

**AIR EMISSION PERMIT NO. 03700015- 001
IS ISSUED TO**

Northern States Power Company
NSP - Inver Hills Generating Plant
3185 117th Street
Inver Grove Heights, Dakota County, Minnesota 55077

The emission units, control equipment and emission stacks at the stationary source authorized in this permit are as described in the following permit application(s):

Permit Type	Application Date
Major Amendment	December 29, 1999
Total Facility Operating Permit	February 12, 1996

This permit authorizes the Permittee to operate and modify the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit¹. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

¹The Permittee is responsible for complying with Amendment Three to Finding and Order dated July 28, 1992. The permit contains Title I requirements from Amendment Three and proposes three alternative requirements to replace various requirements in Amendment Three. The three requirements are listed as **Alternative** requirements and are not effective until this permit and its conditions have been approved under the Title I State Implementation Plan (SIP) program by the U.S. Environmental Protection Agency (EPA).

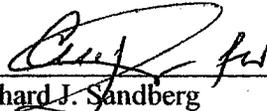
Permit Type: Federal; PSD, Title V operating permit

Issue Date: July 25, 2000

Expiration: July 25, 2005

All Title I Conditions do not expire.

Amendments to Conditions labeled "Title I Condition: State Implementation Plan for Sulfur Dioxide (SO₂)" are required to go through the Federal State Implementation Plan approval process before the change becomes effective.



Richard J. Sandberg
Manager
Major Facilities Section
Metro District

for Karen A. Studders, Commissioner
Minnesota Pollution Control Agency

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NOTICE TO THE PERMITTEE:

Your stationary source may be subject to the requirements of the Minnesota Pollution Control Agency's (MPCA) solid waste, hazardous waste, and water quality programs. If you wish to obtain information on these programs, including information on obtaining any required permits, please contact the MPCA general information number at:

Metro Area	(651) 296-6300
Outside Metro Area	1-800-657-3864
TTY	(651) 282-5332

The rules governing these programs are contained in Minn. R. chs. 7000-7105. Written questions may be sent to: Minnesota Pollution Control Agency, Major Facilities Section/Metro District 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

Questions about this air emission permit or about air quality requirements can also be directed to the telephone numbers and address listed above.

PERMIT SHIELD:

Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Certain requirements which have been determined not to apply are listed in Table A of this permit.

FACILITY DESCRIPTION:

The Inver Hills Generating Plant provides up to 440 Megawatts (MW) of peak electrical generation. The facility is on call to operate, as needed, any or all of six combustion turbine/generator sets fueled by natural gas or fuel oil. On-site distillate and residual oil storage consists of three 10 million gallon tanks. The facility also has two post 1990 emergency diesel engines that are grid connected and thus have applied for a new unit exemption committing to 0.05 wt% sulfur content fuel.

To accommodate every increasing summer peaking electrical demand, the facility is installing inlet air coolers at the inlet of each combustion turbine generator. The inlet air coolers are essentially large volume spray nozzles which add water to the inlet air stream. The water spray is then evaporated by the inlet air stream which in turn cools and carries the evaporated water vapor into the compressor side of the gas turbine. The additional mass flow attributed to the evaporated water and the increased compressibility of the cooled air, improves the mechanical and thus electrical output capability of the gas turbine. Since evaporative cooling is not feasible at dew points at or below the freezing point of water, the inlet air coolers will not operate at air temperatures below approximately 60 degrees Fahrenheit. The modification of adding inlet air cooling to each of the six gas turbines is being considered a seasonal debottlenecking of the facility's electrical output. Due to increased flow rate through the turbine inlet due to the inlet cooling, the fuel usage of each unit is also increased in order to maintain a constant air to fuel ratio. The increased fuel usage will potentially cause a significant net emissions increase in Nitrogen Oxides (NO_x), when burning natural gas and NO_x, SO₂, and Particulate Matter less than 10 um in size (PM₁₀) when burning fuel oil.

The facility is accepting operating hours limitations for the inlet cooling system to limit emissions increases to less than 100 tons per year of any one air pollutant. The limits are taken to avoid Minnesota Environmental Assessment Worksheet requirements and review.

In an attempt to reduce or eliminate the fuel oil sampling and analysis requirements and record keeping, the facility is accepting an alternative fuel oil sulfur limit of 0.5 percent by weight. By limiting the sulfur content of the fuel to 0.5 percent and maintaining the same monthly and annual fuel oil usage limit, a fuel oil supplier certification should provide adequate assurance of compliance with the Title I fuel oil sulfur limit and SO₂ emission limit.

TABLE A: LIMITS AND OTHER REQUIREMENTS

07/25/00

Facility Name: NSP - Inver Hills Generating Plant

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Table A contains limits and other requirements with which your facility must comply. The limits are located in the first column of the table (What To do). The limits can be emission limits or operational limits. This column also contains the actions that you must take and the records you must keep to show that you are complying with the limits. The second column of Table A (Why to do it) lists the regulatory basis for these limits. Appendices included as conditions of your permit are listed in Table A under total facility requirements.

Subject Item: Total Facility

What to do	Why to do it
<p>A. OPERATIONAL REQUIREMENTS</p>	<p>hdr</p>
<p>Parameters Used in Modeling: The stack heights, emission rates, and other parameters used in the modeling for the SO2 SIP are listed in GP 003 of this permit. The Permittee must submit to the Commissioner for approval any revisions of these parameters and must wait for a written approval before making such changes. The information submitted must include, at a minimum, the locations, heights and diameters of the stacks, locations and dimensions of nearby buildings, the velocity and temperatures of the gases emitted, and the emission rates. The plume dispersion characteristics due to the revisions of the information must be equivalent to or better than the dispersion characteristics modeled in the SO2 SIP submittal. The Permittee shall demonstrate this equivalency in the proposal. If the information does not demonstrate equivalent or better dispersion characteristics, or if a conclusion cannot readily be made about the dispersion, the Permittee must remodel.</p>	<p>Title I Condition: State Implementation Plan for SO2; Minn. R. 7009.0020</p>

TABLE A: LIMITS AND OTHER REQUIREMENTS

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E. RECORDKEEPING	hdr
State Implementation Plan Recordkeeping: Retain all records at the stationary source for a period of five (5) years from the date of the required monitoring, sample, measurement, or report that corresponds with the "Title I Condition: State Implementation Plan for SO2" requirement.	Title I Condition: State Implementation Plan for SO2

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: NSP - Inver Hills Generating Plant

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Subject Item: GP 001 Electric Generating Combustion Turbines

- Associated Items:**
- EU 001 Combustion Turbine 1
 - EU 002 Combustion Turbine 2
 - EU 003 Combustion Turbine 3
 - EU 004 Combustion Turbine 4
 - EU 005 Combustion Turbine 5
 - EU 006 Combustion Turbine 6
 - SV 001 Stack 1, Gas Turbine 1
 - SV 002 Stack 2, Gas Turbine 2
 - SV 003 Stack 3, Gas Turbine 3
 - SV 004 Stack 4, Gas Turbine 4
 - SV 005 Stack 5, Gas Turbine 5
 - SV 006 Stack 6, Gas Turbine 6

What to do	Why to do it
Sulfur Dioxide: less than or equal to 0.67 lbs/million Btu heat input on an instantaneous basis. This limit applies to each unit individually.	Title I Condition: State Implementation Plan for SO ₂ ; allowed under Minn. R. 7011.2300, subp. 2
Nitrogen Oxides: less than or equal to 99 tons/year using 12-month Rolling Sum. Calculated as the product of any positive hourly emission rate change measured during the initial emissions tests and the total GP 001 inlet fogging operating hours.	Title I Condition: To keep ambient air impact from inlet air fogging system modification below Class II PSD significant levels; Minn. R. 7007.0500, subp. 5, avoid Environmental Review
Carbon Monoxide: less than or equal to 48 lbs/hour per emission unit, while operating at base load with inlet fogging in operation and combusting natural gas, the emission rate increase over the emission rate at base load without inlet fogging in operation and combusting natural gas.	Title I Condition: To keep ambient air impact from inlet air fogging system modification below Class II PSD significant levels; Minn. R. 7007.0500, subp. 5, avoid Environmental Review
Oil Fuel Usage: less than or equal to 9410000 gallons/month using 12-month Rolling Average	Title I Condition: State Implementation Plan for SO ₂
Sulfur Content of Fuel: less than or equal to 0.5 percent by weight for all fuels	Title I Condition: State Implementation Plan for SO ₂ ; Alternative SIP limit to the 0.64 limit
Sulfur Content of Fuel: less than or equal to 0.64 percent by weight for all fuel types.	Title I Condition: State Implementation Plan for SO ₂
Allowable Fuel Types: Distillate and residual fuel oil and natural gas.	Title I Condition: State Implementation Plan for SO ₂ ; Minn. R. 7007.0800, subp. 2
MONITORING REQUIREMENTS	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

07/25/00

Facility Name: NSP - Inver Hills Generating Plant

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<p>Fuel Oil Analysis: The Permittee shall obtain the fuel oil sulfur content and heating value by either of the following methods:</p> <p>a. By obtaining and retaining a fuel supplier certification from the fuel supplier for each shipment of distillate, residual, or diesel fuel oil delivered to the Facility. Each fuel supplier certification shall include the following information:</p> <ol style="list-style-type: none"> 1) The name of the supplier; 2) The location of where the sample was drawn for analysis to determine the sulfur content of the fuel oil. Specifically, the certification shall include whether each shipment was sampled as delivered to the Facility, or whether the sample was drawn from the storage tanks at the fuel oil supplier's or oil refiner's facility, or other location; 3) The sulfur content of the fuel oil from which the shipment came; 	<p>Title I Condition: State Implementation Plan for SO2</p>
<p>Fuel oil Analysis (cont.):</p> <ol style="list-style-type: none"> 4) The method used to determine the sulfur content shall be American Society for Testing Materials (ASTM) Method D-1552 or another EPA approved ASTM Method as listed in 40 CFR 60, Appendix A, Method 19, Sec. 5.2.2; and 5) The heating value (million British Thermal Units per gallon) of the fuel oil determined in accordance with ASTM Methods D-240, D-1989 or other EPA approved methods, <p>OR,</p> <p>b. By sampling and analyzing the fuel in accordance to the following:</p> <ol style="list-style-type: none"> 1) While the fuel tank is being filled, the Permittee shall collect a sample of the fuel delivery in accordance with ASTM Method D-4057 or other EPA approved method; 2) The Permittee shall analyze fuel delivery samples to determine the sulfur content in accordance with ASTM Method D-1552 or other approved EPA method and heating value of the fuel in accordance with ASTM Method D-240, D-1989 or other approved EPA method; 	<p>Title I Condition: State Implementation Plan for SO2</p>
<p>Fuel Oil Analysis (cont.):</p> <ol style="list-style-type: none"> 3) If the fuel delivery sample analysis result is no greater than 0.64% sulfur, the Permittee shall compute a weighted average sulfur content of the fuel in the tank using the analysis from the fuel delivery sample and any previous value for sulfur content of fuel in the tank. 4) If the delivery sample analysis result is greater than 0.64% sulfur, then a sample must be taken from the fuel tank and analyzed for sulfur content and heating value. The Permittee shall use the tank analysis as the new sulfur content and heating value of the fuel in the tank. 5) In January and July of each year, the Permittee shall collect a sample from the fuel line to the gas turbines. the sample shall be analyzed for sulfur content and heating value. The results shall be used as the new sulfur content and heating value of the fuel in the tank. 	<p>Title I Condition: State Implementation Plan for SO2</p>
<p>Fuel Usage: On a monthly basis the Permittee shall use daily fuel usage data to calculate monthly fuel use based on a 12-month rolling average.</p>	<p>Title I Condition: State Implementation Plan for SO2</p>
<p>SO2 Emission Rate: The Permittee shall calculate the SO2 emission rate from the sulfur content and heating value with the following formula:</p> $\text{Emissions Rate (lb SO2/MMBtu)} = \frac{N \times \% \text{sulfur}}{\text{heating value (Btu/gal)}}$ <p>Where N = 142,000 for distillate oil and 157,000 for residual oil The units for N = Btu lbs SO2/(MMBtu)(gal)</p>	<p>Title I Condition: State Implementation Plan for SO2</p>
<p>RECORDKEEPING</p>	<p>hdr</p>

TABLE A: LIMITS AND OTHER REQUIREMENTS

07/25/00

Facility Name: NSP - Inver Hills Generating Plant

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SO2 and Emissions and Operating Records. The Permittee shall generate and maintain records containing information to demonstrate compliance with the emission limitation and operating requirements. The Permittee shall retain records containing the following information:

1) The fuel oil supplier's certifications containing the information listed in the previous monitoring requirements and the date of each fuel oil delivery cross-referenced to the certification accompanying that delivery; or the results of the fuel oil analyses for sulfur content (percent by weight) and heating value (million British Thermal Units per gallon), the date the fuel oil was sampled, and the methods used to sample the fuel oil and determine the sulfur content and heating value of the fuel oil.

2) Monthly fuel oil use and 12-month rolling averages. The records shall be signed by the person entering information into the record.

Title I Condition: State Implementation Plan for SO2

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TABLE A: LIMITS AND OTHER REQUIREMENTS

07/25/00

Facility Name: NSP - Inver Hills Generating Plant

Permit Number: 03700015 - 001

Subject Item: GP 002 Emergency Diesel Generators

Associated Items: EU 007 Diesel Generator 1 ODG-GEN-001

EU 008 Diesel Generator 2 ODG-GEN-002

SV 007 Stack 7, Diesel Generator 1

SV 008 Stack 8, Diesel Generator 2

What to do	Why to do it
Operating Hours: less than or equal to 816 hours/year using 12-month Rolling Sum	Title I Condition: To remain a nonmajor modification for NOx under 40 CFR Section 52.21.
Recordkeeping: Whenever the emission unit(s) are operated, daily record the operating start and stop times. By the 15th of each month, calculate and record the total combined operating hours of the previous month.	Title I Condition: To remain a nonmajor modification for NOx under 40 CFR Section 52.21.

TABLE A: LIMITS AND OTHER REQUIREMENTS

07/25/00

Facility Name: NSP - Inver Hills Generating Plant

Permit Number: 03700015 - 001

Subject Item: GP 003 Electric Generating Combustion Turbine Stack Vents

- Associated Items:**
- SV 001 Stack 1, Gas Turbine 1
 - SV 002 Stack 2, Gas Turbine 2
 - SV 003 Stack 3, Gas Turbine 3
 - SV 004 Stack 4, Gas Turbine 4
 - SV 005 Stack 5, Gas Turbine 5
 - SV 006 Stack 6, Gas Turbine 6

What to do	Why to do it
Stack Height shall be greater than or equal to 32 feet from ground level. This limit applies to each individual stack.	Title I Condition: State Implementation Plan for SO2
Stack cross-sectional area shall be less than or equal to 150 square feet (7.5 x 20 feet). This limit applies to each individual stack.	Title I Condition: State Implementation Plan for SO2
Individual Stack Exhaust. This limit represents the modeled exhaust flow rate from each stack vent at maximum peak load/peak SO2 emissions. It is not representative of the flow rates at lower loads. Air Flow Rate: greater than or equal to 1150000 actual cubic feet/minute	Title I Condition: State Implementation Plan for SO2
Individual Stack Exhaust. This limit represents the modeled exhaust temperature in each stack vent at maximum peak load/peak SO2 emissions. It is not representative of the exhaust temperature at lower loads. Temperature: greater than or equal to 1050 degrees F	Title I Condition: State Implementation Plan for SO2