



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 012009-010 Project Number: 2008-09-056

Parent Company: Pauwels Transformers

Parent Company Address: Antwerp Sesteen Weg 167, Mechlen, Belgium

Installation Name: Pauwels Transformers Incorporated

Installation Address: One Avantha Drive, Washington, MO 63090

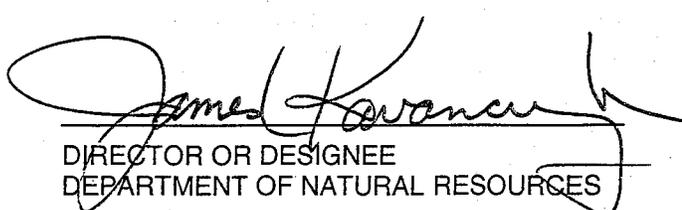
Location Information: Franklin County, S17, T44N, R1W

Application for Authority to Construct was made for:
Construction of small and medium power transformer process. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JAN 29 2009

EFFECTIVE DATE


DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Permit No.	
Project No.	2008-09-056

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Pauwels Transformers Incorporated
Franklin County, S17, T44N, R1W

Work Practice

1. Pauwels Transformers Incorporated shall keep the solvents and cleaning solutions in sealed containers whenever the materials are not in use. Pauwels Transformers Incorporated shall provide and maintain suitable, easily read, permanent markings on all solvent and cleaning solution containers used with this equipment.
2. **Operating Permit Determination**
Pauwels Transformers Incorporated shall include potential to emit (PTE) calculations for all pollutants at the installation as supporting documentation to their next operating permit application or renewal.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2008-09-056
Installation ID Number: 071-0181
Permit Number:

Pauwels Transformers Incorporated
One Avantha Drive
Washington, MO 63090

Complete: September 23, 2008

Parent Company:
Pauwels Transformers
Antwerp Sesteen Weg 167
Mechlen, Belgium

Franklin County, S17, T44N, R1W

REVIEW SUMMARY

- Pauwels Transformers Incorporated has applied for authority to construct a small and medium power transformer process.
- Hazardous Air Pollutant (HAP) emissions are expected from the top coat painting. HAPs of concern from this process are xylene and ethylbenzene.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart XXXXXX, *National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories* applies to the welding equipment.
- Filters on the negative pressure oil filling and degassing operation (EP-2M) are being used to control volatile organic compound (VOC) emissions. Dry expandable paper filters are being used to control particulate matter less than 10 microns in diameter (PM₁₀) from top coat painting.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Franklin County, a nonattainment area for ozone (O₃) and an attainment area for all other criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- A Basic Operating Permit application is required within 30 days of equipment startup, an Intermediate Operating Permit is required within 90 days of equipment startup, and a Part 70 Operating Permit application is required within 1 year of equipment startup. The appropriate Operating Permit application with installation-wide potential to emit (PTE) calculations is required within the applicable time frame.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Pauwels Transformers Incorporated (PT) located in Washington manufactures electrical transformers. This facility is considered a minor source under Construction Permits. The facility received a Basic Operating Permit renewal on January 29, 2008. However, the total potential emissions of the facility is not clearly defined. Therefore, the Air Pollution Control Program has requested that PT calculate the new installation-wide PTE calculations and use this as supporting documentation with their next operating permit application or renewal.

The following permits have been issued to Pauwels Transformers Incorporated from the Air Pollution Control Program.

Table 1: Previously Issued Construction Permits

8Permit Number	Description
0797-014	Relocation of the existing transformer manufacturing facility to a new site.

PROJECT DESCRIPTION

PT is planning to construct an approximate 60,000 square foot building for the manufacture of oil-bath type, small and medium power transformers. The building will house new equipment for producing three phase electrical transformers in the 3,000 MVA to 60,000 MVA range. PT has designed the new facility to produce approximately 250 transformer units per year using two shifts. However, potential to emit (PTE) calculations are based on 400 units per year which is an approximation of the maximum amount of units that can be made when the facility is operated continuously (24 hours a day, 365 days a year).

The assembly of the transformers is explained as following. Electrical coils are wound on specialized equipment and then dried prior to assembly to remove moisture in the insulation paper. The drying process is indirectly heated from a natural gas burner (EP-1M, ST-1M) sized at 1.6 million British thermal units per hour (MMBtu/hr). Transformer cores are cut from grain oriented silicon steel and automatically stacked. The steel is

dry cut, and minimal dust or debris from the operation is expected.

The next step is the core and coil assembly process. This includes sliding the coils onto the individual legs of the transformer core, yoking (assembly of the top of the core), terminating of the wiring, and assembly of the core clamps (structural support of the assembly). After that, the transformers will undergo vapor phase drying. This is a process where heat and a vacuum are applied to the assembly, and then a heated vapor (kerosene) is injected into the oven to absorb any remaining moisture. The vapors are collected in a 1,500 gallon storage tank (BS-6M) and recycled. The drying process will use indirect heat from the same natural gas burner (EP-1M, ST-1M) used for the coil dryer.

From here, the transformer assembly takes place consisting of the core and coil assembly, adding the tank cover and whatever other items the customer requires to be assembled into or onto the transformer tank. Large clamps will securely hold the cover in place.

Afterward, the transformer filling and de-gassing phase occurs. Each unit requires 3,000 gallons of oil for the filling and degassing process. New mineral oil from one of the 15,225 gallon bulk storage tanks (BS-1M through BS-4M) is passed through a degasser which removes water and gases that are typically in oil. The oil is then sent by vacuum to the 5,100 gallon accumulation tank (BS-7M). When the transformer tank is ready to be filled, a vacuum is applied to the transformer tank and oil from BS-7M fills it up. Next, a piece of equipment referred to as a "streamliner" is attached to the transformer with two hoses, at the inlet and outlet, to further clean the oil. The oil is circulated through this degassing process and through filters on the streamliner until the oil is cleaned. The streamliner is equipped with an outlet filter on it (EP-2M) to limit whatever vapor might be discharged.

The transformer is electrically tested and then after successful testing, the cover is welded onto the tank. The welding operation (EP-4M) will generate very small amounts of particulate matter and HAPs. 8 to 10 pounds of welding wire is used per unit. The electrode used is E71T. The outside of the transformer is cleaned and a liquid top coat of paint is applied (EP-3M, ST-2M) using an airless spray gun. Each unit requires approximately 3 gallons of paint, 0.75 gallons of catalysts and maximum of 1 gallon of xylene (EP-3M). If an electrical failure occurs while testing the transformer, the oil in the transformer is considered contaminated by by-products from the failure and is considered "waste oil". The waste oil is collected in a separate 10,500 gallon bulk tank (BS-5M). According to the 2006 Emission Inventory Questionnaire (EIQ) for the existing transformer facility, the ratio of waste oil generated to the new oil used was 0.005. Since this amount can vary from year to year, the ratio was doubled in order to encompass a worst-case throughput for BS-5M.

Final assembly and inspection involves adding fans, nameplates, etc. and a visual inspection to make sure the transformer meets the customer's requirements.

EMISSIONS/CONTROLS EVALUATION

The project's potential emissions are primarily volatile organic compounds (VOCs) associated with the bulk oil storage tanks and top coat painting of the transformer units. Breathing and working losses for the bulk oil storage tanks (BS 1M, 2M, 3M, 4M, 5M, and 7M) and the bulk kerosene storage tank (BS-6M) were calculated using the Environmental Protection Agency's (EPA's) TANKS 4.0 program. VOC emissions for the vacuum filling and degassing process (EP-2M) were estimated using the working losses emission factor derived for the storage tanks BS 1M through 5M. A 90% control efficiency was given to the filter used on the streamliner (EP-2M).

Potential emissions for the top coat painting (EP3M) were estimated using a mass balance approach and information obtained from the Material Safety Data Sheets (MSDS). 100 percent of the VOC and HAP content of the coating mixtures are assumed to be emitted into the atmosphere.

PM₁₀ emissions for the top coat painting were evaluated based on the solids content of the paint and transfer efficiency from the airless spray application. Using guidance from "Sources and Control of Volatile Organic Pollutants", APTI Course 482, 3rd Edition, Table 5-7, a 75 percent transfer efficiency was assumed. If not specifically stated in the MSDS, the solids content of the material was estimated by taking the density of the material and subtracting out the volatile content and assuming the remainder to be PM₁₀. The paint filter is estimated to have a control efficiency for PM₁₀ greater than 80%.

The emission factors used for estimating the emissions from natural gas combustion in the industrial oven (EP1M) were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion* (07/1998).

The emission factors used in the analysis for welding (EP-1) were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, 12.19 *Electric Arc Welding* (1/95).

The following table provides an emissions summary for this project. Based on the 2007 EIQ, existing potential emissions were determined to be less than major. Existing actual emissions were also taken from the installation's 2007 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2007 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	<Major	0.04	0.31	N/A
SO _x	40.0	<Major	0.01	<0.01	N/A
NO _x	40.0	<Major	1.39	0.67	N/A
VOC	40.0	<Major	17.13	8.13	N/A
CO	100.0	<Major	0.28	0.13	N/A
HAPs	10.0/25.0	<Major	N/D	2.26	N/A
Xylene	10.0	N/D	N/D	2.11	N/A
Ethylbenzene	10.0	N/D	N/D	0.14	N/A

N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Pauwels Transformers Incorporated shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220

- *Restriction of Emission of Odors, 10 CSR 10-5.160*

SPECIFIC REQUIREMENTS

- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating, 10 CSR 10-5.030*
- *Control of Emissions From Solvent Metal Cleaning, 10 CSR 10-5.300*
- *Control of Emissions From Industrial Surface Coating Operations, 10 CSR 10-5.330*
- *Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories, 40 CFR Part 63, Subpart XXXXXX*

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Susan Heckenkamp
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 17, 2008, received September 23, 2008, designating Pauwels Transformers as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Saint Louis Regional Office Site Survey, dated October 20, 2008.

Mr. Jim Scannell
Health & Safety
Pauwels Transformers Incorporated
One Avantha Drive
Washington, MO 63090

RE: New Source Review Permit - Project Number: 2008-09-056

Dear Mr. Scannell:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application and with your operating permit is necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Susan Heckenkamp, at the departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:shl

Enclosures

c: Saint Louis Regional Office
PAMS File: 2008-09-056

Permit Number: