

Proposal for C2X WG14 N2384

Title: F.8 update
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Proposal category: Editorial
Target audience: Annex F users
Reference: N2346 ISO/IEC 9899 working draft March 2019

Problem 1:

Annex F silently assumes IEC 60559 default exception handling is in effect. This assumption might be inferred because C provides no way to change to alternate exception handling. However, an explicit statement is desirable, particularly since TS 18661-5 includes a mechanism to change to alternate exception handling and some implementations provide their own ways to change exception handling (e.g., to enable traps). F.8 (Floating-point environment) is an appropriate place to state that Annex F assumes default exception handling.

Problem 2:

While looking at this, we noticed that F.8 refers to “directed-rounding control modes”. In IEC 60559, directed-rounding control modes including rounding up, down, toward zero, and away from zero, but not rounding to nearest. Here the intention is to refer to all the “rounding-direction control modes”. This mistake also appears in footnote 211.

Problem 3:

Finally, the “IEC 60559” dynamic rounding precision and trap enablement modes mentioned in F.8 and footnote 383 were features of the original IEEE 754-1985 standard that were not carried over to IEEE 754-2008 (IEC 60559:2011), nor do they appear in IEEE 754-2019. However, some implementations still provide them. A footnote seems like a more suitable place to mention them.

The following suggested changes address these problems.

Suggested changes:

Replace:

F.8 Floating-point environment

[1] The floating-point environment defined in <fenv.h> includes the IEC 60559 floating-point exception status flags and directed-rounding control modes. It includes also IEC 60559 dynamic rounding precision and trap enablement modes, if the implementation supports them.383)

383) This specification does not require dynamic rounding precision nor trap enablement modes.

with:

F.8 Floating-point environment

[1] The floating-point environment defined in <fenv.h> includes the IEC 60559 floating-point exception status flags and rounding-direction control modes. It may also include other floating-point status or modes that the implementation provides as extensions.383)

[2] This annex does not include support for IEC 60559's optional alternate exception handling. The specification in this annex assumes IEC 60559 default exception handling: the flag is set, a default result is delivered, and execution continues. Implementations might provide alternate exception handling as an extension.

383) Dynamic rounding precision and trap enablement modes are examples of such extensions.

In footnote 211, change “directed-rounding control modes” to “rounding-direction control modes”.