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Introduction

The use of additive manufacturing (AM) technology allows designs that may not be achieved with traditional manufacturing methods. It is important to understand the risk associated with the AM usage by understanding the consequence of failure (including the loss of intended function) of the usage. Such information can be beneficial in establishing consistent manufacturing, inspection, or qualification processes relative to a defined risk scale, which can serve as supporting data when seeking regulatory approval of an AM part. A part classification scheme based on a part's consequence of failure can provide a consistent risk metric. Without carefully defined part classes, the ability to accurately gauge the consequence of failure associated with additively manufactured aviation parts within and across programs, projects, and suppliers becomes exceedingly difficult, resulting in mitigations that are either not commensurate or inconsistent. The part classification scheme documented here does not affect a part's functional requirements, but rather is used to group additive manufacturing aviation parts into categories which can be used in downstream standards. For example, this classification scheme can be used in material and process specifications to determine the appropriate levels of process control, thermal post processing, qualification, and inspection to ensure AM parts meet their application requirements. This classification scheme does not specify how the classification is used in any downstream processes. The use of the classification shall be left to the cognizant engineering or production entities, or downstream documents which reference this standard.

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