NORTHEAST UTILITIES
THE CONNECTICUT LIGHT AND POWER COMPANY
THE HARTFORD ELECTRIC LIGHT COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

P.O. BOX 270
HARTFORD, CONNECTICUT 06101
(203) 666-6911

March 2, 1979

Docket No. 50-336

Director of Nuclear Reactor Regulation
Attn: Mr. R. Reid, Chief
Operating Reactors Branch #4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) W. G. Counsil letter to R. Reid, dated November 8, 1978.
(2) W. G. Counsil letter to R. Reid, dated February 12, 1979.
(3) W. G. Counsil letter to R. Reid, dated January 17, 1979.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Proposed Revisions to Technical Specifications

In Reference (1), Northeast Nuclear Energy Company (NNECO) identified its intent to incorporate a reactor coolant pump speed sensing system in order to provide protection exclusively for the four pump loss of flow incident. This system is an addition to the Millstone Unit No. 2 Reactor Protection System (RPS) and would replace the current steam generator differential pressure (Δp) system only for the four pump loss of flow event. The Δp system will remain in service with its setpoint determined by all other events for which flow measurement is required. This proposal was further discussed during our meeting on November 21, 1978, and at that time, NNECO indicated that a formal license amendment request would be docketed.

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company hereby proposes to amend its operating license, DPR-65, by incorporating the revisions identified in Attachment 1 into the Millstone Unit No. 2 Technical Specifications.

The new system is identified as a separate Reactor Protective System Functional Unit, Underspeed - Reactor Coolant Pumps. This addition has been made to all applicable tables within the Technical Specifications as reflected in Attachment 1. The surveillance requirements proposed are comparable to those in existence for other functional units of the RPS. It is noted that on Page 2-5, the proposed trip setpoint has been omitted. Although the four pump loss of flow has been completed and submitted via Reference (2), the trip setpoint has not as yet been finalized. As soon as the final value has been determined, the information will be forwarded to the NRC Staff as a supplement to this submittal.

P

Qualification details of the RCP speed sensing system are provided as Attachment 2. The entire installation is in conformance with standards comparable to, or in excess of, those standards applied to all other RPS functional units, including the single failure criterion. Attachment 2 also lists all the pertinent equipment and installation documents utilized for the speed sensing system.

The changes provided as Attachment 1 have been reviewed pursuant to the requirements of 10CFR50.59 and have been found to not constitute an unreviewed safety question. The qualification and design of the RCP speed sensing system is comparable to that of other RPS functional units. The Millstone Unit No. 2 Nuclear Review Board has reviewed and approved the above proposed change, and concurred in the above determination.

NNECO has reviewed this proposal pursuant to the requirements of 10CFR170, and has determined that no additional fee is required. This submittal is an integral part of the power uprating effort and is covered by the payment enclosed in Reference (3).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Vice President

Attachment

STATE OF CONNECTICUT)
) ss. Berlin March 2, 1978
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensees herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Sheila M. Oates
Notary Public

My Commission Expires March 31, 1981

DOCKET NO. 50-336

ATTACHMENT 1

MILLSTONE UNIT NO. 2

REACTOR COOLANT PUMP SPEED SENSING SYSTEM

PROPOSED REVISIONS TO TECHNICAL SPECIFICATIONS

MARCH, 1979

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
10. Loss of Turbine -- Hydraulic Fluid Pressure - Low (3)	≥ 500 psig	≥ 500 psig
11. Underspeed - Reactor Coolant Pumps (1)	≥ rpm	≥ rpm

TABLE NOTATION

(1) Trip may be bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is ≥ 5% of RATED THERMAL POWER.

(2) Trip may be manually bypassed below 600 psia; bypass shall be automatically removed at or above 600 psia.

(3) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is ≥ 15% of RATED THERMAL POWER.

(5) Each of four channels actuate on the auctioneered output of two transmitters, one from each steam generator.

Underspeed - Reactor Coolant Pumps

The Underspeed - Reactor Coolant Pumps trip provides core protection to prevent DNB in the event of a sudden significant decrease in reactor coolant pump speed (and flow) on all four reactor coolant pumps. The trip setpoint ensures that a reactor trip will be generated, considering instrument errors and response times, in sufficient time to allow the DNBR to be maintained above 1.19 following a 4 pump loss of flow event.

TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Wide Range Logarithmic Neutron Flux Monitor - Shutdown	4	0	2	3, 4, 5	4
12. Deleted					
13. Underspeed - Reactor Coolant Pumps	4	2(a)	3	1, 2(e)	2

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
1. Manual Reactor Trip	≤ 2.0 seconds
2. Power Level - High	≤ 0.40 seconds*# and ≤ 8.0 seconds##
3. Reactor Coolant Flow - Low	≤ 0.65 seconds
4. Pressurizer Pressure - High	≤ 0.90 seconds
5. Containment Pressure - High	Not Applicable
6. Steam Generator Pressure - Low	≤ 0.90 seconds
7. Steam Generator Water Level - Low	≤ 0.90 seconds
8. Local Power Density - High	≤ 0.40 seconds*# and ≤ 8.0 seconds##
9. Thermal Margin/Low Pressure	≤ 0.90 seconds*# and ≤ 8.0 seconds##
10. Loss of Turbine--Hydraulic Fluid Pressure - Low	Not Applicable
11. Underspeed - Reactor Coolant Pumps	≤ 0.45 seconds

*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

#Response time does not include contribution of RTDs.

##RTD response time only. This value is equivalent to the time interval required for the RTD's output to achieve 63.2% of its total change when subjected to a change in RTD temperature.

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
11. Wide Range Logarithmic Neutron Flux Monitor	S	N.A.	S/U(1)	3, 4, 5 and *
12. Deleted.				
13. Reactor Protection System Logic	N.A.	N.A.	M and S/U(1)	1, 2
14. Reactor Trip Breakers	N.A.	N.A.	M	1, 2 and *
15. Underspeed - Reactor Coolant Pumps	S	R	M	1, 2

DOCKET NO. 50-336

ATTACHMENT 2

MILLSTONE UNIT NO. 2

REACTOR COOLANT PUMP SPEED SENSING SYSTEM

SYSTEM QUALIFICATION AND DESIGN DOCUMENTATION LISTING

MARCH, 1979

Introduction

At the November 21, 1978 meeting in your offices, several areas of concern were raised by the Staff regarding qualification of the RCP Speed Sensing System. This Attachment addresses those concerns, and lists the documents which specify and qualify each major component of the system. A block diagram of a typical installation is also provided.

Cable Separation

All power and signal cabling design is in accordance with Millstone Unit No. 2 FSAR Sections 8.7.1.1 through 8.7.3.2. Cable current carrying capacities and tray/conduit fill are well within acceptable limits in all cases. Existing cable separation criteria are fully observed for the four independent signal channels and for the four 120 VAC vital power source feeds (Z1, Z2, Z3, Z4) supplying the speed sensing system equipment.

Seismicity

Qualifying documents for seismicity of all equipment are identified in Table 1. Independent analysis of the seismic test data indicates that all test acceleration plots envelop the calculated accelerations at the control room and containment mounting locations for the DBE. All components are qualified for seismic conditions in accordance with IEEE 344-1975.

Environmental Qualification

System components are qualified for environmental conditions in accordance with IEEE 323-1971. As stated in Reference (1), operations of the speed sensing system is not required during or subsequent to any Design Basis Event which significantly alters the containment environment (LOCA, Main Steam Line Break, Feedwater Line Break); therefore, it is not required that in-containment equipment be qualified for the adverse environments associated with these events. Detailed environmental information, including design temperature, pressure, humidity, and radiation levels is provided in the documents listed in Table 1.

IEEE 323-1971 Acceptability

All equipment has been procurred, tested, and qualified to IEEE 323-1971. Comparing this certification to that required by IEEE 323-1974, the only major applicable difference is in the area of equipment aging. An independent analysis of the certification provided with the equipment will be undertaken by NNECO to verify that in both the normal and any expected short term abnormal environment, degradation due to aging during the 40-year lifetime of the equipment will not occur to an unacceptable extent.

The equipment specifications (referenced in Table 1) require design bases for 40-year lifetime.

Surveillance Requirements

The Millstone Unit No. 2 Technical Specifications for RPS functional units currently require a "Channel Check" every shift, a "Channel Functional Test"

monthly, and "Channel Calibration" every refueling. This surveillance will be performed in accordance with the definitions of these tests provided in the Technical Specifications.

Design Documentation

SKRJB021579-1 Shts. 1-4	Block Diagram
25203-26032	Piping and Instrument Diagram Reactor Coolant Pump
25203-26014	Piping and Instrument Diagram Reactor Coolant System
25203-28005R	Reactor Coolant System Panel C02R, C03R Rear View
25203-39045 Shts. 53, 54	Wiring Diagram Panel C03R, C04R
25203-39045 Shts. 67, 70	Reactor Coolant System Wiring Diagram, Rear View
SKRJB021579-2	Conduit Schedule
SKRJB021579-3 Shts. 1, 2	Cable Schedule

20613*	Outline - 95 Ohm, 300 HA Probe
21710*	Outline - 95 Ohm Extension Cable
21701*	Outline - Pulse Transmitter
18556*	Outline - Signal Processor Ass'y.
18732*	Bin Ass'y.
21930*	Outline - Power Supply
21950*	Outline - Regulator
21940*	Outline - Pulse Shaper
18938*	Schematic Diagram - Power Supply
18939*	Schematic Diagram - Regulator Assembly
18940*	Schematic Diagram - Pulse Shaper Assembly
25203-39069 Shts. 9-16, 18-25	Schematic Diagram - Reactor Protective System
25203-39070 Sh. 1	Bistable Trip Unit Schematic
25203-39070 Sh. 3	Bistable Trip Unit Parts List
25203-29200 Sh. 1	Bistable Trip Unit Module Ass'y.
25203-31081	Connection Diagram - RPS Trip Unit
25203-31083	RPS Terminal Block Wiring Diagram
25203-31084	RPS Terminal
25203-31085	RPS Terminal
25203-31096	RPS Terminal
25203-32045 Shts. 1-8	Reactor Trip Switchgear
25203-39107 Sht. 11	Reactor Coolant Flow - Channels P-111, 121, and 101 Interconnection Diagram
25203-39107 Sht. 23	RCP Zero Speed and 90% Speed Interconnection Diagram
25203-29148 Sht. 1	General Electric RCP Motor Drawing Table of Contents/Ambient Conditions

* Indicates - Bently Nevada Drawing No.

25203-29148 Sht. 6	General Electric Connection Diagram Speed Switch and Zero Speed Switch
D-18767-416-141	RCP Zero and 90% Speed Interconnection Diagram (C.E. Dwg.)
25203-30022 Shts. 10-13	Vital A-C Panels - One line
25203-30024	Vital A-C - One Line
25203-27017	Vital A-C Equipment Room
25203-34029	East Penetration Room
25203-34030	West Penetration Room
25203-34042	Containment (Elev. 14'6")
25203-34043	Containment (Elev. 38'6")
25203-27027	Control Room Arrangement
791E693, 791E694	General Electric Motor Outlines - Model No. 295 X 290 S/N 8384970, 8384971, 8384972, 8384973, (G.E. Dwgs.)

Additional Drawings

Signal Processing Chassis

Power Supply, Component Arrangement

Regulator, Component Arrangement

Pulse Shaper, Component Arrangement

Power Supply, Wire List

Regulator, Wire List

Pulse Transmitter, Wire List

Bin Assembly, Wire List

Power Supply, Parts List

Regulator, Parts List

Pulse Transmitter, Parts List

Bin Assembly, Parts List

Connector Assembly

System Connection Diagram

Tagging and Color Code

Instruction Manual

Frequency-to-Voltage Converter

Recommended Spare Parts List

Equipment Outline Drawings

Assembly and Components Arrangement

Elementary and Schematic Drawings

Terminal Wiring List or Drawings

Seismic Documentation

Instruction Manual Insert

TABLE 1

SPEED SENSING SYSTEM COMPONENTS

Component	Specification/Qualification
Proximity Probe	A, C
Coaxial Cable	A
Pulse Transmitter	A, D
Signal Processor	A, D
F/V Converter	B
Bistable	E
3/C #16 Signal Cable	F
3/C #12 Power Cable	G

LEGEND

A Combustion Engineering Specification No. 00000-ICE-6003, Revision No. 02, Dated 12/18/75 - Engineering Specification for a Reactor Coolant Pump Shaft Speed Sensing System

B Combustion Engineering Specification No. 00000-ICE-3035, Revision No. 00, Dated 11/9/78 - Engineering Specification for a Frequency To Voltage (F/V) Circuit Assembly

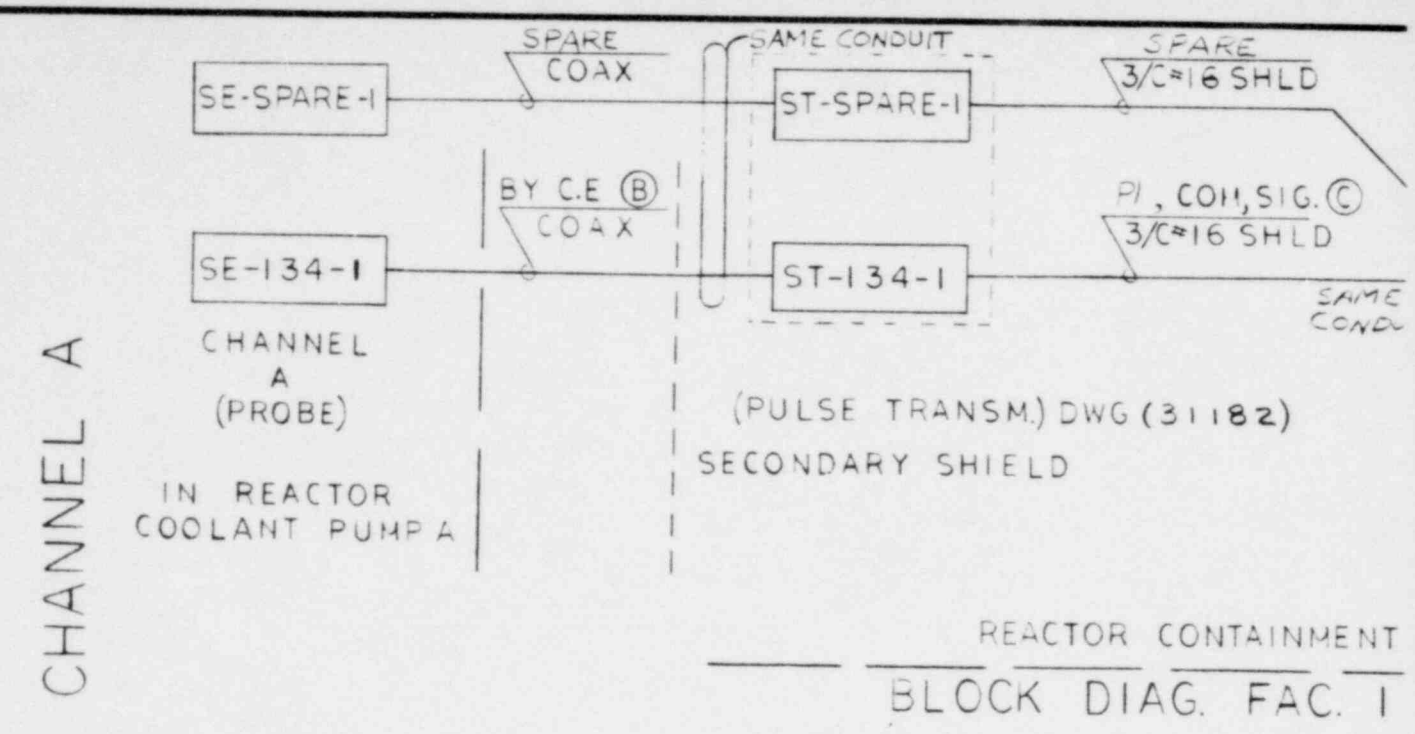
C Combustion Engineering (CENPD-182) Seismic Test Documentation, Data Sheet No. 205 (2 pages), Revision No. 01, Dated 3/77 - Proximity Probe and Connector

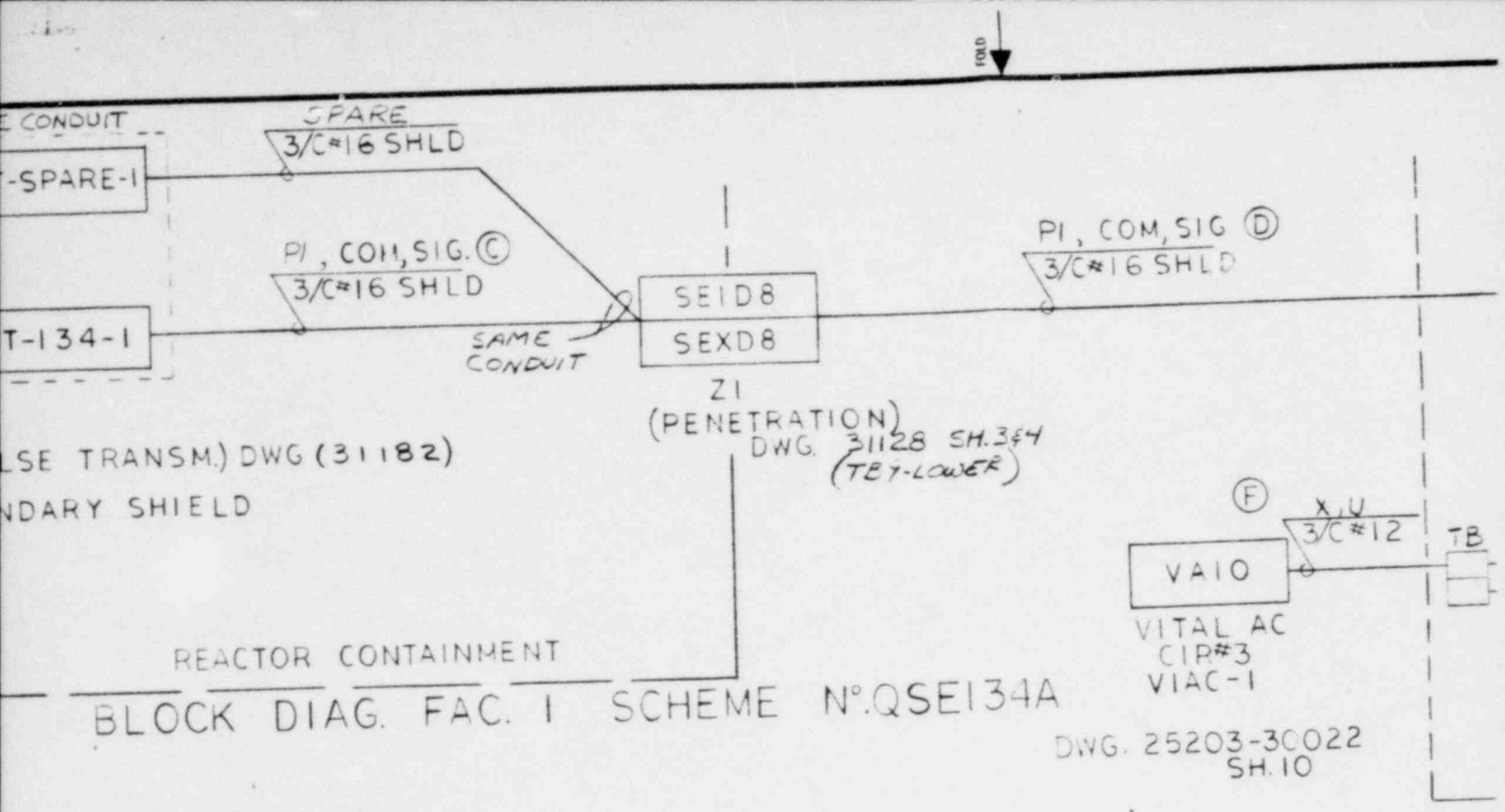
D Combustion Engineering (CENPD-182) Seismic Test Documentation, Data Sheet No. 2j (2 pages), Revision No. 01, Dated 3/77 - Pulse Transmitter and Signal Processor

E Bechtel Specification No. 7604-M-806 Bistable Trip Unit

F Northeast Utilities Service Company Specification No. SP-GEE-14, Revision No. 1, Dated 7/1/78; Kerite Test Report C-7684, Item Nos. 1A, 1B, 1C, 1D - 3C #16 Shielded Cable

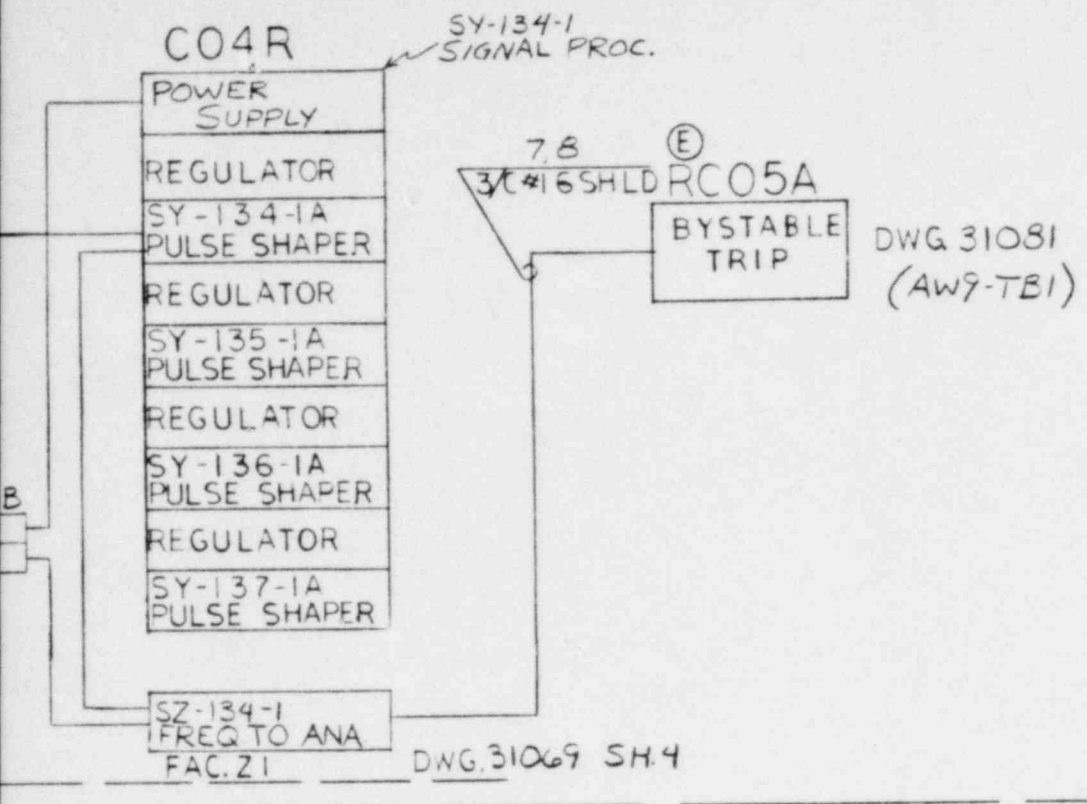
G Northeast Utilities Service Company Q.A., Stock Code No. 13600017 - 3/C #12 Cable


SPARE
COAX
SAME CONDUIT
SPARE
3/C#16 SHLD
SE-SPARE-1
ST-SPARE-1
BY C.E (B)
COAX
PI, COM, SIG. (C)
3/C#16 SHLD
SE-134-1
ST-134-1
SAME COND
CHANNEL A
(PROBE)
IN REACTOR
COOLANT PUMP A
(PULSE TRANSM.) DWG (31182)
SECONDARY SHIELD
REACTOR CONTAINMENT
BLOCK DIAG. FAC. 1
CHANNEL A
CHANNEL B
CHANNEL C
F U
F U
FOLD



FUTURE

FUTURE


C04R
SY-134-1
SIGNAL PROC.
POWER SUPPLY
REGULATOR
SY-134-1A
PULSE SHAPER
REGULATOR
SY-135-1A
PULSE SHAPER
REGULATOR
SY-136-1A
PULSE SHAPER
REGULATOR
SY-137-1A
PULSE SHAPER
SZ-134-1
FREQ TO ANA
FAC. Z1
DWG. 31069 SH. 4
7,8
3 C #16 SHLD
E
RC05A
BYSTABLE TRIP
DWG 31081
(AW9-TB1)

BRUNING 35886

FOLD

CHANNEL D

CHANNEL C

CHANNEL

FUTURE

FUTURE

FUTURE

FOLD

SH. 1 OF 4

REVISIONS DURING CONSTRUCTION			P.A.# 78-788			
A	3-5-79	ISSUE FOR CONST. (REACTOR COOLANT PUMP SPEED SENSING)		PRM		RJB

P.A.#	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR MILLSTONE POINT CO UNIT 2

TITLE
BLOCK DIAGRAM
REACTOR COOLANT PUMP A
SPEED SENSING SYSTEM

BY	CHKD	APP	APP
TY	PRM		RJB
DATE 2-28-79	DATE 3-4-79	DATE 3-5-79	DATE 3-7-79

SCALE —

P.A.# 78-788

DWG. NO 25203-37007