UA Logistics: Road Transport
Information Centre

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1. Minimum requirements for IVMS functionality

In April 2009, the Shell Group HSSE LT has approved the following IVMS requirements:

Minimum requirements to EXISTING units:

- Speed: preferably compared against local speed limits;
- Acceleration: if a driver is accelerating too fast this is an indication for poor anticipation and increases wear and tear of vehicle plus higher fuel consumption
- Deceleration: if a driver is decelerating too fast this is an indication for poor anticipation of traffic flow and not keeping sufficient distance to the vehicle in front.
- Driver Driving Hours: to be recorded to monitor compliance with driving hours requirements to avoid fatigue.
- Driver identification: Data can only be fed back to the driver and driver can only participate in ranking and incentive scheme with proper driver identification.

Minimum requirements to NEW units:

(In addition to the above)

- GPS digital mapping: required to monitor speed against street speed limits where digital maps available can provide the appropriate data;
- Ability to perform geo-banding / geo-fencing[1].
- Speed monitoring may be taken from either GPS speed tracking or vehicle speed sensor, this provides accurate measurement of speed, acceleration, braking, and distance traveled.
- Audible notification (vocal/alarm) to advise the driver in the event of a breach of over speeding and seat belt compliance (where vehicle is equipped with seat belt sensor);
- Internet based downloading via cellular: reduces effort to download data, data becomes available faster;
- Tamper resistant device;
- Crash buffer (incident information): device saves last five minutes of second-by-second data as buffer in case of an incident;
- Compatibility with Shell internal reporting requirements;
- Instant Event Alert Notification for events such as panic, accident, route deviation/entry in no-go areas, vehicle maintenance exceeded or excessive driving hours
  - o Design, labeling and location of a panic button in the vehicle should be considered to avoid unintentional use.
- Device will continue to record data when out of network/download coverage for at least one week.
- Data transmission and sampling rate: The unit shall be capable to at every minute (if no significant event occurs) take a sample of all monitored variables and report/transmit every ten minutes.

Recommended feature:

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[1] **A geo-fence is an electronic geographic boundary (longitude/latitude and/or roads) that can be created to set specific rules around local speed limits and no driving zones.**

- It is recommended to include real-time tracking, especially for areas with limited emergency response time and/or increased security risks. This requires a GPS capable IVMS device with cellular or satellite functionality to be used based on a risk assessment.

Optional features:
- Fuel economy (preferably tied into the CAN bus of the vehicles engine, when available).
- Satellite communications for tracking of vehicles operating outside of cellular coverage.
- In vehicle navigation device for receiving pre-defined routes, providing the driver with seamless navigation.
- Smart card reader for reading of company smart cards for driver identification.
- Portable style IVMS for short term service requirements. Vehicles in service for less than 3 months or otherwise not qualifying for a hardwired system.
- Connection to Tyre Pressure Monitoring Systems for recording of tire pressure.
- Voice communication on activation of panic button.

2. OGP IVMS settings

The International Association of Oil and Gas Producers (OGP) developed guidance for IVMS settings and how to use IVMS data for ranking drivers and companies. The OGP settings are highly recommended as best practice, although local operating environments and conditions may dictate more stringent or tighter settings.

Some settings are provided as a range; based on need, this provides a reasonable entry level when introducing a new IVMS management system and identifies a subsequent target level once familiarity has been achieved.

OGP Recommended Settings:

Speeding	LV: 2 km/h above the speed limit for 20 seconds HGV: 4 km/h above the speed limit for 30 seconds *(speed limit that is applicable anywhere or, when GPS location is used, a variable speed limit)*
Harsh acceleration	LV: 10 - 12 km/h/s (= 0.28 – 0.31 g) HGV: 6 - 8 km/h/s (= 0.14 – 0.17 g) *(Lower HGV acceleration threshold is based on reduced acceleration)*
Harsh deceleration	LV and HGV: 10 – 12 km/h/s (= 0.27 – 0.31 g)
Exceeding driving hours	More than 10 minutes above a maximum driving period More than 10 minutes below a minimum resting/break periods.

3. IVMS Reporting driver feedback

It is recommended to generate weekly driver performance reports that contain at least the following information:

- Rank of driver compared to peers; and
- On what element(s) the driver needs to improve.

Individual driver performance reports should be made available to the direct supervisor weekly.

Summary performance reports for groups of drivers (per team/department/contractor/operating unit/country) should be made available to respective managers on a monthly basis.

Year to date trending graph/report of average driver behaviour score should be made available to respective managers on a monthly basis for tracking of driver performance trends.

Supervisors of drivers use this report to conduct a weekly feedback session with the driver.

Factors to consider:

- Emphasize and reward positive behaviour;
- Data generated by IVMS units with functional or calibration problems shall not be used for driver feedback. Some IVMS systems are capable to auto detect malfunctions and to produce a report. Reports can be scheduled for review by accountable individuals.

4. IVMS Implementation Hints and Tips

The recommendations below have been based on a formal IVMS trial conducted by a third party company running a large road transportation fleet. Though the trial has tested four suppliers and over 100 units, the recommendations below are applicable to any IVMS system implementation programme.

Installation:

- Once a unit is configured to a vehicle, it requires a minimum of wiring which may include an ignition feed, constant battery positive, negative, speed signal, engine rpm signal, driver identification and seatbelt sensor. If there are no existing issues with the vehicle, installation of hardware takes approximately two to three hours to complete a standard type installation including dashboard modification to accommodate additional hardware installation, such as a panic button.
- Driver Identification became an issue within the trial. Drivers were required to tag on to identify themselves. Failure to do so resulted in the system recording data but not tagging the driver. This resulted in difficulties to address behaviour improvement opportunities with individuals, or to identify and reward those individuals with good driving habits.

<u>After installation / maintenance</u>
- Spare IVMS ID identification key bank, jointly with a detailed record of personnel and tag numbers, located in each site so that keys are readily available on site for newcomers.

<u>IVMS contract management</u>
- Vendors contractually commit to a level of accuracy and accessibility of data with penalties applied for non conformance;
- Vendors shall commit to a plan including adequate resources for the implementation of the system signed off at each stage;
- The tender will include penalties to the vendor for scheduled data that is not available outside of notified scheduled server/system maintenance, or for unreasonable amounts of inaccurate, unusable or erroneous data. Also that any solutions for erroneous data that requires new firmware, device drivers or similar applied to the hardware, be done by the vendor at their cost;
- High levels of customer service performance are essential especially in the initial stages of implementation and are important to keep the system optimal at all times in the future. Commitments to ongoing support of the system by the vendor should be carefully considered when looking at the data management fees, and any additional cost associated with maintaining hardware in the vehicles, investigating faults or tampered units, additional reporting beyond minimum reporting requirements, or providing additional training.