APPLICANT'S NAME: **NORTHROP GRUMMAN SPACE AND MISSION SYSTEMS CORP.**

FACILITY PERMIT ID# 800409

CONTACT PERSON: JAMES HEUMANN

MAILING ADDRESS: ONE SPACE PARK
BUILDING CS1/1800
REDONDO BEACH, CA 90278

EQUIPMENT ADDRESS: ONE SPACE PARK
BLDG R3/B107
REDONDO BEACH, CA 90278

Title V Permit Revision:
Application No. 544049

PERMIT TO OPERATE

Equipment Description:

PROCESS 8: INTERNAL COMBUSTION					
Equipment	Device ID	Connected To	Source Type/ Monitoring Unit	Emissions	Equipment Specific Conditions
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, DIESEL FUEL, CATERPILLER, MODEL 3208~~T~~, WITH TURBOCHARGER, ~~240~~269 HP Reference A/N ~~412539~~544050	D~~195~~342		NOX: PROCESS UNIT	CO: 8.5 GRAM/BHP-HR DIESEL(4) [1303(a)(1)-BACT, 5-10-1996]; NOx: 204 LBS/1000GAL DIESEL(1)[RULE 2012, 5-6-2005]; NOx: 6.9 GRAM/BHP-HR DIESEL(4)[1303(a)(1)-BACT, 5-10-1996]; ROG: 0.97 GRAM/BHP-HR DIESEL(4)[1303(a)(1)-BACT, 5-10-1996]; PM: (9) [RULE 404, 2-7-1986]; PM10: 0.4 GRAM/BHP-HR DIESEL (4) [1303(a)(1)-BACT, 5-10-1996; HAP:(10)[40CFR63 SUBPART ZZZZ, 3/9/2011]	~~B61.3~~, B61.4, C1.11, C1.20, E448.3, H23.6, K67.1, K67.5

INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, DIESEL FUEL, CATERPILLER, MODEL 3306~~ATAAC~~, WITH AFTERCOOLER, TURBOCHARGER, ~~377~~382 HP Reference A/N 4~~12488~~544052	D~~221~~343		NOX: PROCESS UNIT	CO: 8.5 GRAM/BHP-HR DIESEL(4) [1303(a)(1)-BACT, 5-10-1996]; NOx: 204 LBS/1000GAL DIESEL(1)[RULE 2012, 5-6-2005]; NOx: 6.9 GRAM/BHP-HR DIESEL(4)[1303(a)(1)-BACT, 5-10-1996]; ROG: 0.97 GRAM/BHP-HR DIESEL(4)[1303(a)(1)-BACT, 5-10-1996]; PM: (9) [RULE 404, 2-7-1986]; PM10: 0.4 GRAM/BHP-HR DIESEL (4) [1303(a)(1)-BACT, 5-10-1996; HAP:(10)[40CFR63 SUBPART ZZZZ, 3/9/2011]	~~B61.3~~, B61.4, C1.11, C1.20, E448.3, H23.6, K67.1, K67.5
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, DIESEL FUEL, CUMMINS, MODEL QSMII-G~~1~~2, WITH AFTERCOOLER, TURBOCHARGER, ~~395~~470 HP Reference A/N 4~~45204~~544053	D~~272~~344		NOX: PROCESS UNIT	CO: 2.6 GRAM/BHP-HR DIESEL(4) [1303(a)(1)-BACT, 5-10-1996; [1303(a)(1)-BACT, 12-6-2002]; NOx: 142 LBS/1000GAL DIESEL(1)[RULE 2012, 5-6-2005]; NOx + ROG: 4.9 GRAM/BHP-HR DIESEL(4)[RULE 2005, 5-6-2005]; PM: (9) [RULE 404, 2-7-1986]; PM10: 0.15GRAM/BHP-HR DIESEL (4) [1303(a)(1)-BACT, 5-10-1996;RULE 1303(a)(1)-BACT, 12-6-2002], HAP:(10)[40CFR63 SUBPART ZZZZ, 3/9/2011]	B61.4, C1.11, C1.20, E448.3, H23.6, K67.1, K67.5

Conditions:

~~B61.3 THE OPERATOR SHALL NOT USE DIESEL FUEL CONTAINING THE FOLLOWING SPECIFIED COMPOUNDS:~~

~~COMPOUND~~	~~PPM BY WEIGHT~~
~~Sulfur greater than or equal to~~	~~0.05~~

B61.4 THE OPERATOR SHALL NOT USE DIESEL FUEL CONTAINING THE FOLLOWING SPECIFIED COMPOUNDS:

COMPOUND	PPM BY WEIGHT
Sulfur greater than	15

C1.11 The operator shall limit the operating time to no more than 200 hour(s) in any one year.

To comply with this condition, the operator shall install and maintain a(n) non-resettable elapse time meter to accurately indicate the elapsed operating time of the engine.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

C1.20 The operator shall limit the operating time to no more than 50 hour(s) in any one year.

To comply with this condition, the operator shall install and maintain a(n) non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

For the purpose of this condition, operating time shall be defined as operation for maintenance and testing purposes.

Operation beyond the allotted time for engine maintenance and testing shall be allowed only in the event of a loss of grid power or up to 30 minutes prior to a rotating outage, provided that the utility distribution company has ordered rotating outages in the control area where the engine is located or has indicated that it expects to issue such an order at a certain time, and the engine is located in a utility service block that is subject to the rotating outage

Engine operation shall be terminated immediately after the utility distribution company advises that a rotating outage is no longer imminent or in effect

E448.3 The operator shall comply with the following requirements:

This engine shall not be used as part of an interruptible service contract in which a facility receives a payment or reduced rates in return for reducing electric load on the grid whenrequested by the utility or the grid operator.

H23.6 This equipment is subject to the applicable requirements of the following rules or regulations:

PM	DISTRICT RULE	1470
PM	DISTRICT RULE	1472
SOx	DISTRICT RULE	431.2

	HAPS	FEDERAL RULE	40CFR63,Subpart ZZZZ
		FEDERAL RULE	40CFR60,Subpart IIII

K67.1 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The date of operation.

The elapsed time in hours.

The reason for operation.

K67.5 THE OPERATOR SHALL KEEP RECORDS, IN A MANNER APPROVED BY THE DISTRICT, FOR THE FOLLOWING PARAMETER(S) OR ITEM(S):

An engine operating log shall be kept and maintained on file to record. The log shall list the date of operation, the timer reading in hours at the beginning and end of operation and the reason for operation.

By January 15th of each year, the operator shall total and record the total hours of operation (including hours for both manual operation and automatic operation) for the previous calendar year.

All records required by this permit shall be retained on the premises for at least five years and shall be made available to any District representative upon request.

Background

Northrop Grumman Space and Missions Systems is engaged in the development and manufacture of advanced semiconductors including fabrication and assembly of electronic components and hardware for integration into satellite and space vehicle. The company also performs research and development relating to chemical lasers, rocket engine thrusters and energy related programs for commercial and non-commercial applications. These operations are currently performed at two major sites within the South Coast Air Basin and they are: Redondo Beach and Manhattan Beach.

Applications 544050(D195), 544052(D221) & 544053(D272) were submitted on 10/18/ 2012 to issue new devices with the correct permit descriptions of existing Emergency Internal Combustion Engines assigned the associated device numbers previously

mentioned. The facility had installed different engines with a higher BHP than what was submitted. The existing equipment devices will be inactivated and a new device assigned.

This is a RECLAIM Cycle 2 and title V facility. The proposed project is considered as a "de minimis significant permit revision to this facility title V permit.

There are no records of nuisance complaints recorded against the facility in last two years. A Notice to Comply (E11077) was issued to the company in October 2011 requiring the company to correct the horsepower rating of an existing 96 BHP engine operating under PERP. The facility corrected the rating the same month the notice was issued and is currently operating in compliance with permit conditions and applicable rules and regulations.

Emission Calculation

The original engines assigned device numbers were not installed. Different ICE's with larger BHPs were installed instead. However, the new engines met the required BACT standards at the time of installation.

Application no. 544050

The engine under this application was installed in 1996. The emissions are summarized as follows:

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.11	6.69	0.0049	1.12	0.149	0.143
lb/hr	0.07	3.96	0.00	0.66	0.0883	0.0848
lb/day Max.	0	4	0	1	0	0
lb/day Avg.	0.098	0.55	0	0.09	0.0120	0.011
lb/yr	3.32	202.15	0.15	33.84	4.50	4.32

Emissions from the previous engine (240HP):

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.04	6.90	0.0049	3.08	0.6	0.576
lb/hr	0.02	3.65	0.003	1.63	0.3172	0.3045
lb/day Max.	0	4	0	2	0	0
lb/day Avg.	0.003	0.51	0.0004	0.22	0.044	0.042
lb/yr	1.08	186.02	0.13	83.04	6.18	15.53

TOTAL EMISSIONS INCREASE/DECREASE FROM THE ENGINE REPLACMENT
(Replacing 240 BHP engine with 269 BHP engine).

	New Engine (269 BHP) lb/day	Old Engine (240 BHP) lb/day	Difference	Emission Increase/Decrease
RHC	0.098	0.003	0.095	Increase
NO_X	0.55	0.51	0.04	Increase
SO_X	0.0004	0.0004	0	
CO	0.09	0.22	-0.13	Decrease
PM_{10}	0.011	0.042	-0.031	Decrease

Application no. 544052
The engine under this application was installed in 2000. The emissions are summarized as follows:

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.143	5.10	0.0049	1.12	0.13	0.125
lb/hr	0.12	4.29	0.00	0.94	0.1094	0.1050
lb/day Max.	0	4	0	1	0	0
lb/day Avg.	0.02	0.60	0.0006	0.13	0.02	0.015
lb/yr	6.14	218.85	0.21	48.06	5.58	5.36

Emissions from the previous engine (377 HP):

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.1	4.01	0.0049	0.63	0.06	0.058
lb/hr	0.08	3.33	0.00	0.52	0.0498	0.0478
lb/day Max.	0	3	0	1	0	0
lb/day Avg.	0.01	0.47	0.0006	0.07	0.007	0.0067
lb/yr	4.23	169.82	0.21	26.68	2.54	2.44

TOTAL EMISSIONS INCREASE/DECREASE FROM THE ENGINE REPLACMENT
(Replacing 377 BHP engine with 382 BHP engine).

	New Engine (382 BHP) lb/day	Old Engine (377 BHP) lb/day	Difference	Emission Increase/Decrease
RHC	0.02	0.01	0.01	Increase
NO_X	0.6	0.47	0.13	Increase
SO_X	0.0006	0.0006	0	

	New Engine (382 BHP) lb/day	Old Engine (377 BHP) lb/day	Difference	Emission Increase/Decrease
CO	0.13	0.07	0.06	Increase
PM_{10}	0.015	0.0067	0.008	Increase

Application no. 544053
The engine under this application was installed in 2005. The emissions are summarized as follows:

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.13	3.82	0.0049	0.75	0.11	0.106
lb/hr	0.13	3.95	0.01	0.78	0.1139	0.1093
lb/day Max.	0	4	0	1	0	0
lb/day Avg.	0.018	0.55	0.001	0.11	0.016	0.015
lb/yr	6.86	201.68	0.26	39.60	5.81	5.58

Emissions from the previous engine (395 HP):

	VOC	**NOx**	**SOx**	**CO**	**PM**	**PM10**
Emission factor, g/HP-hr	0.1	4.70	0.0049	2.60	0.15	0.144
lb/hr	0.09	4.09	0.00	2.26	0.1305	0.1253
lb/day Max.	0	4	0	2	0	0
lb/day Avg.	0.01	0.57	0.0006	0.32	0.018	0.018
lb/yr	4.44	208.55	0.22	115.37	6.66	6.39

TOTAL EMISSIONS INCREASE/DECREASE FROM THE ENGINE REPLACMENT
(Replacing 395 BHP engine with 470 BHP engine).

	New Engine (470 BHP) lb/day	Old Engine (395 BHP) lb/day	Difference	Emission Increase/Decrease
RHC	0.018	0.01	0.008	Increase
NO_X	0.55	0.57	-0.02	Decrease
SO_X	0.001	0.0006	0.0004	Decrease
CO	0.11	0.32	-0.21	Decrease
PM_{10}	0.015	0.018	-0.003	Decrease

Total Emissions increase/decrease from all 3 engines:

	Emissions Increase/Decrease	
RHC	0.112	Increase
NO_X	0.15	Increase
SO_X	0.0	
CO	-0.28	Decrease
PM_{10}	-0.026	Decrease

RISK ASSESSMENT:

Application no. 544050

The actual engine installed was 269bhp instead of 240bhp as submitted. The Tier 2 Risk resulted in the following MICR:

Residential	Commercial
1.24E-08	5.27E-08
Passed	Passed

Based on the emissions from the 269BHP engine.

Application no. 544052

The actual engine installed was 382bhp instead of 377bhp as submitted. The Tier 2 Risk resulted in the following MICR:

Residential	Commercial
1.77E-08	7.56E-08
Passed	Passed

Based on the emissions from the 382BHP engine.

Application no. 544053

The actual engine installed was 470bhp instead of 395bhp as submitted. The Tier 2 Risk resulted in the following MICR:

Residential	Commercial
1.62E-08	6.88E-08
Passed	Passed

Based on the emissions from the 470BHP engine.

Total MICR Risk:

Residential	Commercial
4.63E-08	1.97E-07
Passed	Passed

RULE EVALUATION

Rule 212 (c)(1):This section requires a public notice for all new or modified permit units that emit air contaminants located within 1,000 feet from the outer boundary of a school.

No public notice is required since no school is located within 1,000 ft from the above site.

Rule 212 (c)(2):This section requires a public notice for all new or modified facilities that have on-site emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The proposed project will result in an emission increase for the entire facility. A Rule 212(c) (2) notice will not be triggered since the changes will not result in an emission increase that exceeds the daily maximum under Rule 212(g).

Rule 212(c)(3):This section requires a public notice for all new or modified permit unit with increases in emissions of toxic air contaminants listed in Table I of Rule 1401 resulting in MICR greater than 1E-6 per permit unit or greater than 10E-6 per facility.

The proposed project will result in an emission increase of toxic emissions. However, as discussed in additional detail in the evaluation, the toxic emissions from this equipment will not result in an increase in MICR of more than 1×10^{-6} nor a hazard index greater than 1.0. Public notice is not required under this section of the rule.

Rule 212(g): This section requires a public notice for all new or modified sources that result in emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The increase in Brake Horse Power of the three ICEs will cause an increase in emissions. The following summarizes the emissions:

	Maximum Daily Emissions					
	ROG	NO_x	PM_{10}	SO_2	CO	Pb
Emission increase	0.112	0.15	0	0	0	0

MAX Limit (lb/day)	**30**	**40**	**30**	**60**	**220**	**3**
Compliance Status	Yes	Yes	Yes	Yes	Yes	Yes

No public notice is required since the emission increase is below the thresholds.

Rule 401 With proper operation of this equipment, the visible emissions from the engines are not likely to violate requirements of this rule.

Rule 402 Operation of equipment is not expected to create a nuisance.

Rule 1110.2 Emergency engines are exempt from requirements of this rule.

REG. XIII The proposed engines are tier 1 for engines under application no. 544050, 52 and tier 2 for engine under 544053, as certified by EPA and CARB, which is BACT for emergency diesel engines rated at this capacity as indicated in the table below.

BACT REQUIREMENTS (TIER 1 ENGINES)

	NOx (gm/bhp-hr)	**CO (g**m/bhp-hr)	**ROG (gm/bhp-hr)**	**PM (g**m/bhp-hr)
Required	6.9	8.5	1.0	0.4
Actual a/n 544050	6.69	1.12	0.11	0.11
Actual a/n 544052	5.1	1.12	0.143	0.13
Compliance	Yes	Yes	Yes	Yes

BACT REQUIREMENTS (TIER 2 ENGINES)

	NOx + ROG (gm/bhp-hr)	**CO** (gm/bhp-hr)	**PM (**gm/bhp-hr)
Required	4.8	2.6	0.15
Actual	3.82	0.75	0.11
Compliance	Yes	Yes	Yes

In addition Emergency engines are exempt from Modeling and Offset requirements per section 1304 (a) (4) of Reg. XIII.

Rule 1401: Emergency engines are exempt from the requirements of this rule as per section (g)(1)(F).

Rule 1470: The engine is meeting NOx, ROG and CO & PM emissions standards specified in Table 2 of paragraph (c) (2)(C) (viii) of the rule as summarized above in Reg. XIII evaluation.

Rule 1472: The facility has more than 3 emergency engines on site. A R1472 compliance plan filed under a/no. 494612 was approved for the facility on December19, 2011. The PM emissions from the proposed engines will not significantly increase the Engine Index (0.065). Thus compliance is expected with this rule and a new plan application is not required.

Regulation XX: The facility is under RECLAIM program. The existing engines are meeting the BACT requirements under Rule 2005. The NOx increase due to the increased horsepower of the engines is negligible, compliance is expected.

40 CFR 60 Subpart IIII, These internal combustion engines were manufactured before 2006 and are not subject to the requirements of this NSPS.

40 CFR 60 Subpart JJJJ, The requirements of this subpart are not applicable to Compression Ignition engines.

40 CFR, Part 63,ZZZZ
The above three engines are considered existing emergency engines under the NESHAP. They are all rated at less than 500 BHP and constructed before June 12, 2006. The requirements of the NESHAP such as changing the oil and filter, inspecting the air cleaner, inspection of all hoses and belts, installation of a non-resettable hour meter, maintaining the engine according to manufacturer's specifications, and reporting and record keeping requirements are specified in the permit.

REGULATION XXX:

This facility is in the RECLAIM program. The proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or hazardous air pollutants (HAPs), and a "minor permit revision" for RECLAIM pollutants to the RECLAIM/Title V permit for this facility.

Non-RECLAIM Pollutants or HAPs

Rule 3000(b)(6) defines a "de minimis significant permit revision" as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or HAPs from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

Air Contaminant	Daily Maximum (lbs/day)
HAP	30
VOC	30
NOx*	40
PM10	30
SOx*	60
CO	220

* Not applicable if this is a RECLAIM pollutant

To determine if a project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the 5th permit revision to the Title V renewal permit issued to this facility on June 8, 2010. The following table summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued:

Revision	HAP	VOC	NOx*	PM10	Sox	CO
Previous Permit Revision Total Cummulative to date. Title V permit renewed June 8, 2010	0	2	0	1	0	12
5th Permit Revision Replace 6.5mmbtu/hr boiler D91 with a	0	0	0	0	0	0

new 7.0 mmbtu/hr boiler DXXX						
Installation of 4 emergency ICE's	0	0	4	0	0	0
Replacement of 3 existing ICEs	0	0	0	0	0	0
Cumulative Total	0	2	4*	1	0	12
Maximum Daily	30	30	40*****	30	60	220

* RECLAIM pollutant, not subject to emission accumulation requirements

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs.

RECLAIM Pollutants

Rule 3000(b)(12)(A)(v) defines a "minor permit revision" as any Title V permit revision that does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process.

Since NOx is a RECLAIM pollutant for this facility, a separate analysis shall be made to determine if the proposed permit revision is considered a "minor permit revision" for RECLAIM pollutants. The replacement of the engines will result in a negligible increase in NOx emissions. As a result, this proposed project is considered as a "minor permit revision" for RECLAIM pollutants.

RECOMMENDATION

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants and a "minor permit revision", for RECLAIM pollutant, it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not raise any objections within the review period, a revised Title V permit will be issued to this facility.

Conclusion:

A Permit to Operate is recommended for application numbers 544050, 544052-053 subject to preceding conditions.

Data Inputs

ENGR. INI.	HD
A/N	544052
Appln Date:	10/18/2012
Class:	3

Applicant: NORTHROP GRUMANN
Mailing address: ONE SPACE PARK
REDONDO BEACH, CA 90278

Equipment Address: SAME AS ABOVE

MANUFACTURER:	CATERPILLAR
MODEL NO.:	3306ATAAC
SERIAL NO.:	
CYLINDERS:	6
HP RATING:	382
EMISS.CONTROL:	

Turbocharged	Turbocharged/ Aftercooled	Naturally Aspirated
	X	

TURBOCHARGED AND AFTERCOOLED

Driving: ***GENERATOR***

Generator	Compressor	Pump
X	0	0

GENERATOR

	NMHC	NOx	CO	PM
Emission Factors, g/HP-hr	0.143	5.1	1.12	0.13

	Yes	No
Retard Timing	0	x

Operating schedule

hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50

Data Inputs

ENGR. INI.	HD
A/N	
Appln Date:	10/18/2012
Class:	3

Applicant: NORTHROP GRUMANN
Mailing address: ONE SPACE PARK
REDONDO BEACH, CA 90278

Equipment Address: SAME AS ABOVE

MANUFACTURER: CUMMINS
MODEL NO.: QSM11-G1
SERIAL NO.:
CYLINDERS: 6
HP RATING: 395
EMISS.CONTROL:

Turbocharged	Turbocharged/ Aftercooled	Naturally Aspirated
	X	

TURBOCHARGED AND AFTERCOOLED

Driving: ***GENERATOR***

Generator	Compressor	Pump
X	0	0

GENERATOR

	NMHC	NOx	CO	PM
Emission Factors, g/HP-hr	0.1	4.7	2.6	0.15

	Yes	No
Retard Timing	0	x

Operating schedule

hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50

Data Inputs

ENGR. INI.	HD
A/N	544052
Appln Date:	10/18/2012
Class:	3

Applicant: NORTHROP GRUMANN
Mailing address: ONE SPACE PARK
REDONDO BEACH, CA 90278

Equipment Address: SAME AS ABOVE

MANUFACTURER:	CATERPILLAR
MODEL NO.:	3306TAAC
SERIAL NO.:	
CYLINDERS:	6
HP RATING:	377
EMISS.CONTROL:	

Turbocharged	Turbocharged/ Aftercooled	Naturally Aspirated
	X	

TURBOCHARGED AND AFTERCOOLED

Driving: ***GENERATOR***

Generator	Compressor	Pump
X	0	0

GENERATOR

	NMHC	NOx	CO	PM
Emission Factors, g/HP-hr	0.143	5.1	1.12	0.13

	Yes	No
Retard Timing	0	x

Operating schedule

hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50

Data Inputs

ENGR. INI.	HD
A/N	544053
Appln Date:	10/18/2012
Class:	3

Applicant: NORTHROP GRUMANN
Mailing address: ONE SPACE PARK
REDONDO BEACH, CA 90278

Equipment Address: SAME AS ABOVE

MANUFACTURER: CUMMINS
MODEL NO.: QSM11-G2
SERIAL NO.:
CYLINDERS: 6
HP RATING: 470
EMISS.CONTROL:

Turbocharged	Turbocharged/ Aftercooled	Naturally Aspirated
	X	

TURBOCHARGED AND AFTERCOOLED

Driving: ***GENERATOR***

Generator	Compressor	Pump
X	0	0

GENERATOR

	NMHC	NOx	CO	PM
Emission Factors, g/HP-hr	0.13	3.82	0.75	0.11

	Yes	No
Retard Timing	0	x

Operating schedule

hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50

ATTACHMENT A A/N 544052

Emergency ICEs

Given:

HP	269
g to lb conversion factor	0.0022026
Operating schedule	
hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50

	VOC	NOx	SOx	CO	PM	PM10
Emission factors	0.11	6.69	0.0049	1.12	0.149	0.143

	Yes	No
Retard Timing	0	x

	VOC	NOx	SOx	CO	PM	PM10
Emission correction factor	1	1	1	1	1	1

Computations:

	VOC	NOx	SOx	CO	PM	PM10
Emission factor, g/HP-hr	0.11	6.69	0.0049	1.12	0.149	0.143
lb/hr	0.07	3.96	0.00	0.66	0.0883	0.0848
lb/day Max.	0	4	0	1	0	0
lb/day Avg.	0	0.55	0	0	0	0
lb/yr	3.32	202.15	0.15	33.84	4.50	4.32

Data Inputs

ENGR. INI.	HD
A/N	544050
Appln Date:	10/18/2012
Class:	3

Applicant: NORTHROP GRUMANN
Mailing address: ONE SPACE PARK
REDONDO BEACH, CA 90278

Equipment Address: SAME AS ABOVE

MANUFACTURER:	CATERPILLAR
MODEL NO.:	3208T
SERIAL NO.:	
CYLINDERS:	6
HP RATING:	240
EMISS.CONTROL:	

Turbocharged	Turbocharged/ Aftercooled	Naturally Aspirated
	X	

TURBOCHARGED AND AFTERCOOLED

Driving: ***GENERATOR***

Generator	Compressor	Pump
X	0	0

GENERATOR

	NMHC	NOx	CO	PM
Emission Factors, g/HP-hr	0.04	6.68	1.12	0.149

	Yes	No
Retard Timing	0	x

Operating schedule

hrs/day Max.	1
hrs/day Avg.	1
days/wk	1
hrs/month Max.	4.2
wks/yr	50