PII Information received May 10, 2012 Number of document: 1

Subject: POD calculation

Item – POD example for USCD tool specification

POD - Statistical examples for the USCD tool specification

POD for a 1” long x 0.04” deep crack = 95%

$PoD_{\text{specific defect type and size}}$ = True Positive / (True Positive + False Negative)

Example: - 10 identical cracks of minimum detection level (because the probability of detection is based upon the minimum detection limit and larger cracks would be closer to 99.9% POD) have a tool passed over it 100 times, what is the probability of detecting such cracks?

In the example of 10 identical cracks of the minimum detection dimensions of 1” long and 0.04” deep being present and the tool is passed over them 100 times, then a total of 10 X 100 = 1000 possible occurrences.

0.95 x 1000 = A probability of 950 True positives or 50 False Negatives

0.95 = 950 / (950 + 50)

If there were only a single 1” x 0.04” crack present, it would require 20 passes of the tool before a probability of having a single False Negative (or missed call) occurring.

If there were 10 identical cracks that are larger in size, they would tend be at say 99.9% POD and had a tool pass over them 100 times?

0.999 x 1000 = A probability of 999 True Positives or 1 False Negative

0.999 = 999 / (999 + 1)

If there were only 1 large crack present, it would require 1,000 passes of the tool before a probability of having a single False Negative (or missed call) occurring.