



European Materials Handling Federation

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## **FEM comments on the final ODELIA study report on the scope and limits of the Outdoor Noise Directive (2000/14/EC)**

Brussels, 28<sup>th</sup> September 2016

FEM is the European federation representing manufacturers of materials handling, lifting and storage equipment. Several families of FEM equipment are affected by the Outdoor Noise Directive (2000/14/EC), notably industrial trucks, mobile elevating work platforms, cranes & lifting equipment, hoists and conveyor belts. This equipment has been assessed in the context of the ODELIA study on the OND scope and noise limits.

FEM and its Product Groups provided extensive written and verbal input at every phase of the ODELIA study. However, FEM feels the need to reiterate its main comments considering most of them have been ignored, although they remain valid.

Therefore, this paper provides general comments on methodological aspects, which are shared by the majority of mechanical industry sectors. In addition, this position paper provides specific comments on ODELIA recommendations on individual types of FEM equipment in view of further developments in the OND review.

### **Part I - Methodological and general aspects of the ODELIA study**

#### **1. ODELIA proposals are neither properly justified, nor based on robust evidence**

FEM raises strong concerns about the lack of justification provided in the final ODELIA report, which suggests setting new or stricter noise limits for two-thirds of current equipment in scope. In addition, ODELIA suggests including 13 new equipment types in the OND scope. Although we asked ODELIA to justify recommendations, some assumptions seem to be arbitrary rather than based on robust evidence.

According to the methodology presented in the study report, the following two questions are the starting point for assessing each type of equipment:

- *Are previous findings and recommendations from studies and papers since 2007 still valid?*
- *Is new information and evidence available that supports additional or different conclusions from these documents, in particular the NOMEVAL study and the WG7 paper?*

FEM acknowledges that the final report includes a list of source documents, such as the Nomeval and Arcadis study reports, as well as their main outcomes. In addition, stakeholders' comments, including those submitted by FEM, have been partially included. However, copying previous conclusions and stakeholders' input is not sufficient: no explanation is provided on how some comments have been taken into account or whether new information leads to different conclusions compared to previous findings.

The case of construction winches illustrates our criticisms: the NOMEVAL report and FEM recommended removing these products from the scope, whereas Working Group 7 suggested maintaining them in Article 13. ODELIA recommended keeping the current limits for CE-powered equipment without a proper rationale supporting this proposal and on the basis of a significantly overestimated market population.

## **2. The ODELIA methodology and decision procedures are inappropriate**

The ODELIA proposals to set stricter noise limits, move equipment subject to noise marking only to Article 12 and include new equipment in scope are based on a wrong approach. ODELIA used an automatic process instead of assessing equipment types in the light of the OND objectives. Consequently, final recommendations cannot be valid if they are based on an incorrect starting point.

Indeed, the Outdoor Noise Directive aims to reduce noise in the environment, especially in urban areas. As a consequence, setting a new or stricter limit value is only justified when it is clearly established that the machine type has an important environmental impact. Instead, ODELIA presents Article 13 equipment as a waiting list for setting new noise limits. Then, once introduced into Article 12, the equipment should be subject to lower limits: *“typically 2-3 dB lower and requires around 3-4 years to be introduced”*.

In addition, ODELIA based its decision whether or not to set a new or revised noise limit on a wrong approach. Indeed, ODELIA assessed as a first question: *“are there several local noise problems in one Member State?”*. FEM and other industry stakeholders urged ODELIA to amend its decision flowcharts to ensure that the first step of the evaluation procedure is the environmental impact.

Setting general requirements at EU level on the basis of a local situation is clearly disproportionate and leads to unnecessary equipment redesign. This is likely to result in additional costs for manufacturers, meaning a negative impact on EU competitiveness without environmental benefits. This is clearly contrary to the better regulation principle.

As regards test codes, FEM believes that the decision procedure, notably the flowchart, is unclear and confusing. Instead of the existence or absence of a revised version as a starting point, ODELIA should base the assessment on whether there is a need for a revision or not.

As an example, variable reach trucks and industrial trucks are regulated by the same test code which is not adapted to variable reach trucks. New test codes should be developed when necessary.

## **3. Data used in the study are not fully reliable**

The final study report is based on erroneous and incomplete information, which makes the findings questionable. Indeed, the report is mainly based on information extracted from databases and the NOMEVAL study report, which are not always correct. Consequently, FEM believes that the final ODELIA report cannot be considered as an accurate basis notably to revise the current limits or introduce new limits.

First, the EU Noise Database (the so-called Article 16 Database) is outdated, incomplete and contains many errors: it cannot therefore be considered as a valuable information tool. FEM made several criticisms in 2007, which remain valid. For example, some data on tower cranes were introduced into the CE-driven construction winches category, which gives a totally wrong picture for both products.

As regards other databases (the Italian MARA, UK NMRO and Dutch MIA/VAMIL) they also contain doubtful information. For example, the MARA database includes machines which are not MEWPs (aerial access platforms) although they are classified as such. Values for truck-mounted platforms are mixed with those for self-propelled MEWPs, which results in a wrong picture for both products since these two types of machines cannot be compared.

In addition, ODELIA used the NOMEVAL report as a starting point, notably to identify the environmental impact of each type of equipment. However, FEM believes this study report is not always an accurate basis and should have been reconsidered. This is essential to give a clear and valid picture of FEM equipment currently on the market.

For example, the NOMEVAL report is inconsistent for aerial access platforms (also called mobile elevating work platforms - MEWPs). It shows a low environmental impact for this type of equipment. The NOMEVAL report recommended setting mandatory noise limits, which assumes that MEWPs have, at least, medium environmental impact. FEM agrees with the NOMEVAL conclusions that MEWPs have low environmental impact since the machines give a negligible contribution to process noise during their work cycle. The engine is shut down most of the time and, when it is running, low idle is by far the most frequent working condition. Consequently, setting mandatory noise limits would not contribute to reducing noise in the environment.

Furthermore, many equipment types seem overpopulated in the final report, notably construction winches (item 12b), mobile cranes (item 38) and portal cranes for harbours and terminals (item 107), despite FEM comments on previous drafts.

#### **4. Calculation methodology is not transparent**

Despite numerous FEM requests, the methodology and data sources used to calculate environmental impact and different factors, such as intermittency, are not specified in the final report. In addition, there are only vague assumptions on the values used and the weight of parameters, such as market population, seems to fluctuate from one type of equipment to another.

This lack of transparency is of utmost concern for FEM since environmental impact is the major criterion for setting new or stricter noise limits. ODELIA must provide further clarification on how different parameters and figures have been used. Otherwise, the environmental impact will need to be reassessed.

#### **5. The broader legislative environment has been ignored**

Although the final ODELIA report provides an overview of EU legislation linked to the OND, it does not analyse either its technical impact or the design cycle. However, it is surely essential to take into account the overall legislative environment affecting machinery manufacturers in order to assess the technical and economic feasibility of noise limit proposals. Otherwise, the EU outdoor noise legislation is likely to negatively impact the competitiveness of the European materials handling industry and its world leader position. Indeed, complying with requirements from different pieces of legislation, especially stricter exhaust emission limits, results in a technical challenge which will use substantial R&D resources.

As regards the time scale, the report suggests 2021 for the entry into force of new noise limits, considering that the timescale between 2007 and 2021 is sufficiently long to contain several design cycles. However, once the new regulation will be adopted, manufacturers will not have enough time to redesigning their products a number of times to meet new noise requirements by 2021.

## Part II – Types of FEM equipment

### 1. MEWPs

The MEWPs Product Group strongly disagrees with the findings, conclusions and recommendations provided in the final ODELIA report as regards mobile elevating work platforms (aerial access platforms with combustion engine - equipment 1).

The ODELIA final report suggests moving MEWPs from Article 13 to Article 12 and, consequently, introducing noise limits. ODELIA presumes that the current environmental impact of this type of equipment is medium. However, the information provided in the main part of the report and in the detailed table in Appendix F does not indicate how ODELIA reaches its conclusions. There is no evidence supporting the increase of the environmental impact from low to medium.

In addition, the data provided by FEM have not been fully taken into account: we firmly believe that MEWPs have a low environmental impact.

First, FEM has strong evidence that the number of machines in service decreased in the period 2008-2014: the IPAF rental market report Europe 2015<sup>1</sup> shows that the number of MEWPs in the EU<sup>2</sup> has decreased since 2008. Moreover, the share of electric and hybrid equipment has gained ground in both boom and scissor MEWP categories, which together represent around 86% of the total MEWPs population. The trend is therefore a decrease in the number of MEWPs that contribute to environmental noise.

The environmental impact is calculated as a directly proportional function of both the amount of equipment and the distribution of inhabitants according to each piece of equipment. Considering that both these parameters have been lower than 2008 values for the last 6 years, we assume that there is no justification for considering that the environmental impact of MEWPs has increased to medium.

Furthermore, unlike most types of machinery, MEWPs actually have their engines turned off most of the time. The purpose of a MEWP is to transport operators to a raised position where they can carry out work from the platform. A MEWP is used only to transport and place people at height, not to perform a task. For self-propelled MEWPs, on average the percentage of working time with the diesel engine running is approximately 20%, of which time spent with the engine at low idle and no movement is approximately 70%.

Moreover, MEWPs must fulfil the requirements of the existing Directive on engine exhaust emissions (97/68/EC; 2-stage reductions: 2010-2012 and 2014) and will have to cope with the incoming new engine exhaust emissions Regulation. Engines are and will be noisier than the ones used at the time of the NOMEVAL report.

MEWPs include a wide variety of machines which differ in their layout and dimensions, performance, typical usage and work cycle. This diversity is reflected in the values of the Guaranteed Sound Power Level LWA which differs for each MEWP type. For instance, the LWA for trailer-mounted MEWPs with an engine power of 3.5 kW cannot be mixed up with the value for self-propelled MEWPs with an engine of 75 kW. Therefore, a flat LWA value does not represent the actual noise emissions of the MEWP.

As regards test codes, ODELIA stated that “no new test code with advantage available”. However, the current test code should be amended to suit the actual usage of the machine (most of the time with the engine switched off).

Therefore, imposing noise limits will not result in environmental benefits since the contribution of this type of equipment is negligible. Instead, it will result in high costs for manufacturers and technical difficulties

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<sup>1</sup> Prepared by Ducker Research SAS, it is available here: <http://www.ipaf.org/en/publications/ipaf-rental-reports/>.

<sup>2</sup> The report covers 10 European countries that represent 88% of the market: France, Germany, Italy, the Netherlands, Denmark, Finland, Norway, Sweden, Spain and the UK.

considering the new engine technology meeting new engine exhaust emissions requirements to be made available in the coming years.

## **2. INDUSTRIAL TRUCKS**

FEM strongly disagrees with the ODELIA suggestions to combine all lift trucks with loaders in the same category and introduce stricter noise limit values for current Article 12 equipment and new noise limits for current Article 13 equipment.

FEM believes that smaller lift trucks (up to 10 tonnes) in equipment category 36 should continue to be subject to noise marking only (Article 13) considering they are mainly used indoors. As regards lift trucks above 10 tonnes, current noise limits should be maintained since new engine technology will create a new challenge for reduction of noise emissions. Indeed, industrial trucks will have to comply with new engine exhaust emission requirements (revised NRMM Directive 97/68/EC).

For industrial trucks and rough terrain trucks, the noise sources are mainly the components purchased by the OEM, for instance the engine and cooling system, so the OEM has very limited control over the main sources of noise emission. Noise reduction at equipment level should result from noise reduction at component level which should be proved with reliable data currently not available. This data should be provided in order to achieve common ground for discussion.

The older diesel engines (those in use at the time of the NOMEVAL report) were indirect injection (IDI) type. This kind of engine was used in many machines in the past, especially those with smaller engines. IDI engines are usually inherently quieter than direct injection (DI) engines. Today, almost all diesel engines are DI, i.e. in general noisier than those fitted in the machines considered at the time of the NOMEVAL report.

The new legislation on engine emissions will increase the number of these smaller (noisier) DI engines which will need to meet emission requirements. The cooling system cannot be reduced with the new generation of engines as the amount of heat rejected increases through the various phases. For example, between phase IIIA and IV heat rejection has increased by more than 10%. The level of noise produced by the fan in machines equipped with phase IIIB engines is about 5 dB.

Consequently, new engine exhaust emission requirements lead manufacturers to redesign engines to make them more efficient and environmentally friendly. Diesel engines with indirect injection have been replaced by those with direct injection with a complex after-treatment system (SCR, DOC, DPF) which takes more room in the engine compartment.

These engines have reduced emissions but they generate more heat and so do the after-treatment systems: larger cooling systems are needed, which also take up room in the engine compartment. For example, stage IV engines are more than 50% bigger than the corresponding stage IIIA engines.

In addition, FEM strongly questions the ODELIA conclusion that improvements are possible, since technical feasibility to reduce noise level is not proven.

Indeed, manufacturers have to fit engine compartments with more efficient insulation to reduce the noise of machines. It therefore seems contradictory to put ever larger openings in engine compartments to let air enter for cooling and, at the same time, insulate these engine compartments in order not to let the noise out. Additionally, visibility requirements may limit the size and especially the height of the engine compartment, due to the geometry of e.g. telehandlers.

As regards test codes, FEM firmly believes that they should be revised to properly consider the specific work cycles, applications and working environment for each type of lift truck. Despite FEM requests, ODELIA did not provide justification to demonstrate that new test codes for variable reach lift trucks afford no advantage.

FEM reiterates that test codes need to be adapted to better reproduce the real use of the machine and its impact on the environment. Considering noise limits are connected to the test cycles, limit values should be linked to new test codes and adjusted if need be. The need for specific a test code for each type of lift truck also justifies that lift trucks cannot be in the same group as loaders.

Therefore, FEM proposes the following revision of the test codes:

- Vertical mast lift trucks: EN 12053. This standard includes the manoeuvring mode which is part of a typical work cycle of the machine.
- Rough-terrain vertical mast lift trucks: EN 1459-7 under preparation
- Rough-terrain variable reach trucks: EN 1459-7 under preparation (based on WG7 document 2004)
- Slewing rough-terrain variable reach trucks: EN 1459-7 under preparation
- Industrial self-propelled variable reach trucks: EN 1459-7 under preparation

### 3. CRANES & LIFTING EQUIPMENT

#### **Construction winches (12b)**

FEM still believes this equipment should be removed from the OND scope due to the very small number of items on the market. The estimated population is unclear: ODELIA gives a figure of 26,000 units, while only a few hundred items are present on the market according to FEM.

#### **Mobile cranes (38)**

Against the advice of the former WG7, ODELIA proposed to reduce the limit value for mobile cranes by 1 dB below the current stage II limits and the recommendation of the NOMEVAL report. FEM recommends maintaining the already strict current stage II limit values as recommended by WG7.

A very significant number of cranes cannot fulfil the proposed limit value: according to ODELIA, approximately one-third of cranes on the market today cannot fulfil the lower limit value and will have to be redesigned (65% pass rate). This means that manufacturers face significant redesign costs. The ODELIA report provides no cost-benefit analysis showing that this measure is justified.

In addition, the ODELIA paper does not sufficiently cover hybrids and the work of the Noise Expert Group Task Force. In order to reduce environmental impact, manufacturers seek to downsize engines by including hybrid storage. Downsizing of engines reduces general emissions but not necessarily noise emissions. Therefore, downsizing may not be possible due to the lower noise limit allowed for engines with less power. Any noise limit has to take into account the overall power of the machine.

Moreover, ODELIA estimates the equipment population of mobile cranes to be 105,000, while FEM estimates only 25,000 of which 19,000 are all terrain cranes<sup>3</sup>.

#### **Portal cranes for harbours & terminals (107)**

Against the advice of the former WG7 and the FEM opinion, ODELIA proposed to include “Bridge and gantry cranes used in harbour and portal cranes” in the OND scope.

First, the products targeted by ODELIA in this category are unclear: many different terms are used in the ODELIA and NOMEVAL reports, e.g. “Bridge and gantry cranes used in harbour and portal cranes”, Bridge and gantry crane (harbour/portal) or “Mobile cranes for harbours and terminals (Bridge and gantry cranes)”. Therefore, equipment category 107 should be renamed “Portal cranes used in harbour”.

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<sup>3</sup> “Impact Study on Mobile Cranes”, W. A. Günther et al., 2014; [http://fem-eur.com/data/File/150127\\_Impact-Study-on-mobile-cranes\\_Druckversion.pdf](http://fem-eur.com/data/File/150127_Impact-Study-on-mobile-cranes_Druckversion.pdf)

In addition, mobile cranes used in harbours are already covered by Article 12 and must comply with strict noise limits. Bridge cranes are mainly used in buildings and are not state of the art for use in harbours. Gantry cranes and portal cranes are used in harbours (see ISO 4306).

According to the WG7 paper, noise limits should not be applied to equipment which noise emissions is due to dominance of process noise considering the manufacturer impact is limited. Nevertheless, ODELIA did not take this principle into account. For example, ODELIA takes into account noise impacts of spreader and grounds, while this source of noise is not under the control of the manufacturers. Therefore, this noise source should not be taken into account in sound characteristics and environmental impact.

In addition, the ODELIA study report overstates the population of portal cranes for harbours and terminals. As no definition is given for these cranes, the population figure is difficult to estimate. However, we believe the figure is no more than 10,000 in Europe (EU-28), meaning one-third of the equipment population indicated by ODELIA.

Finally, FEM believes that the test code proposed by ODELIA (DIN 45635 T61) is obsolete and does not give a measurement procedure which is applicable for this specific type of equipment.

#### **Vehicle-mounted loader cranes (108)**

Contrary to FEM opinion, ODELIA recommended including vehicle-mounted loader cranes under the category mobile cranes in such a way that the noise level is declared by the manufacturer who installs the crane on the vehicle.

FEM does not agree with this assessment, as vehicle-mounted loader cranes and mobile cranes differ significantly in design and often in application. They are covered in different harmonised product standards: mobile cranes fall under EN 13000, whereas loader cranes are under EN 12999.

In addition, loader crane manufacturers have limited influence on the overall noise levels as they cannot influence the noise level of the carrying truck.

## **4. OTHER FEM EQUIPMENT**

#### **Straddle carriers & reach stackers (117 & 118)**

According to FEM, the ODELIA recommendation to set a noise limit and mix straddle carriers and reach stackers with lift trucks is wrong: these types of equipment should not be included in the OND. ODELIA acknowledges that the impact on the environment of straddle carriers and reach stackers is very low.

In addition, proper definitions are missing in the ODELIA report.