

Requirement ID: 191

Sponsor Organization: AFS

POC: Les Vipond

Requirement Title: Vision Testing Requirements for Certain Persons Maintaining and Inspecting Aircraft and Aircraft Components

Funded Requirement:

- FY01: No
- FY02: Yes
- FY03: Yes
- FY04: No

Requirement Statement: At a minimum, the goal of this project is to determine the proper standards to be employed in the visual acuity testing of persons inspecting aircraft and aircraft components. This material will then be set forth in an Advisory Circular or eventually be included as an amendment to the Federal Aviation Regulations. This project would involve, as a minimum, the following:

1. Establish the standard to be used for both near and far vision tests.
2. Establish the standard to be used for testing color perception.
3. Determine who will be required to meet these minimum standards for performance of their job function.
4. Determine the time interval when vision tests will be administered.
5. Establish written procedures to provide guidance to organizations that will need to setup programs for administering and documenting the visual acuity examinations.
6. Determine if these standards should be included in an Advisory Circular or as an amendment to the Federal Aviation Regulations.

Background: Part 67 of the Federal Aviation Regulations provides requirements for visual acuity testing for aircraft pilots for first, second and third class medical certificates. There currently is no requirement to assure that persons performing maintenance or inspection of aircraft meet a minimally acceptable vision requirement. Various programs for the certification of persons performing Nondestructive Testing require vision examinations prior to certification. These requirements are neither uniform nor standard throughout the industry. There currently is no requirement for a person performing visual inspections to be tested for visual acuity or color perception. There have been several aircraft accidents where large cracks and/or corrosion were not detected during visual inspections. The National Transportation Safety Board (NTSB) has cited the failure to visually detect detectable cracks as the probable cause of these accidents. Examples of these are as follows:

NTSB 98/01, Aircraft Accident Report, Uncontained engine failure, Delta Airlines, Flight 1288, McDonnell Douglas MD-88, N927DA, Pensacola, Florida, July 6, 1996. A crack with a total surface length of 1.36 inch in the front compressor hub of a

Pratt & Whitney JT8-219 engine, was not detected during Visual and Fluorescent penetrant inspections.

NTSB 09-06, United Airlines Flight 232, McDonnell Douglas DC10-10, Sioux Gateway Airport, Sioux City, Iowa, July 19, 1989. A crack with a total surface length of 0.498 inch in the stage 1 fan disk in the no. 2 CF6-6 engine was not detected during Visual and Fluorescent penetrant inspections. The NTSB determined, based on a count of the fatigue striations that at least two inspections had been accomplished after the crack had reached a detectable length.

NTSB 89/03, Aloha Airlines, Flight 243, Boeing 737-200, N73711, near Maui, Hawaii, April 28, 1988. The NTSB determined that the cause of this accident was the failure of the Aloha Airlines maintenance program to detect the presence of significant disbonding and fatigue damage which ultimately led to the failure of a lap joint at stringer 10L. This damage should have been detected visually and in fact, a passenger boarding the aircraft visually saw cracks that were not detected by Aloha mechanics.

Output: The desired output is an acceptable standard by which visual acuity testing will be performed and documented for those persons inspecting aircraft and aircraft components.

The desired outcome is to initiate a research project to determine visual acuity requirements for persons maintaining and inspecting aircraft and aircraft components to maintain an acceptable level of safety. Over fifty percent of all Advisory Directives issued, require inspection, yet there is no standard to determine how well or if an inspector can see.

Regulatory Link: The National Transportation Safety Board (NTSB) has cited the failure to visually detect detectable cracks as the probable cause of these accidents.