13th **VERT-Forum** - March 21st 2023

NPTI in SWITZERLAND

1.Januar 2023

Jan Czerwinski
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MEASURES TO LOWER EXHAUST EMISSIONS
of
ROAD VEHICLES

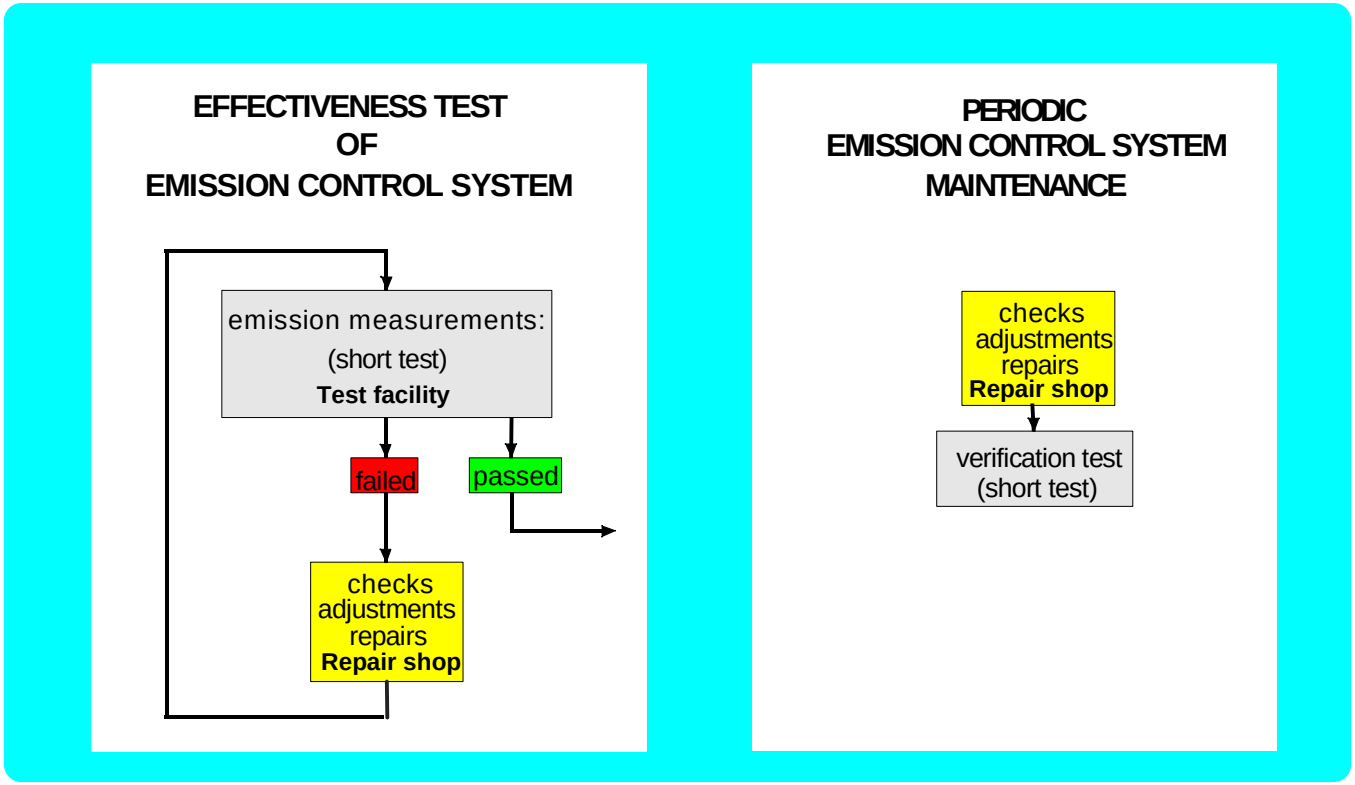
- **Certification test**
- **Control of conformity of production**
- **In use compliance**

Eliminiation of systematic errors

- **Inspection/maintenance program**

Elimination of random failures

I/M CONCEPTS



e.g. USA (without Cal.)

CH 1986 – 2013
California

THE FORMER SWISS I/M PROGRAM

'ABGASWARTUNG'

1

According to the principle that

inspecting cars does not reduce pollution, REPAIRING them does

the following program was introduced

THE FORMER SWISS I/M PROGRAM

'ABGASWARTUNG'

2

- Decentralized periodic maintenance of emission-relevant components and settings with subsequent emission measurement at idle speed
- Applied on LDV with gasoline engines, starting **1.1.1986**, annual implementation (diesel share < 4%)
- Extension to diesel vehicles, **1.3.1995**, smoke test (free accel.), biennial cycle (also for CAT-vehicles)
- Abolished **1.1.2013**, replaced by OBD

(a consequence of the EU-Directive 2014/45)

NPTI - Periodic Testing of DPF

VERT initiated in close cooperation with TNO an International Task Force to evaluate a test procedure for vehicles with diesel engines with DPF

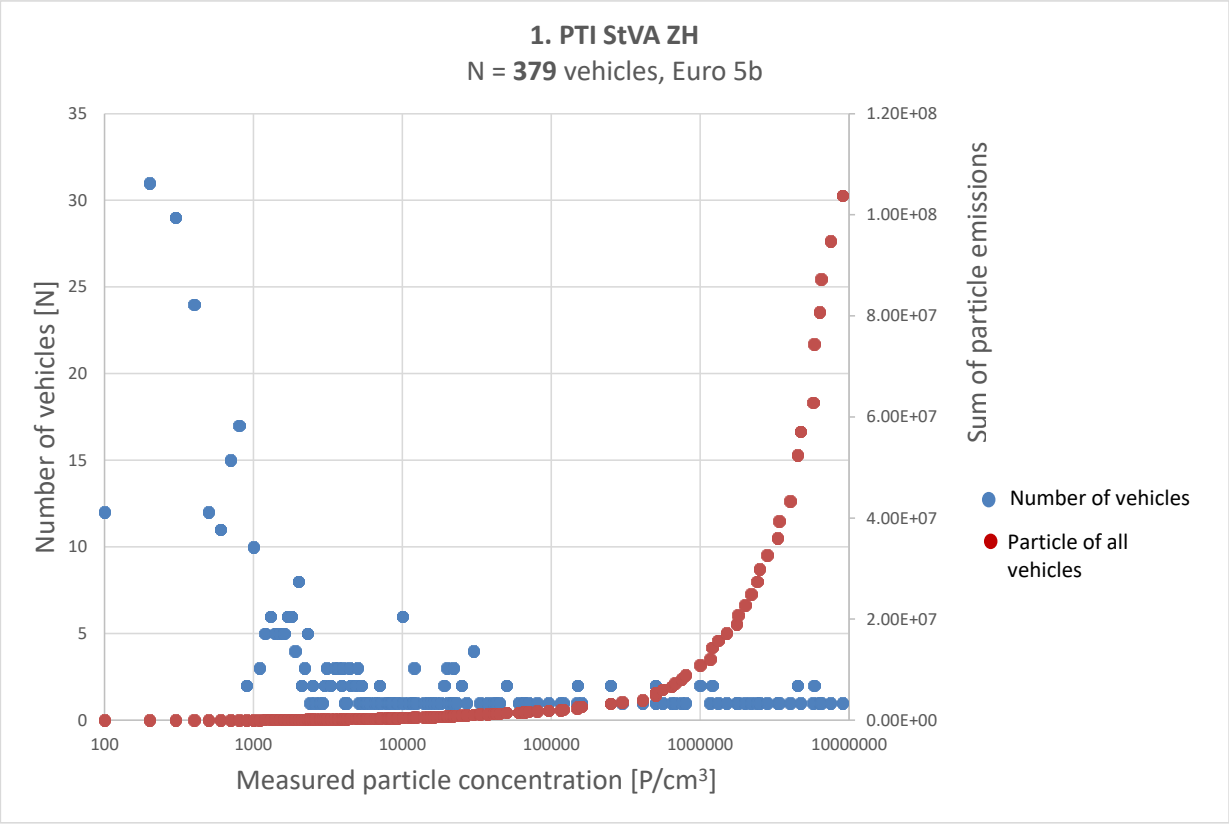
(2016-2018)

Target characteristics

- Delivering repeatable PN results
- Applicable:
  - In workshops
  - For road checks
  - During regular roadworthiness checks (random samples)
- Simplicity, short (< 2 min.), low cost

NPTI - CAUSE

To detect and eliminate high particulate emitters with DPF



Source: AWEL ZH/CH

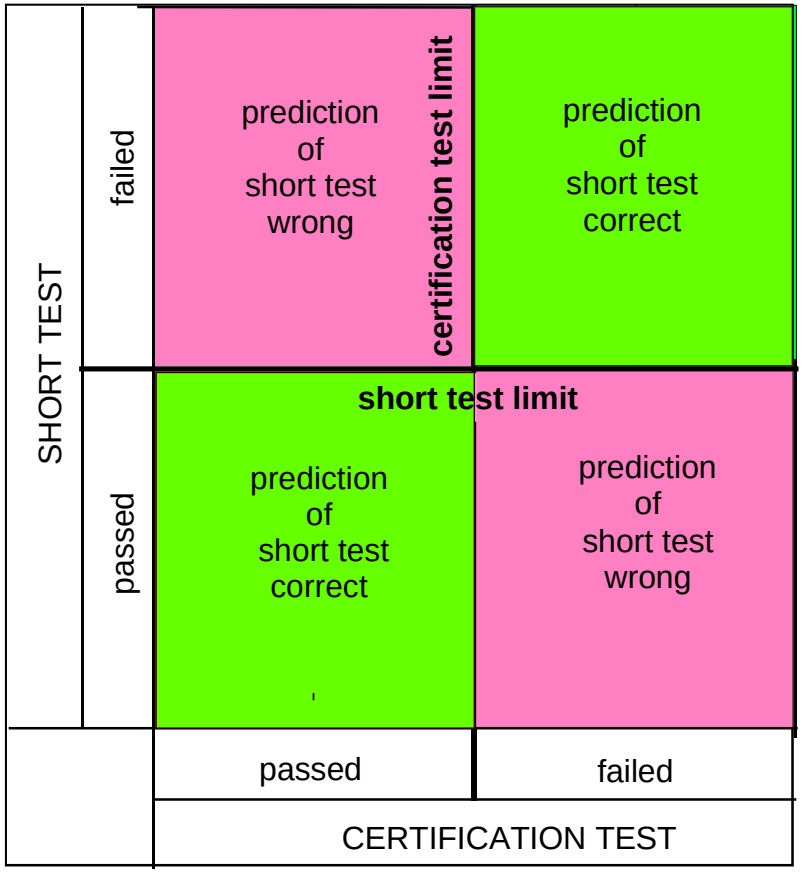
NPTI - CONCEPT

for a very efficient and cost effective 100% in-use periodic emission control for DPF equipped vehicles

- **PN-Test at low idle**
- **Preconditioning of the engine** (no: NL, B / yes: BRD)
- **Pass/fail criterion: ≧250'000 1/cc** (political decision)
- **Periodicity: annual**

Applied actually by NL, B and BRD

NPTI - EVALUATION of a PASS/FAIL CRITERION

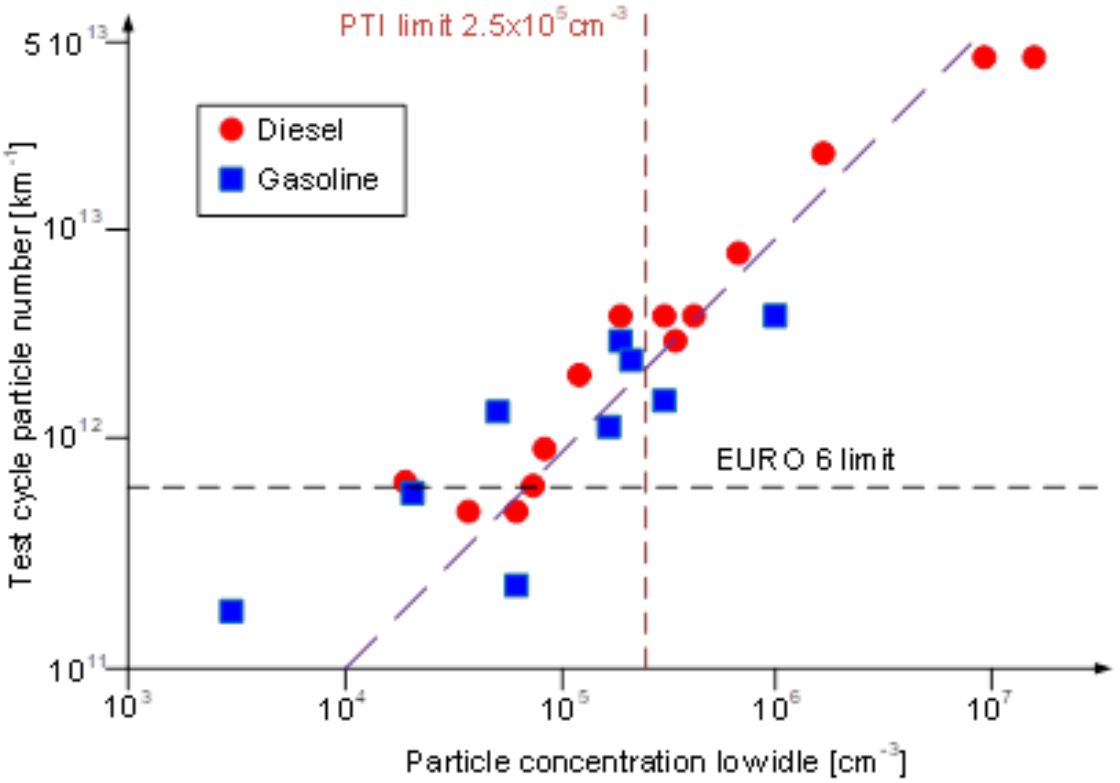


How to respect contingency:

NPTI can not be stricter than type approval

NPTI - EVALUATION of a PASS/FAIL CRITERION

Correlation of type approval test cycle and NPTI low idle test



Source: R.Suarez-Bertoa / EU-JRC

SWISS NPTI 2023 – DIESEL with DPF

(startet 1.January 2023)

Test procedure: *)	**PN measurement at 2'000 rpm (categories M and N, others at high idle!!)**
Preconditioning of the engine:	**yes**
Pass/fail criterion:	**250'000 1/cc**
Execution:	**Road Traffic Offices of the cantons, police**
Periodicity: *)	**Standard intervalls after initial road admission: 5 + 3 + 2…..years**

***) Simplified procedure:** Measuring at low idle, limit 100'000 1/cc

NPTI – PARTICLE COUNTERS

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Manufacturer	Webpage	Type	Type approval
TSI	www.tsi.com	3795 (NPET)	CH
TEN	www.tba-ten.nl	AEM	NL, CH
VLT	www.vltest.nl	E9700	NL, CH
Saarloos	www.saarloos.com	DPC	NL
Capelec	www.capelec.com	CAP3070	NL, CH
AVL-Ditest - Maha	www.avlditest.com	Counter	NL, CH
Continental	www.continental-aftermarket.com	DX 280 DC	NL, CH
Saxon Junkalor	www.saxon-junkalor.de	Nanolyt M	NL
Mahle	www.mahle.com	PMU 400	NL, CH, D
Brainbee	www.brainbee.mahle.com	PMU-400	NL, CH, D
TEXA	www.texa.com	NP 01	NL

SWISS NPTI 2023 - COMMENTS

- **Control frequency** insufficient to bring about a reduction in overall emissions, - regular control of the fleet at shorter intervals is indispensable

  ➡ **Only by delegating the procedure to the repair shops can testing and maintenance be combined and the necessary testing capacity created**

- Increased **engine speeds** do not bring any gain in information about the filter condition
- **Conditioning** the vehicles before the test unnecessarily increases the testing effort
- **Technical detail:** An insertion depth of the sampling probe of 50 mm is not sufficient to reliably prevent exhaust gas dilution.

THANK YOU FOR YOUR ATTENTION