June 2, 1986

Docket Nos. 50-335
and 50-389

LICENSEE: Florida Power and Light Company (FP&L)

FACILITY: St. Lucie Plant, Unit Nos. 1 and 2

SUBJECT: SUMMARY OF MAY 20, 1986 MEETING WITH FP&L AND NRC STAFF REGARDING THE ST. LUCIE SAFETY PARAMETER DISPLAY SYSTEM (SPDS) PROGRESS REVIEW REPORT ISSUED ON FEBRUARY 18, 1986

Introduction

By letter dated February 18, 1986, the NRC staff forwarded to FP&L a report which dealt with a pilot audit of the St. Lucie SPDS. The audit was conducted during the period of October 6-10, 1985. The NRC staff requested FP&L personnel to discuss the results of the report; the meeting was held on May 20, 1986 at the NRC office in Bethesda, Maryland.

The meeting was chaired by the NRC Project Manager for St. Lucie. The agenda for the meeting is contained in Enclosure 1. Enclosure 2 identifies the meeting attendees. A summary of the issues discussed at the meeting follows.

Summary

Mr. K. Harris, V.P., St. Lucie Plant, presented the opening remarks for FP&L. He confirmed FP&L's management support for the SPDS; a copy of his opening remarks is contained in Enclosure 3. Mr. Ron Stevens, FP&L Nuclear Licensing, presented a background discussion on the SPDS, ranging from the October 31, 1980 NRC letter when NUREG-0737 was issued to the present day. A copy of the background is contained in Enclosure 4. Mr. Sean McClure, St. Lucie Plant I&C, presented a system description of the SPDS. It is contained in Enclosure 5. It should be noted that the St. Lucie SPDS system, which FP&L also calls the Safety Assessment System (SAS), is a much larger system than what NRC requires. In the St. Lucie case, the SAS consists of well over 1,000 inputs, which are processed by 14 computers. The NRC-required SPDS is a small subset of the St. Lucie SPDS. It should also be noted that there is no way, from a hardware point of view, to separate the NRC-required part of the system from the non-NRC-required part.

The response to the pilot audit and discussion part of the agenda was combined. Mr. Ron Stevens, FP&L Nuclear Licensing, presented the main NRC statement of concern as excerpted from the audit report and took the lead in explaining the FP&L responses. The NRC concerns and the FP&L responses are contained in Enclosure 6.

Future Work

As a result of the discussion, the personnel from FP&L made six commitments, which are described as follows:

1. Review the status of each safety function to ensure that all functions have been addressed;

2. Initiate a SPDS availability log to record operational data from which availability of the SPDS may be determined;

3. Consider prioritizing the use of display resources to best serve control room operator needs rather than the first-come first-serve allocation of resources currently in use. Also, a licensed operator should have a higher priority to display resources than a non-licensed operator;

4. Perform a task analysis on the new Emergency Operation Procedures (EOPs) and use the results from the task analysis to check the SPDS for adequacy and consistency. The task analysis was not performed for the new EOPs, but was done for the old EOPs;

5. Assure that the necessary manuals needed to operate the SPDS are conveniently located near the SPDS in the control room. Also, these manuals should be located near other installations of the SPDS, such as the Technical Support Center and the Emergency Offsite Facility (EOF). This was not the case when the Project Manager visited the EOF in April 1986; and

6. Develop a change procedure for the computer system. The change procedure should apply to computer hardware as well as computer software. The concern is the need to preserve the integrity and reliability of the operational SPDS when modifications are being designed and implemented on computer implemented functions unrelated to the SPDS. Also, the procedures should apply to modifications made in the SPDS. No procedures exist at this time to control changes in the computer.

The licensee was asked to estimate a future date at which the computer system will be debugged and fully operational. The licensee's response stated late 1987. The licensee maintains that the NRC-required part of the system, the SPDS, is operable for each St. Lucie unit. However, the non-SPDS portions of the software are inoperable.

The NRC Project Manager plans to follow and evaluate the licensee's progress on these commitments.

/S/

E. G. Tourigny, Project Manager
PWR Project Directorate #8
Division of PWR Licensing-B

Enclosures:
As stated

cc w/enclosures:
See next page

DPLB:PD#8	DPLB:PD#8	DPLB:PD#8
PKreutzer	ETourigny	AThadani
5/26/86	5/2/86	5/2/86

Mr. C. O. Woody
Florida Power & Light Company

St. Lucie Plant

cc:
Mr. Jack Shreve
Office of the Public Counsel
Room 4, Holland Building
Tallahassee, Florida 32304

Resident Inspector
c/o U.S. NRC
7585 S. Hwy A1A
Jensen Beach, Florida 33457

State Planning & Development
Clearinghouse
Office of Planning & Budget
Executive Office of the Governor
The Capitol Building
Tallahassee, Florida 32301

Harold F. Reis, Esq.
Newman & Holtzinger
1615 L Street, N.W.
Washington, DC 20036

Norman A. Coll, Esq.
McCarthy, Steel, Hector and Davis
14th Floor, First National Bank Building
Miami, Florida 33131

Administrator
Department of Environmental Regulation
Power Plant Siting Section
State of Florida
2600 Blair Stone Road
Tallahassee, Florida 32301

Mr. Weldon B. Lewis, County
Administrator
St. Lucie County
2300 Virginia Avenue, Room 104
Fort Pierce, Florida 33450

Mr. Charles B. Brinkman, Manager
Washington - Nuclear Operations
Combustion Engineering, Inc.
7910 Woodmont Avenue
Bethesda, Maryland 20814

Mr. Allan Schubert, Manager
Public Health Physicist
Department of Health and
Rehabilitative Services
1323 Winewood Blvd.
Tallahassee, Florida 32301

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Executive Director for Operations
101 Marietta Street N.W., Suite 2900
Atlanta, Georgia 30323

Enclosure 1

AGENDA

SPDS MEETING, FPL/NRC

MAY 20, 1986

I. INTRODUCTION

II. OPENING REMARKS

III. BACKGROUND

IV. SYSTEM DESCRIPTION

V. RESPONSE TO PILOT AUDIT

VI. DISCUSSION

VII. SUMMARY

Enclosure 2

FP&L/NRC SPDS Meeting
May 20, 1986
Attendance List

Name	Affiliation
E. Tourigny	NRC, St. Lucie Project Manager
L. Beltracchi	NRC/NRR/PWR-B/PEICSB
A. Thadani	NRC/NRR/PWR-B/PD#8
D. Sells	NRC/NRR/PWR-B/PD#8
G. Lapinsky	NRC/NRR/PWR-A/FOB
W. Regan	NRC/NRR/PWR-B/FOB
M. Goodman	NRC/NRR/PWR-B/FOB
F. Schroeder	NRC/NRR/PWR-B/Deputy Director
C. Weiss	NRC/NRR/PAEI
K. N. Harris	VP St. Lucie Plant
P. S. McClure	FPL, I&C, St. Lucie Plant
L. W. Pearce	FPL, OPS, St. Lucie Plant
Ronald J. Stevens	FPL, Nuclear Licensing
K. K. Mohindroo	FPL, Power Plant Engineering
J. H. Osborne	FPL, Power Plant Engineering
Mike Shoppman	FPL, Nuclear Licensing

Enclosure 3

GOOD MORNING, GENTLEMEN:

I APPRECIATE THE OPPORTUNITY TO COME HERE TODAY TO DISCUSS WITH YOU THE PILOT AUDIT THAT WAS CONDUCTED ON THE ST. LUCIE SPDS IN OCTOBER OF 1985.

FIRST, LET ME SAY THAT OUR MANAGEMENT IN FLORIDA POWER & LIGHT, FROM OUR CEO DOWN, HAS PROVIDED EXCELLENT SYSTEM SUPPORT. FROM THE ONSET OF THE SPDS, FLORIDA POWER & LIGHT HAS SPECIFICALLY INTENDED IT TO BE A COMPREHENSIVE AID TO PLANT OPERATIONS, NOT JUST A SYSTEM TO MEET THE SPDS REQUIREMENTS. KEEPING THAT GOAL IN MIND, THE SAFETY ASSESSMENT SYSTEM AT ST. LUCIE CONSISTS OF WELL OVER 1000 INPUTS, 14 COMPUTERS, AND A COST-TO-DATE IN EXCESS OF SOME THIRTY MILLION DOLLARS TO INSURE THE SUCCESS OF OUR COMMITMENT.

I BELIEVE THAT ONE OF THE BASIC PREMISES OF OUR SYSTEM HAS BEEN PERCEIVED DIFFERENTLY THAN WE INTENDED. OUR RESPONSES WERE INTENDED TO TRANSMIT OUR POSITION THAT ONLY INSTALLED SAFETY RELATED ENVIRONMENTALLY QUALIFIED INSTRUMENTATION CAN BE USED AS THE PRIMARY SOURCE OF INFORMATION IN AN ACCIDENT.

INFORMATION VIA THE SPDS HARDWARE CAN, AND WILL BE, READILY UTILIZED AS AN OVERVIEW IN SUPPORT OF THESE QUALIFIED INDICATIONS. POSSIBLY OUR RESPONSES ON THIS POINT WERE INADEQUATELY COMMUNICATED SINCE THE AUDIT TEAM CAME AWAY WITH THE PERCEPTION WE WOULD NOT READILY "USE" THE SPDS SYSTEM.

DURING THE DISCUSSIONS I HAD WITH THE AUDIT TEAM, THIS IS THE PARTICULAR ASPECT OF OUR SYSTEM I HOPED TO COMMUNICATE AND I BELIEVE OUR OPERATIONS SUPERVISOR TRIED TO COMMUNICATE. I BELIEVE THAT THIS WAS INTERPRETED TO BE A LACK OF MANAGEMENT SUPPORT FOR THE SYSTEM. PLEASE LET ME AGAIN ASSURE YOU THAT THIS IS NOT THE CASE. OUR STRONG DESIRE AND CONTINUED SUPPORT AND DIRECTION IS THAT, AS I SAID PREVIOUSLY, THE SYSTEM BE A COMPREHENSIVE AID TO PLANT OPERATIONS.

THANK YOU.

Enclosure 4

ST. LUCIE PLANT SPDS

BACKGROUND

October 31, 1980	NUREG 0737 Issued
February 1981	NUREG 0696 Issued
June 1981	Contracted with TEC for SPDS
July 1982	Contracted with Quadrex for site specific modifications to generic SAS software
December 17, 1982	Supplement 1 to NUREG 0737 - Generic Letter 82-33 Issued
February 3, 1984 (L-84-27)	QSPDS Functional Test Report
March 1, 1984 (L-84-48 & L-84-49)	SPDS Implementation Plan and Parameter Selection Report
June 14, 1984	NRC Confirming Order
September 14, 1984	NRC request for additional information
November 1, 1984 (L-84-285)	Response to NRC's September 14, 1984 RAI
November 29, 1984 (L-84-336)	PSL-2 Status of Implementation
November 29, 1984	NRC I & E Inspection Report 50-389/84-37
November 1984	PSL-2 SPDS Operational
November 1984	NUREG 0800 (SRP 18.2) Issued
January 14, 1985 (L-85-19)	Supplemental Response to NRC's September 14, 1984 RAI
April 9, 1985 (L-85-137)	Additional Information in Response to NRC verbal request
June 11, 1985	NRC Safety Evaluation Issued
September 4, 1985 (L-85-332)	Response to NRC's RAI contained in NRC's June 11, 1985 SE
October 1985	Pilot Audit at PSL
December 1985	PSL-1 SPDS Operational
February 18, 1986	NRC's Pilot Audit Report
May 20, 1986	Meeting with NRC on SPDS

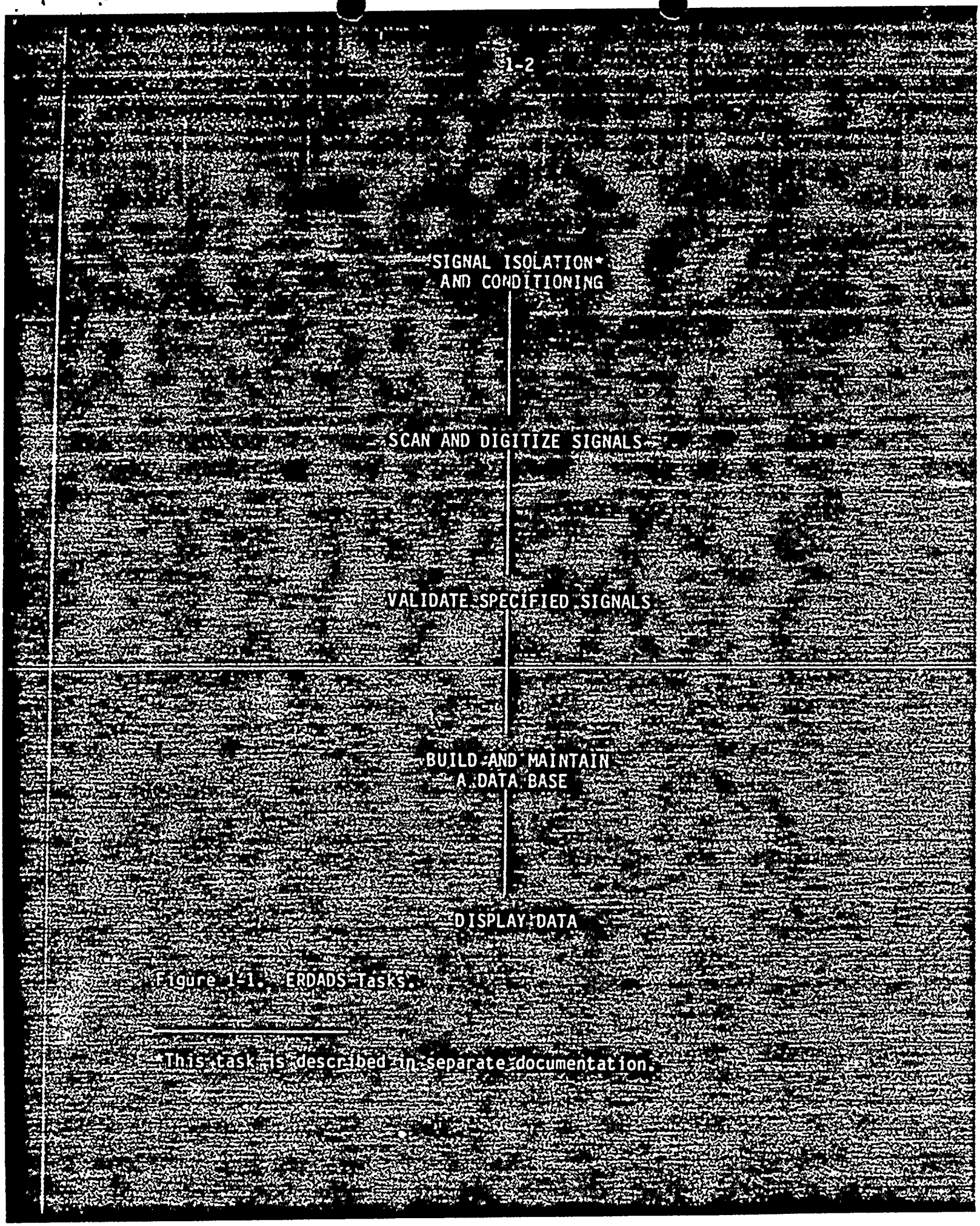


Figure 1-1. ERDADS Tasks.

*This task is described in separate documentation.

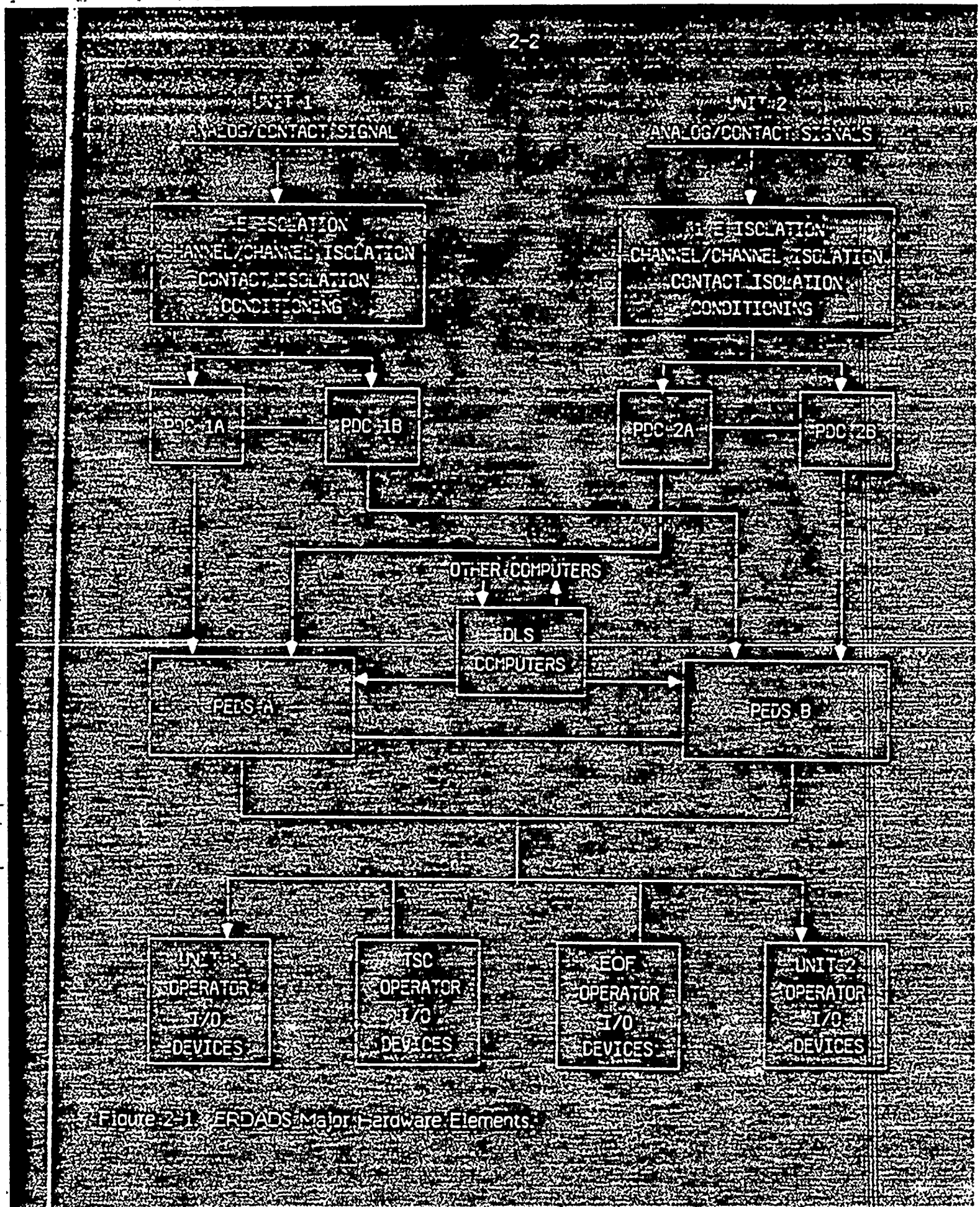


Figure 2-1. ERDADS Major Hardware Elements

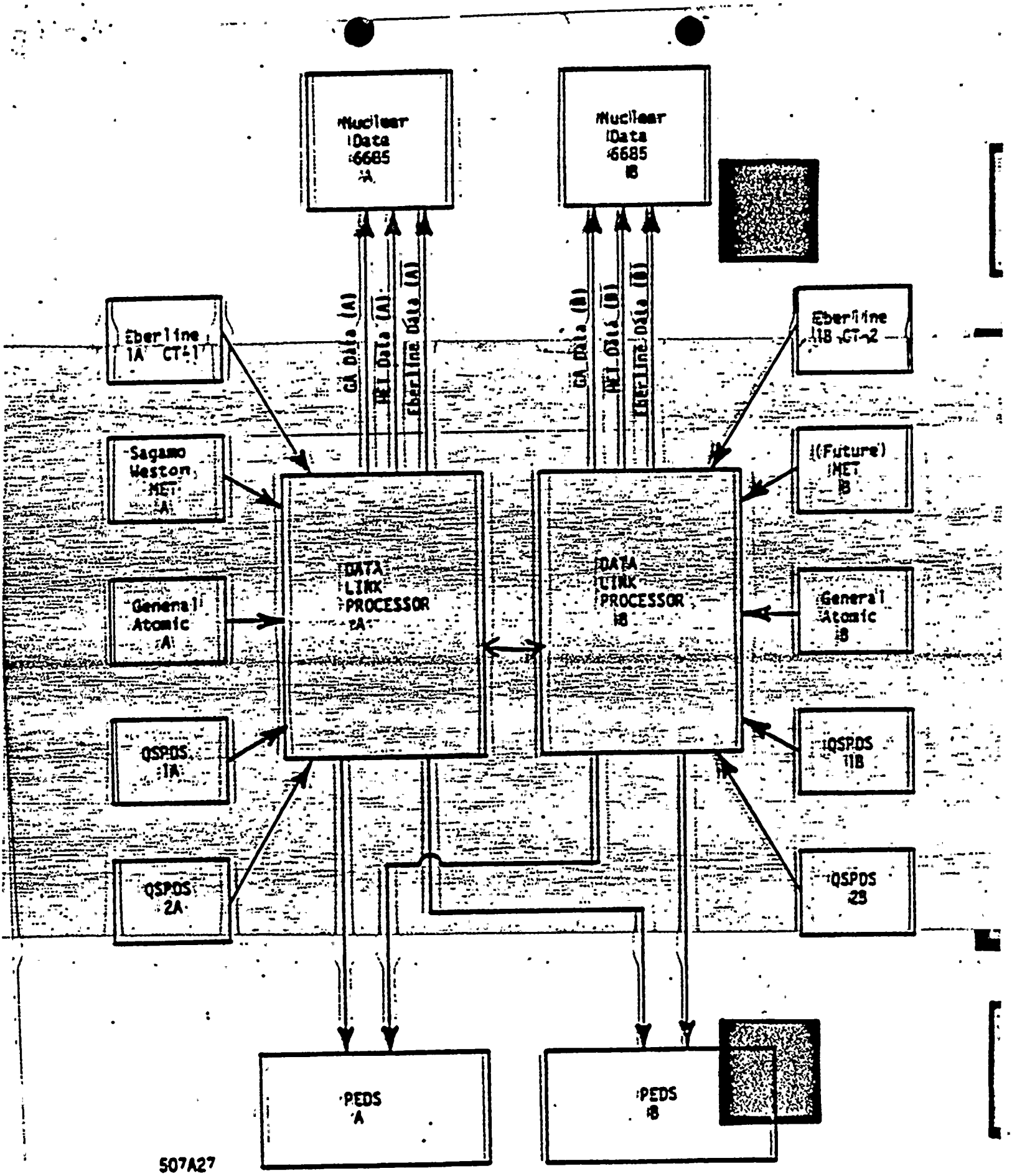
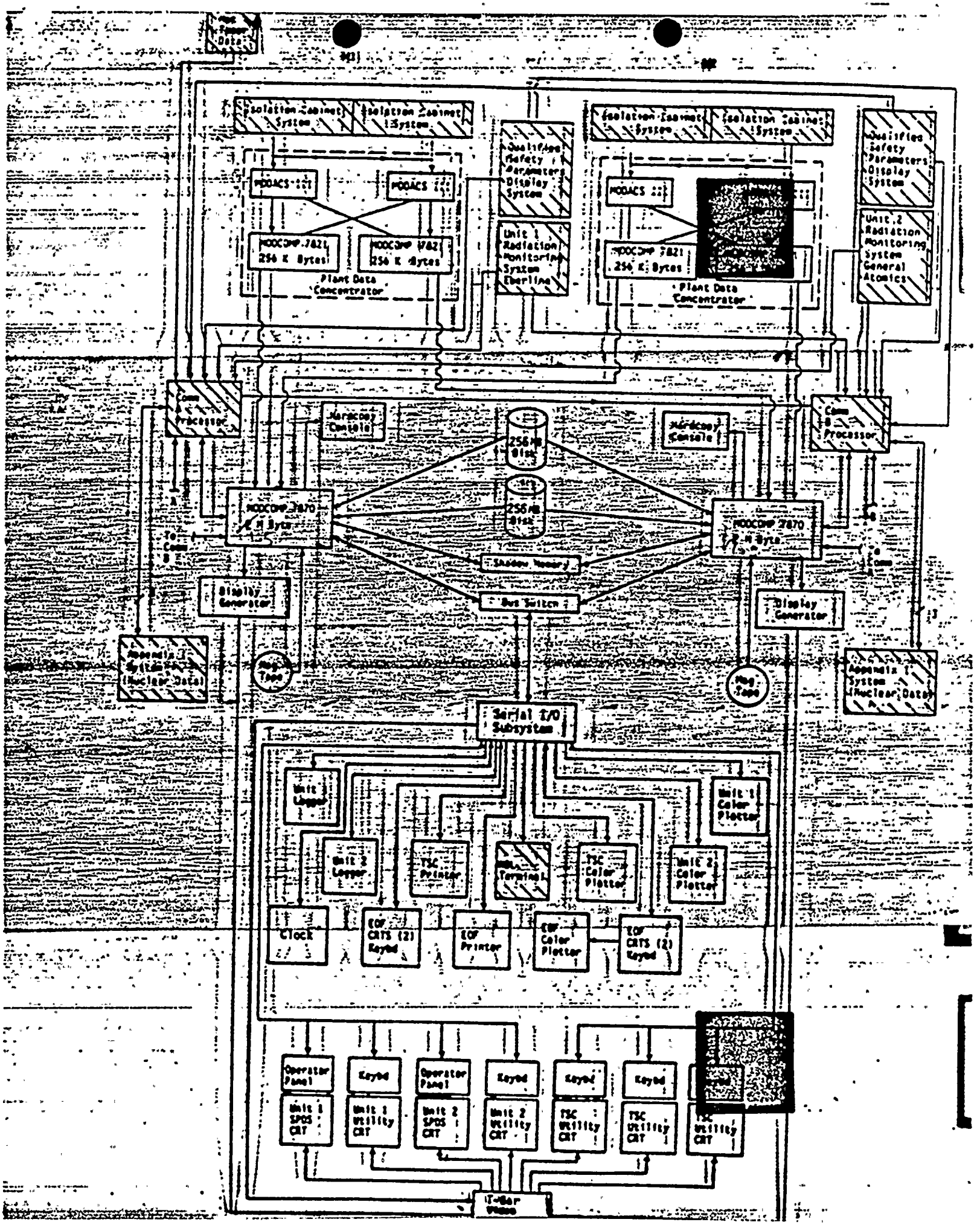


Figure 2 Data Link Subsystem Configuration.


Isolation Cabinet System
Isolation Cabinet System
Qualified Safety Parameters Display System
MODACS
MODACOMP 7821 256 K Bytes
Plant Data Concentrator
Unit 1 Radiation Monitoring System Eberline
Isolation Cabinet System
Isolation Cabinet System
Qualified Safety Parameters Display System
Unit 2 Radiation Monitoring System General Atomics
Comm A Processor
Comm B Processor
Hardcopy Console
256 MB Disk
MODCOMP 7870
Shadow Memory
Bus Switch
Display Generator
Mag Tape
Appendix I System (Nuclear Data)
Serial I/O Subsystem
Unit Logger
Unit 1 Color Plotter
Unit 2 Logger
TSC Printer
TSC Color Plotter
Unit 2 Color Plotter
Clock
EOF CRTS (2) Keyed
EOF Printer
EOF Color Plotter
Operator Panel
Keyed
Unit 1 SPDS CRT
Unit 1 Utility CRT
Unit 2 SPDS CRT
Unit 2 Utility CRT
TSC Utility CRT
Token Ring

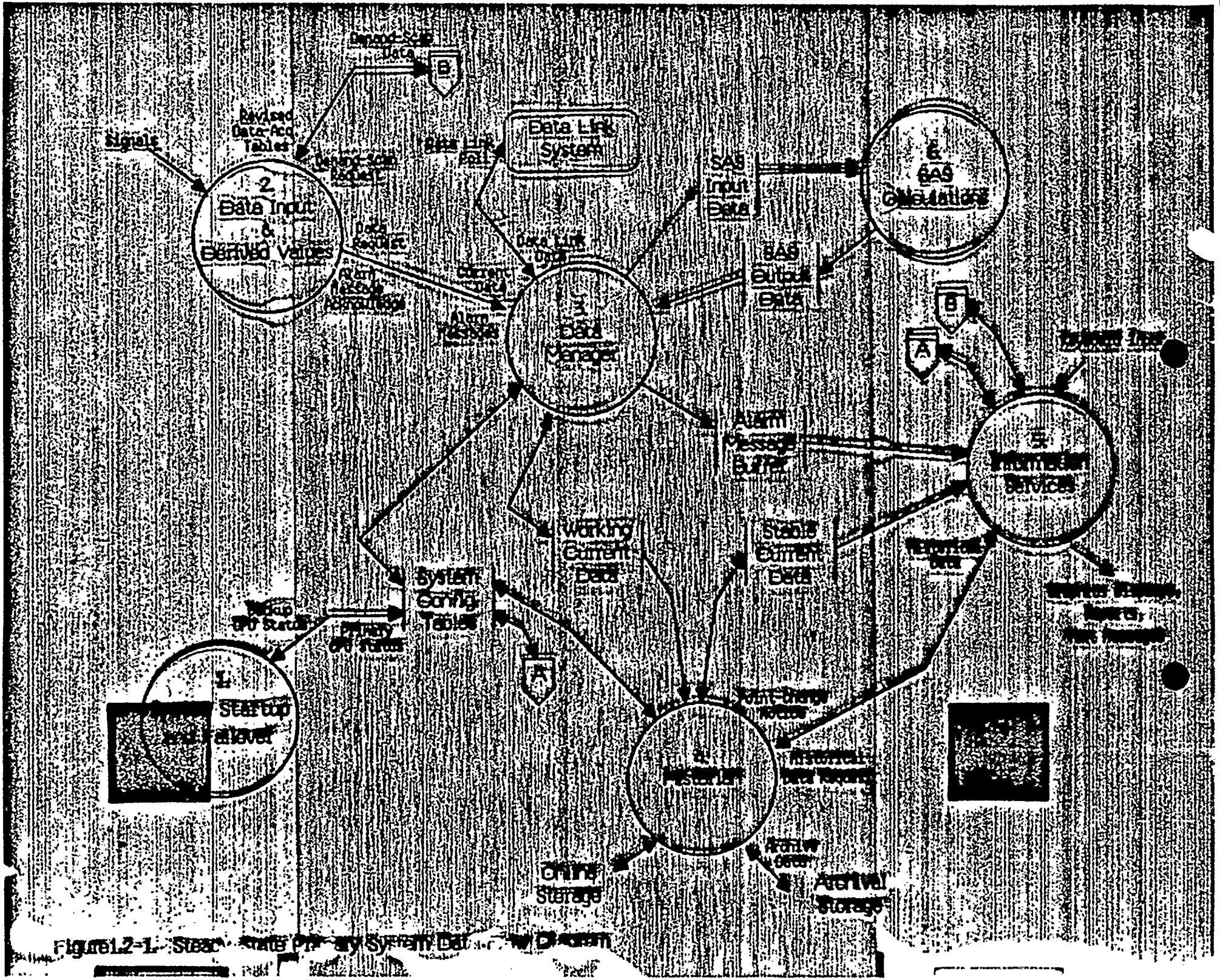


Figure 1.2-1. Steady-State Primary System Data Flow Diagram

NRC Statement:

"The system is clearly unacceptable in its present state even though the licensee declared it operational in November 1984."

FPL Response:

For St. Lucie Unit 2 the system was declared operational prior to startup following the first outage. On November 29, 1984, FPL notified NRC (FPL letter L-84-336) that the SPDS had been installed, was operable, and that the operators had been trained. The letter also provided a status of the implementation of the supplemental parameters and trending information which are provided as operational aids only. The letter stated that some system related (not SPDS) software problems could temporarily disable the SPDS, and that due to the complexity of the integrated system, and due to no previous experience on the system's reliability and maintainability, that considerable maintenance effort may be required. In actual fact, the system has been operational except during those periods of maintenance and debugging.

For St. Lucie Unit 1, the system was not required to be operational until prior to startup of Cycle 7 operation, which occurred in December 1985.

Note: NRC I&E Inspection Report 50-389/84-37, dated November 29, 1984, Section 11, Paragraph h, states, "The inpsector confirmed that the SPDS system has been operable, as described. This included review of operating procedure, and observation of the operators using the SPDS displays."

NRC Statement:

"Control room operators indicated that they did not use the system, and generally did not plan to use it, even if it were functioning properly."

FPL Response:

The SPDS is available as an aid and source of general information and trending of plant parameters in overview. The intended users of the SPDS are identified as the Nuclear Plant Supervisior, the Shift Technical Advisor, and portions of the Technical Support Center Staff and Emergency Operations Facility Staff. The Reactor Operators may use the system but only in conjunction with the use of qualified indications in the control room.

NRC Statement:

"The poor operator acceptance of the system appears to be caused by three primary factors. First, system availability was extremely poor. Second, the information displayed by the system was frequently incorrect. Finally, some of the particular parameters displayed by the SPDS were not understood by the operators, and were not consistent with other control room displays, standard operating procedures, or emergency operating procedures."

FPL Response:

Based upon our observations of the operators using the system, we do not agree with your conclusion of poor operator acceptance.

Regarding the first of the three primary factors, system availability has been impacted primarily by the software debugging and maintenance of the system. This was expected as stated in FPL letter L-84-336.

Regarding the second of the three primary factors, some of the information displayed by the system was incorrect. Software changes have been implemented to correct these problems.

Regarding the final primary factor, all of the intended users of the system fully understand the parameters being displayed, however, it is not intended that the operators understand the several hundred algorithms used in developing the parameters. Where SPDS parameters were not consistent with other control room displays, changes will be implemented as appropriate which correct these inconsistencies. Discrepancies identified between SAS and safety related instrumentation are corrected through the normal plant maintenance process. There is no intention to integrate SPDS into the plant operating procedures, particularly the new emergency operating procedures. The Reactor Operators have been trained and licensed based on the qualified, safety related control room indications. The intended users as described above will be using SPDS as an aid and source of general information and trending of plant parameters in overview. Operator actions will be based solely on the qualified control room instruments.

NRC Statement:

"The system has seldom been available to the operators for more than an hour or two at a time".

FPL Response:

Although no records were maintained for system down time prior to the audit, the major source of down time was due to software debugging as described in FPL letter L-84-336. During these periods of software maintenance the SPDS was available on demand.

Note: During the April 1986 emergency exercise at the St. Lucie Plant, the three terminals at the EOF operated continuously for approximately 7.5 hours at availabilities in excess of 99.3% each.

NRC Statement:

"When the system is available the information displayed is often invalid and inaccurate. For example, at the time of the audit, Unit 1 was operating normally at approximately 99.6% power. However, the SPDS indicated reactor power as varying from 50 to 94%, with six different parameter displays indicating alarm status."

FPL Response:

At the time of the audit, the St. Lucie Unit 1 SPDS had not been declared operational.

NRC Statement:

"Extensive system development will need to be completed before the SPDS is operational."

FPL Response:

The SPDS is operational and has been in operation since November 1984 for St. Lucie Unit 2 and since December 1985 for St. Lucie Unit 1 as indicated above.

NRC Statement:

"During preliminary installation testing some 400 different system problems were identified. At the time of the audit only a little more than half (approximately 250) of these problems had been addressed."

FPL Response:

These problems, once identified, were prioritized to resolve all SPDS problems first, and the remainder to be accomplished during implementation of the rest of SAS. At the time of the audit there were no remaining SPDS problems on Unit 2, and those remaining SPDS problems on Unit 1 were resolved prior to declaring the SPDS operational.

NRC Statement:

"System Verification and Validation (V&V) cannot be considered complete until existing problems have been addressed and a final round of testing completed. In addition to the existing test program, this V&V testing should include both end-to-end and system load tests. Neither of these types of tests have been conducted on the installed system. It has been assumed that sensor input is correctly processed, and no testing has been done to assure that system overloads will not result in excessive response times. Until such testing has been successfully completed, the SPDS should not be considered accurate and reliable."

FPL Response:

Section 7.5.A.3 of the St. Lucie Unit 2 FSAR describes the verification and validation performed on the SAS which includes the SPDS. All SPDS end-to-end testing has been completed and documented. Regarding system overloads, although we experience slight delays when more than one user calls for the same information, we are continuing to evaluate what an acceptable delay time is to determine what changes need to be made to prevent user overloads.

Note: Subsequent to this audit, Florida Power & Light Company was contacted by SAIC to discuss their capabilities to perform V&V services. SAIC was NRC's contractor for this audit.

NRC Statement:

"Both operators and management (from the site Vice President on down) felt that the SPDS would never actually be used in control room operations. This disregard is reflected in the design and implementation of the system. There appears to have been little or no analysis to define user needs, little attention to consistency between SPDS displays and those in the control rooms, and little correspondence between the new Emergency Operating Procedures and the SPDS messages or alarms. There were numerous incompatibilities and inconsistencies between the new display system and current control room design and operations."

FPL Response:

The SPDS has been used and will continue to be used as an aid and source of general information and trending of plant parameters. The statement "never actually be used in control room operations" means that reactor operators will not manipulate controls nor operate the plant based solely on SPDS indications. As stated earlier, the Reactor Operators may use the SPDS when in conjunction with the use of qualified indications in the control room.

It is FPL's position that the Emergency Operating Procedures reflect only the safety-related, qualified control room indications for controlling and operating the plant during emergency conditions. The EOPs were developed based on NRC-approved Procedure Generation Packages and have been implemented as such.

Regarding the consistency between SPDS displays and those in the control rooms, prior to declaring the Unit 2 SPDS operational, all inputs were verified. However, during operation of Cycle 2 at Unit 2, the unit was licensed for stretch power and the new setpoints had not been integrated into SPDS at the time of the audit. These discrepancies were corrected and have been verified.

NRC Statement:

The SPDS was developed as part of the Westinghouse Safety Assessment System (SAS) and is intended to be used under all plant conditions, including emergency transients, abnormal transients, and normal evolutions.

FPL Response:

The St. Lucie SPDS was developed as part of a PWR users group and was not developed from the Westinghouse SAS.

The St. Lucie SPDS was designed to be available under all plant conditions, and is intended to be used as determined necessary by the Nuclear Plant Supervisor, Shift Technical Advisor, and portions of the Technical Support Center and Emergency Operation Facility Staff. The Reactor Operators may use the system but only in conjunction with the use of qualified indications in the control room.

MEETING SUMMARY DISTRIBUTION

Licensee: Flordia Power and Light Company

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

Docket File
NRC PDR
Local PDR
PBD-Reading
F. Miraglia
OELD
E. Jordan
B. Grimes
ACRS-10

NRC Participants

E. Tourigny
L. Beltracchi
A. Thadani
D. Sells
G. Lapinsky
W. Regan
M. Goodman
F. Schroeder
C. Weiss