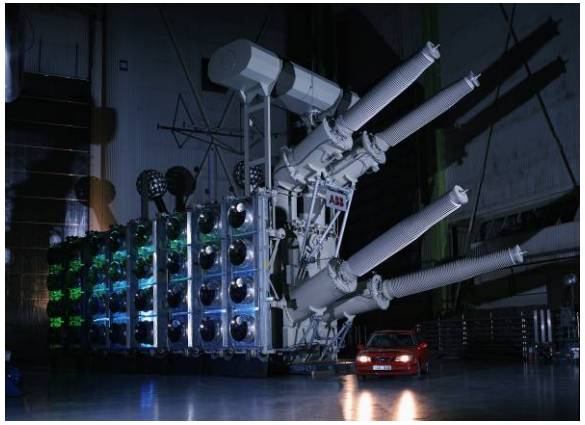
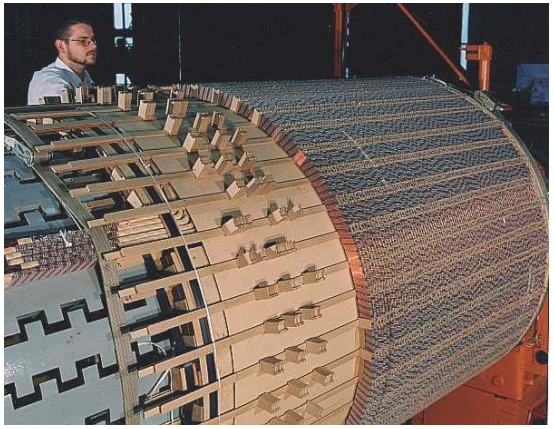
CIGRE A2/A3/B3 JOINT – COLLOQUIUM
Regional Conference
Somerset West, 2009

SC A2 - Transformers
SC A3 – HV Equipment
SC B3 - Substation

P. Boss, Chairman SC A2 'Transformers'
ABB, BU Transformers, Geneva/Switzerland

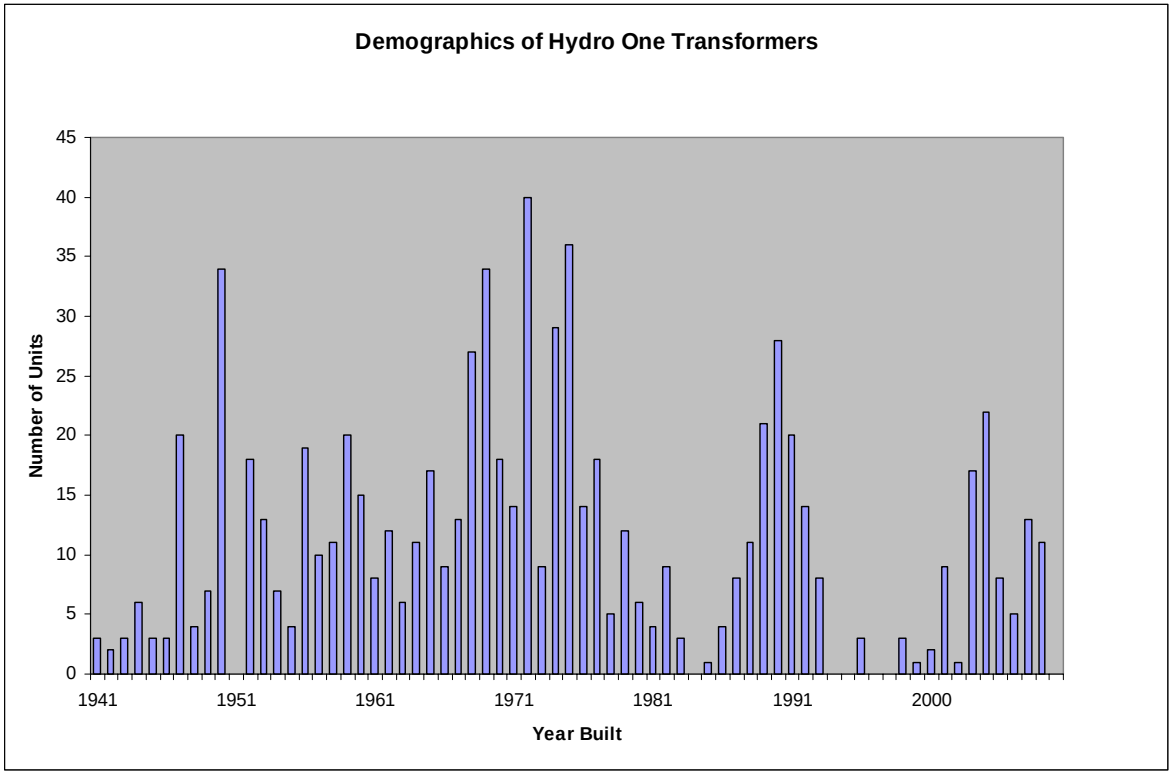




Domains covered during the Conference & Colloquium

-Maintenance issues (opening session)
-Efficiency and Reliability (opening session)
-Insulating material & oils
-Short-circuit behaviour
-Various diagnostic techniques (FRA, DGA, PD)
-Condition assessment
-Asset Management, Aging & end of life issues, Economical consideration
-Theoretical reliability issues
-Safety issues, Tank rupture, New fluids
-Procurement process

Demographics of the Transmission Transformer Fleet

- Aging of the transformer population is of great concern



Average age: 35 y.

20 % > 50 y. old

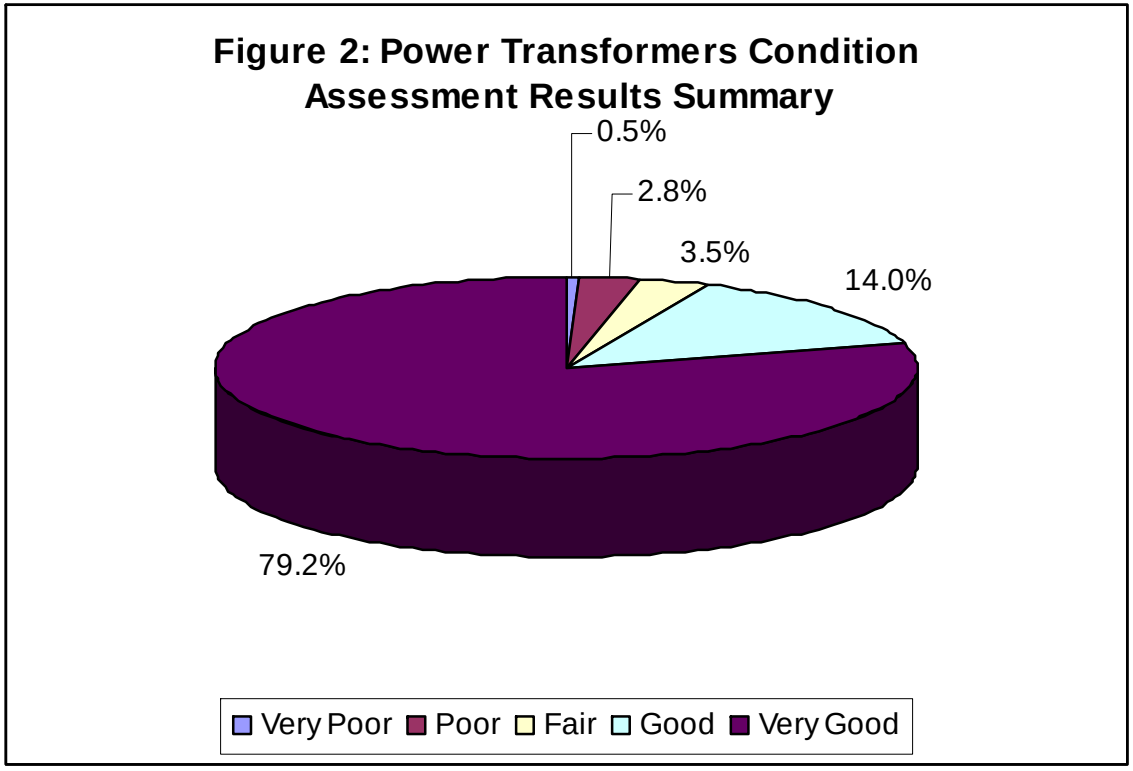
800 units – 3 ph.

Average 100 MVA

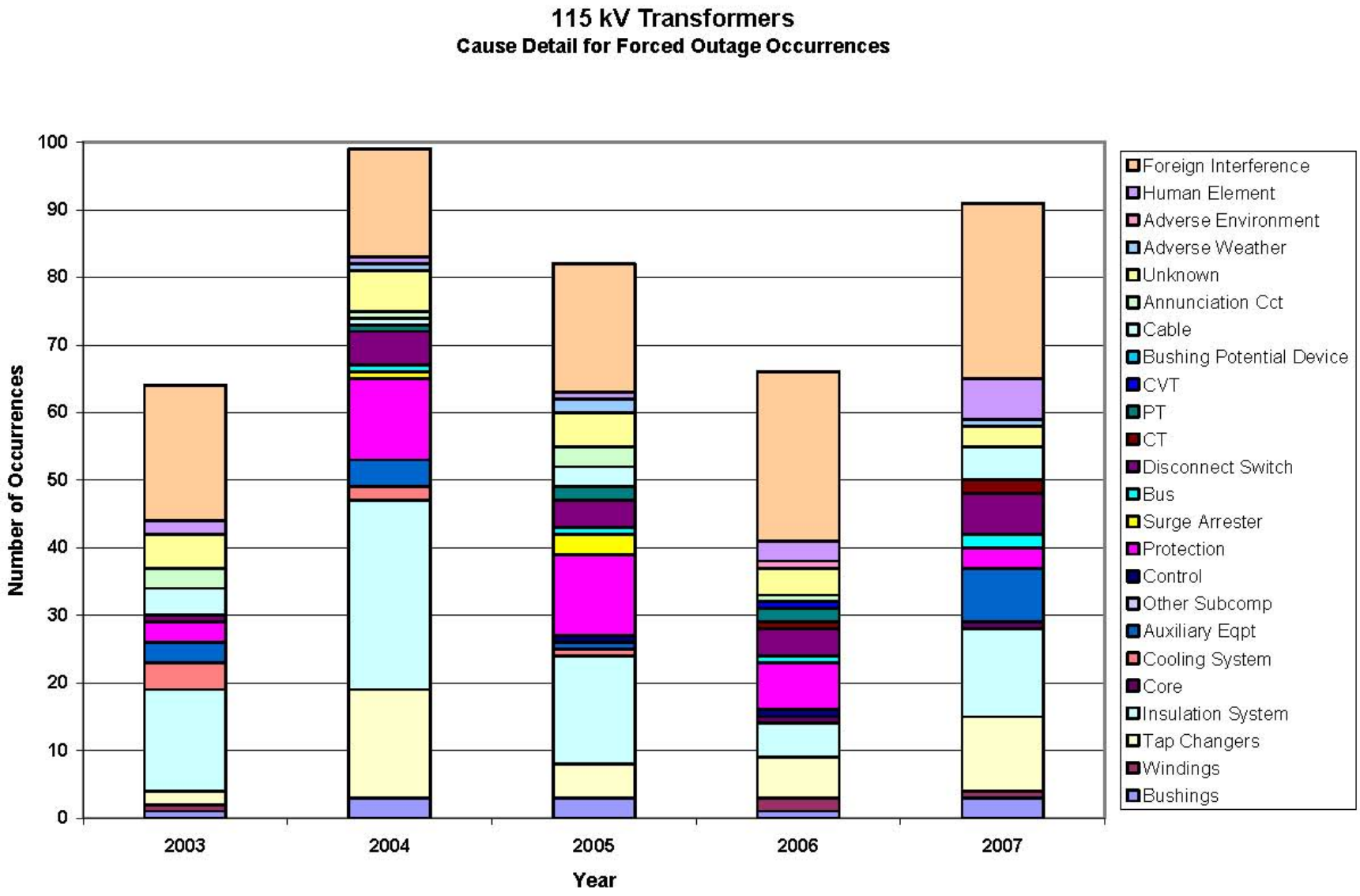
Source: Paper E. Figueroa, Hydro One/Canada

Condition of the Transformer Fleet

- According to a Condition Assessment performed by a consulting firm over 95% of the population is in fair to very good condition.



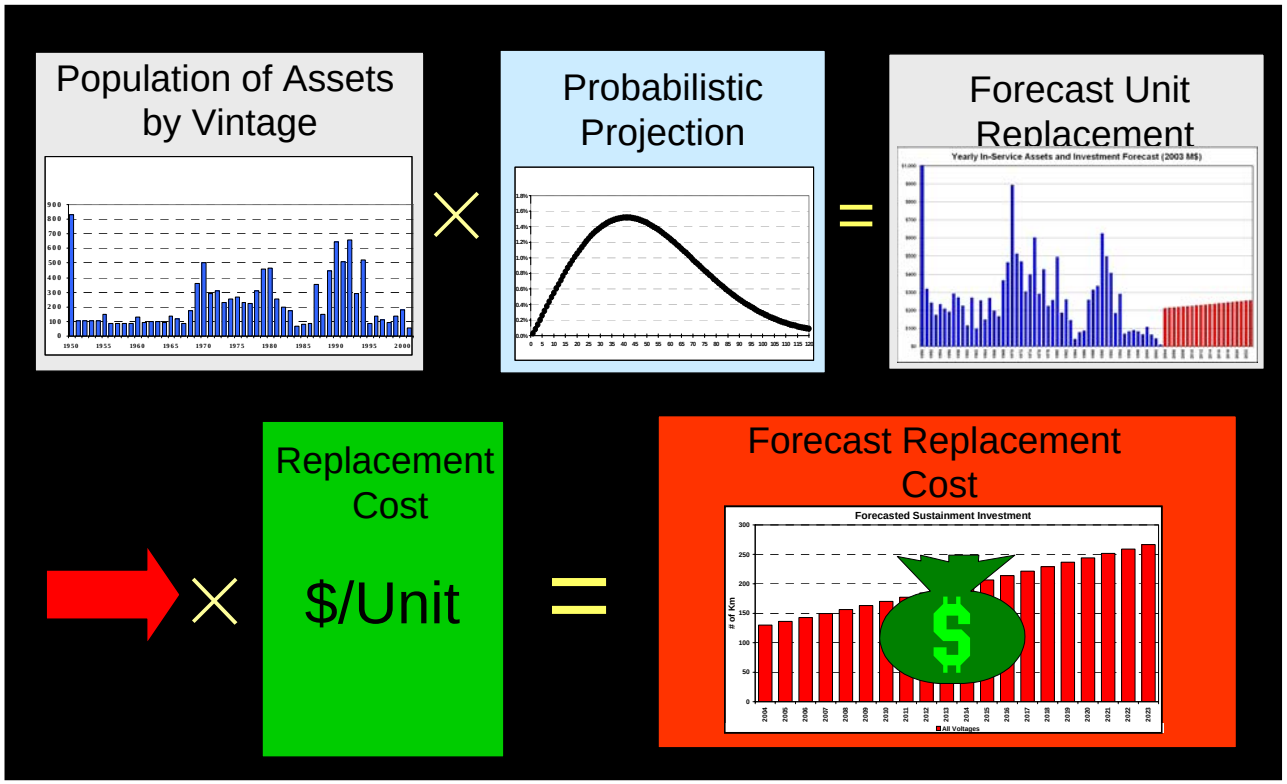
Source: Paper E. Figueroa, Hydro One/Canada



Source: Paper E. Figueroa, Hydro One/Canada

Asset Retirement Model

- Probabilistic method to forecast transformer replacement rate & $'s
- Life expectancy of 60 years: replacement rate = 20/year



Source: Paper E. Figueroa, Hydro One/Canada

Identification of weakness / Need for further developpements

- Interpretation of diagnostic tools
- New diagnostic techniques ??? Acoustic emission, vibrations
- Short-circuit performance of used units
- Tracing of degradation through trend analysis & on-line monitoring
- Better use of post-mortem analysis
- Maintenance strategy
- Efficiency and Reliability
- Recommendation for tank design
- Study of the impact of transients (design, aging of insulating material)
- Asset Management issues (TF CIGRE TC)
- Futur network (TF CIGRE TC)
- Efficiency of Electric Power Systems, CO2 emissions (TF CIGRE TC)

2010 – Paris - August 25

- **Check the report of special reporter(s) which will be posted on CIGRE WEB site after March 2010.**
- **Answer only the questions raised in this report**
- **Send your 'prepared contribution' 2 weeks in advance to SC A2 secretariat**
- **Spontaneous contribution from the floor will be possible, but only with an access to the microphone (no charts)**

SC A2 Preferential Subjects 2010

- **PS1: Transformers incidents in service and failures**
  - **Fire and fire extinction**
  - **Oil spill**
  - **Risk mitigation**
- **PS2: Transformer Life**
  - **Specification**
  - **Procurement**
  - **Maintenance & Diagnostic, Reinvestment**
- **PS3: Transformer Modelling**
  - **Transients (Inrush, Ferroresonnance, Switching)**
  - **Thermal**

- **Thank you to the CIGRE NC of South-Africa for the invitation**

- **Thank you to the organization committee for the preparation**
  - **Roger Cormack (ZA)**
  - **Robert Koch (ZA)**
  - **Claude Rajotte (CA)**
  - **Jacques Aubin (CA)**
  - **All other associate persons in the organization**

- **Thank you to the authors of contributions**

- **Thank you to the sponsors**

Thank you for supporting A2

see www.cigre-a2.org