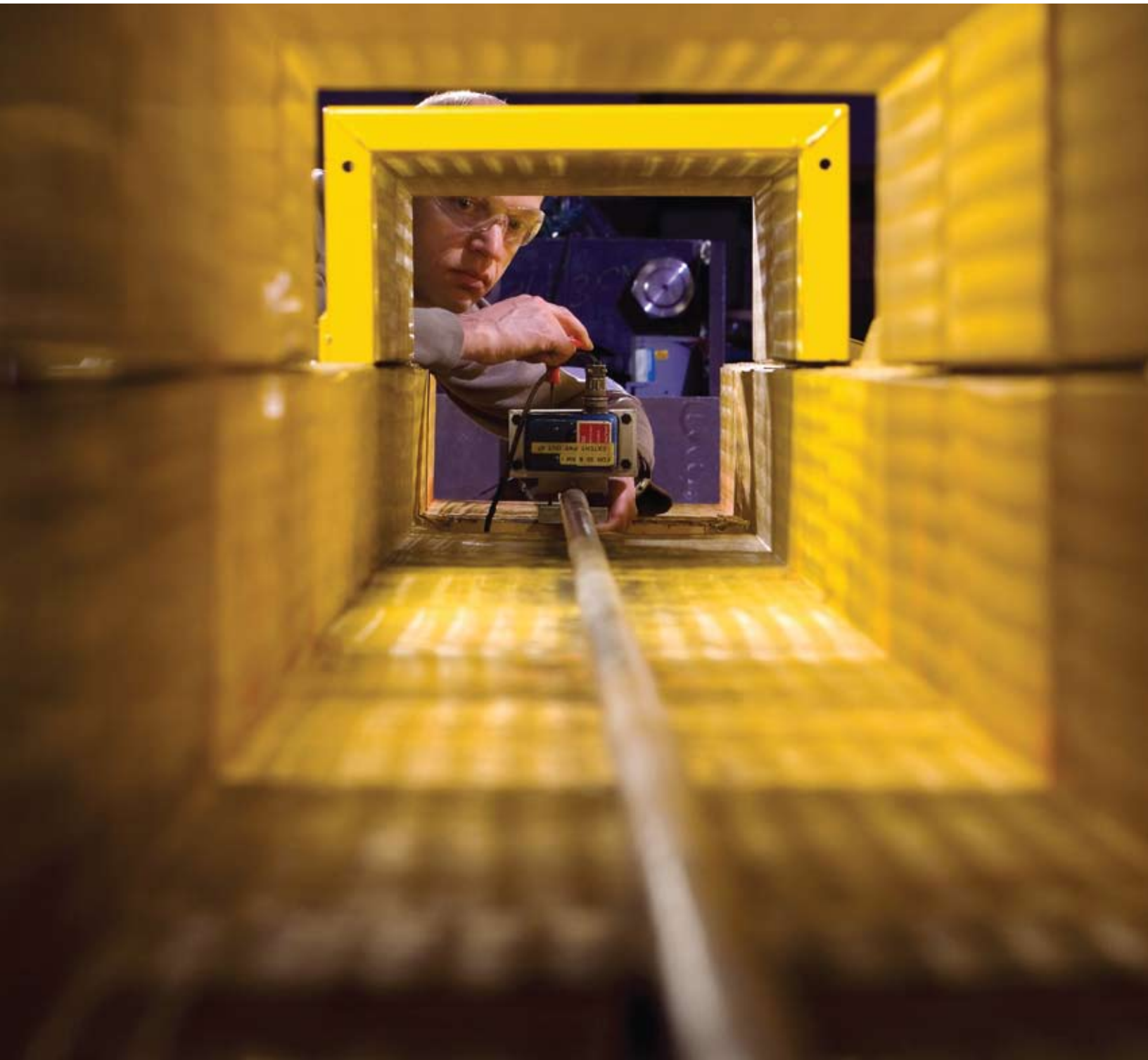




Mechanical Testing of Transmission and Distribution Components



FIBRE OPTIC CABLE TESTING

For electric utility applications, the most common fibre optic cables are optical ground wire (OPGW) cable and all-dielectric self-supporting (ADSS) cable. Rigorous testing standards such as IEEE Std. 1138 and Std. 1222 and IEC Std. 60794-1-2 have been developed by international standards organizations to ensure cable quality is designed to meet acceptable performance levels in the field under a variety of conditions.

Kinectrics, through its IEC 17025 accreditation, is uniquely positioned to provide testing services for fibre optic cables. The company has played a key role in the development of quality and industry testing standards for fibre optic cable, and is internationally recognized as a qualified independent authority on laboratory testing.

Tests

- Water ingress
- Short circuit
- Sheave
- Impact
- Fibre strain
- Stress-strain
- Temperature cycle
- Tensile
- Cable aging
- Seepage of flooding compound
- Aeolian vibration and galloping
- Crush
- Creep
- Strain margin
- Cable cut-off wavelength
- Lightning
- Electrical

CONDITION ASSESSMENT TESTING

Kinectrics conducts condition assessment testing of aged conductors, groundwires, hardware, tower steel and insulators, etc. Our capabilities include both controlled laboratory testing and in-situ field testing.

Lab test results, and the input of that data into suitable models, aid in failure analysis and provide an estimate of remaining life. This information can be used with other factors to help clients take a cost-effective, tiered approach to component repair and replacement on a fully-substantiated prioritized basis. Information from assessments can enable decisions to requalify conductors and groundwires for a specified future period, help estimate remaining unit life, or determine the ideal opportunities to upgrade lines.

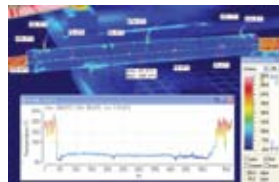


For field testing, Kinectrics employs a variety of tools, including LineVue®, which can be used to measure the remaining cross-sectional area of steel in ACSR and ACSS conductors in engineering units.

CONNECTOR TESTING

In overhead transmission and distribution lines, connectors comprise all components, including equipment such as splices and dead-ends, that connect wires together. The condition of these components is critically important because their failure can lead to a downed line.

Kinectrics conducts qualification tests for the mechanical and electrical performance of connectors according to international standards such as ANSI C119 and IEC 61284. Tests include Current Cycle and Mechanical Tension.



In-depth analysis by infrared camera provides detailed information on temperature distribution on connector surfaces.

Kinectrics also tests permanent station connectors used in substation grounding with the qualification standards in IEEE Std. 837. Tests include Current Cycle, Freeze-Thaw, Salt Spray, Acid Bath, and Short Circuit.

COMPREHENSIVE CAPABILITIES

With more than two decades of practical experience in mechanical testing, Kinectrics' experts can help clients find specific answers to mechanical problems.

- Failure Analysis Analytical studies are conducted to confirm the failure mode and determine the most cost effective measures to prevent or mitigate future failures. In a representative project in this area, Kinectrics is evaluating new conductor damping schemes that can be used in the field to prevent future fatigue damage.
- Vibration Studies Analysis used to understand a vibration issue on a specific line, (e.g. an unacceptable outage rate due to galloping) and to recommend the most effective control device.
- Computer Analysis A number of advanced proprietary software programs developed and employed by Kinectrics to analyze mechanical systems, (e.g. forces due to short circuits on station structures).

Why Kinectrics Should Be Your Source For Mechanical Testing Of Transmission & Distribution Components

Kinectrics is an established, independent company offering clients the advantage of more than 95 years of proven expertise and experience, founded on solving the most demanding technical challenges for Ontario Hydro, one of North America's largest and most reliable utilities. Our Transmission and Distribution group uses unique mechanical test facilities to perform a wide range of testing services for line component manufacturers, industrial power users, transmission / distribution utilities, and power producers.

Kinectrics' laboratories are staffed by skilled professionals with in-depth expertise and experience in the utility and industrial areas. Our specialists have the practical know-how to interpret and explain the details and subtle implications of test data results. Kinectrics testing services can help utilities resolve equipment failures and network system outage problems, to achieve cost-effective system operation, reliability, and customer satisfaction.



ONE-STOP TESTING AND ANALYSIS OF TRANSMISSION AND DISTRIBUTION OVERHEAD LINE COMPONENTS

KINECTRICS offers a full range of mechanical testing services for electric utilities, including testing of new products and aged components, testing of fibre optic cables, and specialized studies in areas such as wind-induced conductor motion and ice loading.

KINECTRICS provides accurate and meaningful test data and analysis that can help manufacturers and asset owners utilize the full capability of their components and avoid potential lost revenue due to poor performance or product failure.

Components Tested

- Conductors and groundwires
- Fibre optic cables
- Connectors
- Suspension and dead-end clamps
- Dampers and spacer-dampers
- Insulators
- Splices and fasteners
- Others

Tests

- Vibration (e.g., Aeolian Vibration, Galloping)
- reep
- Stress-strain
- Corrosion
- Tensile Performance
- Fatigue
- Temperature
- Cable self-damping
- Others

Facilities

Conductor Dynamics Laboratory
(90 m / 300 ft. long)

- 3 Vibration Spans
- 12 Creep Spans

Connector Test Laboratory

- 6 Test loops
- Infrared camera

Mechanical Laboratory

- Tension test span
- Strong floor - 45,000 kg capacity

Field Test Services

- Conductor inspection – LineVue®
- Vibration monitoring

Standards and Specifications

- Industry standards (IEEE, IEC, ASTM, ANSI, CSA)
- Utility and custom specifications



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