NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER 50-289

FILE NUMBER

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

TO:	FROM:	DATE OF DOCUMENT
Mr. R. W. Reid	Metropolitan Edison Company Reading, Penna. R. C. Arnold	11/24/76
		DATE RECEIVED 11/29/76

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DESCRIPTION

Ltr. w/attached....re our 10/4/76 ltr.... furnishing requested information concerning the Loose Parts Monitoring System.

(3-P)

ENCLOSURE

POOR ORIGINAL

PLANT NAME:

Three Mile Island

1487 169

SAFETY			ENVIRO 12/1/76 BJL
	ASSIGNED AD:		ASSIGNED AD:
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FOR ACTION/INFORMATION

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METROPOLITAN EDISON COMPANY

POST OFFICE BOX 542 READING, PENNSYLVANIA 19603 TELEPHONE 215 – 929-3601

November 24, 1976
GQL 1605

Director of Nuclear Reactor Regulation
Attn: R. W. Reid, Chief
Operating Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Docket No. 50-289
Operating License No. DPR-50

Attached is the information concerning the Loose Parts Monitoring System requested in your letter of October 4, 1976.

I trust you will find all the necessary information. However, should you need any additional information on this subject please contact either myself or D. G. Mitchell of our Licensing staff.

Sincerely,

R. C. Arnold
Vice President

RCA:DGM:daf

Attachment

11-29-76

1487 170

12 54

1) Two events have occurred in which a loose part was identified within the reactor coolant system of Three Mile Island, Unit #1.

Late in the 1976 refueling outage, a notched pin measuring 1.288" long and 0.545" in diameter was found in the lower grid section of the core support assembly. A design review was conducted of key reactor coolant system components and interconnecting system components. The review found that none of the major components of the examined systems contained a pin of the type, or of the dimensions noted. It was further concluded that the loose pin did not occur due to deterioration of any system or component important to continued operation or nuclear safety. The presence of this pin was not identified by the Vibration and Loose Parts Monitoring System. However, the unscoured condition of the pin indicated it had not moved and therefore the L.P.M.S. would not detect it.

Earlier in the 1976 refueling outage, anomalies were identified with the reactor vessel surveillance specimen holder tubes. Details of the event have been documented and submitted to the USNRC. The vibrating specimen holder and resulting fractured holder tube were not identified by the Vibration and Loose Parts Monitoring System. In this case the noise created by the vibrating specimen holder was so slight compared to the background noise that it could not be identified by our system or any other system now in use.

2) Vibration and Loose Parts Monitoring of the reactor coolant system components in which a loose part could be entrapped, is provided by eight vibration and two nuclear plant channels. The two nuclear plant channels, placed on opposite sides of the reactor core, use a wide frequency range nuclear power channel to monitor for anomalous cyclic differences in the core and provide reactivity related indications of fuel pin, control rod, and core structure motion. The vibration channels provide acoustics indication of vibration throughout the primary loop using piezoelectric crystal accelerometer. The location in the reactor coolant system of the eight accelerometers provide optimum effectiveness of the system. Two accelerometers are positioned on in-core instrument guide tubes and two more are mounted on the lower flange of the control rod protection shroud. On each steam generator, two accelerometers are located near the inlet tube sheet.

The piezoelectric crystal accelerometers, which are used for acoustic monitoring, have special purpose preamps for wide band operation. The alarm signal activates a light and a solid-state switch when the vibration level exceeds a preset level for a specified period of time. The nuclear plant channel circuits operate in the same manner with the addition of a special filter to discriminate against hydraulic noise. However, the nuclear plant filter circuit is more sensitive than the vibration channels.

Once each shift, when any of the reactor coolant pumps are operating, the loose parts monitoring cabinet is inspected for any alarm lights which would be reported to shift supervision. Also, once each shift, the vibration and loose parts monitoring channels are monitored audibly for abnormal noise, or an increase in noise level. A power spectral density analysis is performed on a monthly basis by plant personnel. Additionally, the data handling and data analysis subsystems provide for recording, audio evaluation, and spectral analysis of selected inputs. The use of the vibration and loose parts monitoring system was introduced during 1973, approximately one year prior to commercial operation.

3) The alarm set points for the vibration and loose parts channels are each set for anticipated noise levels within the reactor coolant system when operating at 100% power. During start-up and cooldown, various internal and extraneous noises frequently exceed the alarm set points. At full power operation spurious alarms have been experienced, but were determined to be inconsequential. There were two occasions, described in Part 1, when the Vibration and Loose Parts Monitoring System did not detect a loose or vibrating part.

4) A cost/benefit analysis has not been applied to the Vibration and Loose Parts Monitoring System at Three Mile Island, Unit 1.

It is the opinion of Metropolitan Edison that the existing system will provide adequate warning in the case of a vibration or loose parts problem that would be important to safety.