

BEFORE THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:)	DOCKET NO. CAA-10-2012-0195
)	
Shell Gulf of Mexico Inc.,)	ADMINISTRATIVE COMPLIANCE
)	ORDER ON CONSENT
)	
)	
Respondent.)	

I. STATUTORY AUTHORITY

1.1. This Administrative Order on Consent (“Order”) is issued under the authority vested in the Administrator of the U.S. Environmental Protection Agency (“EPA”) by Section 113(a)(3) and (4) of the Clean Air Act (“CAA”), 42 U.S.C. § 7413(a)(3) and (4).

1.2. The Administrator has delegated the authority to issue this Order to the Regional Administrator of EPA Region 10, who has re-delegated this authority to the Director of the Office of Compliance and Enforcement in EPA Region 10.

1.3. Pursuant to Section 113(a) of the CAA, 42 U.S.C. § 7413(a), EPA hereby issues, and Shell Gulf of Mexico Inc. (“Shell”) agrees to issuance of, this Order.

II. FINDINGS

Statutory and Regulatory Authority

2.1 Pursuant to Section 328 of the CAA, 42 U.S.C. § 7627, EPA promulgated air quality regulations applicable to Outer Continental Shelf (“OCS”) sources, which are set forth in

40 C.F.R. Part 55. Under 40 C.F.R. § 55.13(d)(2), an OCS source that is a major stationary source and which proposes to locate on the OCS is required to obtain a Prevention of Significant Deterioration (“PSD”) permit before beginning construction. The requirements of the PSD program are established under Part C of Title I of the CAA, 42 U.S.C. §§ 7470-7492, and are found at 40 C.F.R. § 52.21.

2.2 Section 165(a)(3) of the CAA, 42 U.S.C. § 7475(a)(3), and the implementing regulations at 40 C.F.R. § 52.21(k), require a PSD permit applicant to demonstrate that, for all criteria air pollutants that would be emitted in excess of the significance thresholds at 40 C.F.R. § 52.21(b)(23)(i), the allowable emission increases (including secondary emissions) from a proposed new major stationary source, in conjunction with all other applicable emission increases or reductions at the source, would not cause or contribute to a violation of any National Ambient Air Quality Standard (“NAAQS”) nor cause or contribute to a violation of any applicable “maximum allowable increase” over the baseline concentration in any area (“increment”).

2.3 Section 165(a)(4) of the CAA, 42 U.S.C. § 7475(a)(4), and the implementing regulations at 40 C.F.R. § 52.21(j), require “best available control technology” or “BACT” on the stationary source for each pollutant subject to regulation under the CAA that it would have the potential to emit in significant amounts.

2.4 BACT is defined in 40 C.F.R. §52.21(b)(12) in part as:

an emissions limitation ...based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification

Permit

2.5 Pursuant to the authority of Section 328 of the CAA, 42 U.S.C. § 7627, and Part C of Title I of the CAA, EPA issued to Shell Outer Continental Shelf/Prevention of Significant Deterioration Permit No. R10OCS/PSD-AK-09-01 (the "Permit") to authorize air emissions from exploratory oil and gas drilling operations in the Chukchi Sea with the Discoverer drillship and a fleet of associated vessels ("Associated Fleet"). The Permit became effective on January 27, 2012.

2.6 EPA set the emission limits in the Permit based on the best information available to EPA at the time of issuance of the Permit.

2.7 Condition A.1 of the Permit requires Shell to construct and operate the Discoverer and the Associated Fleet in accordance with the application and supporting materials submitted by Shell to EPA prior to issuance of the Permit.

2.8 Shell submitted an application dated June 28, 2012 and received by EPA on June 29, 2012, an amendment to that application dated August 6, 2012, and a supplement to the amendment dated August 14, 2012 (collectively, the "Revision Application"), in which Shell requests certain revisions to the Permit conditions.

Discoverer Main Generator Engines

2.9 The Discoverer is a drillship leased by Shell. Air emissions associated with the Discoverer's oil and gas exploratory drilling operations are authorized under the Permit and subject to the conditions set forth therein.

2.10 Condition C.1 of the Permit requires that the exhaust from each Main Generator Engine be directed to an operating Selective Catalytic Reduction ("SCR") unit at all times that any of the six generator engines on the Discoverer, Units FD 1-6 ("Main Generator Engines"), is operating.

2.11 Condition C.2 of the Permit requires that the exhaust from each Main Generator Engine be directed to an operating oxidation catalyst at all times that any of the Main Generator Engines is operating.

2.12 Condition C.3 of the Permit imposes emission limits identified as BACT limits on emissions from each of the Main Generator Engines as follows:

2.12.1 Condition C.3.1: 0.50 grams of nitrogen oxides (“NO_x”) per kilowatt-hour (“g/kW-hr”);

2.12.2 Condition C.3.2: 5 parts per million by volume (“ppmv”) of ammonia slip at actual stack gas conditions;

2.12.3 Condition C.3.3, C.3.4, and C.3.5: 0.127 g/kW-hr for particulate matter (“PM”), PM less than 10 microns in diameter (“PM₁₀”), and PM less than 2.5 microns in diameter (“PM_{2.5}”);

2.12.4 Condition C.7: 0.1790 g/kW-hr for carbon monoxide (“CO”); and

2.12.5 Condition C.8: 0.0230 g/kW-hr for volatile organic compounds (“VOC”).

2.13 The Permit also contains annual and hourly emission limits for NO_x emissions from the Main Generator Engines (Conditions C.4 and C.5) that are based on anticipated source operations and intended to ensure that operations under the Permit do not cause or contribute to a violation of the NAAQS.

2.14 Shell’s application for the Permit included a BACT analysis for the Main Generator Engines that was based on a technical proposal from D.E.C. Marine for installation of SCR and oxidation catalysts on the Main Generator Engines. Correspondence from D.E.C. Marine included a vendor representation that its SCR unit could achieve an emission rate for NO_x of 0.5 g/kW-hr from each engine.

2.15 Conditions C.1, C.3.1, and C.3.2 of the Permit are based on EPA's determination during issuance of the Permit that SCR represents BACT-level controls for NO_x for the Main Generator Engines because SCR had the highest control effectiveness (90% control) of all technically feasible control technologies and because Shell did not propose to reject SCR on the basis of cost.

2.16 Conditions C.3.3, C.3.4, C.3.5, C.3.7, and C.3.8 of the Permit are based on EPA's determination that an oxidation catalyst, in conjunction with the use of ultra low sulfur diesel fuel, represents BACT-level controls for PM, PM₁₀, PM_{2.5}, CO, and VOC.

2.17 Catalytic diesel particulate filters ("CDPF"), which contain an oxidizing catalyst in addition to a diesel particulate filter system, have a higher control efficiency for PM, PM₁₀, PM_{2.5}, CO, and VOC than other potential control options, but were rejected as BACT-level controls for the Main Generator Engines during issuance of the Permit because CDPFs were not considered to be "available" at the time of Permit issuance for the specific installation on the Discoverer and also were economically infeasible.

2.18 The limit on ammonia slip in Condition C.3.2 is incorrectly characterized as a BACT limit in the Permit because ammonia is not a "regulated NSR pollutant" as defined in 40 C.F.R. § 52.21(b)(50) and is thus not subject to BACT requirements.

2.19 The draft permit issued by EPA for public comment in August 2009 for the Discoverer's operations proposed a limit on and associated ongoing monitoring of ammonia slip emissions to ensure good operation of the SCR on the Main Generator Engines, and thus compliance with the NO_x emission limit in Condition C.3.1. The revised draft permits issued by EPA in January 2010 and July 2011 did not require ongoing monitoring of ammonia slip emissions. The final Permit also does not require ongoing monitoring of ammonia slip emissions but instead relies on continuous monitoring and recording of the inlet temperature and urea flow

and weekly measurements of NO_x concentrations with a portable monitoring device, as provided in Condition B.14. of the Permit, to monitor compliance with the NO_x limit on the Main Generator Engines.

2.20 Shell has advised EPA, through its Revision Application, that it installed the SCR and oxidation catalyst as proposed by D.E.C. Marine (“D.E.C. Control Technology”), but subsequent source testing showed that the D.E.C. Control Technology was not capable of meeting the Permit’s emission limits for NO_x, PM, PM₁₀, PM_{2.5}, and ammonia slip on a continuous basis and that all of the applicable emission limits were met only once in more than 60 source tests. Shell advised EPA that during this testing and tuning phase it tried two additional SCR catalysts to determine whether a different catalyst improved performance of the D.E.C. Control Technology, but the technology was still unable to meet the permitted limits for NO_x, PM, PM₁₀, PM_{2.5}, and ammonia slip simultaneously.

2.21 Shell has advised EPA, through its Revision Application, that the capital cost of the D.E.C. Control Technology for the Main Generator Engines was approximately \$750,000, with a total cost of procuring, engineering and designing, installing, testing, and commissioning the D.E.C. Control Technology of approximately \$23.5 million.

2.22 Shell has advised EPA, through its Revision Application, that after investigating and, in some cases, testing other emissions control technology to improve the performance of the D.E.C. Control Technology in an attempt to consistently meet the BACT emission limits for the Main Generator Engines, the engines with the D.E.C. Control Technology were still only occasionally able to meet the NO_x limit and PM, PM₁₀, and PM_{2.5} emissions were typically 50% higher than the applicable emission limits.

2.23 Shell has advised EPA, through its Revision Application, that it subsequently identified a technology provided by a different vendor (CleanAir) that offered a control system integrating SCR with a newly developed CDPF, referred to as an "E-POD."

2.24 Shell has advised EPA, through its Revision Application, that it determined that the E-POD system offered the best possibility for meeting the Permit's emission limits for NO_x, PM, PM₁₀, PM_{2.5}, and ammonia slip for the Main Generator Engines.

2.25 Shell has advised EPA, through its Revision Application, that despite several months of efforts to refine the performance of the E-POD as applied to the Main Generator Engines, extensive source testing of the Main Generator Engines with E-PODs indicates that the engines are not able to consistently meet the Permit's emission limits for NO_x and ammonia slip simultaneously at all permitted ranges of operation of the engines, but are able to consistently meet the BACT emission limits for PM, PM₁₀, and PM_{2.5} as well as for CO and VOC.

2.26 Shell has advised EPA, through its Revision Application, that the capital cost of the E-PODs and ancillary equipment for the Main Generator Engines was approximately \$3.2 million, with a total cost of procuring, engineering and designing, installing, testing, and commissioning the E-PODs of approximately \$14.8 million, and a total aggregated cost of procuring, engineering and designing, installing, testing, and commissioning control equipment in an effort to meet the Permit's emission limits identified in paragraph 2.12 in excess of \$38 million.

Discoverer Mudline Cellar Compression Engine

2.27 Shell has advised EPA, through its Revision Application, that it installed a CDPF that includes an oxidation catalyst, instead of an oxidation catalyst alone, on Mud Line Cellar (MLC) Compressor Engine Unit FD-9. The CDPF on FD-9 is equipped with a Hi-BACK monitoring system.

Nanuq PM₁₀ and PM_{2.5} Limits

2.28 The Nanuq is an oil spill response vessel leased by Shell that is part of the Associated Fleet authorized to operate under the Permit and is subject to the emission limits and other requirements in Section Q of the Permit.

2.29 Condition Q.1 of the Permit requires that the exhaust from each propulsion engine or non-propulsion engine on the Nanuq be directed to an operating CDPF system at all times while the Discoverer is an OCS source, the Nanuq is within 25 miles of the Discoverer, and any of such engines are in operation.

2.30 Condition Q.4.1 of the Permit imposes an emission limit of 3.03 pounds per day (lbs/day) for PM₁₀ and 3.03 lbs/day for PM_{2.5} from all propulsion and non-propulsion engines on the Nanuq in aggregate.

2.31 Conditions Q.1 and Q.4.1 of the Permit are based on anticipated source operations and intended to ensure that operations under the Permit do not cause or contribute to a violation of the NAAQS.

2.32 The Nanuq is not subject to emission limits representing BACT.

2.33 Shell has advised EPA through its Revision Application that it installed the CDPFs on the Nanuq engines and generators as required by the Permit, but that source testing conducted in March and June 2012 showed that the units are not capable of meeting the Permit's emission limit of 3.03 lbs/day for PM₁₀ and for PM_{2.5} on a continuous basis when the units are operating in accordance with the Permit (including the requirements to use ultra low sulfur diesel fuel and to direct emissions to an operating CDPF) and requested that the limit be increased to 10.0 lbs/day for PM₁₀ and for PM_{2.5}.

Restrictions on Maximum Operating Rates

2.34 The Permit requires that source testing of most emission units on the Discoverer and the Associated Fleet be conducted at multiple loads; generally, at least one test must be conducted at 100% load.

2.35 Shell leases, and does not own, the Discoverer or the Nanuq.

2.36 Shell has advised EPA, through its Revision Application, that in some cases, the owners of the Discoverer and the Nanuq have imposed requirements that certain engines not be operated above certain operating rates or have installed physical restrictions that limit the operating rate of certain engines. For example, although the Main Generator Engines have a nameplate capacity of 980 kW, the owner of the Discoverer has established 800 kW as the maximum operating rate for the Main Generator Engines and has installed a system that limits the engines' operating rate accordingly.

Revision Application

2.37 The Revision Application submitted by Shell requests that EPA:

2.37.1 Increase the BACT limit for NO_x emissions from the Main Generator Engines in Condition C.3.1 from 0.50 g/kW-hr to 1.2 g/kW-hr for Units FD-1, FD-3, FD-4, and FD-5, and to 2.0 g/kW-hr for Units FD-2 and FD-6;

2.37.2 Increase the aggregate annual limit for NO_x emissions from the Main Generator Engines in Condition C.4.1 from 5.83 tons/rolling 12-month period to 17.1 tons/rolling 12-month period;

2.37.3 Increase the aggregate hourly limit for NO_x emissions from the Main Generator Engines in Condition C.5.1 from 4.64 lb/hr to 13.6 lb/hr;

- 2.37.4 Delete the emission limit identified as a BACT limit for ammonia slip in Condition C.3.2;
- 2.37.5 Revise Condition B.15 to expand the applicability of the identified monitoring requirements to a CDPF combined with an SCR control system (in addition to oxidation catalyst devices, as is currently specified);
- 2.37.6 Revise Condition C.2 to require that exhaust from the Main Generator Engines be directed to an operating CDPF (which includes an oxidation catalyst), rather than to an oxidation catalyst alone;
- 2.37.7 Revise Condition F.1 to specify that exhaust from MLC Compressor Engine Units FD-10 and FD-11 be directed to an operating oxidation catalyst, and add an additional permit term requiring that exhaust from MLC Compressor Engine Unit FD-9 be directed to an operating CDPF (which includes an oxidation catalyst) equipped with a Hi-BACK monitoring system;
- 2.37.8 Revise Condition F.8 to add monitoring and recordkeeping requirements for the proposed Hi-BACK monitoring system for the CDPF installed on MLC Compressor Engine Unit FD-9.
- 2.37.9 Impose limits on the maximum operating rates of the following emission units at levels below those identified in the Permit so that operation at these revised maximum operating rates can be considered operating at 100% load for purposes of meeting the source testing requirements of the Permit:
- 2.37.9.1 The Main Generator Engines (Units FD-1 through FD-6);
- 2.37.9.2 The two main propulsion engines on the Nanuq.

2.37.10 Increase the aggregate engine and generator daily emission limits for the Nanuq for PM₁₀ and PM_{2.5} in Conditions Q. 4.1 from 3.03 lbs/day to 10.0 lbs/day.

2.38 The Revision Application states that:

2.38.1 Installing the E-POD systems on the Main Generator Engines, which include CDPFs that combine a particulate filter with an oxidation catalyst, will result in a greater reduction of emissions of PM, PM₁₀, and PM_{2.5} as compared to an oxidation catalyst alone, and will not result in an increase of CO or VOC emissions;

2.38.2 The limit of 0.5 g/kW-hr imposed in Condition C.3.1 of the Permit as the BACT limit for NO_x from the Main Generator Engines is in fact lower than the limit that the Main Generator Engines are capable of meeting on a continuous basis with BACT-level controls, and thus is not BACT for the Main Generator Engines;

2.38.3 The ammonia slip limit imposed in Condition C.3.2 of the Permit as a BACT limit is in fact not a BACT limit because emissions of ammonia are not subject to BACT. In addition, an emission limit on ammonia slip is not needed to monitor the performance of the E-POD systems on the Main Generator Engines;

2.38.4 The aggregate daily emission limits for the Nanuq for PM₁₀ and PM_{2.5} in Conditions Q. 4.1 of 3.03 lbs/hr is lower than an emission limit the engines are capable of achieving on a continuous basis using the controls required by the Permit because of an error in the underlying assumptions used in establishing the emission limits.

2.38.5 If the Permit is revised by EPA as requested by Shell in the Revision Application:

2.38.5.1 NO_x emissions from the Main Generator Engines authorized under the Permit will increase by 11.27 tons per year (tpy);

2.38.5.2 PM₁₀ and PM_{2.5} emissions from the Nanuq authorized under the Permit will each increase by 0.42 tpy;

2.38.5.3 Ammonia emissions will increase by 1.5 tpy;

2.38.6 If the permit is revised as requested by Shell in the Revision Application, emissions authorized under the Permit will not cause or contribute to a violation of the NAAQS.

2.39 EPA is currently reviewing the Revision Application and does not anticipate that it will be able to take final agency action on the application during the current drilling season of July 1 to November 30, 2012.

2.40 Based on EPA's preliminary review of the Revision Application:

2.40.1 The emission limit for NO_x in Section C.3.1 of the Permit is more stringent than an emission limit based on BACT-level controls because it is not technically feasible;

2.40.2 The emission limit for ammonia slip in Section C.3.2 of the Permit is mislabeled as a BACT limit and is no longer needed because the Permit requires a continuous monitoring system to ensure proper operation of the SCR units on the Main Generator Engines;

2.40.3 Installation of CDPFs on the Main Generator Engines and on MLC Compression Engine Unit FD-9 that include oxidation catalyst are

expected to result in emission reductions that are at least as great for all pollutants (and likely much greater with respect to PM, PM₁₀, and PM_{2.5}) than the use of oxidation catalyst alone on these engines;

2.40.4 The aggregate daily emission limits for the Nanuq for PM₁₀ and PM_{2.5} in Condition Q. 4.1 of 3.03 lbs/hr is based on an error in the underlying assumptions used in establishing the emission limits; and

2.40.5 The additional emissions of NO_x, PM₁₀, and PM_{2.5} that may be emitted by the Discoverer and the Associated Fleet during the duration of this Order are not expected to cause or contribute to a violation of the NAAQS.

2.41 Shell has submitted excess emission and permit deviation reports to EPA under Permit Condition A.15

2.42 Shell is operating the Discoverer and other vessels in the Associated Fleet in violation of the Permit and Sections 111(e) and 165 of the CAA, 42 U.S.C. § 7411(e) and 7475.

III. DEFINITIONS

3.1 Unless otherwise expressly provided herein, terms used in this Order shall have the meaning given to those terms in the CAA and the regulations promulgated thereunder. In addition, the following definitions shall apply to the terms used in this Order:

“Effective Date” means the latter date, if any, of signature by the Signatories;

“Order” means this Administrative Order on Consent;

“Parties” means EPA and Shell;

“Shell” means Shell Gulf of Mexico Inc., its successors and assigns, and its officers, directors, agents, servants, and employees in their capacities as such, assignees, and delegates and all other persons and entities as provided for in Fed. R. Civ. P. 65(d);

“Signatories” means EPA and Shell;

“Termination Date” means the date in paragraph 6.10.

IV. TERMS AND CONDITIONS

4.1. Shell admits the jurisdictional allegations contained in Part I of this Order.

4.2. Shell neither admits nor denies the findings in Part II of this Order.

4.3. Shell expressly waives any right to contest issuance of this Order.

4.4. Shell shall comply with all proposed permit terms and conditions in its Revision Application, as set forth in Attachment A.

4.5. In addition, Shell shall:

4.5.1 To the maximum extent possible, use Main Generator Engines Units FD-1, FD-3, FD-4, and FD-5 before using Units FD-2 and FD-6.

4.5.2 Submit a graphical representation of the operating time of each Main Generator Engine during each month no later than the 30 days after the end of the month that includes the period for which the calculations were performed.

4.5.3 Submit the calculations required by Conditions C.9.4 and C.9.5, no later than the 30 days after the end of the month that includes the period for which the calculations were performed.

4.5.4 In addition to the weekly NOx monitoring of exhaust from the Main Generator Engine SCR units required by Condition B.14.6, monitor and record the NOx concentrations two additional times at least five minutes apart. If it is not practicable to complete the increased monitoring required by this paragraph for the SCR units on all six engines in a given

week, Shell may conduct the increased monitoring on a minimum of three SCR units each week provided that the SCR units which are not subject to the increased monitoring requirements of this paragraph in a given week shall be subject to these requirements the following week.

Notwithstanding the increased monitoring described in this paragraph, Condition B.14.6 requires that the NOx emissions of each SCR unit be monitored at least once a week.

4.5.5 For each engine, submit the weekly NOx emission concentrations in parts per million required to be collected by Condition B.14.6 and paragraph 4.5.4 above, along with the operating load recorded in accordance with Condition C.9.3 for one hour before and one hour after the required NOx monitoring during no later than 30 days after the end of the month that includes the weeks for which the calculations were performed.

4.5.6 Report all emissions in excess of and deviations from the requirements of this Order as provided in Condition A.15.

4.6. Shell agrees that EPA's review of the Revision Application shall be conducted as it would be for any proposed permit revision and shall not be prejudiced by the fact that EPA has entered into this Order with Shell.

4.7. Shell shall not rely on or cite to any finding in Paragraph 2.40 of this Order in commenting on any proposed or final action on the Revision Application or in any administrative or judicial appeal of any final permit issued in response to the Revision Application.

4.8. Shell shall cooperate with EPA in the timely issuance of a final action on the Revision Application, including promptly submitting all information requested by EPA.

VI. GENERAL PROVISIONS

6.1 Any violation of this Order may result in a civil judicial action for an injunction or civil penalties of up to \$37,500 per day per violation, or both, as provided in Section 113(b)(2) of the CAA, 42 U.S.C. § 7413(b)(2), as well as criminal sanctions as provided in Section 113(c) of the CAA, 42 U.S.C. § 7413(c).

6.2 All provisions of the CAA remain in full force and effect notwithstanding the issuance of this Order.

6.3 As provided in CAA Section 113(a)(4), nothing in this Order shall prevent EPA from assessing penalties or otherwise affect or limit the United States' authority to enforce under other provisions of the CAA, or affect any person's obligations to comply with any section of the CAA or with a term or condition of any permit or applicable implementation plan promulgated or approved under the CAA.

6.4 Nothing herein shall be construed to limit the power of EPA to undertake any action against Shell or any person in response to conditions that may present an imminent and substantial endangerment to the public health, welfare, or the environment.

6.5 This Order is neither a permit, license, authorization, nor a modification of existing permits under any federal, state, or local law, and in no way relieves Shell of its responsibilities to comply with all applicable federal, state, and local laws, regulations, and permits.

6.6 This Order shall apply to and be binding upon the Parties, their successors and assigns, and their officers, directors, employees in their capacities as such, assignees, and delegates and all other persons and entities as provided for in Fed. R. Civ. P. 65(d).

6.7 From the Effective Date of this Order, until its termination, Shell shall give written notice and a copy of this Order to any successors in interest at least thirty (30) days prior to any transfer of ownership or control of any portion of or interest in the Discover or any vessels in the Associated Fleet while operating under the Permit, or any assignment of rights concerning, or delegation of duties relating to, any of the operations of the Discoverer or any vessels in the Associated Fleet under the Permit. Shell shall condition any transfer, in whole or in part, of ownership of, operation of, or other interest in the Discoverer while operating under the Permit upon a binding written commitment to fully and successfully execute the terms and conditions of this Order. Simultaneously with such notice, Shell shall provide written notice of such transfer, assignment, or delegation to EPA. In the event of any such transfer, assignment, or delegation, Shell shall not be released from the obligations or liabilities of this Order unless EPA has provided written approval of the release of said obligations or liabilities.

6.8 This Order shall be effective upon the Effective Date. Signature by the representative of a Signatory on any copy of the Order shall constitute signature of the Order for determining the Effective Date.

6.9 Any modification of this Order shall be by agreement of the Parties and in writing and shall not take effect until the written agreement is signed by all Signatories.

6.10 This Order shall terminate on the earlier of the following (the "Termination Date") at which point Shell shall operate in compliance with the Permit, including any final and effective revision to the Permit, in all respects or cease operations under the Permit:

6.10.1 One year after the Effective Date of this Order:

6.10.2 The effective date of any final agency action taken by EPA on the
Revision Application:

6.10.3 Immediately upon receipt by Shell of notice from EPA finding that Shell
has not complied with the material provisions of this Order; or

6.10.4 Immediately upon receipt by Shell of notice from EPA finding that an
imminent and substantial endangerment to public health, welfare, or the
environment has occurred.

6.11 Unless this Order states otherwise, whenever, under the terms of this Order,
written notice is required to be given, or a report or other document is required to be sent by one
Signatory to another, it shall be directed to the individuals specified at the addresses in paragraph
6.12, unless those individuals or their successors give notice of a change of address to the other
Signatories in writing. All notices and submissions shall be considered effective upon receipt,
unless otherwise provided.

6.12 The following addresses shall be used for notices and submissions required by
this Order:

U.S. Environmental Protection Agency
Region 10, Mail Stop OCE-164
1200 Sixth Avenue, Suite 900
Seattle, WA 98101
Attn: John Pavitt

With a duplicate sent to:
R10OCSAirPermits_Reports@epa.gov

Shell Gulf of Mexico Inc.
3601 C Street, Suite 1000
Anchorage, AK 99503
Attn : Pauline Ruddy
Team Leader-Regulatory Affairs and Permitting

6.13 Each undersigned representative of the Parties certifies that he or she is authorized to enter into the terms and conditions of this Order to execute and bind legally the Parties to this document.

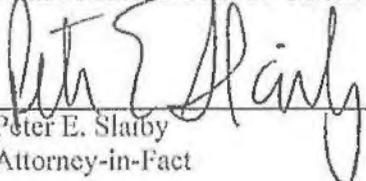
VII. EFFECTIVE DATE

7.1 Pursuant to Section 113(a)(4) of the CAA, an Order does not take effect until the person to whom it has been issued has had an opportunity to confer with EPA concerning the alleged violations. By signing this Administrative Order on Consent, Shell acknowledges and agrees that it has been provided an opportunity to confer with EPA prior to issuance of this Order. Accordingly, this Order will take effect immediately upon signature by the latter of Shell or EPA.

DATED:

09/06/2012

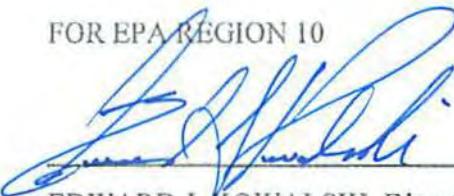
FOR SHELL GULF OF MEXICO INC.


Peter E. Slarby
Attorney-in-Fact

DATED:

9/7/2012

FOR EPA REGION 10


EDWARD J. KOWALSKI, Director
Office of Compliance and Enforcement

ATTACHMENT A¹²
TO ADMINISTRATIVE COMPLIANCE ORDER ON CONSENT
DOCKET NO. CAA-10-2012-0195

COC B.15 Oxidation Catalyst and Combined Catalytic Diesel Particulate Filter (CDPF) Control Device Monitoring. For any emission unit that is required by this permit to be controlled by an oxidation catalyst control device, or a CDPF combined with SCR control system, the permittee shall install, calibrate, operate, and maintain (in accordance with manufacturer specifications) CMS to measure and record inlet temperature (°F), and catalyst activity (CO ppm concentration) as follows:

- 15.1 Prepare and submit 60 days before the first drilling season a site-specific monitoring plan that addresses the monitoring system design, data collection, quality assurance, and quality control elements outlined in this condition. Install, calibrate, operate, and maintain each CMS according to the procedures in the approved site-specific monitoring plan. The plan shall address the performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, sensor tolerance and sensitivity, and data acquisition and calculations; sampling interface (e.g., thermocouple) location such that the monitoring system will provide representative measurements; equipment performance checks, system accuracy audits, or other audit procedures; ongoing operation and maintenance procedures; and ongoing reporting and recordkeeping procedures.
- 15.2 The temperature CMS shall collect data at least once every 15 minutes.
- 15.3 Conduct the CMS equipment performance checks, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan within 60 days prior to each drilling season and at least once every 3 months for the duration of the drilling season.
- 15.4 Conduct a performance evaluation of each CMS in accordance with the site-specific monitoring plan.
- 15.5 Except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system.

¹ The defined terms in Outer Continental Shelf/Prevention of Significant Deterioration Permit No. R10OCS/PSD-AK-09-01 (Permit) apply to this Attachment A.

² All references to permit conditions that are not preceded by "COC" refer to the permit conditions in the Permit. References to permit conditions that are preceded by "COC" refer to conditions in this Attachment A.

quality assurance or quality control activities (including, as applicable, system accuracy audits and required zero and span adjustments), operate the CMS at all times the affected source is operating. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. Complete monitoring system repairs in response to monitoring system malfunctions and return the monitoring system to operation as expeditiously as practicable.

- 15.6 Monitor and record CO emissions (ppm) from the exhaust of each oxidation catalyst unit, or combined CDPF and SCR system once per week using a portable CO monitor that meets the requirements of EPA OTM 13 found at <http://www.epa.gov/ttn/emc/prelim/otm13.pdf>.
- 15.7 Report as a permit deviation under Condition A.15.3 any periods during which the inlet temperature is less than 300°C, or the CO concentration is 120% or more than the CO concentration measured during the most recent previous source test that produced compliance data or emission factors for this permit.

COC C.2 **Operation of CDPF.** At all times that any of Units FD-1– 6 are in operation, the exhaust from each emission unit shall be directed to an operating CDPF.

- 2.1 The CDPF shall be equipped with an operating monitor and alarm unit that records exhaust pressure and temperature.
- 2.2 During each day that each of Units FD-1-6 is operated, the exhaust temperature shall be above 300°C, or 572°F, for at least 30 percent of the time.

COC C.3. **BACT Limits.** Emissions from each generator engine (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below:

- 3.1. **NO_x for Units FD-1, FD-3, FD-4, and FD-5:** 1.2 g/kW-hr
 - 3.1.1 For compliance with Condition COC C.3.1, measurement of NO_x shall be determined using EPA Method 7E.
- 3.2 **NO_x for Units FD-2 and FD-6:** 2.0 g/kW-hr
 - 3.2.1 For compliance with Condition COC C.3.2, measurement of NO_x shall be determined using EPA Method 7E.

3.3 PM: 0.127 g/kW-hr

3.3.1 For compliance with Condition COC C.3.3, measurement of PM shall be determined using EPA Method 5.

3.4 PM₁₀: 0.127 g/kW-hr

3.4.1 For compliance with Condition COC C.3.4, measurement of PM₁₀ shall be determined using EPA Methods 201A and 202.

3.5 PM_{2.5}: 0.127 g/kW-hr

3.5.1 For compliance with Condition COCC.3.5, measurement of PM_{2.5} shall be determined using EPA Methods 201A and 202.

3.6 **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

3.6.1 For compliance with Condition COC C.3.6, measurement of visible emissions shall be determined using EPA Method 9.

3.7 CO: 0.1790 g/kW-hr

3.7.1 For compliance with Condition COCC.3.7, measurement of CO shall be determined using EPA Method 10.

3.8. VOC: 0.0230 g/kW-hr

3.8.1 For compliance with Condition COC C.3.8, measurement of VOC shall be determined using EPA Method 25A.

COC C.4. Annual Emission Limits. Emissions from all six generator engines in aggregate (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below:

4.1. NO_x: 17.1 tons/rolling 12-month period

4.1.1. For compliance with Condition COC C.4.1, measurement of NO_x shall be determined using EPA Method 7E.

COC C.5. Hourly Emission Limit. Emissions from all six generation engines in aggregate (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below:

- 5.1. **NOx:** 13.6 lb/hr
5.1.1. For compliance with Condition COC C.5.1, measurement of NOx shall be determined using EPA Method 7E.

COC C.7. Electrical Power Output Limit. The permittee shall not operate Units FD-1 – 6 such that:

- 7.1 Aggregated electrical power from the attached generators is in excess of 3,872 kWe for any hour that these units are operated; or
7.2 Electrical power from any single generator is in excess of 800 kWe for any hour that such unit is operated.

COC F.1 Operation of Oxidation Catalyst. At all times that either of Units FD-10 – 11 are in operation, the exhaust from each emission unit shall be directed to an operating oxidation catalyst.

COC F.2 Operation of CDPF. At all times that Unit FD-9 is in operation, the exhaust shall be directed to an operating CDPF.

- 2.1. The CDPF shall be equipped with an operating HiBACK monitor and alarm unit that records exhaust pressure and temperature.
2.2. During each day that Unit FD-9 is operated, the exhaust temperature shall be above 300°C, or 572°F for at least 30 percent of the time.

COC F.8 Monitoring, Recordkeeping and Reporting: The permittee shall:

- 8.6. Monitor the exhaust temperature of FD-9 by use of the HiBACK monitor and alarm unit, whenever the engine is in operation.
8.7. Each day, calculate and record for the previous calendar day, the percent of operational time for FD-9 that the exhaust temperature was above 300°C (572°F).
8.8 Monitor and record CO emissions (ppm) from the exhaust of each oxidation catalyst unit or CDPF once per week using a portable CO monitor that meets the requirements of EPA OTM 13 found at <http://www.epa.gov/ttn/emc/prelim/otm13.pdf>

COC Q.4 Daily Emission Limits: At all times while the Discoverer is an OCS source and the Oil Spill Response fleet is within 25 miles of the Discoverer, emissions from the Oil Spill Response Fleet shall not exceed the emission limits specified:

- 4.1. Nanuq propulsion engines and generators in aggregate (Units N-1 – 4):

4.1.1. **PM₁₀**: 10.0 lbs/day

4.1.1.1. For compliance with Condition COC Q.4.1.1, measurement of PM₁₀ shall be determined using EPA Methods 201A and 202.

4.1.2. **PM_{2.5}**: 10.0 lbs/day

4.1.2.1. For compliance with Condition COC Q.4.1.2, measurement of PM_{2.5} shall be determined using EPA Methods 201A and 202.

COC Q.9. Monitoring, Recordkeeping and Reporting. The permittee shall:

9.4. Monitor and record fuel usage for each propulsion and generator engine (Units N-1-4) at least hourly.

COC Q.5.5. Fuel Usage Limit. At all times while the Discoverer is an OCS source and the Nanuq is within 25 miles of the Discoverer, the permittee shall not use in excess of 134 gal/hr of fuel in the Nanuq propulsion engines (Units N-1 – 2) on a per engine basis.