Development Assurance Levels (DALs) for different hardware and software components. See Appendix J for further information about DALs.

Development assurance is a safety requirement that must be approved by AJI. The aviation industry standards that address system development assurance are:

- SAE Aerospace Recommended Practice (ARP)[2] ARP4754A, *Guidelines for Development of Civil Aircraft and Systems*;
- RTCA DO-254, *Design Assurance Guidance for Airborne Electronic Hardware*; and
- RTCA DO-278A, *Software Integrity Assurance Considerations for Communication, Navigation, Surveillance and Air Traffic Management (CNS/ATM) Systems.*

PO planning for development assurance must begin early in the AMS lifecycle so the DALs can be factored into the Business Case. Typically, this occurs prior to the IARD while the OSA is being developed.

New or modified FAA CNS/ATM systems should impose a system development process such as that outlined in SAE ARP4754A. Using this methodology, system-level DALs would be assigned to each function based on the highest severity level within each function. Software DALs using RTCA DO-278A and hardware DALs using RTCA DO-254 could then be allocated to each component and better aligned with system-level DALs. The assignment of DALs is architecture dependent, and the PO should work with ANG to consider designs that not only ensure safety, but also satisfy business goals.

AMS, Section 4.12, specifically identifies the guidance/standards in RTCA DO-278A as the recommended means to accomplish software design rigor. If not using RTCA DO-278A, the PO must propose an equivalent approach that meets the AMS requirement(s) for software design rigor.

Compliance with SAE ARP4754A and RTCA DO-254 is not specifically required; other similar standards may be equally valid. Regardless, the PO must propose an approach that meets the AMS requirement for system, hardware, and software rigor.

2.3.2.1.5 pPRD

The Program Requirements Document defines the operational framework and performance requirements an investment program must achieve. Preliminary program requirements specify what the new capability must do and how well it must perform its intended functions. Safety is one of the key disciplines in the AMS that must be addressed in the pPRD. Thus, safety requirements identified in the OSA become system requirements that must be included as requirements in the pPRD. The PO must plan for the fulfillment of safety performance requirements by testing and tagging requirements that are of interest to safety for special oversight. Writing a safety requirement is no different than writing other engineering requirements as described in the FAA Systems Engineering Manual.

The DALs that are initially established must also be included in the pPRD though it may be appropriate to have a stand-alone document to describe the DAL relationship among the different components and the system.

2. An ARP is a guideline from SAE International.