THE UTILCO COMPANY

TEST REPORT

9107A1

PRODUCT: "POWER-GRIP" SELF CLEANING HOT LINE CONNECTOR SCH-636 DATE: 8/6/91

TYPE TEST: Fault Current

TEST FACILITY: Major Utility REVIEWED BY: 8/21/9

TESTED BY: M. Charneski SUPERVISOR:

PURPOSE:

Evaluate the "Power-Grip" Self Cleaning Hot Line Connector SCH-636 under repeated fault currents.

DEVICE:

Utilco "Power-Grip" Self Cleaning Hot Line Connector SCH-636 is made from extruded 6061-T6 aluminum and is plated with Safety-Film 616 Protector Film. The eyebolt is manufactured from 6061-T6 aluminum and is gold anodized. The hexagon tap bolt is manufactured from 6262-T9 aluminum and is also gold anodized. The wire openings of the "Power-Grip" Self Cleaning Hot Line Connector are a Patented wedge-shaped design. The surfaces of the wedge are serrated. The pads on the bolts contain the wire and force it into the wedge across the serrations. This action "cleans" the wire of oxidation and contaminates.

PROCEDURE:

Two tests were conducted. Test #1 was conducted using 636 MCM AAC (Orchid) Bare Transmission/Distribution Cable, 37 Strands, 1350-H19 Alloy, in the main and tap. Test #2 was conducted using 636 MCM AAC (Orchid) Bare Transmission/Distribution Cable, 37 Strands, 1350-H19 Alloy, in the main and 477 MCM ACSR in the tap.

The main conductors were torqued to 25 foot pounds (300 inch pounds) and the tap conductors were torqued to 35 foot pounds (420 inch pounds) in both tests. The conductors used in both tests were aged conductor obtained from the scrap pile of a large utility. In both tests, the conductors were not wire brushed and anti-oxident was not used in the connections. One SCH-636 HLC was used in Test #1 and a new SCH-636 HLC was used in Test #2.

The sequence of fault current applications in a given trial simulated a 20/40 kV Circuit Breaker Reclosing Sequence. This sequence consisted of ten cycles ON, 30 seconds OFF, ten cycles ON, 60 seconds OFF and ten cycles ON. This sequence was repeated four times in Test #1 and three times in Test #2. A cooling period between sequences allowed the clamp to reach 34°C or below.

Resistance measurements were made between potential points located 12 and 13.5 inches from the clamp in Test #1 and 11.5 and 10 inches from the clamp in Test #2. After each test the clamp and conductors were visually examined for melting or damage and the surface temperature of the clamp and conductor were checked. At the conclusion of each test the contact surfaces of each clamp and the conductor were examined for any damage.

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TEST RESULTS:

The fault currents and duration applied to each clamp are shown in Table 1. The resistance readings between potential points, initial and after each sequence, are shown in Table 2. There was no change in resistance after four sequences on 636 MCM AAC conductor, Test #1. There was no change in resistance after two sequences on 636 MCM AAC to 477 MCM ACSR, Test #2. After sequence #3, a noticeable increase from 50.7 micro-ohms to 73.8 micro-ohms occurred.

After each test, the surface temperatures of the clamp and the conductor several feet away showed the clamp to be from 30°C to 50°C cooler than the conductor. Both the conductors and clamps were essentially at their pre-test condition at the conclusion of the tests.

TABLE 1
Fault Current Tests For Utilco Self-Cleaning Hot Line Clamp SCH-636

Clamp	Conductors Main	Conductors Tap	Test	Shot	Time (seconds)	Duration (cycles)	Applied Current First Cycle (amperes rms)	Applied Current Steady State (amperes rms)
1	636 AA	636 AA	1	1	0	11.0	24,030	18,150
				2	30	11.0	24,030	18,150
				3	60	10.0	18,990	18,150
			2	1	0	11.0	21,630	19,630
				2	30	11.0	21,390	19,630
				3	60	11.0	20,910	19,630
			3	1	0	11.0	20,910	19,260
				2	30	11.0	20,910	19,260
				3	60	10.5	20,910	19,260
			4	1	0	11.0	31,590	30,550
				2	30	11.0	33,440	31,480
				3	60	10.5	34,860	32,100

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TABLE 1
(continued)

Clamp	Conductors Main	Conductors Tap	Test	Shot	Time (seconds)	Duration (cycles)	Applied Current First Cycle (amperes rms)	Applied Current Steady State (amperes rms)
2	636 AA	477 ACSR*	5	1	0	11.0	35,180	34,260
				2	30	11.0	37,240	35,180
				3	60	11.0	38,170	35,180
			6	1	0	11.0	37,040	35,180
				2	30	11.0	37,980	35,180
				3	60	10.0	37,980	35,180
			7	1	0	11.0	37,400	35,180
				2	30	11.0	37,130	35,180
				3	60	11.0	37,130	35,180

*Aged conductor displaying black tarnish

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TABLE 2
Resistance Measurements Of Utilco Self-Cleaning Hot Line Clamps SCH-636 After Fault Current Tests

Clamp	Test	Resistance Between Potential Points (micro-ohms)*
1	Initial	58.4
	1	56.8
	2	57.9
	3	**
	4	58.8
2	Initial	49.3
	1	49.5
	2	50.1
	3	73.8

*Corrected to 20°C

**Unreliable Reading Due To Interference