

# Certification Authorities Software Team (CAST)

## Position Paper CAST-21

### ***COMPILER-SUPPLIED LIBRARIES***

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***(Rev 2)***

***NOTE:*** This position paper has been coordinated among the software specialists of certification authorities from the United States, Europe, and Canada. **However, it does not constitute official policy or guidance from any of the authorities.** This document is provided for educational and informational purposes only and should be discussed with the appropriate certification authority when considering for actual projects.

# Compiler-Supplied Libraries

## *Background*

A number of applicants have posed the question: “how should we address libraries that are supplied with the compiler?” These compiler-supplied libraries are a specific type of commercial-off-the-shelf (COTS) software. Some applicants have tried to use Section 3.31 of DO-248B/ED-94B as support for no additional verification, since DO-248B/ED-94B says that the compiler does not need to be qualified. However, this is a misuse of the term “compiler” and is not what was intended by DO-178B/ED-12B and DO-248B/ED-94B.

## *CAST Position*

The CAST position on compiler-supplied libraries is as follows:

- (1) The functions used from the library become part of the software code to be implemented into the airborne system. Even though the library function may be supplied by the same entity as the compiler, it is not part of the compiler. The compiler is a development tool; in contrast, the library functions become embedded airborne code.
- (2) Library functions should be verified like any other software function to be embedded into the system.
- (3) Once a library function has been verified, it may be suitable for reuse in the future, assuming it does not change and is used in the same way (see chapter 12 of FAA Order 8110.49 and AC 20-148 for more thoughts on reuse of library functions).
- (4) The libraries must satisfy the DO-178B/ED-12B objectives, including the guidance for COTS and previously developed software (see section 12.1).
- (5) Functions not used from the library should either be removed or deactivated.

Note: It should be noted that the above position has been strictly applied for Level A and B certification projects. However, some alternate approaches have been proposed for Level C and D projects (e.g., a combination of extensive functional testing and service history). If an alternate approach is proposed, it should be presented to the cognizant certification office for evaluation prior to implementation.