FROM:
Northern States Power Company
Minneapolis, Minnesota 55401
R.O. Duncanson, Jr.

DATE OF DOCUMENT: July 16, 1971

DATE RECEIVED: July 19, 1971

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LTR.: X
MEMO:
REPORT:
OTHER:

TO:
Dr. Peter A. Morris

ORIG.: 3 signed
CC:
OTHER:

ACTION NECESSARY ☐
NO ACTION NECESSARY ☐
CONCURRENCE ☐
COMMENT ☐
DATE ANSWERED:
BY:

CLASSIF: U

POST OFFICE
REG. NO:

FILE CODE: 50-263

DESCRIPTION: (Must Be Unclassified)
Ltr reporting (3) occurrences which have occurred at Monticello Plant & trans:

ENCLOSURES:
REPORT-Failure of Two High Reactor Pressure Scram Switches to Trip Within the Tech Specs Allowable Deviation which occurred on 7-9-71.....
REPORT-Reactor Coolant Temperature Increase of 115 degrees F during a One-Hour Period which occurred on 6-18-81w/attchmt of a graph....
REPORT-Failure of #11 Standby Gas Treatment

REMARKS: System Air Heater Control Circuitry which occurred on 6-19-71 w/attchmt Fig 1 entitled Block Diagram of Heater Control Circuit......
(3 cys ea encl rec'd)

REFERRED TO	DATE	RECEIVED BY	DATE
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U.S. ATOMIC ENERGY COMMISSION

MAIL CONTROL FORM FORM AEC-326S (8-60)

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NORTHERN STATES POWER COMPANY
Minneapolis, Minnesota 55401

RECEIVED
JUL 19 1971
U.S. ATOMIC ENERGY COMMISSION
Regulatory Mail Section

July 16, 1971

Dr. Peter A. Morris, Director
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Morris:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Reporting of Occurrences

Three conditions have occurred recently at the Monticello Nuclear Generating Plant which we interpret to be reportable to your office in accordance with Section 6.6.B and 6.6.C of Appendix A, Technical Specifications, of the Provisional Operating License DPR-22. The three occurrences are:

1. Failure of Two High Reactor Pressure Scram Switches to Trip Within the Technical Specification Allowable Deviation.

2. Reactor Coolant Temperature Increase of 115°F During a One Hour Period.

3. Failure of #11 Standby Gas Treatment System Air Heater Control Circuitry.

Occurrence 1 is being reported under Section 6.6.B.3 of the Technical Specifications, Occurrence 2 is being reported under Section 6.6.C.4, and Occurrence 3 is being reported under Section 6.6.C.1. The Region III Compliance Office has been previously notified of the occurrences.

The attached reports describe the occurrences and summarize the actions taken to prevent future similar occurrences.

Yours very truly,

R O Duncanson / by CEL

R.O. Duncanson, Jr. P.E.
Gen. Supt. of Power Plants-Mechanical
Chairman - Monticello Safety Audit Committee

ROD/CEL/caf

3197

MONTICELLO NUCLEAR GENERATING PLANT

July 16, 1971

Subject: Failure of Two High Reactor Pressure Scram Switches to Trip Within the Technical Specification Allowable Deviation

1. Summary Description of the Occurrence

[illegible] w/Ltr Dated 7-16-71

On July 9, 1971, while performing a regularly scheduled surveillance test, two of the four reactor high pressure scram trip switches were found to trip outside of the allowable deviation as stated in Section 3.2 of the Technical Specifications. Both pressure switches were immediately replaced with spare units. In addition, the pin-type pressure snubbers installed in the sensing lines of the four switches were removed on the basis that dirty snubbers could have caused or contributed to the failures.

2. Account and Analysis of the Occurrence and Corrective Actions Taken

On July 9th, while performing routine surveillance tests, two of the four reactor high pressure scram switches were found to exceed the Tech Spec allowable deviation. The reactor high pressure scram protection was not defeated, however, since only one failure occurred in each of the two scram logic protection channels. (The high reactor pressure scram switches are connected in a "one of two twice" logic scheme.)

The first switch tested (PS 2-3-55A) tripped at a pressure of 1089 psig, exceeding the "Limiting Safety System Setting" by 14 psig. The second switch tested (PS 2-3-55B) initially tripped at 1188 psig, exceeding the "Limiting Safety System Setting" by 113 psi. During several subsequent trips of switch PS 2-3-55B, the switch tripped at 1071 psig, well within the "Limiting Safety System Setting" of 1075 psig. The two remaining high reactor pressure switches (PS 2-3-55C and D) were found to trip well within the Tech Spec allowable deviation. These switches were each tripped several additional times with no measured changes in the setpoint.

Although the two suspect switches were tested successfully several times after recalibration, it was decided to replace the two switches. In the process of replacing the switches, it was discovered that the pin-type pressure snubber installed in the sensing line of PS 2-3-55A was dirty. The remaining pressure snubbers on the high reactor pressure scram switches were immediately inspected. No additional dirty snubbers were found. A decision was then made to remove the snubber internals from all four pressure switches since it is believed that the snubbers are not essential to proper operation of the pressure switches. Following completion of the pressure switch replacement and pressure snubber internals removal, the four switches were tested to verify operability.

On July 10, the two suspect pressure switches were visually inspected. No abnormalities were revealed. On July 12, attempts were made to reproduce the

failure of PS 2-3-55B with the switch connected in a circuit duplicating the protection system circuit. The failure could not be reproduced. On July 13, the pressure switch vendor was contacted in regard to the failures. The vendor could not explain the switch failures observed but requested that the failed switches be returned to the factory for testing.

3. Prevention of Similar Occurrences

As previously stated, the two most probable causes of the failures (the two suspect pressure switches and the sensing line pressure snubbers) have been removed from the system. Also, the two replaced pressure switches have been returned to the manufacturer for additional testing. Results of the additional testing will be reviewed to determine if further action is required.

A study of critical pressure sensing instruments is being made to determine if presently installed snubbers are necessary. Any pressure snubber that is not essential to the operation of critical instruments will be removed to eliminate the possibility of defeating the instrument action through snubber plugging.

MONTICELLO NUCLEAR GENERATING PLANT

Received w/Ltr Dated 7-16-71 July 16, 1971

Subject: Reactor Coolant Temperature Increase of 115°F During a One Hour Period

1. Summary Description of the Occurrence

On June 18, 1971, while performing a heatup rate test in conjunction with Startup Test Procedure #9, Reactor Vessel Temperature, the reactor coolant temperature was increased by 115°F (210°F to 325°F) during a one hour period.

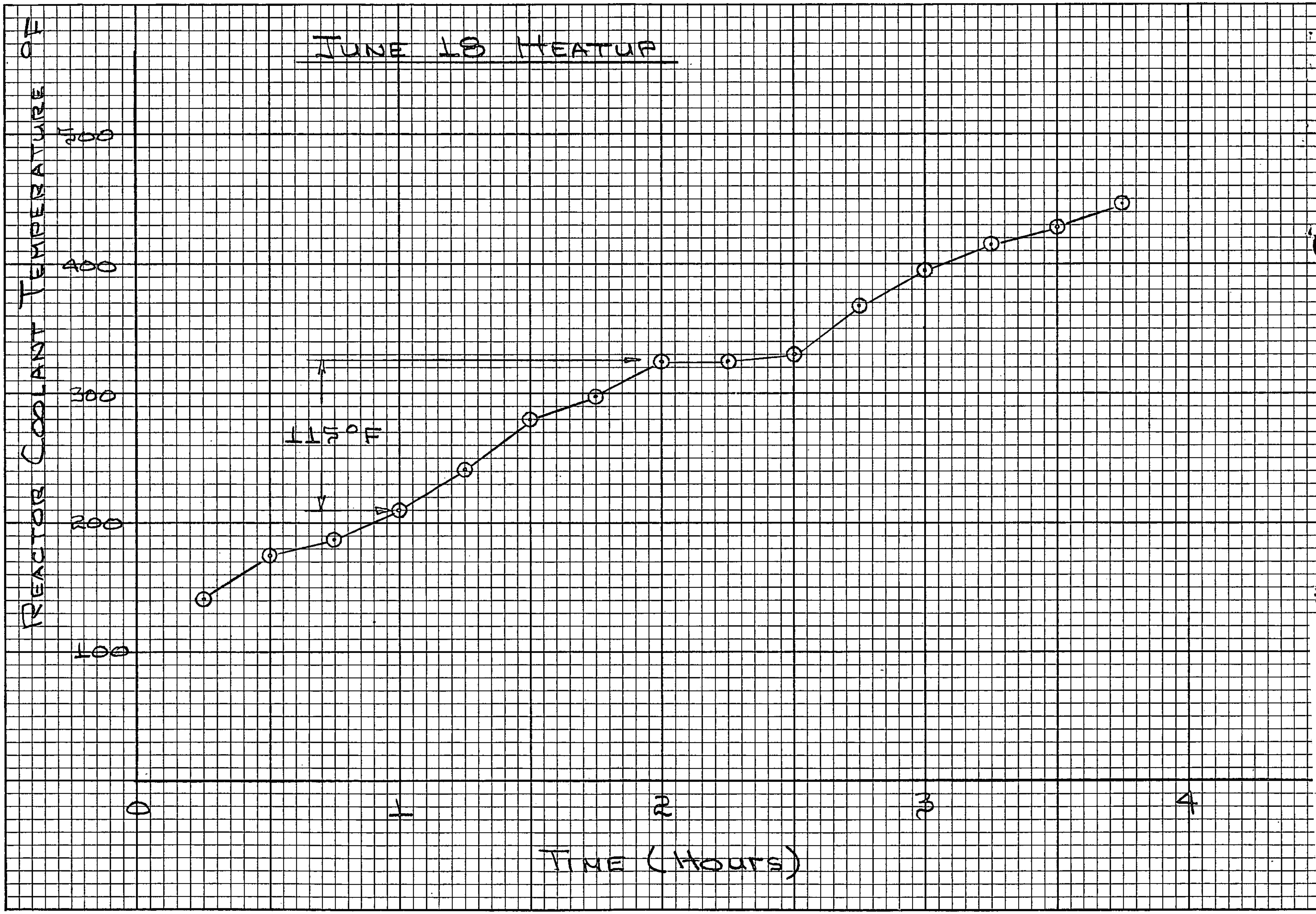
2. Account and Analysis of the Occurrence

A special heatup test was being performed on June 18, 1971 to obtain RPV temperatures during a 90°F to 100°F per hour heatup. The data was being obtained to confirm thermal analysis models. An increase in the reactor coolant temperature of more than 100°F in one hour resulted because personnel directing and performing the test failed to give proper attention to available data.

It has been determined from a review of the test data that the 115°F coolant temperature rise in the one hour period created no unusual stresses on the vessel.

3. Prevention of Future Occurrences

During normal heatup and cooldown operations, reactor coolant temperature changes are controlled at a slower rate than was required for the special heatup test. Although the normal procedures should prevent the temperature from changing more than 100°F in an hour, a memo has been written to the operations personnel stressing that the coolant temperature changes must be watched more closely.



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Received w/Ltr Dated 7-16-71

MONTICELLO NUCLEAR GENERATING PLANT

July 16, 1971

Subject: Failure of #11 Standby Gas Treatment System Air Heater Control Circuitry

1. Summary Description of the Occurrences

On June 19, 1971, a failure of the SGTS #11 air heater SCR power control circuit rendered the train inoperable. The failed components in the control circuitry were replaced. The SGTS #11 was tested successfully and declared operational on June 24, 1971.

On July 5, 1971, another failure of the SGTS #11 air heater SCR power control circuit rendered the train inoperable. The SCR power control circuitry was then replaced by a contactor which provides power to the air heater when flow through the SGTS is established. The SGTS #11 was tested successfully and declared operational on July 9, 1971.

2. Detailed Description of the Occurrences

a. Summary of Conditions

At the time of the first control circuit failure, a plant startup was in progress with the reactor at approximately 500 psig. The second failure was discovered during an operability test of the SGTS prior to a plant startup.

b. Account and Analysis of the Occurrence

On June 19, 1971, at 0230 hours, it was discovered that the air heater over temperature light for SGTS #11 was illuminated. The problem was immediately investigated and it was found that the heater was operating even though the SGTS was shutdown. The heater was taken out of service by opening the circuit breaker to SGTS #11.

Subsequent investigation revealed that a silicon controlled rectifier (SCR #1, shown on attached figure) had developed a leak allowing power to the air heater. The leaking SCR caused overheating of the feedback transformer which in turn damaged the current limiting circuitry and the operational amplifier.

The SCR, current limiting circuit, feedback transformer and operational amplifier were replaced. The system was satisfactorily tested on June 24, 1971, and declared operational.

On July 5, 1971, during an operability test of SGTS #11, it was discovered that the differential temperature controller for the air heater would provide only a maximum output signal of 60% even though there was a large deviation from the setpoint. It was also noticed that only a 3°F differential air temperature could be obtained after operation for one-half hour. An examination of the problem revealed that another SCR (SCR #3) had developed a leak causing damage similar to that which occurred on June 19, 1971.

The airheater SCR control circuitry was removed from SGTS #11 and replaced with contactors which energize the electric heaters when the proper minimum flow is detected by an existing flow switch. The system was tested and declared operational on July 9, 1971.

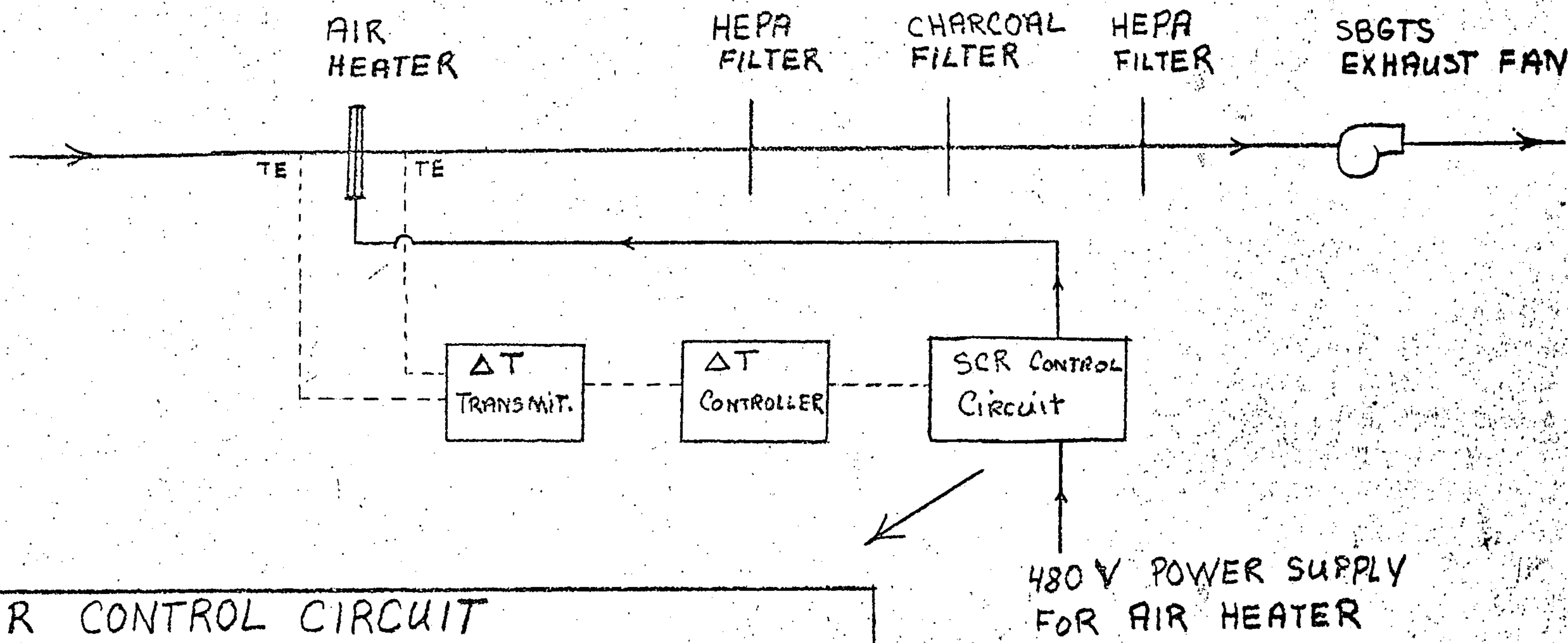
3. Corrective Action

After the July 5th, 1971 occurrence, it was proposed that the entire SGTS #11 air heater control circuit be replaced with contactors which willeenergize the heaters when minimum SGTS flow is detected. The change to the SGTS was reviewed and approved by the Operations Committee. During the Operations Committee review, it was shown that the SCR control circuit was not necessary and that the contactors would be adequate. Previous testing results show that full heater capacity was required to maintain adequate heating of the incoming gas for the operable range of system flows and that no overheating would occur with full heater capacity at the minimum flow condition. The approved modification to the system was completed on July 9th.

A pre-operational type test was conducted on July 9, 1971, to verify proper operation of the newly installed air heaters controls. The system was then declared operational.

Similar air heater modifications are planned for SGTS #12.

Received w/Ltr Dated 7-16-71



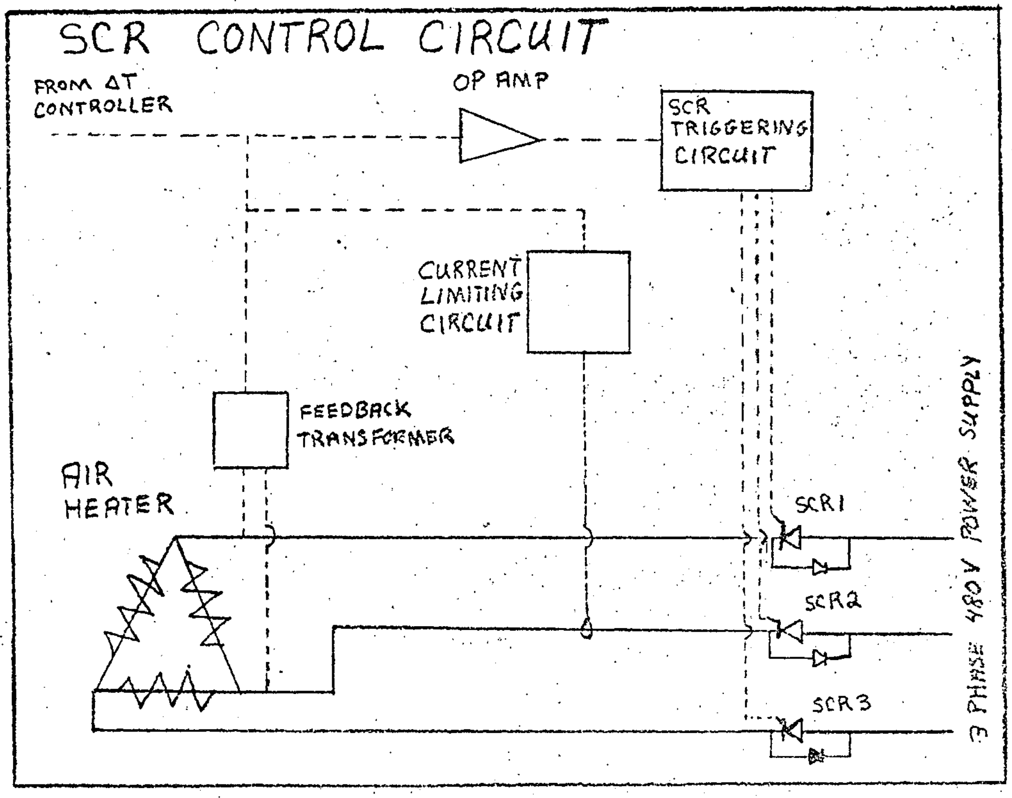


FIGURE 1
BLOCK DIAGRAM OF HEATER CONTROL CIRCUIT