Test 1 & 2

Wet Arc Tracking
Bundle: Seven wires (6 over 1) of BMS 42A/8/1-20 specification, 15 inches in length.
Electrolyte: 1% saline solution @ 200 mg/minute (test 1) , 100 mg/minute (test 2)
Circuit Resistance: 1 Ohm
Generator: 3 phase, 400Hz, 120 line to neutral (208 line to line), 10 kVA.
Length of test: 20 minutes (Test 1), 25 minutes (Test 2)

Observation	Test 1	Test 2
Visible scintillation	00:23	00:15
Flash	16:01	8:44
Strong Arcing	No	No
Circuit Breakers Tripped	No	No
Damage Length	1/2"	5/8"
Number of Wires Failing Wet Dielectric Test	2 of 5 [C] & [B2]	2 of 5 [C] & [A2]

The results of Test 1 and Test 2 were similar to each other though Test 2 did become more active a little sooner than did Test 1. Visible scintillations began within the first minute of the tests. In a couple of minutes, a char path began to develop between the two pre-damaged cracks in the insulation and scintillations were observed along this path. This is shown in Figure 20.

As the tests went on flashing events began to take place. At first the flashing events were at least several seconds apart, sometimes they were up to a minute apart. Soon there were periods where the flash events repeated continuously, sometime several flashes per second. This was followed by periods of dormancy where no electrical activity was observed. The intensity of the flash events varied both in the light and sound produced sometimes lasting several frames of video. After a series of flashes a chemical combustion flame (candle-like flame) was observed burning the insulation for a few seconds (Figure 21). The samples were each tested between 20 and 25 minutes and no circuit breakers tripped.

Looking at the oscillograms taken during the more active times of the test, we see that several of the flashing events lasted for 5 to 10 cycles. An example of this is shown in Figure 22 which shows the current in one of the three phases during Test 1. The sequence begins with 8 cycle consecutive cycles having high current for at least one of the ½ cycles and some times both of the ½ cycles. This is followed by a period intermittent cycles of high current lasting for 50 milliseconds followed by another 5 cycles that had continuous arcing currents. Not shown in Figure 22, but recorded on the oscilloscope, is that there were no high current cycles for the next 4 seconds (corresponding to more than a 1000 cycles).