



The 27th INTERNATIONAL  
ELECTRIC VEHICLE  
SYMPOSIUM & EXHIBITION.

Barcelona, Spain  
17th-20th November 2013

# Evolution in electric vehicle safety legislation and global harmonisation activities

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1 Why safety legislation is necessary

2 Harmonisation mechanisms

3 UN Global Technical Regulation No. 13 (HFCV)

4 Draft UN Global Technical Regulation No. XX (EV)

5 Conclusions

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# Bad press

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## INVESTIGATOR CLAIMS GOV'T-SUBSIDIZED ELECTRIC CAR CAUSED GARAGE FIRE, AUTOMAKER RESPONDS WITH 'SWAT TEAM' OF ENGINEERS & INSPECTORS

May 10, 2012 10:57pm [Becky Adams](#)

Move over, Volt. You may have competition in the spontaneous exploding battery department.

"Last week, a fire badly damaged the home of a new [Fisker Karma](#) owner, and authorities are saying that the electric car was the source of the blaze," [Autonews](#)' David Amato reports.

You may recall, we awarded a \$10,000 grant to the driver of a Fisker Karma who was receiving \$19,000 in subsidies through two different programs.

46 38 8 9 1st 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92

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### New blow for Tesla: Fire in the 'world's safest electric car' began in vehicle's battery

Tesla shares fell twice, by a total of 6%, after a Model S car caught fire

- Incident report suggested the fire was started in electric car's battery
- Driver is said to have hit a large piece of metal debris that caused the crash
- Car touted as 'safest car in America' following highest ever safety rating
- Fire destroyed the car as firefighters struggled to contain the flames
- Drop in shares may also have been caused by an analyst downgrade

By VICTORIA WOOLLASTON

PUBLISHED: 12:52, 3 October 2013 | UPDATED: 14:22, 3 October 2013

26 shares

71 View comments

The fire that ravaged a Tesla Model S electric car earlier this week began in the vehicle's battery compartment, it has been revealed, after the driver hit a large piece of metal debris.

When pictures of the blaze first surfaced on the internet, the California-based car maker's stock dropped. By the end of trading, it had fallen a total of six per cent, closing at \$100.05 (£111.25).

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RECOMMENDED BY PATRICK GEORGE

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PATRICK GEORGE · CAR-G-QUE · 104,210 16.3km

## This Is What Fiery Tesla Model S Death Looks Like (UPDATED)

Yee-owch. We don't know what happened here exactly, but one of our readers captured some stunning photos of a [Tesla Model S](#) that apparently caught fire this week on Washington State Route 167 outside of Seattle. (Update: Tesla officials say the fire was caused by a crash. See more details below.)

## China Car Times

China Auto News, Commentary, Spy Shots, and Intelligence

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Home / Chinese Car News / [BYD Electric Vehicle Catches Fire After Accident; Three Dead](#)

### BYD Electric Vehicle Catches Fire After Accident; Three Dead

May 26, 2012 posted by Jeff Landers in Chinese Car News · Tagged BYD, Electric, Vehicle, Collision, Car, Crash, Combustion, Dead, Electric, Fire, Impact, Nissan, Police, Taxi, Test, Transport, 21

Three people are dead after a Nissan GT-R sports car collided with a BYD electric taxi and proceeded to burst into flames. Shenzhen police have said that the driver of the Nissan GT-R was heavily intoxicated and possibly drag racing. Witnesses claim that the Nissan GT-R was traveling in excess of 200km/h at the time of the accident.

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## The role of legislation

- Reduce risks to users
- Maintain public confidence
- Establish uniform technical requirements
- Harmonisation reduces burden to industry

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## Harmonisation of vehicle regulations

- World Forum for Harmonisation of Vehicle Regulations (WP.29)
  - United Nations Economic Commission for Europe
- Harmonised requirements and tests
  - UN Regulations
  - UN Global Technical Regulations

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- Type-approval and mutual recognition
- “1958 Agreement”
- Systems and components
  - Whole vehicle approval mechanism under development
- Not compatible with self-certification

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- Not a legal document
  - Requirements are transposed into local legislation
- “1998 Global Agreement”
- Compatible with type-approval and self-certification
  - Data-driven
  - Performance based

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- Proposal to develop GTR adopted 2007
  - Co-sponsors: Germany; Japan; United States
- Phase 1 of GTR adopted in June 2013
  - Developed by subgroup on safety
- Phase 2 expected to start in 2014
  - To take account of latest research
  - Harmonise crash test specifications

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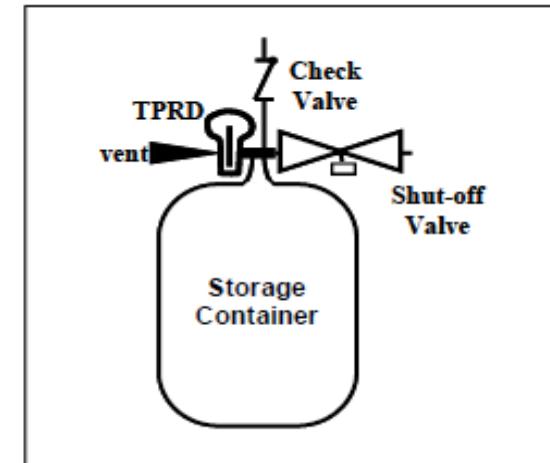
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- Compressed hydrogen storage system
- Vehicle fuel system
  - In use
  - Post crash
- Electrical safety
  - In use
  - Post-crash



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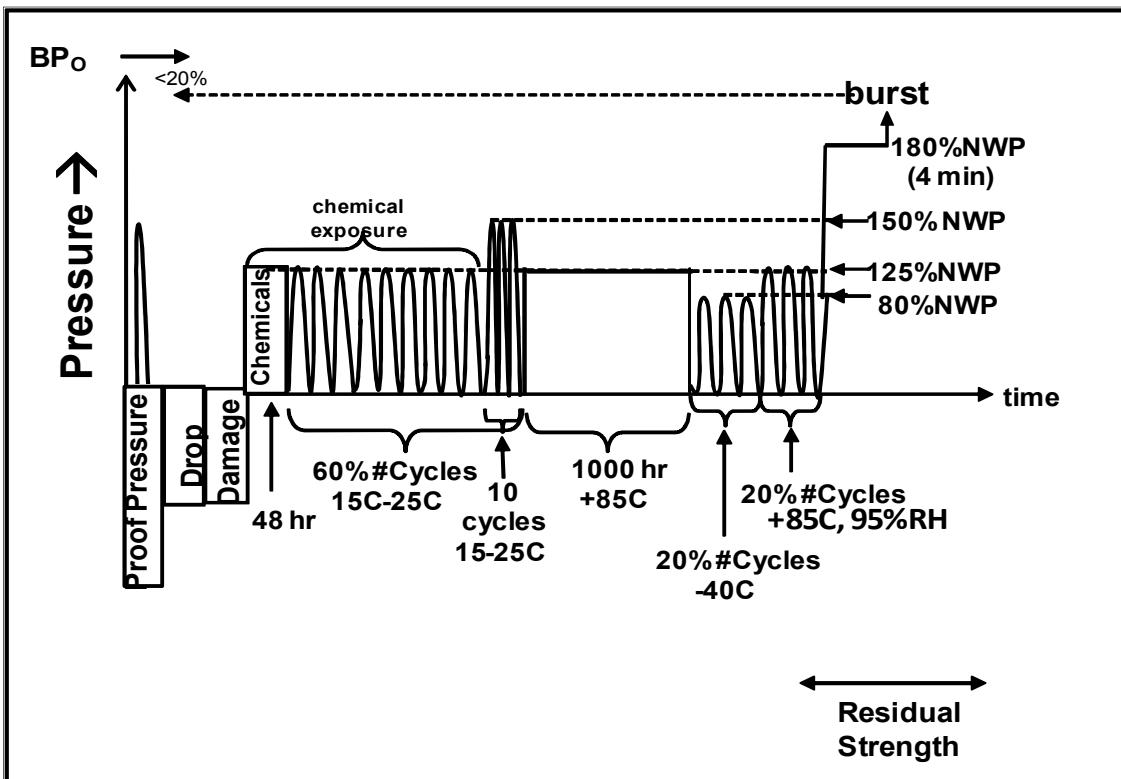
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- Verification test for performance durability



Structural  
resistance to  
rupture:

Sequential  
hydraulic cycling  
(fluid is liquid)

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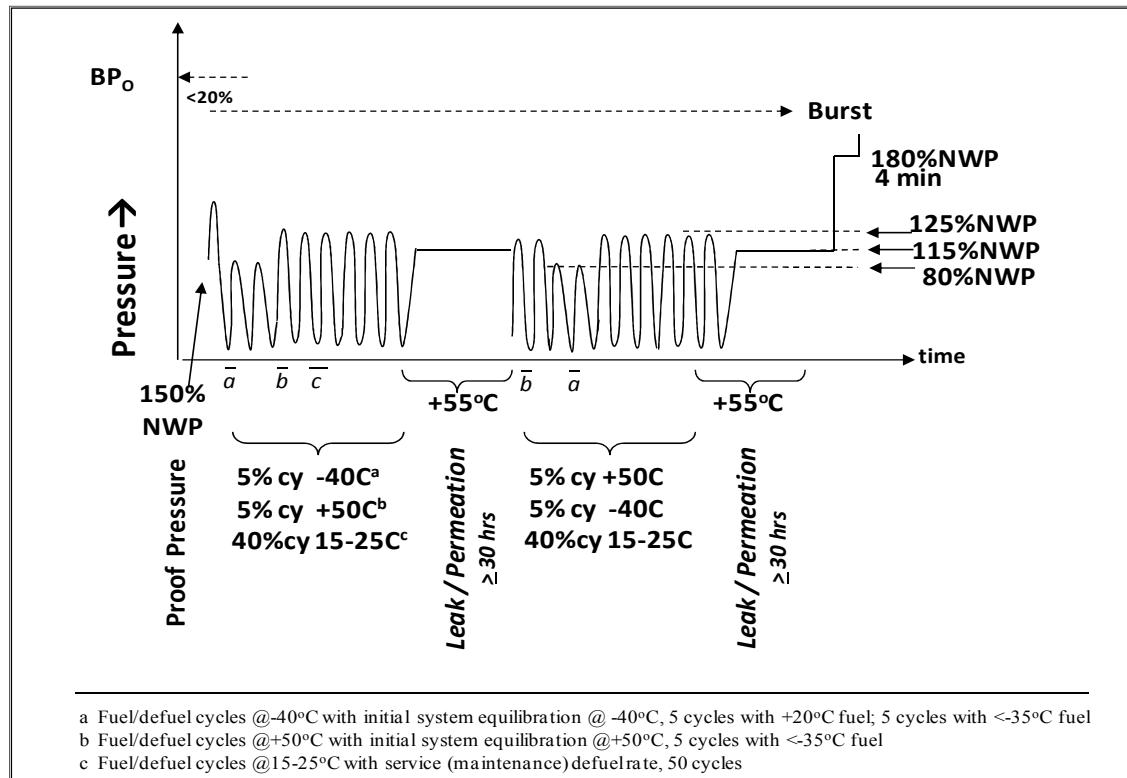


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- Verification test for on-road performance



# Expected worst-case conditions (including fuel):

# Sequential pneumatic cycling (fluid is H<sub>2</sub> gas)

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UN GTR No. XX on electric  
vehicles

- Proposal to establish two new informal groups adopted 2012
  - Co-sponsors: China; EU, Japan; United States
- Work started on safety GTR
  - Four meetings to date
  - Completion 2014

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- Electrical safety in-use
- Electrical safety post-crash
- Safety of rechargeable energy storage system
- First draft draws from UN Regulation 100

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- Vibration
- Thermal shock and cycling
- Mechanical shock
- Mechanical integrity
- Fire resistance
- External short circuit
- Overcharge
- Over-discharge
- Over-temperature

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- Vibration
- Thermal shock and cycling
- Mechanical shock
- Mechanical integrity
- Fire resistance
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- Overcharge
- Over-discharge
- Over-temperature

**No evidence of: electrolyte leakage, rupture, fire, explosion**

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- High levels of cooperation achieved
- Political challenges
  - Political will to transpose requirements
  - Time-consuming
- Technical challenges
  - Technology is evolving

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Expect the unexpected...



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