Proposal for C2Y
WG14 N3305

Title: leftover dependency on WANT macro (updates N3304)
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Date: 2024-07-22
Proposal category: Editorial
Reference: N3220, N3304

This proposal updates N3304 to fix the problem Jens noted in [SC22WG14.26160].

This proposal addresses an issue pointed out in

From: Joseph Myers <josmyers@redhat.com>
Subject: [SC22WG14.24752] __STDC_WANT_IEC_60559_EXT__ and DFP interfaces
Date: February 15, 2024 at 12:43:12 PM PST
To: sc22wg14@open-std.org

...

Some decimal floating-point interfaces in <math.h> are conditional on the user defining
__STDC_WANT_IEC_60559_EXT__, but others aren’t. Specifically, _Decimal32_t, _Decimal64_t,
HUGE_VAL_D32, HUGE_VAL_D64, HUGE_VAL_D128 are conditional on the user defining that macro,
while DEC_INFINITY, DEC_NAN, FP_FAST_* for decimal types, and all functions other than those in
Annex F are not.

I don’t think this division of dependency on that macro makes sense. My understanding of the intent of
what was agreed after the October 2020 discussion of N2570 was that only the interfaces defined in
Annex F should be conditional on __STDC_WANT_IEC_60559_EXT__ - that is, the totalorder and payload
functions and CR_DECIMAL_DIG, but the decimal interfaces enumerated above should not be so
conditional. (FE_SNANS_ALWAYS_SIGNAL is in Annex F but *not* conditional on
__STDC_WANT_IEC_60559_EXT__. Since FE_* is a reserved namespace for <fenv.h>, I think that’s fine.)

Suggested changes:

In 7.12 #4 change

They are present only if the implementation defines
__STDC_IEC_60559_DFP__ and additionally the user code defines
__STDC_WANT_IEC_60559_EXT__ before any inclusion of <math.h>.

In 7.12 #6 change

The macros in this paragraph are only present if the implementation
defines __STDC_IEC_60559_DFP__ and additionally the user code
defines __STDC_WANT_IEC_60559_EXT__ before any inclusion of <math.h>. 
In B.11, in the list under

Only if the implementation defines \texttt{__STDC_IEC_60559_DFP__}:

include

\begin{verbatim}
_Decimal32_t
_Decimal64_t
HUGE_VAL_D32
HUGE_VAL_D64
HUGE_VAL_D128
\end{verbatim}

In B.11, in the list under

Only if the implementation defines \texttt{__STDC_IEC_60559_DFP__} and additionally
the user code defines \texttt{__STDC_WANT_IEC_60559_EXT__} before any inclusion of:

delete

\begin{verbatim}
_Decimal32_t
_Decimal64_t
HUGE_VAL_D32
HUGE_VAL_D64
HUGE_VAL_D128
\end{verbatim}

Make changes to the Index entries for

\texttt{__STDC_WANT_IEC_60559_EXT__}

and

\texttt{__STDC_WANT_IEC_60559_EXT__} macro

to reflect the changes above.