Test 4 & 5

Wet Arc Tracking
Bundle: Seven wires (6 over 1) of Mil-W-81381/12-20 specification, 15 inches in length.
Electrolyte: 1% saline solution @ 100mg/minute
Circuit Resistance: 1 Ohm
Generator: 3 phase, 400Hz, 120 line to neutral (208 line to line), 10 kVA.
Length of tests: <1.5 minutes

Observation	Test 4	Test 5
Visible scintillation	00:20	00:15
Flash	No	No
Strong Arcing	80 sec	20 sec
Circuit Breakers Tripped	Yes	Yes
Damage Length	2"	7/8"
Number of Wires Failing Wet Dielectric Test	4 of 5 [C], [A2], [B2] &[D2]	3 of 5 [C], [A2] & [B2]

Both of the samples in Tests 4 and 5 had relativity short periods of scintillation followed by strong arcing (Figure 27) that damaged the other wires in the bundle and tripped several circuit breakers.

In Test 5 the sample had been wetted with the 1% saline solution before the power was applied. The sample was washed with distilled water and dried with a paper towel. However, this may not have remove all of the saline which may have caused the sample in Test 5 to have strong arcing quicker than the sample in Test 4.

In Test 4 a circuit breaker [C] was reset and strong arcing restarted until circuit breakers re-tripped. A second circuit breaker [B1] was reset and again strong arcing restarted causing more damage to the wire until the breakers re-tripped and the arcing stopped. The sample was then removed. In Test 5 no circuit breakers were reset and the sample was removed after the first strong arcing event.

The oscillogram from the initial arcing in Test 4 indicates that the event last about 3/4 of a second and had current peaks of 125 amperes (Figure 28). The power is estimated to have been 8 kilojoules. The arcing in Test 5 lasted a little under 1 second.

Examination of the bundles showed that the damage to the wire in Test 4 extended for about 2" and that 3/4" of the 5 active wires had eroded completely away (Figure 29). 4 of 5 wires failed a wet dielectric test. Because the circuit breaker was not reset, the damage to the wire in Test 5 was less than Test 4 with the damage only extending 3/4". Although each of the five active wires had been cut through by the arcing, the eroded length was only 3/8". Three of the five wires failed the wet dielectric test.