KINECTRICS NORTH AMERICA INC. TEST REPORT
FOR 1272 kcmil 3M BRAND ACCR CONDUCTOR

Test Name:	**SUSTAINED LOAD TEST ON COMPRESSION DEADEND FITTING FOR 1272 kcmil 3M BRAND COMPOSITE CONDUCTOR AT ROOM TEMPERATURE**
Test Date:	October 14-22, 2003
Cable Supplier:	3M Company
Laboratory:	Kinectrics Inc. 800 Kipling Avenue Toronto, Ontario M8Z 6C4 CANADA
Standard:	Based on ANSI C119.4-2003, Paragraph 7.3.3.1
Kinectrics Staff:	Mr. Craig Pon Mr. Mike Kastelein Mr. Gord Hale

OBJECTIVE

3M contracted with Kinectrics under PO # 0000969870 to conduct a sustained load test. The objective of the test was to verify the room temperature sustained load carrying capability of the Alcoa-Fujikura Ltd. (AFL) Class 1, full tension compression deadend clamp on a 1272 kcmil 3M Brand Composite Conductor. The dead-end catalogue number is B9119-A (special design for 3M Composite Conductor).

TEST SET-UP

A compression deadend clamp was installed on one end of the conductor sample. This was done by AFL at their facilities and then shipped to Kinectrics. The other end of the sample was terminated with an epoxy-resin clamp by Kinectrics.

The sample was installed in a hydraulically-activated horizontal test machine. The distance between pulling eyes of the compression clamp and the epoxy-resin clamp was about 14.4 m

INTRUMENTATION

The MTS equipment associated with load cell #17356-0 that monitors the load and controls the load rate was last calibrated on March 18, 2003. It is due for calibration on March 2004.

TEST PROCEDURE

A test machine having a load accuracy of ± 2% was used for this test. The conductor was preloaded to 1168 lbf (530 kgf) or about 2.7% of the rated breaking strength (RBS) of the conductor (RBS = 43677 lbf, 19812 kgf). The tension in the sample was increased from preload to 33,630 lbf (15,254 kgf) or 77% of the conductor RBS in about 15 minutes. The tension was maintained at this level for 168 hours. The elongation of the conductor over an 8.0 m gauge length was also measured and recorded during the test using a pull wire potentiometer. The ambient temperature in the laboratory was approximately 22^{o}C during the test. On completion of the sustained load test, the tension in the sample was increased at a rate of 4500 lbf/minute until failure.

TEST RESULTS

The conductor sample failed at 42,218 lbf (19,190 kgf) or 96.7% of the RBS of the conductor. The failed occurred approximately 3 feet (1 m) from the AFL deadend. The failure is shown in Figures 1a and 1b.

Figure 2 shows the conductor strain (%) and tension (kgf) plotted against elapsed time during the sustained load phase. Most of the strain (approximately 0.35%) of the conductor occurs during the initial tensioning of the conductor. Approximately 0.05% strain occurred during the remainder of the test.

To qualify under the ANSI standard, a connector must hold 77% of the conductor's rated breaking strength (RBS) for seven days (168 hours). At the end of the sustained load period, the residual strength must exceed 95% of the conductor RBS. The 1272 kcmil deadend exceeded the 95% RBS strength criterion specified in ANSI C119.4-2003.

ACKNOWLEDGEMENT

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DISCLAIMER

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Department of Energy.

Prepared by:

Michael Kastelein
Technologist
Transmission and Distribution Technologies Business

Reviewed by:

Craig Pon
Principal Engineer
Transmission and Distribution Technologies Business

Approved by:

John Kuffel
General Manager
Transmission and Distribution Technologies

Date: February 22, 2005

Figure 1a: 1272 kcmil Conductor after Tension to Failure after 168 Hour Sustained Load Test at Room Temperature

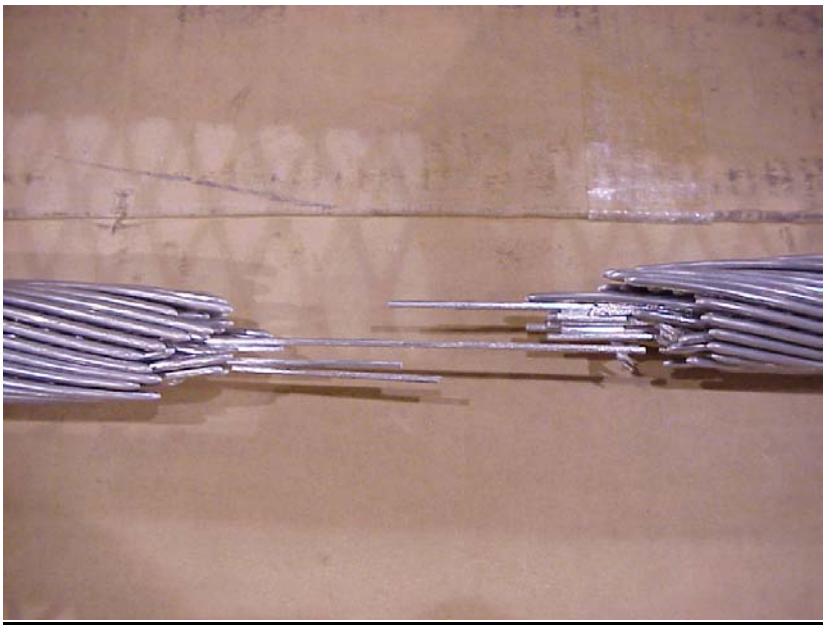

Figure 1b: 1272 kcmil Conductor after Tension to Failure after 168 Hour Sustained Load Test at Room Temperature (Close-Up)

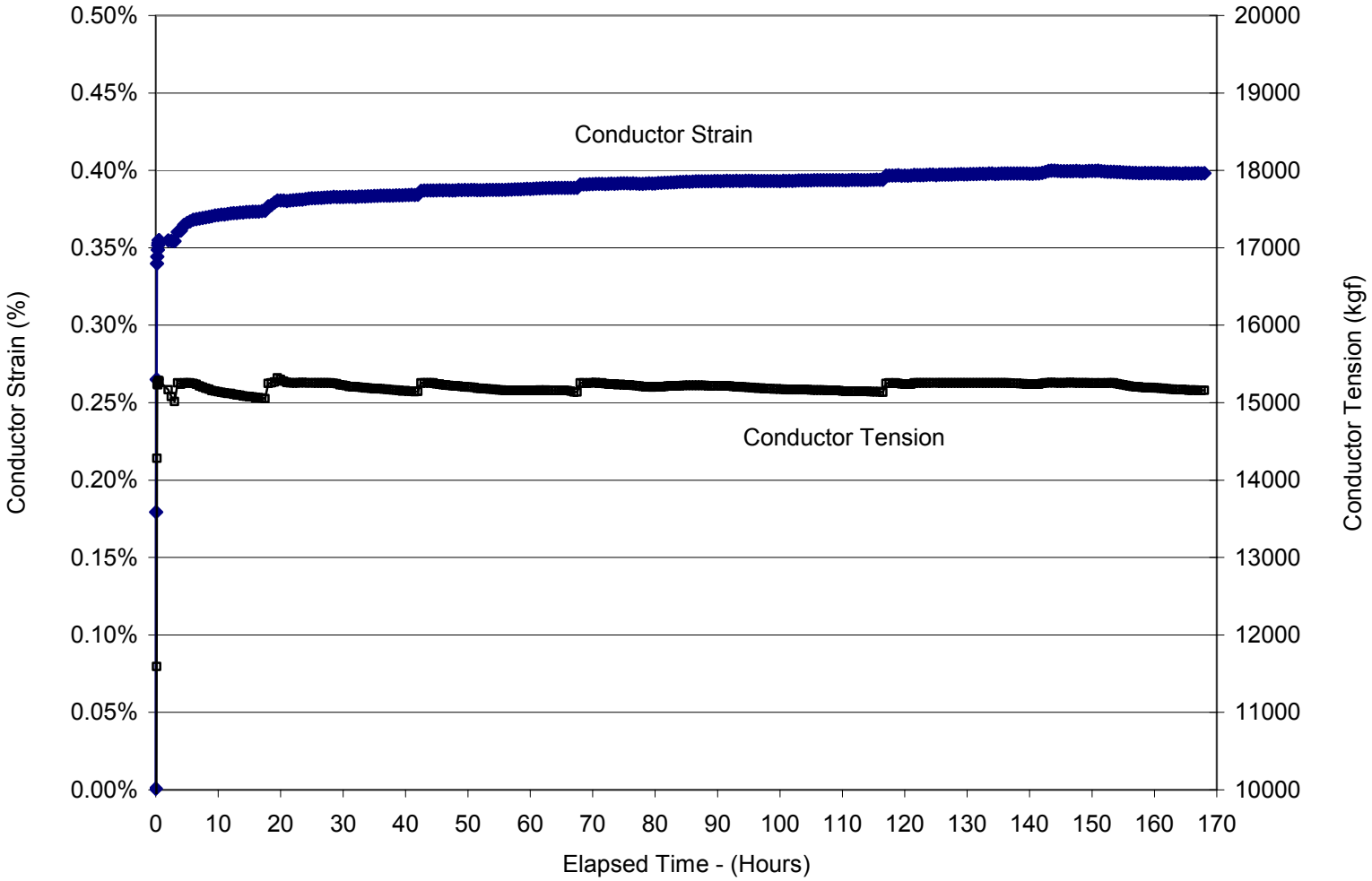

Figure 2: Conductor Strain and Tension vs. Elapsed Time
for 1272 kcmil Sustained Load Test at Room Temperature

DISTRIBUTION

Colin McCullough (2 copies)	3M Company 3130, Lexington Ave. So. Eagan MN 55121-2239 USA
C. Pon	Kinectrics Inc., KB104