

Global Flow Measurement Workshop 24-26 October 2023

Technical Paper

New Measurement Regulation in Norway – Operators View

Vegar Ingdal Hansen, Equinor

1 INTRODUCTION

The Norwegian regulation on fiscal measurement in the petroleum sector has been upgraded significantly in the version entered into force May 1st, 2023 [1]. Part of the motivation for the new regulation has been to strengthen the relation between the regulation and the supervision activity and to align the expressions used with definitions in international standards. Also, qualitative and quantitative requirements are worked out based on requirements in international standards. An expert group with external members has followed the work and has been used for discussions of the various matters.

In this paper, the new measurement regulation is discussed from the view of an Operator. The paper will focus on the process of the regulation development as seen from the Operator, some implementation consequences on existing and new metering stations and the Operator view on flexibility, cost efficiency and predictability.

2 NORWEGIAN PETROLEUM DIRECTORATE (NPD)

The Norwegian Petroleum Directorate (NPD) contributes to achieve the greatest possible value for society from the oil and gas industry through efficient and sound resource management. The NPD set frameworks, lay down regulations and make decisions where this is delegated and are responsible for carrying out measurement technical supervision and collecting fees from the petroleum industry.

The regulation on fiscal measurement in the petroleum sector [2] regulates the requirements for measuring the amount of petroleum produced and the amount subject to CO₂ tax and aims to ensure that accurate and reliable measurements form the basis for calculating the state's taxes and fees, as well as the licensees' income from the petroleum business. Dedicated guidelines [3] elaborates and indicates how the regulation can be fulfilled.

2.1 Co-operation NPD and Operators

The co-operation between the NPD and the Operators have been on a thrust basis based on open dialogue. This means that the Operators have been given an extended responsibility to fulfil agreements and regulations. Open dialogue and low threshold for communication have been a key factor for making this work.

Typically, the minimum follow-up from the NPD have been through audits (approximately every 2nd year for all assets) and annual status reports (sometime every six months). For special cases that needs more attention meetings and/or official letters have been used.

Global Flow Measurement Workshop 24-26 October 2023

Technical Paper

3 THE NEW REGULATION

3.1 Before July 2022

It was known that the NPD was and had been working on updating the regulations for some time. It was also known that they have occasionally been using an reference group. The group consisted of four experts with different background. The reference group was occasionally used to discuss different cases and to ensure alignment with the industry.

3.2 From July 2022

The first hearing [5] started July 1st, 2022, to evaluate the first revision of the new regulation. The news of the hearing was swiftly picked up on by the whole industry and all relevant companies started to evaluate the new regulation. Some discussions started in between the different companies before Offshore Norge initiated a task force. Offshore Norge is an employer and industry organization for companies with activities related with the Norwegian continental shelf [4]. The Operators agreed on creating an Offshore Norge task force and six companies came forward with personnel for the task force. The task force had several work meetings where every single paragraph was thoroughly discussed. The NPD also attended some of the meeting to clarify the biggest concerns from the task force and to make sure that the hearing feedback would be accurate, considering both technical and legal concerns. Due to the complexity of the new regulation, Offshore Norge applied for and received one month extended due date for the hearing. A total of 12 responses was given to during the first hearing including the Offshore Norge response. 3 of the responses was without any comments. Offshore Norge gave approximately 50 comments through their response. After the NPD had reviewed the comments, the NPD presented their view of every single comment thoroughly to the task force. The NPD and Offshore Norge cooperated to agree on the best possible wording for the new regulation considering both the NPD and the Operators view.

The second hearing [6] started February 15th, 2023, to evaluate a revised edition of the new regulation. The Offshore Norge task force came together to discuss the revised regulation and concluded that the comments given during the 1st hearing had been taken into consideration the revised edition of the new regulation. It was therefore decided not to give any more comments. The NPD received 5 responses in total for the revised edition. 3 of them was without any comment.

A timeline showing the progress of the new regulation from July 2022 forward is shown in Figure 1.

Global Flow Measurement Workshop 24-26 October 2023

Technical Paper

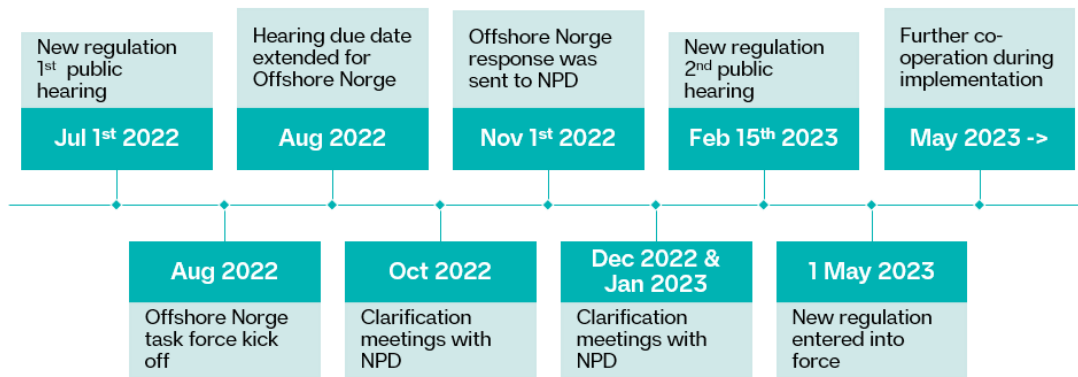


Figure 1 – Timeline new regulation from July 2022

3.3 Changes

The new regulation is a continuation of the old regulation but has been significantly restructured. The new regulation is now closer connected to international standards and guides and have included several current practices. Most of the equipment specific requirements has been removed making room for more flexibility and technology development. The guidelines have been updated and are now more comprehensive. This makes it easier to interpret the regulation. The guidelines were previous a part of the regulation but are now removed and are accessible from the NPD website which makes is more flexible for updates.

3.4 Consequences

It is stated that all agreements, consents and dispensations are still valid, and that the regulation is not retroactive considering design and construction. Even though this is true, some work must be done. Governing documentation must be reviewed and updated. Some new routines are probably needed for all assets. New requirements regarding operation and maintenance applies for all assets from the date the regulation was entered into force.

There is a new routine in the new regulation considering yearly reporting. Fiscal metering will be included as a chapter in an existing report being sent to the NPD (regarding other matters). This standardization will streamline reporting and highlight fiscal metering to a greater extent.

The regulation has reinforced its view on uncertainty (§ 10) where it is extended to reported figures and not only the underlaying measurements. Uncertainty is critical for fiscal metering so the idea behind it is supported. Detailed requirements for instrumental uncertainty have removed (§ 28). Instrumental uncertainties shall be in accordance with and documented in the uncertainty budget. Removing the detailed requirements does not reduce the total requirement for uncertainty but gives the Operators more flexibility choosing technology.

The following requirements concerning uncertainty budget have been implemented:

- The uncertainty budgets shall not only be a part of the initial project, but shall also be maintained (§ 15)

Global Flow Measurement Workshop 24-26 October 2023

Technical Paper

- The uncertainty budgets shall consider missing data (§ 15) and uncertainty for replaced data should be established if possible (guideline § 18)
- The uncertainty budgets for CO₂ tax measurements shall be sent to the NPD annually (§ 96)

All the bullet points above will increase the time spent for the Operators. The details for fulfilling these new requirements are not sorted out as per today. Some new tools might be needed to fulfill these requirements. The Operators are discussing the best way forward considering co-operation. The Operators goal is to work together with the NPD to ensure that this will add value to both the NPD and the Operators.

Gas flow meters shall now be calibrated every five year and oil flow meters with no prover every year (§ 85 and § 83). This does not apply if maintenance can be used to fulfil instrumental uncertainties. Measuring pipes for gas meters must now be inspected regularly (§ 85). This does not apply to subsea or where, by means of maintenance, condition can be monitored in other ways. These requirements will increase the time spent for documentation and follow up, at least in the beginning. Some Operators are already looking into better tools for analyzing flow meters and pipes by more use of diagnostic data and more use of condition-based monitoring.

More detailed requirements for operating and maintaining gas chromatographs (GC) have been included (§ 88). For most cases this is according to current practice. Some Operators are looking into smarter ways to maintain GCs by use of more data.

More requirements are implemented regarding the Operators management system (§ 5). All Operators will have to review their management system to make sure they are aligned. A regular internal revision of the management system shall be performed (§ 6).

Allocation measurements are now included in the regulation and have specific requirements (§ 10). Cost benefit analysis are now specified in the regulation and can be used when considering allocation measurements. Requirements regarding allocation revisions, biases, procedures, calculations, verifications and validations have also been included (§§ 23-25). Multi phase flow measurements are now included in the regulation and have specific requirements (§ 11 and §§ 51-55). Requirements regarding operation and maintenance of such measurements have also been included (§ 86). Including allocation and multi phase are welcome since these cases have been treated as a dispensation until now.

3.5 Summary

All hearings and responses are open for anyone and are available at the NPD website [5] [6]. The regulation can be found at the website lovdata.no together with other Norwegian legal information [2]. The new regulation seems fit for purpose after the extensive work performed by the NPD including the cooperation with the industry, but various details needs to be sorted out. All Operators have started to implement the new regulation and are cooperating to find the optimal implementation together with the NPD.

Global Flow Measurement Workshop 24-26 October 2023

Technical Paper

4 REFERENCES

- [1] Norwegian Petroleum Directorate. (2023, May 3). Ny måleforskrift.
<https://www.npd.no/nyheter/generelle-nyheter/2023/ny-maleforskrift/>
- [2] Norwegian Petroleum Directorate. (2023, May 1). Forskrift om fiskal måling i petroleumsvirksomheten (måleforskriften).
<https://lovdata.no/dokument/SF/forskrift/2023-04-21-532>
- [3] Norwegian Petroleum Directorate. (2023, May 1). Veileder til forskrift om fiskal måling i petroleumsvirksomheten (Måleforskriften).
<https://www.npd.no/globalassets/1-npd/regelverk/veiledninger/veileder-til-forskrift-om-fiskal-maaling-i-petroleumsvirksomheten.pdf>
- [4] Offshore Norge. (2023, May 1). About Offshore Norge.
<https://www.offshorenorge.no/en/about-us/>
- [5] Norwegian Petroleum Directorate. (2023, May 1). Høring – forslag til ny måleforskrift.
<https://www.npd.no/regelverk/horinger/horing--forslag-til-ny-maleforskrift/>
- [6] Norwegian Petroleum Directorate. (2023, May 1). Høring – revidert forslag til ny måleforskrift.
<https://www.npd.no/regelverk/horinger/horing--revidert-forslag-til-ny-maleforskrift/>