Smart Transportation Alliance

2023 Annual Conference
& Innovation Awards

CSI A STRONG PARTNER IN VEHICLES AND PRODUCTS VALIDATION AND HOMOLOGATION

Fausto Mozzarelli

26 October 2023

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IMQ GROUP
COMPANIES

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WHERE WE ARE: WORLD

a staff of **1.400**
800 employees
600 collaborators

more than **220.000** s.m
of lab& testing area.

18.000 certified
companies

115.000 certified
products

40.000 annual
inspections

more than **9.500**
certified personnel

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INTEGRATED TESTING ENGINEERING PLATFORM

Accredited Laboratory

EURO NCAP FOR SAFER CARS Authorised Test Centre 2023

green ncap

ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO

EU Homologation in partnership with

KBA

RDW

NSAI Certification

Testing Lab. for USA, Australia, China, Japan, and Taiwan Certification/Homologation

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OUR TESTING FACILITIES

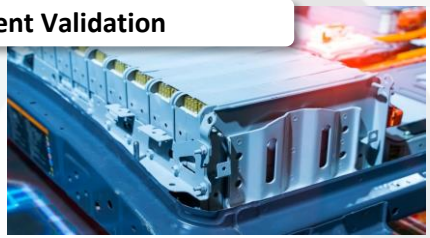
Crash & Rollover

Active Safety & ADAS

NVH

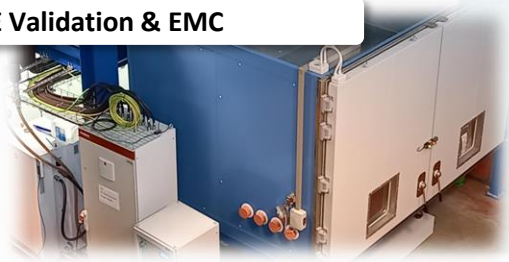
Pedestrian & Occupant Protection

Component Validation



Vehicle Validation

E/E Validation & EMC



Powertrain Validation

Fire Test

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INFRASTRUCTURE & MOBILITY
Business Sector

Accredited laboratory (EN ISO/IEC 17025) for testing :

- Road Restaint systems (EN 1317, AASHTO MASH Standard, GOST 33129-14 and JTG B05-13) (CEN / TS17342)
- Antinoise devices (EN14388)
- Support structures (EN12767)
- Vehicle Security Barrier Systems (BSI PAS68, IWA 14, ASTM F2656)
- Intelligent Transport System and Info-mobility tools

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INFRASTRUCTURE & MOBILITY

FULL SCALE CRASH TEST

- Road restraint systems
- Motorcycle devices
- Support structures for road equipment
- Vehicle security barrier
- Security fence systems
- Antinoise devices

VIRTUAL TEST

- Virtual simulation of full vehicle crash test
- CAE service
- Dynamic analysis with FEM

WORK SITE TEST

- Dynamic tests on site
- Barrier posts behavior check
- "M.A.R.T.IN.A" equipment specifically designed for pull-push tests

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INFRASTRUCTURE & MOBILITY

MECHANICAL STRESS TEST

- Posts pull-push
- Anchor bolts pull-out
- Impact tests
- Material characterization

NOTIFIED BODY N° 0497

- Initial assessment
- Factory production control
- CE certification
- Annual surveillance

INFOMOBILITY ITS

- Stress & endurance tests
- Voluntary & mandatory certification
- EETS & RED EU directive compliance *(IMQ Notified Body)*

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TESTING CAMPAIGN ON UNRELIABLE VRS AND SAFETY RATING

VRS' Crash-Testing Programme:

Campaign of counter-tests of "suspicious" restraint systems carried out in several EU Laboratories (Cidaut, CSI, Transpolis & DSD) other than the laboratory that performed the ITT for CE marking.

"Safety+" Excellence Rating:

Elaboration of a Vehicle Restraint Systems Evaluation Protocol (initially only for barriers and parapets) similar to NCAP for cars, accepting/rejecting and assigning "points" to the systems, based on documentary and videographic information.

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CRASH-TESTING CAMPAIGN

Three safety barriers (two steel guardrails and one concrete barrier) **have been counter-tested** (8 crash-tests in total):

- **1st Barrier = STEEL BARRIER # 1 [H2W4A] by Manufacturer # 1.**
  Tested and certified in an EU TEST HOUSE. Four TB51 impact tests have been carried out in four different laboratories, all with system failure (none of the four complied, three of which broke the barrier).

- **2nd Barrier = CONCRETE BARRIER # 1 [H4bW5B] by Manufacturer # 2.**
  Tested and certified in an EU TEST HOUSE. TB81 test failed (barrier broke) and TB11 test over severity class.

- **3rd Barrier = STEEL BARRIER # 2 [H1W3A] by Steel Manufacturer # 3.**
  Tested and certified in an EU TEST HOUSE. Two TB42 crash tests conducted in TRANSPOLIS and CIDAUT. Both tests showed system failure.

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CRASH-TESTING CAMPAIGN

1st Barrier H2-W4-A. Four Counter-Tests TB51 (13 T bus @ 70km/h & 20°)

CIDAUT (October 2016)

CSI (June 2017)

TRANSPOLIS (December 2017)

DSD (February 2018)

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CRASH-TESTING CAMPAIGN

2nd Barrier H4b-W5-B. Tests TB81 (38 T articulated truck @ 65km/h & 20°)

CSI (May 2021)

Test Failed. Infringes EN 1317-2 Norm due to:

- Complete breakage of a principal element of the barrier
- Vehicle Steps over the barrier
- Vehicle rolls over

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CRASH-TESTING CAMPAIGN

2nd Barrier H4b-W5-B. Tests TB11 (0.9 T car @ 100km/h & 20°)

Irregularity on Certification → Using TB11 control test of original W7 barrier → Infringement of section 4.7 de EN 1317-2 and/or section A.5.2 Annex A of EN 1317-5

CSI (May 2021)

- Severity class according to ASI value of 1.53 is Class C
- Barrier was certified under class B of severity (ASI ≤ 1.4)
- Severity class C (1.5 ≤ ASI ≤ 1.9) not accepted by many Road Authorities

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CRASH-TESTING CAMPAIGN

3rd Barrier H1-W3-A. Tests TB42 (10 T Truck @ 70km/h & 15°)

CIDAUT (October 2022)

Test failed: vehicle steps over the RRS

Breakage of the principal longitudinal element

TRANSPOLIS (November 2022)

Test failed: vehicle steps over the RRS

Material controlled by accredited laboratory Spolka (Poland) and test attended and supervised by an external auditor of certification accredited body Bureau Veritas (Spain) and Asquer (France)

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"UNSAFE RRS ON THE ROAD"

The previous round-robin exercise demonstrates that there may be vehicle restraint systems placed in the market (installed in EU road networks) that have been tested/certified under "demonstrable" non-reliable conditions and hence that those systems may not be safe enough.

These irregularities leads to two main consequences:

- **1st – Big roadside hazards for Drivers (non-containing barriers)**
- **2nd - High risk for Road Authorities that are responsible for VRS' Implementation in their Road Networks (art. 56 CPR)**

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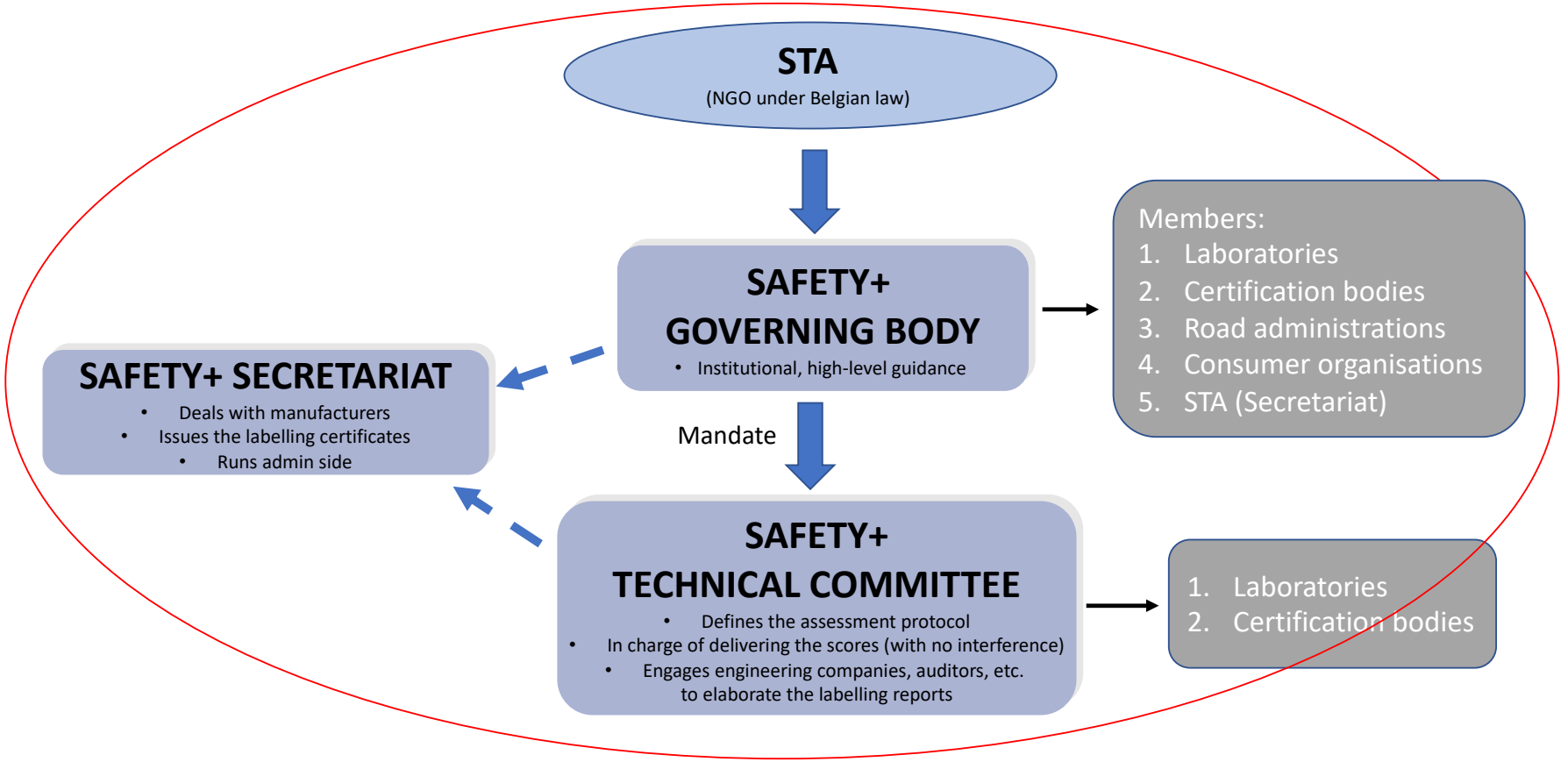
"SAFETY+" VOLUNTARY RATING

- It is an initiative designed to provide a fair, meaningful and objective **assessment of the safety performance of CE-certified Road Restraint Systems** (RRS).

- It is intended to **inform Administrations and consumers**, providing an incentive to manufacturers as well as giving credit to those who provide the best available degree of reliability.

- It is a **RRS Evaluation Protocol (from 1 to 5 stars)** similar to NCAP:
  - **Phase 1**: accepting/rejecting and assigning "points" to CE-marked RRS systems, based on documentary and videographic information.
  - **Phase 2**: defining **new Testing Protocol** to promote higher level of safety (testing with actual vehicles, Introducing new biomechanical indexes, etc.)

Governing structure - Proposal



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"CONCLUSIONS"

Possible actions that can be taken to avoid and minimize this risks:

1. **Adoption of a Labelling Protocol by Road Authorities (Safety+ - Phase 1):** The application of this protocol brings short-term benefits which are effective for correcting gross errors appearing explicitly in the documentation of already certified systems.
2. **Financing tests on RRS:** Random tests on CE marked systems conducted under Road Authorities' control and surveillance, will allow to identify the dimension of the problem, increase the level of awareness and control.
3. **Elaboration and adoption of new Test Protocols for the evaluation of Vehicle Restraint Systems** (**Safety+ - Phase 2,** beyond EN 1317 which is mandatory).

TOGETHER TOWARD EXCELLENCE

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THANK YOU FOR YOUR ATTENTION

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