

REPORT OF  
QUALITY ASSURANCE  
DEPARTMENT AUDIT

Audit No: QAS-JPN-93-4

Location of Audit: Juno Beach, Turkey Point Plant

Date of Audit: November 5, 1993 - January 11, 1994

Audit Scope: Turkey Point Design Control including Production Engineering Group (PEG) and site engineering.

Audit Summary: Based on the activities and objective evidence audited, it was determined that the requirements of the Turkey Point Engineering QA Program were adequately addressed by procedures and the implementation of those procedures was effective. The finding in this report identifies an area where improvement in implementation was needed.

The audit team evaluated the following Turkey Point Engineering Packages, Minor Engineering Packages, and their associated calculations:

PC/M 92-034, "Unit 4 Emergency Bus Load Sequencer Modification"; 93-020, "RCP 4A Motor Refurbishment/Upgrade"; 92-097, "Unit 4 Alternate Safety Injection Thermal Relief Valve Modification"; 93-051, "Unit 3 Hot Leg Injection Cross-Tie Isolation Valve"; 93-072, "Unit 4 Hot Leg Injection Cross-Tie Isolation Valve"; 93-125, "Modify and Repair Unit 3 Intake Structure Beam"; 93-005, "Unit 3 Turbine Runback Elimination"; 92-079, "Modify and Repair Unit 4 Intake Structure Beam"; and 92-181, "Elimination of Unit 4 Turbine Runback Switch."

In addition to the audit finding identified below, four concerns were identified. These are as follows:

1. Specification CN-228 section 3.7.2 revision 1 dated 12/3/91 states that, "ICW bays scheduled for inspection do not require pumps removal but it is desirable for all detailed inspections after the Unit 3 EDG/Cycle 13 outage." Subsequent outages have not removed the pumps. A revision to the specification needs to explain why it is not desirable to remove the pumps based on previous modifications.
2. Design Basis Documents (DBD) are being used for a reference on each PC/M with updates only required every year. DBDs should be updated as changes are made. The FPL approval and review of the verification for the DBDs prepared by contractors should also be maintained as retrievable documents.

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- 3. The RPS Wire List drawing 5610-M-430-168 was recognized as a "Category 5" drawing not subject to updating. Since this drawing and others like it, previously considered to be Category 5 drawings, contain safety related information they should be reviewed for updating or voiding.
- 4. Drawing 5610-M-T-D-14, Sheet 1, revision 9 was the latest revision in the PTN Engineering/Tech Staff library. The correct revision should have been revision 11. Timely updating of these documents should be addressed and engineers need to be alert that these documents are uncontrolled.

Satisfactory  
Areas:

- Engineering Packages
- Minor Engineering Packages
- Design and Safety Analyses
- Calculations

In addition to the above satisfactory areas, the following strengths were noted during the conduct of the audit.

- 1. Review of the Condition Reports and their associated corrective actions over the past six months by the audit team revealed a concern for the accuracy of the PTN Fuse List. Engineering had already initiated a project to correct these deficiencies (was due to finish 12/31/93) and the responsible engineer was knowledgeable of the outstanding CRs.
- 2. The responsible engineer for the Unit 3 Turbine Runback Elimination (PC/M 93-005) was careful to ensure that wiring options available for his design were identical to those installed as part of the Unit 4 modification. Having both units identical aids not only in installation and testing but also in all future I&C maintenance activities.
- 3. The process in place at the site for minimum quorum review several weeks in advance of the issuance of a PC/M allows all affected parties adequate time to consider impacts of the change. The comments noted were judged to be pertinent and evidence of careful consideration.
- 4. The contractor technical specialist on the audit team observed that the FPL PC/M process was well structured and that FPL has a strong engineering staff in comparison to other utilities he has visited.

Findings:

PC/M Post Modification Testing Inadequate

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Details: Finding 1 - PC/M Post Modification Testing Inadequate

Criteria: 10CFR50 Appendix B Criteria III, "Design Control"  
JPN-QI-3.1-3, Rev. 8, page 10, states in part, "Specify any post-modification acceptance testing required . . . Acceptance criteria or references to acceptance criteria shall be provided as required to ensure design adequacy."

Finding: Post modification testing on Unit 4 PC/M 92-181 was inadequate. A work order to install a jumper wire, which activated circuits previously untested during installation of the PC/M, only checked continuity of the wire installed and did not ensure the circuits would activate.

Discussion: The affected circuits activate turbine runback. The oversight of not installing the wire was identified by the responsible engineer for the Unit 3 identical modification and Condition Report 93-740 was written. This deficiency was brought to engineering and tech staff's attention upon discovery (11/15/93).

The Unit 3 PC/M does specify adequate post modification testing requirements.

Recommendation:

A Plant Manager Action Item (PMAI 94-01-038) has been opened to conduct the turbine runback test. The system engineering and nuclear engineering quality instructions (TDI-SE-007 and JPN-QI 3.1) have been revised to require more engineering involvement in and review of post modification testing. No other actions are required. This finding is closed.

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Audit Participants:

<u>Name</u>	<u>Department/Group</u>	<u>A</u>	<u>B</u>	<u>C</u>
W. W. Woodard	JNA JB	X	X	X
R. A. Symes	JNA JB	X	X	X
R. F. Renuart	JPN JB	X		X
J. B. Perkins	JNA JB	X	X	X
D. J. Canazaro	JNA JB	X	X	
D. A. Brown	JPN JB	X	X	
S. G. Brain	JPN JB		X	
J. T. Luke	JPN JB	X	X	X
J. C. Gallagher	JNA JB	X	X	X
J. S. Fields	Gasser Assoc.	X	X	X
R. S. Kundalkar	PTN JPN		X	X*
C. R. Bible	PTN JPN		X	
J. J. Nikitas	PTN JPN		X	
S. P. Chaviano	PTN JPN		X	
K. W. Frehafer	PTN JPN		X	
P. Roney	PTN QC		X	
R. L. Henry	PTN JPN		X	
R. Verges	PTN JPN		X	
P. M. Banaszak	PTN TS		X	
M. K. Adside	PTN TS		X	
M. S. King	PTN TS		X	
E. L. Anderson	JPN ESI		X	
A. Castaldi	JPN JB		X	
T. M. Sweeney	JPN JB		X	
D. Becker	JPN JB		X	
R. S. Custis	JPN JB		X	
S. Kozlin	JDC JB		X	
M. E. Dixon	JPN JB		X	
L. D. Richardson	JDC JB		X	
P. D. Savine	JPN JB		X	
S. Trepanier	JDC JB		X	
D. Glen	JPN JB		X	
L. I. Kennedy	JPN JB		X	

\* - Contacted by phone 1/11/93

REPORT OF  
QUALITY ASSURANCE  
DEPARTMENT AUDIT

Audit No: QAS-JPN-93-4

Key:

- A - Pre-Audit Conference
- B - Interviewed or Contacted During Audit
- C - Attended Post-Audit Conference

References:

- 10 CFR 50, Appendix B
- TQR 3.0
- QP 2.15, 3.2, 3.4, 3.6
- JPN QI 3.1, 3.1-3, 3.1-6, 3.2, 3.14, 6.5

Pre-Audit Conference:

Location: Juno Beach  
Date: November 5, 1993

Post-Audit Conference:

Location: Juno Beach  
Date: December 14, 1993  
 January 11, 1994 (telecon w/R. Kundalkar)

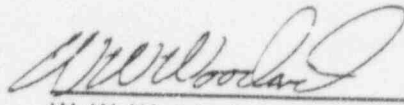
Summary of Post-Audit Conference:

The results of the audit were presented to the auditee. Discussion were held relative to obtaining corrective action to the audit finding and concerns. It was agreed that the audit finding would be closed with the issuance of the Plant Manager Action Item and the revised engineering instructions. It was further agreed that JPN would provide a separate response to the concerns identified in this audit report.

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Audit No: QAS-JPN-93-4

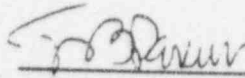
Principal Auditor:

  
\_\_\_\_\_

W. W. Woodard  
Performance Assessment  
Juno Beach

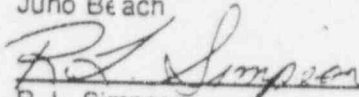
1/14/94  
Date

Accompanying Auditors:

  
\_\_\_\_\_

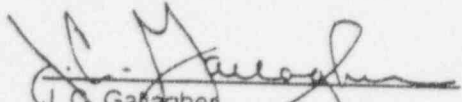
J. B. Perkins  
Performance Assessment  
Juno Beach

1-14-94  
Date

  
\_\_\_\_\_

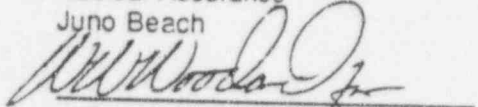
R. L. Simpson  
Nuclear Assurance  
Juno Beach

1-24-94  
Date

  
\_\_\_\_\_

J. C. Gallagher  
Nuclear Assurance  
Juno Beach

1-24-94  
Date

  
\_\_\_\_\_

J. Fields  
Technical Specialist  
Gasser Assoc.

1/18/94  
Date

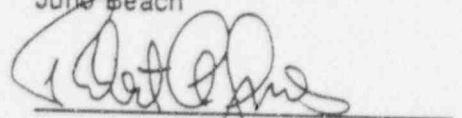
Reviewed By:

  
\_\_\_\_\_

D. J. Canazaro  
Supervisor  
Performance Assessment  
Juno Beach

2/8/94  
Date

Approved By:

  
\_\_\_\_\_

R. A. Symes  
Quality Manager  
Juno Beach

2/8/94  
Date

Facility: PSL Unit: 01 LMD:   
Component: FT-07-3   
Associate: TRANSMITTER   
Date Printed: 10/10/96

Att:   
Rev:   
Page of

TOTAL EQUIPMENT DATA BASE SHEET

EQ Tag: N/A EQ Rev: N/A EQ Doc Pac: N/A

System: 07 CONTAINMENT SPRAY

Seismic: D Safety Class: QR Eng Ref: \_\_\_\_\_ D - Seismic Design - Required

Q Group: N/A EQ Surv Note: N/A EQ Speer: N/A RG197: N

EQ Related: N EQ Scw: N/A RG197 Cat: \_

I - Definite

Q Basis: \_\_\_ EQ Remarks: N/A RG197 Type: \_

Comp Type: IX Sub Type: T Safety Channel: IA Pcm: 061-190

Name: FLOW TRANSMITTER FOR REACTOR CAVITY SUMP LEAK DETECTION

Locn Code: RCB/23/N-14/W-53 Startup System: 039

Locn Desc: IR 25-4A

Instl MFG #: ROE ROSEMOUNT INC. Engineering Verified: Y

Instl Model: 1153DB3PA Rev: 001 Orig Po: NY 422282

Comp Group: F-07-3 NPRDS: Y Acct No: 530

EQ Tab: \_\_\_ Insulation Rmvl: \_ Train: \_

Scaffold Req: \_ Critical Comp: \_ Control Room Comp: \_

Work Group: \_\_\_\_\_ IST Reqd: N RWP Reqd: Y

Maint Pgms: - - - - -

Instrument List Aug.

8770B-270C

EE/48

Facility: PSL Unit: 01 LMD: -  
 Component: PT-07-3  
 Associate: TRANSMITTER  
 Date Printed: 10/10/96

Att:  
 Rev:  
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TOTAL EQUIPMENT DATA BASE SHEET

Drawing:	Sheet:	Coordinates
8770-B-231	07-13	_____
8770-B-327	576	_____
8770-G-088 (L-16)	_____	_____
8770-G-226	1	_____

Tech Manuals:  
 8770-9834

Procedures:  
 1-1400154

Notes:

Approved Alternate

Mfg:	Description:	Model:	Rev.	Instl.	Eng Ver.
FIP	FISCHER & PORTER CO.	13D-2499	000	-	Y
ROE	ROSEMOUNT INC.	1153DB3PA	000	-	Y

Parameter Name:	Value:	UOM:	Verified By:
SENSING LINE QGROUP	_____	N/A	_____
IMPULSE LINE NO	_____	N/A	_____
TUBE TRACK NO	_____	N/A	_____
RANGE DESCR #1	_____	N/A	_____
PROCESS RANGE #1	_____	N/A	_____
SENSING LINE QGROUP	D	N/A	ENGINEERING
IMPULSE LINE NO	N/A	N/A	ENGINEERING
TUBE TRACK NO	N/A	N/A	ENGINEERING
PROCESS RANGE #1	_____	N/A	_____
PROCESS UNITS #1	_____	N/A	_____
SIGNAL INPUT #1	2.05-5.45	N/A	ENGINEERING
INPUT UNITS #1	IN WC	N/A	ENGINEERING
SIGNAL OUTPUT #1	4-20	N/A	ENGINEERING
OUTPUT UNITS #1	mA DC	N/A	ENGINEERING
SCALE RANGE #1	_____	N/A	_____
SCALE UNITS #1	_____	N/A	_____



Facility: PSL Unit: 01 LMD: \_  
Component: FR-07-3  
Associate: \_\_\_\_\_  
Date Printed: 10/10/96

Att: \_\_\_\_\_  
Rev: \_\_\_\_\_  
Page \_\_\_\_\_ of \_\_\_\_\_

TOTAL EQUIPMENT DATA BASE SHEET

EQ Tag: N/A                      EQ Rev: N/A   EQ Doc Pac: N/A  
System: 07    CONTAINMENT SPRAY  
Seismic: D    Safety Class: QR    Eng Ref: \_\_\_\_\_  
Q Group: N/A   EQ Surv Note: N/A   EQ Speer: N/A                      RG197: N  
EQ Related: N    EQ Scaw: N/A                      RG197 Cat: \_  
Q Basis: \_\_\_\_    EQ Remarks: N/A                      RG197 Type: \_  
Comp Type: ID   Sub Type: R1    Safety Channel: IA    Pcm: \_\_\_\_\_  
Name: FLOW RECORDER FOR REACTOR CAVITY LEAK DETECTION  
Locn Code: RAB/RTGB-105                      Startup System: 039  
Locn Desc: \_\_\_\_\_  
Instl MPG #: FIP   FISCHER & PORTER CO.                      Engineering Verified: Y  
Instl Model: 51-1321                      Rev: 000    Orig Po: NY-422282  
Comp Group: F-07-3;ANN N-35                      NPRDS: Y                      Acct No: 530  
EQ Tab: \_\_\_\_    Insulation Rmvl: \_    Train: \_  
Scaffold Req: \_    Critical Comp: \_    Control Room Comp: \_  
Work Group: \_\_\_\_\_    IST Reqd: N    RWP Reqd: N  
Maint Pgms: - - - - -

Facility: PSL Unit: 01 LMD: --  
 Component: PR-07-3  
 Associate: \_\_\_\_\_  
 Date Printed: 10/10/96

Att: \_\_\_\_\_  
 Rev: \_\_\_\_\_  
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TOTAL EQUIPMENT DATA BASE SHEET

Drawing:	Sheet:	Coordinates
8770-4171	_____	_____
8770-8182	_____	_____
8770-B-327	576	_____
8770-G-088 (L-16)	_____	_____
8770-4169	_____	_____

Tech Manuals:  
 8770-8584

Procedure:  
 1-1400154  
 1400065

Notes:

Approved Alternate

Mfg:	Description:	Model:	Rev.	Instl.	Eng Ver.
FIP	FISCHER & PORTER CO.	51-1321 CB	000	-	N

Parameter	Name:	Value:	UOM:	Verified By:
PROCESS RANGE #1		0-12	N/A	ENGINEERING
PROCESS UNITS #1		GPM	N/A	ENGINEERING
SIGNAL INPUT #1		4-20	N/A	ENGINEERING
INPUT UNITS #1		MA DC	N/A	ENGINEERING
SIGNAL OUTPUT #1		_____	N/A	_____
OUTPUT UNITS #1		_____	N/A	_____
SCALE RANGE #1		_____	N/A	_____
SCALE UNITS #1		_____	N/A	_____
CONTROL CLASS #1-1		_____	N/A	_____
ACTION #1-1		INCREASING	N/A	ENGINEERING
FUNCTION #1-1		HI A	N/A	ENGINEERING
PROCESS SETPT #1-1		1	N/A	ENGINEERING
PROCESS RESET #1-1		_____	N/A	_____
PROCESS UNITS #1-1		GPM	N/A	ENGINEERING
ACTUATION SETPT #1-1		_____	N/A	_____
ACTUATION RESET #1-1		_____	N/A	_____
ACTUATION UNITS #1-1		_____	N/A	_____

## EBASCO SERVICES INCORPORATED

TWO RECTOR STREET, NEW YORK, N.Y. 10006

PURCHASE ORDER  
NO. NY-422282DATE OF  
ORDER  
November 30, 1971

SUPPLEMENT NO. 10

DATE May 7, 1975

PAGE 1

TO [ Fischer & Porter Company  
County Line Road  
Warminster, Pennsylvania 18974 ]

FLORIDA POWER & LIGHT COMPANY  
ST. LUCIE PLANT  
(FORMERLY HUTCHINSON ISLAND)  
1975 - 890 MW INSTALLATION - UNIT #1  
ELECTRONIC TRANSMITTERS

Gentlemen:

This supplement authorizes the Seller to furnish the following equipment in strict accordance with Ebasco Specification bearing Purchaser's Identification No. FLO-8770.138, Revision 8, dated April 24, 1975, entitled "Electronic Transmitters & Miscellaneous Electronic Instruments" and data sheet Addendum H which are attached hereto to form a part hereof.

Item No.	Qty	Description	Unit Price	Item Price
-	1	Model 51-1320 Miniature Electronic Recorder. Chart and indicating scale to be non-linear. Tag No. FR-07-3.	To Be Advised	To Be Advised
	1	Model 13D2494U Level Transmitter, Input 0-2.34" H <sub>2</sub> O. Output 4-20 mA dc. Adjustable Suppression. Tag No. FT-07-3. Seismic Class I.	To Be Advised	To Be Advised

PRICE Seller promises to inform Purchaser of its Best Firm Item Prices as soon as possible, but not later than May 20, 1975.

SHIPMENT Seller promises to inform Purchaser of best delivery for these items as soon as possible but not later than May 20, 1975. Purchaser requires delivery of the above items to the jobsite as soon as possible. Seller is urged to use all means to expedite delivery of these items.

SELLER'S DRAWINGS Seller shall submit General Arrangement and Detail Drawings for the above material as soon as possible and in accordance with "Seller's Drawings" clause of the original purchase order.

One (1) reproducible and one (1) print of TYPE B are required.

EBASCO SERVICES INCORPORATED

PURCHASE ORDER NO. NY-422282

PAGE 2

TWO RECTOR STREET, NEW YORK, N.Y. 10006

DATE November 30, 1975

SUPPLEMENT NO. 10

DATE: May 7, 1975

This supplement also records the item price and delivery for the material furnished in Supplement No. 7 of NY-422282 as follows:

Item No.	Qty	Description	Unit Price	Item Price
-	4	Model 50EP107 Pressure Transmitters Seismic Category I. Output Range 4-20MA.	\$845.00	\$3,380.00

Tag Nos. PT-07-5A, PT-07-5B,  
PT-07-4A, PT-07-4B

SHIPMENT

Seller promises delivery of the above material to the jobsite not later than thirty-seven (37) weeks after the date of Supplement No. 7 (January 27, 1975). Purchaser requires delivery to the jobsite as soon as possible. Seller shall use all means at its disposal to expedite shipment and to meet the Purchaser's delivery requirement.

PREVIOUS TOTAL ORDER PRICE.....\$50,725.00  
 INCREASED BY THIS SUPPLEMENT.....\$ 3,380.00  
 PRESENT TOTAL ORDER PRICE.....\$54,105.00

Except as expressly modified herein, all terms and conditions of this Order remain unchanged and shall also apply to this supplement.

Very truly yours,

FLORIDA POWER & LIGHT COMPANY  
EBASCO SERVICES INCORPORATED AGENT  
W.O. LaPointe, Purchasing Agent

By \_\_\_\_\_  
M W Ryan  
Buyer

MWR/es

cc: Fischer & Porter Co  
141 Main Avenue  
Clifton, N J 07014  
Attn: Mr J. Craven



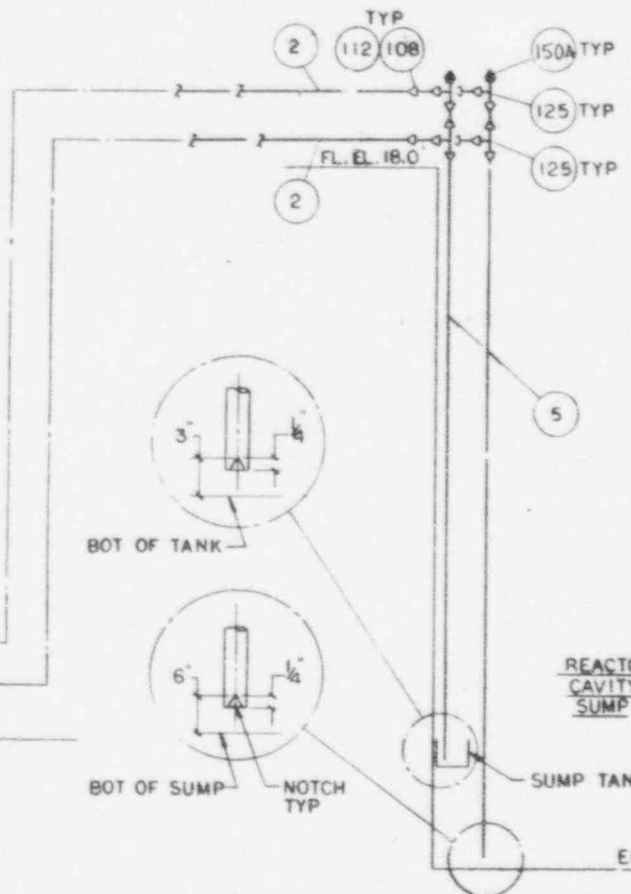
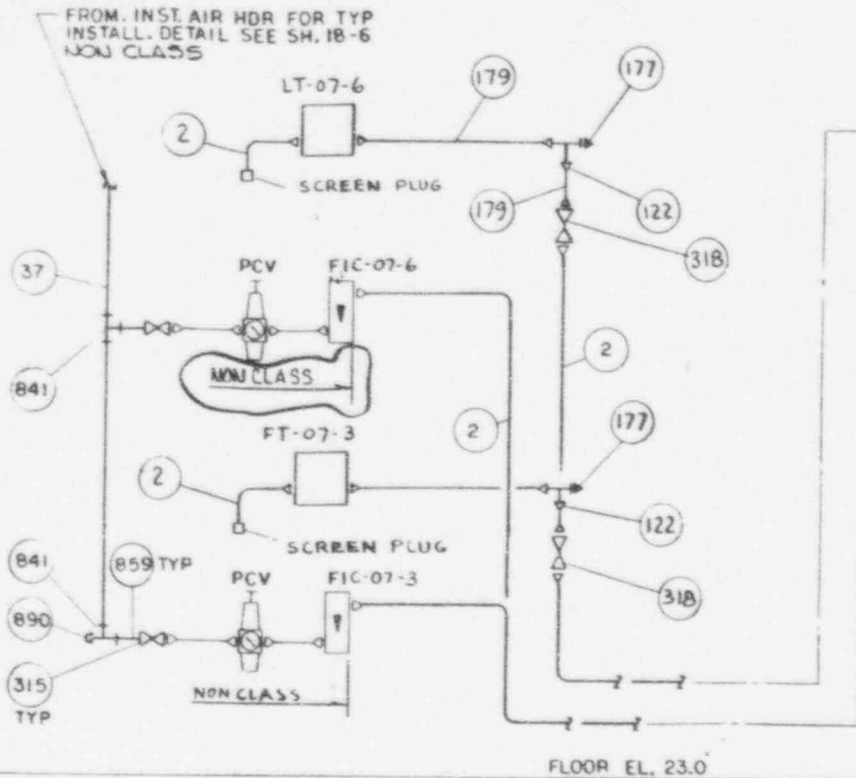
**BILL OF MATERIAL**

ITEM	QTY	ITEM	QTY	ITEM	QTY	ITEM	QTY	ITEM	QTY	ITEM	QTY
2	200FT	108	4	177	2	841	2			318	2
5	100FT	112	4	150A	2	859	2	122	2		
37	25FT	125	4	315	2	890	1	179	4		

**BUBBLER SYSTEM AT REACTOR CAVITY SUMP**

(CATEGORY 7 - SEISMIC CLASS I - LP)  
EXCEPT AS NOTED

**FOR INFORMATION ONLY**  
THIS DOCUMENT IS NOT CONTROLLED. BEFORE USE, VERIFY INFORMATION WITH A CONTROLLED DOCUMENT.  
FLORIDA POWER AND LIGHT CO.  
ST. LUCIE PLANT  
DATE VERIFIED \_\_\_\_\_ INITIAL \_\_\_\_\_



DOC CTRL  
CONTROL 38  
QC RECORDS

- NOTES**
- FIELD TO ROUTE TUBING OUTSIDE SECONDARY SHIELD WALL AND TERMINATE IT AT APPROX. 28.5' AND 4'-0" ABOVE 23'-0" FLOOR, ALSO AIR HEADER SHALL BE INSTALLED AT SAME LOCATION AS SHOWN.

FOR INSTRUMENT SUPPORT ASSEMBLY SEE 8770-B-231 SH. 30-25

R2-PCM 320-18B

PCM No 1704311 RI-PCM 61-190 [E] REV. NR. 2 DATE 9-19-77

EBASCO SERVICES INCORPORATED NEW YORK DIV. I & C DR. RWM SCALE 1/2" = 1'-0" DATE 12-8-77	FLORIDA POWER & LIGHT COMPANY HUTCHINSON ISLAND PLANT UNIT I 1973-890MW INSTALLATION INSTALLATION OF _____ BUBBLER SYSTEM AT REACTOR CAVITY SUMP	8770 B 231 SH. 07-13
--	---	----------------------------

Facility: PSL Unit: 01 LMD: _	
Component: LT-07-12	
Associate: _____	Att: _____
Date Printed: 10/10/96	Rev: _____
	Page _____ of _____

TOTAL EQUIPMENT DATA BASE SHEET

EQ Tag: N/A                      EQ Rev: N/A   EQ Doc Pac: N/A

System: 07    CONTAINMENT SPRAY

Seismic: I    Safety Class: SR    Eng Ref: \_\_\_\_\_

Q Group: N/A   EQ Surv Note: N/A   EQ Speer: N/A                      RG197: N

EQ Related: N    EQ Scew: N/A                      RG197 Cat: \_

Q Basis: \_\_\_\_    EQ Remarks: N/A                      RG197 Type: \_

Comp Type: IX   Sub Type: T    Safety Channe: NS    Pcm: \_\_\_\_\_

Name: LEVEL TRANSMITTE FOR REACTOR CAVITY SUMP LEAK DETECTION

Locn Code: RCB/0/N-0/W-25                      Startup System: 039

Locn Desc: \_\_\_\_\_

Instl MFG #: NAS   NATIONAL SONICS                      Engineering Verified: Y

Instl Model: 300S/320                      Rev: 000    Orig Po: NY-422370

Comp Group: L-07-12                      NPRDS: Y    Acct No: 530

P-Tab: \_\_\_\_    Insulation Rmvl: \_    Train: \_

Scaffold Req: \_    Critical Comp: \_    Control Room Comp: \_

Work Group: \_\_\_\_\_    IST Reqd: N    RWP Reqd: Y

Maint Pgms: \_ \_ \_ \_ \_

Facility: PSL Unit: 01 LMD: -  
 Component: LT-07-12  
 Associate: \_\_\_\_\_  
 Date Printed: 10/10/96

Att: \_\_\_\_\_  
 Rev: \_\_\_\_\_  
 Page of \_\_\_\_\_

TOTAL EQUIPMENT DATA BASE SHEET

Drawing:	Sheet:	Coordinates
8770-8152	_____	_____
8770-B-231	07-11	_____
8770-B-327	576	_____
8770-G-088 (K-16)	_____	_____
8770-G-226	1	_____

Tech Manuals:  
 2998-14281

Procedures:

Notes:  
 SEE PROCEDURE I&C 1-1400154

TKM 9-1-96

Approved Alternate

Mfg: Description:                      Model:                      Rev. Instl. Eng Ver.

Parameter Name:	Value:	UOM:	Verified By:
SENSING LINE QGROUP	_____	N/A	_____
IMPULSE LINE NO	_____	N/A	_____
TUBE TRACK NO	_____	N/A	_____
RANGE DESCR #1	_____	N/A	_____
PROCESS RANGE #1	_____	N/A	_____
SENSING LINE QGROUP	B	N/A	ENGINEERING
IMPULSE LINE NO	N/A	N/A	ENGINEERING
TUBE TRACK NO	N/A	N/A	ENGINEERING
PROCESS RANGE #1	_____	N/A	_____
PROCESS UNITS #1	_____	N/A	_____
SIGNAL INPUT #1	_____	N/A	_____
INPUT UNITS #1	_____	N/A	_____
SIGNAL OUTPUT #1	_____	N/A	_____
OUTPUT UNITS #1	_____	N/A	_____
SCALE RANGE #1	_____	N/A	_____
SCALE UNITS #1	_____	N/A	_____

Facility: PSL Unit: 01 LMD: \_  
 Component: LS-07-12  
 Associate: \_\_\_\_\_  
 Date Printed: 10/10/96

Att: \_\_\_\_\_  
 Rev: \_\_\_\_\_  
 Page of \_\_\_\_\_

TOTAL EQUIPMENT DATA BASE SHEET

Drawing:	Sheet:	Coordinates
8770-B-327	576	_____
8770-G-088 (K-15)	_____	_____
8770-8153	_____	_____
8770-8154	_____	_____

Tech Manuals:  
 2998-14281

Procedures:  
 1-1400154  
 1400065

Notes:

Approved Alternate

Mfg:	Description:	Model:	Rev.	Instl.	Eng	Ver.
------	--------------	--------	------	--------	-----	------

Parameter Name:	Value:	UOM:	Verified By:
PROCESS RANGE #1	_____	N/A	_____
PROCESS UNITS #1	_____	N/A	_____
SIGNAL INPUT #1	_____	N/A	_____
INPUT UNITS #1	_____	N/A	_____
SIGNAL OUTPUT #1	_____	N/A	_____
OUTPUT UNITS #1	_____	N/A	_____
SCALE RANGE #1	_____	N/A	_____
SCALE UNITS #1	_____	N/A	_____
CONTROL CLASS #1-1	_____	N/A	_____
ACTION #1-1	INCREASING	N/A	ENGINEERING
FUNCTION #1-1	HI A	N/A	ENGINEERING
PROCESS SETPT #1-1	1	N/A	ENGINEERING
PROCESS RESET #1-1	_____	N/A	_____
PROCESS UNITS #1-1	GPM	N/A	ENGINEERING
ACTUATION SETPT #1-1	_____	N/A	_____
ACTUATION RESET #1-1	_____	N/A	_____
ACTUATION UNITS #1-1	_____	N/A	_____



Facility: FSL Unit: 01 LMD: _	
Component: LS-07-12	
Associate: _____	Att: _____
Date Printed: 10/10/96	Rev: _____
	Page _____ of _____

TOTAL EQUIPMENT DATA BASE SHEET

EQ Tag: N/A EQ Rev: N/A EQ Doc Pac: N/A

System: 07 CONTAINMENT SPRAY

Seismic: N Safety Class: NNS Eng Ref: \_\_\_\_\_

Q Group: N/A EQ Surv Note: N/A EQ Speer: N/A RG197: N

EQ Related: N EQ Scw: N/A RG197 Cat: \_

Q Basis: \_\_\_\_ EQ Remarks: N/A RG197 Type: \_

Comp Type: 1B Sub Type: B1 Safety Channel: NS Pcm: \_\_\_\_\_

Name: LEVEL SWITCH FOR REACTOR CAVITY SUMP LEAK HIGH DETECTION

Locn Code: RCB/23/N-O/W-25 Startup System: 039

Locn Desc: \_\_\_\_\_

Instl MFG #: NAS NATIONAL SONICS Engineering Verified: Y

Instl Model: 306C Rev: 000 Orig Po: NY-422237

Comp Group: L-07-12/ANN N-46 NPRDS: Y Acct No: 530

EQ Tab: \_\_\_\_ Insulation Rmvl: \_ Train: \_

Scaffold Req: \_ Critical Comp: \_ Control Room Comp: \_

Work Group: \_\_\_\_\_ IST Reqd: N RWP Reqd: Y

Maint Pgms: - - - - -

Purchaser's Identification  
No. FLO-8770.323 H

RECEIVED  
JUL 13 1975

EBASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

PURCHASER Florida Power & Light Company  
STATION St Lucie Plant  
PROJECT 1975-890 MW Installation UNIT NO. 1  
LOCATION Hutchinson Island, Florida  
SELLER National Sonics

RECEIVED  
SEP 10 1980

DOCUMENT CONTROL CENTER

<u>Issue No.</u>	<u>Date</u>	<u>Prepared By:</u>	<u>Reviewed By:</u>	<u>Pages Affected</u>
Original	3/28/75	R Daverio	N Wallach	All
R1	4/10/75	R Daverio	N Wallach	Add. B
R2	5/27/75	R Daverio	N Wallach	Add. C
R3	6/24/75	R Daverio	N Wallach	Add. C

EBASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

CONTENTS

Paragraph		Page
1	SCOPE.....	1
2	PROJECT.....	1
3	GENERAL.....	1
4	STANDARDS.....	2
5	DESIGN AND CONSTRUCTION.....	2
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7	CLEANING.....	4
8	PAINTING.....	5
9	LABELS.....	5
10	SPECIAL TOOLS.....	5
11	QUALITY COMPLIANCE.....	5

ADDENDUM A SH 1.  
 ADDENDUM B SH 2,3  
 ADDENDUM C SH 1

EEASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

Purchaser's Identification  
No. FLO-8770.323H

1. This specification covers performance and construction features of Ultrasonic of Liquid Level Switches. It is not the intent to completely specify all details of design and construction, nevertheless, equipment in all respects shall conform to high standards of engineering, design and workmanship.

SCOPE

2. Operating Company Florida Power & Light Company  
Station St Lucie Plant  
Project 1975 - 890 000 KW Installation Unit 1  
Situated at Hutchinson Island, Florida  
Elevation above sea level 18 ft  
Manufacturer \_\_\_\_\_

PROJECT

3.1 Level switches shall be furnished for service conditions specified on the attached list, Addendum A.

GENERAL

.2 All items shall be suitable for outdoor service in a salt laden atmosphere and for conditions as follows: hurricane winds of 194 mph; tornado winds of 360 mph; torrential rains and high ambient temperature of 135 F and 100 percent humidity.

.3 Switches that are an essential part of the Nuclear Safeguard System are classified Class I. Extra margin of safety shall be used in their design and fabrication to assure reliability under all conditions of operation.

.4 The equipment designated Class I shall be designed to withstand seismic accelerations as represented by the floor response spectra developed for the different buildings in the plant. The Seller will be required to substantiate that the equipment will not suffer loss or change of function under the design accelerations.

EBASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

Purchaser's Identification  
No. FLO-8770. 323H

4. Construction materials shall comply with the latest revision of applicable codes of American National Standards Institute Inc; American Society of Mechanical Engineers, Instrument Society of America, Institute of Electrical & Electronic Engineers and National Electrical Manufacturers' Association.

STANDARDS

5. Design and construction of the level switches shall, unless otherwise noted on the attached data sheets, be as described herein.

DESIGN AND  
CONSTRUCTION

The switch shall be of the ultrasonic type, that is, it shall consist of an ultrasonic sensor and an electronic control unit. The sensor shall be insensitive to variations in viscosity, density, temperature and pressure. The control unit shall be all solid state components mounted on moisture-proof circuit boards. The control unit's enclosure shall be made of steel and shall be able to withstand the following environmental conditions:

- 1) Temp 150 °F
- 2) Radioactive atmosphere of 1 Rad/Hr for 40 years and a 2 hour emergency condition of  $2 \times 10^6$  Rad/Hr.
- 3) Watertight (NEMA4)

The sensor shall be made of 316 Stainless Steel and shall be able to withstand the following environmental conditions:

- 1) Temp 300 °F
- 2) Pressure 1000 psig
- 3) Radioactive atmosphere of  $5 \times 10^8$  rads

The coaxial cable shall be able to withstand the following environmental conditions:

- 1) Temp 235 °F continuous
- 2) Radioactive atmosphere of  $5 \times 10^8$  rads.

ERASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

Purchaser's Identification  
No. FLO-8770.323H

6. Seller's drawing reproducibles shall include at least the following:

DRAWING  
DATA

- a - Tag numbers.
- b - Complete piping and wiring connections.
- c - Mounting and space requirement dimensions,
- d - Purchase Order Number

7. The Seller shall maintain a high standard of cleanliness during fabrication and assembly of the instruments to insure accurate and trouble free performance. Introduction of foreign materials and compounds into the process system by contaminants in instruments is objectionable. Halogens in contact with stainless steels is particularly objectionable. The parts of any instrument in contact with process fluids shall be thoroughly cleaned of chips, dust, rust, abrasives, scale, oils and greases.

CLEANING

Stainless steel and nickel base alloy process-contacting portions of the furnished instruments shall be rinsed with a halogen-free detergent such as Alconox or a solvent such as Acetone or 99.9 percent pure Isopropyl Alcohol. followed by an appropriate flushing with water or other solution containing no more than 20 ppm of halogens and then dried with oil-free air.

EBASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

Purchaser's Identification  
No. FLO-8770.323H

8. All surfaces subject to corrosion shall have at least one shop coat of suitable paint after cleaning, as by wire brush. All assembled equipment shall have a complete permanent exterior finish of the nature and the color customarily used by the Seller.

PAINTING

9. All equipment and system components shall be identified by the Seller with metal tag bearing Purchaser's Order No. and Tag No. substantially wired to the object.

LABELS

10. Seller shall furnish all special tools required for the installation and care of the equipment.

SPECIAL  
TOOLS

11. Seller shall submit to the Purchaser the following documents for review and acceptance prior to any fabrication on all switches designated Class I.

QUALITY  
COMPLIANCE

- a - Material Specifications for process contacting portions.
- b - Cleaning procedures
- c - Copies of seismic qualifying data per paragraph 3.4 of this specification.

EBASCO SPECIFICATION  
ULTRASONIC LIQUID LEVEL SWITCHES

Purchaser's Identification  
No. FLO-8770.223H

11.3 Seller shall submit the following documents to the purchaser prior to fabrication.

a - Manufacturer's quality control procedures.

.4 Seller shall submit two copies of all test reports to the purchaser.

QUALITY  
COMPLIANCE  
(Cont'd)



DATE

FLORIDA POWER & LIGHT CO.

PLANT SECTION NAME

ST LUCIE PLANT - UNIT 1

SPECIFICATION NO. FLO 9773 20314

APPROVED BY

1 QUANTITY ONE  
 2  
 3 MANUFACTURER NATIONAL SEISMIC DIVISION  
 4  
 5 DESCRIPTION ULTRASONIC LEVEL SENSING SYSTEM  
 6 CONSISTING OF LEVEL SENSOR + CONTROL UNIT

ISSUE

7  
 8 SENSOR (EXTENDED LENGTH OF 18 inches)  
 9

DATE

10 MODEL NO 300 S  
 11  
 12 MATERIAL 316 SS

APPROVED BY

13 FITTING 32 S  
 14  
 15  
 16 CABLE 200 feet hermetically sealed to sensor  
 17 TAG NO LT-07-12

ISSUE

18  
 19 CONTROLLER  
 20  
 21 MODEL 300 C

DATE

22  
 23 POWER 115 Vac / 60 Hz  
 24

APPROVED BY

25 ENCLOSURE NEMA 7E  
 26  
 27 RELAY 10 AMP - DPDT  
 28  
 29 TAG NO. LS-07-12

ISSUE

30  
 31 REMARKS BOTH SENSOR & CONTROLLER  
 32 MUST BE SEISMIC CLASS 1  
 33  
 34  
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 49  
 50

PREPARED BY

R. DAVERIO

DATE

3-31-75

SHEET

OF

ISSUE RECORD

FLORIDA POWER & LIGHT CO

PLANT SECTION NAME

ST LUCIE PLANT - UNIT 1

SPECIFICATION NO. FLO 8770 3211

1 QUANTITY ONE  
 2  
 3 MANUFACTURER NATIONAL SONICS DIVISION  
 4  
 5 DESCRIPTION ULTRASONIC LEVEL SENSING SYSTEM  
 6 CONSISTING OF LEVEL SENSOR & CONTROL UNIT

7  
 8  
 9 SENSOR

10  
 11 MODEL NO 300 S

12  
 13 MATERIAL 316 SS

14  
 15 FITTING 32 S

16  
 17 CABLE 100 FEET HERMETICALLY SEALED TO SENSOR

18  
 19 TAG NO. LT-06-40

20  
 21  
 22 CONTROLLER

23  
 24 MODEL 300 C

25  
 26 POWER 115 VAC / 60 HZ

27  
 28 ENCLOSURE NEMA IV

29  
 30 RELAY 10 AMP - DPDT

31  
 32 TAG NO LS-06-40

33  
 34 REMARKS BOTH SENSOR & CONTROLLER  
 35 MUST BE SEISMIC CLASS 1  
 36

ISSUE PREPARED BY  
 R DAUERIO

DATE  
 4-9-75

1  
 2  
 SHEET OF

ISSUE HISTORY

APPROVED BY

ISSUE

DATE

APPROVED BY

ISSUE

DATE

APPROVED BY

ISSUE

DATE

APPROVED BY

ISSUE

CLIENT		FLORIDA POWER & LIGHT CO	
PLANT SECTION NAME		ST LUCIE PLANT - UNIT 1	
		SPECIFICATION NO. FLO 87703011	
APPROVED BY	1	QUANTITY	ONE
	2		
APPROVED BY	3	MANUFACTURER	NATIONAL SONICS DIVISION
	4		
APPROVED BY	5	DESCRIPTION	ULTRASONIC LEVEL SENSING SYSTEM
	6		CONSISTING OF LEVEL SENSOR & CONTROL UNIT
ISSUE	7		
	8		
ISSUE	9		SENSOR
	10		
DATE	11	MODEL NO	3005
	12		
DATE	13	MATERIAL	316SS
	14		
DATE	15	FITTING	32 S
	16		
DATE	17	CABLE	40 FEET HERMETICALLY SEALED TO SENSOR
	18		
DATE	19	TAG NO.	LT-06-41
	20		
DATE	21		
	22		CONTROLLER
DATE	23		
	24	MODEL	300C
DATE	25		
	26	POWER	115 VAC. / 60 HZ
DATE	27		
	28	ENCLOSURE	NEHA IV
DATE	29		
	30	RELAY	10 AMP - DPDT
DATE	31		
	32	TAG NO	LS-06-41
DATE	33		
	34	REMARKS	BOTH SENSOR & CONTROLLER
DATE	35		MUST BE SEISMIC CLASS 1
	36		
DATE	37		
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DATE	39		
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DATE	47		
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DATE	49		
	50		

CLIENT		FLORIDA POWER & LIGHT CO.	
PLANT SECTION NAME		ST LUCIE PLANT - UNIT 1	
		SPECIFICATION NO. F-8773324	
APPROVED BY	1	QUANTITY	THREE
	2		
APPROVED BY	3	MANUFACTURER	NATIONAL SONICS DIVISION
	4		
APPROVED BY	5	DESCRIPTION	ULTRASONIC LEVEL SENSING SYSTEM
	6		CONSISTING OF LEVEL SENSOR & CONTROL UNIT
ISSUE	7		
	8		
ISSUE	9		<u>SENSOR</u>
	10		
DATE	11	MODEL	300 S
	12		
DATE	13	MATERIAL	316 SS
	14		
APPROVED BY	15	FITTING	32 S
	16		
APPROVED BY	17	CABLE	10 FT HERMETICALLY SEALED TO SENSOR
	18		
APPROVED BY	19	TAG NOS.	LT-07-7A, LT-07-7B, LT-07-7C
	20		
ISSUE	21		<u>CONTROLLER</u>
	22		
ISSUE	23		
	24	MODEL	300 C
DATE	25		
	26	P.W.V.	115 VAC / 60 Hz
DATE	27		
	28	ENCLOSURE	NEMA III
APPROVED BY	29		
	30	Wiring	10 APP - DPDT
APPROVED BY	31		
	32	TAG NOS.	LS-07-7A, LS-07-7B, LS-07-7C
APPROVED BY	33		
	34		
APPROVED BY	35	NOTES	BOTH SENSOR AND CONTROLLER MUST BE SEISMIC CLASS 1
	36		
ISSUE	37		
	38		
ISSUE	39		
	40		
DATE	41		
	42		
DATE	43		
	44		
APPROVED BY	45		
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APPROVED BY	47		
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APPROVED BY	49		
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APPROVED BY	51		
	52		
PREPARED BY	DATE		
S. MAURIO	5-27-75	1	1
		SHEET	OF

ISSUE RECORD



**EBASCO SERVICES INCORPORATED  
MATERIALS ENGINEERING  
QUALITY COMPLIANCE REPORT**

CLIENT Florida Power & Light Company ORDER NO. NY-422370  
 PROJECT St Lucie Plant Unit #1 SUPP NO. \_\_\_\_\_  
 MANUFACTURER National Sonics  
 MATERIAL Ultrasonic Liquid Level Switches  
 SPEC NO. FLO-8770-32H REV 0 NOW PROMISED June 18, 1975 REPORT TITLE Final Release  
 REF. NO. 11587 LOCATION Farmingdale, New York  
 SHOP NO. - - - DATE June 18, 1975  
 PERSONNEL CONTACTED & TITLE T Dubble - Sales Representative  
A Cacioppo - Field Eng  
F DiCrescio - QC Insp'r

ELECTRICAL EQUIPMENT REPORT NO. 1

I visited the facilities of National Sonics in Farmingdale, New York today for the purpose of conducting a final examination on the equipment being supplied on this order. Upon completion of my examination of the equipment, functional tests were performed. Test results from National Sonics Quality Control tests were reviewed and found to be satisfactory. The liquid level switches and associated control units are acceptable and are released.

Equipment Examined:

<u>Item No.</u>	<u>Quantity</u>	<u>Tag No.</u>	<u>Description</u>	<u>Serial No.</u>
1	1	<del>LT-07-12</del>	Model 300S Level Sensor with 18" extended length sensor, 200 feet of radiation cable	
2	1	LT-06-40	Model 300S Level Sensor with 100 feet of radiation cable	
3	1	LT-06-41	Model 300S Level Sensor with 40 feet of radiation cable	
4	3	LS-06-41	Model 300C Controller	75D63
		<del>LS-07-17</del>	NEMA 4 enclosure, 10A-	75D64
		LS-06-40	DPDT relay, 115V/60Hz	75D65

~~The equipment was examined and tested for compliance with the specifications FLO-8770-32H and the requirements of the purchase order, as set forth in the following drawing provided by the Vendor:~~