

Rollover Warning Device

**INSERT Name of Speaker
and Job Title**



INSERT Date



Shell Chemicals

The journey to Goal Zero



Background

- Chemical tanker truck rollovers are a fortunately rare but potentially serious safety risk, both in terms of loss of product containment and personal injury.
- Rollovers involving Shell Chemicals contractor haulier's vehicles have reduced dramatically in recent years thanks to increased focus and engagement on logistics safety.
- However, incidents continue to occur from time to time in all regions.
- Rollovers may result in injuries/fatalities, damage to the environment, public disruption and damage to Shell reputation.



The problem

Sudden or severe changes in speed and direction can produce sufficient inertia to tip a trailer over and by the time the driver realises what's happening it's usually too late to do anything about it.



RWD Development



Development of a theoretical model to calculate the rollover threshold of various vehicle types, based on the ECE 111 regulation.



Development of a working device with specified functionalities and compatible with Electromagnetic Compatibility (EMC) and ADR regulations.



RWD currently tested on 8 vehicles in Italy and 1 vehicle in Netherlands in Chemicals CoB. Another pilot on 5 vehicles in Finland and 5 vehicles in Norway is currently being started in Distribution CoB.

How the RWD works



Capacitive
accelerometer
sensor

Wireless transmission



Receiving unit

The Receiver



LED scale

External peripherals connection, programming port

Mini-USB connection port (power supply and communication)

USB connection port (communication and data download)

Pilot study results

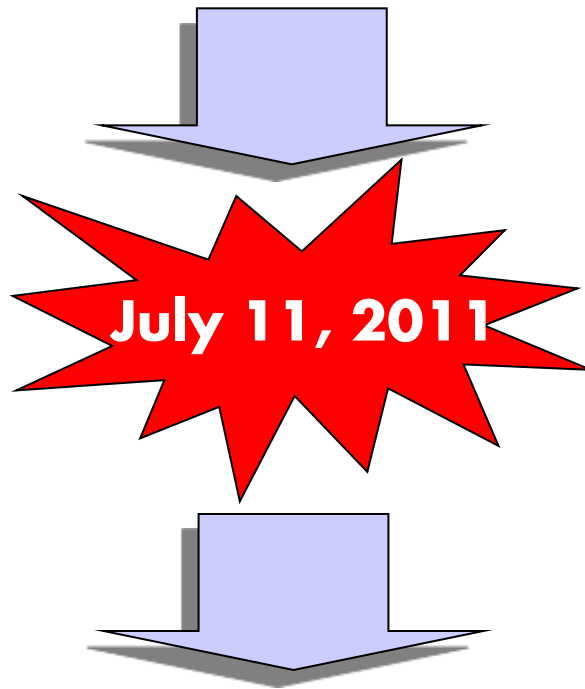
- Very positive feedback from drivers.
- Particularly useful for training purposes, especially with new drivers.
- System reliable and easy to install.
- No recalibration necessary.
- Acceleration data easy to download and analyse by fleet managers.

Roll out

- The existing trailers and those in operation until July 11, 2011 without EBS will continue to operate, until their life end.
- The trailers manufactured after July, 11 2011 will be compulsory fitted with EBS only if the manufacturer has chosen to adopt the ECE n. 13 Regulation (presumably apx. 30%).
- It would be advisable that in the tender document Shell specify that the vehicle must be equipped with an antirollover system according to the ECE n. 13 Regulation Amendment 11 or, alternatively, with a rollover warning device.

Roll out

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(estimated c.30%).

Customer feedback

On the road it is a fantastic tool for training new drivers and let the experienced drivers feel what is going on with the cargo and the combination. Especially on round points, and when a direct brake is planned.

As monitor I'm thankful for this extra tool and I use it very much in the program of B.B.S. and also to teach new drivers working with liquid loads.

Key benefits for the drivers

- Continuous feedback on the vehicle stability conditions.
- This allows drivers to adapt the vehicle speed to the actual road/vehicle conditions.
- Particularly important for inexperienced drivers, but also for more experienced drivers in case of distraction.



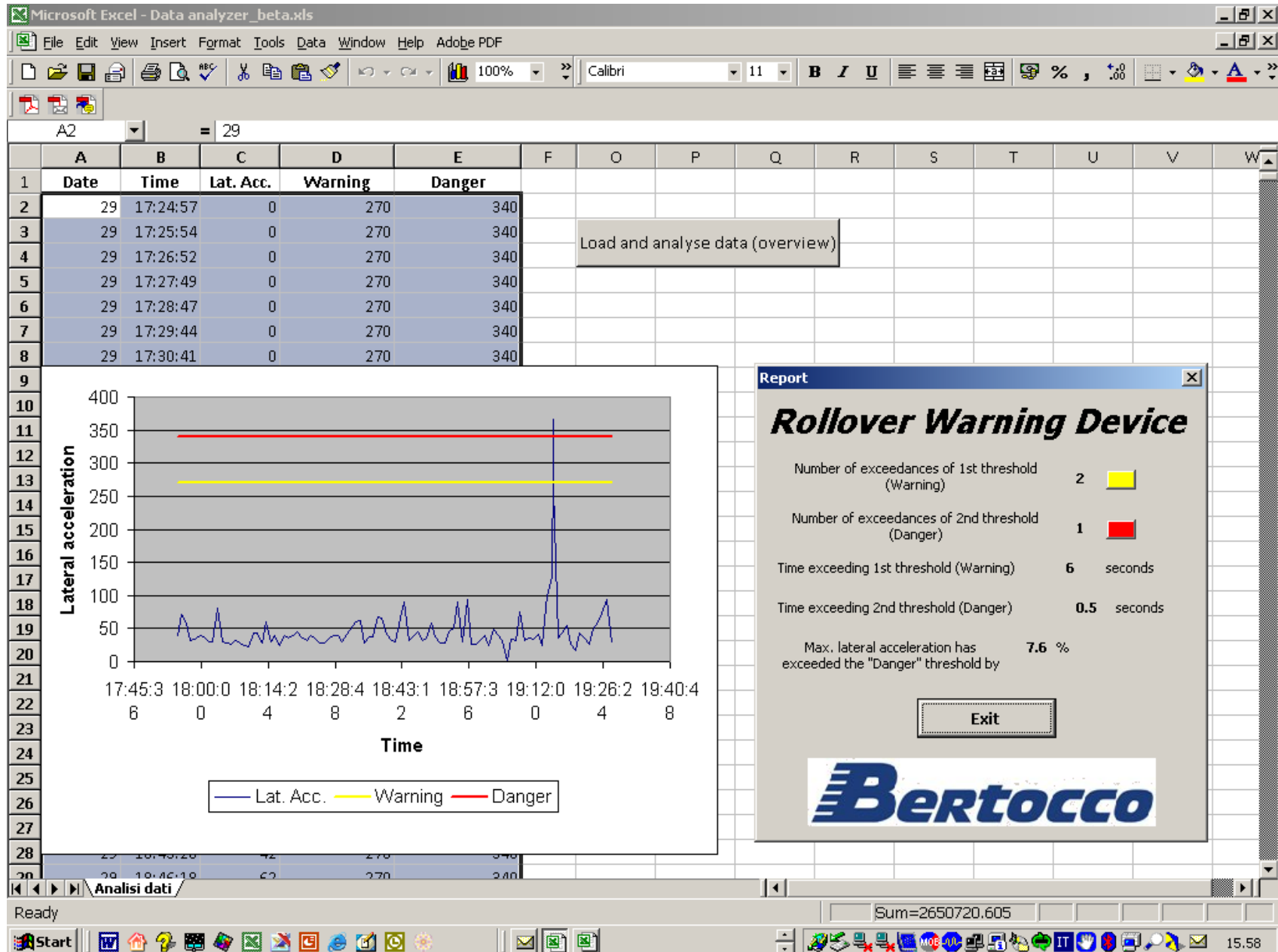
Key benefits for the fleet managers

- Ability to monitor drivers behaviour through vehicle data analysis.
- Reckless drivers may be more easily identified and appropriate corrective measure can be taken.
- Hazardous spots can be better identified (cross- check with existing GPS data.)

**Eventually a smoother driving
behaviour will result in lower fuel
consumption and less maintenance
costs.**



Examples of data analysis



Strengths of RWD

- Simple, low-cost device.
- Can be retrofitted on existing vehicles.
- Influences driver behaviour positively.
- Calibration specific to the type of trailer used.
- Acceleration sensor is installed where rollover normally starts.
- Fleet managers can monitor drivers behaviour.

Some challenges

- Not an active system (i.e. does not activate the braking system)
- Not currently integrated with other devices (e.g. GPS, IVMS, etc...)
- Drivers may adapt their driving to the high amber thresholds, if monitoring is not done.
- It will be replaced by the new EBS systems in the long term.

Conclusion – next steps

- Units will cost apx. 500 Euro each.
- Installation is very easy and can be done in less than 1 hr.
- Bertocco has installation procedures ready to apply.



Many thanks

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