

BIPM Workshop on Challenges in Metrology for Dynamic Measurement:

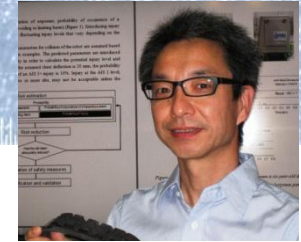
Speaker Introductions

BIPM, Sèvres

15-16 November 2012

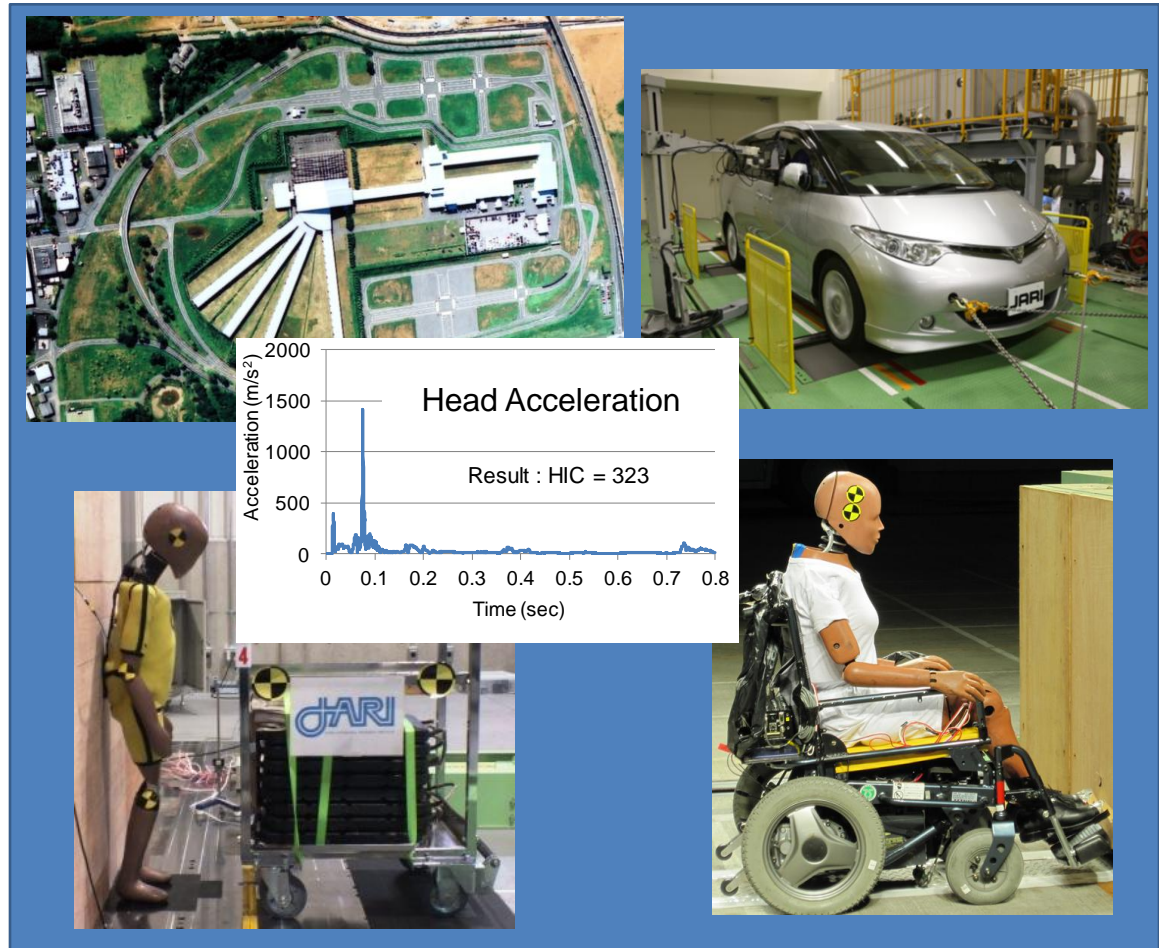
Title: Requested reliability of dynamic mechanical measurement in mobility, from automobile to service robot

Speaker: Dr. Tatsuo Fujikawa, JARI



➤ JARI: Independent lab. for automotive research & test in Japan

- ✓ Research and testing on automotive safety and environments by contracts with government and private companies
- ✓ Expanding their research and testing field to safety of robotics in terms of interactions with human
- ✓ In this presentation, dynamic measurement methods for collision of robots will be reported and discussed.



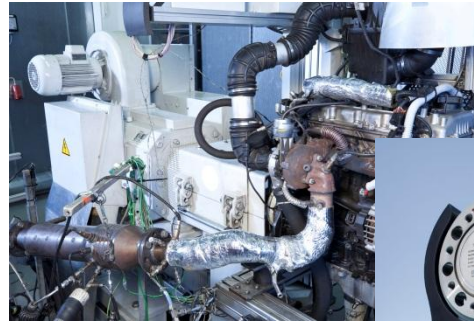
Title: Challenges in dynamic torque and force measurement with special regard to industrial demands

Dr. André Schäfer, HBM



□ Dynamic Torque

- engine test stands
- power measurement



Source: HBM



Source: HBM

□ Dynamic Force

- In production
- In material testing



Source: „Bremsenhandbuch...“ ATZ/MTZ publishing



Source: HBM

Requirements
today and in
the
foreseeable
Future

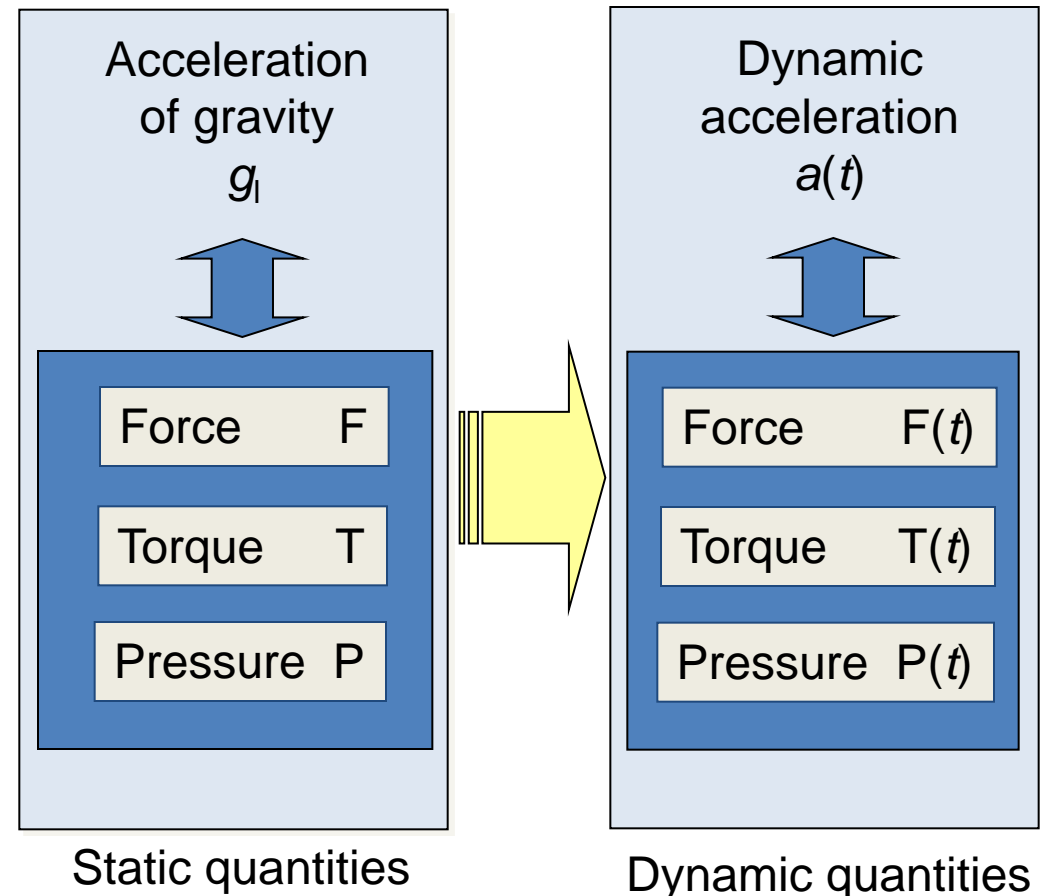
Title: Dynamic measurements for mechanical quantity standards, from NMIs to industries

Dr. Gustavo Ripper, INMETRO



Vibration Laboratory

- ❑ Realization
 - ❑ Acceleration as a strongly related example
 - ❑ Measurement principles
 - ❑ Facilities at NMI level
- ❑ Dissemination
 - ❑ Calibration labs and accreditation
 - ❑ Documentary standards
- ❑ Is the international metrology fit for dynamics?

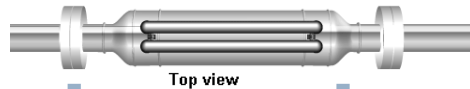


Title: Challenges in Characterizing Flowmeter Dynamic Response

Chuck Gray, Micro Motion

Coriolis Mass Flow Metering

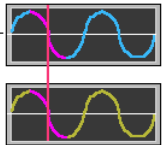
Mass Flow is directly proportional to
Delta T (Pickoff Signal Phase Shift)



Top view

No Flow

Pickoff (inlet side)



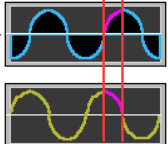
Pickoff (outlet side)

FLOW



ΔT

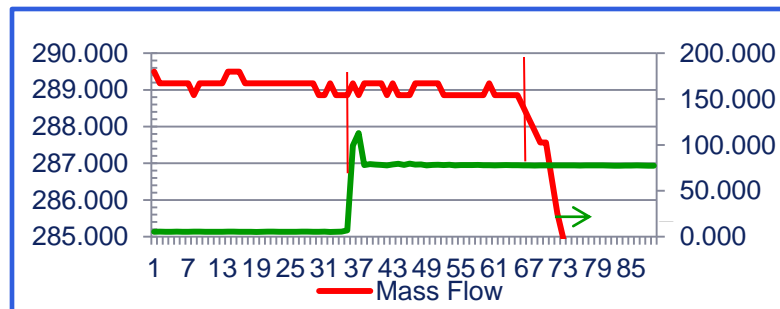
Pickoff (inlet)



Pickoff (outlet)



In this Presentation I will
Discuss Industrial Applications
for High Speed Flow Metering



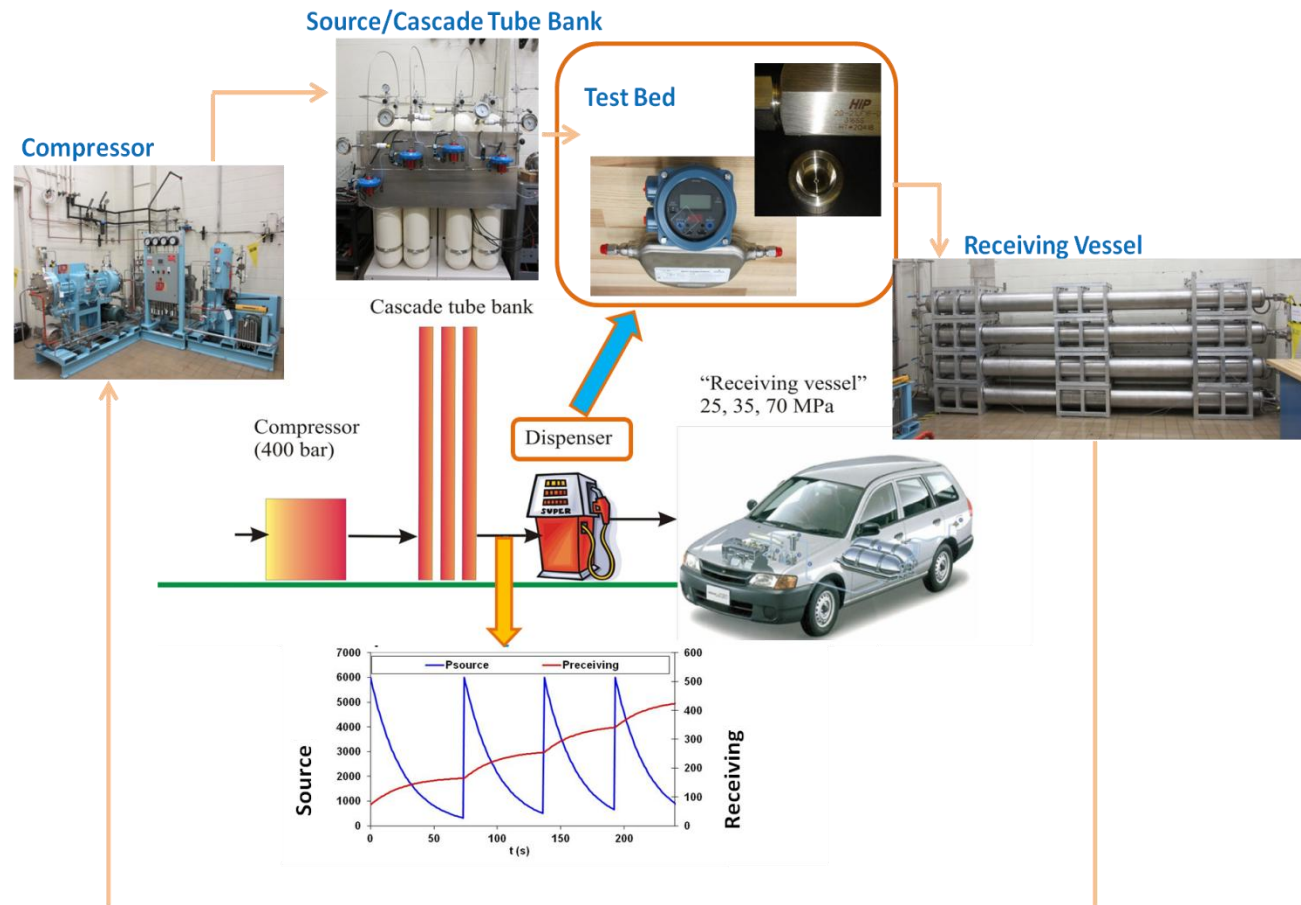
Title: Flow Measurements for Gaseous Fuel Dispensers

Dr. John Wright and Dr. Jodie Pope, NIST



➤ Need for transient flow metrology

- Flow meter calibrations are normally performed under steady state conditions.
- Transient conditions exist in important meter applications (compressors, refueling, engines).
- New facility evaluates flow meters under transient pressure, temperature, and flow conditions.



Title : Response time of temperature sensors for civil nuclear applications

Co-Speaker : Mr. Benedict-John Willey, EdF, France

➤ EdF: a leading energy player, active in all major electricity businesses

✓ **EDF-Septen :**

Expertise in the design of new nuclear power stations

Establishing the safety and technical doctrine applicable to the design of facilities and equipment (principles, rules, technical specifications)

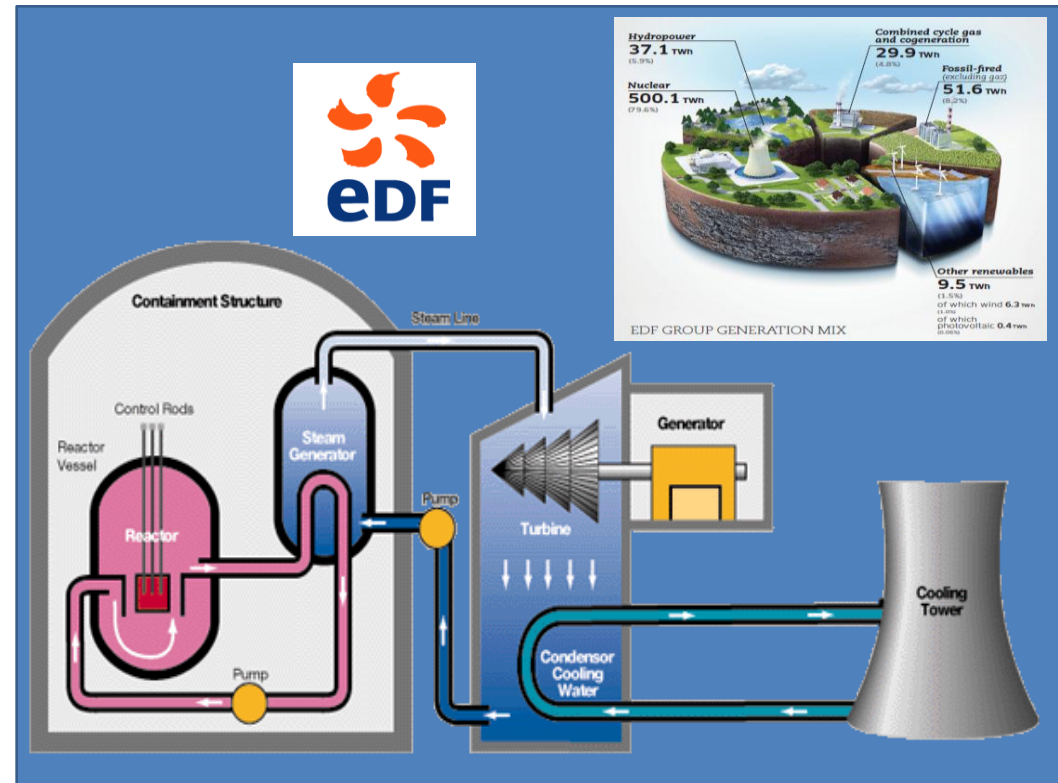
✓ **Particular Nuclear Challenges:**

Qualify equipment to demonstrate their ability to fulfill their mission and keep their characteristics throughout their operating life,

Exploit feedback from ourselves & third operators to always re-examine our best-practices.

✓ **Co-developments** with LNE to validate technical criteria prior to installation of equipment for decades

✓ **This lecture** : Dynamic measurement methods for temperature sensors will be presented and discussed



Source: <http://press.edf.com>

Title : Dynamic measurements of thermophysical properties for materials

Speaker : Dr. Tetsuya Baba, AIST/NMIJ, Japan



➤ AIST/NMIJ: Supporting the Japanese economic activities in the international market

✓ Research Field :

Thermal and measurement science,
Thermal engineering,
Material metrology

✓ Introduced :

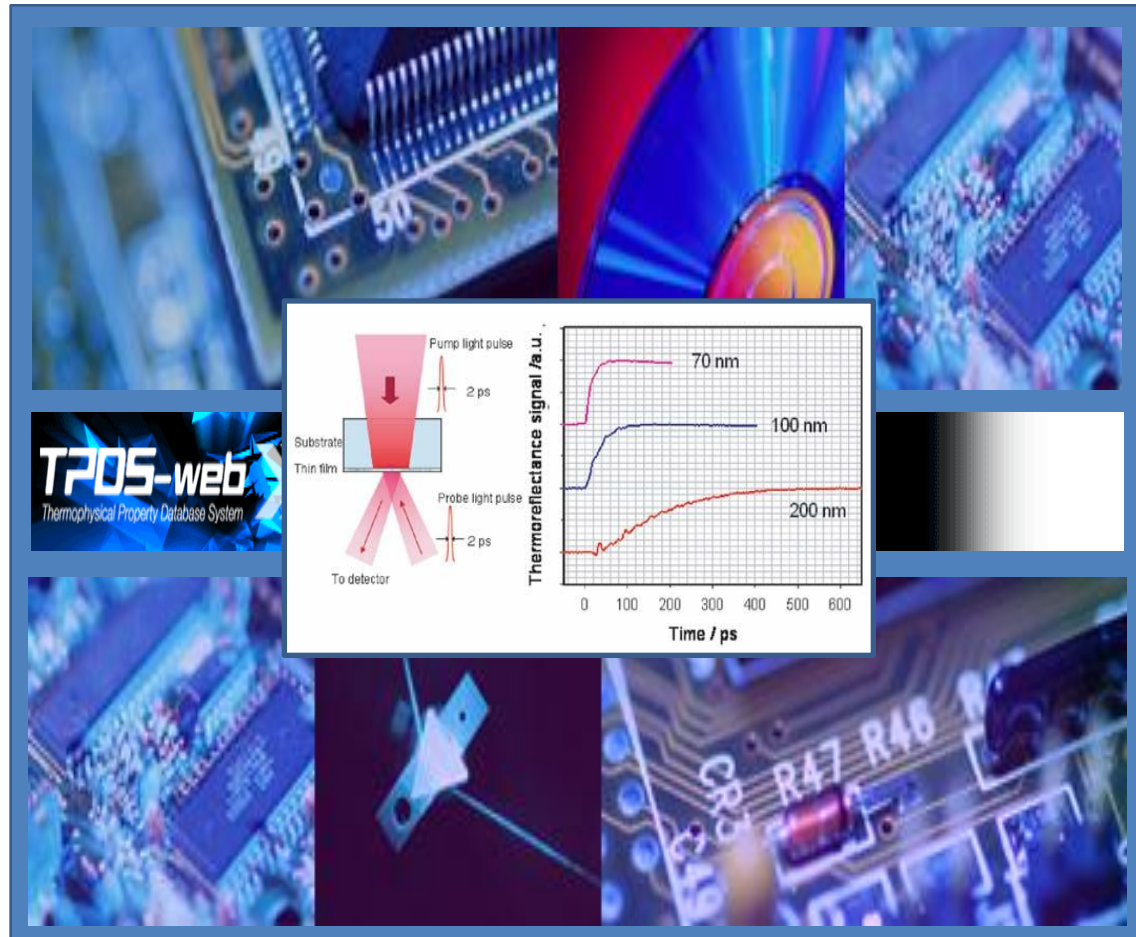
Impulse response function and
transfer function to analyze laser flash
method for thermophysical properties
measurement

✓ Developed:

Thermophysical properties
measurement for thin films by
thermo-reflectance techniques

✓ In this presentation :

Dynamic measurement methods for
advanced materials and energy issues
will be reported and discussed



Title: Dynamic Measurement Challenges: An Industry View

Speaker: Pete Loftus – Rolls-Royce plc



➤ Rolls-Royce - The Global Power-Systems Company

- ✓ Remit: Measurement Engineering for Test, Manufacturing, Laboratories, and Product Systems
- ✓ Interested in: measurement process and optimising the research portfolio
- ✓ In this presentation: overview of requirements for dynamic measurement capability



Title: System identification and uncertainty analysis for challenging dynamic measurement applications: a case study in micro-Newton level force measurement

Speaker: Ben Hughes, NPL



➤ NPL: National Physical Laboratory, UK

✓ The UK's National Metrology Institute, maintains and disseminates measurement standards.

✓ Developing methods and instruments for measurement of dynamic thrust and vibration at the micro-newton level.

✓ In this presentation, uncertainty analysis for dynamic measurement applications.



Pictures courtesy of ESA