

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8707210600 DOC. DATE: 87/07/15 NOTARIZED: NO DOCKET #
 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
 AUTH. NAME: WOODY, C. O. AUTHOR AFFILIATION: Florida Power & Light Co.
 RECIP. NAME: RECIPIENT AFFILIATION: Document Control Branch (Document Control Desk)

SUBJECT: Forwards info on diverse scram sys conceptual design & plant-specific auxiliary feedwater actuating sys/reactor protective sys diversity study, per 861103 commitment.

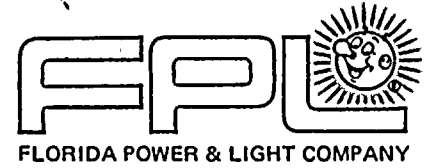
SEE Repts.

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JULY 15 1987

L-87-301
10CFR50.62

U. S. Nuclear Regulatory Commission
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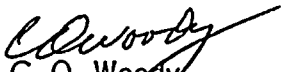
Gentlemen:

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Anticipated Transients Without
Scram (ATWS) Plant Specific Information

In accordance with Florida Power & Light Company (FPL) letter L-86-446, dated November 3, 1986, the plant specific Diverse Scram System Conceptual Design and the plant specific AFAS/RPS Diversity Study are enclosed.

Should any additional information be required, please contact us.

Very truly yours,


C. O. Woody
Group Vice President
Nuclear Energy Department

COW/GRM/gp

Enclosures (2)

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

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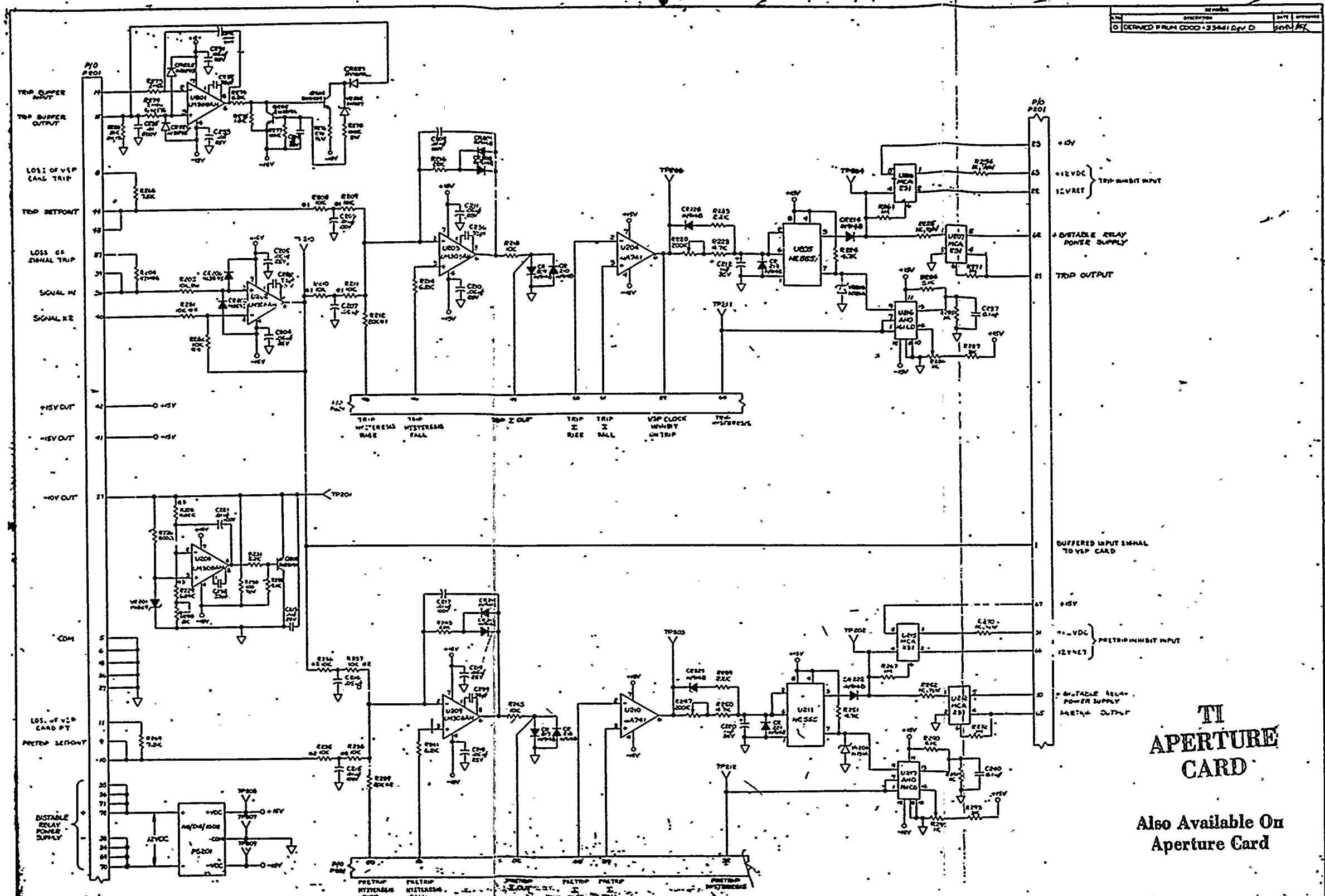
Fourth main block of faint text, possibly a concluding statement.

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Sixth main block of faint text, possibly a date or location.

Seventh main block of faint text, possibly a final note or reference.





TI APERTURE CARD

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- NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHMS AND ARE 1/4W, 5% CARBON.
 2. E-W REFERS TO RESISTORS MATCHED FOR TRACKING.
 3. E SETS OF 7112 & E SETS OF 7107.
 4. 5W RESISTORS ARE .01% EXCEPT FOR SETS WHICH IS 0.1%.
 5. ALL DIODES AND TRANSISTORS ARE JMW TYPE.
 6. ALL OP-AMPS EXCEPT U104, U204 ARE LM308AH.
 7. UNLESS OTHERWISE SPECIFIED, ALL CAPACITORS ARE IN μ F.
 8. R237, R238 ARE 1/4W, 1% 1200 Ω RESISTORS.

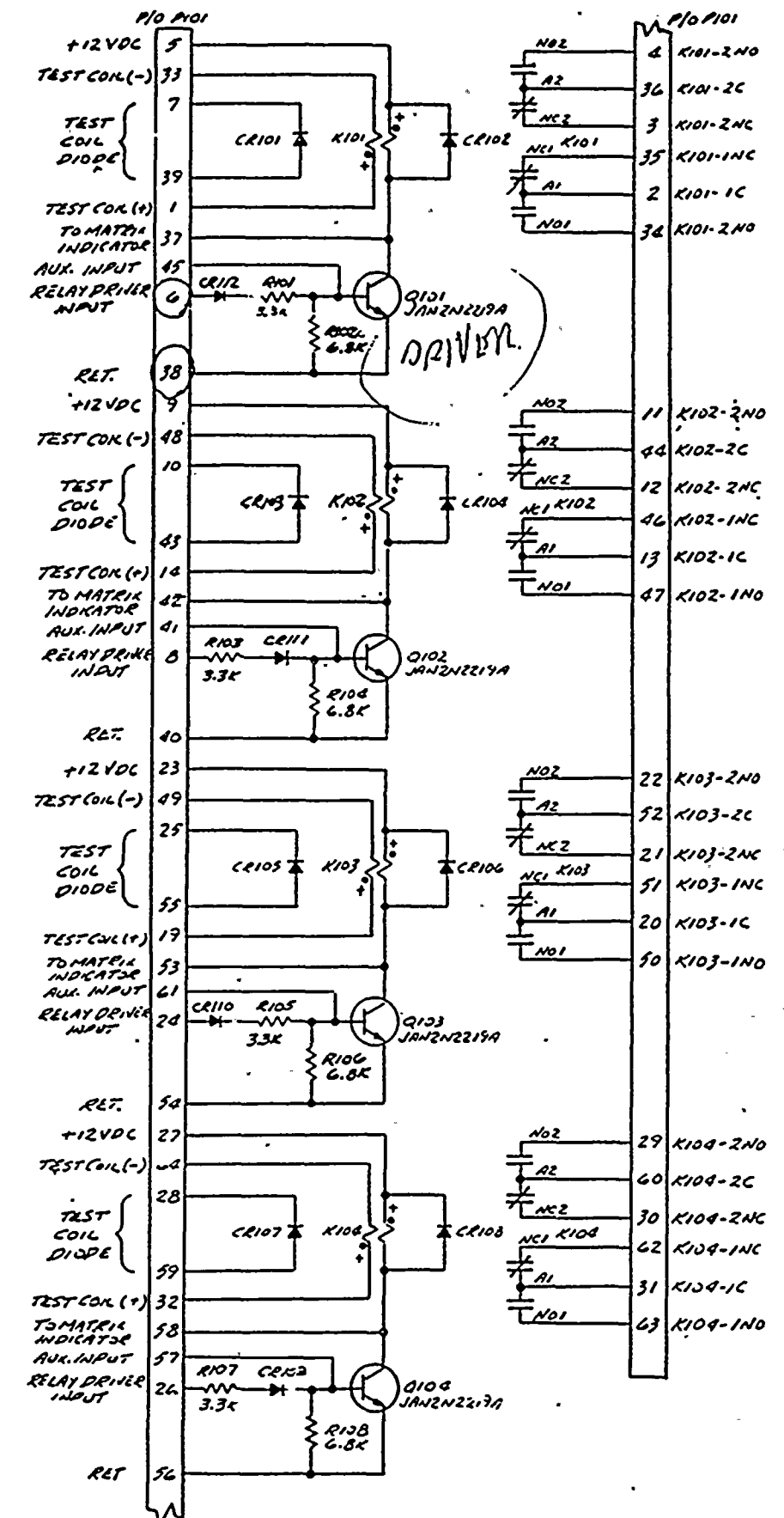
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2	8/24/67	REVISED TO ADD PRETRIP SIGNAL

ALBERTS & SCHMIDT, INC.
 ANALOGY PROGRAMS, AUTOMATIC SYSTEMS
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 PLAZA POWER & LIGHT CO., LITTLE PLAIN, COLORADO
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Figure 5.3
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33372	CARD RACK ASSY WIRE LIST, BAY C
33373	CARD RACK ASSY WIRE LIST, BAY D

- NOTES
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTOR VALUES ARE IN OHMS
 ALL RESISTORS ARE 1/2 W, 5%
 ALL RELAYS ARE JAN 29350
 DIODES CR10, THRU CR103 ARE GE A.17J
 DIODES CR109 THRU CR112 ARE IN914B

AS BUILT

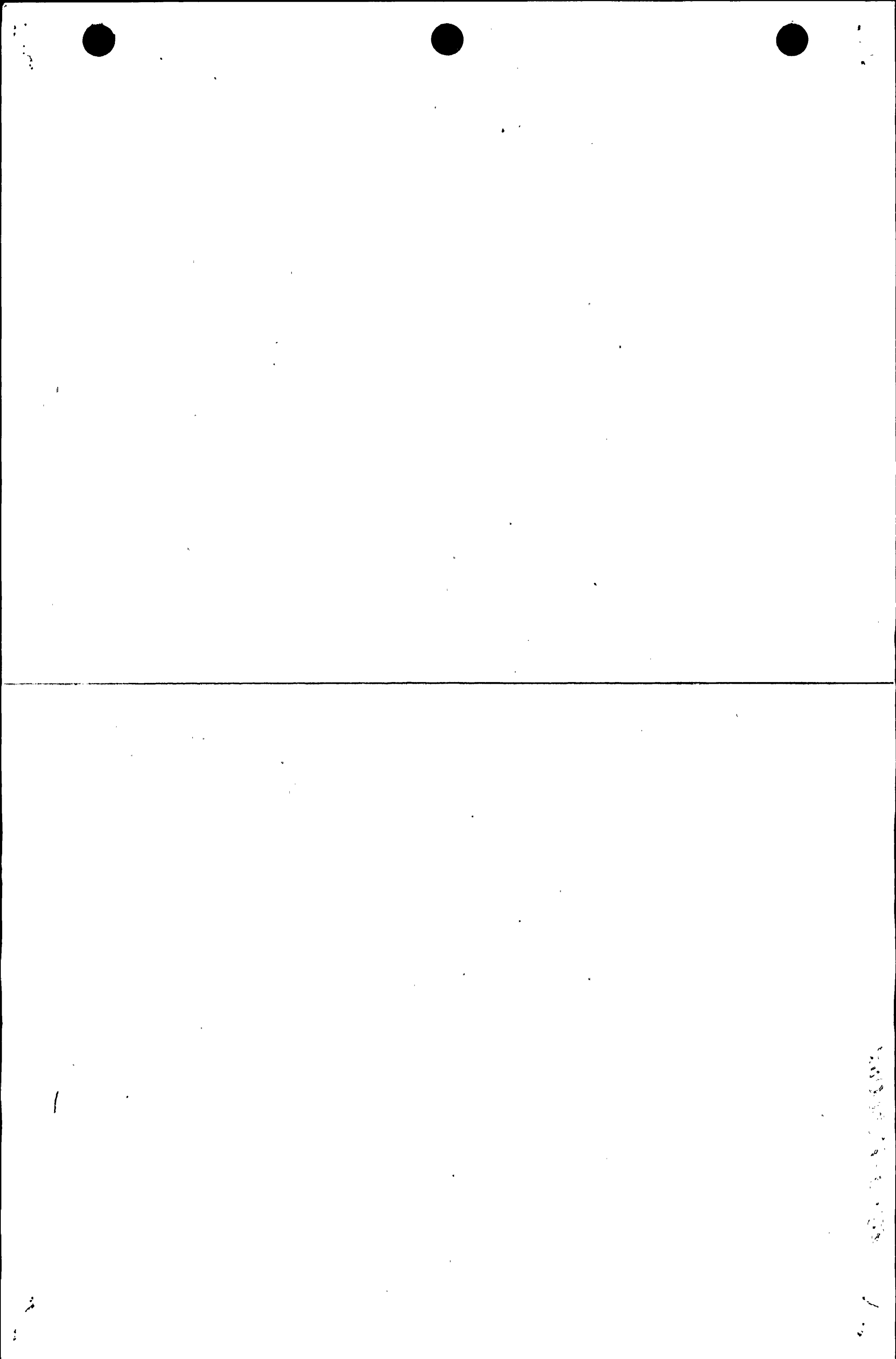
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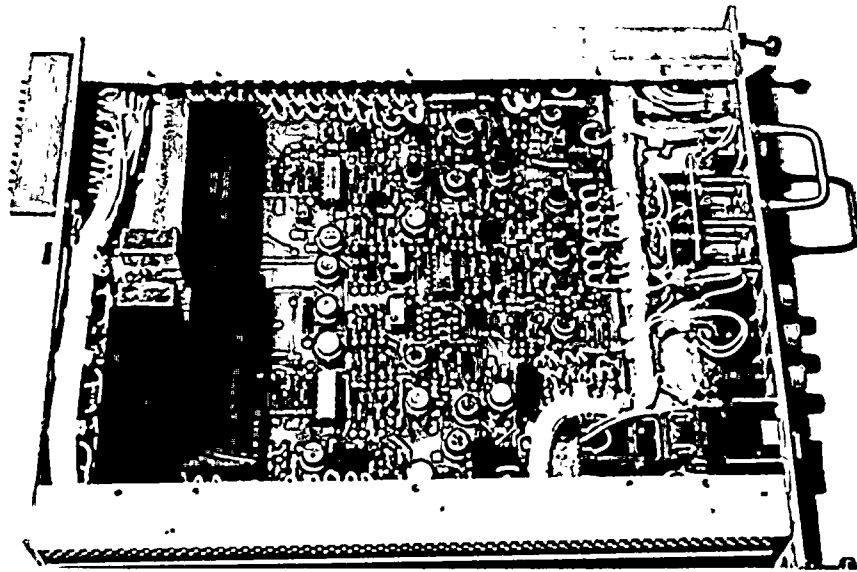
ELECTRO-MECHANICS, INC.
 NEW BRITAIN, CONN.
 AUXILIARY FEEDWATER ACTUATION SYSTEM
 SCHEMATIC-BISTABLE, AUX/MATRIX RELAY CARD

FLORIDA POWER & LIGHT ST. LOGIC PLANT UNITS 1 & 2
 P.O. #13378-9130022 & #13172-9130023
 C.E. Spec. #00000-ICE-3046

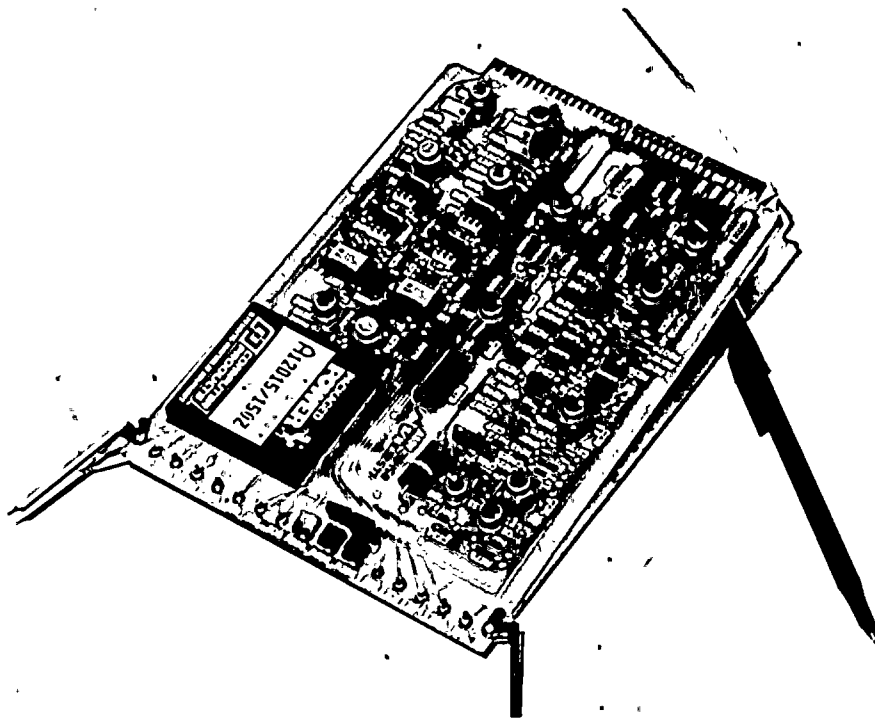
APPROVED: *Rick Galt* DATE: 9-11-77
 SIZE: CODE IDENT NO: D 96568 DWG NO: 6918 - 333370
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Figure 5.4
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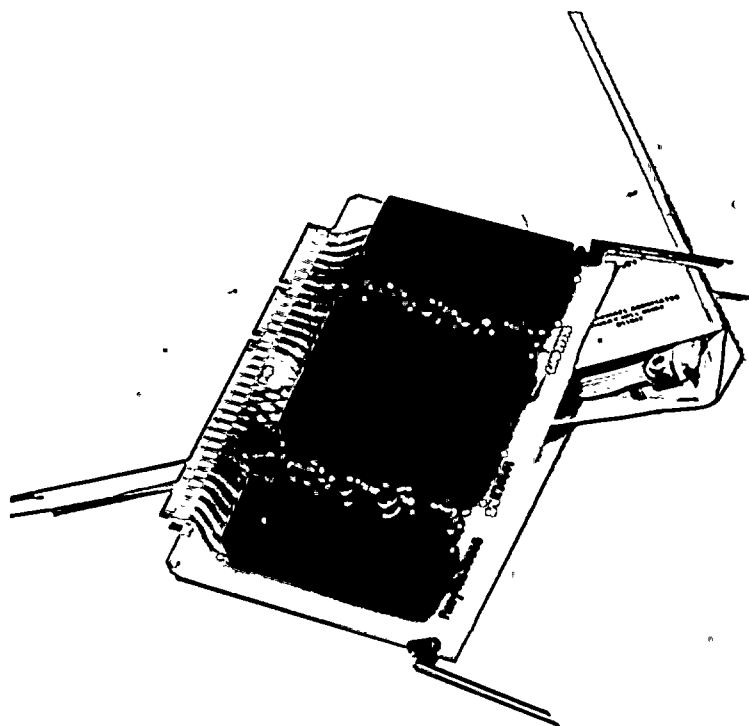


ST. LUCIE UNIT 2 RPS BISTABLE
SCHEMATIC NO. 34868 CARD PART NO. 34610



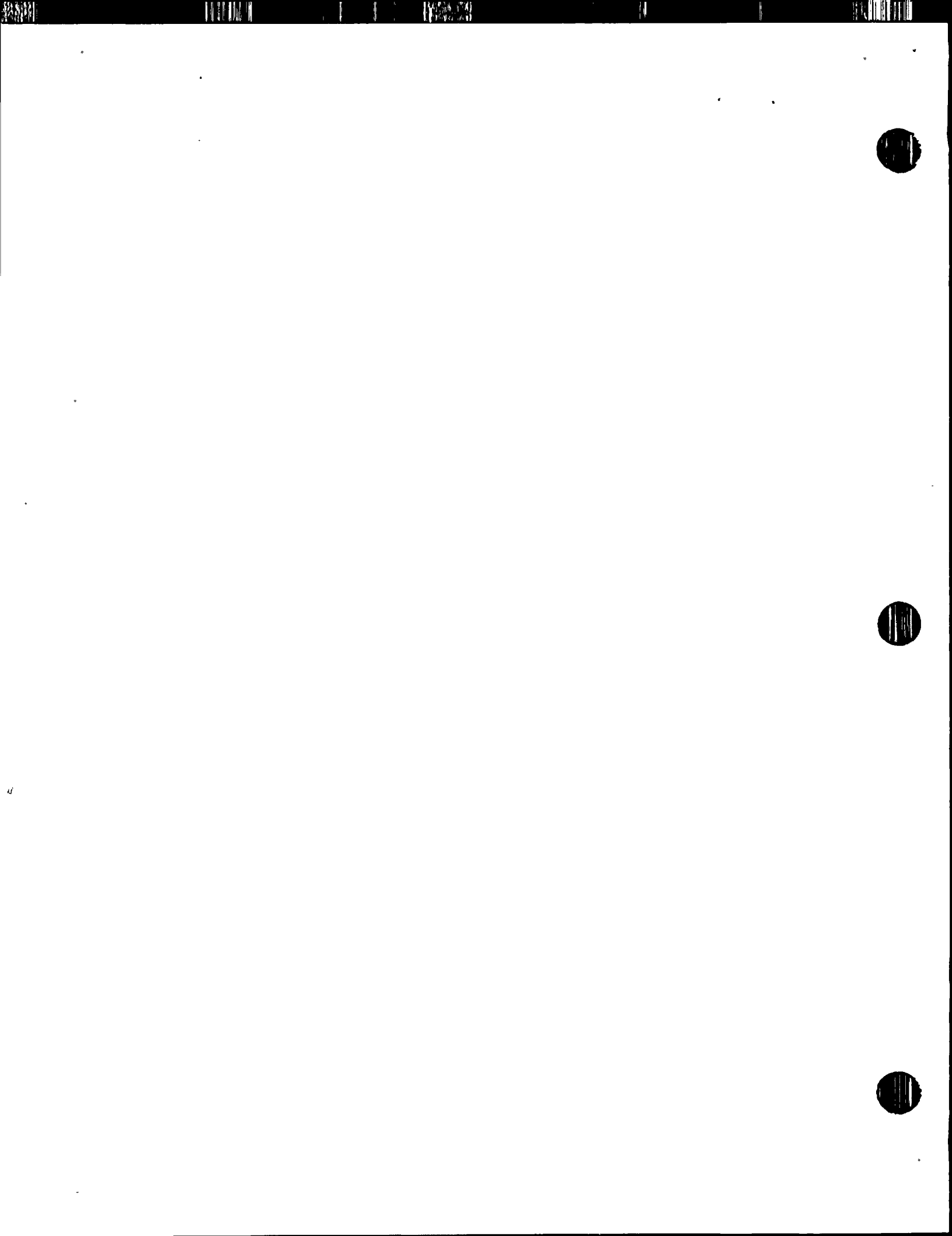
ST. LUCIE UNITS 1 AND 2 AFAS BISTABLE
SCHEMATIC NO. 33441 CARD PART NO. 33440

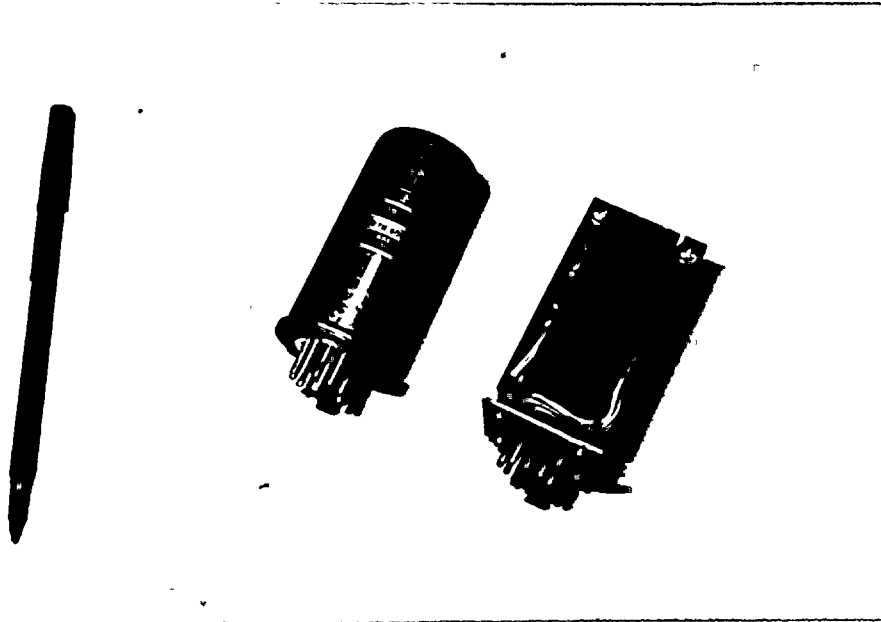
FIGURE 5.5



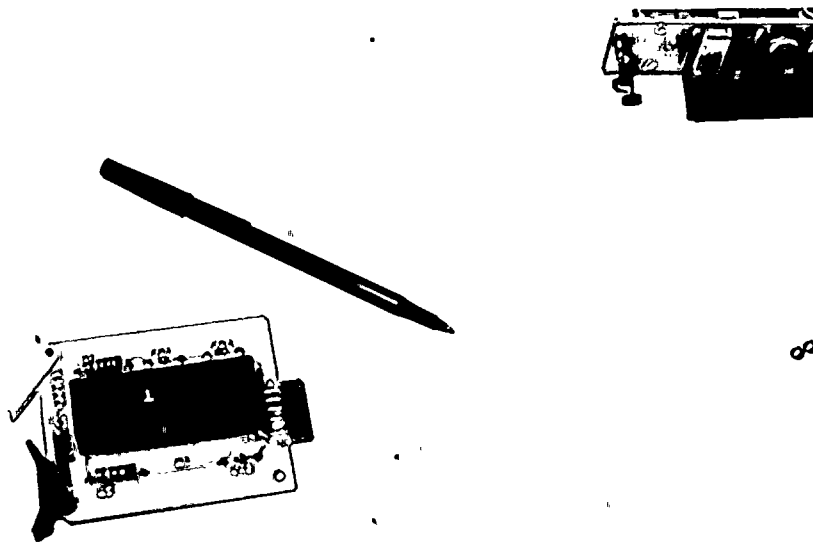
ST. LUCIE UNITS 1 AND 2
AFAS BISTABLE AND MATRIX RELAY CARD

FIGURE 5.6





ST. LUCIE UNIT 1 RPS MATRIX RELAY
ORIGINAL CLARE RELAY SHOWN WITH THE
REPLACEMENT DOUGLAS RANDAL ASSEMBLY



ST. LUCIE UNIT 2 RPS MATRIX RELAY CARD
PART NO. 34610

FIGURE 5.7

6.0 SYSTEM RELIABILITY AND RESISTANCE TO COMMON MODE FAILURES

Diversity by itself is not sufficient to satisfy the intent of the ATWS Rule. Several proposals to solve ATWS preceeded the requirements of 10CFR50.62.

The Hendric Rule 46FR57521 proposed to resolve ATWS by establishing a reliability assurance program for systems that prevent or mitigate ATWS accidents.

The Hendric Rule recognized that reliability/availability is the key to reducing ATWS risk. In addition to the Final Rule requirements Commissioner Roberts suggested a reliability assurance program to improve plant safety.

Clearly, reliability and safety are most important. The final ATWS rule with its diversity requirements is intended to improve these two qualities by diversity and resistance to common mode failures.

The initial reliability of a system depends upon piece parts selection criteria, circuit design margins (derating), packaging, parts screening test, assembly burn-in, and many other mechanical, electrical, electronic, and environmental considerations.

After installation and startup, failure rates may be relatively high as weak parts, that escaped the test screens, are weeded out of the system.

Accumulation of system operation time acts to eliminate latent defects. As operating time increases, the resistance to all failure modes, including common mode failures, increases.

After a few years of operation and correction of defects and deficiencies, the system approaches a minimum failure rate and maximum sustained reliability. In a well designed all solid state system, this reliability is sustained indefinitely since there is no wear out characteristic. The St Lucie RPS and AFAS have reached this mature level of reliability and proposed system changes to increase hardware diversity should be approached with extreme caution.

1. The first part of the document discusses the general situation of the country and the role of the government.

2. The second part of the document discusses the economic situation and the role of the private sector.

3. The third part of the document discusses the social situation and the role of the state.

4. The fourth part of the document discusses the political situation and the role of the people.

5. The fifth part of the document discusses the cultural situation and the role of the state.

6. The sixth part of the document discusses the environmental situation and the role of the state.

7. The seventh part of the document discusses the international situation and the role of the state.

8. The eighth part of the document discusses the future of the country and the role of the state.

APPENDIX A

NRC EVALUATION OF CEN-315 SUMMARY OF THE DIVERSITY BETWEEN THE REACTOR TRIP SYSTEM AND THE AUXILIARY FEEDWATER ACTUATION SYSTEM FOR CE PLANTS

St. Lucie Unit 1 (Figure 6)

The RPS bistables and associated DC power supplies are from different manufacturers than the AFWS bistables and power supplies. Both the RPS and AFWS matrix relays, however, are Douglas Randall electromechanical (reed switch) relays. The relays have different model numbers and the associated power supplies are from different manufacturers and have different voltage ratings. The RPS and AFWS initiation relays are both electromechanical relays, but are from different manufacturers. The associated power supplies are also from different manufacturers and use AC versus DC power. The final actuation devices are from different manufacturers, and use different power supplies and principles of operation.

CEN-315 claims that although the matrix relays have the same manufacturer and design principle, since they are different models and have different DC power sources, that an adequate level of diversity exists between the two systems. The staff can not reach a conclusion regarding the acceptability of diversity between RPS and AFWS matrix relays based on the information provided. The differences in the physical and operational characteristics of the two models must be analyzed to determine the potential for CMF mechanism affecting the two models.

The RPS and AFWS bistables, initiation relays, and actuation devices appear to be sufficiently diverse to satisfy the diversity requirements of the ATWS rule. The plant specific submittal should include additional information concerning similarities and differences between the RPS and AFWS matrix relays and how these factors affect their susceptibility to CMFs.

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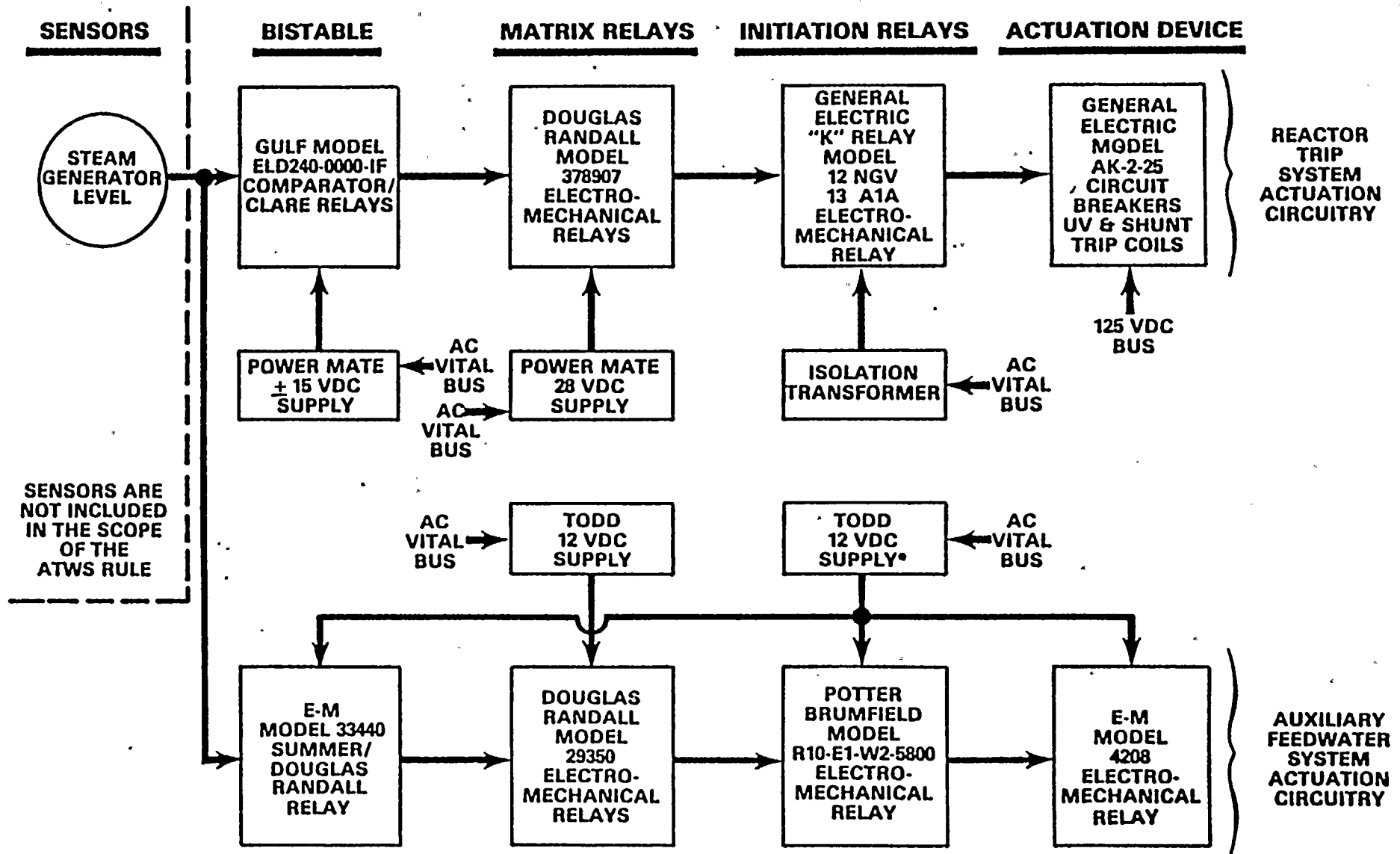
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DIVERSITY BETWEEN THE EXISTING REACTOR TRIP SYSTEM AND AUXILIARY FEEDWATER SYSTEM ACTUATION CIRCUITRY FOR ST. LUCIE UNIT 1



*AUCTIONEERED

FIGURE 6

