

Requirement ID: 920

Sponsor Organization: AFS-300

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Requirement Title: Effects of fatigue/vigilance/environment on inspectors performing Fluorescent Penetrant and/or Magnetic Particle Inspections

Funded Requirement:

- FY02: No
- FY03: Yes
- FY04: Yes
- FY05: Yes

Requirement Statement: As a result of the National Transportation Safety Boards investigation into the July 6, 1996, uncontained engine failure in Pensacola, Florida, of Delta Air Lines flight 1288, a McDonnell Douglas MD-88, Safety Recommendation A-98-17 was issued to the FAA. This safety recommendation requests that the FAA, “conduct research to determine the optimum amount of time an inspector can perform nondestructive testing inspections (NDI) before human performance decrements can be expected.” A research project studying NDI as a whole is very expensive, time consuming and hard to quantify, however the two primary methods of NDI that lend themselves to such a study are Liquid Penetrant and Fluorescent Magnetic Particle Inspection.

Background: Inspectors performing these two methods are expected to scan wide areas of critical parts looking for small defects. The inspector viewing these parts must work for extended periods of time in a dark room using ultra violet light to accomplish these inspections. It is well documented that the probability of detecting small defects decreases as time on the job increases. Does the working environment; i.e. working in the dark, low expectation of finding critical defects, further magnify this vigilance decrement for inspectors performing Liquid Penetrant or Fluorescent Magnetic Particle Inspections?<p>

Conduct empirical research to study the effects of fatigue/environment on the vigilance decrement of inspectors who perform Liquid Penetrant or Fluorescent Magnetic Particle Inspections as their primary work function. Determine the optimum time that can be realistically spent performing these two inspection methods before detectability is significantly decreased.

Output: A “Best Practices” document to inform the aviation community of the potential problems associated with fatigue in combination with environment when performing these two inspection processes. This can serve to educate the NDI community, and emphasize the need for regulating the time and individual spends performing these processes.

Regulatory Link: The National Transportation Safety Board (NTSB) issued Safety Recommendation A-98-17 as a result of the Delta/Pensacola accident.