

PERMIT BOOK

STATE OF MISSOURI



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: 012011-005 Project Number: 2010-08-038

Parent Company: DRS Technologies

Parent Company Address: 5 Sylvan Way, Parsippany, NJ 07054

Installation Name: DRS-Sustainment Systems Inc.

Installation Number: 091-0011

Installation Address: #1 McDaniel Street, West Plains, MO 65775

Location Information: Howell County, S20, TN24, R8W

Application for Authority to Construct was made for:

The testing of 6-cylinder Detroit Diesel engines on the Tunner air craft cargo loaders; the testing of an on-board hydraulic power units on the M1000 a heavy equipment transport trailer; and the testing of 350 gallon per minute pump engines. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

JAN 05 2011

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 within 30 days of actual startup. 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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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."

DRS-Sustainment Systems Inc.
Howell County, S20, TN24, R8W

1. Emission Limitation
 - A. DRS-Sustainment Systems Inc. shall emit less than 40.0 tons of nitrogen oxides (NO_x) combined in any consecutive 12-month period from EP-50 the Tunner engine test.
 - B. Attachment A, or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A.
 - C. DRS-Sustainment Systems Inc. shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for fuels used.
 - D. DRS-Sustainment Systems Inc. shall report to the Air Pollution Control Program's Compliance Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

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

Project Number: 2010-08-038
Installation ID Number: 091-0011
Permit Number:

DRS-Sustainment Systems Inc.
#1 McDaniel Street
West Plains, MO 65775

Complete: November 02, 2010

Parent Company:
DRS Technologies
5 Sylvan Way
Parsippany, NJ 07054

Howell County, S20, TN24, R8W

REVIEW SUMMARY

- DRS-Sustainment Systems Inc. has applied for authority to perform the testing of 6-cylinder Detroit Diesel engines on the Tunner air craft cargo loaders; the testing of on-board hydraulic power units; and the testing of 350 gallon per minute pump engines.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. Those hazardous air pollutants associated with the combustion of diesel fuel are Benzene CAS# 71-43-2, Toluene CAS# 108-88-3, Xylenes CAS# 108-38-3, 1,3-butadiene CAS# 106-99-0, Formaldehyde CAS# 50-00-0, Acetaldehyde CAS# 75-07-0, Acrolein CAS# 107-02-8 and Naphthalene CAS# 91-20-3.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment. Title 40 Part 63 Subpart PPPP, "*National Emission Standards for Hazardous AIR Pollutants for Engine Test Cells/Standards,*" does not apply based on the description described in the application, as the engines do not meet the definition of uninstalled. Title 40 Part 63 Subpart ZZZZ, "*National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines,*" does not apply as the engines are not stationary.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of NO_x are conditioned below de minimis levels.

- This installation is located in Howell County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are limited to below de minimis levels.
- Emissions testing is not required for the equipment.
- A Part 70 Operating Permit application is required for this installation within one year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

DRS Sustaining Systems (DRS) is a manufacturing installation with four core product areas: electronic systems; battlefield systems; fuel and water systems; and mobility and armor systems. They are located at #1 McDaniel Street, West Plains, MO 65775, in Howell County. The processes at the approximately 100 acre installation include thirteen paint booths, shot blasting, welding and engine testing. The installation operates in accordance with Operating Permit OP2010-032, a Part 70 permit, which was effective on April 14, 2010, and expires on April 14, 2015. The installation has an equipment limit imposed in Permit 1088-013A on EU 0020 (solvent usage from Brinks paint spray operation) of 40 tons of VOC and a limit of less than 250 tons installation wide for VOC in Permit 042009-007. The 40 ton VOC limit is not added to the 250 ton limit, but included under the 250 ton installation wide limit. It has a NO_x limit of 40 tons applied in Permit 042009-007 for EP-49 DPGDS diesel engine testing. The source has a MACT applied Title 40 Part 63 Subpart M, *National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products* and is considered a major source for HAPs. It is a minor source for all other pollutants.

The parent company, DRS Technologies, headquartered in Parsippany, New Jersey, is a leading supplier of integrated products, services and support to military forces, intelligence agencies and prime contractors worldwide. Focused on defense technology, the company develops, manufactures and supports a broad range of systems for mission critical and military requirements, as well as homeland security.

The following permits have been issued to DRS-Sustainment Systems Inc. from the Air Pollution Control Program. This installation name was changed several times. It was Esco Electronics Corp. and then was changed to Systems & Electronics Incorporated and then became DRS.

Table 1: Permit History

Permit Number	Description
0787-006	incinerator
1088-013	Paint spray operation
0990-005	Three paint booths and a natural gas boiler
0395-014	Abrasive blast booth
0896-001	Install a dust filter for plasma arc cutter
0197-027	Pyrolysis cleaning oven with afterburner
OP2002-033	Part 70 Operating Permit
1088-013A	Amendment
1198-016	Replace painting and cleaning system
OP2010-032	Part 70 Operating Permit
042009-007	Diesel Engine Testing

PROJECT DESCRIPTION

DSR performs operational testing on the Tunner engine for the military. The testing occurs intermittently depending upon contracts with the military. This testing has been occurring for over ten years and is presently being reported by DRS to the Missouri Department of Natural Resources, Air Pollution Control Program. The Tunner engine testing area is vented to a stack. The engine is designed to operate on diesel. Each Tunner engine is a 6-cylinder Detroit Diesel engine rated at 350 horsepower. Each engine can consume 19.6 gallons of fuel per hour when tested under full load. They are not tested at full load during the entire five-hour test. The testing is for operation of the systems connected to the engine and full power is not required for these tests. The most that can be tested at one time is two engines. The systems connected to the engine are being tested as well as minor tuning of the engine. The installation has elected to take a 40 ton NOx limit and track the gallons of fuel to maintain the project emission limit below de minimis levels. The installation will be a minor source with an installation potential to emit of more than 80 tons for NOx with the two NOx limits of 40 tons and other NOx sources in the permitting history.

Two other projects included are the M1000 auxiliary power unit (APU) testing and the 350 gallon per minute pump engine testing emissions. M1000 APU testing has been occurring at the installation for about 15 years. The 350 gallon per minute pump engine testing started in 2010. The Tunner engine testing, the M1000 APU testing, and the 350 gallon per minute pump engine testing are not substantially related because these projects were added at different and separate time frames and therefore these projects are not aggregated. The M1000 APU testing and the 350 gallon per minute pump engine testing are not part of the current project and will not be considered part of the project's Potential to Emit but were included in the application. As described below, they have been included for informational purposes.

The M1000 is a heavy equipment transport semitrailer used by the military to carry armored vehicles and other heavy equipment. The APU is an on-board hydraulic power unit on the M1000. Each APU is powered by a Kubota EB300 4 cycle diesel engine. Each APU consumes 0.48 gallons of fuel per hour. No controls are on the M1000 APU except low sulfur diesel fuel is reported as being used. The maximum number of

engines that can be tested at one time is two. This calculates to a pound per hour rate of less than the significant levels, see Table 2. The M1000 APU would be considered exempt by not exceeding the exemption levels of 0.5 pounds per hour as required at that time instead of the current levels.

Table 2: Emission Rate of M1000 APU Testing to Exemption Emission Rates.

Pollutant	Insignificant Emission Exemption Levels (lbs/hr)	Potential To Emit at the Maximum Hourly Design Rate of M1000 APU Engine Testing (lbs/hr)
PM ₁₀	0.5	0.028
SO _x	0.5	7.22 x 10 ⁻⁵
NO _x	0.5	0.247
VOC	0.5	0.0176
CO	0.5	0.282

The 350 gallon per minute pump engine testing is designed to operate on low sulfur diesel fuel or JP-8. Each 350 gallon per minute pump has a 2.4 Liter three cylinder John Deere engine (rated horsepower is 66). Each engine can consume 3.9 gallons of fuel per hour when tested at full load although they are not tested at full load during the entire test. Per the test procedure, each 350 gallon per minute pump is tested for about two hours before it is shipped to the customer. The pumps are tested at a maximum two at a time inside a building with the exhaust routed through the ceiling. The two wheel frame makes the units easy to move over short distances. Flat bed hauling is made easy by the overhead lift sling provision. This calculates to a pound per hour rate of less than the significant levels, (see Table 3.) The 350 gallon per minute pump would be considered exempt by not exceeding the insignificant levels found at 10 CSR 10-6.061(3)(A)B3.A.

Table 3: 350 GPM Pump Engine Emission Rate to Exemption Emission Rates.

Pollutant	Insignificant Emission Exemption Levels (lbs/hr)	Potential To Emit at the Maximum Hourly Design Rate of 350 GPM pump Engine Testing (lbs/hr)
PM ₁₀	1.0	0.055
SO _x	2.75	0.0004
NO _x	2.75	1.43
VOC	2.75	0.015
CO	6.88	N/D

EMISSIONS/CONTROLS EVALUATION

The SO_x emission factors used in this analysis for the Kubota EB3000 4- cylinder diesel and the 2.4 liter John Deere Engine were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 3.3 and 3.4, Stationary Internal Combustion Sources, 10/96. At the Tier 1-3 stage, the sulfur content in nonroad diesel fuels was not limited by environmental regulations. The oil industry specification was 0.5% (wt., max), with the average in-use sulfur level of about 0.3% = 3,000 ppm. To enable sulfur-sensitive control technologies in Tier 4 engines—such as catalytic particulate filters and NO_x adsorbers—the EPA mandated reductions in sulfur content in nonroad diesel fuels. Tier 4 impacts the fuel these engines can burn. The Tunner SO_x emission factor was therefore supplied by the engine manufacturer because Tier 4 does not apply, but does restrict design.

Also, the remaining emission factors (PM, NO_x, VOC, and CO) for the 6-cylinder Detroit Diesel, The Kubota EB3000 4- cylinder diesel and the 2.4 liter 3-cylinder John Deere Engine emission factors came from the manufacturer. The HAP emission factors came from AP42, Chapter 3, Table 3.3-2 (Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines), October 1996.

The first federal standards (Tier 1) for new nonroad (or off-road) diesel engines were adopted in 1994, for engines over 37 kW (50 hp), to be phased-in from 1996 to 2000. In 1996, a Statement of Principles (SOP) pertaining to nonroad diesel engines was signed between EPA and engine makers (including Caterpillar, Cummins, Deere, Detroit Diesel, Deutz, Isuzu, Komatsu, Kubota, Mitsubishi, Navistar, New Holland, Wis-Con, and Yanmar). On August 27, 1998, the EPA signed the final rule. This 1998 regulation introduced Tier 1 standards for equipment under 37 kW (50 hp) and increasingly more stringent Tier 2 and Tier 3 standards for all equipment with phase-in schedules from 2000 to 2008. The Tier 1-3 standards are met through advanced engine design, with no or only limited use of exhaust gas aftertreatment (oxidation catalysts). Tier 3 standards for NO_x+HC are similar in stringency to the 2004 standards for highway engines, however Tier 3 standards for PM were never adopted. Therefore use of the Tier 3 tables for PM₁₀ or PM_{2.5} emission would not be appropriate.

Therefore, the PM₁₀ and PM_{2.5} emission factors were not provided. The CALIFORNIA EMISSION INVENTORY AND REPORTING SYSTEM (CEIDARS) was used to establish emission rate for PM₁₀ and PM_{2.5} emissions in this permit. The PM₁₀ and PM_{2.5} emission rates are listed as a fraction of PM emissions from the CEIDARS table (see Table 4). Engine details or specifications are not disclosed in the table. The PM emissions provided from the manufacturer were multiplied by the fraction determined in Table 4 to determine PM₁₀ and PM_{2.5}.

Table 4: CEIDARS PM₁₀ and PM_{2.5} Multiplier Method.

Numbered Line in CEIDARS Table	Fraction from testing that was PM ₁₀	Fraction from testing that was PM _{2.5}
112	0.976	0.967
115	0.994	0.992
116	0.960	0.937
132	0.997	0.927
Total	3.927	3.823
Average Value	0.982	0.956

On May 11, 2004, the EPA signed 69 FR 38957-39273, 29 June 2004, the final rule introducing Tier 4 emission standards, which are to be phased-in over the period of 2008-2015. The Tier 4 standards require that emissions of PM and NOx be further reduced by about 90%. Such emission reductions can be achieved through the use of control technologies—including advanced exhaust gas aftertreatment—similar to those required by the 2007-2010 standards for highway engines. Therefore, Tier 4 emission standards were not applied to this permit.

Potential emissions of the application represent the potential of the Tunner engine, assuming continuous operation (8760 hours per year.) The following table provides an emissions summary for this project.

Table 5: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2009 EIQ)	Potential Emissions of the Application	New Equipment Conditioned Potential
PM _{2.5}	15.0	N/D	N/D	3.49	N/A
PM ₁₀	15.0	7.6	0.62	3.58	N/A
SOx	40.0	<40.0	0.01	12.03	N/A
NOx	40.0	57.2	0.0	40.45	<40.0
VOC	40.0	<250.0	31.11	1.19	N/A
CO	100.0	4.0	0.0	31.42	N/A
HAPs	10.0/25.0	N/D	3.10	0.09	N/A

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

Existing potential emission determined from permit number 042009-007 with project number 2007-05-042.

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 NOx are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

DRS-Sustainment Systems Inc. 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 on April 1st for hard copy May 1st if submitted on line and payment is due on June 1st for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065

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.

Timothy Paul Hines
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 23, 2010, received August 23, 2010, designating DRS Technologies as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated September 14, 2010.

Attachment A - NO_x Compliance Worksheet for EP-50 Tunner Engine Test

DRS Sustainment Systems Inc.
 Howell County, S 20, T24N R 8W
 Project Number: 2010-08-038
 Installation ID Number: 091-0011
 Permit Number: _____

This sheet covers the month of _____ in the year _____

Copy as needed.

Column A	Column B	Column C
(a) Monthly Amount of Fuel Combusted or Hours of Operation (include units)	(b) Emission Factor (include units)	(c) Monthly NO _x Emissions (Tons)
(d) Total NO _x Emissions Calculated for this Month in Tons:		
(e) NO _x Emissions Total from the Previous Eleven (11) Months in Tons:		
(f) Current 12-month Total of NO _x Emissions in Tons:		

- (a) Total amount of fuel combusted in each diesel generator.
- (b) Emission factor for NO_x can be obtained from (1) AP-42, Chapter 3.4, (2) manufacturer's performance data or (3) stack test performed by the facility. The AP-42 factor is 0.438 lbs of NO_x per gallon of diesel.
- (c) Column A x Column B x 0.0005.
- (d) Summation of [Column C] in Tons;
- (e) NO_x emissions total from the previous eleven (11) months can be obtained by summing (d) in the Attachment A for the last eleven (11) months.

Calculate the new 12-month NO_x emissions total. **A 12-Month NO_x emissions total of less than 40.0 tons of NO_x indicates compliance.**

Ms. Tammy Hampton
Environmental Specialist
DRS-Sustainment Systems Inc.
#1 McDaniel Street
West Plains, MO 65775

RE: New Source Review Permit - Project Number: 2010-08-038

Dear Ms. Hampton:

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 amended 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 Timothy Paul Hines at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:thk

Enclosures

c: Southeast Regional Office
PAMS File: 2010-08-038

Permit Number: