

CONTINUOUS REACTOR SURVEILLANCE

SYSTEM

B0442

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THE ORNL SURVEILLANCE SYSTEM HAS THE FOLLOWING CAPABILITIES

- 0 AUTOMATICALLY OBTAINS PSDs OF FOUR SIGNALS
- 0 BASED ON A LEARNING PERIOD SET STATISTICAL LIMITS  
ON SIGNAL DISCRIMINANTS
- 0 USING STATISTICAL LIMITS DETECT PSDs THAT EXCEED  
STATISTICAL BAND
- 0 SAVE THE PSDs THAT EXCEED THE STATISTICAL BAND
- 0 SAVE STEADY-STATE VALUES OF AVAILABLE PLANT  
PARAMETERS AS PSD LABELS

SURVEILLANCE SYSTEM HAS BEEN  
INSTALLED AT SEQUOYAH 1

- SIGNALS OBTAINED VIA PATCH PANEL
- ISOLATION AMPLIFIERS REQUIRED TO REMOVE PULSES
- SOFTWARE MODIFICATION
- INSTALLATION OF SYSTEM
- OPERATIONAL VERIFICATION

SURVEILLANCE SYSTEM HAS ACCESS TO  
TWENTY-THREE SIGNALS AT SEQUOYAH - 1

- 4 EXCORE POWER RANGE NUCLEAR SIGNALS (LOWER SECTION)
- 2 EXCORE POWER RANGE NUCLEAR SIGNALS (AVERAGE SIGNALS)
- 1 EXCORE INTERMEDIATE RANGE NUCLEAR SIGNAL
- 4 CORE EXIT THERMOCOUPLES
- PRESSURIZER LEVEL

LOOP 4 COOLANT SYSTEM

- PRESSURE
- FLOW
- INLET TEMPERATURE
- EXIT TEMPERATURE

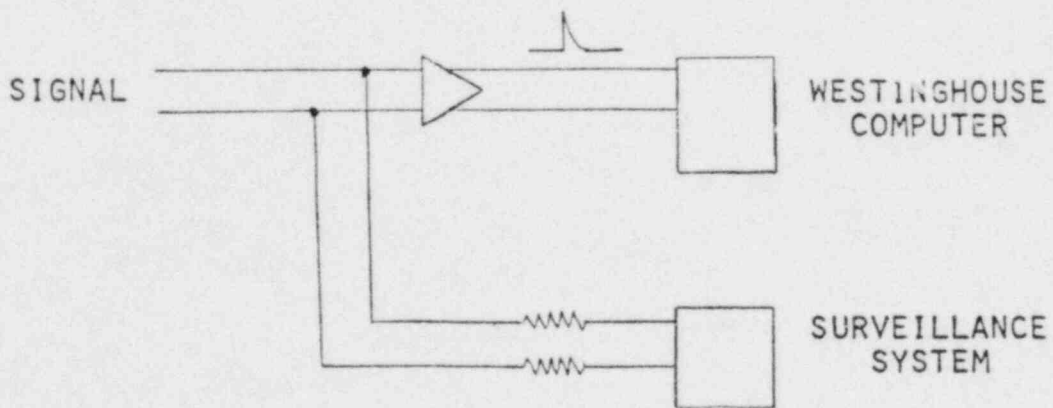
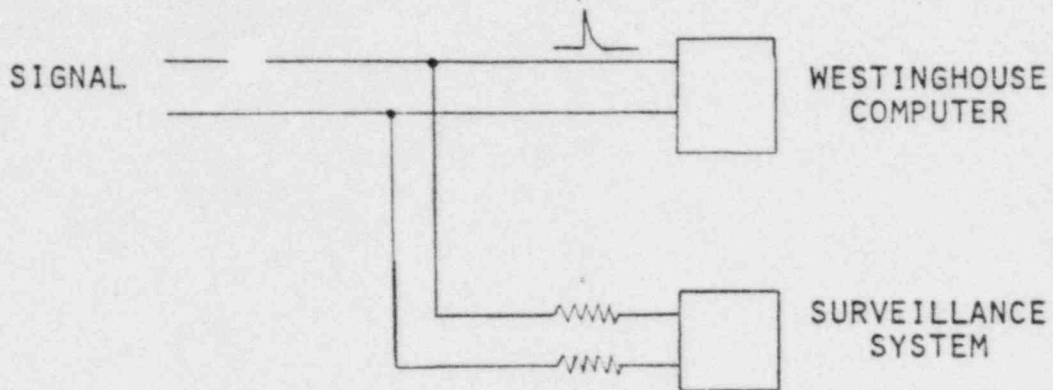
LOOP 4 STEAM GENERATOR

- STEAM PRESSURE
- STEAM FLOW
- FEEDWATER FLOW
- FEEDWATER TEMPERATURE
- WATER LEVEL

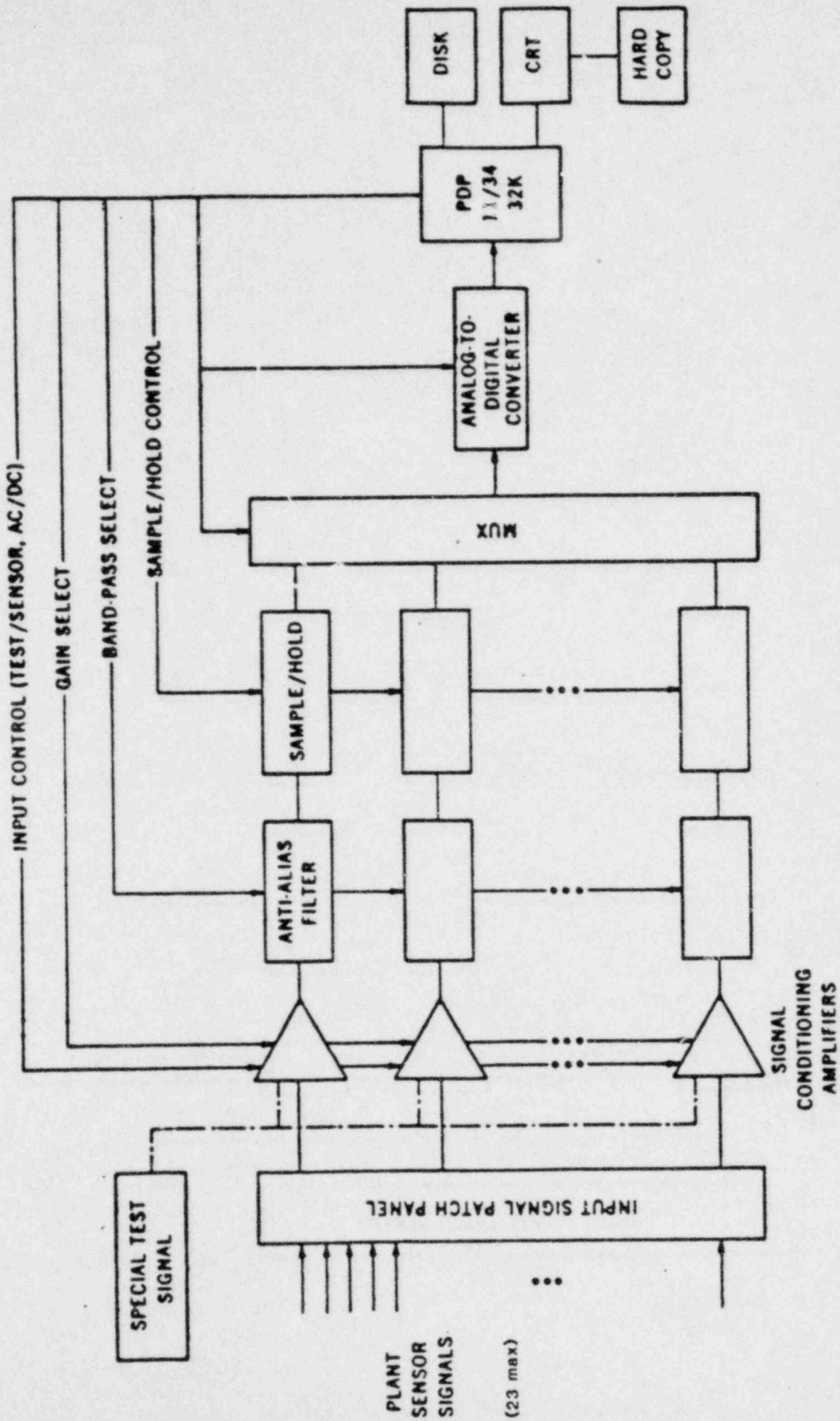
LOOSE PARTS MONITORING SYSTEM

- RPV TOP ACCELEROMETER
- CRDM INTERRUPT

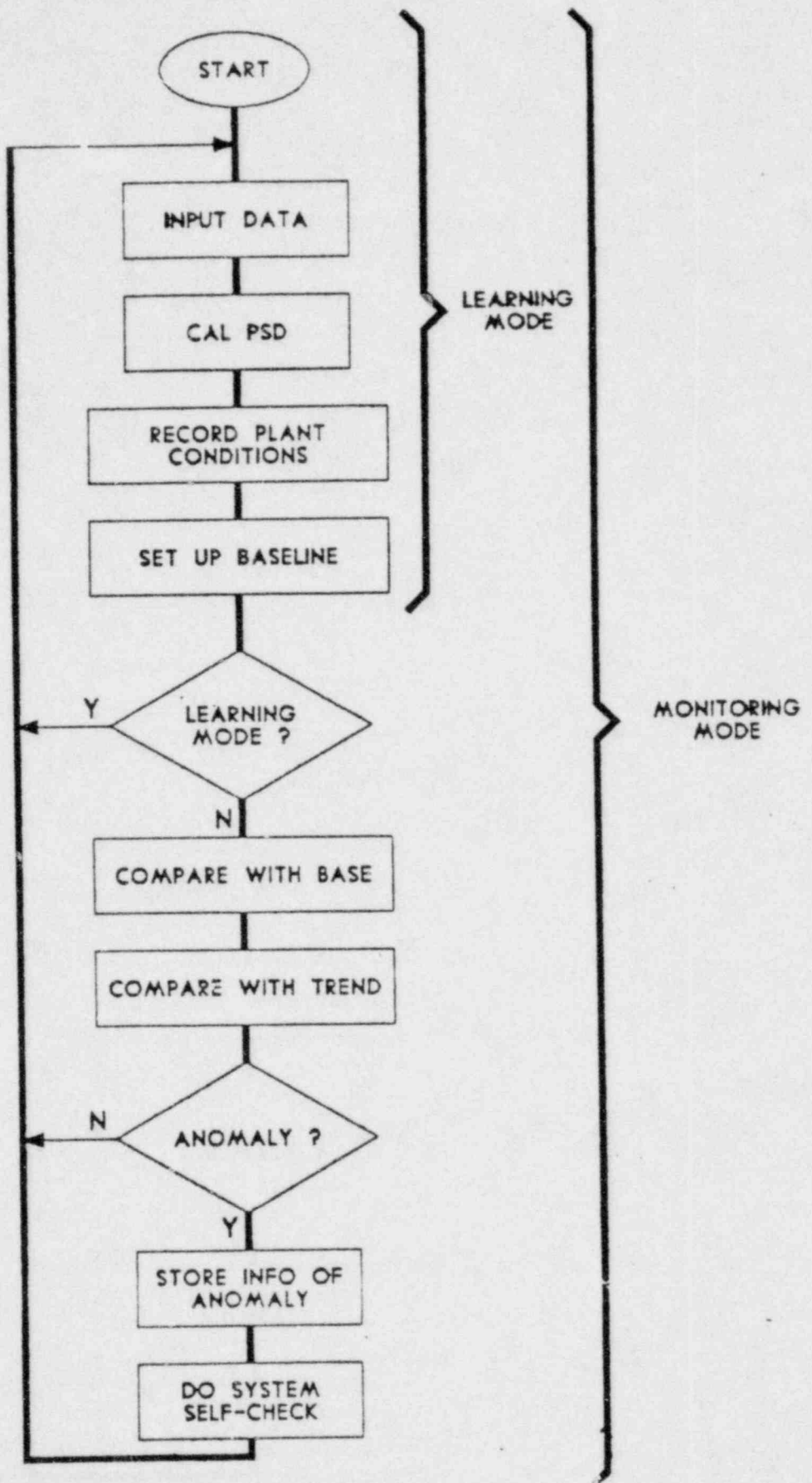
ISOLATION AMPLIFIERS WERE REQUIRED TO REMOVE PULSES



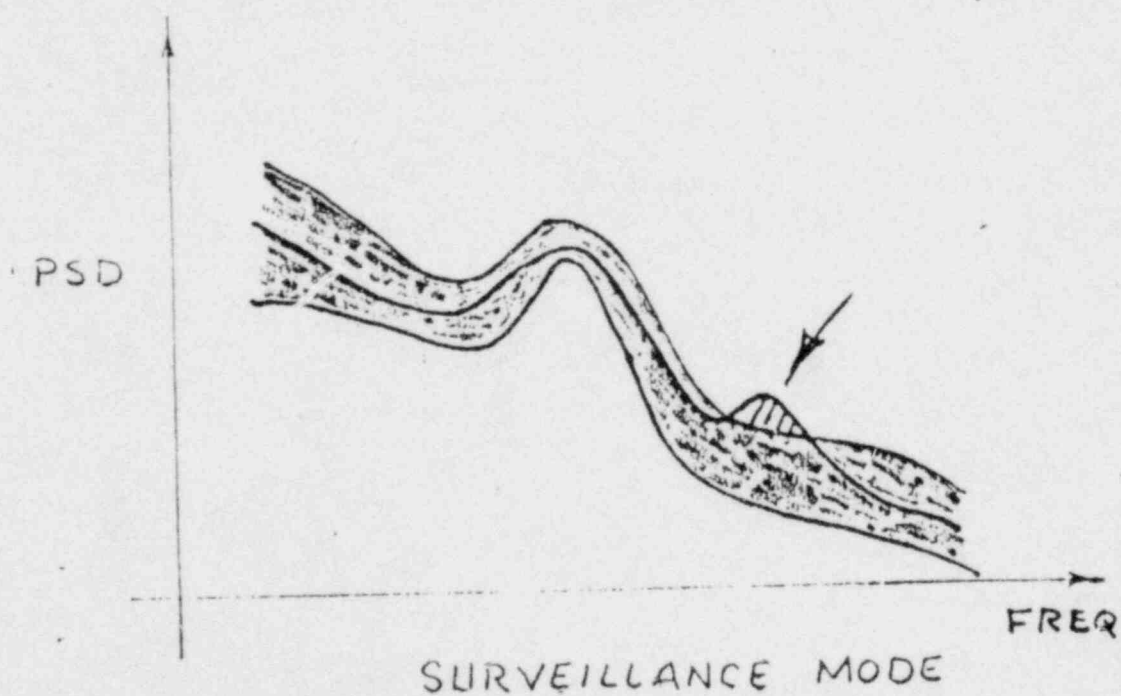
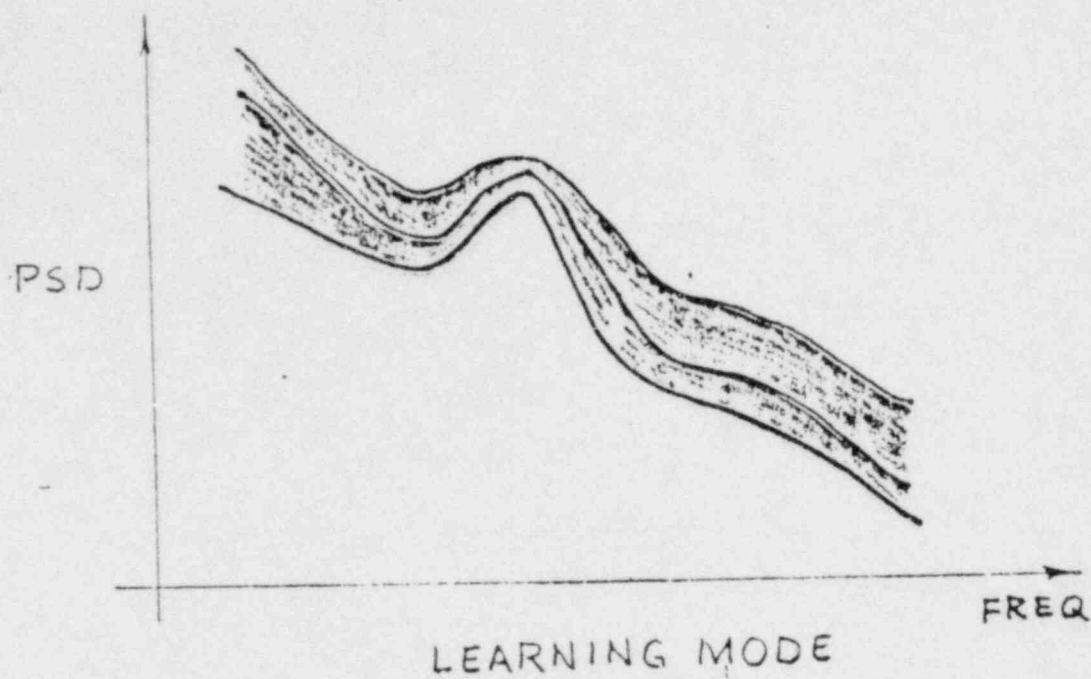
THIS SYSTEM HAS BEEN INSTALLED AT SEQUOYAH-1



The software logic:



# PATTERN RECOGNITION TECHNIQUES





PROCUREMENT AND CONSTRUCTION  
OF NEW (NRC) SYSTEM

- PDP 11/34 ..... ON ORDER
- A/D CONVERTER ..... ON ORDER
- ANALOG EQUIPMENT ..... IN DESIGN

## TASKS THAT ARE TO BE DONE

- SOFTWARE MODIFICATION REQUIRED BY NEW SYSTEM

HARDWARE DRIVERS

REMOTE COMMUNICATIONS

- METHODS OF DATA PRESENTATION

- METHODS OF DATA INTERPRETATION

- SOFTWARE TO OBTAIN TIME SERIES DATA