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Final Report Submission from

ESSF sub-group on Implementation

INTRODUCTION

Background

Air pollution is of major concern in the European Union (EU), causing significant damage to human health and the environment. The 2013 Clean Air Policy Package^[1] included strategic objectives and action targets for 2020 and 2030 as well as a new National Emission Ceilings Directive (NECD)^[2] and a new Medium Combustion Plants Directive. The EU ratification of the 2012 amendment of the Gothenburg Protocol under the UNECE Long-Range Trans boundary Air Pollution (LRTAP) Convention was also proposed. The latest revision of Directive 1999/32/EC ("the Directive") as regards the sulphur content of marine fuel was amended in 2012 (Directive 2012/33/EU) aligning EU legislation to IMO convention MARPOL Annex VI. Member States were, on 18 June 2014, to transpose the Directive into their national law. The Directive foresaw a number of implementing and delegated acts, which aimed, inter alia, to help Member States with the monitoring, implementation and enforcement of the Directive requirements. The Directive also foresaw that a committee^[3] and an expert group composed of Member States' competent authorities and experts would assist the Commission to prepare these acts. The COM Implementing Decision (EU 2015/253) setting for the EU Member stricter measures on inspections and monitoring through sampling and reporting States was adopted under the Directive in February 2015.

The Sub-group on Implementation of Directive 1999/32/EC

^[1] http://ec.europa.eu/environment/air/clean_air_policy.htm

^[2] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the reduction of national emissions of certain atmospheric pollutants and replacing the current National Emission Ceilings Directive (2001/81/EC) as well as amending Directive 2003/35/EC. COM/2013/0920 <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013PC0920>

^[3] Committee for the implementation of the Directive on sulphur content in marine fuels, based on Article 9 of Directive 1999/32/EC.

The Commission set the mandate, the adopted Terms of Reference (ToR), the membership, the objectives, the tasks and modus operandi of the mentioned expert group: the sub-group (SG) on Implementation of Directive 1999/32/EC under the European Sustainable Shipping Forum^[4] (ESSF) as endorsed by the ESSF plenary.

The sub-group had a central role in carrying out the most urgent tasks facilitating a timely and cost-effective implementation and enforcement of the Directive in the EU. The focus was on monitoring and enforcement practices, such as the fuel-specific inspection of ships under the Directive requirements, the procedures for sampling, analysis and reporting on Sulphur content in the fuel being used, emission monitoring, sanctions for non-compliance, approaches to fuel or abatement systems non-availability claims, to form the basis for harmonised guidelines and rules. Other issues have been treated when considered urgent by the SG. In line with the ToR, the sub-group discussed and exchanged views on technical and regulatory aspects which served as a fundamental basis for the development of the Implementing Decision setting provisions on sampling and reporting and launching the use of Thetis-S, a key albeit voluntary enforcement tool under the Directive.

The main objectives were to:

- provide the technical basis needed for the adoption before the end of 2014, by the Commission and the MS, of the implementation rules in a pragmatic and cost effective timely manner;
- reinforce the EU compliance practices and culture aligning with the IMO initiatives; and,
- Facilitate MS' and the overall shipping community's preparation for the monitoring of compliance and enforcement of the 2012/33/EU sulphur standards in the EU.

In accordance with the ToR the Implementation sub-group included members drawn from:

- The European Commission (DG-MOVE and DG-ENV)
- The European Maritime Safety Agency (EMSA)
- Member States (MS)
- Classification Societies
- Equipment Manufacturers
- Ship Owner/ Operator Associations
- Ship Owners/Operators
- Ports
- European Oil Refiners
- Environmental Non-Governmental Organisation

Four meetings of the Implementation sub-group (SG) were held on; 3 December 2013, 13 March 2014, 3 July 2014 and a final meeting on 27 January 2015 (during the second half of 2014 there were no meetings so as not to interfere with the Committee of Member States while working on the Implementing decision).

^[4] Commission Decision of 24.9.2013 on setting- up the group of experts on maritime transport sustainability - The European Sustainable Shipping Forum (ESSF) C(2013) 5984 final

According to point 3.4 of the ToR on duration and possible next-step perspectives, the SG has disbanded as soon as its core mandate was fulfilled. However, at the last meeting of the SG it became clear that dealing with further relevant open issues would be needed and the members have requested to continue the work of the SG as appropriate in the future. Moreover, at its last meeting in December 2014, ESSF plenary members requested the Commission to extend its mandate and to continue beyond 2015 both for the plenary and its subgroups.

1. ToR Deliverables Summary

The Sub-group was assigned four main deliverables, for which a series of work packages (WP) were generated, to address a particular objective or task outlined in the ToR as defined below. These WP's were to support the development of the Implementing Act, which would set obligations and or guidelines on sampling strategies (methods and frequencies) and reporting (content and format) harmonized at EU level, as foreseen under the directive for Member States. The four main deliverables being:

D.1.1 Comprehensive assessment of guidelines and/or standards, rules, relevant for smooth and timely implementation/transposition by Member States:

D.1.2 Recommendations for remedial actions to address some of the barriers hampering efficient and cost-effective implementation.

D.1.3 Recommendations on possible ways to ensure coordination with other initiatives and activities carried out by relevant international bodies (IMO, etc.). This included receiving inputs from both the EGCS and the LNG SG's.

D.1.4 Best practices compendium

2. D.1.4 Best practices compendium

The sub-group was able to meet the deliverables given and in addition address a number of other issues that came to light during the discussions. In accordance to the requested deliverables, the following key outcomes were delivered identifying best practice approaches, the work packages which enabled these outcomes are detailed in the next chapters:

2.1. *The Commission Implementing Decision EU 2015/253 of 16 February 2015 (see Annex 'F')*

2.2. *Sulphur Inspection Guidance Council Directive 1999/32/EC (EMSA) (See Annex 'G')*

2.3. *THETIS-S – Uniform Information System (EMSA)*

In the development of 1,2 and 3 further important outcomes, outside that which was anticipated were recognised and the sub-group generally agreed should be followed through, these were:

2.4. *Publication of the document 'Overview of 'fuel changeover' issues and challenges as they affect ECA-SOx compliance. Published by VDR and ECSA(See Annex'H')*

2.5. *The recognition of the development and potential of the use of 'Remote Sensing technology' on monitoring exhaust emissions.*

2.6. *Detailed background work regarding on board fuel sampling procedures and use of designated sampling points as partly covered in the Implementing Decision and a submission made to IMO (MEPC 68), requesting universal ' Guidelines for onboard sampling and the verification of the sulphur content of the fuel oil used on board ships' (See Annex 'J')*

2.7. *Exhaust Gas Cleaning Systems (EGCS) in cooperation with the 'Scrubber SG'*

2.7.1. *Clarity been given what are termed as 'trials' and 'commissioning' of equivalent means to sulphur compliance.*

2.7.2. *Commission work on aligning the requirements of the MARPOL Resolution PC 184.(59) wash water guidelines referred to in the Directive with the Water Frame Work Directive.*

2.7.3. *Submissions into IMO on the BDN wording and on the pH calculation methods*

2.8. *Liquid Natural Gas (LNG)*

2.8.1. *Extending the BOG pilot fuel requirements to full ECA-SOx operations under the Directive*

3. D.1.1 Comprehensive assessment of guidelines and/or standards, rules, relevant for

smooth and timely implementation/transposition by Member States. (WP 3,5&6)

3.1. Representative Samples and Methods of onboard sampling and Analysis (WP 3).

3.1.1. Introduction

The Directive stipulates the obligation (in Article 6) for Member States to check by sampling that the sulphur content of marine fuels being used by vessels, while in relevant sea areas and ports, comply with Articles 3a, 4a, and 4b. This obligation has been further developed in the Commission Decision where it is stated that a staged approach shall be applied in the sampling and compliance verification of sulphur standards.

The sub-group early on in the discussions confirmed that whilst there were some sampling guidelines (i.e. IMO Res. MEPC.184(59) on the drawing of a representative bunker sample), further guidelines were needed for a harmonized approach for carrying out the document verifications on board ships and with regards to the drawing of statutory samples on board from fuel storage or service system. Therefore EMSA, with the support of Member States and guidance from the industry, developed a set of guidelines for sulphur inspectors aiming at a uniform enforcement of the requirements of the Directive. In addition, extensive work was conducted drawing on commonly understood industry practices for the sample location, analysis and interpretation of results.

3.1.2. Summary of findings (See Annex ‘A’ for more detail’)

The Subgroup identified at an early stage the need for detailed guidelines regarding the enforcement of the provisions of the Directive. The discussions translated into the development by EMSA of a comprehensive Sulphur Inspection Guidance primarily oriented for Administrations and inspectors in the Member States (See Annex ‘G’).

The Sulphur Inspection Guidance aims at a harmonized enforcement of the Directive. It strictly follows the obligations for the Member States in the Directive and in the Implementing Decision. In its development, consideration has been given to the different backgrounds of Sulphur Inspectors across the EU. The document also emphasizes the differences between the enforcement regime as a result of the Directive and that of Port State Control and MARPOL Annex VI. The scope of application of the Directive is also covered in depth, as well as the documentation that may be verified during the inspections. Furthermore, various inspections scenarios are described like the inspection of a ship with or without abatement methods. The SG members from the industry requested the SG to develop a guidance document specifically for the ship operators. This was supported by the MS and also those participating at the Sulphur Committee on May 5th.

In addition, considerable work was devoted to certain practical matters based on direct expertise drawn from the industry. These include the process of sampling from tanks, issues with fuel transition time, the definition of sampling points, interpretation of analysis and test results, and responsibility between owners and charterers for the bunkering process. The Subgroup did not manage to fully address some of these additional matters. Whereas many issues were tackled during the discussions and this has been reflected in Implementing Decision and the Sulphur Inspection Guidance developed by EMSA, some matters might require further development in the future.

3.1.3. Request to the ESSF Plenary

1. *To acknowledge the development, by EMSA in cooperation with Member States and industry, of the Sulphur Inspection Guidance aimed at a harmonized approach in the enforcement of the Directive. (endorsed)*
2. *To explore ways for addressing the additional practical matters identified by maritime experts and aimed at facilitating understanding and cooperation of the industry and operators during inspections. (future consideration)*
3. *To bring in discussion at IMO on the proposal fo designated sampling points (future consideration)*
4. *Acknowledge the industry request for the development of an operators guide to be developed through EMSA in cooperation with the industry as appropriate (future consideration)*

3.2. Sampling Frequency Options and Recommendations (WP5)

3.2.1. Introduction

The ESSF Sub Group on Implementation discussed the determination of sampling frequency and the importance of developing harmonised targeting strategies for sampling. It was concluded that a risk based approach, similar to the one in THETIS, could be the most cost-effective way forward. Therefore, EMSA, upon request of the Member States, acknowledging the potentials of existing EMSA information system (THETIS) and taking into account that similar actions have been realised in the past to cater other EU legal acts (Directive 99/35, Directive 20/2009, Regulation 392/2009, etc.), proposed to develop a new module to cater the provisions of the Directive.

3.2.2. Summary of Findings (See Annex ‘B’ for more detail)

The sub-group favoured the determination of marine fuel sampling frequency obligations for Member States based on a risk-approach and, therefore, considered the development of a dedicated Union information system for monitoring of compliance and enforcement under the Directive to an existing EMSA information system.

THETIS-S was developed and made available to Member States from 1 January 2015. It facilitates the work of the Member States as a platform to record and exchange information on the results of individual compliance verifications under the Directive.

Member States are not obliged to transfer information related to inspections performed in accordance with the Sulphur Directive. They are however encouraged to do so, since a Member State opting to use THETIS-S to record, exchange and share data on the compliance verification, will contribute substantially to correct enforcement. They may use the annual aggregated compilation of enforcement efforts, provided by the Union information system, to fulfil its reporting obligations (Article 7 of Directive and Article 8 of Commission Implementing Decision (EU) 2015/253).

In the period between 1 January and 15 April 2015 a total of 1458 Sulphur Inspections were successfully recorded in the system by the Member States, among which 89 non-compliances were identified. Although at the end of this period there were still some Member States yet to start voluntarily reporting their inspections into THETIS-S, the information gathered already provided a clear indication as to the level of compliance and issues being faced.

When sufficient data is available in THETIS-S a risk-based targeting mechanism based on inspection results and associated findings can be developed enabling Member States, again on voluntary basis, to target sulphur inspections at non-compliant ships. Reference to the Union Information system and its targeting tool was made in the Implementing Decision.

3.2.3. Request to the ESSF Plenary

- 5. To acknowledge the successful development and use of the Union Information System, THETIS-S, for monitoring of compliance, reporting and sharing of sulphur content inspection results, including fuel related data. To encourage Member States to make effective use of THETIS-S (and those Member States that have not opted yet for its use to do so as soon as possible) as a valuable tool, albeit optional, to rationalise and optimise the compliance verification and for their reporting as from 1st January 2015.*

3.3. Reporting Obligations of the MSs under the S Directive (WP6)

3.3.1. Introduction

According to the Sulphur Directive (Article 7) Member States shall report annually to the Commission about the level of compliance to the Sulphur limits on the basis of the results of the sampling, analysis and sulphur in fuel specific inspections carried out. A similar obligation already existed in the previous version, yet the amending Directive states that reporting by Member States has proved insufficient for the purpose of verification of compliance with that Directive due to the lack of harmonized and sufficiently precise provisions on the content and the format of the Member States' reports. Therefore, more detailed indications in regards to the content and the format of the report were necessary to ensure more harmonised reporting (recital 18).

EMSA, who analyses the annual reports of Member States on behalf of the Commission, confirmed that the reporting of the previous version of the Directive presented a general lack of homogeneity.

3.3.2. Summary of findings (See Annex D for details)

In light of this background, the annual reporting obligations of the MSs under the Sulphur Directive have been discussed with the technical assistance from EMSA and served as a basis for the discussion in comitology. It was emphasized that the reporting should represent a balance between providing sufficient information to be able to assess the level of compliance of all requirements in the Directive while not making the reporting obligation too burdensome and time-consuming. The Implementing Decision on reporting was closely aligned with other developments related to enforcement, and notably the Implementing Act

concerning the frequency of sampling. Within the harmonised approach to reporting the electronic format was considered more efficient and less burdensome for both Member States and the Commission.

The main points of view expressed showed that MS's supported a harmonized reporting format and content (quality, clarity and uniform terminology) and further considered and supported the need to create an effective enforcement tool with assistance of EMSA where data can be retrieved for reporting and monitoring purposes. This was considered essential to better assess whether the objectives of the Directive are actually achieved and to ensure an equal spreading of enforcement efforts among all Member States.

It was emphasized that the reporting should represent a balance between providing sufficient information to be able to assess the level of compliance of all requirements in the Sulphur Directive, while not making the reporting obligation too burdensome and time-consuming.

The reporting format for member States not using THETIS-S and for land based fuel applications, also covered by the Directive, has been submitted to the Committee for future consideration (Committee meeting of 6/5/2015) . Some national reports under the previous Directive which were very complete served as input for draft reporting template which has been developed by COM through a service contract with AMEC for marine fuels (for those MSs not using THETIS-S) and for land fuel.

With the encouragement of the ESSF plenary the discussions within the sub-group about the appropriate content and format of the annual reporting by Member States continued for the purpose of improving the verification of compliance with the Sulphur Directive and in view of the adoption of the relevant provisions of the Implementing Decision. It was decided that a reporting format for member States not using THETIS-S and for the fuel for land based applications, also covered by the Directive, would be dealt with at a later stage (Committee meeting of 6/5/2015). Some national reports under the previous Directive which were very complete served as input for draft reporting template which has been developed by COM through a service contract with AMEC for marine fuels (for those MSs not using THETIS-S) and for land fuel.

3.3.3. Request to the ESSF Plenary

6. *To acknowledge the successful development and use of the Union Information System THETIS-S, primarily for monitoring of compliance but also for the reporting possibilities on annual aggregated basis as recognised by the Implementing Decision*

4. D.1.2 Recommendations for remedial actions to address some of the barriers hampering efficient and cost-effective implementation. (WP 1,4)

4.1. Switchover (transition) - Study on the level of safety and timing of flushing required to changeover from HFO to distillates (WP1)

4.1.1. Introduction

Under WP-1 the sub-group were requested to address the impact on safe operations when carrying out the changeover between a High Sulphur Residual Fuel Oil (HSRFO/HFO) and a Low Sulphur Distillate Fuel Oil (LSDFO/MGO), along with understanding the issues ships may face in regards to attaining compliance as a result of cross contamination between the two, when the fuels pass through a common fuel service supply system.

Outside the ECA-SOx the fuel oil used will remain, for now, to be usually a high viscosity residual fuel oil generally limited to 3.50% maximum sulphur content– (HSRFO). Up until 1 January 2015 the 1.00% maximum sulphur fuel oil limit for operations within the ECA-SOx was for the most part, like the outside ECA-SOx fuel oil, a residual fuel oil product. The switch to 0.10% maximum sulphur content on 1 January 2015 has mostly resulted in ships choosing to change over to a low sulphur (up to 0.10% S) distillate fuel oil (LSDFO). There are however alternative new formulations of 0.10% S fuels designed for use in the ECA, which have shared properties between distillate and residual fuel oils, only recently being offered to the marine market, however distillates will be the main stream ECA-SOx compliant fuel option for the near future.

Ships operating both inside and outside ECA-SOx, may well be switching between fuels with such diverse characteristics on a more regular basis, representing a major change from existing practice both in terms of having to more regularly manage the different characteristics of the two types of fuel oils used and the increased sulphur differential between the fuels.

4.1.2. Summary of Findings

The sub-group agreed that there is a broad concern in the industry about the safety implications of the fuel changeover process, but that the general issue is not a new process to shipping. The safety issues and especially the risk of loss of propulsion of ships resulting from a fuel changeover, illustrated by experiences reported by the US Coast Guard, were well understood and generated considerable concern. The EU industry however considered they were ready for the change; the concern was more being pointed towards non EU ships being less aware of the risks and perhaps with insufficient crew training for carrying out a safe changeover. This was considered to pose a potential hazard to other ships whilst passing into a high traffic density area.

The sub-group agreed that against this background a pragmatic informed approach to inspection and sampling was needed. It was also agreed that information collection is vital in order to identify any rising trend specific to changeover problems, as well as assessing the level of noncompliance, hence the need for THETIS-S to play also the role of a common information sharing platform for the competent authorities of the Member States.

Based on these discussions, the sub-group developed a guidance document, made available in early December 2014 and published on the ECSA and ICS websites entitled *“Overview of*

‘fuel changeover’ issues and challenges as they affect ECA-SOx compliance”, [See Annex ‘H’] for the benefit of informing the policymakers, competent authorities of the Member States and industry alike to better grasp the issues and raise awareness on the safety aspects and possible fuel contamination problems relating to the implementation of the fuel changeover process for obtaining compliance. In response, Denmark has voluntarily taken the initiative to issue a pamphlet for ships with a *‘check list for compliance’* and a MS contact list should there be any questions regarding the sulphur regulatory requirements. (See ANNEX ‘I’)

4.1.3. Request to Plenary

7. *To encourage awareness raising on the challenges ship's safe changeover and potential for cross contamination between HSFO and LSFO.*
8. *To encourage awareness raising and for all MS to inform their sulphur inspectors of these challenges ships face in achieving compliance*

4.2. Use of remote sensing and novel techniques of sampling / Emissions monitoring tools for efficient ship targeting in the EU (WP4)

4.2.1. Introduction

According to the ToR, the sub-group should assess monitoring and verification strategies. Alternatives to sampling such as monitoring and verification tools should also be discussed for their potential contribution to a cost effective implementation and enforcement of the Directive.

In order to address alternative measures to fuel sampling on-board, the sub-group defined WP 4, on the use of remote sensing and novel techniques of sampling and analysis. As well as remote sensing for monitoring exhaust emissions remotely, the monitoring of fuel temperature and analyzing fuel samples on board with the use of a quick scan portable analyzer were also studied and discussed.

The Implementing Decision acknowledges the use of remote sensing technologies and quick scan methods. According to Article 3, paragraph 3 (a), the frequency of sampling of marine fuel being used can be adjusted, if remote sensing or quick scan methods are applied.

The Implementing Decision also encourages Member States to select ships for fuel compliance verification on the basis of risk-based targeting mechanisms or the use of innovative compliance verification technologies. It is intended that the collected information will be shared with other Member States, preferably, although on a voluntary basis, through the Union Information system THETIS-S.

4.2.2. Summary of Findings (See Annex ‘C’ for more detail)

4.2.2.1. Remote Sensing

The sub-group agreed that remote sensing from fixed and airborne platforms using conventional gas analysers or optical methods can be an efficient tool for targeting the selection of ships for inspection. However, it still includes a number of barriers.

The Sub-Group discussed the practicalities of the use of the remote sensing and soon realized a need for sharing of knowledge and experience between Member States applying remote sensing, in order to reach higher efficiencies and cost savings. The results obtained would be for the benefit of all Member States, only if they are efficiently shared, for example through THETIS-S. In order to ensure good quality of the results, there is a need for Member States to co-operate with the aim to develop common procedures for the evaluation and quality assurance of results.

Some members of the sub-group were of the view, that there is a need for economic support to the Member States that are willing to take the task of performing remote sensing to the benefit of all Member States. The possibility of dedicated EU funding programmes, i.e. TEN-T was discussed. It was noted, that in a longer term perspective, remote sensing could potentially be handled by only a few operators or Member States. This could therefore advantageously be coordinated by the Commission or EMSA.

A number of countries (Finland, Sweden, Belgium and the Netherlands) applied to the CEF (former TEN-T) program for funding their monitoring projects. The applications are submitted at the end of February and are now subject for approval by the CEF.

4.2.2.2. Fuel Temperature Indicator

The use of the fuel temperature, as an indicator of fuel type being used, was also considered by the sub-group. The sub-group agreed that high temperature in the fuel system during inspection could be used as an indicator of the use of high sulphur fuel oil. It was however noted, that the use of new fuel types, such as low sulphur heavy fuel oil, would make it more difficult to distinguish between compliant and non-compliant fuel and therefore this approach should only be considered with the knowledge that the fuel viscosity is sufficiently high enough to warrant a recordable change of temperature when changing over the fuels.

4.2.2.3. Quick Scan Portable Analysers

The sub-group discussed the use of portable sulphur analyzers, as a means to perform a quick scan of the sulphur content of a fuel sample during on-board inspection. The sub-group welcomed the information provided from The Netherlands and Finland, on their plans to use portable equipment.

The sub-group concluded however, that since the portable equipment does not measure in accordance with ISO 8754 sulphur test method, a ship cannot be detained or fined based on measurements made with the portable equipment. The group agreed, however, that the portable equipment could be used to target ships for carrying out a full fuel sampling inspection and potentially save time and cost.

4.2.2.4. ESSF Plenary initial feedback

A presentation on remote sensing was given at the ESSF-plenary plenary meeting in December 2014. The presentation intended to recognize the cost efficiency and inform about these activities being carried out in a number of Member States.

Some participants found it premature to consider remote sensing as an enforcement tool. Several participants acknowledged however that remote sensing could be a cost efficient technology. They also acknowledged the efforts of Member States planning to apply remote sensing.

4.2.3. Request to ESSF Plenary

9. *To acknowledge the efforts of the Member States who are applying remote sensing and novel techniques for sampling and analysis. (not endorsed by last plenary)*
10. *Encourage the Member States to share their information with other Member States, preferably through THETIS-S*
11. *Support further co-operation between Member States, with the aim of coordinating activities and developing common procedures for the evaluation and quality assurance of results (future consideration)*

5. D.1.3 Recommendations on possible ways to ensure coordination with other initiatives and activities carried out by relevant international bodies (IMO, etc.).
(This included receiving inputs from both the EGCS and the LNG SG's.)

5.1. Penalties and Fines in some EU Member States (WP8)

5.1.1. Introduction

The requirement for such penalties is explicit in the Directive, Article 11: *Member States shall "determine the penalties applicable to breaches of the national provisions adopted pursuant to the Directive. The penalties determined must be effective, proportionate and dissuasive and may include fines calculated in such a way as to ensure that the fines at least deprive those responsible of the economic benefits derived from their infringement and that those fines gradually increase for repeated infringements."* Furthermore, the obligation to have an appropriate enforcement mechanism in place stems from the Treaty.

Under the Tor the sub-group's had preliminary discussions to assess information and share best practice on the development of penalties, administrative fines and criminal sanctions. The outcome was not final since those discussions took place in parallel with ongoing work of the Member States on the transposition of the Sulphur Directive into national laws and was around/just after its deadline on 18/6/2014. However, some Members States in the SECA area gave important feedback on the work ongoing and then presented to the SG useful updated on their penalties systems.

The sub-group generally agreed that enforcement will have to be strengthened through effective penalty systems, which are to be determined by the Member States since it is under their competence.

5.1.2. Summary of Findings (see Annex 'E' for more details)

The group exchanged views and experience on penalties. Some Member States have systems for administrative fees and others for criminal penalties through the relevant courts. In other Member states, the penalties for the Sulphur Directive are based on general provisions of the general environmental regulation. However, in the special case of the SOx, it was being considered to have the penalties set higher than what is usually applied for environmental violations.

In general, referring a case for penalties under criminal law to the relevant court can be very complex and some Member States have experienced long process times when compared to issuing administrative fees. In court, it has proved to be difficult to demonstrate criminal intent or negligence in one form or another, while unrestricted administrative fines may be easier to administer. One country was considering a penalty system where the ship is fined based on the advantage it has gained over other ships.

Some Member States foresee detaining ships in cases where there is a clearly demonstrated non-compliance of the sulphur regulation. Detention can however not be considered as a penalty. A ship can only be detained until the ship has rectified the conditions by bunkering the required compliant fuel.

The urgent need of increasing the penalties, a crucial aspect in the enforcement of the Directive, with the more stringent sulphur limit in SECA's from 2015, was recognised by the SG to preserve an even playing field for the economic operators.

Some MS have already published the outline of their penalty scheme, such as from Sweden; '*Control and compliance of the more stringent requirements on the sulphur content of marine fuels*' (See ANNEXES: ',K','L','M' &'N')

Enforcement also on fuel suppliers was strongly advocated within the sub-group. In some EU countries relevant fines against fuel suppliers in court has already reached as much as € 50000, with criminal laws applying. Outside the EU, fuel suppliers can lose their license like for example in Singapore. The enforcement of the Articles in the Sulphur Directive concerning sampling the fuel supplied by the bunker supplier and to ensure appropriate control of fuel suppliers (Art. 4a(6)) has been covered to a certain extent by the Implementing Decision as a result of all the SG discussions).

5.1.3. Request to ESSF Plenary

12. The plenary is requested to encourage MS to support a cooperative and coordinated approach to the enforcement on marine fuel suppliers to ensure the fuel is compliant as ordered.

13. The Plenary are requested to encourage MS to increase their efforts to reinforce cooperation in the exchange of information on administrative penalty regimes and the joint use of the EU information system

5.2. Other Implementation and Transposition issues, with IMO Documentation Status (WP 2 and 7)

5.2.1. Introduction

The SG addressed and discussed specific implementation technical issues but also referred to other relevant contexts, including other associated sub-groups established under the ESSF, the following issues included: Boil Off Gas (BOG) mixture use in SECAs, Exhaust Gas Cleaning Systems (EGCS) use in ports, their trials, commissioning and approval procedures.

5.2.2. Analysis of Findings

5.2.2.1. LNG BOG – HFO fuel mixture allowed for compliance outside ports under Sulphur Directive and extended to SECAs also for propulsion purposes

The use of fuel mixture of Boil Off Gas (BOG) and pilot heavy fuel oil was allowed as an emission abatement method under the Directive by the Commission in SECAs provided the S content of the HFO is below 0.5% or a relevant threshold depending on the operating conditions and, as in ports, given the mandatory use of sensors and metering equipment for continuous monitoring of emissions. This abatement method technically ensures that the LNG carriers in question continuously achieve reductions of SO_x emissions that are at least equivalent to the reductions that would be achieved by using 0.10% sulphur marine fuels. Moreover it promotes LNG as an alternative marine fuel and even allows for SO_x reduction beyond legislation.

The SG was consulted on this issue to clarify relevant technical aspects and assess the acceptance of the mentioned method by Member States and port authorities in the SECA. Under the Directive and was permitted without the need of modification of the legal context. The use of this equivalent has also been notified to IMO.

5.2.2.2. Emission Abatement methods – Exhaust Gas Cleaning Systems (EGCS)

According to the Directive the access to emission abatement methods should be facilitated. The already known alternative abatement methods, such as the use of on-board exhaust gas cleaning systems, the mixture of fuel and liquefied natural gas (LNG) or the use of biofuels has been recognised in the Union. Moreover, it is important to promote the testing and development of new emission abatement methods in order, among other reasons, to boost technological innovation and limit modal shift from sea to land-based transport. These methods can provide emission reductions at least equivalent to, or even greater than, those achievable using low sulphur fuel, provided that they have no significant negative impacts on the environment, such as marine ecosystems.

Despite the clear and unambiguous regulatory acceptance of EGCS by IMO and within the Sulphur Directive and MED, the industry has faced a number of regulatory, operational and economic challenges when trying to adopt EGCS as a compliance option. These challenges have hampered EGCS technology take-up; the EGCS sub-group therefore was established to examine these challenges in an integrated manner.

Two specific issues that have been made aware to the SG are: first the acceptability of wash water discharge from wet scrubbing, requiring careful alignment with the stricter requirements of the 'Water Framework Directive' in some sea areas, requiring environmental protection and secondly the need to have further guidance with regards to

the process of trials and commissioning of these EGCS systems. Work is ongoing within the Scrubber SG to address these

The SG acknowledges that the use of Scrubbers and acceptance in EU waters is a complicated issue and for the time being it involves a relatively low number of ships choosing these options. Through the ongoing work of the SG Exhaust Cleaning Systems; raising awareness and communication, may be a way forward to finding a solution.

5.2.3. Request to ESSF Plenary

14. *The plenary is requested to note the work still ongoing and support its continuance to achieve a uniform EU understanding working towards aligning with IMO where applicable and in accordance with position agreed in the Council on EU coordinated positions.*

ANNEXES

Extended detail on the working packages 'Analyses of Findings' for:

- A. WP3
- B. WP5
- C. WP4
- D. WP6
- E. WP8

Key Outcome - Supporting Documentation

- F. Commission Implementing Decision (EU) 2015/253
- G. Sulphur Inspection Guidance
- H. VDR Overview of fuel changeover
- I. Denmark – Sulphur Regulation Pamphlet
- J. IMO Submission MEPC 68-3-18 – 'Guidelines for onboard Sampling

Contributions to Penalties and Fines WP8

- K. Germany
- L. Sweden – [web link <http://transportstyrelsen.se/sv/Nyhetsarkiv/Sanktionsavgifter-och-kontroller-kravs-for-att-sakra-skarpta-krav-pa-marint-bransle/>]
- M. Finland
- N. EMSA

Annex A

Analysis of Findings WP3

Representative Samples and Methods for on-board Sampling and Analysis.

As stated in the EU Directive, the sampling process includes the inspection of ships log books and bunker delivery notes (BDN). In addition, fuel samples may be drawn from on board sealed samples of the fuel as loaded (namely the MARPOL sample), from the storage tanks or from the fuel service system to the machinery plant with the importance being made on the representativeness of the sample of the fuel being used. The sub-group identified the need to develop comprehensive guidance in relation to the revision of the documentation on board, ascertaining compliance with the sulphur standards, the use of alternative abatement methods, and the challenges for drawing a representative sample of the fuel in use.

On the basis of the discussions, and as a result of a request from the Member States during EMSA's Administrative Board in June 2014, EMSA circulated a first version of guidelines for inspectors to the Subgroup in July 2014. Both Member States and industry had then the opportunity to contribute to the initial draft. A workshop for Member States was also organized in EMSA in September 2014 followed by a second meeting in December 2014. A consolidated version was circulated to the Subgroup for discussion during its meeting in January 2015 leading to a new revised version issued and discussed at the Sulphur Committee in May 2015.

In combination with EMSA's initiative, the sub-group further drew on maritime experts to explain the fuel system arrangements on board, the challenges and practicalities of selecting a location for drawing a representative sample of the fuel in use, in particular from the fuel tanks. This work led to a number of key concerns as follows:

- Sampling from tanks: Due to inaccessibility of tanks in certain cases, this sampling procedure was recommended to be considered as a last option. Access to tanks, for drawing a representative sample, are often not easy to reach, and even sometimes this might not be allowed for safety reasons in some ship types, such as, tankers and gas carriers. Sulphur inspectors would also very likely be required to engage suitably trained specialists for drawing tank samples making the process less cost effective and time consuming.
- Fuel transition time: Clearing residues of HSFO from tanks and pipelines might sometimes be unpredictable which could lead to marginal excesses of the 0.10%. However, it is recognized that ships operating 100% on LSFO should have fully cleaned out HSFO remnants from the fuel system in a relatively short period of time.
- Fuel 'in-use' sampling points: It was highlighted the benefits of having on board safe and accessible fuel 'in-use' sampling points to facilitate the drawing of a representative sample. Ships may currently not have these points identified or even fitted, as there is no requirement to have them. This matter was discussed in detail including potential associated documentation, fitting of safe sampling valves and suitable locations.
- Interpretation of sample analysis test results: The MARPOL Sample is required in the Sulphur Directive to be analysed in accordance with the MARPOL Appendix VI verification procedure. However, the industry might be more familiar with the widely

adopted ISO 4259 for commercial sampling. Discussions were held on test precision and test accuracy in the SG. Future discussion at IMO will address this issue which may lead to further technical discussions also at EU level.

- Bunkering process: Concern was raised by some on ensuring that the MARPOL sample is taken on delivery, in accordance with the requirements of Regulation 18 of MARPOL Annex VI, and that it is representative of the fuel loaded on board the ship with correct labelling and supporting BDN documentation. The industry further indicated that there may also be an issue with respect to the responsibility between owners and charterers.

Whereas many issues were tackled during the discussions; this being reflected in Commission Implementation Decision and the Sulphur Inspection Guidance developed by EMSA, some matters might require further development in the future.

Annex B

Analysis of Findings WP5

Sampling Frequency Options and Recommendations

According to the Terms of Reference, the Subgroup was tasked with the assessment of standards for sampling strategies, including method and frequency, of marine fuels regulated by the Directive.

A wide range of targeting proposals was discussed. At the ESSF Plenary meeting held on June 26th 2014, the sub-group recommended to support the determination of marine fuel sampling frequency obligations for Member States based on a risk-approach and, therefore, consider the development of a dedicated module to THETIS for monitoring of compliance and enforcement of the Sulphur Directive to start collecting and sharing among Member States enforcement findings.

On the basis of the support expressed by the Plenary and the request by a number of Member States during the March 2014 Administrative Board of EMSA, a cooperation agreement for the support on the implementation of Directive 2012/33/EU and relevant technical assistance, was drafted by EMSA & DG ENV, endorsed by the Administrative Board of EMSA and finally signed in August 2014 by EMSA Executive Director and the Director of DG Environment Directorate C: Quality of Life, Water & Air.

Under the cooperation agreement, the road map for the development of the system was set up including steps for collecting input from experts from the Member States. Various meetings were organised including a training session for end-users after the delivery of a first prototype. The system was conceived with the following main characteristics:

- own user community with their own access rights,
- re-use of the ship (particulars) database existing in THETIS,
- re-use of port call information in THETIS provided by the Member States to provide accurate information on ship arrivals and departures,
- elaborate on the existing THETIS messaging (alerts) to include alerts for the Sulphur Directive,
- allow the new user community (PSC or non-PSC staff depending on the MSs Designation of authority) to record inspections under the Sulphur Directive,
- store inspection data for future reference by subsequent users in different ports of call, and
- keep separated inspection data of PSC and Sulphur Inspections as per relevant legal basis.

The THETIS-S system was developed around the inspection process of consulting the ships, selecting a ship for inspection, inspecting the ship and reporting the outcome including test

sampling results if applicable. It went live on the 1st of January 2015 despite the tight deadlines.

Although THETIS-S benefits from data on ship particulars and port calls in THETIS, the two systems are completely separated. This is done through the separation of users and access rights, inspection forms and strict rules impeding the sharing of sensitive or proprietary data between the two systems. The system further allows for the exchanging of messages (alerts) between Member States.

Annex C

Analysis of Findings WP4

Use of remote sensing and novel techniques of sampling / Emissions monitoring tools for efficient ship targeting in the EU

Remote Sensing

Based on presentations and information from a number of Member States, the sub-group discussed different technologies for remote sensing of sulphur emissions from ships at sea.

In-Situ Trace Gas Monitoring (“Sniffer”) method

At present, the most accurate determination of fuel sulphur content via a ship external approach seem to be provided by standard in situ trace gas monitoring equipment, so called “sniffer” instruments. “They measure the SO₂/CO₂ concentration, which enables the calculation of the equivalent sulphur content of the fuel oil used by the ship. However, “sniffers” need to be exposed to the ships’ exhaust plume and thus the method relies on meteorological conditions (wind) to enable the detection of individual exhaust plumes.

Optical method

Optical remote sensing methods apply a different measuring principle. Most optical instruments are applying the absorption of sunlight to characterize specific gases in the instrument view direction, making it possible to perform measurements from a longer distance. It is possible to measure NO₂ and SO₂, but the detection of carbon dioxide is currently not easily possible. This makes further assumptions about ships engine load and operation mode necessary, to calculate back from remote sensing measurements to the sulphur content of the fuel oil in use.

Installation

Remote sensing equipment can be installed in fixed positions like port entrances and/or on bridges, as well as on planes and helicopters. Results of remote sensing can be combined with GPS and identification data from ships (AIS-data), in order to target potential violators.

“Sniffers” and optical measurements have been proven in several demonstration projects in Sweden, Germany, Finland and The Netherlands.

The sub-group realized that there is room for further development of remote sensing technologies, in order to obtain more cost-effective solutions. It was noted, that new less expensive technologies, such as unmanned aerial vehicles (UAV’s) and with the use of low cost sensors, are currently under development in some Member States.

The sub-group welcomed the information from those Member States¹ who reported, that they plan to use remote sensing as a part of their enforcement of the sulphur directive. (Table 1) supplies an overview of the current activities.

Table 1: Overview on MS status with remote sensing.

¹ Finland, Belgium, the Netherlands, Sweden, Denmark and Germany

Member state	Research/demonstration projects	Plans for 2015-2016
Belgium	Installation of a sniffer on board of a Britten Islander Plane	At least 100 flight hours/annum
Denmark	Test of low cost sensors on drones and on the Great Belt Bridge. The test projects will run until the beginning of 2015.	Approx. 1 mill € reserved for remote sensing from fixed and airborne platforms. EU Tender in progress. Expected duration: Summer 2015 to the end of 2016.
Finland	Test of remote sensing using airborne equipment. New research project (possible) also starting early 2015 for low cost and light sensors on drones.	Approx. 1,6 M € reserved for remote sensing from airborne and fixed platforms in 2014 -2016. Handheld equipment for surveyors to be used for on board sampling and analysing.
Germany	Since 2012 test of in-situ ("Sniffer type") and optical remote sensing instrumentation for ship emission monitoring in the context of an R&D-project (www.mesmart.de). Temporary operation of the equipment at two monitoring stations along the Elbe River (Wedel, Neuwerk), and test on board of research vessels. The project is running until Sept. 2015.	Current project proposal (2015-2017) with the aim to develop the so far successfully tested equipment further, to: <ul style="list-style-type: none"> • an operational applicable monitoring system, • Be fit for purpose in a network of ship emission monitoring sites. Further on: Test of new active remote sensing equipment which doesn't belong to sun light (DOAS + artificial light source). The current planning is to use the existing measurement sites of the precursor MeSMarT -project.
Sweden	Land based sniffer equipment in port of Gothenburg for several years. Several years of experience with air-surveillance with both sniffer and optical equipment.	We plan for these two methods but not yet decided. Use of handheld equipment for fast results on board ships. A land based equipment on the bridge of Öresund.

Member state	Research/demonstration projects	Plans for 2015-2016
The Netherlands	<p>Test of sniffer equipment in the Berghaven of Hoek van Holland at the entrance of the port of Rotterdam for about five months. Ships are inspected based on the sniffer system results and samples are taken in order to check the accuracy of the sniffer system.</p> <p>Two months test of handheld analysing equipment in order to have a quick scan on board of the sulphur content in the fuel. The samples were sent to an accredited laboratory in order to check the accuracy of the equipment.</p>	<p>Continue the use of sniffer systems by the port entrances of Rotterdam and Vlissingen and Terneuzen which also covers Antwerpen.</p> <p>Probably the use of an air plane together with Belgium in order to check compliance at sea.</p> <p>Continue the use of handheld analysing equipment for fast results on board ships.</p>

ANNEX D

WP6 Analysis of findings

Reporting Obligations of the MSs under the S Directive

The main points of view expressed showed that MSs supported a harmonized reporting format and content (quality, clarity and uniform terminology) and further considered and supported the need to create an effective enforcement tool with assistance of EMSA where data can be retrieved for reporting and monitoring purposes. This was considered essential to better assess whether the objectives of the Directive are actually achieved and to ensure an equal spreading of enforcement efforts among all Member States. It was emphasized that the reporting should represent a balance between providing sufficient information to be able to assess the level of compliance of all requirements in the Sulphur Directive while not making the reporting obligation too burdensome and time-consuming. The Implementing Act on reporting was closely aligned with other developments related to enforcement (including penalties), and notably the Implementing Act concerning the frequency of sampling. Within the harmonised approach to reporting the electronic format was considered more efficient and less burdensome for both Member States and the Commission.

With the encouragement of the ESSF plenary the discussions within the sub-group about the appropriate content and format of the annual reporting by Member States continued for the purpose of improving the verification of compliance with the Sulphur Directive and in view of the adoption of the relevant Implementing Acts. With the assistance of the sub-group, EMSA, the ESSF plenary, the Commission services have adopted through comitology such Implementing Act on 16 February 2015.

Examples of such useful additional fields in the annual reporting were discussed: non-availability reports/letters of protest, use of alternative emission abatement methods and their possible (temporary) malfunctioning, information about the bunker suppliers, use and results of alternative enforcement techniques (e.g. 'sniffers'), number and size of penalties, and possible others in accordance with the provision the Implementing Act on 'frequency of sampling'.

ANNEX E

WP8 – Analysis of Findings

Penalties and Fines in some EU Member States

The discussions were set against the background on penalties resulting from the EMSA survey carried out in 2013 on enforcement and addressed to the member States. Some indications could be shared on penalty systems and fine levels by the courts and Administrations in the Member States under the previous version of the Sulphur Directive.

The penalties were generally low level and showed big variations among Member States. This re-iterated concern by many in the sub-group since it was explained by the ship owner associations within the SG how a ship could cover the fines levied by EU MS, for not adhering to the regulations in the Directive, by the savings made from using cheaper noncompliant fuel within two or three days of sailing. Therefore, the urgent need for MS to take action and remove the economic reason to cheat and preserving the level playing field while meeting the projected environmental targets was further stressed. To this aim, the Commission had only started detailed monitoring following the transposition by launching conformity studies on transposition of all provisions of latest amendment to the Directive and a possible comparison with the corresponding provisions for all Members States under the previous version but this is work in still progress and results will not be available in the short term.

The sub-group also stressed the usefulness future work towards a stronger harmonisation among MS in this field would be if it could even consider to include some elements for a harmonized calculation of penalties in the inspection guidance document developed by EMSA. However, under EU legislation, penalties are a competence of the MS and it is entirely on their discretion to cooperate on this aspect since there is no EU legal mandate to suggest neither harmonisation nor the development of such methods other than reminding the general guiding principles on how penalties have to be calculated under the Directive or, if requested, to facilitate a common understanding among the Members.

As a comparison with other EU legislation, some members even recommended to consider future adoption of dissuasive measures for infringement calculation similar to the Aviation ETS where planes are fined per tonne of CO₂ avoided. Both administrative and criminal sanctions were allowed under the EU Ship Source Pollution Directive 2005/35/EC. However, this only covered offences under Annex 1 and 2 of MARPOL. Moreover, the Fuel Quality Directive stipulates criminal penalties should be used if the quality of fuel supplied is not up to standard.

The Subgroup also reflected on the effective application of fuel non-availability clause and discuss possible Member State's actions to ensure fuel availability to demonstrate how they fulfil their obligation (art. 4a(5a)) also in terms of implications on sanctions.

The fact that MS competent authorities will only be able to check for compliance in national jurisdictions under the Directive represents an issue in case for example of the use of remote sensing as targeting tool. Therefore action cannot be taken for offences which have been conducted in the territorial waters of another MS under the Sulphur Directive. However, under MARPOL inspectors are empowered to check for compliance beyond national waters and this should be used in conjunction with the Sulphur Directive.

This reinforced interaction mentioned is needed for strengthened cooperation among MS in judicial matters which is only possible only under a criminal law regime not under an administrative regime. However, reinforced cooperation among MS can be set under their own initiative to address; for example, environmental issues jointly under UNCLOS were harmonisation of administrative fines could be addressed.

Sub-group has successfully discussed the relevant national provisions on penalties and control systems for fuel suppliers and identified best practices which could form a basis of an effective system of sanctions. A significant amount of work remains to be done both from COM and Member States sides. Cooperation and Coordination among Member States will need to significantly step up and the SG discussions and the joint use of the EU information system is giving impetus for reinforced coordination in penalty systems by the Member States and its future shaping and evolution.

(See MS and EMSA Contributions: Annex's 'J', 'K', 'L' and 'M')

Note: Penalties referred to in the EMSA slides Annex 'M' were based on cases before 1 January 2015 after which the can be expected to be higher due to the wider variance in the economic margins between high and low sulphur 0.10% fuel oil.
