SAFETY BULLETIN 28/21

Vehicle Data Management

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Based on EIGA Safety Info TS 11/19 – Vehicle Data Management

Vehicle Data Management

Introduction

Modern vehicles generate large amounts of data from their on-board computer systems fitted by the vehicle manufacturer and also from the electronic devices and driver aids that are often retrofitted to monitor vehicle and driver performance. Managing this data can provide a strong foundation for transport safety performance management and improvement.

Scope

This Safety Information provides an overview of how data can be managed and used to improve the transport safety performance of industrial gases company and their contractors' delivery vehicles, for the transportation of industrial and medical gases.

Definitions

Accelerometer: G-Sensor detecting left/right, forward/backward movement
ADAS: Advanced Driver Assistance Systems
KPI: Key Performance Indicator
OBC: On Board Computer (these can be either developed by the vehicle manufacturer or retrofitted systems)
RSS: Roll stability system – usually part of the trailer braking system

Learning more about vehicle data management

1. Do you know what systems are installed on the vehicles delivering your products?
2. Does your company have a policy stating the minimum equipment that should be installed on your vehicles?
3. Are you collecting and analyzing performance data as part of your day to day transport activities?
4. Are you using this information for managing transport safety performance?
5. Do you have processes in place to manage this data?

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

THIS TRANSPORT SAFETY INFORMATION GIVES GUIDANCE ON VEHICLE DATA MANAGEMENT WHICH WILL HELP TO IMPROVE SAFETY IN ROAD TRANSPORT.

Types of systems collecting data

- Tachograph: In some Asian countries, all hazardous material transportation vehicles must be fitted with recording devices known as tachographs. Their function is to record the driving times, breaks and rest periods of individual drivers and also speed trace for further analysis;
- OBC or telematics systems: monitor, record and transmit the data on driving behavior in relation to how the vehicle is being driven. These systems can also have GPS location tracking;
- Camera systems: record events on video such as harsh braking, cornering or accelerating which can be triggered by an accelerometer; and
- ADAS such as lane departure warning, collision avoidance warning system, fatigue and distraction, emergency braking and etc.
- Other vehicle safety system such as tyre pressure monitoring, RSS and etc.

Additional information about these and other safety systems can be found listed in Vehicle specification and maintenance AIGA SB 27/21, *Vehicle Specification and Maintenance* [1].

This list is not exhaustive as new and existing technologies are being continuously developed.

Use of the data and procedures

All procedures and data management shall be compliant with the requirements of. Data Protection Regulations that are applicable in the specific countries.

The data generated by these systems can be consolidated into a scorecard for use by the driver's management team. By tracking KPIs and following up on the performance (good and poor), you can ensure your drivers are performing safely, to an acceptable standard and good performance is recognized. If you manage your transport activities through a carrier, these key performance indicators can be used to manage the service your carriers provide. These KPIs can also be linked to contractual obligations to ensure the carrier has a vested interest in providing you with a safe and efficient service.
Safety related KPI's you should consider tracking include:

- Number of tachograph infringements;
- Number and severity of speeding violations – can be tracked using the tachograph or the OBC/telematics system;
- Harsh braking/accelerating – can be tracked using the tachograph, OBC/telematics or camera system;
- Hard cornering – can be tracked using accelerometer usually present in the camera or OBC/telematics system;
- RSS activations from the trailer braking system;
- Lane departure warning activations;
- Collision Avoidance warning activities;
- Fatigue/Distraction events; and
- Emergency braking activations.

Using the data

By focussing on KPI trends it is possible to highlight driving habits that can be improved via personal or group coaching and training. Over time, the transport management team should monitor the driver's

performance using these KPIs to ensure the driver's safety is improving and the driver is performing to an acceptable standard concerning safety.

It is important that drivers and their representatives are involved in the implementation, to ensure they understand the safety objectives.

Acceptable standards can be defined based on achievable levels of performance when measuring drivers against

- Their own performance over time;
- Their peer group; and
- External benchmark.

By comparing drivers doing the same or similar tasks, the transport management team can determine a baseline of acceptable performance. Drivers not meeting this baseline should receive an increased level of coaching and training to help them improve.

The baseline for measuring acceptable performance should be dynamic to facilitate continuous improvement. The objective should always be to improve the overall safety performance of the fleet and not just achieving a fixed target.

Where a carrier manages your transport operation, the carrier should use the data generated by these systems to demonstrate to your transport management team that the drivers' safety performance is being managed to an acceptable standard as described above.

Appropriate actions should be taken if drivers are not performing at acceptable standards that you define or that you agree with your carrier. By targeting improvement effort at the lowest performing drivers, you can drive safety improvement in your overall fleet.

These trends will also tell you which drivers are having the most activations and in which locations your drivers are at the highest risk. You can use these trends to target coaching and training to drivers who are your highest risk. You can also identify activation hotspots and use this information in safety briefings and training to ensure drivers and schedulers are aware of these locations and take extra care.

If you consider these activations as unsafe acts, behaviours or conditions as seen in the incident ratio model (Heinrich's Triangle), you can focus your efforts on reducing your activations at the bottom of this triangle and therefore minimize your risk at the top.

The "accident pyramid", as depicted by H. Heinrich in his 1931 book Industrial Accident Prevention: A Scientific Approach.

Incident Ratio Model: Adapted from Heinrich's Theory - https://www.rmf.harvard.edu/Blog/2018/August/Leveraging-the-largest-patient-safety-learning-engine

More information on human behaviors within transport operations can be found in the AIGA SB 11/18, *Human Behavior within Transport Operations* [2]

Procedures

A documented procedure should be in place defining the process which the transport management teams should follow in the use of this data. This should include a record of the feedback given to drivers and any coaching or training. These records can be used to determine if appropriate action is being taken over time, should the driver be performing below your defined acceptable standard.
These procedures should also define how this data is protected. Access to driver performance data, including any video or tachograph information, should be covered by your data protection procedures to ensure only approved personnel can access this information.

Conclusions

Vehicle technology is constantly improving and becoming more connected, so access to this information is getting easier. Using data generated by the vehicles safety systems and OBCs to manage driver performance is an excellent way to ensure continuous improvement in the safety of your transport operation. Trends can help you target coaching and training activities towards drivers who are your biggest risk and provide good information for safety briefings enabling your drivers to take extra care when most at risk.

References

[1] AIGA SB 27/21 *Vehicle Specification and Maintenance* www.asiaiga.org
[2] AIGA SB 11/18 *Human Behaviors within Transport Operations* www.asiaiga.org
Resource: *EIGA Safety Info TS 11/19 Vehicle Data* Management www.eiga.eu