



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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August 12, 2013

Mr. AliRiza Ganioglu
The Gillette Manufacturing (USA), Inc.
South Boston Manufacturing Center
One Gillette Park
Boston, MA 02127-1096

RE: **BOSTON** - Metropolitan
Boston/Northeast Region
310 CMR 7.13 Stack Testing
310 CMR 7.02 Plan Approval
App. No. MBR-00-COM-047
Transmittal No. W011710
**FINAL APPROVAL AND STACK
TEST APPROVAL**

Dear Mr. Ganioglu:

The Metropolitan Boston/Northeast Region of the Department of Environmental Protection ("MassDEP" or "Department"), Bureau of Waste Prevention, has reviewed the compliance emissions testing results for Boiler No. 3 (EU3) at your existing powerhouse plant located at One Gillette Park, Boston, Massachusetts. Compliance emissions testing of EU3 was conducted to demonstrate compliance with the requirement of Conditional Approval No. MBR-00-COM-047, dated January 24, 2001.

MassDEP received on February 21, 2013, an application for a significant modification to your existing Air Operating Permit (MBR-95-OPP-076R) to replace the existing Parametric Emission Monitoring System (PEMS) for oxides of nitrogen (NO_x) and carbon monoxide (CO) emissions with a new Continuous Emission Monitoring System (CEMS), including a Data Acquisition System, for EU3. MassDEP is incorporating this change into this Final Approval.

A. EQUIPMENT DESCRIPTION

The submitted information indicates that the existing powerhouse plant at Gillette Manufacturing (USA), Inc. (Gillette) consists of a Combustion Engineering Model VP-14WT boiler (EU2) having a maximum energy input capacity of 153,000,000 British thermal units per hour (Btu/hr). EU2 utilizes natural gas as the only fuel of use. EU2 is used as a tertiary option to the Combustion Turbine Generator (CTG)/Heat Recovery Steam Generator (HRSG) (EU1/EU9). EU3 (described below) is used as a secondary option to EU1/EU9.

EU3, an Alstom Power Energy Model No. 31VP2180 boiler, has a maximum energy input capacity of 196,000,000 Btu/hr and is able to produce 140,000 pounds of steam per hour at 1000 pounds per square inch gauge (psig) and 900 degrees Fahrenheit (⁰F) steam temperature. EU3 combusts natural gas as its primary fuel and Ultra Low Sulfur Distillate (ULSD) fuel oil having a maximum sulfur content of less than or equal to 0.0015 percent by weight as its auxiliary fuel. Auxiliary fuel use shall be limited to no more than 1,041,600 gallons per rolling twelve month calendar period (equivalent to 744 hours of full operation per year) (See Condition No. 4).

The average of the most recent 5-years of actual nitrogen oxides (NO_x) emissions from the powerhouse (Boiler No. 1 and EU2) was 211.5 tons per year. Boiler No. 1 was removed on December 31, 2008. The new powerhouse configuration (EU2 and EU3) shall be limited to no more than 211.5 tons of NO_x per rolling twelve month calendar period (See Condition No. 2).

EU3 is equipped with a Coen Low NO_x burner with Flue Gas Recirculation (FGR) and a Peerless Selective Catalytic Reduction (SCR) system to minimize the emissions of NO_x and a Peerless oxidation catalyst system to minimize the emissions of carbon monoxide (CO).

The flue gas from both boilers exits from a single, existing steel stack having a height of 160 feet above ground level and an exit diameter of 6.33 feet. For EU3, the maximum stack gas exit velocity is 45.0 feet per second at a maximum stack gas exit temperature of 320 ⁰F. This existing stack was originally equipped with a Fireye System FE-5 opacity monitor/recorder and alarm. This existing opacity monitoring system shall be replaced with a new LAND 4500 MkIII or equivalent Continuous Opacity Monitoring System (COMS) for EU2 and a separate new LAND 4500 MkIII or equivalent COMS for EU3.

B. NEW SOURCE PERFORMANCE STANDARDS (NSPS)

EU3 is subject to the New Source Performance Standards (NSPS) 40 CFR 60 Subpart Db for boilers since it is rated at more than 100 million Btu/hr (See Proviso No. 26). Gillette shall ensure that the subject boiler complies with the NSPS NO_x limit through the use of a low NO_x burner with FGR in conjunction with a SCR add-on NO_x control technology to control NO_x emissions to 0.0061 pounds/million Btu (lbs. /MMBtu) during natural gas firing and 0.11 lbs. /MMBtu during ULSD fuel oil firing.

Subpart Db limits NO_x to 0.1 lbs. /MMBtu for natural gas-fired and distillate oil fired units with low heat release rates and 0.2 lb/MMBtu for natural gas-fired and distillate oil fired units with high heat release rates. EU3 is a high heat release boiler. The EU3 emission limits, contained in Table 1 below, are below the Subpart Db limits.

C. COMPLIANCE TESTING

MassDEP review of the report's test results indicates that the air emissions from EU3 demonstrated compliance with its air emission requirements. A summary of the test results is given in Table I below.

Table I. Emission Testing Results for EU3 Combusting Natural Gas

	Run #1	Run #2	Run #3	Average	Emission Limit
NO _x *	0.0041	0.0043	0.0043	0.0042	0.0061
CO*	0.0006	0.0002	0.0000	0.0003	0.015
Total Particulate Matter (PM)*	0.0123	0.0084	0.108	0.0105	0.011
NH ₃ Slip**	0.0	0.0	0.0	0.0	2.0

* Emission rate units are in pounds per million British Thermal Units (Btu).

** Emission rate in parts per million by volume, dry at 7 percent O₂

Emission rates are averaged from the results of three test runs.

= number, NO_x = oxides of nitrogen, CO = carbon monoxide, NH₃ = ammonia

D. EMISSION LIMITATIONS

Table II below contain the maximum emission rates of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO₂), particulate matter (PM) and ammonia slip (NH₃) from EU3 in pounds per million Btu.

Table II Emission Limitations

Pollutant	Emission Rate, pounds per million Btu	
	Natural Gas	Fuel Oil ¹
NO _x	0.0061	0.10
PM ³	0.011	0.011
CO	0.015	0.016
VOC	0.010	0.010
SO ₂	0.0006	0.0015
NH ₃ Slip	2.0 ²	2.0 ²

1 = ULSD fuel oil containing less than or equal to 0.0015 percent sulfur content by weight.

2 = parts per million by volume, dry at 7 percent O₂

3 = includes condensable particulate matter

E. CONDITIONS

1. Gillette shall notify this Regional Office in writing when the CEMS and COMS installations are complete and the equipment is ready for continuous operation, within fourteen (14) days thereof.

2. Gillette shall restrict air emissions from EU2 and EU3 combined to less than or equal to: 70.0 tons of NO_x per month and 211.5 tons of NO_x per twelve month rolling calendar period.
3. In order to verify that Gillette does not exceed the emission limits listed above, Gillette shall maintain on-site adequate monthly records to document actual emissions. These records shall list the actual amount of fuel used per month and the actual NO_x emissions for the previous 12 months (the total of the current month's emissions plus the emissions from the 11 months preceding the current month). The following formula shall be used to calculate EU2 and EU3 NO_x emissions:

$$\frac{(A)(6.1 \times 10^{-6})}{2000} + \frac{(B)(0.0154)}{2000} + \frac{(C)(4.0 \times 10^{-4})}{2000} + \frac{(D)(0.056)}{2000} \leq F$$

- A = cubic feet of natural gas combusted in EU3;
B = gallons of ULSD fuel oil having a maximum sulfur content of less than or equal to 0.0015 percent by weight combusted in EU3;
C = cubic feet of natural gas combusted in EU2;
D = gallons of ULSD fuel oil having a maximum sulfur content of less than or equal to 0.0015 percent by weight combusted in EU2;
F = 211.5 tons per 12- month rolling period and 70 tons per month.

Gillette shall submit to this office, attention Permit Chief for the Bureau of Waste Prevention, by January 31 and July 31 for the previous six months, respectively, a semi-annual compendium of the latest 6 months emissions. Records of the above emission rates shall be maintained on-site for at least the five (5) most recent years, and shall be made available to MassDEP personnel upon request.

4. In order to verify that the emission limits in Condition 2 above are not exceeded, Gillette shall:
 - a) install, calibrate, maintain, and operate separate fuel-metering devices and recorders for each fuel of use for EU2 and EU3 so that fuel usage can be recorded for the individual EUs;
 - b) utilize natural gas as the primary fuel and ULSD fuel oil having a maximum sulfur content of less than or equal to 0.0015 percent by weight as the auxiliary fuel in EU3. The use of ULSD fuel oil in EU3 shall not exceed 1,041,600 gallons per rolling twelve-month period;
 - c) ensure that EU3 shall comply with the emission limitations in pounds per million Btu heat input, for each fuel of use, contained in Table II in Section D above. Documentation from the equipment manufacturer shall be maintained on site that EU3 and its appurtenances as designed and installed

shall comply with the emission limitations contained in Table II in Section D when operated in accordance with the manufacturer's instructions;

- d) conduct NO_x/CO optimization and tune EU3 according to procedures contained in EPA 340/1-83-023 "Combustion Efficiency Optimization Manual for Operators of Oil and Gas Fired Boilers" with the goal of reducing air pollutant emissions to optimum levels. In addition, Gillette shall tune EU3 in accordance with said procedures and inspect and maintain EU3 per manufacturer recommendations as well as test for efficient operation on an annual basis. The results of said inspection, maintenance, and testing and the date upon which it was performed shall be recorded and posted conspicuously on or near the subject equipment;
 - e) keep ongoing records for EU2 and EU3 that include:
 - which EU(s) are operative at any given time; and,
 - fuel purchases receipts and fuel usage logs which reflect actual fuel usage on a weekly basis. Said fuel usage logs shall also contain: monthly totals of fuel usage and resulting emissions from each type of fuel burned, the actual sulfur content of the fuel oil used, and the total fuel usage and resulting emissions from each type of fuel burned for the previous twelve months;
 - f) maintain adequate records on site, which document the number of gallons of ULSD fuel oil that Gillette has utilized on a rolling 12-month period;
 - g) maintain adequate records on site of when Gillette switches to ULSD fuel oil in EU3. These records shall indicate the date and time of the fuel switch, the duration of the fuel switch, the amount of ULSD fuel oil consumed during each fuel switch, and the date and time for return to natural gas firing;
 - h) keep all required records on site for five (5) years and make them available for inspection by MassDEP personnel upon request.
5. For the purpose of calculating emissions resulting from each fuel burned, the following values shall be used:

Heat Content:

Natural Gas = 1,000 Btu per cubic foot
ULSD fuel oil = 140,000 Btu per gallon

6. That for compliance testing purposes, EU3 shall be constructed so as to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two outlet sampling ports for the unit must be located at a minimum of one duct diameter upstream and two duct diameters downstream of any flow disturbance.

7. Gillette shall conduct emissions compliance testing on EU3 for NO_x, CO, particulate matter and NH₃ to demonstrate compliance with the emission limitations as specified in Table II above, if and when Gillette decides to utilize ULSD fuel oil in EU3. All emission testing shall be completed within 90 days of the utilizing ULSD fuel oil in EU3 and shall be conducted in accordance with the appropriate test methods and procedures as contained in 40 CFR 60 Appendix A or in accordance with a test protocol approved by MassDEP. This compliance testing shall be witnessed by MassDEP personnel at a mutually agreeable time and date.
8. Gillette shall conduct NH₃ slip optimization/minimization compliance stack testing on EU3 on an annual basis by October 1st of each year.
9. Gillette shall ensure that the SCR control equipment for EU3 is operational whenever the exhaust temperature attains 550 °F at the inlet to the SCR unit.
10. Gillette shall keep properly maintained, operable, portable ammonia detectors for use during an ammonia spill, or other emergency situation involving ammonia, at or nearby the powerhouse control room.
11. Gillette shall ensure that the subject ammonia storage tank shall be equipped with high and low level audible alarm monitors.
12. Gillette shall maintain an adequate supply of spare parts on-site to maintain the CEMS equipment servicing EU3.
13. Gillette shall install, calibrate, test and operate a Data Acquisition and Handling System(s) (DAHS) and CEMS and COMS in accordance with the Federal Regulations under 40 CFR Part 60, Appendices B and F. These systems shall be used to measure and record the following emissions for EU3:
 - a) Oxygen (O₂)
 - b) Oxides of Nitrogen (NO_x)
 - c) Carbon Monoxide (CO)
 - d) Opacity
14. Gillette shall ensure that all emission monitors and recording equipment servicing EU3 comply with MassDEP approved performance and location specifications, and conform with the EPA monitoring specifications at 40 CFR Part 60.13 and 40 CFR Part 60 Appendices B and F, and all applicable portions of 40 CFR Parts 72 and 75.
15. Gillette shall equip the CEMS and COMS with audible and visible alarms to activate whenever emissions from EU3 exceed the limits established in Table II of this Final Approval.
16. Gillette shall operate each CEMS and COMS servicing EU3 at all times except for periods of CEMS and COMS calibration checks, zero and span adjustments, preventative maintenance, and periods of unavoidable malfunction.

17. Gillette shall obtain and record emission data from each CEMS and COMS serving EU3 for at least 75% of the emission unit's operating hours per day, for at least 75% of the emission unit's operating hours per month, and for at least 95% of the emission unit's operating hours per quarter, except for periods of CEMS and COMS calibration checks, zero and span adjustments, and preventive maintenance.
18. All periods of excess emissions from EU3, even if attributable to an emergency/malfunction or start up/shutdown shall be quantified and included by Gillette in the determination of annual emissions and compliance with the annual emission limits as stated in Condition No. 2 of this Final Approval ("**Excess Emissions**" are defined as emissions, which are in excess of the short term emissions as stipulated in Table II.). An exceedance of emission limits in Table II due to an emergency or malfunction shall not be deemed a federally permitted release as that term is used in 42 U.S.C. Section 9601(10).
19. Gillette shall use and maintain its CEMS and COMS servicing EU3 as "direct-compliance" monitors to measure NO_x, CO, O₂ and Opacity. "Direct-compliance" monitors generate data that legally documents the compliance status of a source.
20. A quality assurance/quality control (QA/QC) Plan must be developed for the long-term operation of the CEMS and COMS serving EU3 which conforms to 40 CFR Part 60, Appendix F, all applicable portions of 40 CFR Parts 72 and 75. The QA/QC Plan must be submitted in writing, and reviewed and approved in writing by MassDEP at least 30 days prior to commencement of facility operation. Any subsequent changes to the Plan that effect air emissions shall be approved by MassDEP.
21. Gillette shall operate a continuous monitor and alarm system to monitor the temperature at the inlet to the SCR catalyst serving EU3.
22. That Gillette shall allow MassDEP to witness tuning of EU3 if and when requested by MassDEP.
23. That Gillette shall comply with the requirements of 40 CFR Part 60, Subpart Db for EU3.
24. That Gillette shall operate the facility in such a manner as to prevent the occurrence of noise, dust and odor, and/or visible emissions from the facility, which cause or contribute to a condition of air pollution. Gillette shall take immediate steps to abate any nuisance condition(s), including but not limited to noise, dust and odor, and/or visible emissions, that may be generated by the operation of this facility.
25. That Gillette shall post a copy of this Final Approval letter adjacent to EU3.
26. A copy of the Standard Operating and Maintenance Procedures for EU3 shall be located at or nearby the subject equipment.

27. That Gillette shall report to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form and this Final Approval letter.
28. That Gillette shall promptly report to MassDEP all instances of deviations from permit requirements by telephone, fax or e-mail, within three days of discovery of such deviation.
29. Gillette shall maintain an Environmental Logbook, or equivalent, which shall document actions associated with environmental issues and overall emissions changes at the facility. The facility shall record information such as the results of federal, state, or local environmental inspections; maintenance or corrective actions related to pollution control equipment; and measures taken to lower overall emissions to the environment (air, odors, solid waste, etc.). This Logbook, or equivalent, shall be made available to MassDEP personnel upon request.
30. Gillette shall allow MassDEP personnel access to the plant site, buildings, and all pertinent records at all reasonable times for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

Failure to comply with any of the above stated conditions or any other part of this Approval will constitute a violation of the "Regulations" and can result in the revocation of the Approval granted herein and/or other appropriate enforcement action as provided by law. MassDEP may also revoke this Approval if the construction work has not begun within two years from the date of issuance of this Approval, or if the construction work is suspended for one year or more.

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Environmental Affairs, for air quality purposes, was not required prior to this action by the Department. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and Regulation 301 CMR 11.00, Section 11.03, provide certain "Fail-Safe Provisions" which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report at a later time.

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and be postmarked within twenty-one (21) days after the date you receive this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection

P.O. Box 4062
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Please be advised that this Approval does not negate the responsibility of Gillette to comply with this or any other applicable federal, state, or local regulations now or in the future. Nor does this Approval imply compliance with any other applicable federal, state, or local regulations now or in the future.

Should you have any questions concerning this Approval, please contact Marc Altobelli at (978) 694-3284 or at the following address: Massachusetts Department of Environmental Protection, 205B Lowell Street, Wilmington, Massachusetts 01887.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Marc Altobelli
Environmental Engineer
Bureau of Waste Prevention

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

James E. Belsky
Permit Chief
Bureau of Waste Prevention

cc: Board of Health, 1010 Massachusetts Avenue, Boston, MA 02118
Fire Headquarters, 115 Southampton Street, Boston, MA 02118
E-copy: DEP/BOSTON, Business Compliance, 7th Floor, Attn: Y. Tian