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Tittel: Kommentar til høringsdokumentene juli 2021

Hei.
Vi vil gjerne gi innspill til endringsforskriftene i HMS regelverket fra juli 2021 angående NOx-utslipp fra energianlegg. Emission Care er leverandør av PEMS og gjennomfører akkrediterte målinger av NOx-utslipp. Vi har kontorer i Nederland og Norge. Arend Smit, daglig leder i Emission Care, har ledet den europeiske arbeidsgruppen som skrev CEN/TS 17198 for PEMS.
Vi har kommentert høringsdokumentene i detalj (se nedenfor) og presenterer har et forslag til å forbedre kvaliteten av utslippstall med lavere kostnad.

Bedre kvalitet av utslippstall med lavere kostnad

In the document «Konsekvensutredning for bestemmelse av NOx» it is described that if a PEMS model will be used for multiple emission sources at one location, the model only needs to be verified for one emission source.
PEMS are by nature plant-specific measurement methods, which shall be tailored to the characteristics of each emission source (gas turbine, engine, steam boiler, etc). The NOx emissions of an emission source are influenced by many factors, amongst others wear and tear of the plant over time. This means that the NOx emissions of two identical plants will never be identical and PEMS models need to be adapted to the emission profile of each source. We can show you measurements of three completely identical gas turbines, operating under identical conditions and settings, indicating a deviation of more than 30% in NOx emissions.
Given the above, it makes sense that each individual PEMS shall be tested to demonstrate compliance with the uncertainty requirements.
Your proposal not to test each PEMS, but only each PEMS model, will limit the number of plants to be tested and will reduce the verification cost for the operator. However, we are afraid that this approach will increase the uncertainty of the total reported annual NOx load significantly, if compared to testing all plants. Moreover, we doubt whether this approach is in line with the Gøtenborg protokoll requirements. And last but not least, since NOx emissions are taxed, this may lead to incorrect tax payments.
We propose to test each individual PEMS, but agree upon a test-procedure allowing the stack tester to work more efficiently. For example: the standards EN 14181 and CEN/TS 17198 prescribe a QAL2 test lasting 3 days. This time period can be shortened to less than 1 day without noticeably affecting the measurement uncertainty, if additional requirements are given with respect to the operational modes of the plant to be tested. Another option is to allow different test methods for off shore stack testing. The current standard for NOx measurements (EN 14792) prescribes the use of chemiluminescence as reference method. If other methods are allowed, less labour intensive monitoring methods can be used. We are willing to assist you in this process by demonstrating the equivalence of alternative methods with the reference method.
We have more ideas to improve the efficiency of the stack testing procedures. We are convinced that we can significantly reduce the time needed to test a PEMS and test 2 or 3 PEMS at the same cost currently estimated for testing one PEMS model. This will improve the quality of reported emission data and allow Norway to better align these draft regulations to the Gøtenborg-protokoll requirements. We are also willing to share other ideas to improve the requirements for PEMS, given in your draft regulation.

Arend Smit (convenor of the CEN/TS 17198 working group) is willing to contribute to this process, assisting you in drafting detailed requirements for the stack tester and PEMS supplier. Although he isn't yet fluent in Norwegian, most communication can be in the Norwegian language.

Med vennlig hilsen,
Arend Smit

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Kommentar / spørsmål til høringsdokument 2021

Veiledning til Rammeforskriften

§ 70b om måling av utslipp av NOx-utslipp fra energianlegg

Setning 2: CEMS eller PEMS skal minimum hvert tredje år **kalibreres** mot…..

According to EN 14181 (quality assurance of CEMS) and CEN/TS 17198 (Quality assurance of PEMS), the word "calibration" means performing a QAL2 test, lasting 3 days with minimum 5 tests per day of minimum 30 minutes each. Please confirm that QAL2 tests shall be performed every 3 years.

Setning 2: ….akkrediterte utslippsmålinger utført ved representative lastgrader **på alle modeller** av turbiner, motorer …..

Can you please elaborate the meaning of the wording "every model"? Many PEMS models are based on a generic function describing the relation between a number of input parameters and the NOx emission of an emission source (gas turbine, etc.). This generic function is tuned to an individual emission source using data of a stack test performed at the source. Is the word "model" referring to the generic model or the tuned model? In other words, shall the requirement to test "every model" be interpreted to only test one gas turbine, assuming that all other gas turbines on the off shore platform show the same emission characteristics, or shall each gas turbines be tested?

Please note that CEN/TS 17198 clearly indicates that PEMS are **plant-specific emission monitoring systems**. Each plant receives a dedicated model (which can be based on a generic function). In line with CEN/TS 17198, each emission source (gas turbine, etc.) needs to be tested.

Siste setning: Avviket mellom NOx-konsentrasjon….

The word "deviation" is not defined in the standards EN 14181 and CEN/TS 17198. We assume that you refer to testing the variability as defined in the QAL2 testing procedure with an uncertainty of ±10%. The variability test is described in EN 14181 section 6.7. Please confirm.

Kommentar / spørsmål til høringsdokument 2021

Veiledning til Aktivitetsforskriften

§ 70b om måling av utslipp av NOx-utslipp fra energianlegg

Till tredje led
Please indicate the procedure to be followed if a test fails and the CEMS / PEMS shall be corrected. According to EN 14181 and CEN/TS 17198 a new QAL2 test shall be performed within 6 months after the failing test, proving that the corrected CEMS / PEMS meets the requirements.

Kommentar / spørsmål til Krav til bestemmelse av NOx-utslipp fra energianlegg (aktivitetsforskriften §70)

Vurdering av økonomiske og administrative konsekvenser

Seksjon 4.1 Prioriteringer og avgrensninger, krav til sensorvalidering og integritetstesting. Vi stiller ikke absolutte krav om sensorvalidering og integritetstesting.:
A continuous check of the PEMS input is one of the basic principles of quality assurance of a PEMS (because incorrect input will automatically lead to incorrect emission data). A sensor validation system checks the correctness of the PEMS input. In case no requirements are given for sensor validation, the correctness of the emission data can not be guaranteed. We strongly recommend to incorporate the requirement for a sensor validation system to bring the Norwegian PEMS systems in line with the requirements of CEN/TS 17198. This requirement improves the quality of the reported emission data and provides a level playing field amongst all operators with respect to NOx tax payments.
The requirement for integrity testing of a PEMS system is included in CEN/TS 17198 to avoid fraud. If an operator manipulates the PEMS model to reduce the reported emission data and/or the amounts payable under the taxation system, this is almost impossible to detect without a PEMS integrity test system (especially if a sensor validation system isn't required and verification measurements are minimized). The integrity test is relatively simple to incorporate in a PEMS: a standard input is fed to the PEMS on a daily basis and the outcome is compared to the standard output. Deviations are an indication for alteration of the PEMS model. We strongly recommend to incorporate the requirement for a PEMS integrity test system.

Seksjon 4.1 Vi foreslår å fastsette en grense for største tillatte avvik på ± 10 prosent mellom resultater av PEMS og akkrediterte utslippsmålinger……. Vi legger til grunn at dette er enklere krav å følge opp, både for operatørene og myndighetene, enn usikkerhetskravet i tillatelsene som har vært gjeldende til nå…..:
Can you please clarify this statement, making reference to the quality assurance principles of EN 14181 CEN/TS 17198? Both standards require a proof of suitability of the measurement method (QAL1 test = comparison of the measurement method against the required measurement uncertainty), accredited verification measurements (QAL2 and AST tests) and regular performance tests during normal operation (QAL3 / sensor validation).
Is this statement to be interpreted as if a QAL1 test isn't required? If no, please clarify this statement. If yes, we have to conclude that hardly any requirement of the EU quality assurance standards is maintained in the proposed regulations, except for some verification measurements. We sincerely hope that that this interpretation is incorrect.