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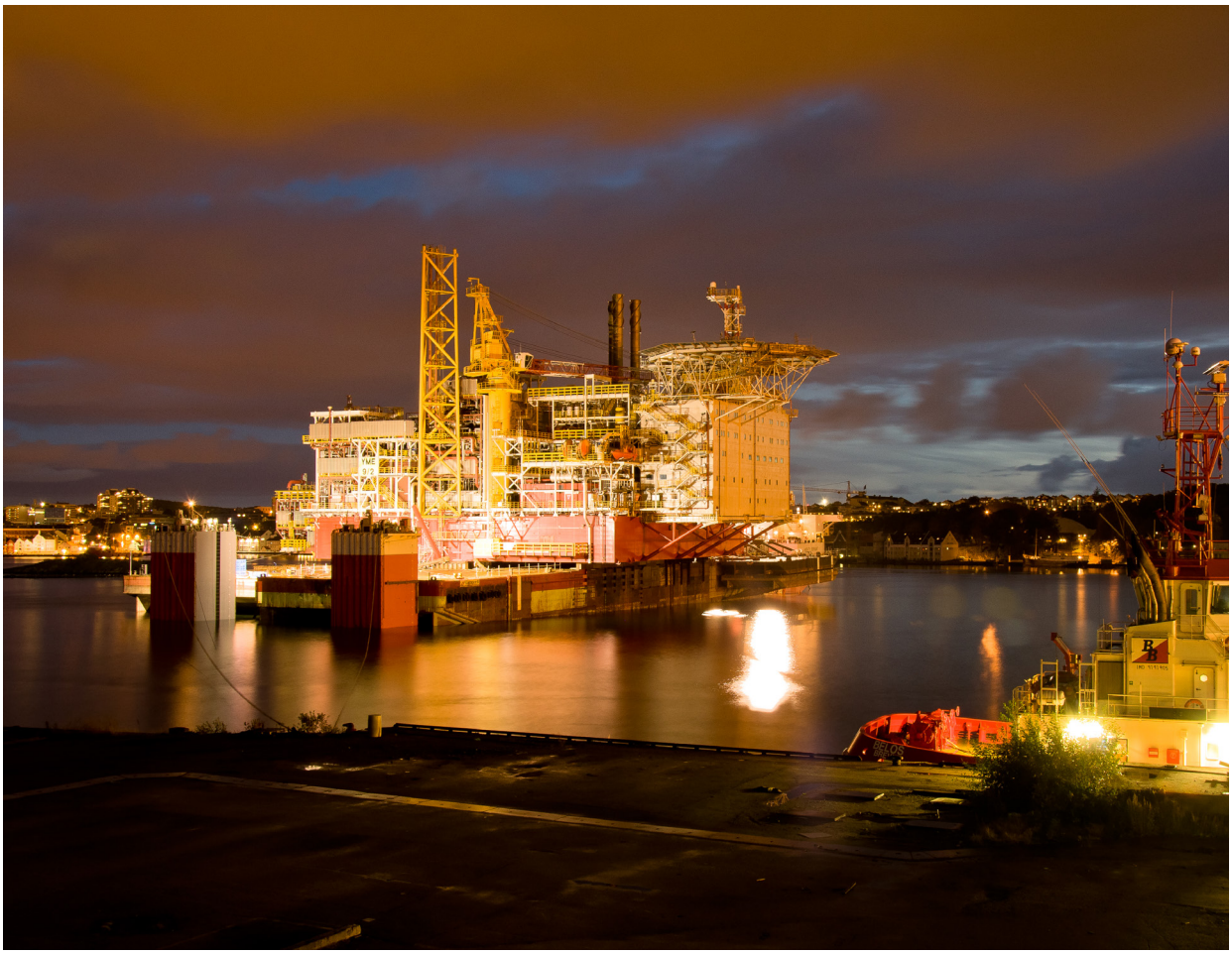
Germany Assessment of Discharges, Spills and Emissions from Offshore Oil and Gas Installations in 2013 -17



Offshore Oil & Gas Industry Series

2019

Assessment of the Discharges, Spills and Emissions from Offshore Installations on the German Continental Shelf (GCS) in 2013-2017

Contents

Executive Summary

This report presents the discharge, spills and emission data from offshore oil and gas operations on the German Continental Shelf (GCS) of the North Sea over the period 2013-2017 and the assessment of the data. The data on which the assessment is based is published by OSPAR .

Level of Activity

The German Continental Shelf (GCS) is a mature area within the OSPAR region but still provides exploration opportunities.
The level of activity is presently relatively low , comprising 2-3 wells drilled annually.
The total production figures of oil, gas and condensate produced from a total of 2 fixed installations were relatively stable at slightly above 1 Mio toeq annually.
Produced water is the only contributor to planned oil discharges to sea from the petroleum industry.

Discharges and spills of oil

Overall the quantity of dispersed[1] oil (aliphatic oil) discharged to sea via produced water **decreased significantly** during the reporting period, dropping from 0,20 tonnes in 2013 to 0,01 tonnes in 2017 due to fundamental technical upgrades on the discharging platform. The discharges for the single years during the period varied depending on shut down times due to construction works, the number of wells produced and changing geological conditions.
There were no oil spills to sea on the GCS between 2013 and 2017.

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a. Chemicals

The use and discharge of chemical substances have been regulated by OSPAR protocols since the beginning of 2001 and have been implemented into German regulatory practice by means of the operation plan procedure
(Betriebsplanverfahren) in accordance with German mining law.
The annual total quantity of chemicals discharged depends very much on the number of wells drilled within the respective year in the German Exclusive Economic Zone
(EEZ).
Within the reporting period this varied between 0-2 wells per year.

b. Atmospheric emissions

Atmospheric emissions are not regulated by OSPAR measures but they are reported annually to OSPAR.
The trend of emissions to the atmosphere has been stable in the German sector at a comparatively low level. An exemption has been the year 2017 where due to special one off activities the figures were generally higher. Nearly all the emissions are caused by gas turbines installed on the two platforms.

Récapitulatif

[1] * "Aliphatics" and "aromatics" are defined by the reference method set in OSPAR Agreement 2005-15 (Sovent extraction, Infra-Red measurement at 3 wavelengths). In that context, "aliphatics" and "dispersed oil" mean the same thing.

Le présent rapport comporte des données portant sur les rejets, déversements et émissions provenant des activités pétrolières et gazières offshore sur le plateau continental allemand (GCS) en mer du Nord entre 2013 et 2017 ainsi que leur évaluation. Les données sur lesquelles se fonde l'évaluation sont publiées par OSPAR.

Niveau d'activité

Le plateau continental allemand (GCS) est une région pétrolière et gazière arrivée à maturité de la zone OSPAR mais elle offre encore des possibilités d'exploration.

Le niveau actuel d'activité est relativement faible, deux à trois puits étant forés chaque année.
La production totale gazière, pétrolière et de condensat réalisée par deux installations fixes a été relativement stable, étant légèrement supérieure à 1 Mio toeq par an.
L'eau de production est le seul contributeur aux rejets d'hydrocarbures en mer prévus par l'industrie pétrolière.

Rejets et déversements d'hydrocarbures

Dans l'ensemble, la quantité d'hydrocarbures dispersés[2] (hydrocarbures aliphatiques) rejetés en mer dans l'eau de production **a diminué considérablement** au cours de la période de notification, passant de 0,20 tonnes en 2013 à 0,01 tonnes en 2017 grâce à des mises à jour techniques fondamentales des plateformes responsables des rejets. Les rejets par année au cours de la période varient selon la durée de la fermeture pendant les travaux de construction, le nombre de puits produits et la variabilité des conditions géologiques.
Aucune marée noire ne s'est produite sur le GCS entre 2013 et 2017.

Produits chimiques

L'utilisation et le rejet de produits chimiques sont réglementés par des protocoles OSPAR depuis le début de 2001 et ont été mis en vigueur dans le cadre de la réglementation allemande grâce au plan d'opération (Betriebsplanverfahren) conformément à la législation minière allemande.

La quantité totale annuelle de produits chimiques rejetés dépend beaucoup du nombre de puits forés au cours de l'année concernée dans la Zone économique exclusive (ZEE) allemande.
Il s'agit d'un à deux puits par an durant la période de notification.

Emissions atmosphériques

Les émissions atmosphériques ne sont pas réglementées par les mesures OSPAR mais elles sont notifiées tous les ans à OSPAR.
La tendance des émissions atmosphériques s'est stabilisée à un niveau relativement bas dans le secteur allemand. L'année 2017 a cependant été l'exception car les résultats ont été

[2] Les hydrocarbures « aliphatiques » et « aromatiques » sont définis par la méthode de référence énoncée dans l'Accord OSPAR 2005-15 (Extraction par solvant, mesure par infrarouges à 3 longueurs d'onde). Dans ce contexte, les termes « hydrocarbures aliphatiques » et « hydrocarbures dispersés » ont le même sens.

dans l'ensemble plus élevés en raison d'activités ponctuelles. La presque totalité des émissions sont causées par des turbines à gaz installées sur les deux plateformes.

1. Introduction and infrastructure

This report provides an assessment of the discharges, spills and emissions to the North Sea from offshore oil and gas activities on the German Continental Shelf
(GCS) during the period 2013 - 2017.
The report is based on data submitted by the operators on the GCS to the German Authorities and reported by Germany in the annual OSPAR Report on discharges, spills and emissions from offshore oil and gas installations.
The purpose of this OSPAR reporting initiative is to assess trends related to the effectiveness of OSPAR measures and national regulation. It must be stated that in the case of Germany, the low level of activity and the dominant effect of single projects (e.g.drilling of only 1 well can result in a 100% increase of discharges in the EEZ) make it difficult to show meaningful long term trends.
The data from 2013-2017 used in this report have previously been collected and published by OSPAR's Offshore Industry Committee (OIC) after assessment by the Expert Assessment Panel (EAP), and the data is provided in Annex 1.
It should be noted that Germany is a very small oil and gas producer in the OSPAR region with a negligible contribution to the total emissions and discharges to the North Sea.

Level of activity
Germany has only two producing platforms and is a small producer of oil and gas in the OSPAR region. One of the two platforms operates in a zero discharge mode to sea, i.e. there are no discharges to the marine environment.
The German offshore oil and gas production has remained largely stable over the reporting period at about 1 Mio toeq / year, however gas production has shown a decreasing trend from about 100000 toeq in 2013 to 67338 toeq in 2017.
The total number of wells drilled -both production and exploration wells- ranged between 2-3 drilling projects annually.

2. Discharge of produced / displacement water

a. Dispersed oil discharges

Discharges of dispersed oil are regulated in accordance with OSPAR Recommendation 2001/1 (as amended) with its 30 mg dispersed oil per liter limit.
During the reporting period, the total quantity of dispersed oil (aliphatic oil) discharged to the sea from produced water decreased significantly from 0,20 tonnes in 2013 to 0,01 tonnes in 2017. The decisive factor for that decrease was a fundamental modernization of the separation technology on the discharging platform introduced as a BAT/BEP measure.
Displacement water is not used or discharged in the GSC.
Fortunately no spills to sea occurred in the GSC during the reporting period.

b. Concentrations of oil in water discharges

The 30 mg/l performance standard for oil in produced water, undertaken in accordance with OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations, was not exceeded during the period.

Due to the technical measure mentioned under **a.** the annual average dispersed oil concentration figures decreased from about 18 mg/l in 2013 to 1,24 mg/l in 2017.

c. Risk based Approach (RBA)

In 2012 OSPAR Recommendation 2015/5 for a risk based approach to the management of produced water discharges from offshore installations was adopted.
All operators who discharge produced water have to perform risk assessments by the end of 2018.
Germany follows a substance and whole effluent toxicity based approach to the RBA analogous to the procedure used in the Netherlands.
First results indicate that the risk is adequately controlled and no additional measures are needed.

d. Oil spills

No spills to sea from the oil and gas industry occurred during the reporting period in the GCS.

3. Discharges of Organic Phase Fluids (OPF) to sea

OSPAR Decision 2000/3 aims to prevent and eliminate pollution resulting from the use and discharge of OPF and OPF-contaminated cuttings[2] and prohibits the discharge of cuttings contaminated with OBF[3] at a concentration greater than 1% by weight on cuttings.
There were no discharges of cuttings contaminated with **O**rganic **P**hase **F**luids (OPF) to sea in the GCS, as defined in OSPAR Decision 2000/3.
Cuttings drilled with OPF were 100 % transported to shore.
The OPF drilling fluids were completely recycled and reused or transported to shore but never discharged to sea.

4. Chemicals

a. Use & Discharge

Since 2001 use and discharge of chemicals have been regulated by OSPAR.
Germany as a very small oil and gas producer does not have a registration system for offshore chemicals itself as the effort would be disproportionate.
As nearly 100 % of the activities in the GCS are directed from operators and contractors in the Netherlands, the German system of handling chemicals is based on the Dutch system.
Chemicals are registered for the Netherlands by the Centre of Environment, Fisheries and Aquaculture Science (CEFAS Laboratories) in the UK.
Every supplier is obliged to register their chemicals at CEFAS. After extensive testing each chemical receives a risk ranking so that the use and discharge is controlled.The total quantity of chemicals discharged on the GCS ranged between 1287 tonnes in 2013 when there were higher levels of drilling activities down to less than 13 tonnes in the following years.
On average more than 95% of the discharged substances were chemicals from the OSPAR Plonor[2] list with the remaining 5% from the ranking category.
No substances from the OSPAR List of Chemicals for Priority Action (LCPA[3]) were used in the German sector of the North Sea during the reporting period.

b. Spills

In the German Continental Shelf (GCS) there were no chemical spills caused by the oil and gas industry within the reporting period.

5. Atmospheric Emissions

Atmospheric emissions are not covered by OSPAR measures or harmonized OSPAR measure methodologies.
Pollutants are regulated under relevant EU and German national regulations which are applicable within the 12 nm zone.

The substances reported to OSPAR each year are: CO2, NOx, nmVoc, CH4 and SO2.
In general the reported and published figures indicate a slight upward trend of those emissions though they remain at a relatively low level.
Due to the small number of sources even single activities or projects can significantly change the overall statistics.

[2] PLONOR : **P**ose **L**ittle **O**r **N**o **R**isk to the environment
[3] LCPA : Substance listed in the OSPAR **L**ist of **C**hemicals for **P**riority **A**ction

6. Counting and QA procedures relating to OSPAR data

There are some differences in the manner in which Contracting Parties count installations.
In Germany this is not a problem as only **two** fixed platforms are installed and no subsea installations, no FPSOs etc. need to be taken into account.
Quality assurance, transparency and harmonization of the reported data are achieved through the use of:

- harmonized sampling and analysis procedures
- certified laboratories
- data collection formats
- an Expert Assessment Panel (EAP)

The quality of the data submitted is the responsibility of each operator.

Data Overview:
An overview of the data reported annually by Germany and assessed by the EAP are published on the OSPAR website.

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