

# **NSP**

**NORTHERN STATES POWER COMPANY**

MINNEAPOLIS, MINNESOTA 55401

February 2, 1979

Mr. James G. Keppler  
Director - Region III  
Office of Inspection and Enforcement  
United States Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

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

The following information concerning the Monticello Nuclear Generating Plant is hereby reported in accordance with Item 4 of IE Bulletin 78-14. The numbered items correspond to similarly numbered items in the bulletin.

1. Buna-N material applications in our control rod scram system had been reviewed prior to receiving the bulletin (as a result of the events described in the bulletin).
2. As a result of this review, Monticello has implemented a preventative maintenance program for all Buna-N parts in control rod scram system solenoid valves. This program, as shown in Tables 1 and 2, assures that all critical parts are replaced at frequencies consistent with General Electric recommendations and plant scram valve operational and maintenance history. This will be a five-year replacement frequency for all valve parts once replacement of original or old parts is complete in 1980. Table 3 shows the time since packaging for all parts presently installed in the scram system solenoid valves. Parts with times since packaging in excess of seven years will be replaced during the 1980 refuel outage with newly procured parts. Our maintenance program will then assure that the combined shelf and in-service life is no longer than seven years from 1980 on.
3. General Electric recently completed a study of scram pilot valve failures in operating BWR's. The attached letter from General Electric Company to Northern States Power Company, dated January 30, 1979, summarizes the failure data and

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concludes that a combination of shelf and in-service life of seven years from packaging date is conservative. From this conclusion and our operating and maintenance history, we have determined that a replacement frequency of five years and retention of parts in-service or in-stock for no longer than seven years is sufficient. The following is a synopsis of Monticello Buna-N failures and maintenance findings which supports this decision:

- a. Scram Pilot Valves - No diaphragm failures have ever occurred and all diaphragms removed in 1977 and 1978 were in excellent condition. Seven of the 242 plungers replaced in 1978 were found broken. These plungers had been in service since plant startup (1971) and were installed in 1968.
- b. Backup Scram Pilot Valves - No failures have occurred since installation in 1968, and all parts removed in 1978 were in excellent condition.
- c. Scram Discharge Volume Vent and Drain Solenoid Valves - No failures have occurred since installation in 1968. All parts removed in 1978 were in excellent condition except the plungers had begun to harden.
- d. Scram Discharge Volume Test Solenoid Valve - No failures have occurred since installation in 1968, and all parts removed in 1978 were in excellent condition.

Yours very truly,



L. J. Wachter  
Vice President  
Power Production and  
System Operation

cc: Mr. G. Charnoff  
NRC Office of Inspection and Enforcement  
Washington, D.C.

Enclosures

Table 1

Scram Pilot Valve Maintenance Frequency

<u>Part</u>	<u>Date</u>											
	<u>11/77</u>	<u>7/78</u>	<u>10/78</u>	<u>R/80</u>	<u>R/81</u>	<u>R/82</u>	<u>R/83</u>	<u>R/84</u>	<u>R/85</u>	<u>R/86</u>	<u>R/87</u>	<u>R/88</u>
Plunger/Disc	--	100%	--	--	--	50%	50%	--	--	--	50%	50%
Diaphragms (2)	21%	--	29%	50%	--	50%	50%	--	--	--	50%	50%
Pilot Gasket	--	100%	--	--	--	50%	50%	--	--	--	50%	50%
O-Ring Gaskets (2)	100%	--	--	--	--	50%	50%	--	--	--	50%	50%
O-Ring Seal	100%	--	--	--	--	50%	50%	--	--	--	50%	50%
Body Passage Gaskets (2)	21%	--	29%	50%	--	50%	50%	--	--	--	50%	50%

Repeat 5-year replacement frequency as necessary.

Table 2

Other Scram Solenoid Valve Maintenance Frequency

<u>Component</u>	<u>Date</u>												
	<u>7/78</u>	<u>10/78</u>	<u>R/80</u>	<u>R/81</u>	<u>R/82</u>	<u>R/83</u>	<u>R/84</u>	<u>R/85</u>	<u>R/86</u>	<u>R/87</u>	<u>R/88</u>	<u>R/89</u>	<u>R/90</u>
Back-up Pilot Valves (all Buna-N Parts)	100%	--	100%	--	--	--	--	100%	--	--	--	--	100%
Scram Disch. Valves (all Buna-N Parts)	--	100%	--	--	--	100%	--	--	--	--	100%	--	--
Scram Disch. Test Valve (all Buna-N Parts)	--	100%	100%	--	--	100%	--	--	--	--	100%	--	--

Repeat 5-year replacement frequency as necessary.

Table 3

Time Since Packaging

<u>Component</u>	<u>Time (Years)</u>
Scram Pilot Valves	
(1) All parts except 50% of diaphragms and body gaskets	2-3
(2) 50% of diaphragms and body gaskets	10
Backup Pilot Valves	10
Scram Discharge Valves	3
Test Valve	10

# GENERAL ELECTRIC

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WRITER'S DIRECT DIAL NUMBER

G-EK-9-9

January 30, 1979

Mr. M. H. Clarity  
Monticello Nuclear  
Generating Plant  
Monticello, MN 55362

SUBJECT; RESPONSE TO NRC-IE BULLETIN 78-14

Dear Mr. Clarity:

This letter has been prepared by the General Electric Company to provide information to the operating BWR owners to assist them in responding to the NRC-IE Bulletin 78-14, and to provide a clarification of the recommendations in Service Information Letter 128.

In order to establish a common base for discussing maintenance recommendations, and their bases, it is helpful to start with a few definitions.

1. Cure-Date (C.D.)

This is the date on which the Buna-N elastomer parts are created in a molding and heat curing process. This is the true "beginning-of-life" for the material. While the cure-date is the ideal reference for defining useful life of an elastomer, historically it has not been identified on piece parts for a variety of manufacturing related reasons.

2. Packaging Date (P.D.)

This is the date on which the various piece parts are packaged into replacement part kits. The times between curing and packaging are not always known accurately; therefore, it is conservatively assumed to be equal to or less than two years (P.D. = C.D. +2 yrs.).

### 3. Service Life (S.L.)

Service life is defined as the period of time from packaging date during which the elastomer retains enough of its design properties to perform its design function. Service life includes shelf time prior to installation.

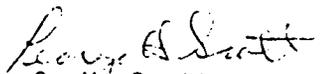
#### Discussion

The service life of elastomer parts in a pneumatic system is affected by environmental factors such as temperature, radiation, air quality, etc. The initial Service Information Letter (3/31/75) recommended replacement of the Buna-N parts after three years of actual service. This recommendation was made with knowledge that as much as four years could elapse between the cure-date and the beginning of actual service. It was also made without the benefit of a significant quantity of service life data. The 1/30/76 revision to the Service Information Letter revised the expected service life based on actual in-service performance data (see Figure 1). At that time there were three plants that reported diaphragm failures. These three plants had times to failure of 7, 7 and 10 years from the time the valves or valve parts were shipped to the sites. At the time of failure of diaphragms of the last two of these three plants there were eight other plants that had been in operation longer with no failures in 1252 valves. (At another plant there were two failures not related to aging/hardening of the elastomer material. The first was at four years after valve shipping dates; the second at seven years; these are considered isolated failures not related to the subject of this letter.)

The 8/78 supplement to the Service Information Letter took into account, for the first time, the failure of the Buna-N disc in the solenoid valve core assembly (plunger). Prior to this time only the dynamic (i.e., flexing) parts of the valves were considered to have a limited life. The disc in the plunger is almost completely surrounded and is mechanically captured by the metal plunger body. It is a passive element which flexes only minimally when the plunger strikes the valve seat. The first time a failure of the Buna-N disc in the solenoid plunger was observed at a plant there were 14 other plants that had been in operation longer with no similar failures in 2574 valves. The actual time to failure from the year the valves were built was ten years.

Figure 1 summarizes the experience to date with failures of Buna-N components in scram pilot valves. It is clear that the probability of aging-type failures beginning to occur before seven years from the packaging date is low enough to be acceptable; therefore, a combination of shelf and in-service life of seven years from packaging date is conservative.

Very truly yours,

  
G. H. Scott  
Service Supervisor

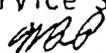
  
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Figure 1  
Scram Pilot Valves

