April 26, 1993

See Meeting Summary

Docket Nos. 50-315
and 50-316

LICENSEE: Indiana Michigan Power Company (IMPC)

FACILITY: D. C. Cook, Units 1 and 2

SUBJECT: MEETING SUMMARY OF APRIL 7, 1993

On April 7, 1993, representatives of the American Energy Power Services Corporation (parent company of IMPC) and Foxboro met with members of the NRC staff and contractors from Idaho National Engineering Laboratory (INEL) in Rockville, Maryland to discuss the planned installation of digital processing equipment in the reactor protection systems (RPS) for both units. A list of attendees is enclosed (Enclosure 1).

This meeting was a followup meeting from ones that were held in April and December 1992 and was timed to coincide with the inclusion of the INEL contractors to the project for review and audit purposes. The licensee provided a brief history of the project, and discussed the proposed schedule and project organization. A Foxboro representative described the instrumentation that will be installed and the licensee then briefly discussed its plans for conducting the verification and validation process for the project. The final part of the licensee's presentation was associated with how the pertinent documentation is arranged and the scope of their license amendment package. The licensee described the type and volume of information that was available to support the staff's review process. This included an extensive effort to cross-reference the information to any staff issues or questions that have arisen in the past. A copy of the licensee's presentation is enclosed (Enclosure 2).

The INEL contractors asked a number of questions of a technical nature to become better familiarized with the status of the licensee's project. The meeting then concluded, though several of the licensee's technical representatives remained to more thoroughly answer some of the questions posed to them by the staff and INEL contractors.

Original signed by

William M. Dean, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures: As stated

cc w/enclosures:
See next page

NRC FILE COPY

Office	LA:PDIII-1	PM:PDIII-1	D:PDIII-1
Name	MShuttleworth	WDean/vsb:sw	LMarsh
Date	~~12/ /92~~	~~12/ /92~~ 4/20/93	~~12/ /92~~ 4/20/93

4/22/93

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PDR ADOCK 05000315
P PDR

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DISTRIBUTION LIST FOR MEETING SUMMARY April 7, 1993

Docket File w/encls.
NRC & Local PDRs
PDIII-1 RDG File
w/o enclosure 2
T. Murley
F. Miraglia
J. Partlow
J. Roe
J. Zwolinski
L. Marsh
W. Dean
OGC
E. Jordan, MNBB 3701
J. Wermiel 10/D/24
J. Mauck 8/H/3
S. Rhow 8/H/3
ACRS (10)
G. Grant, EDO
W. Shafer, RIII
E. Schweibinz, RIII
B. Jorgensen, RIII

cc:

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Indiana Michigan Power Company
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1 Riverside Plaza
Columbus, Ohio 43216

ENCLOSURE 1

April 7, 1993

D. C. Cook, Units 1 and 2 RPS Modification Meeting

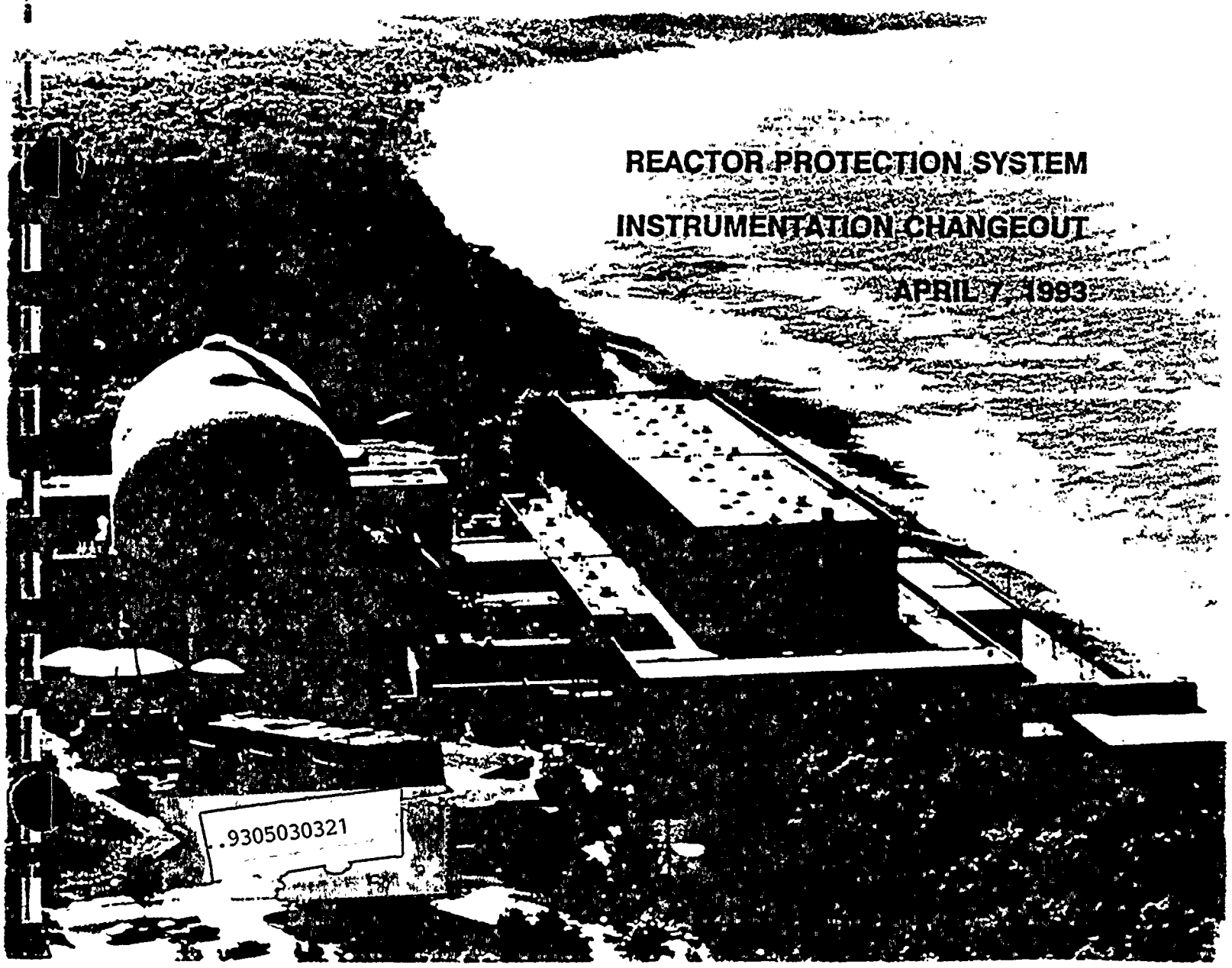
List of Attendees

Name	Organization
Bill Dean	Senior Project Manager, PDIII-1/NRC
Ed Schweibinz	Senior Project Engineer, RIII/NRC
Joe Joyce	HICB/NRR
Sang Rhow	HICB/NRR
Paul Loeser	HICB/NRR
Jim Stewart	HICB/NRR
Jeb Kingseed	AEPSC
Bill Sotos	AEPSC
Doug Malin	AEPSC
Hal Hoffman	AEPSC
Robert Carruth	AEPSC
Mark Wilken	AEPSC
James Keiper	Foxboro
Jeff Hansen	EG&G/INEL
Bob Richards	EG&G/INEL

ENCLOSURE 2

COOK NUCLEAR PLANT

Bridgman, Michigan



REACTOR PROTECTION SYSTEM

INSTRUMENTATION CHANGEOUT

APRIL 7, 1993

USNRC/INEL/AEPNO

APRIL 7, 1993 MEETING

REACTOR PROTECTION SYSTEM

PROCESS INSTRUMENTATION REPLACEMENT

WHITE FLINT OFFICE

ROCKVILLE, MD

PROJECT HISTORY, SCOPE AND STATUS..... W. G. SOTOS

TECHNICAL DESCRIPTION AND COMPARISON
WITH CONNECTICUT YANKEE APPLICATION.....W. G. SOTOS

OVERVIEW OF FOXBORO INSTRUMENTATION ..... J. T. KEIPER

SOFTWARE VERIFICATION AND VALIDATION ..... H. H. HOFFMAN

OVERVIEW OF SUBMITTAL ..... M. A. WILKEN

PROJECT HISTORY, SCOPE AND STATUS

W. G. SOTOS

INITIAL STUDY (INITIATED 1988)

EQUIPMENT

- H-LINE EQUIPMENT END OF LIFE
- DECLINING VENDOR SUPPORT
- DECLINING ELECTRONIC PIECE/PART LEVEL SUPPORT

DESIGN PHILOSOPHY

- USE MATURE PRODUCT LINES
- NO FUNCTION CHANGES
- NO CHANGES IN SEPARATION
- NO CHANGE IN DIVERSITY
- NO DIGITAL COMMUNICATION NETWORKS
- USE EXISTING FIELD WIRING
- MINIMIZE IMPACT ON TECHNICIANS AND OPERATORS
- MINIMIZE IMPACT ON PLANT PROCEDURES
- MAXIMIZE PRE-INSTALLATION TESTING

FIRST EFFORT

COMBUSTION ENGINEERING CONTRACT (OCTOBER 1989)

SCOPE

REACTOR PROTECTION SETS

CONTROL GROUP PROCESS INSTRUMENTATION

CONTROL PANEL HARDWARE

WATER SYSTEMS INSTRUMENTATION

FABRICATION START (NOVEMBER 1990)

FACTORY ACCEPTANCE TEST START (SEPTEMBER 1991)

C E REACTOR PROTECTION SET INVOLVEMENT ENDED (MARCH 1992)

NO INVOLVEMENT ON SAFETY RELATED WORK

TAYLOR EQUIPMENT IS KEPT IN NON-SAFETY WORK

FOXBORO CONTRACT (APRIL 1992)

SCOPE

REACTOR PROTECTION SETS

CURRENT PROJECT

FOXBORO

REACTOR PROTECTION SYSTEM

TAYLOR

CONTROL GROUP PROCESS INSTRUMENTATION

WATER SYSTEMS INSTRUMENTATION

CONTROL PANEL HARDWARE

AMSAC (CHANGED FROM FOXBORO TO MAINTAIN DIVERSITY)

SCOPE OF WORK

REPLACE EXISTING ANALOG FOXBORO

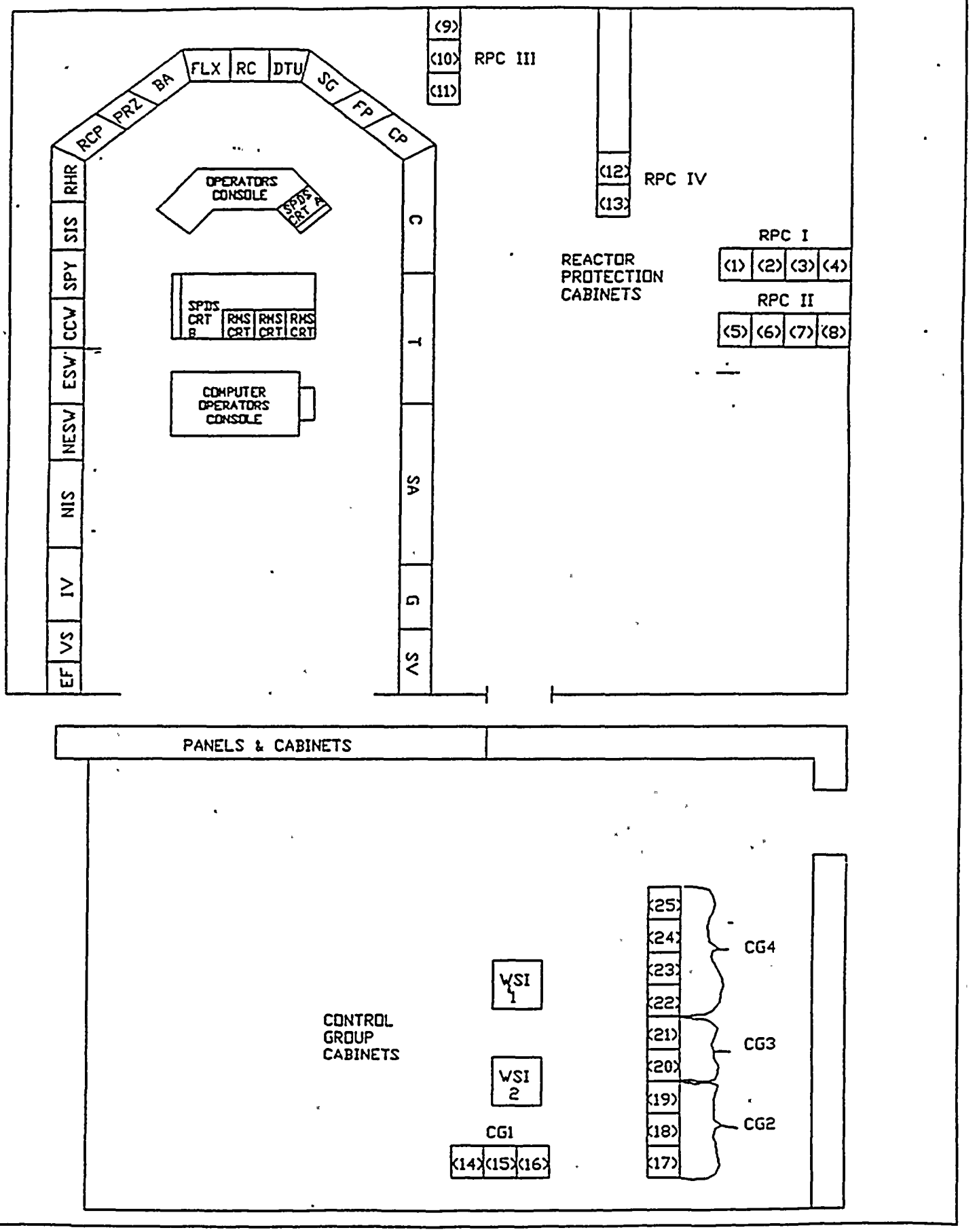
H-LINE EQUIPMENT WITH NEW FOXBORO

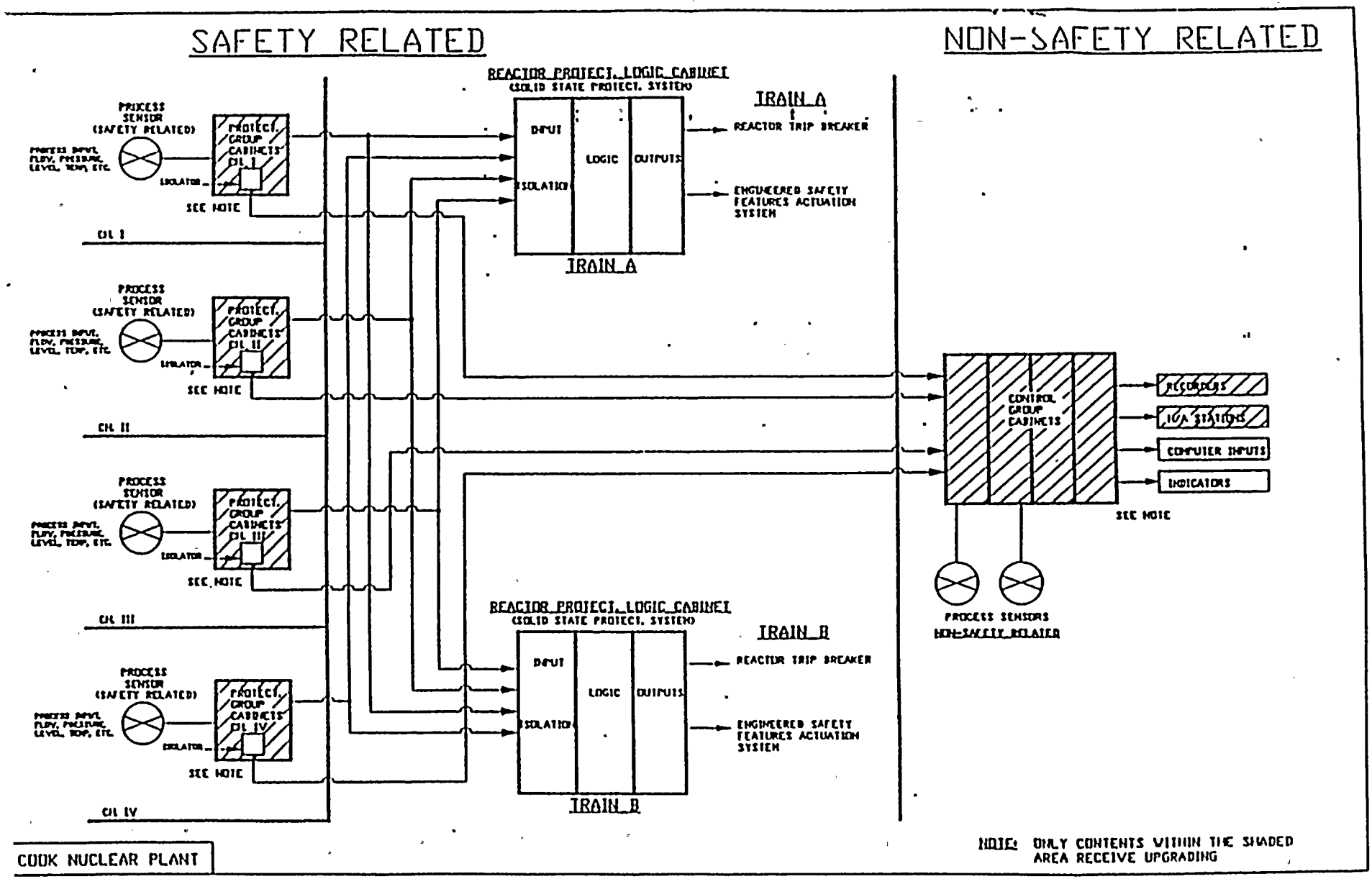
SPEC 200 AND SPEC 200 MICRO HARDWARE

IMPACTS 13 REACTOR PROTECTION PROCESS

INSTRUMENTATION CABINETS EACH UNIT

D.C. COOK MAIN CONTROL ROOMS
(UNIT ONE & TWO TYPICAL)




SAFETY RELATED
NON-SAFETY RELATED
REACTOR PROTECT. LOGIC CABINET
(SOLID STATE PROTECT. SYSTEM)
TRAIN A
INPUT
ISOLATION
LOGIC
OUTPUTS
REACTOR TRIP BREAKER
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
TRAIN A
PROCESS SENSOR (SAFETY RELATED)
PROCESS INPUT, FLOW, PRESSURE, LEVEL, TEMP, ETC.
ISOLATOR
PROTECT. GROUP CABINETS
SEE NOTE
CH. I
CH. II
CH. III
CH. IV
CONTROL GROUP CABINETS
RECORDERS
I/A STATIONS
COMPUTER INPUTS
INDICATORS
SEE NOTE
PROCESS SENSORS
NON-SAFETY RELATED
REACTOR PROTECT. LOGIC CABINET
(SOLID STATE PROTECT. SYSTEM)
TRAIN B
TRAIN B
COOK NUCLEAR PLANT
NOTE: ONLY CONTENTS WITHIN THE SHADED AREA RECEIVE UPGRADING

TECHNICAL AREAS OF INTEREST

- ENVIRONMENTAL QUALIFICATION
- SEISMIC QUALIFICATION
- EMI/RFI SUSCEPTIBILITY
- POWER
- INDEPENDENCE/DIVERSITY
- FAILURE MODES AND EFFECTS
- RELIABILITY
- FUNCTIONALITY
- VERIFICATION AND VALIDATION
- TESTING

PROJECT ORGANIZATION AND MANAGEMENT

AEPNO DEDICATED PROJECT TEAM

MANAGEMENT

LEAD ENGINEER

SUPPORTING I&C ENGINEERS

CONTRACTING CONSULTING ENGINEERS

MECHANICAL AND ELECTRICAL DESIGNERS

PLANT PROJECT ENGINEER

PLANT I&C PERSONNEL

QUALITY ASSURANCE

NUCLEAR SAFETY AND LICENSING

CURRENT STAFFING

17 FULL TIME PERSONNEL

28 PART TIME (GREATER THAN 25% OF AVAILABLE TIME)

FORMAL STATUS AND ACTION ITEM LISTS REGULARLY UPDATED

PROJECT SCHEDULE (UNIT 2 UNLESS NOTED)

RPS DOCUMENTATION	COMPLETE
VENDOR DRAWING/DESIGN	COMPLETE
FACTORY ACCEPTANCE TEST	
COMPLETION	MAY 1993
AEP DRAWING/DESIGN	
COMPLETION	JULY 1993
PRE-INSTALLATION TEST	
COMPLETION	AUGUST 1993
PLANT PROCEDURE	
COMPLETION	DECEMBER 1993
UNIT 1 INSTALLATION	FEBRUARY 1994

TECHNICAL DESCRIPTION AND COMPARISON WITH CONNECTICUT YANKEE APPLICATION

W. G. SOTOS

TECHNICAL DESCRIPTION AND COMPARISON WITH CONNECTICUT YANKEE (C.Y.) APPLICATION

FUNCTIONAL

HARDWARE/HARDWARE APPLICATIONS

SOFTWARE/SOFTWARE APPLICATIONS

TECHNICAL DESCRIPTION AND COMPARISON WITH
CONNECTICUT YANKEE APPLICATION

FUNCTIONAL - REACTOR PROTECTION AND ESF

CONNECTICUT YANKEE	D.C. COOK
PRESSURIZER LEVEL	PRESSURIZER LEVEL
PRESSURIZER PRESSURE	PRESSURIZER PRESSURE
REACTOR COOLANT FLOW	REACTOR COOLANT FLOW
S/G NARROW RANGE LEVEL	S/G NARROW RANGE LEVEL
S/G STEAM FLOW	S/G STEAM FLOW

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

FUNCTIONAL - REACTOR PROTECTION AND ESF

CONNECTICUT YANKEE	COOK NUCLEAR PLANT
S/G PRESSURE	S/G PRESSURE
FEEDWATER FLOW	FEEDWATER FLOW
T_{AVG}, ΔT (THOT, TCOLD)	T_{AVG}, ΔT (THOT, TCOLD)
CONTAINMENT PRESSURE	CONTAINMENT PRESSURE
TURBINE FIRST STAGE PRESSURE	TURBINE IMPULSE PRESSURE

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

FUNCTIONAL - OTHER SAFETY RELATED APPLICATIONS

CONNECTICUT YANKEE	COOK NUCLEAR PLANT
WIDE RANGE RCS TEMPERATURE	WIDE RANGE RCS TEMPERATURE
WIDE RANGE RCS PRESSURE	WIDE RANGE RCS PRESSURE
	RWST LEVEL
	CONTAINMENT LEVEL
	AUXILIARY FEEDWATER FLOW
	TSAT INPUT SELECT
	CONDENSATE STORAGE TANK LEVEL

TECHNICAL DESCRIPTION AND COMPARISON WITH CONNECTICUT YANKEE APPLICATION (CONTINUED)

FUNCTIONAL DIFFERENCES

REACTOR PROTECTION AND ESF - NONE

OTHER SAFETY RELATED - ADDITIONAL APPLICATIONS FOR REG GUIDE 1.97

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

HARDWARE

CONNECTICUT YANKEE	D.C. COOK
ANALOG INPUT MODULES:	ANALOG INPUT MODULES:
N-2AI-I2V	
N-2AI-P2V	N-2AI-H2V
N-2AI-T2V	N-2AI-P2V
N-2AI-C2L	N-2AI-T2V
	N-2AI-C2L
ANALOG OUTPUT MODULES:	ANALOG OUTPUT MODULES:
N-2AO-VAI	
N-2AO-V2I	
N-2AO-V2H	N-2AO-V2H (CUSTOM)
CONTACT OUTPUT MODULES:	CONTACT OUTPUT MODULES:
N-2AO-L2C-R	N-2AO-L2C-R

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

HARDWARE

CONNECTICUT YANKEE	D.C. COOK
DIGITAL MODULES:	DIGITAL MODULES:
N-2CCA-S N-2CCA-D	N-2CCA-S N-2CCA-D
POWER SUPPLIES/DISTRIBUTION:	POWER SUPPLIES/DISTRIBUTION:
N-2AX+DP11	N-2AX+DP11 N-2AX+DP10-E N-2ARPS05-A6
N-2ARPS05-A6 N-ARPS-A6	P0300CQ

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

HARDWARE

CONNECTICUT YANKEE	D.C. COOK
NESTS:	NESTS:
N-2ANU-DM	N-2ANU-DM
RACKS:	RACKS:
NEW N-2ES SERIES	EXISTING AMCO FX78 SERIES

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

HARDWARE DIFFERENCES

ANALOG INPUT MODULES - 10 - 50 - MA VS 4 - 20 MA

ANALOG OUTPUT MODULES - N - 2AO - V2H MODIFIED TO PROVIDE ISOLATION

CONTACT OUTPUT MODULES - NONE

DIGITAL MODULES - NONE

POWER SUPPLIES/ DISTRIBUTION

MINOR FUSING DIFFERENCES IN POWER DISTRIBUTION MODULES USED

75 VDC POWER SUPPLY REQUIRED

NESTS - NONE

RACKS - EXISTING VS NEW

TECHNICAL DESCRIPTION AND COMPARISON WITH

CONNECTICUT YANKEE APPLICATION

(CONTINUED)

SOFTWARE

CONNECTICUT YANKEE	D.C. COOK
SOFTWARE BLOCKS USED:	SOFTWARE BLOCKS USED:
CALC	CALC
ALRM	ALRM
LLAG	LLAG
GATE	GATE
	RAMP
	SSEL

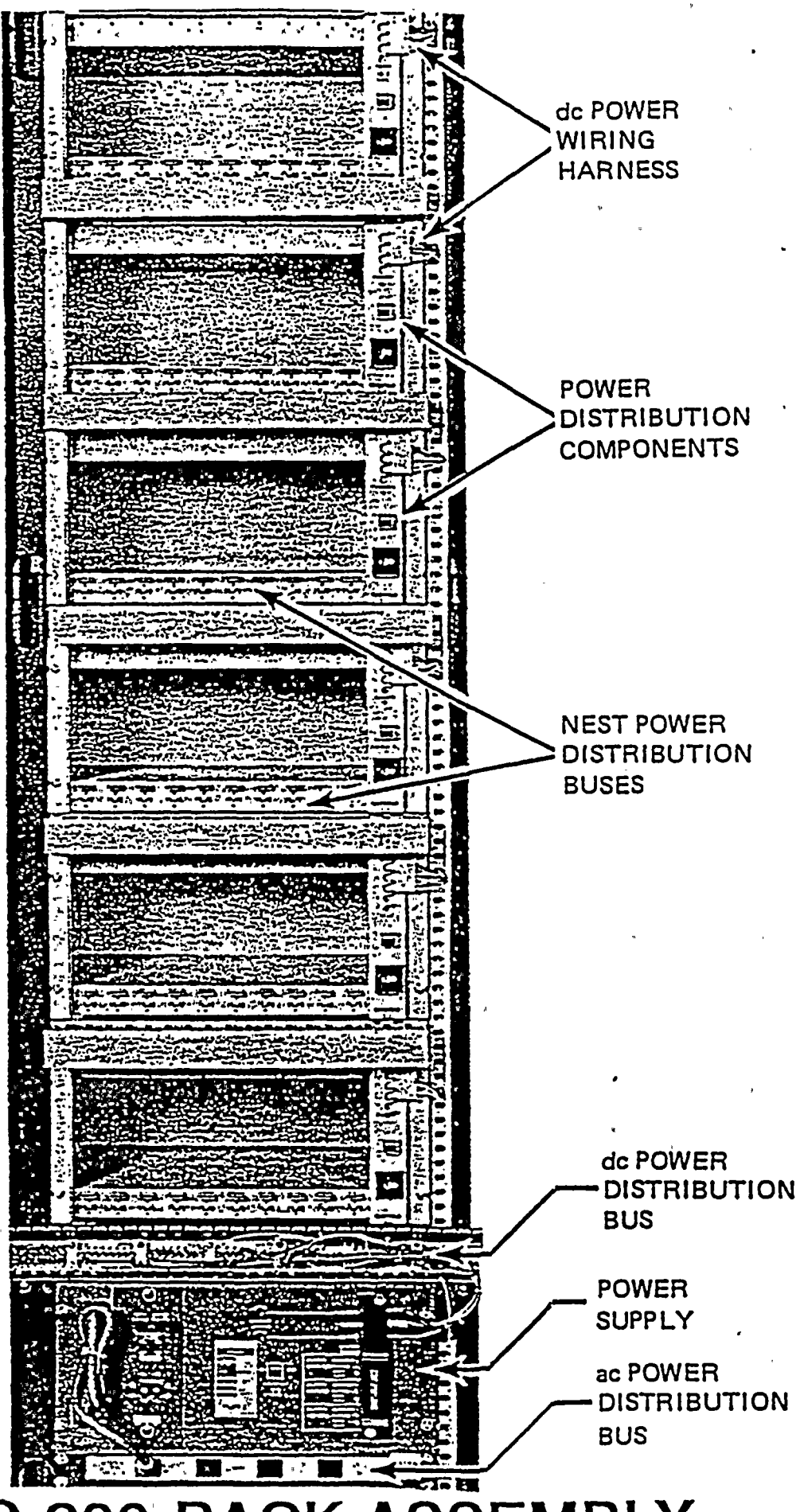
- VERIFICATION AND VALIDATION PER ANSI/IEEE-ANS-7-4.3.2

OVERVIEW OF FOXBORO INSTRUMENTATION

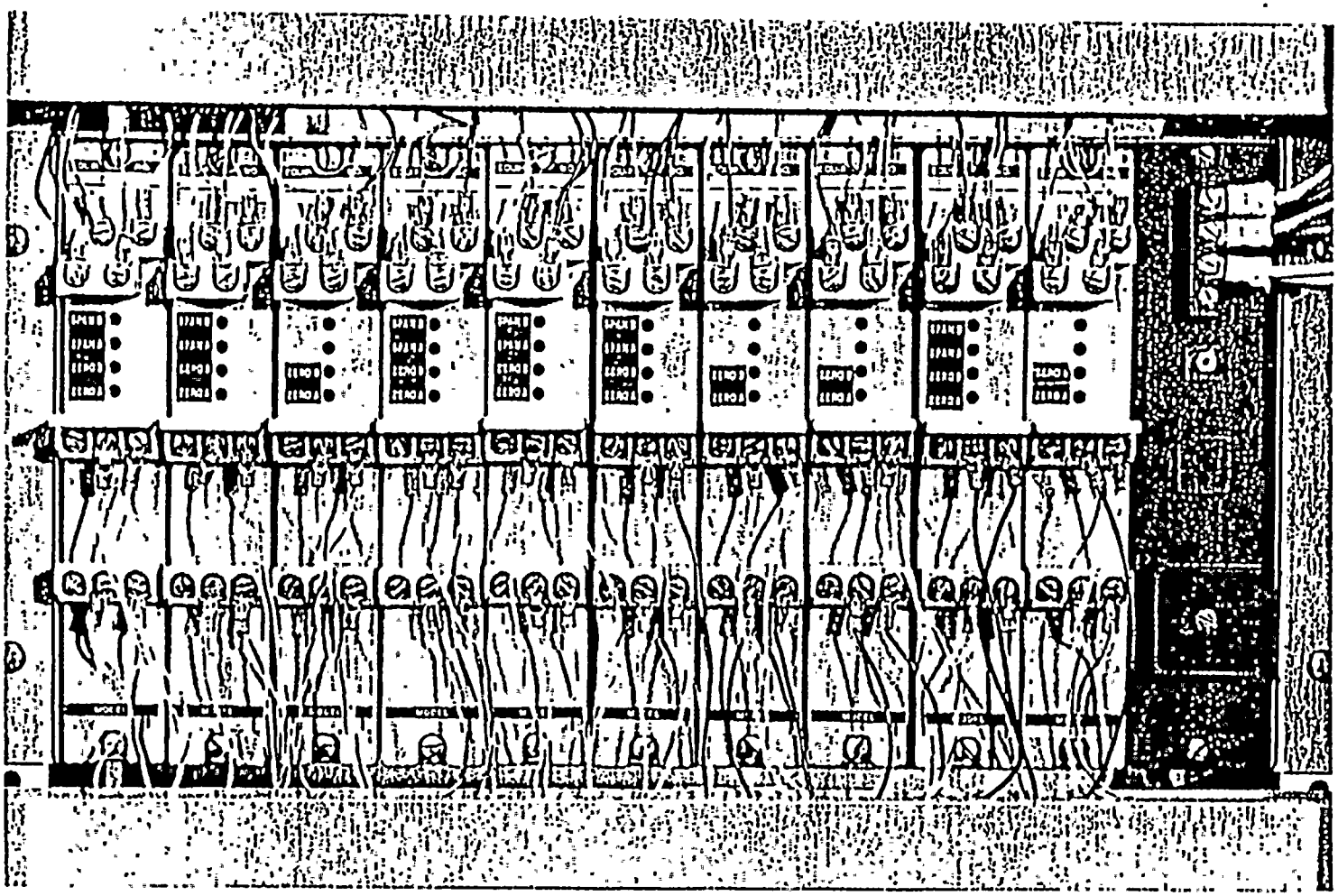
J. T. KEIPER

INDUSTRY CONSULTANT

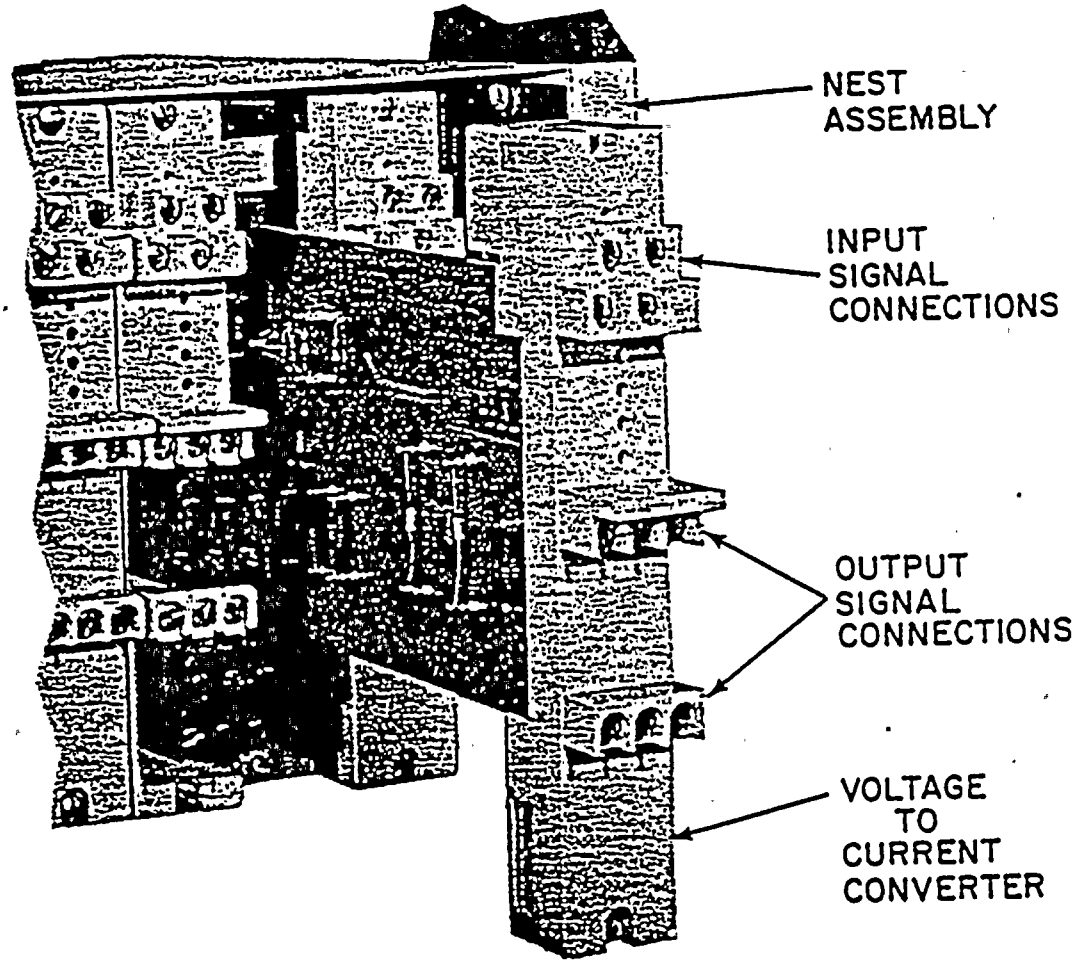
THE FOXBORO COMPANY



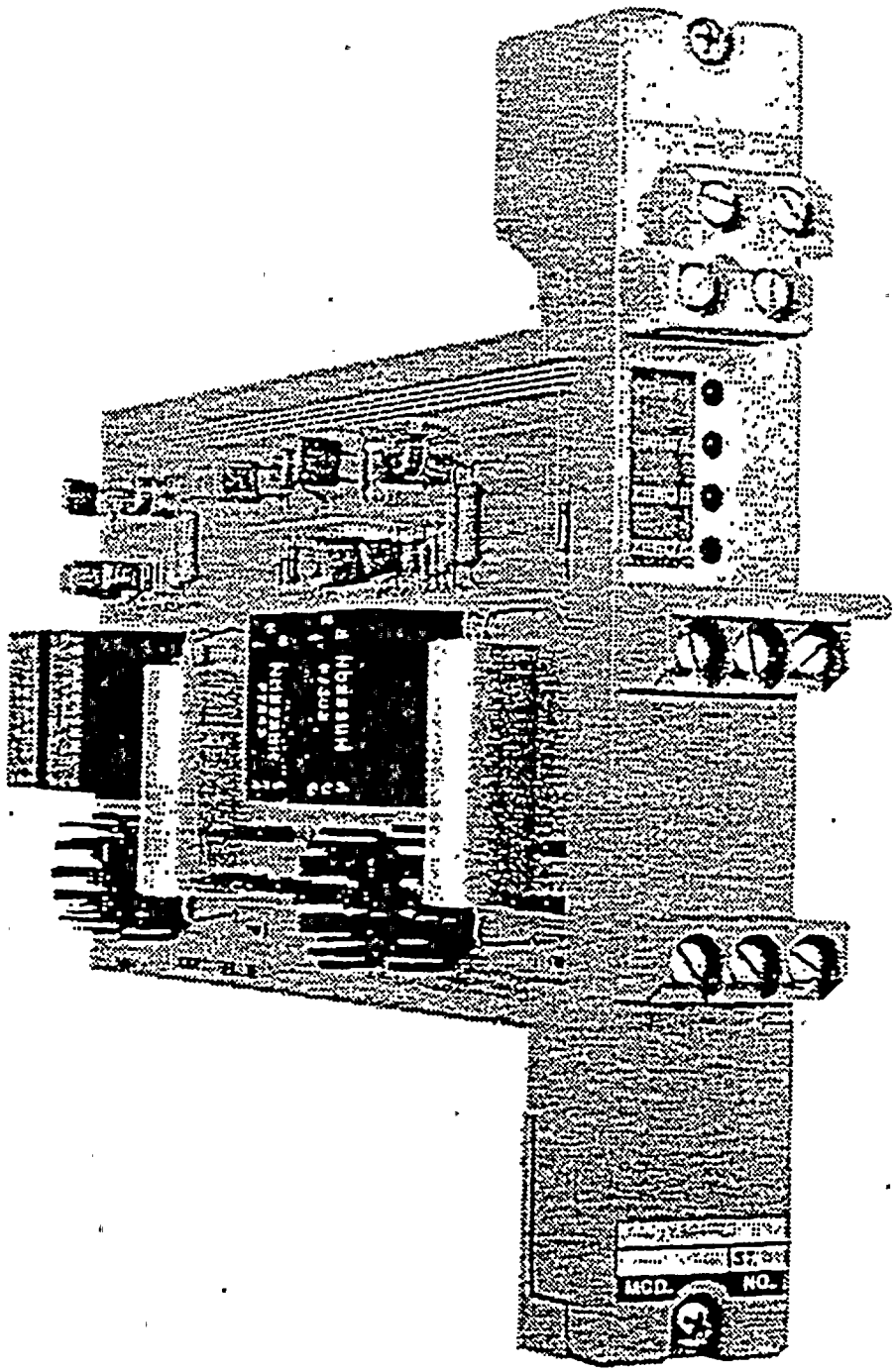
SPEC 200 RACK ASSEMBLY



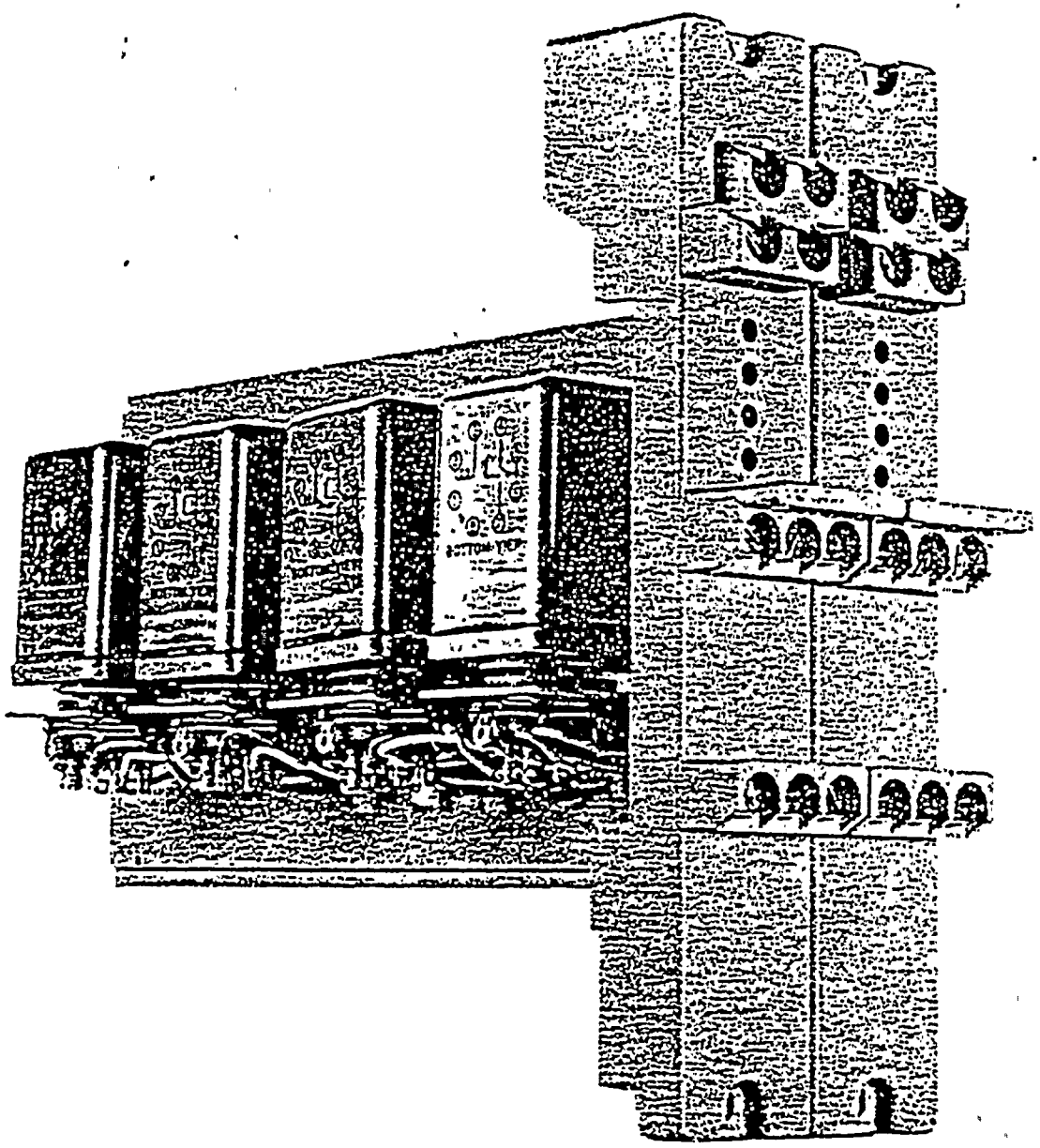
SPEC 200 NEST ASSEMBLY



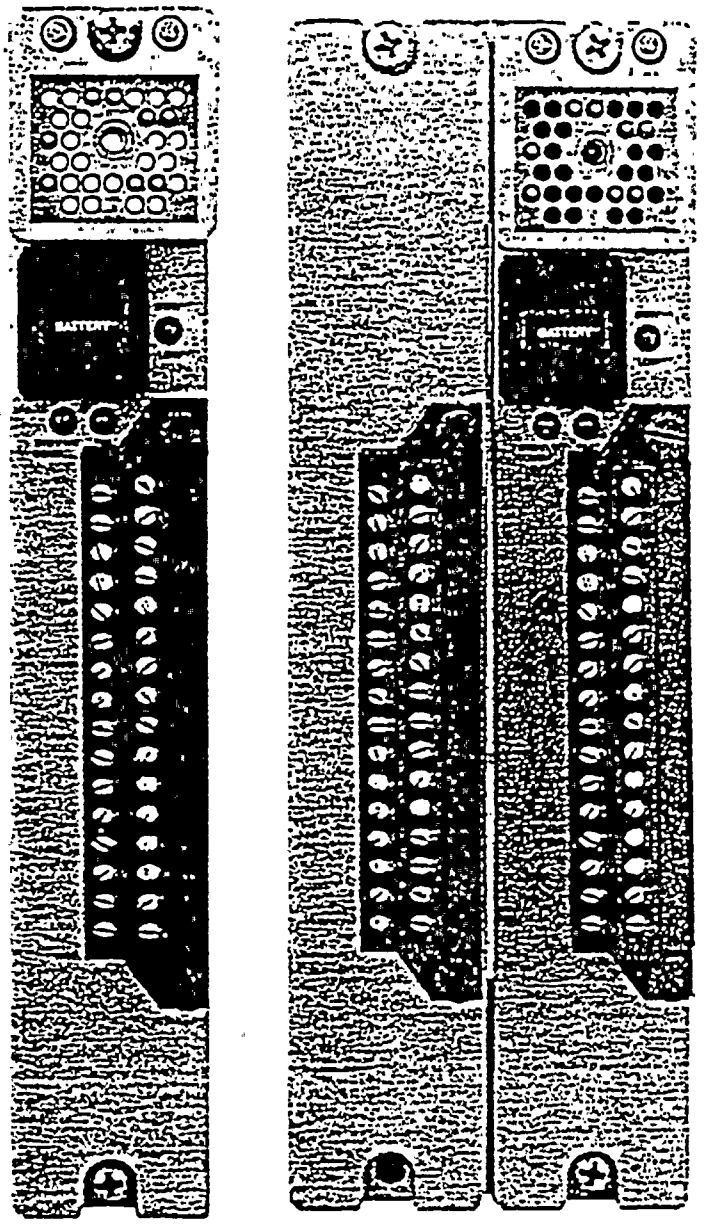
TYPICAL MODULE INSTALLATION



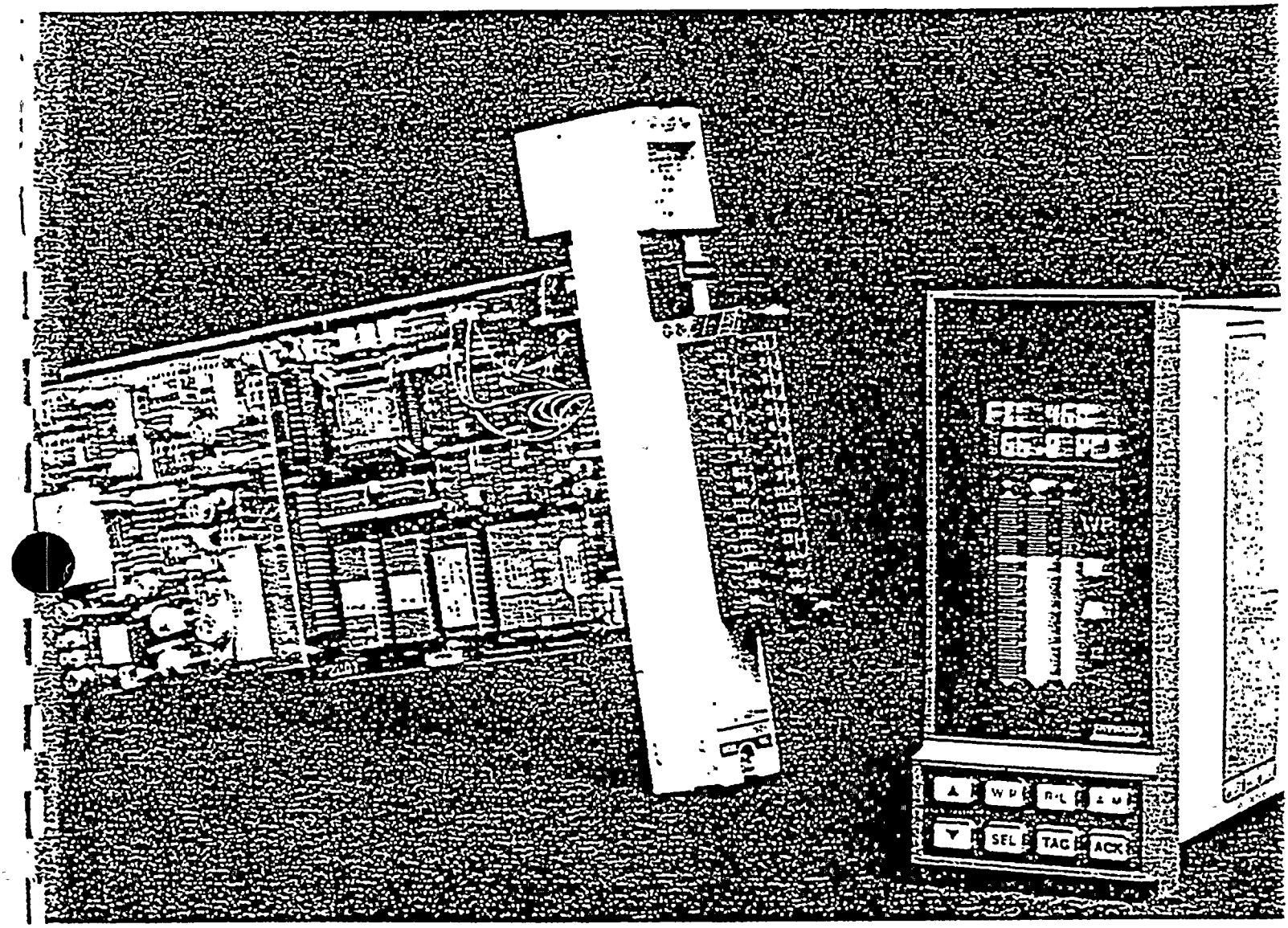
TYPICAL ANALOG I/O MODULE



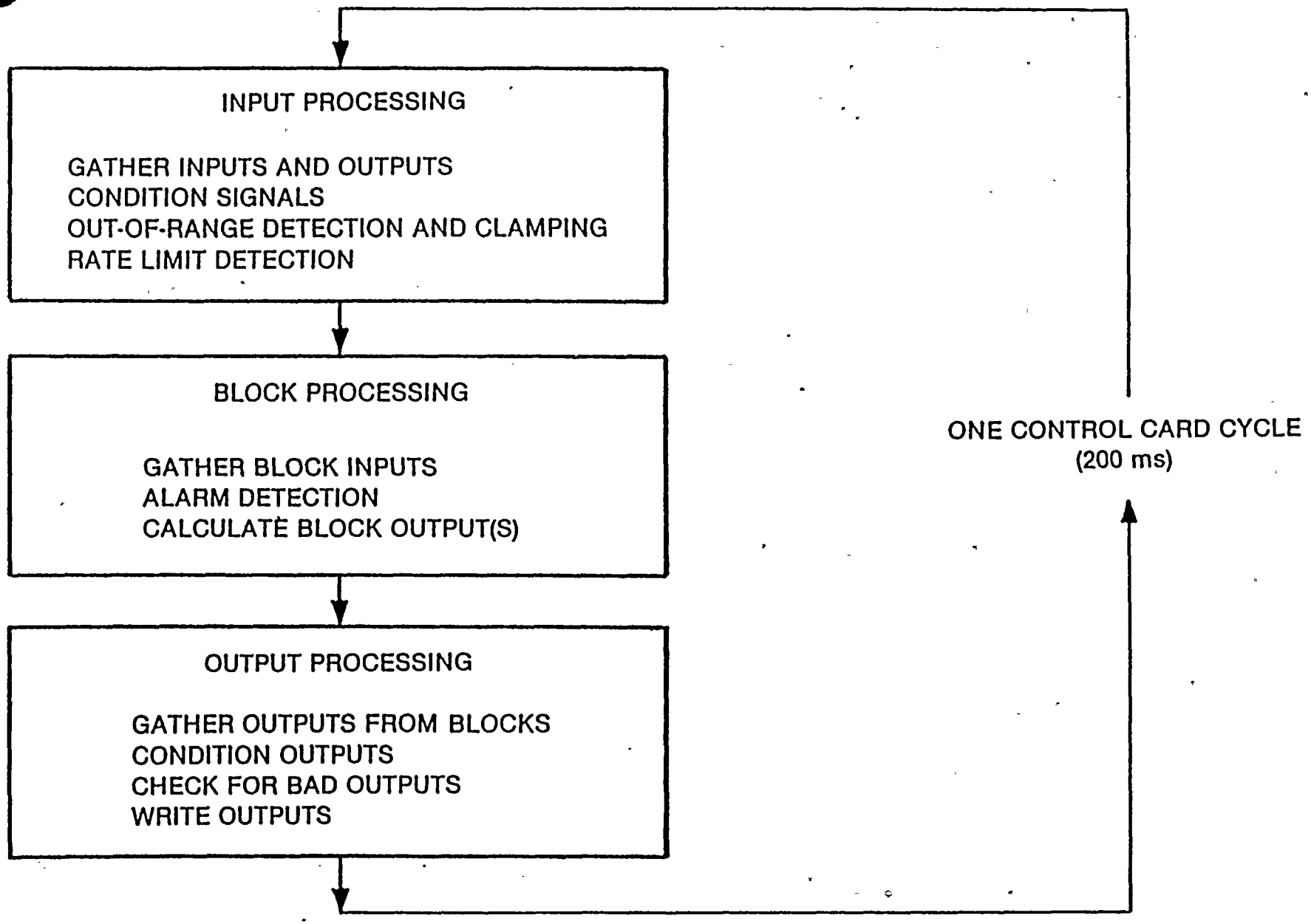
CONTACT OUT MODULE



SPEC 200 MICRO MODULES



SPEC 200 MICRO



SPEC 200 MICRO CONTROL CYCLE

CONFIGURABLE BLOCK TYPES

CONTROL:

PID	=	PROPORTIONAL/INTEGRAL/DERIVATIVE CONTROLLER
TUNE	=	EXACT-TUNING EXTENDER (PID)
NONL	=	NON-LINEAR EXTENDER (PID)
INT	=	INTEGRAL ONLY CONTROLLER
AMB	=	AUTOMATIC/MANUAL STATION WITH BIAS
RTIO	=	RATIO INPUT AND CONVERSION

INPUT AND CONVERSION:

MIB	=	MULTIPLE INPUT BLOCK
CHAR	=	PIECEWISE LINEAR CHARACTERIZER

DIGITAL/LOGIC:

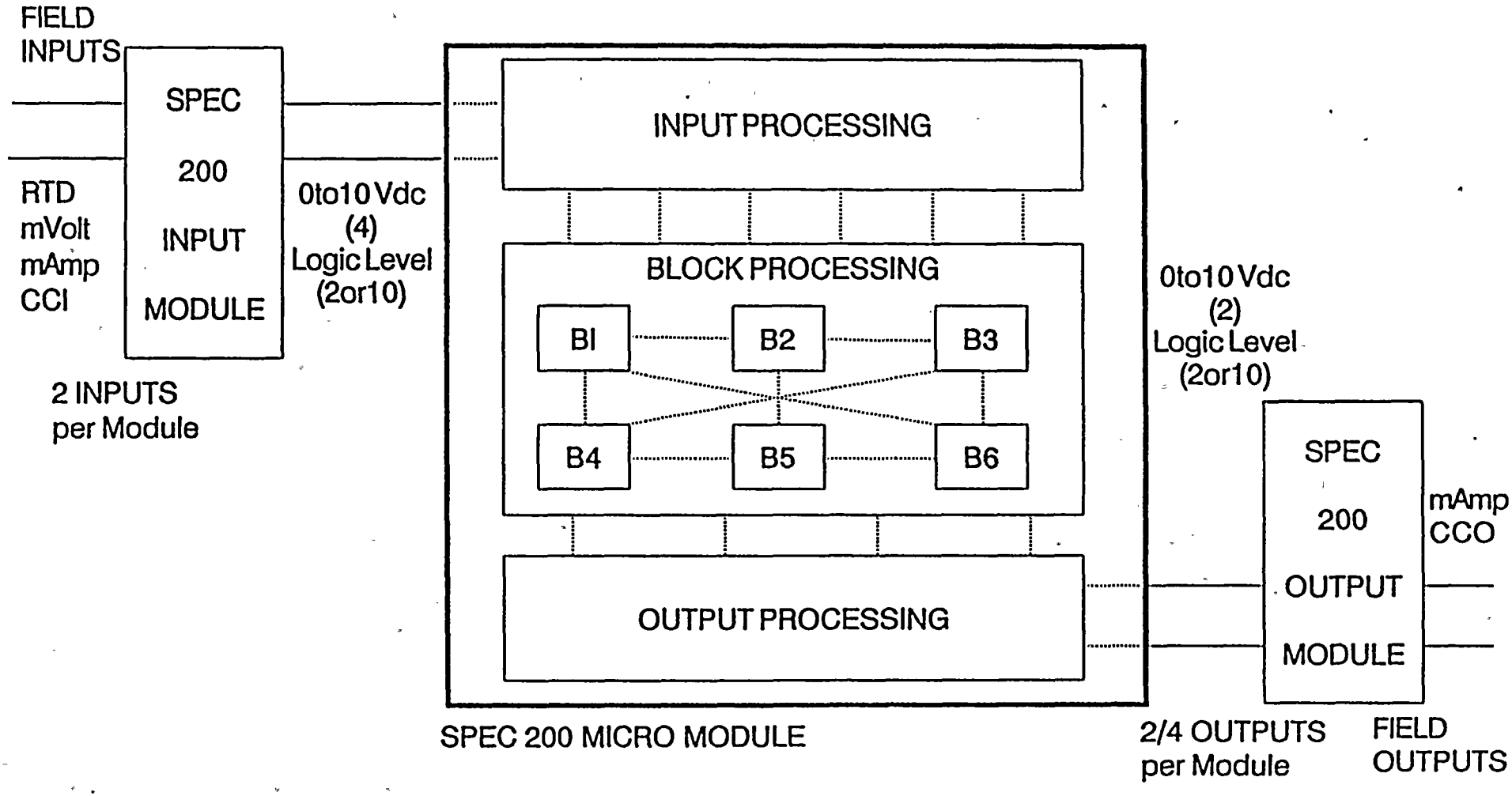
DIN	=	DIGITAL INPUT
DOUT	=	DIGITAL OUTPUT
GATE	=	MULTIPLE GATE
SEQ	=	SEQUENCER

DYNAMIC COMPENSATION:

LLAG	=	LEAD/LAG DYNAMIC COMPENSATOR
DTIM	=	DEAD TIME

MISCELLANEOUS:

SWCH	=	SWITCH
SSEL	=	SIGNAL SELECTOR
ALRM	=	ALARM AND LIMITER
RAMP	=	UNIVERSAL RAMP GENERATOR
TIMR	=	TIMER
ACUM	=	ACCUMULATOR
CALC	=	CALCULATOR

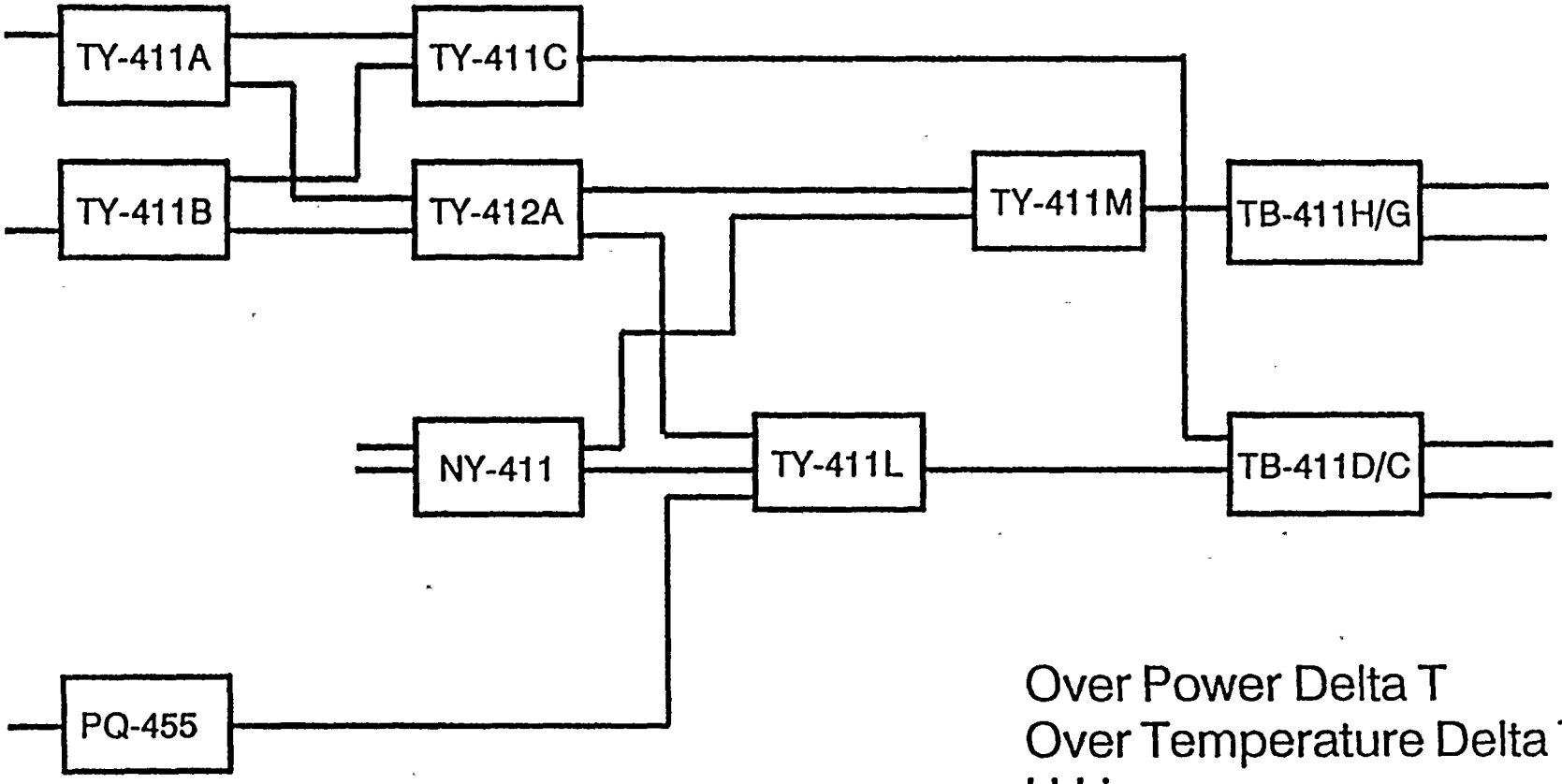


Power Distribution via SPEC 200 Nest
Power Distribution Module and
Multi-Nest Power Supply

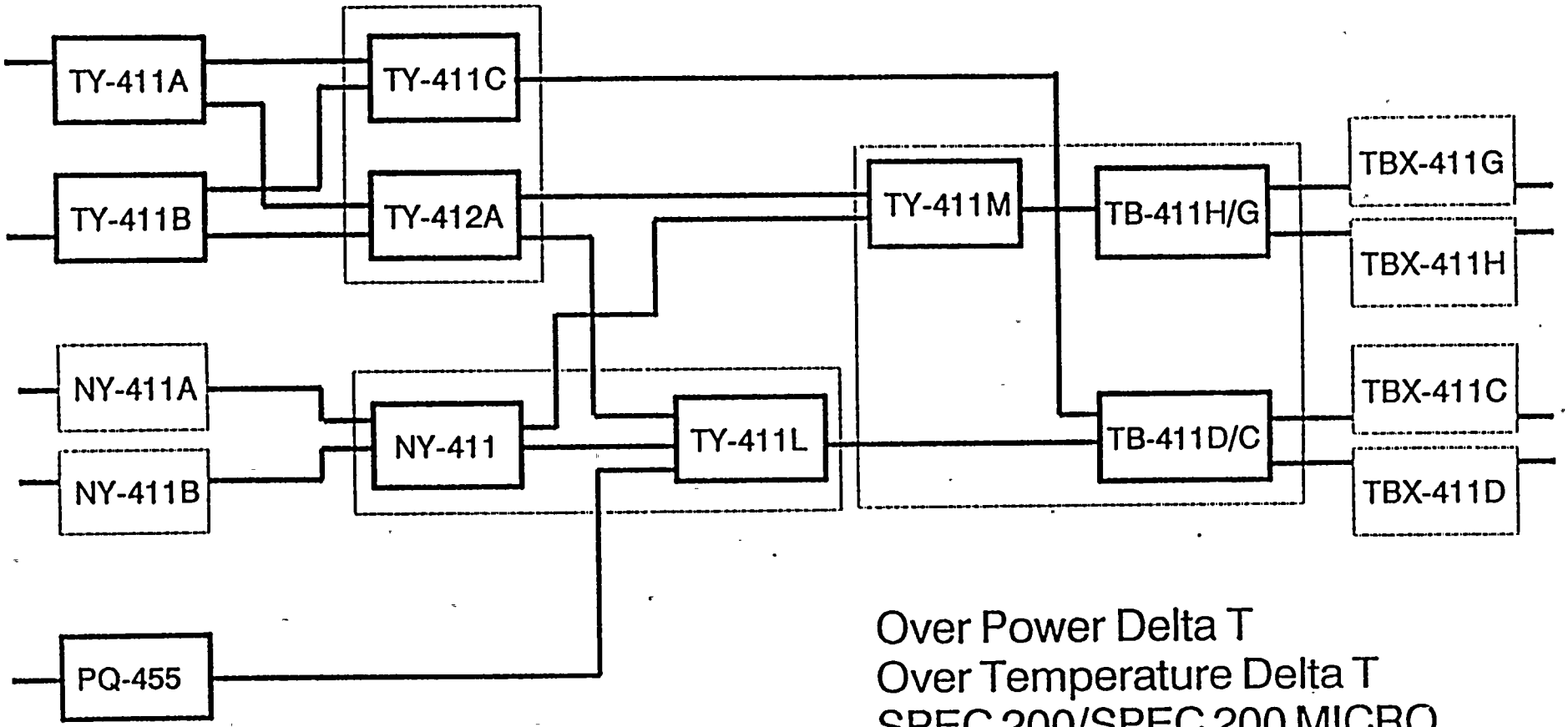
SPEC 200/SPEC 200 MICRO SIMPLIFIED BLOCK DIAGRAM

High Pressurizer Pressure
H-Line

High Pressurizer Pressure
SPEC 200/SPEC 200 MICRO



Over Power Delta T
Over Temperature Delta T
H-Line



Over Power Delta T
Over Temperature Delta T
SPEC 200/SPEC 200 MICRO

SPEC 200/SPEC 200 MICRO ANNUAL SALES

	1977	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	Total
N-2AI	695	411	482	690	563	725	253	592	416	364	324	268	961	120	214	297	7375
N-2AO	219	340	377	797	658	774	306	686	379	518	512	412	971	218	337	701	8205
N-2AX	1708	1080	1570	2195	2041	2649	1044	2169	1121	1341	676	846	2907	903	2871	497	25618
N-2CCA										73	151	75	390	59	68	221	1037
N-2CDS										10	53	20	115	54	4	13	269
N-2AN	195	263	281	416	291	262	86	214	176	188	146	80	507	58	113	185	3461
N-2ES	59	56	22	40	31	17	7	88	13	6	7	3	31	1	2	6	389
N-2AR	46	59	75	75	110	90	36	51	38	40	49	22	107	41	6	57	902
N-2AC	47	137	125	140	127	282	54	91	134	47	19	13	59	18	27	4	1324
N-2AP	535	450	643	767	596	588	269	516	207	177	170	131	472	98	127	97	5843
N-227						51	20	87	80	107	52	14	94	21	37	11	574
N-E27						16	9	20	59	15	41	9	3	9	33	2	216
N-25X	43	40	74	105	230	101	185	94	213	147	87	46	567	294	1244	14	3484

PRODUCT EXPERIENCE

N-SPEC 200

> 100 NUCLEAR PLANTS

> 50,000 NUCLEAR MODULES

N-SPEC 200 MICRO

30 NUCLEAR PLANTS

> 1000 NUCLEAR MODULES

SPEC 200 MICRO

> 400 USERS

> 14,700 MODULES

SOFTWARE VERIFICATION AND VALIDATION

H. H. HOFFMAN

VERIFICATION

A PROCESS THAT GOES ON DURING THE ENTIRE LIFE CYCLE. THE PROCESS IS THAT OF DETERMINING WHETHER OR NOT THE PRODUCT OF A GIVEN PHASE OF THE SOFTWARE DEVELOPMENT CYCLE FULFILLS THE REQUIREMENTS IMPOSED BY THE PREVIOUS PHASE.

VALIDATION

THE TEST AND EVALUATION OF COMPLETED SOFTWARE TO ENSURE CORRECTNESS AND COMPLIANCE WITH SOFTWARE REQUIREMENTS AND APPLICABLE STANDARDS, RULES, AND CONVENTIONS. FOR EXAMPLE, SOFTWARE MAY BE VALIDATED EITHER: (1) MANUALLY (A NON-PROGRAMMABLE CALCULATOR IS CONSIDERED MANUAL), (2) BY BENCHMARKING AGAINST ANOTHER CONTROLLED AND VALIDATED SOFTWARE PROGRAM, (3) BY COMPARING THE SOFTWARE OUTPUT TO EXPERIMENTAL DATA, OR (4) BY BENCHMARKING AGAINST A TEST CASE WITH KNOWN RESULTS.

HARDWARE

QUALIFICATION

IEEE 603-1980 STANDARD CRITERIA FOR SAFETY SYSTEMS FOR NUCLEAR POWER GENERATING STATIONS.

IEEE 344-1975 RECOMMENDED PRACTICES FOR SEISMIC QUALIFICATION OF CLASS 1E EQUIPMENT FOR NUCLEAR POWER GENERATING STATIONS.

ANSI/IEEE ANS-7-4.3.2-1982, APPLICATION CRITERIA FOR PROGRAMMABLE DIGITAL COMPUTER SYSTEMS IN SAFETY SYSTEMS OF NUCLEAR POWER GENERATING STATIONS.

SOFTWARE

VERIFICATION & VALIDATION

PLAN

IEEE -730.1 - 1989 PLAN USED FOR SOFTWARE DEVELOPMENT AND MAINTENANCE

SECTION	3.3	-	MANAGEMENT
	3.4	-	DOCUMENTATION
	3.4.1	-	GOVERNING DOCUMENTATION
	3.4.2	-	MINIMUM DOCUMENTATION REQUIREMENTS
	3.5	-	STANDARDS PRACTICES AND CONVENTIONS
	3.8	-	PROBLEM REPORTING AND CORRECTIVE ACTION
	3.9	-	TOOLS TECHNIQUES AND METHODOLOGIES
	3.10	-	CODE CONTROL
	3.11	-	MEDIA CONTROL
	3.12	-	SUPPLIER CONTROL
	3.13	-	RECORDS COLLECTION MAINTENANCE AND RETENTION

SOFTWARE

VERIFICATION & VALIDATION

REPORT

COMPLIANCE TO

ANSI/IEEE - ANS - 7 - 4.3.2

- COMPUTER SYSTEM REQUIREMENTS
- HARDWARE REQUIREMENTS
  - INPUT/OUTPUT
  - DESIGN FEATURES
  - INITIALIZATION REQUIREMENTS
  - SECURITY AND DIAGNOSTICS
  - HUMAN-FACTORS ENGINEERING
  - INTERRUPT FEATURES

COMPLIANCE TO

ANSI/IEEE - ANS - 7 - 4.3.2 Continued

- SOFTWARE REQUIREMENTS
  - PROCESS INPUTS
  - OPERATING SYSTEM, UTILITY ROUTINES, OTHER AUXILIARY PROGRAMS
  - ALGORITHMS
  - DATA FILES
  - OUTPUTS
  - INITIALIZATION
  - PROGRAM LOGIC FOR FAILURES
  - OPERATOR INTERFACE
  - IN-SERVICE TEST FEATURES
  - TIMING REQUIREMENTS
  - PROCESSING IDLE TIME
  - SECURITY REQUIREMENTS
  - CONFIGURATOR

COMPLIANCE TO

ANSI/IEEE - ANS - 7 - 4.3.2 Continued

- HARDWARE/SOFTWARE INTEGRATION
- SOFTWARE DEVELOPMENT
- HARDWARE/SOFTWARE INTEGRATION
- COMPUTER SYSTEM VALIDATION
- VERIFICATION/VALIDATION
- COOK NUCLEAR PLANT SPECIFIC APPLICATION

OVERVIEW OF SUBMITTAL

M. A. WILKEN

OBJECTIVE

- DESCRIBE HOW NRC CONCERNS HAVE BEEN ADDRESSED

CE/TAYLOR EQUIPMENT AUDITS

DURING THE AUDIT OF THE PROPOSED CE/TAYLOR EQUIPMENT THE NRC REQUESTED EXTENSIVE AMOUNTS OF DOCUMENTATION AND ASKED US TO RESPOND TO NUMEROUS QUESTIONS.

REQUESTS WERE WRITTEN IN OUR AUDIT NOTES AND IN INFORMAL INFORMATION EXCHANGES BETWEEN AEPNO AND THE NRC.

NRC MEETINGS

- APRIL 1992
  - NRC REQUESTED US TO ADDRESS THE ISSUES RAISED DURING THEIR REVIEW OF THE CE/TAYLOR EQUIPMENT.
  - NRC IDENTIFIED OTHER AREAS OF INTEREST, E.G., FUNCTIONAL DIVERSITY
  - INFORMATION TO BE DOCKETED.
- DECEMBER 1992
  - PROVIDED STATUS ON THE RPS PROJECT TO THE NCR SINCE THE APRIL 1992 MEETING
  - DETERMINE THE FORMAT OF THE LICENSING SUBMITTAL DATED DECEMBER 15, 1992

ACTIONS TAKEN TO RESPOND TO NRC INFORMATION REQUESTS

- COMPILED OUR NOTES AND LISTS OF QUESTIONS.
- DELETED QUESTIONS NOT RELEVANT TO THE FOXBORO EQUIPMENT, I.E., THOSE SPECIFIC TO THE CE/TAYLOR EQUIPMENT.
- CREATED A FILING SYSTEM TO IDENTIFY THE SPECIFIC ISSUES THAT NEEDED TO BE ADDRESSED.
- PROVIDED SPECIFIC RESPONSES TO THE APPLICABLE QUESTIONS (APPROXIMATELY 150) IN OUR ENGINEERING DOCUMENTATION.
- PREPARED A "ROAD MAP" TO FACILITATE NRC REVIEW OF OUR ENGINEERING DOCUMENTATION.

As of 12/ 15/ 92

DOCUMENTATION TRACKING LIST

The following items are those that the NRC expects to be available for review (after November 30, 1992). These items were identified during the April 21, 1992 meeting at NRR. The items, primary responsible group, and due date are as follows:

1. Background Information

   A. Functional Drawings
      1. Existing - (AEPSC I&C - CMPLT)
         2-98501 thru 2-98516

      2. New - (Foxboro - CMPLT)
         See Appendix G

      3. Functional Requirement Summary - (AEPSC I&C - CMPLT)
         Report No. 2985-DPS-01

   B. System Architecture Description
      1. Existing
         a. Instruction Manuals - (AEPSC I&C - CMPLT)
            Foxboro Manuals Volumes I thru IV
         b. Simple Block Diagram - (AEPSC I&C - CMPLT)
            No Document No.

      2. New
         a. List of Applicable Instruction Manuals - (Foxboro - CMPLT)
            No Document no. - Attached as Appendix A
         b. Applicable Instruction Manuals - (AEPSC I&C - CMPLT)
            See Appendix A
         c. Write General System Description - (Foxboro - CMPLT)
            0310-4120

	FILE NO.
1. BACKGROUND INFORMATION	
A. FUNCTIONAL DRAWINGS	
1. For any "functional" or "logic" changes, provide diagrams and an explanation.	1A2 - Functional Drawings 1B2d-General System Description
2. Provide the loop diagrams, and functional diagrams for the RPS channels including the current revision of the modification package.	Existing: 1-D-1, 1-A-1 New: 1A2, 1D2
3. Provide rack internal and external arrangement drawings.	1G
4. Provide plant one-line power drawings (120v) feeding cabinets (new and existing).	Existing: 1E1 New: 1E2
7. Provide the existing elementary drawings - RPS only.	1-D-1
8. Provide the new elementary drawings - RPS only.	1-D-2
9. Provide rack assembly drawings.	1-G
B. System Architectural Descriptions	
1. Detailed drawings of the Foxboro Spec 200/Spec 200 Micro Electronics.	1-B-2b, drawings contained in Instruction Manuals
2. Provide Foxboro RPS equipment information including the Factory Acceptance Tests, Service Bulletins, trouble reports/maintenance requests.	Available at Foxboro
3. Provide assurance that the system, when installed, will meet the requirements of the plant design basis, including the FSAR and licensing commitments.	
- Origin of functional requirements	1-B1-B existing 1-B2-E new
- Provide functional block diagrams before/after the upgrade	V&V report in file 24A5, figures 1 and 2, and Section 2.2.
- Demonstrate equivalency, are there differences in the functional requirements.	1. 50.59 review 2. 4/21/92 presentation
4. Provide setpoints, gains, constants, resets, etc., traceable to design basis.	24.G.2

G. Approved U2 Set 1 Foxboro Drawings/ Complete Set - **(AEPSC I&C - CMPLT)** *
See Appendix F & G *

H. Approved U2 Set 1 Sys Decrip/ Config Data Base - **(AEPSC I&C - CMPLT)** *
Foxboro Doc No. TP-150 *
Foxboro Doc No. DB-151 *

2. Reg Guides and Standards applicable

A. Provide summary in revised RFC packet - **(AEPSC I&C - See Item 36.C)**
RFC 2985 Rev 1 packet *

B. Explain how we comply with each and any differences that apply.
1. Explain existing variances - **(AEPSC I&C - CMPLT)**
Report No. 2985-NCF-01 *

2. Explain any new equipment variances - **(Foxboro - None Identified/ No Specific Action)**

C. Describe any special conditions to our license and impact on standards compliance - **(AEPSC NS - CMPLT)**
See RFC DC-12-2985 packet Safety Review Memo file 36.C

3. Provide a specific comparison to Haddam Neck for both hardware and software

A. Update information provided at April 21, 1992 NRC meeting - **(AEPSC I&C - CMPLT)**
No document number

B. Provide applicable MI's as references (see Item 1.B.2.b)

	FILE NO.
- Outputs; isolation, separation and barriers	1. V&V report in file 24A5, Sect. 2 and Sect. 3.1.3, discussion on IEEE-603-1980. 2. 281, pages 8 and 9 of 13
- Independence of safety/non-safety signals; isolation separation and barriers	1. V&V report in file 24A5, Sect. 2 and Sect. 3.1.3, discussion on IEEE-603-1980. 2. 281, pages 8 and 9 of 13
C. Details on how we meet all of the Reg. Guide, IEEE Standards, etc., referenced in our purchase order specification.	24A5 and 281

3. Specific Comparison to Haddam Neck for Both Hardware and Software	3-A

4. Temperature and Humidity	
A. Provide the evaluation that established the design temperature limits to be experienced within the enclosure for the new instrumentation.	4B page 2 of 4 Specifies equipment requirements The overall environmental report will not be written until February 1993.
B. Provide thermal test reports and plans.	4A 4B-reviews 4A 4C-add'l plan 4D-appv'l for 4C plan Items 4C and 4D are test procedures which will be performed to demonstrate that the heat rise in the circuit cards is acceptable.
C. Describe any anomalies that may have occurred during all of the Foxboro testing and how they were resolved.	4B An additional heat rise test will be done in January 1993.

CONCLUSIONS

- NRC STATED CONCERNS HAVE BEEN ADDRESSED IN ENGINEERING DOCUMENTATION

- LICENSE AMENDMENT PER 10 CFR 50.59 (b)(3)(c) HAS BEEN SUBMITTED FOR DOCKETING WITH ENGINEERING DOCUMENTATION.