioning a given indication by length, size, depth or location on a case by case basis in accordance with the analysis procedure (Reference 10).

Indication Locations

The locations of the ECT indications are recorded to identify their "elevation" or "axial location" in the OTSG tubes. For free span indications, the locations are recorded in inches above "+" the tubesheet surfaces or tube support plate center. For indications located within or adjacent to the tube support plates, the indications are recorded as "+" or "-" from the tube support plate center. The relative location of the tubesheets and tube support plates are shown in Figure II-4.

B.5 Data Management

Two separate data management systems were used to assure all indications were documented and dispositioned appropriately. The examination results were obtained from the EddyNet report files and loaded into the data management systems used during the outage. The Rockridge Data Management system was updated by Rockridge personnel while the ISIS Data Management system was updated by GPUN personnel. Final results reports from the two systems were then compared to address any inconsistencies between the two systems.

B.6 Dispositioning of Results

Generally the combined results of the bobbin coil and rotating probe examinations are used to disposition the individual tubes. This dispositioning process may involve data which was analyzed by several different data analysts. Since the various techniques are complimentary and do not necessarily supersede one another, the individual evaluations of each technique are not changed to reflect the disposition of the tube.

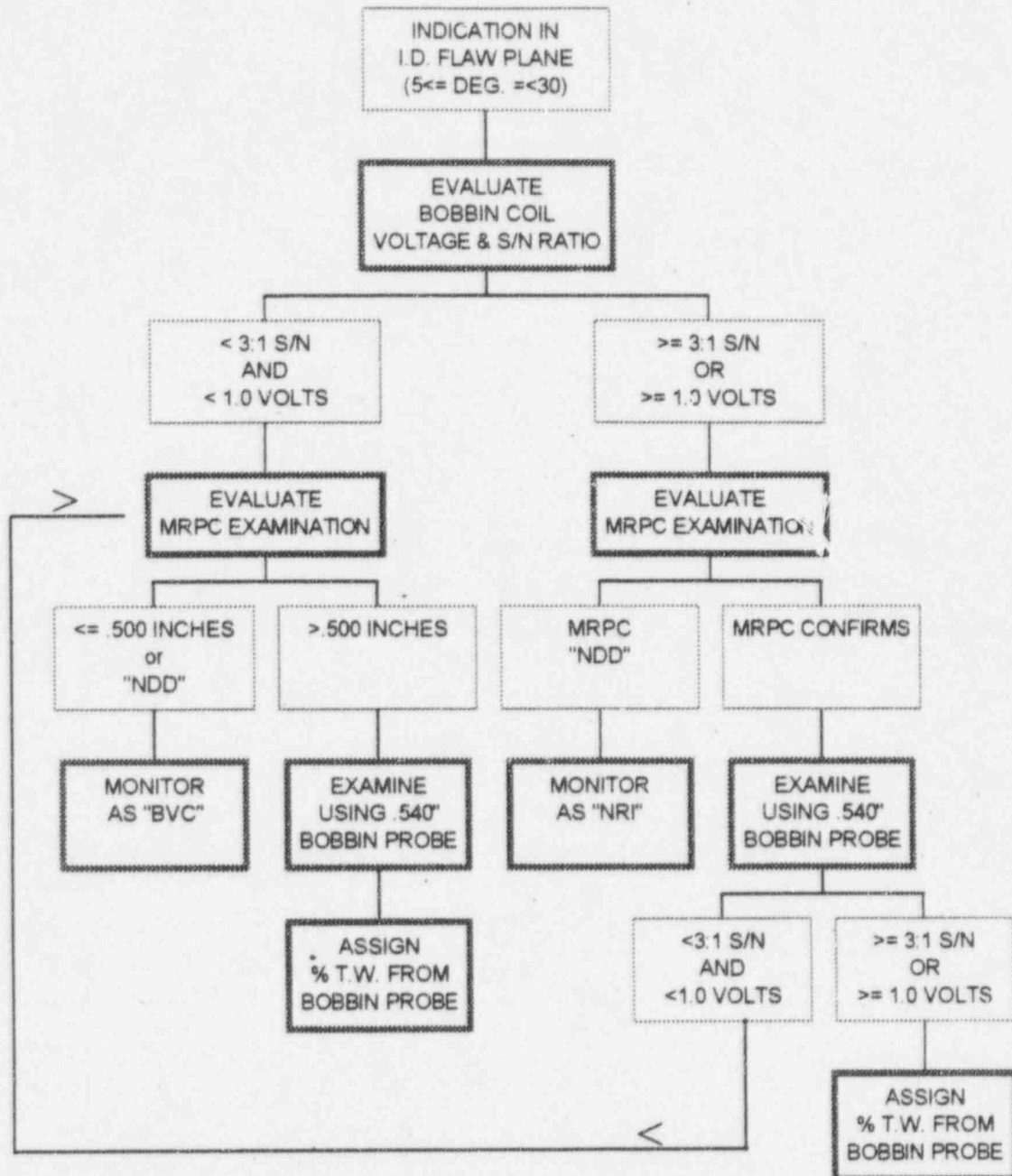
C. RECORDS

The results of the eddy current examinations are considered to be permanent records. The following records have been transmitted to Information Services for retention.

- Optical discs containing the raw data and the primary, secondary and resolution results.
- Printed copies of the primary, secondary and resolution results.
- Printed copies of "Overruling Pluggable Indications" forms.
- Printed copy of the data base containing the complete examination results.
- Copies of the site orientation and indoctrination forms.
- Copies of the data analyst performance demonstrations.
- Computer diskettes containing the ISIS data base used to disposition the tubes.

FIGURE II-1

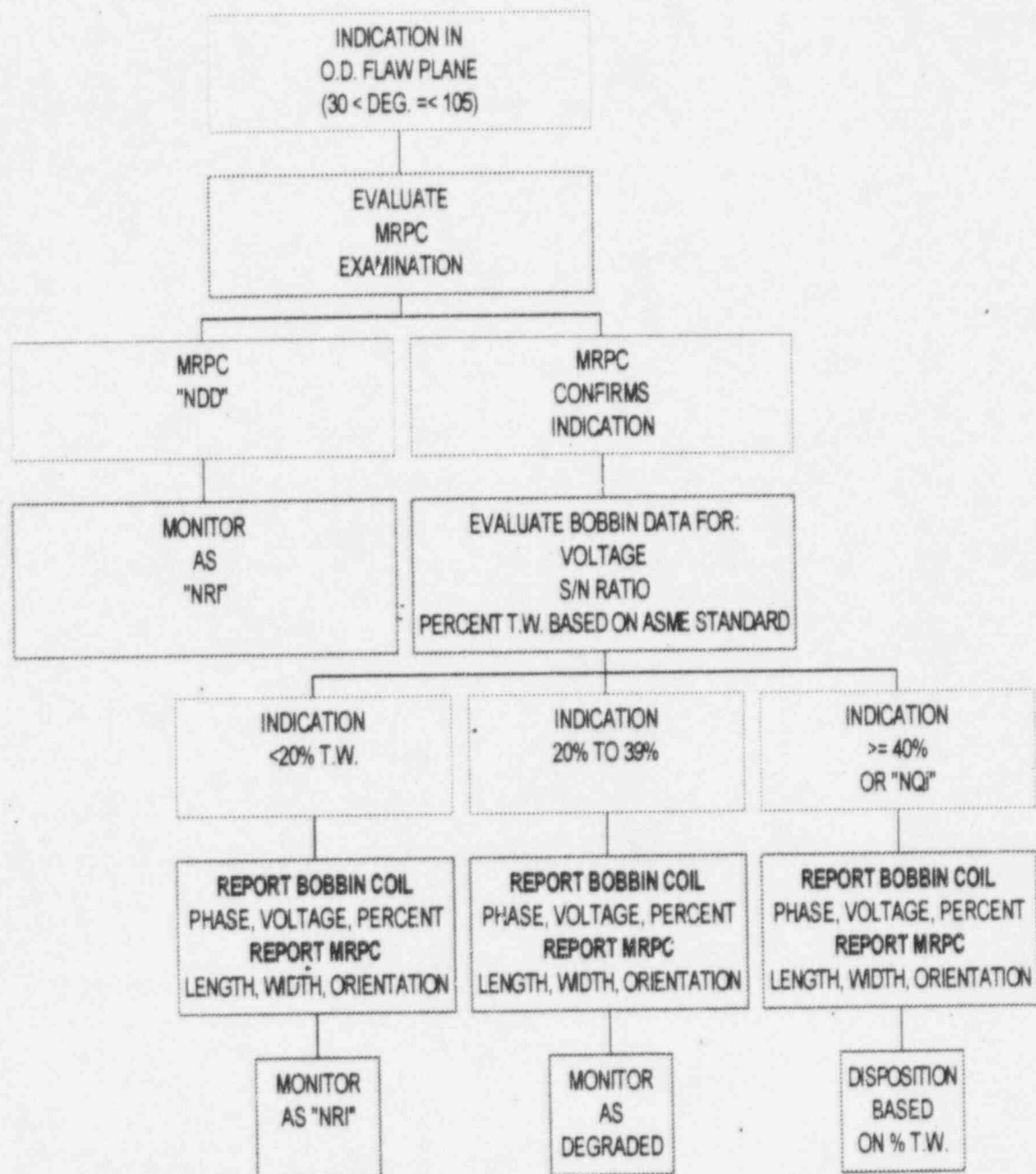
ID INDICATION DISPOSITION FLOW CHART



"NRI" is defined as a non-reportable indication.

FIGURE II-2

OD INDICATION DISPOSITION FLOW CHART



"NRI" is defined as a non-reportable indication.

FIGURE II-3
B&W ROLLED SLEEVE

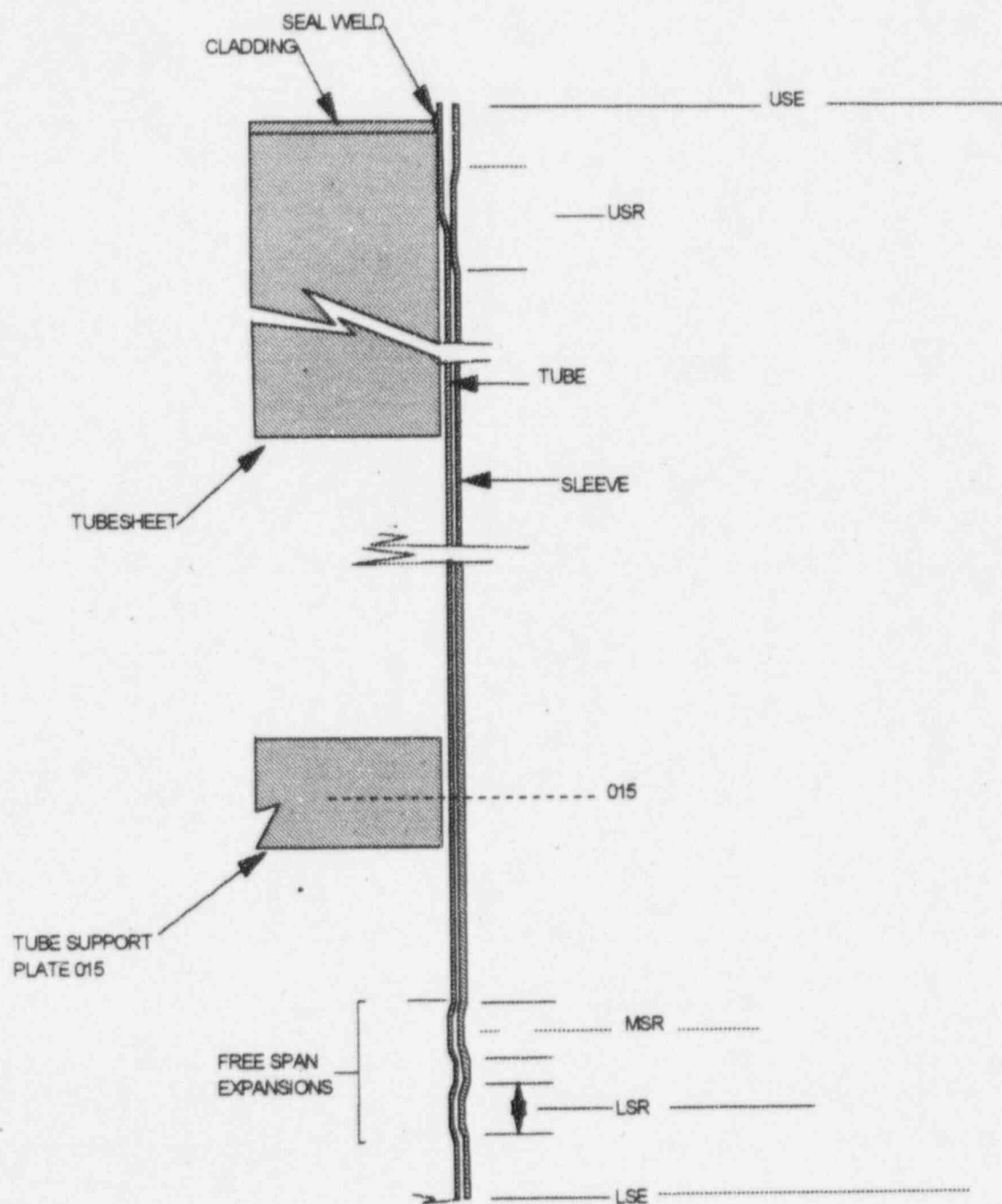


FIGURE II-4

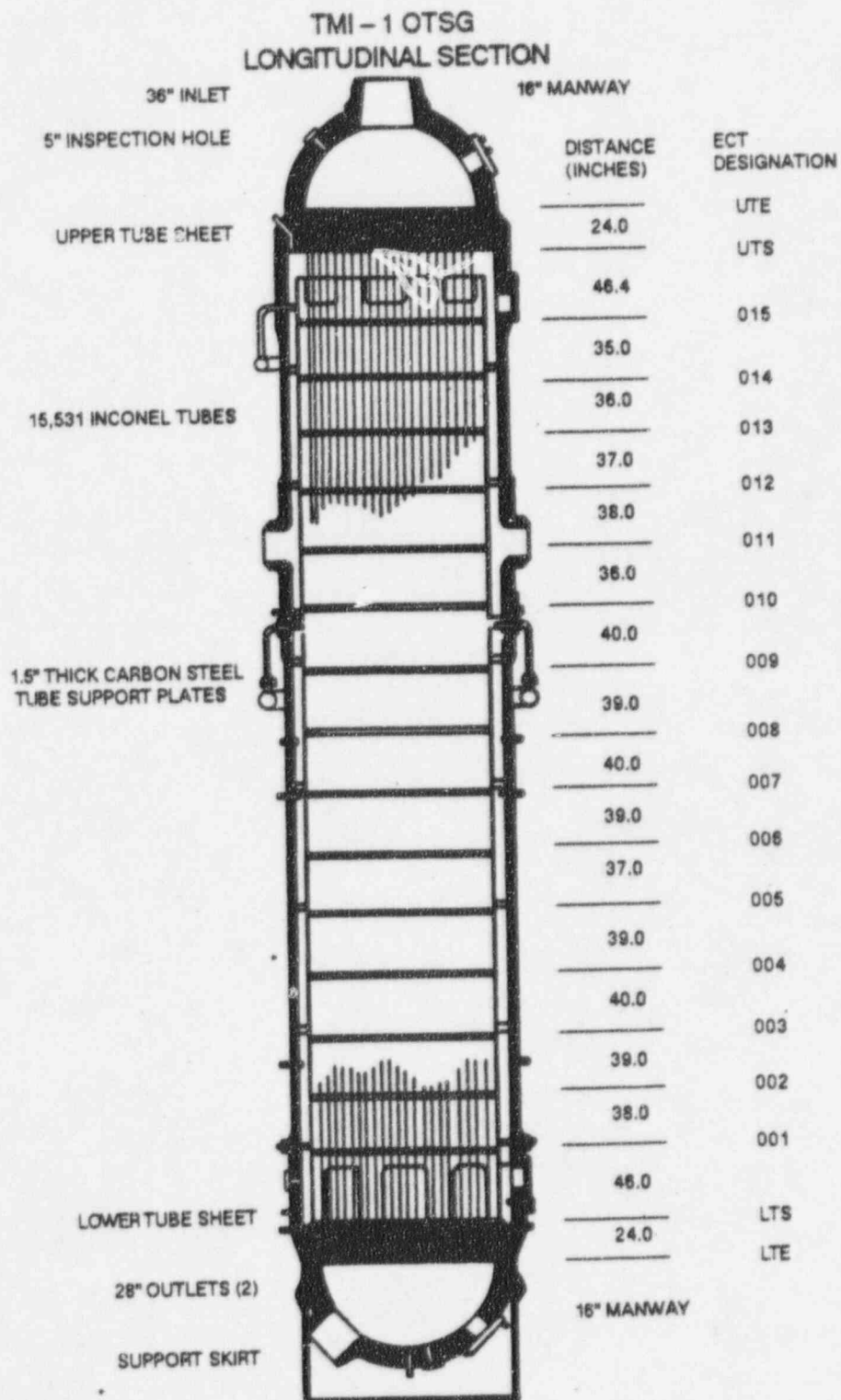


TABLE II-1
LISTING OF PROBES USED DURING OUTAGE 11R

<u>PROBE NAME</u>	<u>PROBE MODEL *</u>	<u>COIL DESIGN</u>	<u>COIL DIAMETER/ LENGTH (inches)</u>	<u>USE</u>
Bobbin	A-400MULC	Bobbin Differential	.400	Sleeve Freespan
Bobbin	A-490MULC/HF	Bobbin Differential	.490	Obstructed Tubes
Bobbin	A-510-LC/NF/M/HF	Bobbin Differential	.510	Tubes without indications Profilometry Exams
Bobbin	A-510-MULC/HF	Bobbin Differential	.510	Tubes without Indications Profilometry Exams
Bobbin	A-540-LC/NF/M/HF	Bobbin Differential	.540	Tubes with Indications
Bobbin	A-540-MULC/HF	Bobbin Differential	.540	Tubes with Indications
MRPC	D#3392-3-C	Pancake 2-Coil Absolute	.080, .115	Dented Tubes
MRPC	MRPC-520-3C/52PH	Pancake 3-Coil Absolute	.115	Lane/Wedge Tubes with Indications
MRPC	D#3331-2-A	Plus Point Differential	.127	Sleeve End and Sleeve Rolls
Dent Profile	8-490-DP/TS	Pancake 8 Coil	.092	Dent Profiling

*** ALL PROBES WERE MANUFACTURED BY ZETEC INC.**

III.

OUTAGE 11R EXAMINATION CATEGORIES AND RESULTS

The location of the tubes and sleeves examined during Outage 11R are shown on Figures III-1 through III-4. The examinations were performed in three major groups, based on the examination requirement:

- A. Examinations required by Technical Specification 4.19 or Generic Letter 95-03.
- B. GPUN elective examinations

The groups are further divided into specific categories. When classifying the tubes by examination category, some tubes may satisfy the criteria for more than one category and may need to be examined with more than one probe (in which case the tube will appear in more than one category). If the tube meets the criteria for multiple categories requiring examination with the same probe, the tube is placed into a category which gives precedence to the Technical Specification required examinations. Previously degraded tubes have the highest priority followed by Technical Specification required samples followed by GPUN elective examinations. This section defines the examination scope, purpose, selection criteria, and examinations results by category.

A. SCOPE SELECTION

During Outage 11R GPUN chose to initially perform bobbin coil examinations on 21% of the total number of tubes in each OTSG. In order to define an examination results classification in accordance with Technical Specification 4.19 GPUN assigned tubes to technical specification samples or other groups prior to the Outage. Sample expansion was then based on the results of each examination using Technical Specification Interpretation 4.19 (Reference 1).

Tables III-1 through III-4 provide the examination categories, quantities, probe size and reason for examination.

TABLE III-1
BOBBIN COIL TUBE EXAMINATION SCOPE¹

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
ISI ISI-10R	.540	290	39	These tubes have been previously categorized as degraded per Technical Specification (TS) 4.19 and are required to be examined each inspection per TS 4.19.2.a.1. These are part of the 3% initial sample designated as "S" in TS 4.19. These were the first tubes chosen for examination (had the highest scheduling priority).
ISI	.510	2	1	These tubes were scheduled for examination with this probe during Outage 11R because of obstructions with the .540 probe. The degraded portion of these tubes was examined with the .540 probe.
ISI-UNSLV	.540	2	0	These tubes were scheduled for examination for the same reason as the "ISI" Data Set above. The "UNSLV" designation indicates that this is a degraded sleeved tube. The unsleeved section of this tube was examined with this probe.
3%-TS	.510	182	429	These tubes were second in the examination scheduling sequence after the "ISI" tubes above. All inservice tubes not selected above were open for selection during this step. These tubes were randomly chosen by the ISIS Data Management System random selection process. These tubes along with tubes above comprised the initial 3% sample minimum of 465 tubes. Tubes with the additional "BVC" and "GAP" designations are part of the 3% sample but were also examined for a second reason listed later in this table. Tubes with the additional "UNSLV" designation are sleeved tubes. This examination was performed on the unsleeved portion of the tube only. The sleeved portion of the tube was examined using appropriate sleeve examination techniques.
3%-TS-BVC		1	0	
3%-TSGAP		1	0	
3%-UNSLV		0	8	

¹ Tubes selected for the 6% and 12% samples were systematically chosen to better utilize time and radiation dose reduction devices such as dual guide tubes. The population was evenly distributed over the tube array to the extent practical. All inservice tubes in about every fifth row were scheduled for examination. Within each row tubes were randomly assigned to the 6% or 12% sample to retain the "Random" selection for assigning the Inspection Results Category required by TS-4.19.2. During the Outage 11R all tubes required to be examined with a specific probe were examined in a sequence to minimize time and personnel radiation exposure.

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
6%-TS 6%-TSRERL 6%-TSGAP	.510	932 1 0	958 0 1	These tubes comprise the 6% Technical Specification sample and were chosen as described in Footnote 1. Tubes with the "RERL" were also scheduled for examination for the reason described in the "REROLL" Data Set listed below. Tubes with the "GAP" designation were also scheduled for examination for the reason listed in the "GAP" Data Set below.
12%-TS 12%-TSGAP 12%-TSRERL	.510	1943 1 3	1899 0 0	These tubes comprise the 12% Technical Specification sample population and were chosen as described in Footnote 1. Tubes with the "RERL" designation were also scheduled for examination for the reason listed in the "REROLL" Data Set listed below. Tubes with the "GAP" designation were also scheduled for examination for the reason listed in the "GAP" Data Set below.
12%-TS	.540	1	0	This tube is part of the 12% Technical Specification sample population described above but was examined with a .540 diameter probe to minimize personnel radiation exposure by not changing to a .510 diameter probe.
12%-TS-S	.490	0	2	These tubes were scheduled for examination with this probe because of obstructions limiting passage of the .510" diameter bobbin coil probe. All data acquired with the larger diameter probe was evaluated up to the obstructed area.
BVC-10R BVC-UNSLV	.510	8 0	8 1	These are tubes with small amplitude (<1.0 volts), low signal to noise ratio and short arc length (<.500") indications which are monitored to assure no change in tube condition is occurring.
HI-PLG-DNS	.510	19	0	OTSG-A has an area of high plug density which is being monitored by the B&W Owners Group to assure high plug density is not adversely affecting inservice tubes in this area.
NRI-UNSLV	.540	1	0	This tube previously had a bobbin coil indication recorded as $\geq 20\%$ through wall. Subsequent MRPC examination of this area identified no recordable indication and the tube was dispositioned as acceptable. This examination was scheduled to assure no changes are occurring.
ADR	.510	0	1	A previous examination of this tube had identified an absolute drift signal in this tube. This tube was examined to assure no degradation is present in this tube.

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
GAP	.510	5	8	These tubes were examined for normal tube condition and an upper tubesheet profile to assure no corrosion products are present, in the gap area (areas of exposed carbon steel tubesheet ligament in the upper tubesheet above the load bearing portion of the tube in the kinetic expansion), which could be denting the tube.
WEAR	.510	0	2	These tubes were scheduled to monitor condition of tubes with indications indicative of tube to tube support plate wear less than 20% through wall.
NRI	.510	0	4	These tubes previously had a bobbin coil indication recorded as $\geq 20\%$ through wall. Subsequent MRPC examination of this area identified no recordable indication and the tube was dispositioned as acceptable. This examination was scheduled to assure no changes are occurring.
EXTRA	.510	4	7	These tubes were inadvertently examined. They were not part of the original examination scope.
EXTRA	.540	1	0	This tube was inadvertently examined. It was not part of the original examination scope.
REROLL	.510	6	0	These tubes were examined for normal degradation and tubesheet profilometry. The tubes were rerolled in the lower tubesheet roll expansion during the shop fabrication hydrostatic test process. The profilometry data was obtained to aid in determining what, if any, rerolling process took place.
BOUND	.540	2	26	These tubes were expanded scope to bound areas where degradation was not previously detected. The examinations were performed in accordance with Technical Interpretation 4.19.
CONFIRM	.540	0	1	This examination was performed to size an inside diameter originating indication detected with the .510" diameter bobbin coil probe and confirmed with the MRPC probe.
MRPC-CONF	.540	23	1	During MRPC examinations of the Lane/Wedge tubes very small volumetric type, inside diameter originating, indications were detected in the tubesheet region of some tubes. The bobbin coil probe examination results were used to aid in dispositioning these tubes.
WET	.540	1	0	This tube location exhibited a wet area during the lower tubesheet drip test. The tube was examined to confirm the wet area was not due to tube leakage.

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
LEAK-UNSLV	.510	0	2	These tube locations exhibited a wet area during the lower tubesheet drip test. The unsleeved portions of these tubes were scheduled for examination as a result of the drip test to confirm the wet area was not due to a leaking tube. The sleeved portion of these tubes were scheduled for appropriate examinations under the normal examination program.

TABLE III-2
 MRPC-TUBE EXAMINATIONS

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
BORDER-SLV	.520 3 Coil	77	79	These tubes were examined as part of a commitment to NRC Generic Letter 95-03 to assure the current sleeve zone is appropriate. The area of examination was the 15th tube support plate, upper tubesheet secondary face and the kinetic expansion transition. These examinations were performed as a commitment to Generic Letter 95-03 (Reference 3).
LANE/WEDGE	.520 3 Coil	216	217	These tubes were examined to assure the current sleeve zone is appropriate and that no Lane/Wedge type degradation is occurring. The area of examination was the 15th tube support plate, upper tubesheet secondary face and the kinetic expansion transition. These examinations were performed as a commitment to Generic Letter 95-03 (Reference 3).
CONFIRM	.520 3 Coil	51	34	These examinations were performed at specific locations where bobbin coil examinations identified tube wall degradation or distorted signals which could be indicative of tube wall degradation. These examinations confirmed the extent of suspected tube wall degradation. The results of these examinations also provided information required to determine repair methods if necessary.
DENT	.520 3 Coil	8	44	These examinations were performed at specific areas where the bobbin coil examinations identified tube diameter reductions. All areas above the lower tubesheet secondary face with recorded diameter reductions were examined. All lower tubesheet secondary face diameter reductions greater than 40 volts with bobbin coil examination were examined along with a large sample of lesser voltage diameter reductions.
DENT	.520 2 Coil	0	1	This tube was examined at a tube diameter reduction which prevented passage of the .520" diameter 3 Coil probe.
REROLL	.520 3 Coil	10	0	During the shop fabrication hydrostatic test these tubes were rerolled in the lower tubesheet tube expansion area because of leaks. These tubes were examined, in the rerolled area, because they have a higher susceptibility to stress corrosion cracking because the rerolling occurred after full steam generator stress relief. These examinations were performed as a commitment to Generic Letter 95-03 (Reference 3).

TABLE III-3
SLEEVE EXAMINATIONS

DATA SET	PROBE SIZE/TYPE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
ISI-SLV	.400 BOBBIN	2	0	The unexpanded portion of the sleeve and parent tube were examined with this probe to detect any general degradation. The unsleeved portion of these tubes had areas of acceptable degradation identified during previous examinations. These tubes are required to be examined each refueling outage by Technical Specification 4.19
SLEEVE	.400 BOBBIN	102	120	The unexpanded portion of the sleeve and parent tube were examined with this probe to detect any general degradation. An approximate 50% sample of sleeves were chosen for examination.
3%-SLV	.400 BOBBIN	0	8	The unexpanded portion of the sleeve and parent tube were examined with this probe to detect any general degradation. These locations were chosen during the random sample selection process to comply with Technical Specification 4.19 sample size and selection.
ISI-SLV	.400 +-POINT	2	0	The lower sleeve end and roll expansions (including transitions) were examined with this probe because of its higher sensitivity to degradation in these locations. These tubes were examined for the same reasons as described for the "ISI-SLV" bobbin coil examinations above.
3%-SLV	.400 +-POINT	0	8	The lower sleeve end and roll expansions (including transitions) were examined with this probe because of its higher sensitivity to degradation in these locations. These tubes were examined for the same reasons as described for the "3%-SLV" bobbin coil examinations above.
SLEEVE	.400 +-POINT	124	120	The lower sleeve end and roll expansions (including transitions) were examined with this probe because of its higher sensitivity to degradation in these locations. These tubes were examined for the same reasons as described for the "SLEEVE" bobbin coil examinations above. In OTSG-A 5 of the 124 sleeves had examinations completed on only the upper roll expansion or lower sleeve end to upper lower roll expansion because of schedule limitations and the absence of indications found in the remainder of the extensive examination sample.

PROBE SIZE/TYPE	DATA SET	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
.400 +-POINT .	EXTRA	2	0	The lower sleeve end and roll expansions (including transitions) were examined with this probe because of its higher sensitivity to degradation in these locations. These locations were not originally scheduled for examination but were examined inadvertently.

TABLE III-4

8 COIL PROFILOMETRY EXAMINATIONS

DATA SET	PROBE SIZE	OTSG-A TUBES EXAMINED	OTSG-B TUBES EXAMINED	REASONS FOR SELECTION
DENTS	.490	0	10	To profile lower tubesheet secondary face dents observed during bobbin coil examinations. Tubes of different voltages were selected in an effort to understand extent of denting. This data was collected to obtain information on dent morphology and was not used in dispositioning of any tube for continued service.

B. TUBE EXAMINATION RESULTS

1. DEGRADED TUBE EXAMINATIONS

DATA SETS: ISI, ISI-10R, ISI-UNSLV

TRENDING OF ID INDICATIONS

To monitor for evidence of continuing degradation of identified indications, the 1995-11R examination results were compared to the 1993-10R examination results. The indications included in this comparison were previously recorded indications with through wall values of 16% or greater (see note on Table III-6) in both 1995-11R and 1993-10R. A summary and a complete listing of the indications are shown in Table III-5 and Appendix III respectively.

In OTSG-A, 168 indications met the above criteria. The mean change in the indications was +0.80% of wall thickness between 10R and 11R (standard deviation 6.31% of wall). The amplitude of these indications showed a mean change of -0.30 volts (standard deviation 0.40 volts). During Outage 11R a new calibration standard was introduced into the examination system to accommodate newer examination equipment. This standard affected voltage measurements when compared to the standard used during Outage 10R. The mean change in voltage, when using a voltage correction to compare Outages 10R to 11R more correctly is -0.15 volts. The correction factor was established by measuring the voltage differences between the old and new standard for ten different cal groups. The correction factor for each cal group was determined by the formula (correction factor = old standard voltage/new standard voltage). The mean for these corrections was used to establish the correction factor to be used for statistical purposes. A 1.41 volts correction factor (Outage 11R voltage x 1.41 = 11R corrected voltage) was applied for those indications affected.

In OTSG-B, 29 indications met the criteria. The mean change in the indications was +1.72% of wall thickness between 10R and 11R (standard deviation 6.80% of wall). The amplitude of these indications showed a mean change of -0.05 volts (standard deviation 0.19 volts). A new calibration standard was also introduced into the examination system for OTSG-B also, but voltage comparisons between the new and old standards revealed that no corrections for data comparison were required.

When combined, the average change per indication for both OTSGs was +0.93% of wall (standard deviation 6.39% of wall). The mean amplitude change was -0.26 volts (standard deviation 0.40 volts).

To determine the significance of these changes, the data was compared to similar evaluations performed during previous examinations. Based on this comparison (see Table III-6), in which the mean change has been both positive (apparent increase in the depth of the indications) and negative (apparent decrease in the depth of the indications), the identified changes are considered to be within the qualified repeatability of the ECT process, and do not indicate a trend of ongoing degradation. This variability is discussed in Reference 6.

TABLE III-5
COMPARISON OF INDICATIONS IN DEGRADED TUBES

	NUMBER OF TUBES		
	OTSG A	OTSG B	TOTAL
Total Degraded Tube Population	292	39	331
Tubes Included in Comparison *	118	20	138
Indications in Comparison	168	29	197
Tubes Excluded from Comparison **	174	19	193

* Comparison includes only indications >16% T.W. in 10R and 11R.

** Excluded indications were not recorded as > 16% T.W. in 10R or 11R.

% Through Wall Comparison

OTSG	Number Indications	No. Inds % T.W. Increased 10R-11R	No. Inds % T.W. Decreased 10R-11R	No. Inds % T.W. Unchanged 10R-11R	Mean Change % T.W. 10R- 11R	Std Deviation % T.W. 10R-11R
A	168	73	56	39	+0.80	6.31
B	29	15	7	7	+1.72	6.80
Both A & B	197	88	63	46	+0.93	6.39

Amplitude Comparison

OTSG	Number Indications	No. Inds Volts. Increased 10R-11R	No. Inds Volts Decreased 10R-11R	No. Inds Volts Unchanged 10R-11R	Mean Change Volts 10R-11R	Std Deviation Volts 10R-11R
A	168	42 *	125 *	1	-0.30 *	0.42 *
B	29	12	16	1	-0.05	0.19
Both A & B	197	54	141	2	-0.26	0.40

* After calibration standard voltage correction, 59 indications increased in voltage and 108 indications decreased in voltage. Corrected mean change in volts is -0.15 volts and corrected voltage standard deviation is 0.33.

TABLE III-6

COMPARISON OF STATISTICAL EVALUATION TO PREVIOUS EVALUATIONS

Period	Number Indications	Mean Change % T.W.>	STD Deviation % T.W.	Mean Change Volts	STD Deviation Volts
1984/1986-5M	152	-2.6	6.1	-0.2	0.3
1986-5M/1986-6R	118	+1.1	6.6	+0.0	0.2
1986-6R/1988-7R	119	+2.6	5.5	+0.2	0.3
1988-7R/1990-8R	291	-0.2	7.43	-0.25	0.35
1990-8R/1991-9R	229	-2.0	6.96	+0.07	0.31
1991-9R/1993-10R	207	-0.6	6.62	+0.16	0.28
1993-10R/1995-11R	197	+0.9	6.39	-0.26	0.40

Previous data extracted from GPUN TDR 1134, Revision 0 (Reference 13)

NOTE: For Outages 1984 through 1988-7R, all indications were examined with both the 8x1- and .540" bobbin coil probes and only indications >20% T.W. and confirmed by both probes were included. This criteria conservatively biased the data by eliminating indications which showed a decrease in % T.W., thereby dropping below 20% T.W., or were affected by the variability of the 8x1-ABS probe. For 1990-8R through 1995-10R, all indications $\geq 16\%$ T.W. were included, which allows for the full variability of the process and accounts for the increased number of indications.

RESULTS

The results of the 11R examinations of the "Degraded" tubes were consistent with previous examination results. The majority of the previously identified indications showed no evidence of change from previous examinations. In three cases (one in OTSG-A and two in OTSG-B), the reported percent through wall values exceeded the established plugging criteria. All three tubes were removed from service by plugging.

OTSG-A

One (1) sleeved tube (66-1) had an inner diameter initiated indication of 43% through wall located 27.5 inches above the 4th support plate (outside the sleeved portion of the tube). The indication was noted as 37% through wall with a slightly larger voltage during Outage 10R so, in accordance with Technical Specification 4.19, is not considered in the inspection results count of defective tubes for results categorization (less than 10% through wall growth). One tube (67-130) had a dent at the 15th support plate which was examined with MRPC and dispositioned as no detectable degradation. One tube had a less than 40 volt dent at the lower tubesheet. Indications identified during Outage 11R but not previously recorded are detailed in Table III-7.

TABLE III-7

OTSG-A INDICATIONS NOT PREVIOUSLY IDENTIFIED

Row/Tube No.	Axial Location	Description/Information
2-25	013 +26.3	BVC indication with no detectable degradation with MRPC.
6-48	014 -0.7	Bobbin coil DSI confirmed as 13% T.W. tube to tube support plate wear by MRPC.
8-2	UTS +5.4	BVC indication with no detectable degradation with MRPC.
32-81	015 +36.0	Freespan 20% T.W. ID indication confirmed as volumetric by MRPC. Indication was present in previous examination but with poor signal to noise ratio. Because this is a newly defined degraded indication this tube is applied to the total of newly degraded tubes.
37-27	013 +21.0	BVC indication with no detectable degradation with MRPC.
42-114	013 +0.7	Bobbin coil DSI confirmed as 16% T.W. tube to tube support plate wear by MRPC.
57-65	015 +38.2	Freespan 37% T.W. ID indication with no detectable degradation with MRPC.
57-65	015 +41.2	Freespan 33% T.W. ID indication with no detectable degradation with MRPC.
57-65	015 +43.4	BVC indication with single volumetric indication confirmed by MRPC.
57-65	015 +44.8	BVC indication with no detectable degradation with MRPC.
119-107	010 +13.8	Freespan 36% T.W. OD indication with no detectable degradation with MRPC.
124-100	012 +21.4	BVC indication with confirmed single volumetric indication with MRPC. Indication was present in previous examination but with poor signal to noise ratio.
124-100	013 +2.4	BVC indication with confirmed single volumetric indication with MRPC. Indication was present in previous examination but with poor signal to noise ratio.
139-67	014 +0.7	DSI indication confirmed as 11% T.W. tube to tube support plate wear by MRPC.
139-71	015 +1.2	NQI indication with no detectable degradation with MRPC.
139-71	015 +1.5	Freespan 19% T.W. OD indication with no detectable degradation with MRPC.
141-60	015 +1.7	Freespan 27% T.W. OD indication with no detectable degradation with MRPC.
147-7	006 +17.1	Freespan 20% T.W. ID indication confirmed as a single volumetric indication with MRPC. Indication was present in previous examination with poor signal to noise ratio. Because this is a newly defined degraded indication this tube is applied to the total of newly degraded tubes.
149-30	012 +6.7	BVC indication with confirmed single volumetric indication with MRPC. Indication was present in previous examination with poor signal to noise ratio.

OTSG-B

Two tubes (7-42 and 120-42) had indications which were $\geq 40\%$ through wall. Tube 7-42 had a 40% through wall inner diameter indication located 11.4 inches above the 13th support plate. During Outage 10R this indication measured 37% through wall with a voltage essentially identical to that measured in Outage 11R. A one degree change in phase angle between Outages 10R and 11R resulted in this indication's increase to 40% through wall. Tube 120-42 had a 44% outer diameter indication located 14.5 inches above the 4th support plate, during Outage 10R this indication measured 35% through wall with a slightly smaller voltage. In accordance with Technical Specification 4.19, these indications are not considered in the inspection results count of defective tubes for results categorization (less than 10% through wall growth). Two tubes had less than 40 volt dents at the lower tubesheet.

Indications identified during Outage 11R but not previously recorded are detailed in Table III-8.

TABLE III-8

OTSG-B INDICATIONS NOT PREVIOUSLY IDENTIFIED

Row/Tube No.	Axial Location	Description/Information
79-47	004 +24.9	NQI indication with no detectable degradation with MRPC.

2. TECHNICAL SPECIFICATION TUBE SAMPLE EXAMINATIONS

DATA SETS: 3%-TS, 3%-TS-BVC, 3%-TSGAP, 3%-UNSLV, 6%-TS, 6%-TSGAP, 6%-TSRERL, 12%-TS, 12%-TSGAP, 12%-RERL, BOUND

RESULTS

A summary of the Technical Specification 4.19 required examinations are listed below in Table III-9. All Technical Specification required examinations were completed and repairs were completed before the steam generators were returned to service.

TABLE III-9

TECHNICAL SPECIFICATION EXAMINATION RESULTS SUMMARY

SAMPLE	TUBES EXAMINED		TUBES DEGRADED		TUBE DEFECTIVE		RESULTS CATEGORY	
	OTSG-A	OTSG-B	OTSG-A	OTSG-B	OTSG-A	OTSG-B	OTSG-A	OTSG-B
3%*	476	476	2**	0**	1***	2***	C-1	C-1
6%	933	959	0	1	0	0	C-1	C-1
12%	1948	1899	1	3	0	3	C-1	C-2

* The 3% sample was comprised of previously degraded tubes and additional tubes that were randomly chosen to comprise more than 3% of the total number of tubes. Total number of tubes is 15531.

- ** Only newly defined indications which alone would cause a tube to be categorized as "Degraded" are included in this number. Previously recorded indications $\geq 20\%$ through wall are not included in this number.
- *** These tubes were all repaired for indications $\geq 40\%$ through wall. The indications all exhibited $\leq 10\%$ through wall growth since the last inspection. In accordance with Technical Specification 4.19 these tubes are not counted in the Inspection Results percentage of tubes defective.

3% SAMPLE TUBES

OTSG-A

The 3% random sample of tube examinations in OTSG-A identified no newly degraded or defective tubes. These results combined with examinations of the previously degraded tubes (two newly degraded tubes, see Table III-7 tubes 32-81 and 147-7) resulted in an inspection results categorization of C-1 per Technical Specification 4.19.

One tube exhibited a relatively small dent (25 volts) at the lower tubesheet with no evidence of degradation. Tubes with wall loss and "I" code type indications are detailed below in Table III-10.

TABLE III-10

OTSG-A 3% SAMPLE INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
17-6	015 +45.1	NQI indication evaluated as no detectable degradation by MRPC.
79-82	011 +18.7	14% T.W. outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
70-34	009 +0.8	DSI indication confirmed as 16% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
75-56	005 -0.8	DSI indication evaluated as no detectable degradation by MRPC.

OTSG-B

The 3% random sample of tube examinations in OTSG-B identified no newly degraded or defective tubes. These results combined with examinations of the previously degraded tubes (no newly recorded degradation) resulted in an inspection results categorization of C-1 per Technical Specification 4.19.

Fourteen tubes exhibited recordable dents at the lower tubesheet with no evidence of degradation. Three of these tubes were examined with MRPC and no degradation was detected. Tubes with wall loss and "I" code type indications are detailed below in Table III-11.

TABLE III-11

OTSG-B 3% SAMPLE INDICATIONS OF INTEREST

Row/Tube	Axial Location	Description/Information
15-70	008 -0.7	DSI indication confirmed as 10% T.W. tube to tube support plate wear by MRPC. This indication was subsequently assigned a 13% T.W. dimension by bobbin coil examination. This tube will be monitored as an NRI tube during Outage 12R.
117-96	007 +0.7	DSI indication confirmed as 5% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
118-38	UTS +1.9	17% T.W. inside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
131-79	LTE +17.3	20% outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.

6% SAMPLE TUBES

OTSG-A

The 6% random sample of tube examinations in OTSG-A identified no newly degraded or defective tubes so this sample was categorized as C-1 per Technical Specification 4.19. Eleven tubes had recordable lower tubesheet dents with no evidence of degradation. The dent in tube 99-78 was examined with MRPC because it had a 65 volt response. No degradation was identified with the MRPC examination.

Tubes with wall loss and "I" code type indications are detailed in Table III-12 below:

TABLE III-12

OTSG-A 6% SAMPLE INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
11-24	008-0.7	DSI indication confirmed as 11% tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
15-30	LTS -0.2	DTI (Distorted Tubesheet Indication) evaluated as no detectable degradation by MRPC.
43-98	003 +0.7	DSI indication confirmed as 8% tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
48-85	LTS +3.0	NQI indication evaluated as no detectable degradation by MRPC.
67-11	LTE +19.0	12% outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
104-6	009 -0.2	DSI indication evaluated as no detectable degradation by MRPC.
118-57	015 +16.2	NQI indication evaluated as no detectable degradation by MRPC.

Row/Tube No.	Axial Location	Description/Information
137-45	LTS -1.5	NQI indication evaluated as no detectable degradation by MRPC.

OTSG-B

The 6% random sample of tube examinations in OTSG-B identified one degraded and no defective tubes so this sample was categorized as C-1 per Technical Specification 4.19. Thirty-nine tubes had recordable lower tubesheet dents with no evidence of degradation. Thirteen of these dents were examined with MRPC and no degradation was identified with the MRPC examinations. One ding indication was identified in tube 66-46 and examined with MRPC with no detectable degradation noted.

Tubes with wall loss and "I" code type indications are detailed in Table III-13 below.

TABLE III-13

OTSG-B 6% SAMPLE INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
NEWLY DEGRADED TUBES		
111-114	010 +0.6	DSI indication confirmed as 25% T.W. tube to tube support plate wear by MRPC. This tube will be added to the Outage 12R degraded tube population.
OTHER WALL LOSS AND "I" CODE TYPE INDICATIONS		
16-43	004 +0.8	DSI indication confirmed as 8% T.W. tube to tube support plate wear by MRPC. A 12% through wall bobbin coil dimension was assigned after MRPC confirmation. This tube will be monitored as an NRI tube during Outage 12R.
51-66	LTS +2.8	13% T.W. outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
91-86	015 +0.8	DSI indication evaluated as no detectable degradation by MRPC.
121-102	009 +0.7	DSI indication evaluated as no detectable degradation by MRPC.
146-29	009 -0.4	DSI indication confirmed as 14% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.

12% SAMPLE TUBES

OTSG-A

The 12% random sample of tube examinations in OTSG-A identified one degraded and no defective tubes so this sample was categorized as C-1 per Technical Specification 4.19. Twenty-one tubes had recordable lower tubesheet dents with no evidence of degradation. All dents ≥ 40 volts (five total) were examined with MRPC and no degradation was detected.

Tubes with wall loss and "I" code type indications are detailed in Table III-14 below:

TABLE III-14

OTSG-A 12% SAMPLE INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
NEWLY DEGRADED TUBES		
127-90	011 -0.1	DSI indication confirmed as 13% T.W. tube to tube support plate wear by MRPC. A 20% T.W. bobbin coil through wall measurement was assigned after confirmation by MRPC. This tube will be monitored as a degraded tube during Outage 12R.
OTHER WALL LOSS AND "I" CODE TYPE INDICATIONS		
6-15	008 +0.8	DSI indication confirmed as 11% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
6-33	005 +0.9	DSI indication confirmed as 17% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
25-51	015 +32.3	NQI indication evaluated as no detectable degradation by MRPC.
34-25	006 +0.7	DSI indication confirmed as 12% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
71-81	LTS +42.0	NQI indication evaluated as no detectable degradation by MRPC.
90-20	015 -0.0	23% T.W. inside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
85-22	004 +19.3	NQI indication evaluated as no detectable degradation by MRPC.
90-62	LTS +1.0	20% T.W. outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as an NRI tube during Outage 12R.
137-39	014 +0.1	DSI indication confirmed as 8% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as an NRI tube during Outage 12R.

OTSG-B

The 12% random sample of tube examinations identified three degraded tubes due to tube to tube support plate wear. The 12% random sample of tube examinations in OTSG-B, also initially identified two defective tubes so this sample was categorized as C-2 per Technical Specification 4.19. The required actions required for a C-2 categorization were completed (bounding tube examinations and plugging of defective tubes was completed). The initial 3%, 6% and 12% samples complied with the sample requirements for a C-2 categorization except for bounding examinations. Bounding examinations performed around one tube (46-117) identified one additional defective tube (45-118) which was counted towards the total count of defective tubes in the 12% sample per Technical Specification Interpretation 4.19 (Reference 1). Bounding examinations around tube 45-118 identified no newly degraded or defective tubes. Seventy-four tubes had recordable lower tubesheet dents with no evidence of degradation. Twenty-seven of these dents were examined with MRPC and no degradation was detected. These twenty seven dents were comprised of all dents ≥ 40 volts and an additional 18 dents less than 40 volts.

Tubes with wall loss and "I" code type indications are detailed in Table III-15 below:

TABLE III-15

OTSG-B 12% SAMPLE INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
DEFECTIVE TUBE INDICATIONS		
46-117	011 -0.7	DSI indication confirmed as 23% T.W. tube to tube support plate wear by MRPC.
46-117	012 -0.7	DSI indication confirmed as 42% T.W. tube to tube support plate wear by MRPC. This tube was removed from service for this indication.
46-117	014 +0.6	DSI indication confirmed as 31% T.W. tube to tube support plate wear by MRPC.
45-118	011 -0.7	DSI indication confirmed as 12% T.W. tube to tube support plate wear by MRPC.
45-118	012 -0.7	DSI indication confirmed as 22% T.W. tube to tube support plate wear by MRPC.
45-118	014 +0.6	DSI indication confirmed as 31% T.W. tube to tube support plate wear by MRPC. A 44% T.W. bobbin coil dimension was assigned to this indication after confirmation with MRPC. This tube was removed from service for this indication.
126-58	015 +29.0	27% T.W. inside diameter indication confirmed as a single volumetric indication with MRPC. Follow-up examination with .540 bobbin coil probe assigned a 43% T.W. dimension to this indication. This tube was removed from service for this indication.
NEWLY DEGRADED TUBES		
1-7	007 -0.6	DSI indication confirmed as 10% T.W. tube to tube support plate wear by MRPC. A 27% T.W. bobbin coil dimension was assigned to this indication after confirmation with MRPC. This tube will be monitored as a degraded tube during Outage 12R.
31-103	014 +0.7	DSI indication confirmed as 20% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as a degraded tube during Outage 12R.
56-125	005 +0.9	DSI indication confirmed as 16% T.W. tube to tube support plate wear by MRPC. A 20% T.W. bobbin coil dimension was assigned to this indication after confirmation with MRPC. This tube will be monitored as a degraded tube during Outage 12R.
OTHER WALL LOSS AND "I" CODE TYPE INDICATIONS		
11-38	003 +0.4	DSI indication evaluated as no detectable degradation with MRPC.
26-60	015 +0.7	DSI indication evaluated as no detectable degradation with MRPC.
36-110	011 -0.7	DSI indication evaluated as no detectable degradation with MRPC.
46-50	004 +9.9	NQI indication evaluated as no detectable degradation with MRPC.
Row/Tube No.	Axial Location	Description/Information
46-118	011 -0.8	DSI indication confirmed as 7% T.W. tube to tube support plate

		wear by MRPC. This tube will monitored as a NRI tube during Outage 12R.
56-57	LTS +1.6	NQI indication evaluated as no detectable degradation with MRPC.
66-57	010 +1.5	18% T.W. outside diameter indication evaluated as no detectable degradation by MRPC. This tube will be monitored as a NRI tube during Outage 12R.
91-55	015 +36.3	NQI indication evaluated as no detectable degradation with MRPC.
91-85	015 +0.8	DSI indication evaluated as no detectable degradation with MRPC.
121-94	007 -0.6	DSI indication evaluated as no detectable degradation with MRPC.
126-4	LTE +4.0	NQI indication evaluated as no detectable degradation with MRPC.
126-94	008 +0.8	DSI indication evaluated as no detectable degradation with MRPC.
151-5	012 +0.0	DSI indication evaluated as no detectable degradation with MRPC.

3. LANE/WEDGE EXAMINATIONS

DATA SETS: LANE/WEDGE, BORDER-SLV

RESULTS

The examinations identified no evidence of high cycle fatigue or precursors to high cycle fatigue. These examinations completed commitments in the GPUN response to Generic Letter 95-03 (Reference 3).

During examinations in both OTSGs very small inside diameter initiated indications were identified with the MRPC examinations. These were single volumetric indications (not crack like) with sizes consistent with IGA identified during previous tube pull specimen analysis (Reference 14). Subsequent examinations with the .540" bobbin coil probe determined they were not of a significant nature, not crack like based on MRPC and because they were either not detectable or were classified as BVC indications (small amplitude indications with low signal to noise ratio). Tables III-16 and III-17 below detail the results of these examinations for OTSG-A and OTSG-B, respectively.

TABLE III-16

OTSG-A LANE/WEDGE AND BORDER MRPC EXAMINATION RESULTS

Row/Tube No.	Axial Location	Description/Information
73-29	UTS +5.3	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-33	ETL +0.0	Inside diameter SVI indication with no detectable degradation with .540 bobbin coil exam. This indication also exhibited MRPC phase angles, length and width dimensions similar to indications located outside the expansion transition area which were dispositioned as acceptable a with .540" bobbin coil examination. This tube will be monitored as a BVC tube during Outage 12R
74-35	ETL +0.0	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam. This indication also

Row/Tube No.	Axial Location	Description/Information
		exhibited MRPC phase angles, length and width dimensions similar to indications located outside the expansion transition area which were dispositioned as acceptable with a .540" bobbin coil examination.. This tube will be monitored as a BVC tube during Outage 12R.
74-36	ETL -0.2	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-54	ETL -0.4	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-54	UTS +0.2	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-54	UTS +4.2	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-55	UTS +0.1	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
74-55	UTS +1.7	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
77-57	UTS +0.7	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-36	ETL -0.4	Inside diameter indication SVI indication with .540 bobbin coil examination confirming a BVC indication (0.46 volt indication with less than 3 to 1 signal to noise ratio). This tube will be monitored as a BVC tube during Outage 12R.
78-40	UTS +5.0	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-56	UTS +5.4	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-58	UTS +5.6	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-59	ETL -0.7	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-59	UTS +3.8	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-59	UTS +4.3	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
78-20	UTS +5.4	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-24	UTS +2.1	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-25	UTS +2.2	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-26	UTS +5.1	Inside diameter indication SVI indication with .540 bobbin coil examination confirming a BVC indication (0.78 volt indication with less than 3 to 1 signal to noise ratio). This tube will be monitored as a BVC tube during Outage 12R.
79-29	UTS +0.6	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-29	UTS +2.9	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.

Row/Tube No.	Axial Location	Description/Information
79-40	UTS +3.9	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-41	ETL -0.4	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
79-47	UTS +3.3	Inside diameter indication SVI indication with .540 bobbin coil examination confirming a BVC indication (0.88 volt indication with less than 3 to 1 signal to noise ratio). This tube will be monitored as a BVC tube during Outage 12R.
79-52	UTS +2.0	Inside diameter indication SVI indication with .540 bobbin coil examination confirming a BVC indication (0.65 volt indication with less than 3 to 1 signal to noise ratio). This tube will be monitored as a BVC tube during Outage 12R.
80-26	UTS +5.9	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
80-27	UTS +0.6	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
80-28	UTS -0.4	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
80-30	UTS +0.2	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.
80-30	UTS +4.1	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.

TABLE III-17

OTSG-B LANE/WEDGE AND BORDER MRPC EXAMINATION RESULTS

Row/Tube No.	Axial Location	Description/Information
79-59	ETL -0.5	Inside diameter indication SVI indication with no detectable degradation with .540 bobbin coil exam.

4. MISCELLANEOUS TUBE EXAMINATIONS

DATA SETS: SEE BELOW

RESULTS

A number of small tube populations were examined for various reasons such as commitments to Generic Letter 95-03 (Reference 2), recommendations from previous examinations or Engineering request. This section of the report will provide the results of these examinations by OTSG and Data Set group.

OTSG-A

Data Set: HI-PLG-DNS

Nineteen tubes were initially examined, with bobbin coil probes, in an area of high plug density to monitor what affect the large number of plugged tubes has on adjacent tubes remaining in service. Table III-18 below provides details on wall loss and "I" code type indications recorded. Three tubes in this data set exhibited measurable tube to tube support plate wear.

TABLE III-18

OTSG-A HIGH PLUG DENSITY INDICATIONS OF INTEREST

Row/Tube No.	Axial Location	Description/Information
134-74	014 +0.6	DSI indication confirmed as 26% T.W. tube to tube support plate wear by MRPC. Following confirmation with MRPC a 26 % through wall dimension was assigned to the bobbin coil examination. This tube will be monitored as a degraded tube during Outage 12R.
139-66	014 +0.5	DSI indication confirmed as 12% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as a NRI tube during Outage 12R.
140-70	014 +0.9	DSI indication confirmed as 26% T.W. tube to tube support plate wear by MRPC. Following confirmation with MRPC a 26 % through wall dimension was assigned to the bobbin coil examination. This tube will be monitored as a degraded tube during Outage 12R.

Data Set: REROLL

Ten tubes were examined with 3 Coil MRPC to identify if any cracking exists in shop post stress relief roll expansions. These expansions were all located in the lower tubesheet (cold leg) of this steam generator. No degradation was identified in the tubes examined. These tubes were also examined full length with bobbin coil probes and no degradation was identified.

The shop manufacturing records are not clear on the exact location for some of these tubes so all inservice tubes where shop records indicated a reroll could likely exist were examined. One reroll was positively identified with both MRPC and bobbin coil tubesheet profile techniques. Two additional tubes exhibited MRPC data indicative of an additional rolling process.

Data Set: GAP

Five (seven when including 3% and 12% sample tubes) tubes were examined with bobbin coil probes. One tube, 110-26, had a 17% T.W. inside diameter indication which MRPC evaluated as no detectable degradation. This tube will monitored as a NRI tube during Outage 12R.

Bobbin coil tubesheet profilometry analysis indicated there was no denting present in the area of exposed tubesheet (no corrosion product buildup reducing tube diameter). Detailed profilometry results were provided to Engineering by interoffice memorandum (Reference 15).

Data Set: BVC-10R

Eight (nine when including the 3% sample tubes) tubes were examined with bobbin coil probes. Tube 4-30 was the only tube which exhibited a "BVC" type indication. A "BVC" indication was located at UTS +6.5 and was evaluated as no detectable degradation by MRPC. No other degradation type indications were recorded.

Data Set: NRI-UNSLV

The unsleeved section of tube 72-11 was examined with bobbin coil as a follow-up commitment for a previously unconfirmed outside diameter indication. The indication was documented as an INR indication during Outage 11R.

Data Set: EXTRA

Five tubes were inadvertently examined with bobbin coil probes. Tube 73-38 had a DSI indication at 008 -0.8 which was confirmed as 10% T.W. tube to tube support plate wear by MRPC. This tube will be monitored as a NRI tube during Outage 12R. Tube 136-67 had a DSI indication at 014 +0.7 which was evaluated as no detectable degradation by MRPC.

Data Set: WET

One tube was examined with a bobbin coil probe and no detectable degradation was identified.

OTSG-B

Data Set: GAP

Eight (nine when including the 6% sample tubes) tubes were examined with bobbin coil probes. No tubes exhibited any degradation.

Bobbin coil tubesheet profilometry analysis indicated there was no denting present in the area of exposed tubesheet (no corrosion product buildup reducing tube diameter). Detailed profilometry results were provided to Engineering by interoffice memorandum (Reference 15).

Data Set: BVC-10R

Nine tubes were examined with bobbin coil probes. One tube (67-1) exhibited a BVC indication at 012 +28.9 and will be monitored during Outage 12R. The indication was unchanged from Outage 10R so no MRPC examination was required. No other degradation type indications were recorded.

Data Set: NRI

Four tubes were examined from this data set. Tube 26-31 had a 12% T.W. outside diameter indication recorded at 007 +17.1 and tube 79-65 had a 18% T.W. outside diameter indication recorded at LTS +2.1. Both indications were considered unchanged from Outage 10R when MRPC examinations confirmed no detectable degradation. These two tubes will be monitored as NRI tubes during Outage 12R.

Data Set: EXTRA

Five tubes were inadvertently examined with bobbin coil probes. No detectable degradation was identified in these tubes.

Data Set: LEAK-UNSLV

One tube was examined with a bobbin coil probe and no detectable degradation was identified.

Data Set: ADR

One tube was examined with a bobbin coil probe and no detectable degradation was identified.

Data Set: WEAR

Two tubes were examined with bobbin coil probes. One tube (80-12) had a DSI indication recorded at 009 -0.2 which was confirmed as 15% through wall tube to tube support plate wear by MRPC. A bobbin coil through wall dimension of 31% was assigned after confirmation by MRPC. This tube will be monitored as a degraded tube during Outage 12R.

Data Set: DENTS

Ten tubes were examined with 8 coil profilometry to obtain additional information on lower tubesheet dents. The results of these examinations were forwarded to Engineering by memorandum (Reference 16).

5. SLEEVE EXAMINATIONS

DATA SETS: ISI-SLV, SLEEVE, EXTRA, 3%-SLV

RESULTS

OTSG-A

No detectable degradation was recorded for both the bobbin coil and +-point examinations.

OTSG-B

No detectable degradation was recorded for either the bobbin coil and +-point examinations.

C. DISCUSSION OF RESULTS

1. Inner Diameter Tube Indications

Since 1981, GPUN has characterized the location and distribution of indications in the OTSGs by a bulk comparison of the recorded indications. This characterization includes both newly detected and previously detected indications and is intended to confirm that the population of indications is stable and the condition of the OTSGs has not changed significantly since the previous examination. The data from the 1982 examinations is presented to show the contrast between the examination prior to and after the 1982 repairs. See Figures III-5 to III-8.

The breakdown of the indications shows they are located towards the top of the tube bundle in both OTSG-A and OTSG-B. In OTSG-A, the indication rates are higher towards the periphery of the tube bundle, while in OTSG-B the distribution is more uniform.

A characterization of the size of the indications shows the relative amplitude continues to remain small, with 88 percent of the indications less than 2.0 volts. The indications continue to be part through wall with 260 of the 263 indications, which could be assigned through wall values, recorded as less than 40 percent through wall.

The circumferential extent was recorded with respect to the orientation of the indication. Of the 72 indications recorded with the MRPC probe, all were recorded as single volumetric (i.e. not "crack like") indications (SVI) indicating there was no significant axial or circumferential extent.

During this outage bobbin coil examinations, in tubes not considered previously degraded, identified 4 inside diameter indications in 4 tubes. A comparison of these indications to previously identified indications shows they are consistent in both size and location to indications identified in other tubes.

During this outage, MRPC examinations were performed on the Lane/Wedge tubes instead of the previously used 8x1 array probe. The MRPC probe uses a 0.115" diameter coil instead of a 0.187" diameter coil plus provides essentially 360 degree circumferential coverage with more consistent sensitivity than the 8x1 probe. The smaller coil design provides a slightly improved response to very small indications. Improved uniform sensitivity increases the chance that very small indications will be detected. These two improvements significantly increase the probability of detection of very small volumetric indications that were not previously detected. During Outage 11R MRPC examinations of the Lane/Wedge and Sleeve Border tubes identified 34 SVI indications in 27 tubes. All of these indications were examined with a 0.540" bobbin coil probe and evaluated as no detectable degradation or BVC (less than 1 volt and less than 3 to 1 signal to noise ratio). Based on these factors and results from previous tube pulls, these were judged to be a result of the 1981 sulfur intrusion and not an indication of a new or continuing degradation. The reason for identification during Outage 11R is the result of the improved examination technique. This conclusion is further supported by the rate of occurrence in the OTSGs (OTSG-A has a higher rate of occurrence than OTSG-B).

2. WEAR INDICATIONS

Eddy current examinations performed during Outage 11R identified 31 (18 in OTSG A and 13 in OTSG B) tubes with tube to tube support plate wear. During Outage 11R all bobbin coil distorted support plate indications were examined with the 3 coil MRPC examination technique. Support plate locations with confirmed indications, similar to wear indications from pulled tubes at other OTSGs, were sized using a voltage calibration curve from the MRPC probe. Outage 11R was the first outage in which this sizing technique was used at TMI-1. A bobbin coil through wall measurement was, however, recorded where the signal permitted meaningful measurement. The more conservative through wall measurement was used for determining repair requirements and classification of results (classifying the indication as an imperfection or degradation).

Examinations in OTSG-A identified three newly degraded tubes due to tube to tube support plate wear (no defective tubes due to wear). Examinations in OTSG-B identified two defective and six newly degraded tubes due to tube to tube support plate wear. Figure III-9 provides a tubesheet plot of all wear indications recorded in OTSG A during Outage 11R and Figure III-10 provides the same for OTSG B. Review of the plots shows that the wear is generally limited to the lane/wedge or locations outside the tie-rods. No pattern of tubesheet location relative to support plate elevation could be established. Wear indications were identified at support plate locations as low the 3rd support plate. Table III-19 below provides a breakdown of recorded wear indications by support plate elevation. Where more than one elevation exhibited wear, each elevation was counted as a location (two tubes in OTSG B had wear at three locations and were removed from service).

Table III-19
Number of Occurrences of Wear By Support Location

Support Plate Location	Number of Occurrences OTSG-A	Number of Occurrences OTSG-B
015	0	0
014	6	3
013	1	0
012	0	2
011	1	3
010	1	1
009	1	2
008	3	1
007	1	2
006	1	0
005	2	2
004	0	1
003	1	0

Support Plate Location	Number of Occurrences OTSG-A	Number of Occurrences OTSG-B
002	0	0
001	0	0

Review of the above table indicates just over 25% of the total indications occur at the 14th support plate with no other elevations showing a concentration of any significance. Distribution throughout the elevations appears to be consistent in both OTSGs.

The mean through wall loss for these wear tubes, based on MRPC sizing results, in OTSG-A is 13.5% and 17.5% in OTSG-B. A mean through wall loss for the bobbin coil technique was not recorded because the majority of these wear indications remain classified as "DSI" signals without an assigned bobbin coil percent through wall (through wall measurement was assigned from the MRPC examination).

Indication History and Growth Rate

Eddy current data from previous outages was reviewed to aid in quantifying a growth rate (due to the absence of previous sizing data using the MRPC probe). Twenty of the 31 indications were evident in previous examinations dating back to as early 1984. Of the eleven tubes not exhibiting previous indications eight were previously examined in 1984. This review reveals a slow growth rate based on the long cycle of existence.

3. OTHER OUTSIDE DIAMETER INDICATIONS

Bobbin coil examinations identified possible outer diameter indications (which were not confirmed as tube to tube support plate wear) in 22 tubes in OTSG-A and 21 tubes in OTSG-B. These indications were evaluated in a very conservative manner and the subject locations were then examined with the MRPC probe unless comparisons indicated they were unchanged from Outage 10R and were evaluated as no detectable degradation at that time. All these indications were evaluated as no detectable degradation except for one tube (B120-42). None resembled axial groove IGA as seen at another BWOG licensee plant.

Tube B120-42 was a previously degraded tube which was dispositioned as 35% T.W. at 004 +14.4" during Outage 10R. During Outage 11R this indication was dispositioned as 44% T.W. with a confirmed single volumetric indication by MRPC examination. This tube was removed from service for this indication. Review of Outage 10R data showed no change in shape or amplitude for this indication.

4. DENTING INDICATIONS

During Outage 11R dents and dings greater than ten volts were recorded. All recorded dings (tube diameter reductions not attributable to a support structure) were examined with MRPC. All recorded dents above the lower tubesheet were examined with MRPC. At the lower tubesheet secondary face all recorded dents greater than forty volts were examined with MRPC while a sample of dents less than 40 volts were examined with MRPC. None of these MRPC examinations showed evidence of degradation. Table III-20 below details a summary of dent and ding quantities and MRPC examinations performed for both OTSGs.

TABLE III-20
DENT AND DING SUMMARY

DESCRIPTION	RECORDED QUANTITY IN OTSG-A	RECORDED QUANTITY IN OTSG-B	QUANTITY ≥40 VOLTS IN OTSG-A	QUANTITY ≥40 VOLTS IN OTSG-B	QUANTITY MRPC EXAMINED
DINGS	1	1	0	0	2
DENTS ABOVE THE LTS	1	0	0	0	1
TOP OF LTS DENTS	34	129	6	18	49
LTS DENTS DUE TO ADJACENT EXPLOSIVE PLUGS	47	23	0	0	0

The LTS dents due to adjacent explosive plugs are generally midway between the primary and secondary faces of the LTS and are due to distortion of the tubesheet ligament resulting from installation of explosive plugs in adjacent tubes. These dents are small (generally 10 to 15 volts in amplitude) and have experienced over a decade of service with no growth or degradation. The LTS dents at the secondary face are generally located in the OTSG "kidney-shaped" area which is generally an area of light sludge buildup (2-3"). All of the recorded dings and dents passed a 0.510 bobbin coil probe. One LTS dent (tube B-56-74) did not pass the 0.520 MRPC probe and was examined with a 0.500 MRPC probe.

The Outage 11R "Top of LTS Dents" MIZ-30 dent voltages were compared to previous examinations with MIZ-18 acquired data. (Previous data obtained with MIZ-12 instrumentation was excluded because of signal saturation. This exclusion involved all data acquired prior to 1988.) The mean change in voltage in OTSG-A was +2.60 volts and in OTSG-B was +0.67 volts. In OTSG-A four dents increased in voltage and four dents decreased in voltage. In OTSG-B nine dents increased in voltage and seven decreased in voltage. The relatively small number of dents related to specific outages does not statistically support a voltage growth per cycle conclusion. The mean voltage change and the fact that all these dents passed a 0.510" bobbin coil probe qualitatively support a slow growth rate, if any.

An Outage 12R examination scope to continue to monitor diameter reductions will be established prior to the Outage.

FIGURE III-1
 OTSG-A
 TUBES EXAMINED

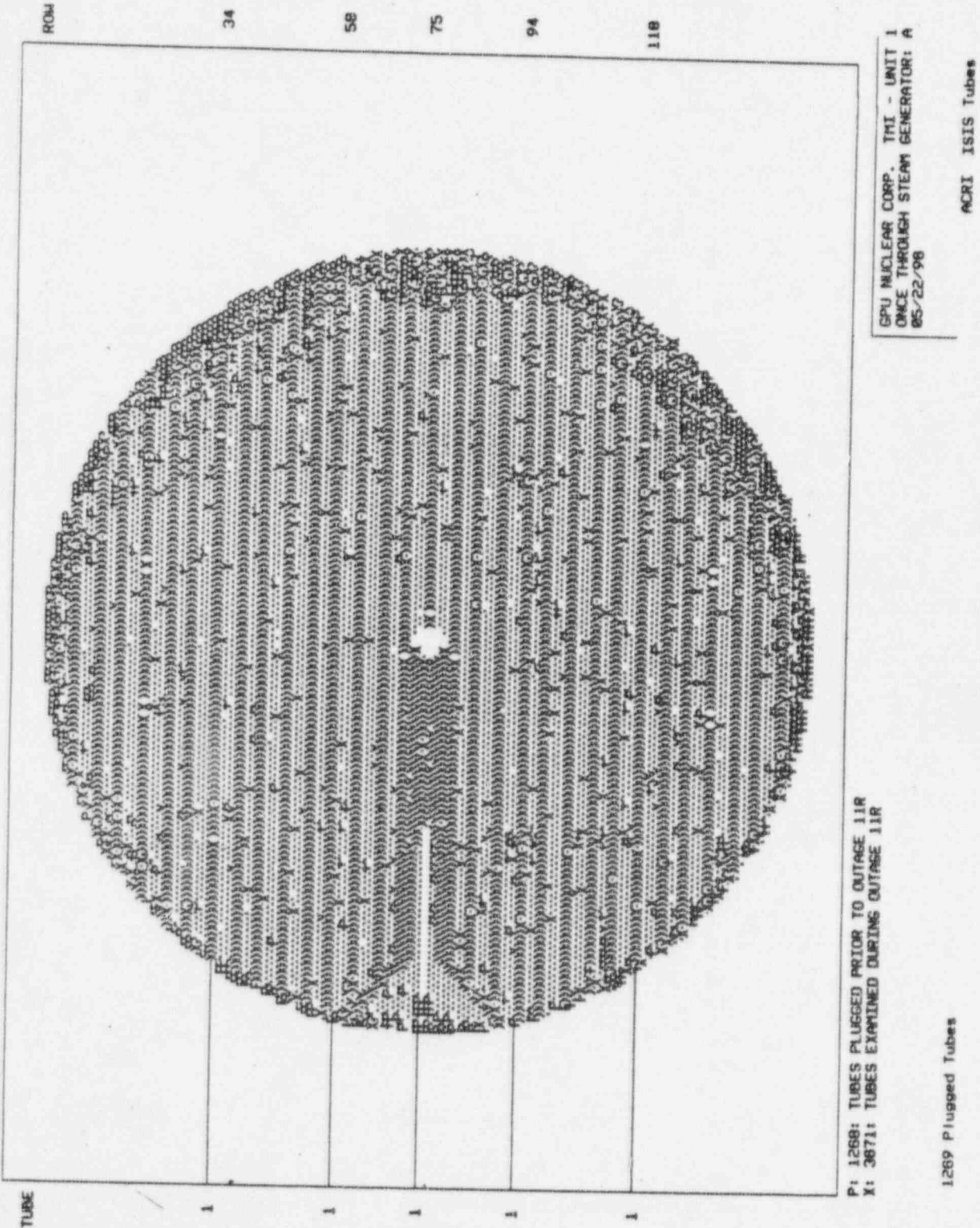
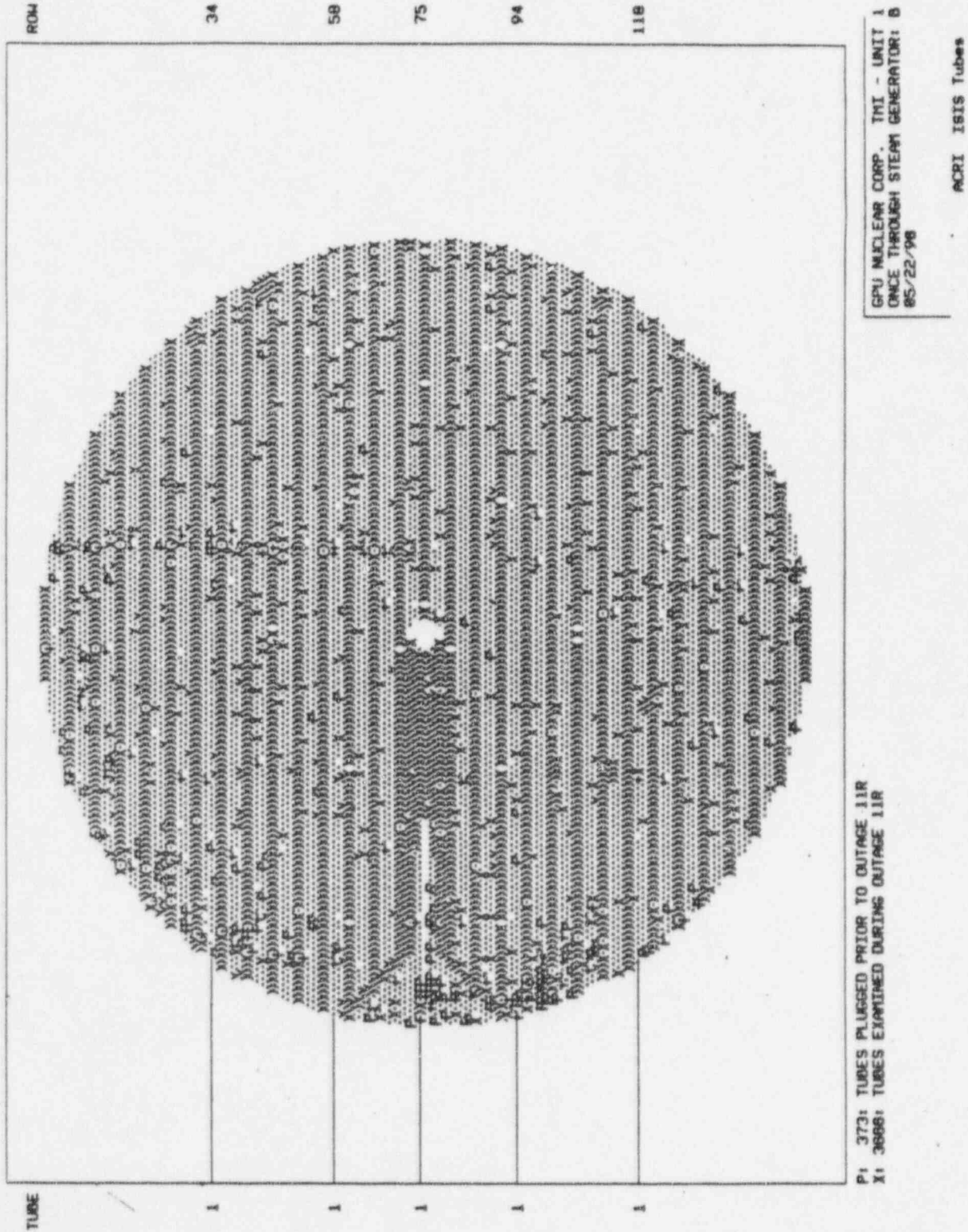


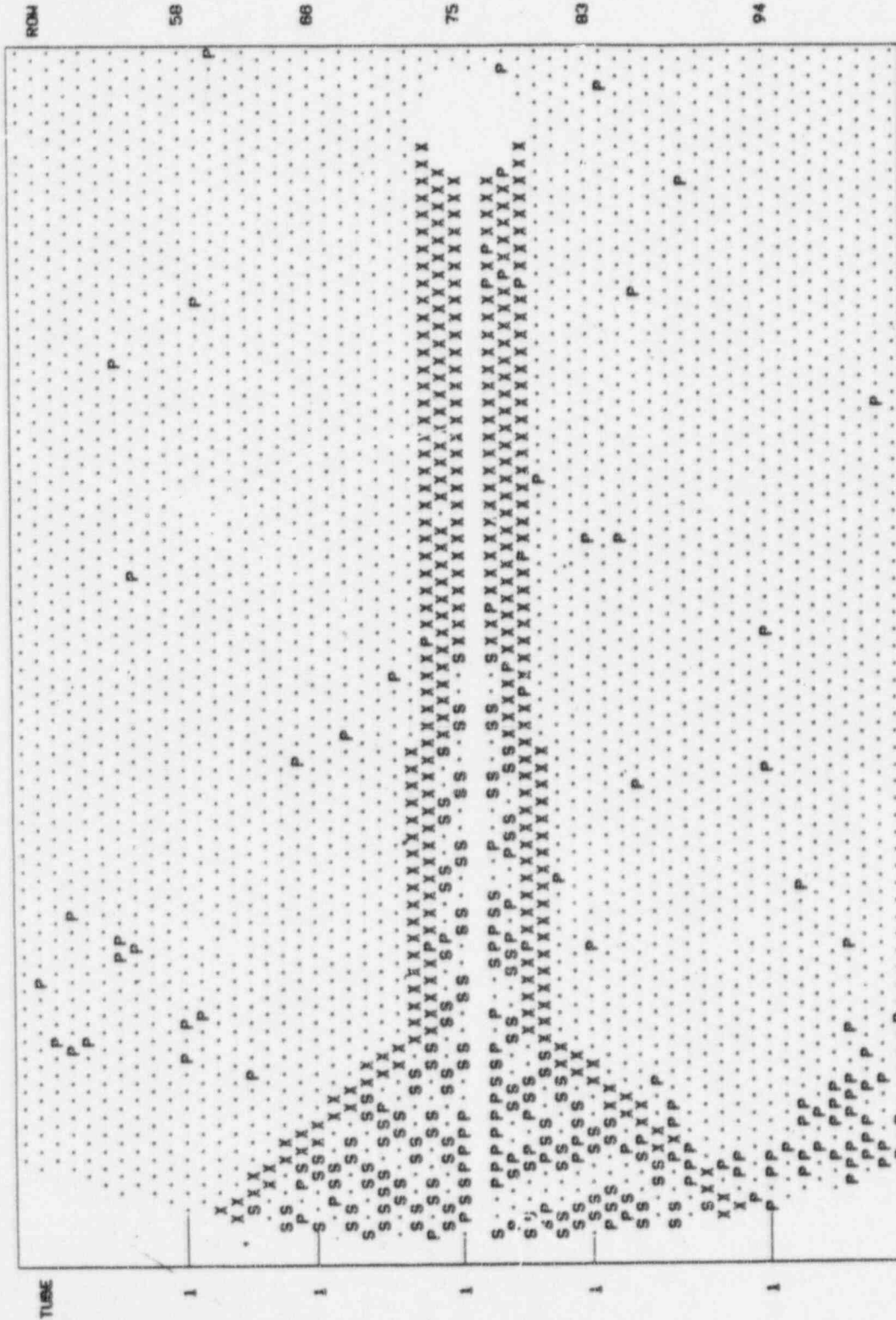
FIGURE III-2
OTSG-B
TUBES EXAMINED



SLEEVE, LANE/WEDGE AND SLEEVE BORDER EXAMS



FIGURE III-4
 OTSG-B
 SLEEVE, LANE/WEDGE AND SLEEVE BORDER EXAMS



GPU NUCLEAR CORP. TMI - UNIT 1
 ONCE THROUGH STEAM GENERATOR: 0
 95/22/98

ACRI ISIS Tubes

P: 125: PLUGGED TUBES
 S: 126: SLEEVES EXAMINED DURING OUTAGE 11R
 X: 298: 11R LANE/WEDGE & SLEEVE BORDER EXAM

FIGURE III-5
 DISTRIBUTION OF INDICATIONS BY AXIAL LOCATIONS
 (INCLUDES PREVIOUSLY IDENTIFIED INDICATIONS)

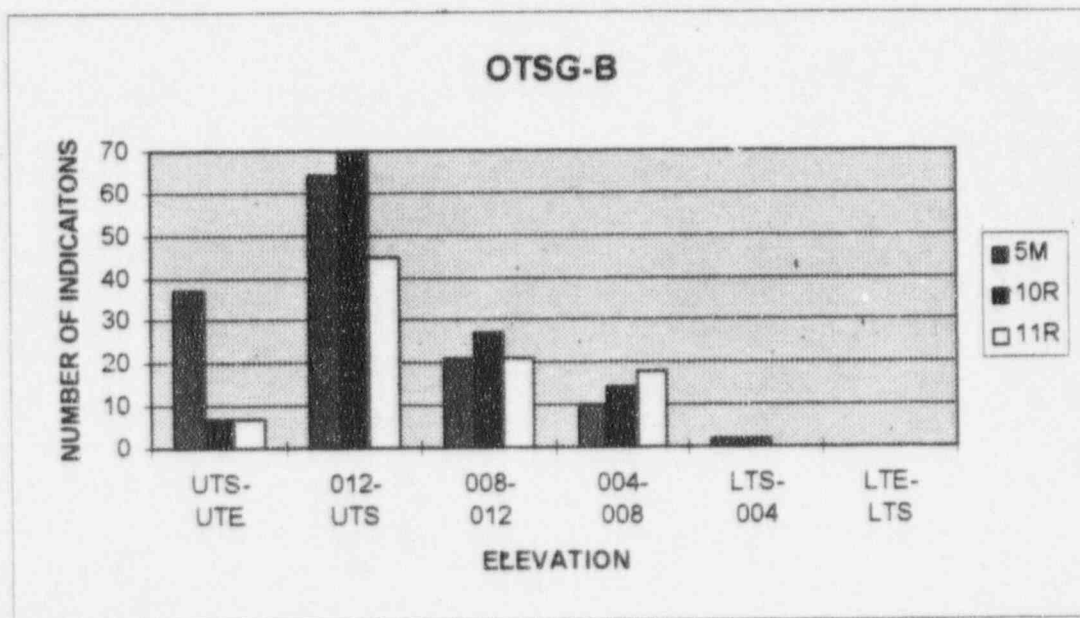
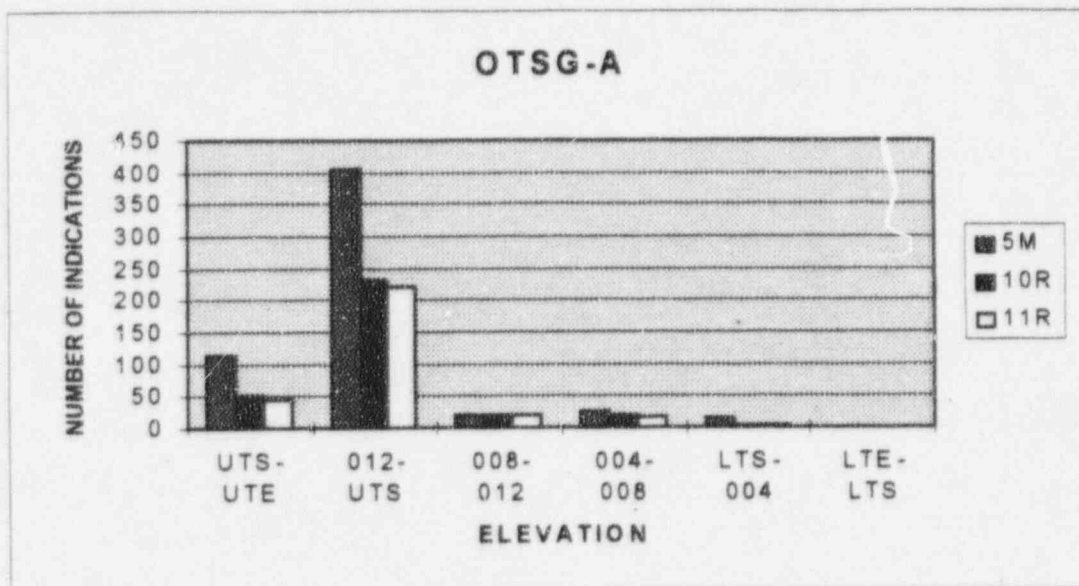
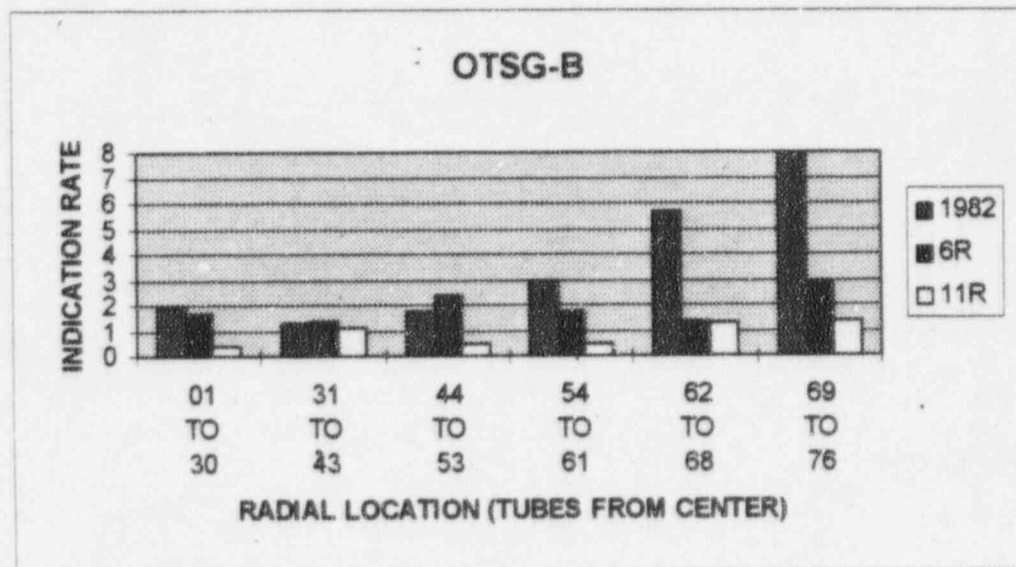
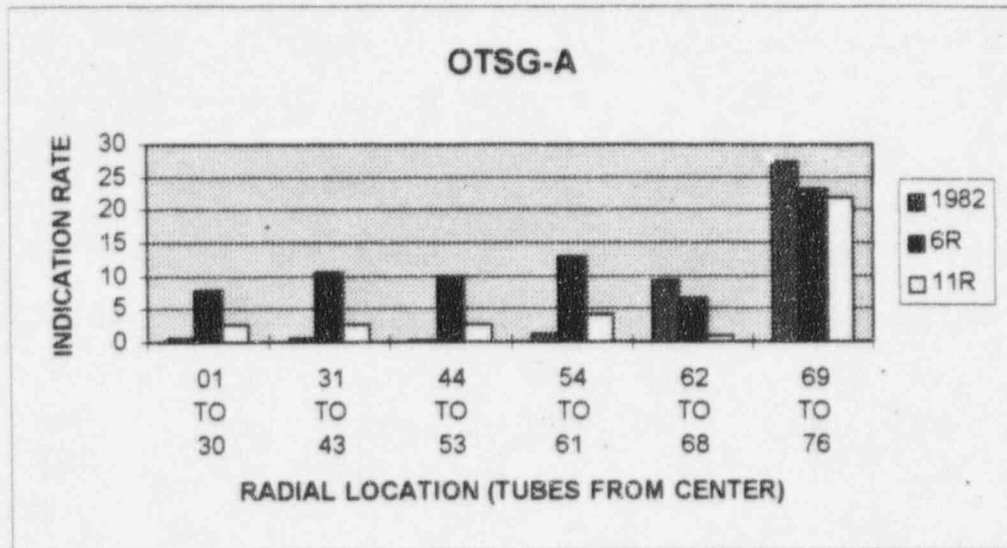


FIGURE III-6

INDICATION RATES BY REGION

(INCLUDES PREVIOUSLY IDENTIFIED INDICATIONS)



INDICATION RATE IS THE PERCENTAGE OF EXAMINED TUBES WITH INDICATIONS

FIGURE III-7
 DISTRIBUTION OF INDICATIONS BY PERCENT THROUGH WALL
 (INCLUDES PREVIOUSLY IDENTIFIED INDICATIONS)

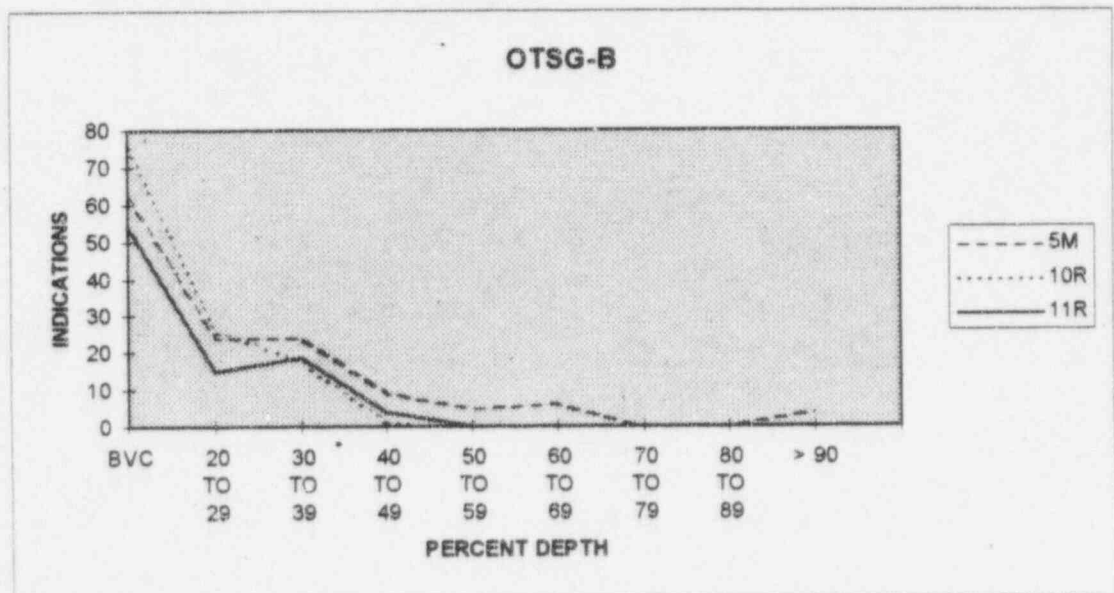
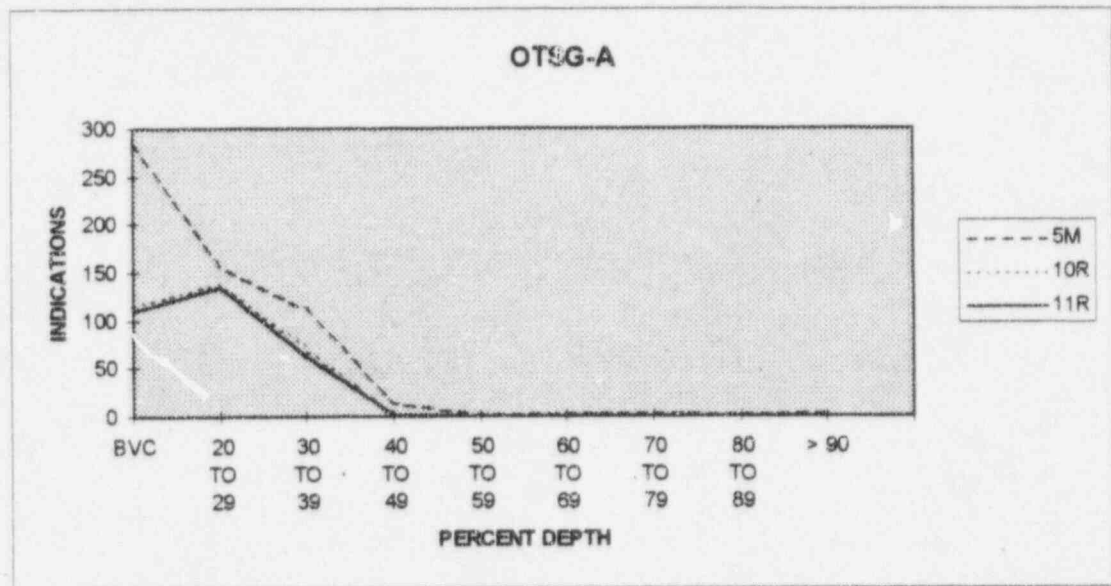


FIGURE III-8
DISTRIBUTION OF INDICATIONS BY AMPLITUDE
(INCLUDES PREVIOUSLY IDENTIFIED INDICATIONS)

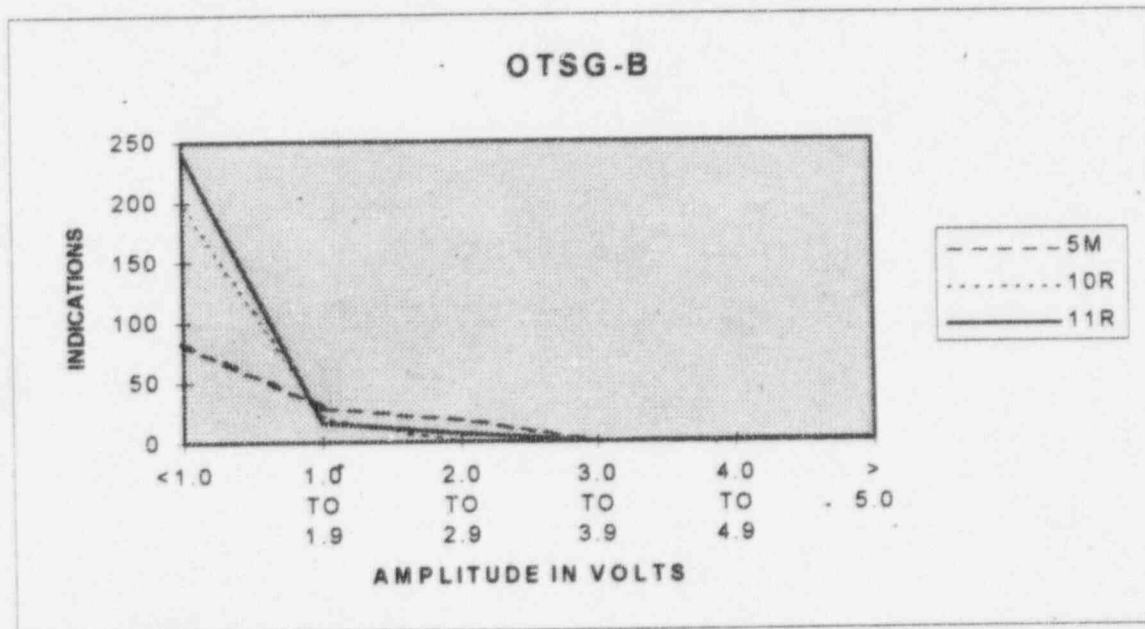
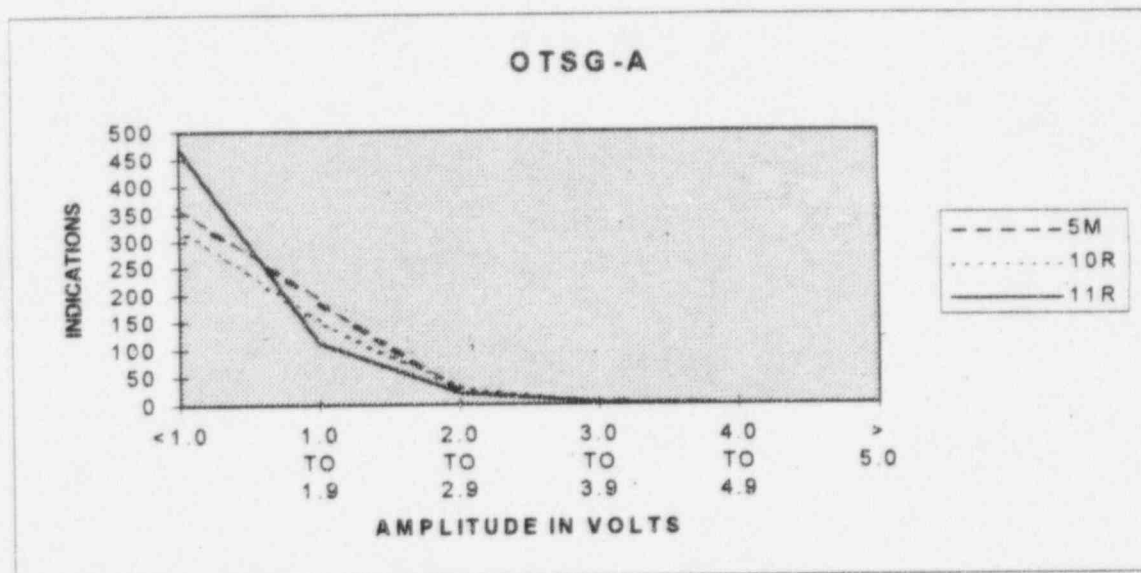


FIGURE III-9
 OTSG-A
 WEAR INDICATION TUBES

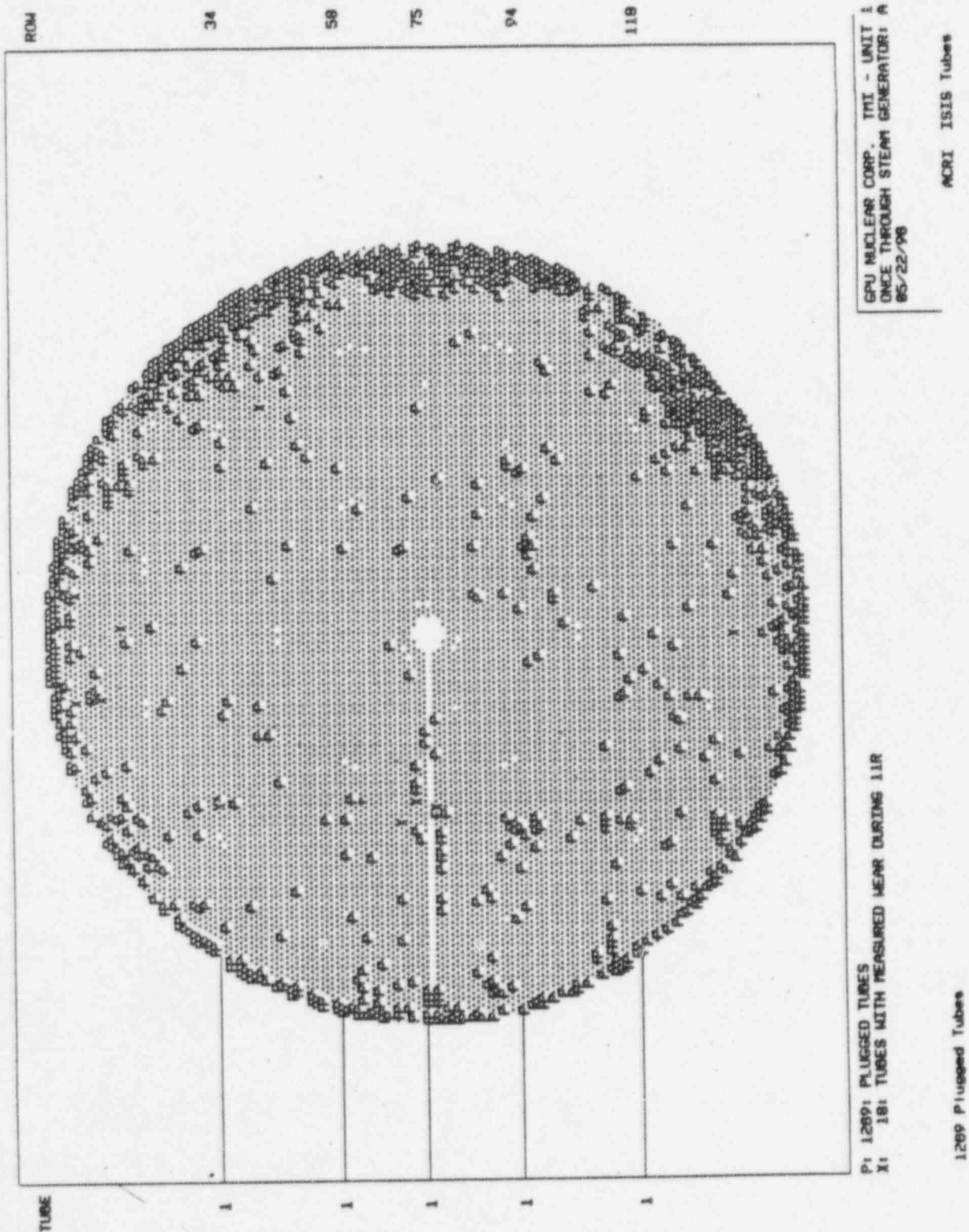
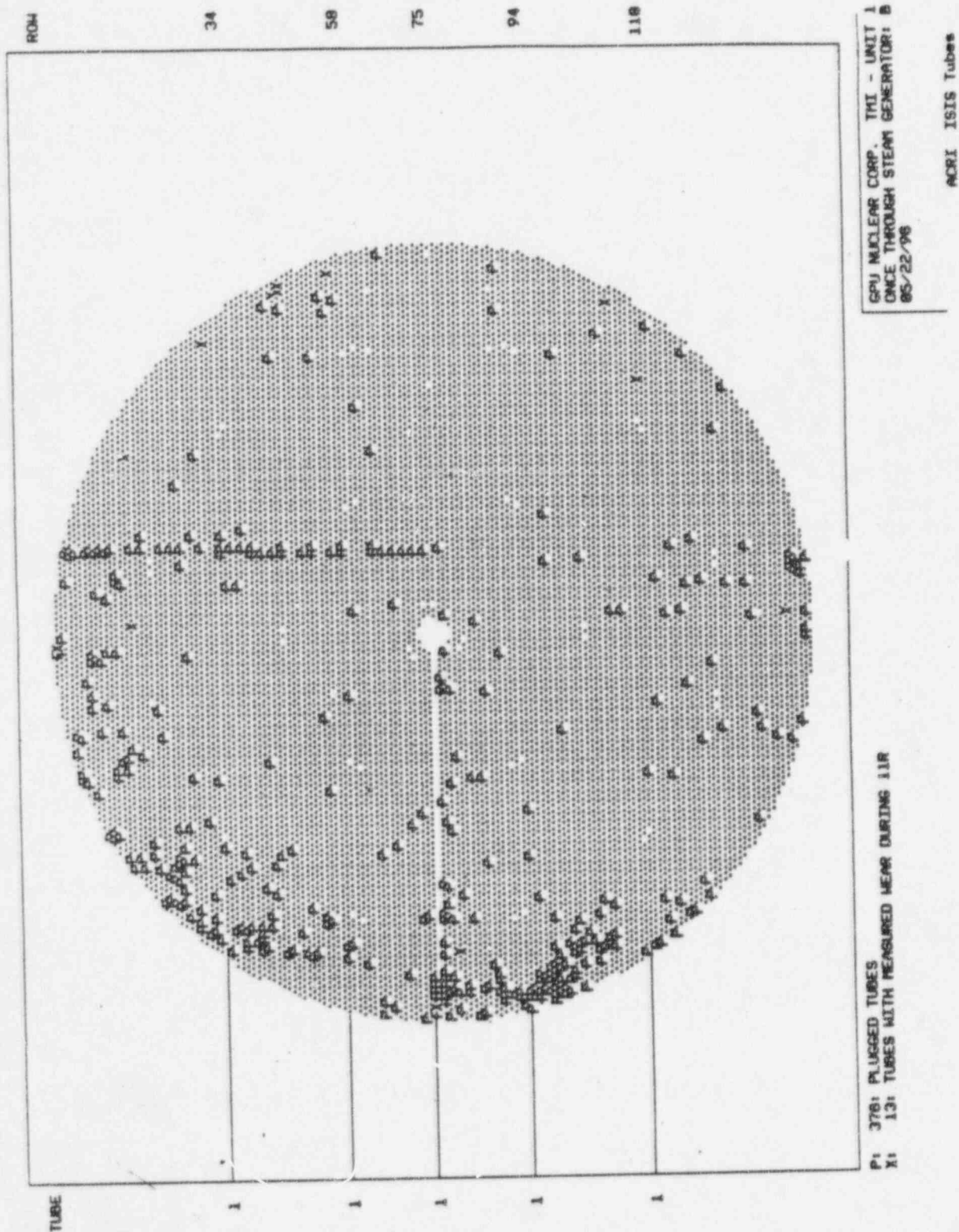


FIGURE III-10
 OTSG-B
 WEAR INDICATION TUBES



IV.

CONCLUSIONS

Based on the results of the 1995, Outage 11R, ECT examinations and data evaluations, GPUN was able to reach the following conclusions:

1. The examinations of the previously "Degraded Tubes" did not indicate a trend of ongoing degradation.
2. The results of the 21% Technical Specification sample tubes did not reveal a trend of new damage mechanisms.
3. Tube to tube support plate wear is occurring in relatively low numbers and growth rate is considered small based on previous existence. This mechanism will continue to be monitored.
4. Tube denting at the secondary face of the lower tubesheet is occurring which is typical of the OTSG kidney shaped sludge pile region. No evidence of cracking was present based on MRPC examinations. Continued monitoring of dented tubes will better define rate of increase of diameter reduction and will indicate if cracking would begin to develop.
5. The results of the "Gap Tube" sample indicate no degradation to the exposed carbon steel tubesheet.
6. The results of the "LANE/WEDGE" and "BORDER/SLV" examinations identified no presence of high cycle fatigue or cracking in the kinetic expansion transition area.
7. The sleeve examinations performed indicated that the installed sleeves continue to perform without degradation.
8. The examinations performed as commitments to Generic Letter 95-03 identified no circumferential cracks.
9. No freespan "Groove IGA" or axial cracking was identified.
10. The MIZ-30 eddy current system performed equivalent to the MIZ-18A system.

V.

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11. EPRI Report NP-6201, Rev. 3, PWR Steam Generator Examination Guidelines. November 1992.
12. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components", 1986 Edition.
13. GPUN TDR 1134, Rev. 0, M. Torborg, "10R OTSG Eddy Current Results", 07/21/94.
14. GPUN TDR 686, Rev. 1, J. Janiszewski, "Characterization of IGA in TMI-1 OTSG Tube Samples, 10/03/85.
15. GPUN Memorandum 5361-95-120, Subject Gap and Rerolled Tube Examinations Performed During Outage 11R, G. Navratil to R. Barley, October 12, 1995.
16. GPUN Memorandum 5361-95-133, Subject Lower Tubesheet Dent Profiles Using 8 Coil Profilometry, G. Navratil to R. Barley, November 1, 1995.

ANALYST TRAINING OUTLINE

OUTAGE 11R ANALYST INDOCTRINATION
TMI-1 OTSG INFORMATION

STEAM GENERATOR DESCRIPTION

- Standard OTSG 177FA design with 15, 531 tubes per steam generator.
- Tubes are 0.625" OD by 0.034" wall thickness, 673.37" long.
- Tubesheets are 24" thick with fifteen 1 ½" thick support plates. See analysis procedure for specific landmarks.
- Support plates are a broach design except for 1,626 tubes in the 15th support which are drilled instead of broached.
- The lower tubesheet has a 1 ½" long mechanical roll at the outlet tube end leaving an open crevice between the tube and tubesheet at the top of the tubesheet.
- The upper tubesheet tubes have been kinetically expanded over a length of 17" or 22" from the top of the tubesheet.
- Tubes plugged to date are 1,268 in OTSG-A and 373 in OTSG-B.
- 80" upper tubesheet sleeves installed to date are 249 in OTSG-A and 253 in OTSG-B. All sleeves are inconel 690 material.

ANALYST TRAINING OUTLINE

STEAM GENERATOR OPERATING EXPERIENCE

- Have operated the entire fuel cycle with approximately 2 GPH primary to secondary leakage.
- A decreasing plugging trend has been evident since restart in 1986.
- Last 100% examination occurred in 1984.
- Average exam scope since restart has been 1,400 tubes per steam generator.
- Outage 10R identified two tubes which required removal from service. One was sleeved and one was plugged.
- Tubes plugged since 1986 due to ECT results are as follows:

<u>OUTAGE YEAR</u>	<u>QTSG-A</u>	<u>QTSG-B</u>
1986	10	15
1986	20	19
1988	13	8
1990	5	3
1991	1	2
1993	0	1

- Most tubes were plugged due to inside diameter IGSAC (Intergranular Stress Assisted Corrosion) or inside diameter IGA in the upper regions of the tube bundle. Some TSP to tube wear has been noticed with about four tubes plugged for this condition.

ANALYST TRAINING OUTLINE

- One leaker outage in 1990 occurred. This was due to high cycle fatigue.
- OCONEE-3 RECENT REFUELING OUTAGE
 - Small amplitude free span indications
 - IGA like axial indications
 - Sleeve indications
 - Wear/impingement
 - Collapsed plugs
- RECENT TUBE PULLS FROM OTHER STEAM GENERATORS
 - Crystal River-3
 - IGA in lower regions
 - TSP wear
 - Classic wear
 - Clam shell type wear
 - Oconee-1
 - IGA in axial groove (lower burst pressure)
 - Wear
- POSITION VERIFICATION
 - Notify GPUN of all bad position verifications and what was done to correct the condition.

ANALYSIS GUIDELINES

- Scope - See attachments and tubesheet maps.
- All personnel doing analysis must be QDA.

ANALYST TRAINING OUTLINE

- Site Specific Test requires 80% of total available score.
- Rockridge should do Primary analysis and BWNT should do Secondary analysis.

FOLLOW THE ANALYSIS PROCEDURE. IF IT NEEDS CHANGING, GET IT CHANGED!

DON'T DO WHAT'S RIGHT AND VIOLATE THE PROCEDURE BECAUSE IT ISN'T CORRECT!

ANALYST TRAINING OUTLINE

TMI-1 DATA ANALYSIS

BOBBIN COIL PERFORMANCE DEMONSTRATION

The TMI-1 bobbin coil data analysis performance demonstration will consist of analysis of tubes on the cal groups included in test 1 or test 2.

The examinee will be given procedure 5361-NDE-7209.63 and an analysis station for testing. Scoring of the test will be as follows:

INDICATION CATEGORY	ACTUAL % TW	NOT CALLED	TW ≥ 10%	LOCATION ≥ 1"
Through Wall Indication	40-100%	-15	-1	-1
Through Wall Indication	30-39%	-10	-1	-1
Through Wall Indication	20-29%	-5	-1	-1
Through Wall Indication	<20%	-5	-1	-1
Large "I" Codes (≥ 1 volt)	All	-10	NA	-1
Small "I" Codes (< 1 volt)	All	-5	NA	-1
Dent, PVN, DNG, IDC	All	-1	NA	-1

Incorrect extents will be deducted 1 point.

Overcalls will be deducted 0.5 points.

Use the cal set-ups available in the resolution directory except for one cal group in each test which requires examinee set-up.

BOBBIN TEST 1 WILL INCLUDE THE FOLLOWING CAL GROUPS AND HAS A TOTAL AVAILABLE SCORE OF 315 POINTS:

TMI-1 DATA

SGA_HCAL00010	SGB_CCAL00019
SGA_CCAL00026 (SET-UP CAL)	SGB_CCAL00022
SGA_CCAL00029	SGB_CCAL00026
SGB_HCAL00004	

OCORER 1 DATA

SGA_CCAL00145	SGB_CCAL00020
SGA_CCAL00146	SGB_CCAL00089
SGB_CCAL00130	SGB_CCAL00091

ANALYST TRAINING OUTLINE

TMI-1 DATA ANALYSIS BOBBIN COIL PERFORMANCE DEMONSTRATION

BOBBIN TEST 2 WILL INCLUDE THE FOLLOWING CAL GROUPS AND HAS A TOTAL AVAILABLE SCORE OF 300 POINTS:

TMI-1 DATA

SGA_HCAL00010	SGE_CCAL00020
SGA_CCAL00029	SGE_CCAL00022
SGE_HCAL00002	SGE_CCAL00026
SGE_HCAL00004	

QCONER 1 DATA

SGE_HCAL00003	SGE_CCAL00089
SGE_HCAL00130	SGE_CCAL00099
SGE_CCAL00016	SGE_CCAL00131
SGE_CCAL00058	SGE_CCAL00160

A SCORE OF 80% OR GREATER IS REQUIRED TO PASS. ADDITIONAL TRAINING WILL BE REQUIRED PRIOR TO TAKING A SECOND TEST.

MRPC PERFORMANCE DEMONSTRATION

The TMI-1 MRPC data analysis test will consist of analysis of the tubes in test 1 or test 2.

The examinee will be given procedure 5361-NDE-7209.63, bobbin coil results, and an analysis station for testing. Scoring of the test will be -10 points for missed indications ≥ 1 volt and -5 points for missed indications < 1 volt. Incorrect extents and false calls will be deducted 1 point.

Use the set-ups available in the resolution directory. Bobbin Coil data results are attached.

TEST 2 TUBES TO ANALYZE

72-124	95-127
7-4	119-77
13-10	
77-37	

TEST 1 TUBES TO ANALYZE

72-124	20-85
8-2	40-98
13-10	100-90

A total of 125 points is available on test 1 and 100 points on test 2.

A minimum score of 80% is required to pass. Additional training is required prior to taking a second test.

ANALYST TRAINING OUTLINE

TMT-1
PERFORMANCE DEMONSTRATION
GRADE SHEET

NAME: _____

EXAM NUMBER: _____

SSN: _____

EXAMINEE: _____

FORMULA FOR GRADING

$$100 - \left(\left(\frac{\text{POINTS MISSED}}{\text{AVAILABLE POINTS}} \right) \times 100 \right) = \text{SCORE}$$

REVIEW OF MISSED INDICATIONS

EXAMINEE: _____

ANALYSIS CODES TO BE PUT IN PERCENT COLUMN

Absolute Drift Indication	ADR
Absolute Drift	ADO
Axial Outer Diameter Anomaly	COD
Circumferential Outer Diameter Anomaly	RBD
Retest Bad Data	DNT
Dent	DNI
Dent With Possible Indication	DNG
Ding	DRT
Distorted Roll Transition	DRI
Distorted Roll Transition W/Poss Indication	DTS
Distorted Tubesheet Signal	DTI
Distorted Tubesheet Signal With Indication	DSS
Distorted Tube Support Signal	DSI
Distorted Tube Support Signal W/Indication	ETL
Expansion Transition Location	FIX
Fixture	IDC
ID Chatter	RDC
Retest IDC	BVC
Indication Below Voltage Criteria	INR
Indication Not Reportable	INF
Indication Not Found	MCI
Multiple Circumferential Indication	MAI
Multiple Axial Indication	MVI
Multiple Volumetric Indication	NDD
No Detectable Discontinuity	NQI
Non Quantifiable Indication	OBS
Obstructed	PVI
Parent Tube Volumetric Indication	PCI
Parent Tube Circumferential Indication	PAI
Parent Tube Axial Indication	PVN
Permeability Variation	RPV
Retest PVN	PID
Positive Identification of Tube	PLG
Plugged	PTI
Parent Tube Indication	RIC
Retest Incomplete Exam	RNC
Retest Tube Number Check	SVI
Single Volumetric Indication	SAI
Single Axial Indication	SCI
Single Circumferential Indication	SLG
Sludge	WAR
Wear	

EXPLANATION OF ANALYSIS CODES

Absolute Drift Indication (ADI) - Normally refers to drift in the crevice of non-expanded tubesheets. Can also be used for tube to be wear in free standing section of tubing. Possible indicator of Inter Granular Attack (IGA). Recorded in low frequency absolute.

Absolute Drift (ADR) - Normally refers to low frequency absolute drift signals which do not form in a flaw like manner. The signals are due to such items as deposits, conductivity, etc.

Bad Data (RBD) - Self explanatory

Dent (DNT) - Tube I.D. smaller than nominal I.D., occurring at support plate. Intersections or top of tubesheets. Recorded in differential mix.

Dent With Possible Indication (DNI) - Possible discontinuity indication associated with dent but is not measurable. Recorded from differential mix.

Ding (DNG) - Similar to dent but in free-standing part of tube. Either caused in manufacturing or by mechanical cause. Recorded in prime frequency.

Distorted Roll Transition (DRT) - Self explanatory.

Distorted Roll Transition W/Possible Indication (DRI) - A distorted rolled transition that has sufficient distortion that a discontinuity may be creating the distortion.

Distorted Tubesheet Signal (DTS) - Self explanatory.

Distorted Tubesheet Signal With Indication (DTI) - An indication at the intersection of the upper or lower secondary tubesheets which may be indicative of a possible discontinuity. The signal may be distorted by deposits, dents, or saturated tubesheet signals.

Distorted Tube Support Signal (DSS) - A tube support signal which may be distorted due to deposits or denting.

Distorted Tube Support Signal w/Possible Indication (DSI) - A distorted support plate signal which is also indicative of a possible discontinuity.

Fixture (FIX) - Used when tubes cannot be examined because the fixture foot is obstructing tube or the fixture will not reach a particular tube.

EXPLANATION OF ANALYSIS CODES

ID Chatter (IDC) - Caused by manufacturing process (pilgering). Characterized by long areas of horizontal motion. Recorded in prime frequency.

Indication Below Voltage Criteria (BVC) - Low level indications which are below the establish voltage criteria for assigning percent through wall values.

Indication Not Reportable (INR) - Indication that has been previously reported but does not meet current reporting criteria.

Indication Not Found (INF) - Indication that has been previously reported but is not found on current examination.

Multiple Circumferential Indication (MCI) - Self explanatory.

Multiple Axial Indication (MAI) - Self Explanatory.

Multiple Volumetric Indication (MVI) - Self Explanatory.

No Detectable Discontinuity (NDD) - Entry not required if dBASE system used.

Non Quantifiable Indication (NQI) - Condition where a signal forms abnormally and is indicative of degradation which is non-quantifiable.

Obstructed (OBS) - Tube that is obstructed by foreign material, i.e., dirt, chunk of metal, broken off probe head, etc.

Positive Identification (PID) - Code assigned to show the examination was performed to verify the tube identification and the tube is properly identified.

Parent Tube Axial Indication (PAI) - An axially oriented indication located in the parent tube of a sleeved joint.

Parent Tube Circumferential Indication (PCI) - A circumferentially oriented indication located in the parent tube of a sleeved joint.

Parent Tube Volumetric Indication (PVI) - A volumetric indication located in the parent tube of a sleeved joint.

Permeability Variation (PVN) - Self explanatory. Recorded in prime frequency free-standing tube, measured in differential mix at support plate intersections.

Plugged (PLG) - Permanent mechanical plug, not to be confused with obstruction.

Retest Incomplete Exam (RIC) - Tube not run to the extent required or complete tube not recorded.

Retest Tube Number Check (RNC) - Used when the tube identity is in doubt.

Single Volumetric Indication (SVI) - Self explanatory.

Single Axial Indication (SAI) - Self explanatory.

Single Circumferential Indication (SCI) - Self explanatory.

Sludge (SLG) - Accumulation of ferromagnetic material on top of tubesheets or support plates. Recorded in lowest absolute frequency as per specific plant requirements.

Wear (WAR) - Bobbin coil indications indicative of tube to support plate, tube to tube contact, or loose part to tube contact tube wall reduction.

THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
1	4	ISI	11R	22654	013+ 6.7	5	17	1.57		
		ISI	10R	19946	013+ 6.7	8	27	2.01	-00.44	-10.00
		ISI	11R	22654	015+ 36.5	9	30	1.67		
		ISI	10R	19946	015+ 36.1	7	23	2.42	-00.75	07.00
2	6	ISI	11R	22655	015+ 24.6	5	17	0.78		
		ISI	10R	19947	015+ 25.1	7	23	1.79	-1.01	-6.00
		ISI	11R	22655	015+ 25.3	5	17	0.99		
		ISI	10R	19947	015+ 25.1	7	23	1.79	-00.80	-6.00
		ISI	11R	22655	015+ 29.1	6	20	1.41		
		ISI	10R	19947	015+ 28.8	7	23	2.42	-1.01	-3.00
2	25	ISI	11R	22656	012+ 35.7	11	37	1.22		
		ISI	10R	19948	012+ 35.5	8	27	1.34	-00.12	10.00
		ISI	11R	22656	013+ 9.8	6	20	1.52		
		ISI	11R	22656	013+ 10.9	6	20	1.51		
		ISI	11R	22656	013+ 13.6	8	27	0.72		
3	17	ISI	11R	22750	015+ 33.0	10	33	0.87		
4	29	ISI	11R	22657	015+ 27.6	8	20	1.70		
		ISI	10R	19949	015+ 27.3	9	30	2.17	-00.47	-10.00
5	3	ISI	11R	22658	015+ 44.8	6	20	1.07		
		ISI	10R	19950	015+ 44.4	6	20	2.09	-1.02	00.00
		ISI	11R	22658	015+ 45.3	7	23	1.93		
		ISI	10R	19950	015+ 45.0	8	27	3.83	-1.90	-4.00
5	5	ISI	11R	22752	012+ 27.2	92	24	0.36		
		ISI	10R	20047	012+ 27.1	92	34	0.81	-00.45	-10.00
		ISI	11R	22752	015+ 34.9	10	33	1.06		
		ISI	10R	20047	015+ 34.7	5	17	1.62	-00.56	16.00
6	43	ISI	11R	22660	UTS+ 3.6	8	27	2.52		
		ISI	10R	19952	UTS+ 3.6	7	23	2.63	-00.11	04.00
6	47	ISI	11R	22661	015+ 20.1	7	23	0.65		
		ISI	10R	19953	015+ 19.9	5	17	1.27	-00.62	06.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
		ISI	11R	22661	015+ 34.3	8	27	0.84		
		ISI	10R	19953	015+ 34.0	5	17	1.68	-00.84	10.00
8	2	ISI	11R	22663	012+ 16.1	9	30	1.34		
		ISI	10R	19955	012+ 16.1	7	23	1.79	-00.45	07.00
		ISI	11R	22663	012+ 18.9	8	27	1.03		
		ISI	10R	19955	012+ 18.8	5	17	1.46	-00.43	10.00
		ISI	11R	22663	012+ 24.8	8	27	2.36		
		ISI	10R	19955	012+ 25.1	7	23	2.85	-00.49	04.00
		ISI	11R	22663	012+ 29.0	9	30	1.51		
		ISI	10R	19955	012+ 29.1	7	23	2.17	-00.66	07.00
		ISI	11R	22663	012+ 33.2	8	27	2.08		
		ISI	10R	19955	012+ 33.4	7	23	2.55	-00.47	04.00
8	43	ISI	11R	22753	015+ 24.1	7	23	0.72		
		ISI	10R	20048	015+ 23.7	5	17	1.62	-00.90	06.00
		ISI	11R	22753	015+ 24.5	9	30	0.78		
		ISI	10R	20048	015+ 24.2	6	20	1.38	-00.60	10.00
11	4	ISI	11R	22664	015+ 21.6	10	33	0.94		
		ISI	10R	19956	015+ 21.3	10	33	1.48	-00.54	00.00
13	1	ISI	11R	22665	011+ 35.9	8	27	0.94		
		ISI	10R	19957	011+ 35.6	8	27	1.74	-00.80	00.00
		ISI	11R	22665	013+ 22.4	7	23	2.50		
		ISI	11R	22665	013+ 23.3	6	20	1.79		
		ISI	10R	19957	013+ 23.1	10	33	2.16	-00.37	-13.00
13	10	ISI-10	11R	22943	UTS+ 5.0	7	23	0.79		
15	77	ISI	11R	22754	012+ 27.6	5	17	0.78		
		ISI	10R	20049	012+ 27.4	7	23	1.05	-00.27	-6.00
		ISI	11R	22754	012+ 30.6	6	20	0.92		
		ISI	10R	20049	012+ 30.4	8	27	1.25	-00.33	-7.00
16	2	ISI	11R	22666	015+ 42.9	7	23	0.70		
		ISI	10R	19958	015+ 42.5	6	20	1.52	-00.82	03.00
17	82	ISI	11R	22911	015+ 5.8	8	27	0.67		
		ISI	10R	20206	015+ 5.8	8	27	1.07	-00.40	00.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
18	3	ISI	11R	22756	015+ 25.4	8	27	0.94		
		ISI	10R	20051	015+ 25.2	9	30	1.12	-00.18	-3.00
18	84	ISI	11R	22667	015+ 32.8	8	27	0.81		
		ISI	10R	19959	015+ 32.7	6	20	1.28	-00.47	07.00
		ISI	11R	22667	015+ 32.9	8	27	1.33		
		ISI	10R	19959	015+ 32.7	6	20	1.28	00.05	07.00
		ISI	11R	22667	015+ 33.3	10	33	1.36		
		ISI	10R	19959	015+ 33.2	8	27	1.50	-00.14	06.00
		ISI	11R	22667	015+ 33.4	10	33	0.79		
		ISI	10R	19959	015+ 33.2	8	27	1.50	-00.71	06.00
		ISI	11R	22667	015+ 34.8	5	17	0.76		
		ISI	10R	19959	015+ 34.6	8	27	1.37	-00.61	-10.00
		ISI	11R	22667	015+ 34.8	6	20	1.43		
		ISI	10R	19959	015+ 34.6	8	27	1.37	00.06	-7.00
		ISI	11R	22667	015+ 36.0	6	20	1.12		
		ISI	10R	19959	015+ 35.9	5	17	1.14	-00.02	03.00
		ISI	11R	22667	015+ 38.4	6	20	1.54		
		ISI	10R	19959	015+ 38.2	7	23	1.63	-00.09	-3.00
		ISI	11R	22667	015+ 41.2	11	37	1.10		
		ISI	10R	19959	015+ 41.0	11	37	1.17	-00.07	00.00
		ISI	11R	22667	015+ 41.2	11	37	0.67		
		ISI	10R	19959	015+ 41.0	11	37	1.17	-00.50	00.00
20	56	ISI	11R	22668	015+ 33.8	7	23	0.88		
		ISI	10R	19960	015+ 33.4	5	17	1.20	-00.32	06.00
20	85	ISI	11R	22669	010+ 17.6	6	20	1.12		
		ISI	10R	19961	010+ 17.6	9	30	1.55	-00.43	-10.00
		ISI	11R	22669	010+ 18.5	6	20	0.96		
		ISI	10R	19961	010+ 18.5	8	27	1.38	-00.42	-7.00
		ISI	11R	22669	010+ 21.4	7	23	0.67		
		ISI	10R	19961	010+ 21.3	7	23	1.25	-00.58	00.00
		ISI	11R	22669	010+ 31.9	5	17	0.74		
		ISI	10R	19961	010+ 31.7	5	17	1.19	-00.45	00.00
		ISI	11R	22669	014+ 31.6	10	33	0.80		
		ISI	10R	19961	014+ 31.5	10	33	0.99	-00.19	00.00
22	35	ISI	11R	22759	UTS+ 4.0	9	32	0.69		
		ISI	10R	20054	UTS+ 4.0	8	27	1.22	-00.53	05.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
25	2	ISI	11R	22929	013+ 2.6	7	23	0.98		
27	78	ISI	11R	22762	015+ 29.6	8	27	0.83		
		ISI	10R	20057	015+ 29.9	7	23	1.50	-00.67	04.00
		ISI	11R	22762	015+ 32.5	11	37	1.11		
		ISI	10R	20057	015+ 32.8	11	37	1.84	-00.73	00.00
27	96	ISI	11R	22671	015+ 37.6	5	17	0.72		
		ISI	10R	19963	015+ 37.5	6	20	1.56	-00.84	-3.00
28	78	ISI	11R	22672	015+ 14.7	6	20	2.54		
		ISI	10R	19964	015+ 14.5	7	23	2.83	-00.29	-3.00
		ISI	11R	22672	015+ 28.4	5	17	0.96		
		ISI	10R	19964	015+ 28.2	9	30	1.00	-00.04	-13.00
29	58	ISI	11R	22763	015+ 30.0	7	23	1.07		
		ISI	10R	20058	015+ 29.8	6	20	1.33	-00.26	03.00
		ISI	11R	22763	015+ 34.0	8	27	1.12		
32	81	ISI-10	11R	22942	015+ 35.6	10	33	1.28		
		DS7	10R	20385	015+ 35.5	10	33	3.33	-2.05	00.00
		ISI-10	11R	22942	015+ 36.0	6	20	1.22		
		DS7	10R	20385	015+ 35.5	10	33	3.33	-2.11	-13.00
34	1	ISI	11R	22890	006+ 15.8	10	33	1.06		
		ISI	10R	20185	006+ 15.6	9	30	1.28	-00.22	03.00
34	3	ISI	11R	22675	UTS+ 2.1	8	27	1.09		
		ISI	10R	19967	UTS+ 2.0	6	20	2.58	-1.49	07.00
36	106	ISI	11R	22765	015+ 34.4	7	23	1.39		
		ISI	10R	20060	015+ 34.3	7	23	1.54	-00.15	00.00
37	27	ISI	11R	22931	013+ 29.7	5	17	1.14		
37	109	ISI	11R	22766	015+ 39.3	11	37	1.07		
		ISI	10R	20061	015+ 39.1	11	37	1.17	-00.10	00.00
38	29	ISI	11R	22767	012+ 3.8	5	17	1.39		
		ISI	10R	20062	012+ 3.6	6	20	1.73	-00.34	-3.00

Continues Next Page ==>

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
39	101	ISI	11R	22677	015+ 34.8	5	17	1.22		
		ISI	10R	19969	015+ 34.4	7	23	1.21	00.01	-6.00
39	110	ISI	11R	22678	015+ 39.8	11	37	1.21		
		ISI	10R	19970	015+ 39.8	10	33	1.22	-00.01	04.00
41	16	ISI	11R	22795	014+ 3.0	98	22	0.36		
		ISI	10R	20090	014+ 3.1	94	33	0.74	-00.38	-11.00
41	94	ISI	11R	22679	015+ 15.6	7	23	1.18		
		ISI	10R	19971	015+ 16.0	7	23	1.07	00.11	00.00
42	114	ISI	11R	22797	015+ 34.8	5	17	0.89		
		ISI	10R	20092	015+ 34.7	7	23	1.06	-00.17	-6.00
43	82	ISI	11R	22680	007+ 37.7	7	23	0.88		
		ISI	10R	19972	007+ 37.2	8	27	1.59	-00.71	-4.00
46	88	ISI	11R	22798	015+ 30.4	8	27	1.30		
		ISI	10R	20093	015+ 30.1	5	17	1.78	-00.48	10.00
48	118	ISI	11R	22682	014+ 23.1	6	20	0.93		
		ISI	11R	22682	014+ 29.4	11	37	0.94		
		ISI	10R	19974	014+ 29.9	5	17	0.97	-00.03	20.00
		ISI	11R	22682	014+ 30.3	9	30	0.71		
		ISI	10R	19974	014+ 29.9	5	17	0.97	-00.26	13.00
49	73	ISI	11R	22683	UTS+ 5.0	9	30	1.53		
		ISI	10R	19975	UTS+ 5.1	9	30	1.90	-00.37	00.00
50	2	ISI	11R	22920	015+ 22.6	8	23	0.96		
50	102	ISI	11R	22685	015+ 16.4	8	27	1.64		
		ISI	10R	19977	015+ 16.1	7	23	1.63	00.01	04.00
		ISI	11R	22685	015+ 16.6	7	23	1.34		
		ISI	10R	19977	015+ 16.1	7	23	1.63	-00.29	00.00
52	34	ISI	11R	22893	013+ 23.1	9	30	0.73		
		ISI	10R	20188	013+ 23.0	5	17	1.13	-00.40	13.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason ISI	Exam Out 11R	Exam Numb 22893	Indication Location 014+ 12.6	Ind Deg 6	% T.W. 20	Ind Volt 0.85	Delta Volts	Delta Depth
55	124	ISI	11R	22808	015+ 14.4	9	30	1.16		
57	63	ISI	11R	22686	015+ 37.1	7	23	1.96		
		ISI	10R	19978	015+ 36.9	9	30	2.31	-00.35	-7.00
57	65	ISI	11R	22687	015+ 37.7	7	23	0.87		
		ISI	10R	19979	015+ 37.6	11	37	1.03	-00.16	-14.00
		ISI	11R	22687	015+ 38.2	11	37	1.06		
		ISI	11R	22687	015+ 41.2	10	33	0.70		
58	25	ISI	11R	22908	015+ 43.9	6	20	0.65		
60	65	ISI	11R	22816	015+ 37.4	6	20	1.16		
		ISI	10R	20111	015+ 37.3	8	27	0.99	00.17	-7.00
60	126	ISI	11R	22818	014+ 26.2	8	27	0.65		
		ISI	10R	20113	014+ 26.3	7	23	1.03	-00.38	04.00
64	66	ISI	11R	22916	015+ 40.2	9	30	1.03		
64	129	ISI	11R	22689	015+ 45.7	10	33	1.21		
		ISI	10R	19981	015+ 45.2	11	37	1.61	-00.40	-4.00
66	1	ISI-UN SLEEVE	11R	22939	004+ 27.5	13	43	1.81		
			10R	19830	004+ 27.2	11	37	2.40	-00.59	06.00
66	127	ISI	11R	22691	015+ 44.8	9	30	0.72		
		ISI	10R	19984	015+ 44.8	10	33	1.10	-00.38	-3.00
72	21	ISI	11R	22823	015+ 35.7	6	20	0.78		
		ISI	10R	20118	015+ 35.6	5	17	1.61	-00.83	03.00
72	86	ISI	11R	22692	UTS+ 4.0	8	27	1.04		
		ISI	10R	19985	UTS+ 3.8	10	33	1.35	-00.31	-6.00
75	122	ISI	11R	22828	015+ 45.0	8	27	1.11		
75	123	ISI	11R	22695	015+ 21.8	8	27	0.55		

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason ISI	Exam Out 11R	Exam Numb 22695	Indication Location 015+ 24.2	Ind Deg 7	% T.W. 23	Ind Volt 1.45	Delta Volts	Delta Depth
77	126	ISI	11R	22696	015+ 10.4	8	27	0.76		
		ISI	11R	22696	015+ 18.7	7	23	1.04		
		ISI	10R	19990	015+ 18.8	5	17	1.17	-00.13	06.00
79	130	ISI	11R	22698	UTS+ 5.5	11	37	1.16		
		ISI	10R	19992	UTS+ 5.4	9	30	1.05	00.11	07.00
81	92	ISI	11R	22699	015+ 42.2	9	30	0.95		
81	130	ISI	11R	22831	012+ 14.3	7	23	1.04		
		ISI	10R	20126	012+ 14.4	6	20	1.01	00.03	03.00
82	32	ISI	11R	22700	UTS+ 6.4	11	39	1.40		
		ISI	10R	19994	UTS+ 6.5	11	37	2.29	-00.89	02.00
82	128	ISI	11R	22833	015+ 7.9	7	23	1.21		
		ISI	10R	20128	015+ 8.0	6	20	1.19	00.02	03.00
83	17	ISI	11R	22701	015+ 35.8	9	30	0.89		
		ISI	10R	19995	015+ 35.6	9	30	1.43	-00.54	00.00
83	29	ISI	11R	22774	015+ 34.3	5	17	0.64		
		ISI	10R	20069	015+ 33.8	6	20	0.78	-00.14	-3.00
84	103	ISI	11R	22834	015+ 32.6	8	27	0.81		
85	57	ISI	11R	22702	UTS+ 3.8	5	17	0.93		
		ISI	10R	19996	UTS+ 3.6	5	17	1.42	-00.49	00.00
87	1	ISI-UN	11R	22940	012+ 7.7	7	23	2.65		
		ISI	10R	19997	012+ 7.4	5	17	3.81	-1.16	06.00
		ISI-UN	11R	22940	012+ 8.0	8	27	2.49		
		ISI	10R	19997	012+ 7.8	6	20	3.66	-1.17	07.00
87	20	ISI	11R	22835	015+ 33.4	9	30	1.04		
		ISI	10R	20130	015+ 33.2	7	23	1.03	00.01	07.00
88	124	ISI	11R	22836	015+ 3.6	8	27	1.00		
		ISI	10R	20131	015+ 3.7	6	20	1.08	-00.08	07.00

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R

COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
90	80	ISI	11R	22776	015+ 32.3	9	30	1.30		
90	128	ISI	11R	22703	015- 0.2	7	23	2.21		
		ISI	10R	19998	015- 0.3	5	17	2.23	-00.02	06.00
		ISI	11R	22703	015+ 2.2	5	17	1.13		
		ISI	10R	19998	015+ 2.2	6	20	1.70	-00.57	-3.00
		ISI	11R	22703	015+ 4.0	8	27	1.13		
93	27	ISI	11R	22777	015+ 38.1	6	20	0.73		
		ISI	10R	20072	015+ 38.0	5	17	1.02	-00.29	03.00
93	58	ISI	11R	22839	UTS+ 4.7	11	37	1.12		
		ISI	10R	20134	UTS+ 4.6	10	33	1.19	-00.07	04.00
93	90	ISI	11R	22840	UTS+ 0.9	10	33	0.99		
		ISI	10R	20135	UTS+ 0.8	10	33	1.23	-00.24	00.00
93	123	ISI	11R	22898	015+ 6.8	6	20	1.02		
		ISI	10R	20193	015+ 6.7	7	23	0.91	00.11	-3.00
		ISI	11R	22898	015+ 7.1	8	27	0.92		
		ISI	10R	20193	015+ 6.7	7	23	0.91	00.01	04.00
94	113	ISI	11R	22899	015+ 32.9	6	20	1.40		
		ISI	10R	20194	015+ 32.9	5	17	1.37	00.03	03.00
95	111	ISI	11R	22705	015+ 40.3	6	20	1.39		
95	123	ISI	11R	22706	UTS+ 2.0	6	20	3.50		
		ISI	10R	20001	UTS+ 2.1	5	17	3.63	-00.13	03.00
95	127	ISI	11R	22923	012+ 13.5	7	23	0.71		
		ISI	10R	20218	012+ 13.5	8	27	0.74	-00.03	-4.00
		ISI	11R	22923	012+ 25.0	6	20	0.92		
		ISI	10R	20218	012+ 25.0	6	20	0.85	00.07	00.00
		ISI	11R	22923	015+ 13.3	11	37	1.21		
		ISI	10R	20218	015+ 13.6	11	37	1.04	00.17	00.00
96	32	ISI	11R	22707	015+ 37.9	5	17	1.40		
		ISI	10R	20002	015+ 37.5	6	20	1.71	-00.31	-3.00

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
		ISI	11R	22707	015+ 43.6	9	30	1.19		
		ISI	10R	20002	015+ 43.2	11	37	0.95	00.24	-7.00
96	114	ISI	11R	22841	015+ 6.0	5	17	1.05		
		ISI	10R	20136	015+ 6.0	5	17	1.06	-00.01	00.00
99	1	ISI	11R	22709	004+ 24.0	6	20	1.57		
		ISI	10R	20004	004+ 24.0	5	17	1.53	00.04	03.00
		ISI	11R	22709	008+ 5.1	7	23	1.01		
		ISI	10R	20004	008+ 5.1	7	23	1.13	-00.12	00.00
99	17	ISI	11R	22710	015+ 33.2	6	20	1.24		
		ISI	10R	20005	015+ 33.1	8	27	1.82	-00.58	-7.00
100	90	ISI	11R	22922	UTS+ 3.0	10	33	1.13		
		ISI	10R	20217	UTS+ 3.0	6	20	1.31	-00.18	13.00
100	122	ISI	11R	22711	UTS+ 5.2	7	23	2.06		
		ISI	10R	20006	UTS+ 5.2	7	23	1.81	00.25	00.00
101	16	ISI	11R	22712	015+ 31.6	8	27	0.85		
		ISI	10R	20007	015+ 31.4	6	20	1.34	-00.49	07.00
101	51	ISI	11R	22713	UTS+ 1.4	8	27	1.46		
		ISI	10R	20008	UTS+ 1.5	10	33	1.33	00.13	-6.00
		ISI	11R	22713	UTS+ 4.1	8	29	1.41		
		ISI	10R	20008	UTS+ 4.1	11	37	1.49	-00.08	-8.00
101	61	ISI	11R	22715	015+ 29.7	9	30	2.05		
103	77	ISI-10	11R	22944	015+ 24.7	11	37	1.59		
		3%-TS	10R	22103	015+ 24.8	7	23	2.28	-00.69	14.00
103	121	ISI	11R	22716	014+ 12.4	9	30	1.11		
		ISI	10R	20011	014+ 12.3	5	17	1.22	-00.11	13.00
		ISI	11R	22716	014+ 15.8	8	27	1.05		
		ISI	10R	20011	014+ 15.5	6	20	1.07	-00.02	07.00
		ISI	11R	22716	015+ 43.8	8	27	2.55		
		ISI	10R	20011	015+ 43.7	7	23	2.30	00.25	04.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
		ISI	11R	22716	015+ 44.1	9	30	1.39		
		ISI	10R	20011	015+ 43.7	7	23	2.30	-00.91	07.00
104	75	ISI	11R	22779	015+ 39.5	6	20	1.17		
		ISI	10R	20074	015+ 39.2	6	20	1.35	-00.18	00.00
105	94	ISI	11R	22717	014+ 0.1	100	27	2.66		
		ISI	10R	20012	014+ 0.1	95	28	2.33	00.33	-1.00
106	2	ISI	11R	22718	015+ 10.6	10	33	1.09		
		ISI	10R	20013	015+ 10.7	7	23	1.08	00.01	10.00
106	112	ISI	11R	22719	015+ 45.1	5	17	0.85		
107	2	ISI	11R	22720	015+ 33.8	5	17	1.70		
		ISI	10R	20015	015+ 34.1	6	20	1.55	00.15	-3.00
107	55	ISI	11R	22846	015+ 37.0	7	23	1.08		
107	120	ISI	11R	22722	UTS+ 3.4	6	20	1.29		
		ISI	11R	22722	UTS+ 4.9	6	20	1.37		
		ISI	10R	20017	UTS+ 4.9	8	27	1.56	-00.19	-7.00
109	108	ISI	11R	22723	UTS+ 3.8	8	27	2.10		
		ISI	10R	20018	UTS+ 3.8	6	20	2.56	-00.46	07.00
110	52	ISI	11R	22724	015+ 40.6	5	17	1.21		
		ISI	11R	22724	UTS+ 1.2	11	37	1.16		
		ISI	10R	20019	UTS+ 1.2	13	37	1.38	-00.22	00.00
		ISI	11R	22724	UTS+ 3.0	12	25	1.03		
		ISI	10R	20019	UTS+ 2.8	14	33	1.32	-00.29	-8.00
111	33	ISI	11R	22725	UTS+ 4.7	9	30	1.03		
		ISI	10R	20020	UTS+ 4.7	9	30	1.46	-00.43	00.00
111	51	ISI	11R	22852	015+ 39.4	7	23	1.45		
112	116	ISI	11R	22726	008+ 31.2	11	30	1.01		
		ISI	11R	22726	012+ 22.0	6	20	2.18		
		ISI	10R	20021	012+ 22.3	5	17	1.82	00.36	03.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
114	93	ISI	11R	22727	015+ 41.2	9	30	1.54		
114	113	ISI	11R	22781	013+ 29.5	6	20	2.14		
		ISI	10R	20076	013+ 29.3	6	20	2.26	-00.12	00.00
115	109	ISI	11R	22729	UTS+ 5.3	6	20	3.36		
		ISI	10R	20024	UTS+ 5.2	5	17	3.14	00.22	03.00
116	2	ISI	11R	22909	006+ 3.8	8	27	2.41		
		ISI	10R	20204	006+ 3.8	8	27	2.25	00.16	00.00
116	109	ISI	11R	22730	015+ 33.7	5	17	1.15		
		ISI	11R	22730	015+ 36.8	10	33	1.23		
		ISI	10R	20025	015+ 36.7	7	23	1.35	-00.12	10.00
117	24	ISI	11R	22854	015+ 34.3	6	20	1.23		
		ISI	11R	22854	015+ 42.9	5	17	1.54		
118	67	ISI	11R	22782	015+ 38.0	6	20	1.18		
119	77	ISI	11R	22731	015+ 29.5	7	23	2.10		
		ISI	10R	20026	015+ 29.3	9	30	1.82	00.28	-7.00
		ISI	11R	22731	015+ 35.8	11	37	0.96		
		ISI	10R	20026	015+ 35.6	10	33	0.93	00.03	04.00
119	107	ISI	11R	22732	010+ 13.8	93	36	1.12		
		ISI	11R	22732	015+ 7.2	8	27	1.07		
		ISI	11R	22732	015+ 38.7	7	23	1.96		
		ISI	10R	20027	015+ 38.7	7	23	1.96	00.00	00.00
120	67	ISI	11R	22733	015+ 36.2	7	23	1.43		
121	104	ISI	11R	22735	015+ 4.2	8	27	1.23		
		ISI	10R	20030	015+ 4.3	7	23	1.24	-00.01	04.00
122	26	ISI	11R	22901	015+ 46.0	8	27	0.78		
		ISI	10R	20196	015+ 45.5	6	20	1.31	-00.53	07.00
123	85	ISI	11R	22885	015+ 45.2	7	23	1.16		

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
123	96	ISI	11R	22869	015+ 41.8	6	20	2.36		
		ISI	10R	20164	015+ 41.6	6	20	2.24	00.12	00.00
		ISI	11R	22869	015+ 42.8	5	17	1.40		
124	1	ISI	11R	22737	012+ 23.4	7	23	1.28		
		ISI	10R	20032	012+ 23.6	7	23	1.74	-00.46	00.00
125	82	ISI	11R	22886	015+ 31.8	7	23	1.18		
		ISI	10R	20181	015+ 31.5	8	27	1.02	00.16	-4.00
125	98	ISI	11R	22870	015+ 29.9	5	17	1.34		
		ISI	10R	20165	015+ 29.8	5	17	1.20	00.14	00.00
126	34	ISI	11R	22738	015+ 37.1	9	30	0.81		
126	94	ISI	11R	22871	015+ 35.9	10	33	2.39		
		ISI	10R	20166	015+ 35.9	8	27	2.62	-00.23	06.00
127	94	ISI	11R	22873	UTS+ 4.6	10	33	1.10		
		ISI	10R	20168	UTS+ 4.6	11	37	0.91	00.19	-4.00
129	27	ISI	11R	22860	015+ 36.3	5	17	0.62		
130	41	ISI	11R	22739	015+ 28.0	6	20	1.32		
130	46	ISI	11R	22861	015+ 22.8	6	20	1.05		
130	73	ISI	11R	22874	015+ 42.0	6	20	0.82		
		ISI	10R	20169	015+ 42.0	7	23	0.83	-00.01	-3.00
131	1	ISI	11R	22905	013+ 25.5	8	27	1.18		
		ISI	10R	20200	013+ 25.6	8	27	1.34	-00.16	00.00
131	82	ISI	11R	22868	015+ 15.8	7	23	1.75		
		ISI	11R	22868	015+ 37.9	9	30	1.92		
		ISI	10R	20163	015+ 37.6	10	33	1.74	00.18	-3.00
		ISI	11R	22868	015+ 43.1	10	33	1.37		
		ISI	10R	20163	015+ 42.6	8	27	1.19	00.18	06.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
132	39	ISI	11R	22932	015+ 31.6	6	20	0.79		
		ISI	10R	20227	015+ 31.3	5	17	1.33	-00.54	03.00
134	1	ISI	11R	22741	004+ 2.4	8	27	1.43		
		ISI	10R	20036	004+ 2.4	8	27	1.27	00.16	00.00
		ISI	11R	22741	004+ 3.4	7	23	1.21		
		ISI	10R	20036	004+ 3.3	6	20	1.11	00.10	03.00
134	65	ISI	11R	22888	015+ 37.6	6	20	1.28		
135	2	ISI	11R	22742	013+ 33.4	5	17	1.07		
		ISI	10R	20037	013+ 33.8	5	17	0.94	00.13	00.00
		ISI	11R	22742	015+ 11.9	7	23	1.24		
		ISI	10R	20037	015+ 12.0	9	30	1.21	00.03	-7.00
		ISI	11R	22742	015+ 36.3	5	17	1.45		
		ISI	10R	20037	015+ 36.5	6	20	1.32	00.13	-3.00
136	5	ISI	11R	22745	015+ 34.5	8	27	0.65		
		ISI	11R	22745	015+ 39.0	7	23	1.13		
136	6	ISI	11R	22746	015+ 36.6	9	30	1.38		
		ISI	10R	20041	015+ 36.8	10	33	1.71	-00.33	-3.00
		ISI	11R	22746	015+ 40.3	5	17	0.59		
		ISI	10R	20041	015+ 40.3	5	17	0.79	-00.20	00.00
136	69	ISI	11R	22875	015+ 33.5	9	30	1.06		
		ISI	10R	20170	015+ 33.3	5	17	1.23	-00.17	13.00
		ISI	11R	22875	015+ 37.7	5	17	2.65		
		ISI	10R	20170	015+ 37.5	5	17	2.35	00.30	00.00
138	65	ISI	11R	22876	UTS+ 6.1	8	27	1.46		
		ISI	10R	20171	UTS+ 6.1	10	33	1.69	-00.23	-6.00
139	67	ISI	11R	22907	015+ 45.8	11	37	1.33		
139	71	ISI	11R	22877	013+ 25.8	6	20	2.11		
		ISI	10R	20172	013+ 25.4	8	27	1.98	00.13	-7.00
		ISI	11R	22877	015+ 1.5	103	19	1.09		

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason ISI	Exam Out 11R	Exam Numb 22877	Indication Location 015+ 41.4	Ind Deg 5	% T.W. 17	Ind Volt 0.87	Delta Volts	Delta Depth
140	67	ISI	11R	22878	UTS+ 3.6	18	37	1.15		
		ISI	10R	20173	UTS+ 3.5	11	37	1.20	-00.05	00.00
141	60	ISI	11R	22879	015+ 1.7	88	27	0.47		
		ISI	11R	22879	015+ 44.2	6	20	0.74		
		ISI	11R	22879	015+ 45.7	6	20	0.70		
143	57	ISI	11R	22912	015+ 43.3	8	27	0.71		
145	50	ISI	11R	22880	UTS+ 4.4	6	20	2.96		
		ISI	10R	20175	UTS+ 4.5	5	17	4.01	-1.05	03.00
146	1	ISI	11R	22747	004+ 35.7	11	37	1.05		
		ISI	10R	20042	004+ 35.4	7	23	1.72	-00.67	14.00
146	50	ISI	11R	22882	003+ 35.6	6	20	2.09		
		ISI	10R	20177	003+ 35.8	8	27	1.98	00.11	-7.00
147	2	ISI	11R	22748	012+ 10.7	8	27	0.89		
		ISI	10R	20043	012+ 10.7	11	37	1.08	-00.19	-10.00
147	7	ISI	11R	22865	006+ 17.1	6	20	0.74		
147	15	ISI	11R	22866	015+ 20.5	7	23	0.86		
		ISI	10R	20161	015+ 20.3	5	17	1.16	-00.30	06.00

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Total Tubes Included : 151 Total Indications : 227

Voltage Summary :

Tubes Compared :	118	Number Increased :	42
Indications Compared :	168	Number Decreased :	125
		Number No Change :	1
		Mean Change :	- 0.30
		Std. Dev. :	0.42

Percent Summary :

Tubes Compared :	118	Number Increased :	73
Indications Compared :	168	Number Decreased :	56
		Number No Change :	39
		Mean Change :	0.80
		Std. Dev. :	6.31

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
1	11	ISI	11R	17518	UTS+ 2.6	5	17	1.32		
		ISI	10R	14983	UTS+ 3.0	7	23	1.22	00.10	-6.00
6	4	ISI	11R	17539	UTS+ 5.1	6	20	2.37		
7	42	ISI	11R	17519	012+ 12.0	10	33	0.86		
		ISI	10R	14984	012+ 12.1	7	23	0.87	-00.01	10.00
		ISI	11R	17519	013+ 11.4	12	40	0.95		
		ISI	10R	14984	013+ 11.3	13	37	0.91	00.04	03.00
		ISI	11R	17519	014+ 22.9	9	30	0.81		
		ISI	10R	14984	014+ 23.2	10	33	0.79	00.02	-3.00
9	22	ISI	11R	17520	015+ 44.7	9	30	1.24		
		ISI	10R	14985	015+ 44.8	9	30	1.29	-00.05	00.00
19	44	ISI	11R	17521	015+ 41.5	9	30	1.74		
		ISI	10R	14986	015+ 41.5	8	27	1.77	-00.03	03.00
24	11	ISI	11R	17555	005+ 30.4	7	23	2.54		
30	13	ISI	11R	17522	015+ 45.2	10	33	2.21		
		ISI	10R	14987	015+ 44.9	10	33	2.06	00.15	00.00
30	71	ISI	11R	17523	015+ 31.4	7	23	1.64		
		ISI	11R	17523	015+ 31.9	11	37	1.19		
		ISI	10R	14988	015+ 32.0	7	23	1.71	-00.52	14.00
38	72	ISI	11R	17552	012+ 7.3	10	33	0.84		
		ISI	10R	15017	012+ 7.3	11	37	0.80	00.04	-4.00
		ISI	11R	17552	012+ 35.7	10	33	0.73		
		ISI	10R	15017	012+ 35.7	11	37	0.83	-00.10	-4.00
50	39	ISI	11R	17547	008+ 33.9	8	27	1.23		
		ISI	10R	15012	008+ 34.0	7	23	1.14	00.09	04.00
		ISI	11R	17547	008+ 33.9	8	27	1.23		
		ISI	10R	15012	008+ 34.0	7	23	1.14	00.09	04.00
60	83	ISI	11R	17524	015+ 39.2	9	30	1.05		
		ISI	10R	14989	015+ 39.7	9	30	1.05	00.00	00.00

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG B
OUTAGE : 11R
COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
64	83	ISI	11R	17525	015+ 31.5	10	33	1.11		
		ISI	10R	14990	015+ 31.4	8	27	1.78	-00.67	06.00
74	56	ISI	11R	17550	014+ 2.3	5	17	1.33		
		ISI	10R	15015	014+ 2.3	8	27	1.51	-00.18	-10.00
104	77	ISI	11R	17526	UTS+ 4.2	1	20	1.68		
		ISI	10R	14991	UTS+ 4.5	6	20	1.69	-00.01	00.00
105	8	ISI	11R	17527	UTS+ 6.7	9	30	1.33		
		ISI	10R	14992	UTS+ 6.5	6	20	1.32	00.01	10.00
109	11	ISI	11R	17528	015+ 44.8	10	33	1.12		
		ISI	10R	14993	015+ 45.1	10	33	1.13	-00.01	00.00
		ISI	11R	17528	015+ 45.8	9	30	0.94		
		ISI	10R	14993	015+ 46.0	7	23	1.01	-00.07	07.00
		ISI	11R	17528	UTS+ 5.4	9	30	1.03		
		ISI	10R	14993	UTS+ 5.4	7	23	1.10	-00.07	07.00
109	112	ISI	11R	17529	004+ 0.1	7	23	2.27		
		ISI	10R	14994	004+ 0.1	8	27	2.14	00.13	-4.00
		ISI	11R	17529	004+ 4.8	9	30	0.90		
		ISI	10R	14994	004+ 4.8	6	20	1.25	-00.35	10.00
		ISI	11R	17529	006+ 13.5	6	20	2.56		
117	56	ISI	11R	17542	012+ 14.3	6	20	1.30		
120	42	ISI-10	11R	17556	004+ 14.5	77	44	1.16		
		DS7	10R	15134	004+ 14.4	81	35	0.90	00.26	09.00
136	40	ISI	11R	17532	015+ 40.3	7	23	1.39		
		ISI	10R	14997	015+ 40.5	6	20	1.46	-00.07	03.00
143	43	ISI	11R	17533	010+ 7.8	8	27	0.79		
		ISI	10R	14998	010+ 7.9	8	27	0.78	00.01	00.00
		ISI	11R	17533	012+ 0.3	11	37	0.59		
		ISI	10R	14998	012+ 0.2	10	33	0.86	-00.27	04.00
146	37	ISI	11R	17535	012+ 7.5	5	17	1.11		
		ISI	10R	15000	012+ 7.3	11	37	1.00	00.11	-20.00

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 OUTAGE : 11R
 COMPARISON OF PREVIOUS EXAM RESULTS

Row	Tube	Exam Reason	Exam Out	Exam Numb	Indication Location	Ind Deg	% T.W.	Ind Volt	Delta Volts	Delta Depth
150	25	ISI	11R	17536	007+ 25.5	9	30	1.00		
		ISI	10R	15001	007+ 25.4	9	30	1.09	-00.09	00.00
		ISI	11R	17536	015+ 19.9	9	30	0.71		
		ISI	10R	15001	015+ 19.5	7	23	0.75	-00.04	07.00

Total Tubes Included : 23

Total Indications : 34

Voltage Summary :

Tubes Compared : 20
 Indications Compared : 29

Number Increased : 12
 Number Decreased : 16
 Number No Change : 1
 Mean Change : - 0.05
 Std. Dev. : 0.19

Percent Summary :

Tubes Compared : 20
 Indications Compared : 29

Number Increased : 15
 Number Decreased : 7
 Number No Change : 7
 Mean Change : 1.72
 Std. Dev. : 6.80

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
66	1	ISI-UN	54C-MIZ30	A010	004+	27.5	13	43	1.81	LSE 22939	11R
66	1	CONFIR	MRPC-3C	A012	004+	27.2	130	SVI	2.90	005 27189	11R
66	1	ISI-SL	400-MIZ30	A021	+	0.0	0	0	0.00	LSE 22949	11R
66	1	ISI-SL	MRPC-SLV	A028	+	0.0	0	0	0.00	USR 22947	11R
		ISI-SL	MRPC-SLV	A028	+	0.0	0	0	0.00	LSE 22947	11R

Total Examinations : 4

Total Indications : 5

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
7	42	ISI	540-MIZ30	B026	+ 0.0	0	RNC	0.00	LTE	17519	11R
		ISI	540-MIZ30	B090	004+ 33.6	7	BVC	0.45	LTE	17519	11R
		ISI	540-MIZ30	B090	005+ 16.8	8	BVC	0.53	LTE	17519	11R
		ISI	540-MIZ30	B090	005+ 19.3	18	BVC	0.54	LTE	17519	11R
		ISI	540-MIZ30	B090	011+ 2.5	14	BVC	0.49	LTE	17519	11R
		ISI	540-MIZ30	B090	012+ 4.2	16	BVC	0.44	LTE	17519	11R
		ISI	540-MIZ30	B090	012+ 12.0	10	33	0.86	LTE	17519	11R
		ISI	540-MIZ30	B090	012+ 18.2	12	BVC	0.56	LTE	17519	11R
		ISI	540-MIZ30	B090	012+ 32.5	14	BVC	0.46	LTE	17519	11R
		ISI	540-MIZ30	B090	013+ 0.3	12	BVC	0.70	LTE	17519	11R
		ISI	540-MIZ30	B090	013+ 11.4	12	40	0.95	LTE	17519	11R
		ISI	540-MIZ30	B090	013+ 28.7	15	BVC	0.52	LTE	17519	11R
		ISI	540-MIZ30	B090	014+ 9.5	12	BVC	0.61	LTE	17519	11R
		ISI	540-MIZ30	B090	014+ 22.9	9	30	0.81	LTE	17519	11R
7	42	CONFIR	MRPC-3C	B106	004+ 33.6	0	NDD	0.00	004	21814	11R
		CONFIR	MRPC-3C	B106	005+ 16.8	0	NDD	0.00	004	21814	11R
		CONFIR	MRPC-3C	B106	005+ 19.3	0	NDD	0.00	004	21814	11R
		CONFIR	MRPC-3C	B106	012+ 12.0	0	NDD	0.00	012	21814	11R
		CONFIR	MRPC-3C	B106	012+ 18.2	0	NDD	0.00	012	21814	11R
		CONFIR	MRPC-3C	B106	012+ 32.5	0	NDD	0.00	012	21814	11R
		CONFIR	MRPC-3C	B106	013+ 0.4	349	SVI	0.74	012	21814	11R
		CONFIR	MRPC-3C	B106	013+ 12.4	2	SVI	0.71	012	21814	11R
		CONFIR	MRPC-3C	B106	013+ 28.6	0	NDD	0.00	012	21814	11R

Total Examinations : 2

Total Indications : 23

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
45	118	CONFIR	MRPC-3C	B114	014+	0.5	0	31	4.39	014	21892 11R
45	118	BOUND	540-MIZ30	B110	011-	0.7	123	DSI	1.00	LTE	21860 11R
		BOUND	540-MIZ30	B110	012-	0.7	130	DSI	0.84	LTE	21860 11R
		BOUND	540-MIZ30	B110	014+	0.6	80	DSI	2.06	LTE	21860 11R
45	118	CONFIR	MRPC-3C	B114	011-	0.7	0	12	1.56	011	21892 11R
		CONFIR	MRPC-3C	B114	012-	0.9	0	22	2.87	012	21892 11R

Total Examinations : 3

Total Indications : 6

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
46	117	12%-TS	510-MIZ30	B067	011-	0.7	129	DSI	0.78	LTE	18498 11R
		12%-TS	510-MIZ30	B067	012-	0.7	80	DSI	1.92	LTE	18498 11R
		12%-TS	510-MIZ30	B067	014+	0.6	64	DSI	1.41	LTE	18498 11R
46	117	CONFIR	MRPC-3C	B106	011-	0.9	0	23	1.75	011	21834 11R
		CONFIR	MRPC-3C	B106	011+	0.7	0	7	0.49	011	21834 11R
		CONFIR	MRPC-3C	B106	012-	0.8	0	42	4.39	011	21834 11R
		CONFIR	MRPC-3C	B106	014+	0.6	0	31	2.68	014	21834 11R

Total Examinations : 2

Total Indications : 7

THREE MILE ISLAND:UNIT 1
COMPONENT : SG B
TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
120	42	ISI-10	540-MIZ30	B014	004+ 14.5	77	44	1.16	LTE	17556	11R
		ISI-10	540-MIZ30	B025	004+ 14.6	78	PID	1.05	LTE	17556	11R
120	42	CONFIR	MRPC-3C	B108	004+ 14.6	32	SVI	0.38	004	21815	11R

Total Examinations : 2

Total Indications : 3

THREE MILE ISLAND:UNIT 1
COMPONENT : SG B
TUBES REPAIRED DURING OUTAGE 11R

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Circ	Ind Volt	Per Ext	Exam ID #	Out age
126	58	12%-TS	510-MIZ3G	B037	015+ 29.0	8	27	4.21	LTE	19612	11R
126	58	CONFIR	MRPC-3C	B109	015+ 29.0	9	SVI	9.19	015	21812	11R
126	58	CONFIR	540-MIZ30	B115	UTS -17.4	13	43	7.40	UTS	21878	11R

Total Examinations : 3

Total Indications : 3

THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
INDICATIONS >= 20 % T.W.
INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
1	4	ISI	540-MIZ30	A038	015 + 36.5	9	30	1.67	LTEUTE
2	6	ISI	540-MIZ30	A015	015 + 29.1	6	20	1.41	LTEUTE
2	25	ISI	540-MIZ30	A037	012 + 35.7	11	37	1.22	LTEUTE
		ISI	540-MIZ30	A037	013 + 9.8	6	20	1.52	LTEUTE
		CONFIR	MRPC-3C	A111	013 + 10.7	7	SVI	1.06	013014
		ISI	540-MIZ30	A037	013 + 10.9	6	20	1.51	LTEUTE
		CONFIR	MRPC-3C	A111	013 + 10.7	7	SVI	1.06	013014
		ISI	540-MIZ30	A037	013 + 13.6	8	27	0.72	LTEUTE
		CONFIR	MRPC-3C	A111	013 + 13.6	330	SVI	1.84	013014
3	17	ISI	540-MIZ30	A015	015 + 33.0	10	33	0.87	LTEUTE
4	29	ISI	540-MIZ30	A015	015 + 27.6	8	20	1.70	LTEUTE
5	3	ISI	540-MIZ30	A015	015 + 44.8	6	20	1.07	LTEUTE
		ISI	540-MIZ30	A015	015 + 45.3	7	23	1.93	LTEUTE
5	5	ISI	540-MIZ30	A015	012 + 27.2	92	24	0.36	LTEUTE
		ISI	540-MIZ30	A015	015 + 34.9	10	33	1.06	LTEUTE
6	43	ISI	540-MIZ30	A037	UTS + 3.6	8	27	2.52	LTEUTE
6	47	ISI	540-MIZ30	A017	015 + 20.1	7	23	0.65	LTEUTE
		ISI	540-MIZ30	A017	015 + 34.3	8	27	0.84	LTEUTE
8	2	ISI	540-MIZ30	A037	012 + 16.1	9	30	1.34	LTEUTE
		ISI	540-MIZ30	A037	012 + 18.9	8	27	1.03	LTEUTE
		ISI	540-MIZ30	A037	012 + 24.8	8	27	2.36	LTEUTE
		ISI	540-MIZ30	A037	012 + 29.0	9	30	1.51	LTEUTE
		ISI	540-MIZ30	A037	012 + 33.2	8	27	2.08	LTEUTE
8	43	ISI	540-MIZ30	A017	015 + 24.1	7	23	0.72	LTEUTE
		ISI	540-MIZ30	A017	015 + 24.5	9	30	0.78	LTEUTE
11	4	ISI	540-MIZ30	A015	015 + 21.6	10	33	0.94	LTEUTE

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
INDICATIONS >= 20 % T.W.
INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
13	1	ISI	540-MIZ30	A038	011 + 35.9	8	27	0.94	LTEUTE
		ISI	540-MIZ30	A038	013 + 22.4	7	23	2.50	LTEUTE
		ISI	540-MIZ30	A038	013 + 23.3	6	20	1.79	LTEUTE
13	10	ISI-10	540-MIZ30	A017	UTS + 5.0	7	23	0.79	LTEUTE
15	77	ISI	540-MIZ30	A017	012 + 30.6	6	20	0.92	LTEUTE
16	2	ISI	540-MIZ30	A017	015 + 42.9	7	23	0.70	LTEUTE
17	82	ISI	540-MIZ30	A017	015 + 5.8	8	27	0.67	LTEUTE
18	3	ISI	540-MIZ30	A013	015 + 25.4	8	27	0.94	LTEUTE
18	84	ISI	540-MIZ30	A017	015 + 32.8	8	27	0.81	LTSUTE
		ISI	540-MIZ30	A038	015 + 32.9	8	27	1.33	LTEUTE
		ISI	540-MIZ30	A038	015 + 33.3	10	33	1.36	LTEUTE
		ISI	540-MIZ30	A017	015 + 33.4	10	33	0.79	LTSUTE
		ISI	540-MIZ30	A038	015 + 34.8	6	20	1.43	LTEUTE
		ISI	540-MIZ30	A038	015 + 36.0	6	20	1.12	LTEUTE
		ISI	540-MIZ30	A038	015 + 38.4	6	20	1.54	LTEUTE
		ISI	540-MIZ30	A038	015 + 41.2	11	37	1.10	LTEUTE
		ISI	540-MIZ30	A017	015 + 41.2	11	37	0.67	LTSUTE
20	56	ISI	540-MIZ30	A014	015 + 33.8	7	23	0.88	LTEUTE
20	85	ISI	540-MIZ30	A017	010 + 17.6	6	20	1.12	LTEUTE
		ISI	540-MIZ30	A017	010 + 18.5	6	20	0.96	LTEUTE
		ISI	540-MIZ30	A017	010 + 21.4	7	23	0.67	LTEUTE
		ISI	540-MIZ30	A017	014 + 31.6	10	33	0.80	LTEUTE
22	35	ISI	540-MIZ30	A013	UTS + 4.0	9	32	0.69	LTEUTE
25	2	ISI	540-MIZ30	A037	013 + 2.6	7	23	0.98	LTEUTE
27	78	ISI	540-MIZ30	A017	015 + 29.6	8	27	0.83	LTEUTE
		ISI	540-MIZ30	A017	015 + 32.5	11	37	1.11	LTEUTE

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
INDICATIONS >= 20 % T.W.
INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
28	78	ISI	540-MIZ30	A017	015 + 14.7	6	20	2.54	LTEUTE
29	58	ISI	540-MIZ30	A014	015 + 30.0	7	23	1.07	LTEUTE
		ISI	540-MIZ30	A014	015 + 34.0	8	27	1.12	LTEUTE
32	81	ISI-10	540-MIZ30	A017	015 + 35.6	10	33	1.28	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 36.0	357	SVI	2.98	015UTS
		ISI-10	540-MIZ30	A017	015 + 36.0	6	20	1.22	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 36.0	357	SVI	2.98	015UTS
34	1	ISI	540-MIZ30	A038	006 + 15.8	10	33	1.06	LTEUTE
34	3	ISI	540-MIZ30	A015	UTS + 2.1	8	27	1.09	LTEUTE
36	106	ISI	540-MIZ30	A037	015 + 34.4	7	23	1.39	LTEUTE
37	109	ISI	540-MIZ30	A037	015 + 39.3	11	37	1.07	LTEUTE
39	110	ISI	540-MIZ30	A037	015 + 39.8	11	37	1.21	LTEUTE
41	16	ISI	540-MIZ30	A013	014 + 3.0	98	22	0.36	LTEUTE
41	94	ISI	540-MIZ30	A037	015 + 15.6	7	23	1.18	LTEUTE
43	82	ISI	540-MIZ30	A016	007 + 37.7	7	23	0.88	LTEUTE
46	88	ISI	540-MIZ30	A016	015 + 30.4	8	27	1.30	LTEUTE
48	118	ISI	540-MIZ30	A037	014 + 23.1	6	20	0.93	LTEUTE
		ISI	540-MIZ30	A037	014 + 29.4	11	37	0.94	LTEUTE
		ISI	540-MIZ30	A037	014 + 30.3	9	30	0.71	LTEUTE
49	73	ISI	540-MIZ30	A016	UTS + 5.0	9	30	1.53	LTEUTE
50	2	ISI	540-MIZ30	A037	015 + 22.6	8	23	0.96	LTEUTE
		CONFIR	MRPC-3C	A109	015 + 23.4	0	SVI	0.81	015UTS
50	102	ISI	540-MIZ30	A099	015 + 16.4	8	27	1.64	LTEUTE

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS >= 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
		ISI	540-MIZ30	A017	015 + 16.6	7	23	1.34	LTSUTE
52	34	ISI	540-MIZ30	A013	013 + 23.1	9	30	0.73	LTEUTE
		ISI	540-MIZ30	A013	014 + 12.6	6	20	0.85	LTEUTE
55	124	ISI	540-MIZ30	A017	015 + 14.4	9	30	1.16	LTEUTE
57	63	ISI	540-MIZ30	A016	015 + 37.1	7	23	1.96	LTEUTE
57	65	ISI	540-MIZ30	A016	015 + 37.7	7	23	0.87	LTSUTE
		CONFIR	MRPC-3C	A109	015 + 37.2	353	SVI	3.32	015UTS
		ISI	540-MIZ30	A037	015 + 38.2	11	37	1.06	LTEUTE
		CONFIR	MRPC-3C	A109	015 + 38.2	0	NDD	0.00	015UTS
		ISI	540-MIZ30	A037	015 + 41.2	10	33	0.70	LTEUTE
		CONFIR	MRPC-3C	A109	015 + 41.2	0	NDD	0.00	015UTS
58	25	ISI	540-MIZ30	A013	015 + 43.9	6	20	0.65	LTEUTE
60	65	ISI	540-MIZ30	A016	015 + 37.4	6	20	1.16	LTEUTE
60	126	ISI	540-MIZ30	A017	014 + 26.2	8	27	0.65	LTEUTE
64	66	ISI	540-MIZ30	A039	015 + 40.2	9	30	1.03	LTEUTE
64	129	ISI	540-MIZ30	A038	015 + 45.7	10	33	1.21	LTEUTE
66	1	ISI-UN	540-MIZ30	A010	004 + 27.5	13	43	1.81	LSELTE
		CONFIR	MRPC-3C	A012	004 + 27.2	130	SVI	2.90	005004
66	127	ISI	540-MIZ30	A017	015 + 44.8	9	30	0.72	LTEUTE
72	21	ISI	540-MIZ30	A013	015 + 35.7	6	20	0.78	LTEUTE
72	86	ISI	540-MIZ30	A016	UTS + 4.0	8	27	1.04	LTEUTE
75	122	ISI	540-MIZ30	A017	015 + 45.0	8	27	1.11	LTEUTE
75	123	ISI	540-MIZ30	A017	015 + 21.8	8	27	0.55	LTEUTE

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS >= 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason ISI	Exam Tech 540-MIZ30	Exam Reel A017	Indication Location 015 + 24.2	Ind Deg 7	% / Coils 23	Ind Volt 1.45	Extent Tested LTEUTE
77	126	ISI	540-MIZ30	A098	015 + 10.4	8	27	0.76	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 10.8	327	SVI	1.91	015UTS
		ISI	540-MIZ30	A098	015 + 18.7	7	23	1.04	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 18.9	323	SVI	1.66	015UTS
79	130	ISI	540-MIZ30	A098	UTS + 5.5	11	37	1.16	LTEUTE
81	92	ISI	540-MIZ30	A016	015 + 42.2	9	30	0.95	LTEUTE
81	130	ISI	540-MIZ30	A098	012 + 14.3	7	23	1.04	LTEUTE
82	32	ISI	540-MIZ30	A014	UTS + 6.4	11	39	1.40	LTEUTE
82	128	ISI	540-MIZ30	A098	015 + 7.9	7	23	1.21	LTEUTE
83	17	ISI	540-MIZ30	A014	015 + 35.8	9	30	0.89	LTEUTE
84	103	ISI	540-MIZ30	A098	015 + 32.6	8	27	0.81	LTEUTE
87	1	ISI-UN	540-MIZ30	A010	012 + 7.7	7	23	2.65	LSELTE
		ISI-UN	540-MIZ30	A010	012 + 8.0	8	27	2.49	LSELTE
87	20	ISI	540-MIZ30	A014	015 + 33.4	9	30	1.04	LTEUTE
88	124	ISI	540-MIZ30	A098	015 + 3.6	8	27	1.00	LTEUTE
90	20	12%-TS	510-MIZ30	A048	015 - 0.0	7	23	17.88	LTEUTE
		CONFIR	MRPC-3C	A109	015 - 0.0	0	NDD	0.00	015015
90	62	12%-TS	510-MIZ30	A113	LTS + 1.0	94	20	1.14	LTEUTE
		CONFIR	MRPC-3C	A119	LTS + 1.1	0	NDD	0.00	LTS LTS
90	80	ISI	540-MIZ30	A098	015 + 32.3	9	30	1.30	LTEUTE
90	128	ISI	540-MIZ30	A098	015 - 0.2	7	23	2.21	LTEUTE
		ISI	540-MIZ30	A098	015 + 4.0	8	27	1.13	LTEUTE

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS \geq 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
93	27	ISI	540-MIZ30	A014	015 + 38.1	6	20	0.73	LTEUTE
93	58	ISI	540-MIZ30	A118	UTS + 4.7	11	37	1.12	LTEUTE
93	90	ISI	540-MIZ30	A098	UTS + 0.9	10	33	0.99	LTEUTE
93	123	ISI	540-MIZ30	A098	015 + 6.8	6	20	1.02	LTEUTE
		ISI	540-MIZ30	A098	015 + 7.1	8	27	0.92	LTEUTE
94	113	ISI	540-MIZ30	A098	015 + 32.9	6	20	1.40	LTEUTE
95	111	ISI	540-MIZ30	A098	015 + 40.3	6	20	1.39	LTEUTE
95	123	ISI	540-MIZ30	A098	UTS + 2.0	6	20	3.50	LTEUTE
95	127	ISI	540-MIZ30	A098	012 + 13.5	7	23	0.71	LTEUTE
		ISI	540-MIZ30	A098	012 + 25.0	6	20	0.92	LTEUTE
		ISI	540-MIZ30	A098	015 + 13.3	11	37	1.21	LTEUTE
96	32	ISI	540-MIZ30	A014	015 + 43.6	9	30	1.19	LTEUTE
99	1	ISI	540-MIZ30	A038	004 + 24.0	6	20	1.57	LTEUTE
		ISI	540-MIZ30	A038	008 + 5.1	7	23	1.01	LTEUTE
99	17	ISI	540-MIZ30	A014	015 + 33.2	6	20	1.24	LTEUTE
100	90	ISI	540-MIZ30	A098	UTS + 3.0	10	33	1.13	LTEUTE
100	122	ISI	540-MIZ30	A098	UTS + 5.2	7	23	2.06	LTEUTE
101	16	ISI	540-MIZ30	A014	015 + 31.6	8	27	0.85	LTEUTE
101	51	ISI	540-MIZ30	A016	UTS + 1.4	8	27	1.46	LTEUTE
		ISI	540-MIZ30	A016	UTS + 4.1	8	29	1.41	LTEUTE
101	61	ISI	540-MIZ30	A118	015 + 29.7	9	30	2.05	LTEUTE
103	77	ISI-10	540-MIZ30	A098	015 + 24.7	11	37	1.59	LTEUTE

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG A
OUTAGE : 11R
INDICATIONS >= 20 % T.W.
INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
103	121	ISI	540-MIZ30	A098	014 + 12.4	9	30	1.11	LTEUTE
		ISI	540-MIZ30	A098	014 + 15.8	8	27	1.05	LTEUTE
		ISI	540-MIZ30	A098	015 + 43.8	8	27	2.55	LTEUTE
		ISI	540-MIZ30	A098	015 + 44.1	9	30	1.39	LTEUTE
104	75	ISI	540-MIZ30	A118	015 + 39.5	6	20	1.17	LTEUTE
105	94	ISI	540-MIZ30	A098	014 + 0.1	100	27	2.66	LTEUTE
106	2	ISI	540-MIZ30	A038	015 + 10.6	10	33	1.09	LTEUTE
107	55	ISI	540-MIZ30	A118	015 + 37.0	7	23	1.08	LTEUTE
		CONFIR	MRPC-3C	A121	015 + 37.3	324	SVI	1.80	015UTS
107	120	ISI	540-MIZ30	A098	UTS + 3.4	6	20	1.29	LTEUTE
		ISI	540-MIZ30	A098	UTS + 4.9	6	20	1.37	LTEUTE
109	108	ISI	540-MIZ30	A098	UTS + 3.8	8	27	2.10	LTEUTE
110	52	ISI	540-MIZ30	A014	UTS + 1.2	11	37	1.16	LTEUTE
		ISI	540-MIZ30	A014	UTS + 3.0	12	25	1.03	LTEUTE
111	33	ISI	540-MIZ30	A014	UTS + 4.7	9	30	1.03	LTEUTE
111	51	ISI	540-MIZ30	A014	015 + 39.4	7	23	1.45	LTEUTE
112	116	ISI	540-MIZ30	A098	008 + 31.2	11	30	1.01	LTEUTE
		ISI	540-MIZ30	A098	012 + 22.0	6	20	2.18	LTEUTE
114	93	ISI	540-MIZ30	A098	015 + 41.2	9	30	1.54	LTEUTE
114	113	ISI	540-MIZ30	A098	013 + 29.5	6	20	2.14	LTEUTE
115	109	ISI	540-MIZ30	A098	UTS + 5.3	6	20	3.36	LTEUTE
116	2	ISI	540-MIZ30	A038	006 + 3.8	8	27	2.41	LTEUTE
116	109	ISI	540-MIZ30	A098	015 + 36.8	10	33	1.23	LTEUTE

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS >= 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
117	24	ISI	540-MIZ30	A014	015 + 34.3	6	20	1.23	LTEUTE
118	67	ISI	540-MIZ30	A098	015 + 38.0	6	20	1.18	LTEUTE
119	77	ISI	540-MIZ30	A098	015 + 29.5	7	23	2.10	LTEUTE
		ISI	540-MIZ30	A098	015 + 35.8	11	37	0.96	LTEUTE
119	107	ISI	540-MIZ30	A098	010 + 13.8	93	36	1.12	LTEUTE
		CONFIR	MRPC-3C	A110	010 + 13.8	0	NDD	0.00	010011
		ISI	540-MIZ30	A098	015 + 7.2	8	27	1.07	LTEUTE
		ISI	540-MIZ30	A098	015 + 38.7	7	23	1.96	LTEUTE
120	67	ISI	540-MIZ30	A098	015 + 36.2	7	23	1.43	LTEUTE
121	104	ISI	540-MIZ30	A098	015 + 4.2	8	27	1.23	LTEUTE
122	26	ISI	540-MIZ30	A014	015 + 46.0	8	27	0.78	LTEUTE
123	85	ISI	540-MIZ30	A098	015 + 45.2	7	23	1.16	LTEUTE
123	96	ISI	540-MIZ30	A098	015 + 41.8	6	20	2.36	LTEUTE
124	1	ISI	540-MIZ30	A038	012 + 23.4	7	23	1.28	LTEUTE
125	82	ISI	540-MIZ30	A098	015 + 31.8	7	23	1.18	LTEUTE
126	34	ISI	540-MIZ30	A014	015 + 37.1	9	30	0.81	LTEUTE
126	94	ISI	540-MIZ30	A098	015 + 35.9	10	33	2.39	LTEUTE
127	90	12%-TS	510-MIZ30	A068	011 - 0.1	85	20	0.61	LTEUTE
		CONFIR	MRPC-3C	A110	011 - 0.2	0		1.57	011011
127	94	ISI	540-MIZ30	A107	UTS + 4.6	10	33	1.10	LTEUTE
130	41	ISI	540-MIZ30	A014	015 + 28.0	6	20	1.32	LTEUTE
130	46	ISI	540-MIZ30	A014	015 + 22.8	6	20	1.05	LTEUTE

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS >= 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
130	73	ISI	540-MIZ30	A098	015 + 42.0	6	20	0.82	LTEUTE
131	1	ISI	540-MIZ30	A038	013 + 25.5	8	27	1.18	LTEUTE
131	82	ISI	540-MIZ30	A098	015 + 15.8	7	23	1.75	LTEUTE
		ISI	540-MIZ30	A098	015 + 37.9	9	30	1.92	LTEUTE
		ISI	540-MIZ30	A098	015 + 43.1	10	33	1.37	LTEUTE
132	39	ISI	540-MIZ30	A014	015 + 31.6	6	20	0.79	LTEUTE
134	1	ISI	540-MIZ30	A038	004 + 2.4	8	27	1.43	LTEUTE
		ISI	540-MIZ30	A038	004 + 3.4	7	23	1.21	LTEUTE
134	65	ISI	540-MIZ30	A014	015 + 37.6	6	20	1.28	LTEUTE
134	74	HI-PLG	510-MIZ30	A069	014 + 0.6	102	26	0.76	LTEUTE
		CONFIR	MRPC-3C	A109	014 + 0.7	0		2.25	014014
		CONFIR	MRPC-3C	A109	014 + 0.7	0	25	2.25	014014
		CONFIR	MRPC-3C	A109	014 + 0.7	0		2.25	014014
135	2	ISI	540-MIZ30	A038	015 + 11.9	7	23	1.24	LTEUTE
136	5	ISI	540-MIZ30	A014	015 + 34.5	8	27	0.65	LTEUTE
		ISI	540-MIZ30	A014	015 + 39.0	7	23	1.13	LTEUTE
136	6	ISI	540-MIZ30	A014	015 + 36.6	9	30	1.38	LTEUTE
136	69	ISI	540-MIZ30	A098	015 + 33.5	9	30	1.06	LTEUTE
138	65	ISI	540-MIZ30	A014	UTS + 6.1	8	27	1.46	LTEUTE
139	67	ISI	540-MIZ30	A107	015 + 45.8	11	37	1.33	LTEUTE
139	71	ISI	540-MIZ30	A098	013 + 25.8	6	20	2.11	LTEUTE
140	67	ISI	540-MIZ30	A098	UTS + 3.6	18	37	1.15	LTEUTE
140	70	CONFIR	MRPC-3C	A109	014 + 0.7	0	20	1.83	014014
		CONFIR	MRPC-3C	A109	014 + 0.7	0		1.83	014014

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THREE MILE ISLAND:UNIT 1
 COMPONENT : SG A
 OUTAGE : 11R
 INDICATIONS \geq 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
		HI-PLG	510-MIZ30	A069	014 + 0.9	81	26	0.63	LTEUTE
		CONFIR	MRPC-3C	A109	014 + 0.7	0		1.83	014014
141	60	ISI	540-MIZ30	A014	015 + 1.7	88	27	0.47	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 1.7	0	NDD	0.00	015UTS
		ISI	540-MIZ30	A014	015 + 44.2	6	29	0.74	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 44.0	315	SVI	2.18	015015
		ISI	540-MIZ30	A014	015 + 45.7	6	20	0.70	LTEUTE
		CONFIR	MRPC-3C	A110	015 + 45.1	338	SVI	1.44	015015
143	57	ISI	540-MIZ30	A014	015 + 43.3	8	27	0.71	LTEUTE
145	50	ISI	540-MIZ30	A014	UTS + 4.4	6	20	2.96	LTEUTE
146	1	ISI	540-MIZ30	A038	004 + 35.7	11	37	1.05	LTEUTE
146	50	ISI	540-MIZ30	A014	003 + 35.6	6	20	2.09	LTEUTE
147	2	ISI	540-MIZ30	A014	012 + 10.7	8	27	0.89	LTEUTE
147	7	ISI	540-MIZ30	A014	006 + 17.1	6	20	0.74	LTEUTE
		CONFIR	MRPC-3C	A110	006 + 17.3	308	SVI	1.37	006007
147	15	ISI	540-MIZ30	A014	015 + 20.5	7	23	0.86	LTEUTE

Total Tubes Included : 144

Total Indications : 203

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 OUTAGE : 11R
 INDICATIONS >= 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
1	7	12%-TS CONFIR	510-MIZ30 MRPC-3C	B061 B106	007 - 0.6 007 - 0.8	98 0	27	0.69 0.70	LTEUTE 007007
6	4	ISI	540-MIZ30	B026	UTS + 5.1	6	20	2.37	LTEUTE
7	42	ISI CONFIR ISI CONFIR ISI	540-MIZ30 MRPC-3C 540-MIZ30 MRPC-3C 540-MIZ30	B090 B106 B090 B106 B090	012 + 12.0 012 + 12.0 013 + 11.4 013 + 12.4 014 + 22.9	10 0 12 2 9	33 NDD 40 SVI 30	0.86 0.00 0.95 0.71 0.81	LTEUTE 012014 LTEUTE 012014 LTEUTE
9	22	ISI	540-MIZ30	B026	015 + 44.7	9	30	1.24	LTEUTE
19	44	ISI	540-MIZ30	B026	015 + 41.5	9	30	1.74	LTEUTE
24	11	ISI	540-MIZ30	B026	005 + 30.4	7	23	2.54	LTEUTE
30	13	ISI	540-MIZ30	B026	015 + 45.2	10	33	2.21	LTEUTE
30	71	ISI ISI	540-MIZ30 540-MIZ30	B026 B026	015 + 31.4 015 + 31.9	7 11	23 37	1.64 1.19	LTEUTE LTEUTE
31	103	CONFIR CONFIR	MRPC-3C MRPC-3C	B106 B106	014 + 0.5 014 + 0.5	0 0	20	1.56 1.56	014014 014014
38	72	ISI ISI	540-MIZ30 540-MIZ30	B013 B013	012 + 7.3 012 + 35.7	10 10	33 33	0.84 0.73	LTEUTE LTEUTE
45	118	CONFIR CONFIR CONFIR CONFIR BOUND CONFIR	MRPC-3C MRPC-3C MRPC-3C MRPC-3C 540-MIZ30 MRPC-3C	B114 B114 B114 B114 B110 B114	012 - 0.9 012 - 0.9 014 + 0.5 014 + 0.5 014 + 0.6 014 + 0.5	0 0 0 0 80 0	22 22 31 31 44 44	2.87 2.87 4.39 4.39 2.06 4.39	012012 012012 014014 014014 LTEUTE 014014
46	117	CONFIR CONFIR	MRPC-3C MRPC-3C	B106 B106	011 - 0.9 011 - 0.9	0 0	23	1.75 1.75	011012 011012

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THREE MILE ISLAND:UNIT 1
COMPONENT : SG B
OUTAGE : 11R
INDICATIONS $\geq 20\%$ T.W.
INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
		CONFIR	MRPC-3C	B106	012 - 0.8	0	42	4.39	011012
		CONFIR	MRPC-3C	B106	012 - 0.8	0		4.39	011012
		CONFIR	MRPC-3C	B106	014 + 0.6	0	31	2.68	014014
		CONFIR	MRPC-3C	B106	014 + 0.6	0		2.68	014014
50	39	ISI	540-MIZ30	B090	008 + 33.9	8	27	1.23	LTEUTE
		ISI	540-MIZ30	B090	008 + 33.9	8	27	1.23	LTEUTE
56	125	12%-TS	510-MIZ30	B069	005 + 0.9	80	20	0.67	LTEUTE
		CONFIR	MRPC-3C	B106	005 + 0.9	104		1.21	005005
60	83	ISI	540-MIZ30	B013	015 + 39.2	9	30	1.05	LTEUTE
64	83	ISI	540-MIZ30	B013	015 + 31.5	10	33	1.11	LTEUTE
75	3	CONFIR	MRPC-3C	B012	005 - 0.7	0	20	1.68	005005
		CONFIR	MRPC-3C	B012	005 - 0.7	0		1.68	005005
80	12	WEAR	510-MIZ30	B056	009 - 0.2	76	31	0.57	LTEUTE
		CONFIR	MRPC-3C	B109	009 - 0.3	0		1.36	009009
104	77	ISI	540-MIZ30	B013	UTS + 4.2	1	20	1.68	LTEUTE
105	8	ISI	540-MIZ30	B026	UTS + 6.7	9	30	1.33	LTEUTE
109	11	ISI	540-MIZ30	B014	015 + 44.8	10	33	1.12	LTEUTE
		ISI	540-MIZ30	B014	015 + 45.8	9	30	0.94	LTEUTE
		ISI	540-MIZ30	B014	UTS + 5.4	9	30	1.03	LTEUTE
109	112	ISI	540-MIZ30	B025	004 + 0.1	7	23	2.27	LTEUTE
		ISI	540-MIZ30	B025	004 + 4.8	9	30	0.90	LTEUTE
		ISI	540-MIZ30	B025	006 + 13.5	6	20	2.56	LTEUTE
111	114	CONFIR	MRPC-3C	B109	010 + 0.6	0	25	2.38	010010
		CONFIR	MRPC-3C	B109	010 + 0.6	0		2.38	010010
117	56	ISI	540-MIZ30	B025	012 + 14.3	6	20	1.30	LTEUTE
120	42	ISI-10	540-MIZ30	B014	004 + 14.5	77	44	1.16	LTEUTE
		CONFIR	MRPC-3C	B108	004 + 14.6	32	SVI	0.38	004005

Continues Next Page =>

THREE MILE ISLAND:UNIT 1
 COMPONENT : SG B
 OUTAGE : 11R
 INDICATIONS \geq 20 % T.W.
 INCLUDES MRPC WHERE AVAILABLE

Row	Tube	Exam Reason	Exam Tech	Exam Reel	Indication Location	Ind Deg	% / Coils	Ind Volt	Extent Tested
126	58	12%-TS	510-MIZ30	B037	015 + 29.0	8	27	4.21	LTEUTE
		CONFIR	MRPC-3C	B109	015 + 29.0	9	SVI	9.19	015015
		CONFIR	540-MIZ30	B115	UTS -17.4	13	43	7.40	UTSUTE
131	79	3%-TS	510-MIZ30	B034	LTE + 17.3	92	20	2.57	LTEUTE
		CONFIR	MRPC-3C	B109	LTE + 17.3	0	NDD	0.00	LTELTS
136	40	ISI	510-MIZ30	B090	015 + 40.3	7	23	1.39	LTEUTE
143	43	ISI	540-MIZ30	B026	010 + 7.8	8	27	0.79	LTEUTE
		ISI	540-MIZ30	B026	012 + 0.3	11	37	0.59	LTEUTE
150	25	ISI	540-MIZ30	B090	007 + 25.5	9	30	1.00	LTEUTE
		ISI	540-MIZ30	B090	015 + 19.9	9	30	0.71	LTEUTE

Total Tubes Included : 30

Total Indications : 46

As required by the Provisions of the ASME Code Rules

1. Owner Metropolitan Edison Company, 2800 Pottsville Pike, Reading, PA
(Name and Address of Owner)
Three Mile Island

2. Plant Nuclear Generating Station, Route 441 South, Middletown, PA
(Name and Address of Plant)

3. Plant Unit 1 4. Owner Certificate of Authorization (if required) None

5. Commercial Service Date 9-2-74 6. National Board Number for Unit Reactor Vessel N-109

7. Components Inspected

[illegible]

Note: Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8½ in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-1 (back)

8. Examination Dates 09-15-95 to 09-28-95 9. Inspection Interval from NA to NA

10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval. The examinations included 3671 tubes and 128 sleeves in RC-H-0001A and 3665 tubes and 128 sleeves in RC-H-0001B. The scope of work is governed by Plant Technical Specifications, therefore, the ASME Section XI interval does not apply.
11. Abstract of Conditions Noted
Indications 40% through wall or greater were recorded in six tubes. See attachment for details.
12. Abstract of Corrective Measures Recommended and Taken
One sleeved tube in RC-H-0001A was removed from service by plugging.
Five tubes in RC-H-0001B were removed by service by plugging.

We certify that the statements made in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Date July 30 19 96 Signed Mgr, NDE/ISI Svcs By J. S. Janich
Owner

Certificate of Authorization No. (if applicable) NA Expiration Date NA

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Pennsylvania and employed by H.S.B. I&I Co. of Hartford, CT have inspected the components described in this Owners' Data Report during the period 09-15-95 to 09-28-95, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owners' Data Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owners' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date July 30 19 96

J. S. Janich Commissions NB 5478 (I) (N) PA-1887
Inspector's Signature National Board, State, Province and No.

FORM NIS-1 OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

As required by the Provisions of the ASME Code Rules

1. Owner Metropolitan Edison Company, 2800 Pottsville Pike, Reading, PA
(Name and Address of Owner)
Three Mile Island
2. Plant Nuclear Generating Station, Route 441 South, Middletown, PA
(Name and Address of Plant)
3. Plant Unit 1 4. Owner Certificate of Authorization (if required) None
5. Commercial Service Date 9-2-74 6. National Board Number for Unit Reactor Vessel N-109
7. Components Inspected

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
RC-H-0001A	Babcock & Wilcox	620-0005-55-1	B103811	N-111
RC-H-0001B	Babcock & Wilcox	620-0005-55-2	B103812	N-112

Note: Supplemental sheets in form of lists, sketches, or drawings may be used provided (1) size is 8½ in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-1 (back)

8. Examination Dates 09-15-95 to 09-28-95 9. Inspection Interval from NA to NA

10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval. The examinations included 3671 tubes and 128 sleeves in RC-H-0001A and 3665 tubes and 128 sleeves in RC-H-0001B. The scope of work is governed by Plant Technical Specifications, therefore, the ASME Section XI interval does not apply.
11. Abstract of Conditions Noted
Indications 40% through wall or greater were recorded in six tubes. See attachment for details.
12. Abstract of Corrective Measures Recommended and Taken
One sleeved tube in RC-H-0001A was removed from service by plugging.
Five tubes in RC-H-0001B were removed by service by plugging.

We certify that the statements made in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Date July 30 19 96 Signed Mgr, NDE/ISI Svcs By Jed S. Janich
Owner

Certificate of Authorization No. (if applicable) NA Expiration Date NA

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Pennsylvania and employed by H.S.B. I&I Co. of Hartford, CT have inspected the components described in this Owners' Data Report during the period 09-15-95 to 09-28-95, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owners' Data Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owners' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date July 30 19 96
J. J. Hebb Commissions NB 5478 (I)(N) PA-1887
Inspector's Signature National Board, State, Province and No.