

Docket No. 50-263

JUN 17 1974

Mr. Rodney G. Loper, President
Clear Air - Clear Water Unlimited
Post Office Box 311
South St. Paul, Minnesota 55102

Dear Mr. Loper:

Distribution
~~Docket File~~
AEC PDR
Local PDR
JRO'Leary, L
DKnuth, RO
Solicitor
FDAnderson, L:ORB #2
Gertter, DRA (#7107)
MGroff, DRA
TJCarter, L:OR
DLZiemann, L:ORB #2
JJShea, L:ORB #2
RMDiggs, L:ORB #2
EHughes, L:RP
SECY Mail Fac. (3)(#74-5514)

We are pleased to reply to your request of May 20, 1974, to Chairman Ray regarding the hydrogen explosion experienced at the Monticello Nuclear Generating Plant at Monticello, Minnesota. Enclosed for your information is a copy of the report of the incident to which you have referred.

The Monticello plant recently experienced hydrogen detonations in the off-gas system. The detonations occurred during the process of activating the augmented off-gas system which is designed to reduce the level of radioactive effluents (such gases include primarily hydrogen and oxygen with some radioactive gases) released to the environs. Although hydrogen detonations in the off-gas system were not considered to be routine occurrences, the off-gas system was designed to withstand such occurrences. The system performed as designed to protect the remainder of the off-gas equipment from excessive overpressure. The releases of radioactivity from the plant due to these detonations were within permissible limits as specified in Monticello's operating license Technical Specifications and do not represent a risk to the health and safety of the public or to the water supply for Twin Cities.

The cause of these detonations is presently under investigation so that the system may be placed in continuous service as soon as possible. The Directorate of Regulatory Operations will continue to follow up on these occurrences as it does on all such occurrences at nuclear plants.

If we can be of further assistance, please let us know.

Sincerely,

Original signed by:
Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Copy sent PDR

Enclosure:

Report dtd 5/29/74

SEE ATTACHED YELLOW FOR PREVIOUS CONCURRENCES:

OFFICE >	L:OR					
X7415	KRGoller					
SURNAME >						
DATE >	6/14/74					

Docket No. 50-263

Mr. Rodney G. Loper, President
Clear Air - Clear Water Unlimited
Post Office Box 311
South St. Paul, Minnesota 55102

Dear Mr. Loper:

We are pleased to reply to your request of May 20, 1974, to Chairman Ray regarding the hydrogen explosion experienced at the Monticello Nuclear Generating Plant at Monticello, Minnesota.

The Monticello plant recently experienced a hydrogen detonation in the off-gas system during reactor startup. The detonation occurred during the process of activating the augmented off-gas system which is designed to reduce the level of radioactive effluents released to the environs. The off-gas system is used to remove gases from the reactor system during operation. Such gases include primarily hydrogen and oxygen with some radioactive gases. Although hydrogen detonations in the off-gas system were not considered to be routine occurrences, such conditions were considered to be credible and were included as a design condition for the off-gas system. Therefore, the off-gas system was designed with a rupture disk in the air-ejector subsystem which would preferentially fail under such high-pressure (explosive) conditions. The cause of the detonation has not been determined but operation of the steel valves in the system at that time may have caused a spark(s) which could have resulted in the hydrogen detonation. The rupture disk did perform as designed to protect the remainder of the off-gas system from excessive overpressure. The releases of radioactivity from the plant due to this detonation were well within the limits specified in Monticello's operating license Technical Specifications and do not represent a risk to the health and safety of the public or to the water supply for Twin Cities.

The licensee, Northern States Power Company, has estimated a maximum radioactive effluent release rate of 6200 uCi/sec for less than five minutes. Within less than three hours, the release rate was less

Mr. Rodney G. Loper

- 2 -

than 100 uCi/sec. During the highest release rate, the release rate would have been less than 30 percent of the most restrictive effluent release limit for the plant.

The Monticello plant has been returned to power with the augmented off-gas system isolated until the cause of the incident can be determined and corrective action taken to prevent a recurrence of the event. The Directorate of Regulatory Operations will continue to follow up on this occurrence as it does on all such occurrences at nuclear plants.

If we can be of further assistance, please let us know.

Sincerely,

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

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Docket File
AEC PDR
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JFO'Leary, L
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RMDiggs, L:ORB #2
EHughes, L:RP
SECY Mail Facility (3) (#74-5514)

OFFICE ➤	L:ORB #2	L:ORB #2	L:ORB #2	L:ORB #2	OGC	L:OR
X7403	<i>FD</i>	<i>Shea</i>	<i>RMD</i>	<i>DLZ</i>	<i>5 H Lewis</i>	KRGoller
SURNAME ➤	FDAnderson:sjh	JJShea	RMDiggs	DLZiemann	5 H Lewis	KRGoller
DATE ➤	5/24/74	5/24/74	5/24/74	5/24/74	5/29/74	5/ /74

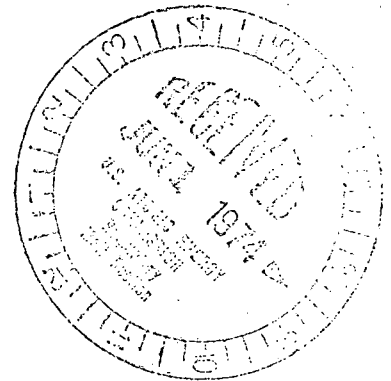
IN 313

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

May 29, 1974

Mr. J F O'Leary, Director
Directorate of Licensing
Office of Regulation
U S Atomic Energy Commission
Washington, DC 20545



Dear Mr. O'Leary:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263, License No. DPR-22, AO 263/74-11

Off Gas Ignition

A condition occurred at the Monticello Nuclear Generating Plant which we are reporting to your office in accordance with Section 6.7.B.1, Abnormal Occurrence Reports, or Appendix A. Technical Specifications, of Provisional Operating License DPR-22.

During plant startup on May 20, 1974, while operating at 575 psig reactor pressure and conducting on-line testing of the modified off gas holdup system, an off gas ignition occurred resulting in the rupture of both air ejector discharge line rupture discs and a release of off gas from the reactor building vent. The release rate reached a maximum of 6200 uci/sec for five minutes, then decreased to less than 100 uci/sec after 2½ hours. At no time was the Technical Specification release limit of 210,000 uci/sec approached.

The ignition occurred immediately after a rapid closure of 'B' train recombiner flow control valve (FCV 7489B) from an intermediate position as evidenced by the rupture of both air ejector discs and isolation of the air ejector suction valves on high pressure. It is noted that a high pressure recombiner train shutdown, which is initiated by either of two high pressure switches set at 20 psia, did not occur during the incident indicating that the pressure surge did not propagate downstream of the recombiner inlet flow control valve. The ignition was, therefore, limited to the air ejector discharge-recombiner train inlet piping.

Investigation into the occurrence revealed that the apparent cause of the ignition was the impact of the 'B' train inlet flow control valve on the valve seat. Other ignition sources (including heat tracing, inlet hydrogen analyzers, and flowmeters) were considered and eliminated as the cause of the ignition based on inspection of the components and based on the fact that the ignition occurred simultaneously with the fast closure of the flow control valve. The flow control valve is a rapid-closing hard-seated valve and the presence of scale or other interfering material on the seating surfaces may have caused a sparking condition.

Mr. J F O'Leary
May 29, 1974
Page 2

To prevent a recurrence the power operated and check valves which are normally exposed to undiluted off gas hydrogen-oxygen mixture were modified as follows:

The plug material of recombiner train 'A' and 'B' flow control valves FCV 7489A and B, was changed from stellited stainless steel to aluminum bronze. The plug cages and seats of the off-gas pressure control valves, PCV 7496A and B were changed from stellited stainless steel to bronze. Check valves (OG 51-1 and 2) downstream of the pressure control valves were modified by welding a silicon bronze alloy material on the strike point of the disc hanger. These changes render the valves non-sparking under operating conditions.

An inspection of the components located in the air ejector room and recombiner cubicles revealed no equipment damage. It is noted that the off-gas system is designed to withstand an ignition of the off-gas mixture.

The only previous off-gas combustion, which occurred at Monticello in November of 1971, involved welding on an unpurged off-gas line and is therefore unrelated to this occurrence. Testing of the modified off-gas holdup system will continue with the above described changes.

Yours very truly,



L O Mayer, PE
Director of Nuclear Support Services

LOM/kn

cc: J G Keppler
G Charnoff
Minnesota Pollution Control Agency
Attn. E A Pryzina

NO. 74-5514 LOGGING DATE May 21, 1974**AEC SECRETARIAT**

TO: ☐ COMMISSIONER _____ DATE: 5/22
☐ GEN. MANAGER ☐ GEN. COUNSEL ☐ INFO. SERVICES
☒ DIR. REGULATION ☐ PLAN. & ANAL. ☐ SECRETARY
☐ _____

INCOMING FROM: Rodney G. Loper, Pres. To: Dr. Ray
Clear Air - Clear Water Unlimited
St. Paul, Minnesota

DATE: Mailgram dtd 05/20/74

SUBJECT: Hydrogen Explosion at NSP Montecello
Reactor

PREPARE REPLY FOR SIGNATURE OF:

- ☐ CHAIRMAN
☐ COMMISSIONER
☐ GM, DR, GC, PA, IS, SECY
☐ SIGNATURE BLOCK OMITTED

☐ PLEASE RETURN ORIGINAL WITH RESPONSE☒ FOR DIRECT REPLY☒ SEND COPY OF REPLY TO:

- ☒ SECY MAIL FACILITY (3)
☐ CHAIRMAN
☐ COMMISSIONERS
☐ SECRETARY

- ☐ FOR APPROPRIATE ACTION
☐ FOR INFORMATION
☐ FOR RECOMMENDATION

REMARKS: cy to SolicitorFOR THE COMMISSION: Jana

WHEN SEPARATED FROM ENCLOSURES
HANDLE THIS DOCUMENT AS

DE. 7107

ACTION SLIP

FROM

Rodney G. Loper, President
Clear Air-Clear Water Unlimited
St. Paul, Minn.

CONTROL NUMBER

7107

FILE LOCATION

DATE OF DOCUMENT

5/20/74

ACTION COMPLETION DEADLINE

5/31/74

TO

Chairman

ACTION PROCESSING DATES

Acknowledged _____

Interim Reply _____

Final

5/15/74

PREPARE FOR SIGNATURE OF:

Chairman_____
Director of Regulation

X

Giambusso

DESCRIPTION

for
Malignant X ☒ Original

☐ Copy☐ Other

6/17/74

REMARKS

In view of hydrogen explosion at Monticello reactor, demands
complete safety inspection and review of 40 year operating
license

SEXY 74-5514

REFERRED TO

DATE

Giambusso f/action

5/22/74

IS NOTIFICATION TO THE JCAE

RECOMMENDED? _____

Cys:

O'Leary

Knuth

Docket File(s) 50-263

FDR

LPDR

DIRECTOR OF REGULATION
COMMUNICATIONS CONTROL

Form HQ-32 (1-73)
USAEC

FROM

Rodney G. Loper, President
Clear Air-Clear Water Unlimited
St. Paul, Minn.

TO

Chairman

CONTROL NUMBER

7107

DATE OF DOCUMENT

5/20/74

FILE LOCATION

ACTION COMPLETION DEADLINE

5/31/74

ACTION PROCESSING DATES

Acknowledged _____

Interim Reply _____

Final _____

PREPARE FOR SIGNATURE OF:

Chairman_____
Director of Regulation**X** **Cianbunso**

DESCRIPTION

Mailgram X☒ Original☐ Copy☐ Other

REMARKS

In view of hydrogen explosion at Monticello reactor, demands complete safety inspection and review of 40 year operating license

DOXY 74-5314

REFERRED TO

DATE

IS NOTIFICATION TO THE JCAE

RECOMMENDED? _____

Cianbunso f/action**5/22/74**

Cys:

O'Leary**Knoth****Becket Files) 50-263****FDR****LFDR**

DIRECTOR OF REGULATION
 COMMUNICATIONS CONTROL

Form HQ-32 (1-73)
 USAEC

FROM

Rodney G. Loper, President
Clear Air-Clear Water Unlimited
St. Paul, Minn.

TO

Chairman

CONTROL NUMBER

7107

DATE OF DOCUMENT

5/20/74

FILE LOCATION

ACTION COMPLETION DEADLINE

5/31/74

ACTION PROCESSING DATES

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Interim Reply _____

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PREPARE FOR SIGNATURE OF:

Chairman_____
Director of Regulation**X** **Gianbunco**

DESCRIPTION

☒ Original☐ Copy☐ Other

Mailman 1

In view of hydrogen explosion at Monticello reactor, demands complete safety inspection and review of 40 year operating license

SECT 74-5514

REMARKS

REFERRED TO

DATE

IS NOTIFICATION TO THE JCAE

RECOMMENDED? _____

Gianbunco f/action

5/22/74

Cys:

O'Leary

Knuth

Docket Files) 50-263

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LFER

DIRECTOR OF REGULATION
 COMMUNICATIONS CONTROL

Form HQ-32 (1-73)
 USAEC

MGMWSHT HSB
2-043239E140 05/20/74
ICS IPMBNGZ CSP
6123312094 MGM TDBN MINNEAPOLIS MN 100 05-20 0719P EDT
ZIP 20545



Mailgram



DR DIXIE LEE RAY
UNITED STATE ATOMIC ENERGY COMMISSION
WASHINGTON DC 20545

IN VIEW OF HYDROGEN EXPLOSION AT NSP MONTECELLO REACTOR WE DEMAND
COMPLETE SAFETY INSPECTION AND REVIEW OF 40 YEAR OPERATING LICENSE
YOU GRANTED THIS FACILITY UPSTREAM FROM TWIN CITIES WATER SUPPLY
RODNEY G LOPER PRESIDENT CLEAR AIR CLEAR WATER UNLIMITED BOX
311 SOUTH ST PAUL MINNESOTA

19:19 EDT

MGMWSHT HSB

Rev'd. Off. of Dir.
of Licensing

Date 5/22/74
Time 3:25 P.M.

DR- 7107

OFFICE OF THE SECRETARY

MAY 21 PM 3:56

Rev'd. Off. of Dir. of Reg.

Date 5/22/74

Time 11:35

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NO. <u>74-5514</u>	LOGGING DATE <u>May 21, 1974</u>
AEC SECRETARIAT	
TO: <input type="checkbox"/> COMMISSIONER	DATE: <u>5/22</u>
<input type="checkbox"/> GEN. MANAGER	<input type="checkbox"/> GEN. COUNSEL
<input checked="" type="checkbox"/> DIR. REGULATION	<input type="checkbox"/> PLAN. & ANAL.
<input type="checkbox"/>	<input type="checkbox"/> INFO. SERVICES
	<input type="checkbox"/> SECRETARY

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- ☐ COMMISSIONER
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- ☐ SIGNATURE BLOCK OMITTED

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- ☐ COMMISSIONERS
- ☐ SECRETARY

- ☐ FOR APPROPRIATE ACTION
- ☐ FOR INFORMATION
- ☐ FOR RECOMMENDATION

REMARKS:

cy to Solicitor

FOR THE COMMISSION:

Jana

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Dr. 7107

ACTION SLIP

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2-043239E140 05/20/74

western union

Maingram



ICSPMBNGZ CSP

6123312094 MGM TDBN MINNEAPOLIS MN 100 05-20 0719P EDT

ZIP 20545

DR DIXIE LEE RAY
UNITED STATE ATOMIC ENERGY COMMISSION
WASHINGTON DC 20545

IN VIEW OF HYDROGEN EXPLOSION AT NSP MONTECELLO REACTOR WE DEMAND
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YOU GRANTED THIS FACILITY UPSTREAM FROM TWIN CITIES WATER SUPPLY
RODNEY G LOPER PRESIDENT CLEAR AIR CLEAR WATER UNLIMITED BOX
311 SOUTH ST PAUL MINNESOTA

19119 EDT

MGMWSHT HSB

OFFICE OF THE ATTORNEY GENERAL

95:6 MAY 12 AM

DR- 7107

Rec'd Off. Dir. of Reg.

Date 5/22/74

Time 11:35