Test 3

Wet Arc Tracking
Bundle: Seven wires (6 over 1) of BMS 42/1/1-20 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), 10kVA.
Length of test: ***5*** Minutes

Observation	Test 3
Visible scintillation	00:10
Flash	3:03
Strong Arcing	3:11
Circuit Breakers Tripped	Yes
Damage Length	2"
# Wires Failing Wet Dielectric Test	5 of 5 [C] ,[A2], **[B2], [D1] & [D2]**

Scintillations were observed on the sample almost immediately after Test **3** was started. Several minutes in to the test, before a visible char track was developed a flash was observed. On the next drop of saline the sample burst into intense arcing that lasted less that a second and damaged all of the active wires in the bundle though no circuit breakers were tripped (Figure 24). The sample became dormant for about **30** seconds before another burst of arcing which did trip the circuit breaker in series with wire [C]. The arcing stopped and the sample was inactive for about ***5*** minutes. At this point the circuit breaker was reset and the bundle arced again. This time 3 circuit breakers [B1], [B2] and [C] were tripped and the arc stopped. The sample was then removed from the test apparatus.

A look at the oscilloscope recording of the first burst of strong arcing shows that the event lasted for less than 1/4 of a second and that all three phases became involved within 30 milliseconds (Figure 25). There were many current peaks greater than 100 amperes during the arc. Estimates of the electrical energy dissipated in the two events before the circuit breaker tripped is about 2 kilojoules. The second burst of arcing that resulted in the tripping of the circuit breaker was not recorded because the data from the first arcing was in the process of being stored to disk at that time.

Examination of the sample after the test (Figure 26) showed that the damage and charring of the wire took place over **a** 2 inch span of the bundle and ~1 inch of the 5 active wires were eroded. All wires failed a wet dielectric test.