



Position Paper of
FEM Product Group Cranes and Lifting Equipment -
Sub-Group Mobile Cranes
Regarding: "Data Recorder/Event Recorder – Mobile Cranes"

"This paper should serve only as a reference and overview: it is meant to provide guidance in the assessment of risks. It neither addresses each and every imaginable scenario, nor is it a binding interpretation of the existing legal framework. It does not and cannot replace the study of the relevant directives, laws and regulations. In addition, the specific features of different products and their various applications have to be taken into account. This is why the assessments and procedures referred to in this paper may be impacted by a large variety of circumstances."

FEM has thoroughly discussed the application of event recorders as required by the European safety standard for mobile cranes EN13000:2010, here named "data recorder".

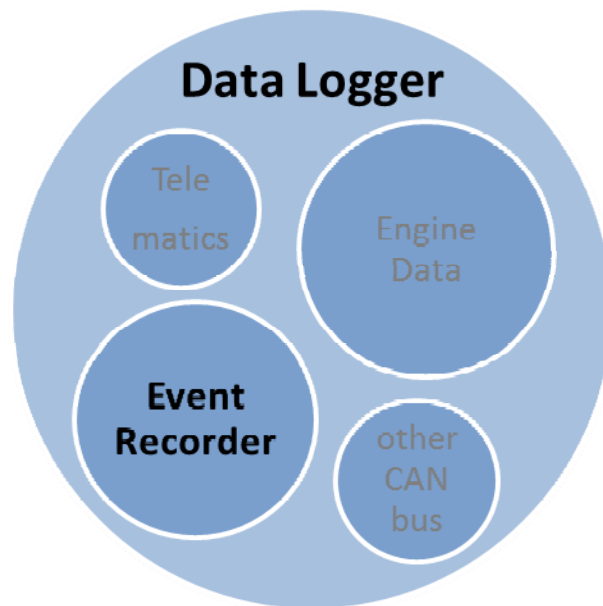
Definitions:

Event recorder:

an event recorder monitors and records load-related data and geometric information when occurrences trigger the system, such as errors, bypasses, overloads, and configuration changes. The event recorder is capable of storing a certain amount of data in a memory system. Once the memory fills, the system begins recording over old data (oldest to newest); whereas the number of overloading events shall be counted together with the classified percentage of overloading; this data shall be kept for the lifetime of the mobile crane.

Data logger:

This is a device that can record any data e.g. geometric information, engine data, fuel consumption. The data logger may include the data of events as recorded in the event recorder. The data logger is typically capable of storing a certain amount of data in a memory system.



FEM is of the opinion, that:

The periodic inspections of mobile cranes as stipulated by national law and the records of these inspections which shall be kept are not affected by events recorded according to EN13000:2010.

The records of periodic inspections will contain data and information which for technical reasons can not be recorded by the event recorder; this additional information is nevertheless necessary for a full evaluation of the crane condition. Especially unusual occurrences during crane use need to be recorded by the user/owner (e.g. malfunctions, damages, repairs, unforeseen climatic influences). Some guidance for monitoring of cranes is given in ISO 12482-1¹ "Cranes – Condition Monitoring".

An event recorder as foreseen in EN13000:2010 shall operate as follows:

1. The following load-related data shall be recorded to enable accident investigation and/or reconstruction.

¹) ISO 12482-1 „Cranes – Condition Monitoring“ establishes amongst others requirements and recommendation duties of user/owner related to inspection and maintenance which are:

- keep records of crane use, inspections and maintenance including unusual occurrences (e.g. unexpected loads from operational error, extreme climatic conditions), breakdowns, repairs and modifications,
- carry out thorough examination (special assessment) at appropriate time,
- carry out overhaul arising from results of examinations before further use,
- when records are not available or kept an inspection according ISO 9927-1 shall be made, any requirements as result shall be carried out before further usage of the crane.
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- carry out overhaul arising from results of examinations before further use,
- when records are not available or kept an inspection according ISO 9927-1 shall be made, any requirements as result shall be carried out before further usage of the crane.

The minimum amount of different data written in the event recorder when the crane is overloaded (event triggered recording necessary for accident investigation) has been identified by FEM as:

- date and time
- crane configuration
- permitted load, actual load, percentage of usage of rated capacity
- radius of load
- total boom length and sequence of extension when necessary
- main boom angle, luffing jib angle (if operated with luffer)
- status of override bridging key, booming up bridging, set up button and bridging devices

2. The data of the events belong to the owner of the crane; he might involve the manufacturer for further analysis.
3. The data of the events for accident investigation (see above) shall be recorded for a limited period of minimum 3 days and may be automatically overwritten. The number of overloading events may be counted together with the classified percentage of overloading.

Note: As mobile cranes are designed for a limited number of load cycles in accordance with the classification of ISO 4301 the data may support accident investigation/reconstruction.

4. The amount of data recorded in the event recorder does not allow the direct assessment of worn out overloaded components or stressed areas of the structure per each incident. The event recorder does not allow condition monitoring!
5. The event recorder is not substituting the regular (periodic) inspection as required by national law/requirements and/or manufacturers instructions; the final decision on fitness for further purpose can only be based on thorough examinations carried out by experts (i.e. visual inspection, magnetic particle, etc.).

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