Document: N1512
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Subject: Exceptional conditions vs floating-point exceptions

This paper proposes editorial changes to reduce the chances of confusion about the terms "exceptional conditions" and "floating-point exceptions".

These clauses define the terms:

> 6.5 #5 If an "exceptional condition" occurs during the evaluation of an expression (that is, if the result is not mathematically defined or not in the range of representable values for its type), the behavior is undefined.

> 7.6 #1 A "floating-point status flag" is a system variable whose value is set (but never cleared) when a "floating-point exception is raised", which occurs as a side effect of exceptional floating-point arithmetic to provide auxiliary information.

This clause acknowledges that the terms refer to different concepts:

> 6.4.4.2 #5 Floating constants are converted to internal format as if at translation-time. The conversion of a floating constant shall not raise an exceptional condition or a floating-point exception at execution time.

In most cases in the draft, "exception" appears in a qualified form so it's clear whether "exceptional condition" or "floating-point exception" is intended. In some other cases, the context makes it clear.

Following are the results of a search for "exception" without an explicit qualification, and recommendations for possible editorial changes.

Use of unqualified "exception" where "floating-point exception" is intended:

    Footnote 204 – recommend replacing "an exception" with "a floating-point exception"
    7.6.2.1 #3 – defer to editor
    7.6.2.3 #3 – defer to editor
    7.6.2.5 #4 – recommend no change
    7.12.1 #1 - recommend inserting "floating-point" before "exceptions"
    F.8.4 #2 – defer to editor
    F.8.5 #2 – defer to editor
    G.6.4.1 #1 – defer to editor

Use of unqualified "exception" where "exceptional condition" is intended:

    7.14.1.1 #3 – could change to "computational exceptional condition" – defer to editor
    J.2 bullet referencing 7.14.1.1 – ditto
    J.3.2 bullet referencing 7.14.1.1 – ditto

Use of "exception" where "LIA-1 exception" is intended:

    H.2 #1 – defer to editor
    H.3 #1 – defer to editor
    H.3.1.2 #3 – recommend inserting "LIA-1" before "arithmetic"
    H.3.1.2 #4 – recommend inserting "LIA-1" before "arithmetic"

Use of unqualified "exception" where another term would be better:

J.1 last bullet – change "exceptional values" to "special cases"