Prepared by WG-17 Transport Safety SI-TS 17/25

Implementing a Fatigue and Distraction Detection System in Delivery Vehicles

Introduction

In Europe, the majority of all road accidents are fatigue- and distraction-related. [1]

Fatigue is a human condition and nobody can fight it.

In some cases, drivers can easily recognize the first signs (yawning, blinking eyes). Despite the risk of accidents, some still believe they can fight fatigue, believe falling asleep behind the wheel cannot happen to them or even do not detect the first signs and continue their journey. Fatigue can also result in microsleeps which the driver may not be aware of. These can be caused by undiagnosed sleep apnoea.

Today technologies exist which can detect the signs of fatigue. They can also detect microsleeps and wake the driver if the driver experiences a microsleep while driving. These technologies have proven efficient in assisting drivers and organizations to effectively manage the risk of accidents related to fatigue. They are capable of mapping the driver's face and body and thanks to AI are able to identify deviations to the normal posture or position of the face/the body.

The subject of fatigue is so serious that the EU transport commission has introduced new legislation. The European directive 2019/2144 of November 2019 requires all new heavy goods vehicles delivered to the market to be equipped with a fatigue and drowsiness detection system, applicable as of 7 July 2024.

These technologies are already commercially available. They have been implemented in many transport operations around the world, including EIGA members. Many lives have been saved.

The effective implementation of these fatigue detection systems will mean a change for the drivers and for the logistics organizations. This document provides guidelines, based on lessons learned, to help ensure that these systems are successfully implemented.

The effective implementation of this technology should be done in a structured and organized way as it constitutes a major change for drivers. It should include, in addition to the proper selection of the device, fair communication and the implementation of an effective programme to ensure the information is used for the benefit of the drivers.

The following document is a guideline to facilitate the implementation of this technology.

Scope

This Safety Information is focused on improving driver safety through the introduction of fatigue detection technology in vehicles used for delivery of products. The management of fatigue as a condition is covered in TSI 013. [2]

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1. Fatigue or distraction are not the reason for accidents on the road within your operations?
2. Do you manage drivers’ fatigue and distraction?
3. Do you have a system implemented that analyses drivers’ behaviour while driving?

If the answer to any of the above questions is ‘no’, then you should consider taking action!

THIS TRANSPORT SAFETY INFORMATION RAISES AWARENESS OF THE RISKS ASSOCIATED WITH DRIVER FATIGUE AND DISTRACTION AND MEASURES THAT WILL MITIGATE THESE RISKS

Device and Recording Functionality

- Direct fatigue and distraction detection systems (camera or sensor) should detect if:
  - eyes are closing/blinking in an abnormal way;
  - driver is yawning;
  - driver is uncomfortable at the wheel;
  - head and eyes of the driver are not focused on the road ahead (because of eating, drinking, electronic device usage, etc.);
- The event data should be kept in an appropriate location, where no unauthorized third party is granted access. Only data related to detected events should be recorded and stored for a time permitted under local regulations
- The detection system should not work if the motor of the vehicle is turned off
- Drivers should be immediately alerted (e.g. seat vibration or audio message) in case of a fatigue event.
- If the system is disabled it should send a notification
- Transmission of information should be preferably automatic.
- A fatigue alert should be shared preferably immediately to the driver’s supervisor / line manager
- Access to fatigue data should be restricted to drivers and the supervisor / line manager
- Each driver should have access to their own personal information.
- An appropriate event reporting system is recommended

Under no circumstances shall fatigue data be made public!

Service

The system should cover all aspects, including device, data management, data protection in compliance with local regulations and GDPR [3], and the system should:

- Where possible include a 24 h support service for alert analysis (via a verification centre)
- Be supported with a robust after sales service including repair or replacement of any failing component or software updates within an agreed timescale after notification.
- Be evaluated regarding reliability
- Provide easy, secure access to data via a dashboard with events per driver, only accessible to the supervisor / line manager and the driver
- Enable sharing of anonymous trend data

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Role of Gas companies and their Carriers

Often logistics activities are contracted out by the gas companies.
In this case the gas company should not have access to any carrier's employee's personal information but should have access to high level and anonymous data and statistics.

When a carrier partner operates the system on behalf of a gas company, the carrier should:

- Select a system compliant with the gas company's requirements
- Perform coaching of drivers on the most significant events and formalize the records of the coaching session
- Prepare a review of the high-level statistics for the periodic contract review meeting with the gas company

The gas company should:

- Regularly review the evolution of trends and ensure that events are effectively followed up and appropriate action is taken.

Implementation of the system: Managing the change

Some drivers can feel such systems may be intrusive.
Implementing such devices should be managed in a step-by-step manner, the following is an example of the steps that could be taken:

1. Communicate using the feedback you can get from the system provider on how it works, what it records, what it does not. Answer questions about privacy, data protection.
2. Implement a few devices with a selection of volunteer drivers. Communicate the results and exchange with all drivers about the outcomes
3. Then deploy the system without alerts to the drivers for an agreed period to establish a baseline and calibrate the system,
4. Share the results without finger pointing at specific individuals and exchange the results with the drivers.
5. Switch on the in-cab alerts to the drivers to notify them of events and allow them to adjust their own working practices
6. Once the number of events has reduced to a manageable level (ideally after a few months), start the coaching of individuals on the few remaining events. If no change takes place, consider further actions.

Management of the system

The purpose of the system is to assist drivers in recognising and managing their fatigue and enabling them to stop the vehicle safely before it is too late. From an organizational point of view, it is also important to schedule the delivery tour in a way that drivers get sufficient rest and that the system is not triggered. The first events collected with the systems may help to identify opportunities for improvement.

Role of dispatchers/scheduler

To avoid fatigue, dispatchers/schedulers should incorporate enough time for the drivers to take sufficient breaks during the routes, and:

- Where appropriate identify the safe rest places and provide the location
- Support the driver in modifying the trip if the driver suffers from fatigue and needs to take a break

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Event follow up

For each safety relevant observation, the supervisor/line manager should make a review of the event with the driver.
Causes should be identified, recorded and measures for improvement agreed.

An example of how events could be managed is as follows:

- On activation of a fatigue alert for the first time a driver should consider the circumstances that led up to the fatigue detection device activating
- Following the first activation, the driver should take immediate action which could include (but is not limited to) opening a window to increase the flow of fresh air into the cab
- After taking initial remedial action, the driver shall pull over at the first available parking location, take a 15-minute break and make a self-assessment to determine whether they have adequately managed the effects of fatigue
- If the driver feels ok and the effects of fatigue have passed and is ok to continue their journey, if no further fatigue alert activations are recorded, the driver can proceed as normal
- If it is felt by the driver that the level of fatigue cannot be managed following the first activation, or the driver feels they are ok to proceed and receives a second or further fatigue activations, they shall contact their supervisor or if out of normal hours, the on-call duty manager at the first available stop

If multiple fatigue alerts are experienced by the driver in the same trip the route should be suspended, and the driver shall discuss next steps with supervisor/line manager/dispatcher.

If a driver is frequently identified with fatigue alerts, the supervisor/line manger shall take appropriate measures.

Example of a procedure for managing fatigue alerts

Purpose:
This procedure ensures the safety of drivers and the public by providing clear steps to manage fatigue alerts. Drivers must follow these instructions upon activation of a fatigue detection system.

Step 1: First Activation of Fatigue Alert

- Immediately assess the circumstances that led to the fatigue alert.
- Take immediate actions, such as:
  - Open the window to increase airflow.
  - Adjust posture or seat position to promote alertness.

Step 2: Pull Over and Take a Break

- The driver must pull over at the first available safe location.
- Take a **15-minute break** to self-assess the effects of fatigue.
  - If fatigue has passed, continue the journey.
  - If fatigue persists, proceed to the next step.

Step 3: Escalating the Situation

- If the driver receives a second or subsequent fatigue alert:
  - **Immediately contact the supervisor** or the on-call manager using company communication systems.
  - Provide details of the fatigue incidents and follow their guidance.

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Step 4: Handling Multiple Fatigue Alerts in One Trip

- If multiple alerts are received, the route must be suspended.
    - Discuss next steps with the supervisor, dispatcher, or line manager before continuing the journey.

Step 5: Regular Monitoring and Supervisor Involvement

- Supervisors must review the performance of drivers who frequently experience fatigue alerts.
    - Appropriate measures may include adjusting schedules, reviewing health status, or enrolling drivers in a fatigue management program.

Conclusions

A study conducted in 2023 in France [4] shows that working hours in developed countries have fallen by over 25 % in 60 years. In the same period, sleep time was reduced by one to one and a half hours. Lifestyles have changed. More time is spent looking at screens, and there is a higher demand for free time.

The focus on activity and utility overlooks the importance of rest for physical and cognitive skills to regenerate which are vital bodily needs. This trend also impacts drivers of the gases industry. Effectively mitigating the risk of accidents related to fatigue is possible nowadays thanks to the technological evolution. Implementing behavioural detection systems is a way to support drivers of the gases industry to avoid accidents due to negative behavioural patterns.

References

[1] European Road Safety Observatory, *Road Safety Thematic Report – Fatigue*. https://road-safety.transport.ec.europa.eu

[2] EIGA SI-TS 013, *Managing Driver Fatigue*.www.eiga.eu

[3] EC Regulation 2016/679 *General Data Protection Regulation.* https://eur-lex.europa.eu

[4] National Institute of Sleep and Vigilance https://institut-sommeil-vigilance.org/wp-content/uploads/2020/02/Dossier-de-presse-JS-2023.pdf

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