Docket S030
Ex. 68-9

KINECTRICS

Testing and Certification of Insulating Links to Improve Safety

John Kuffel

Washington DC
July 2004

Overview of Kinectrics

KINECTRICS

- Formerly the R&D Division of Ontario Hydro
- Facilities include major electrical, mechanical, and environmental laboratories
- Kinectrics was established as a stand alone company on August 2nd, 2000
- An organisation with 85 years experience in providing technical support to Ontario Hydro, other electrical utilities, and the electric power industry
- Employees ~ 250 (scientists, engineers, support staff)

Personal Qualifications

KINECTRICS

- General Manager, Transmission and Distribution Technologies
- P. Eng, IEEE Fellow, with Ph.D. in High Voltage Engineering.
- 28 years experience in commercial and developmental testing of HV and EHV power apparatus including insulators, power cables, switchgear and transformers.
- Participated in numerous R&D projects in transmission and distribution system engineering, investigations into power apparatus performance, insulator failures, over-voltage protection, electromagnetic induction problems, crane link characterization, personnel safety grounding and live-line maintenance.
- Published extensively in technical journals including IEEE, CEA, and CIGRE
- Co-author of a text book entitled "High Voltage Engineering Fundamentals."
- Serves on several IEEE, CIGRE, IEC (TC 36 and TC 42), ANSI (C29) and CEA technical committees dealing with preparation of standards on high voltage testing and high voltage insulators.

High Voltage/High Current Tests

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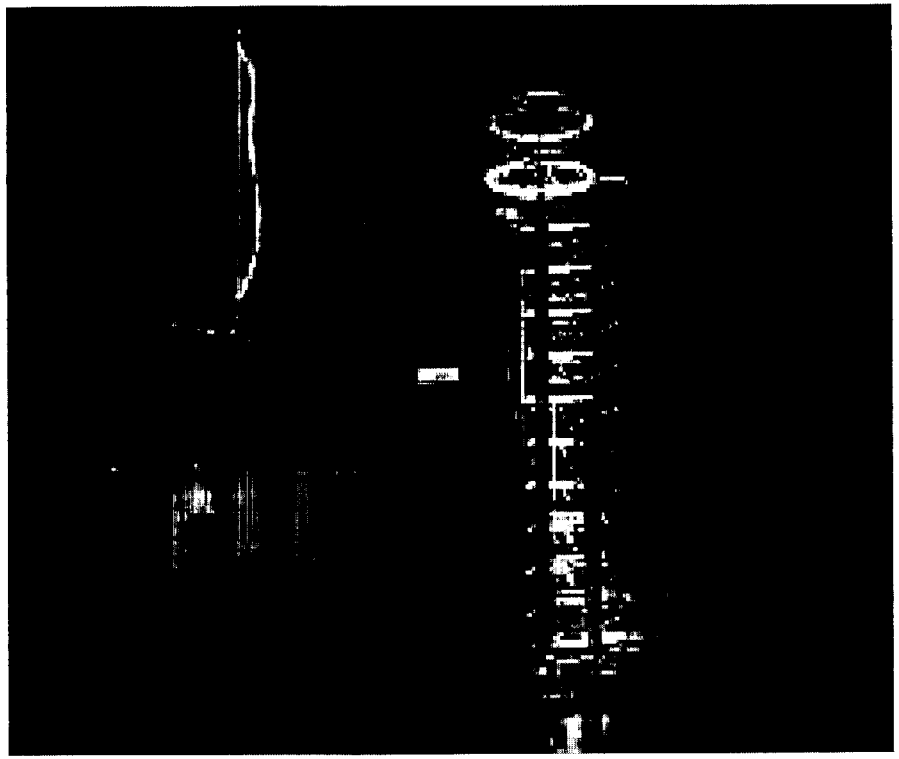
- Conduct testing for certification, product development, and failure analysis
- Identify if products operate to standard/non-standard requirements



Electrical Safety Equipment and Power Apparatus Testing

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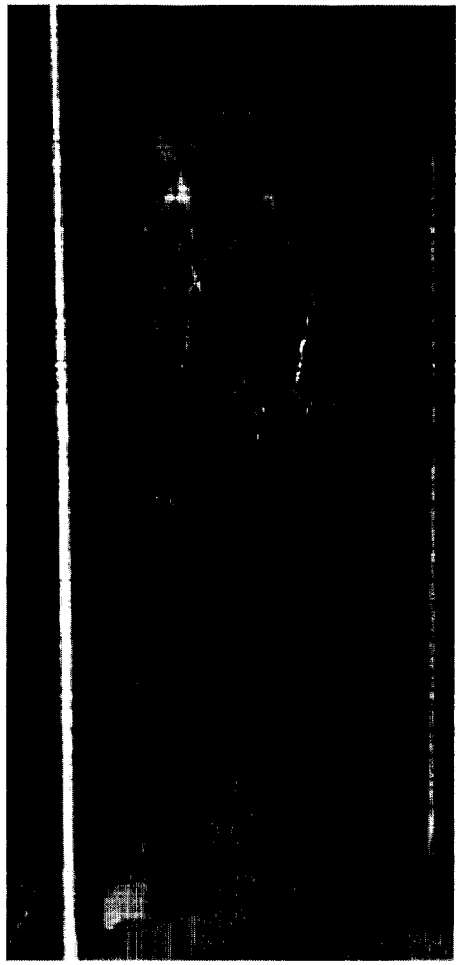
Equipment reliability and worker safety are key issues for utilities.

Through use of our labs, we have developed standards and testing procedures to help ensure that utility staff and other electrical workers are provided with safe, reliable, and certified equipment



High Voltage Laboratory

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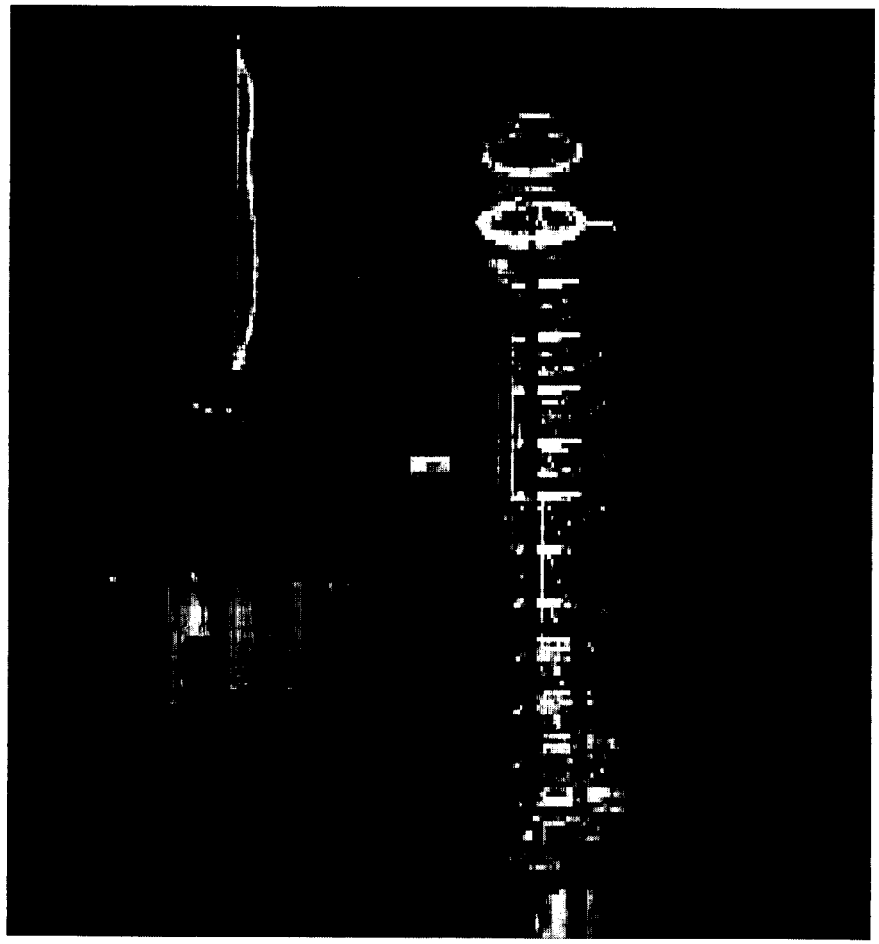
2 MV Impulse Generator

Fixed 60 Hz Supplies

- 800kV, 600kV, 350kV, 150kV,etc

Mobile 60 Hz supplies

- 700kV, 60kV, 40kV



Environmental Testing Chamber

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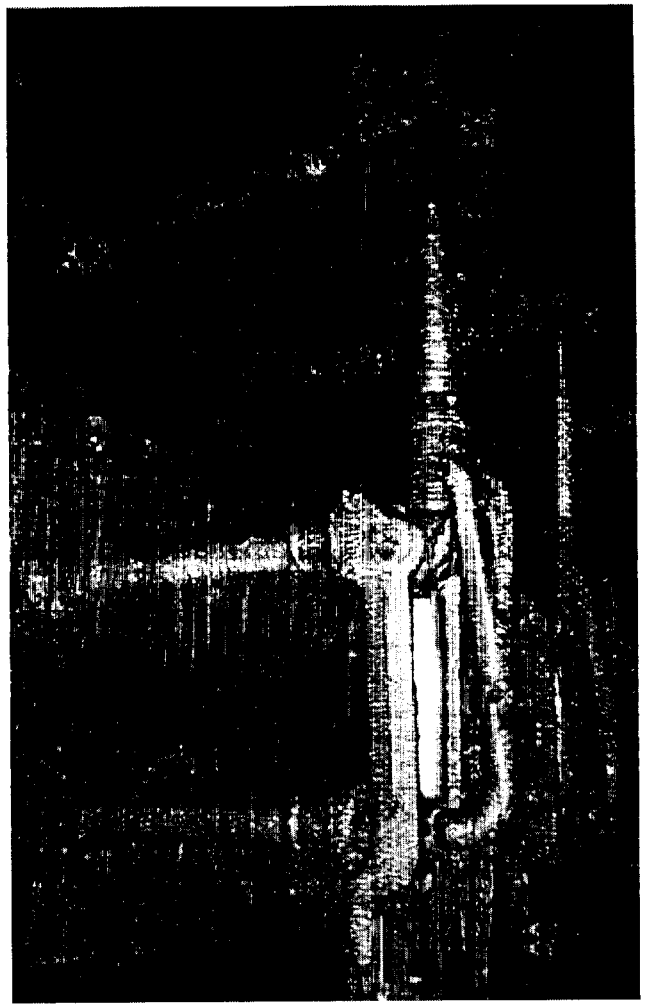
HV ENVIRONMENTAL TESTING CHAMBER

- 350 kV, 1.6 MVA supply
- Dimensions - 30ft by 15ft by 40 ft high
- Temperature from -15C to 40C
- Wind Speed 13 km/hr
- Iceing test capability
- Fog saturated ambient (cond 0 - 300uS/cm)



High Power Laboratory

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HIGH CURRENT TESTING

- 200 MVA capacity
- 100 kA max rms current
- Explosion proof test chamber

Destructive and withstand testing of equipment such as insulators, transformers, clothing, PPE, grounding systems, etc.

Contamination Related Flashovers

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True environmental conditions resulting in failure of outdoor insulation are routinely reproduced under voltage in our HV environmental chamber

- Allows us to assess and predict the real life performance of insulation systems and components under contaminated in-service conditions

Wrap-Up

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Commercial testing laboratories such as ours can work with industry to:

- ensure that links and alarms meet appropriate standards which confirm their effectiveness and performance
- make field practices safer for workers

General Comments

- Insulating links designed using accepted technology developed for HV insulators can function to reduce accidents in the field
- Properly designed links are far superior to slings or non-conductive ropes as they are designed to be resistant to flashover in contaminated conditions which characterize typical construction sites
- Daily testing of links for surface contamination by measuring leakage current is a good and technically feasible safety measure.