The `fprintf` specification for `aA` style formatting in 7.21.6.1 #8 in the current C2X draft (N2573) says:

... if the precision is missing and `FLT_RADIX` is not a power of 2, then the precision is sufficient to distinguish 300) values of type `double`

... 300) The precision $p$ is sufficient to distinguish values of the source type if $16^{p-1} > b^n$ where $b$ is `FLT_RADIX` and $n$ is the number of base-$b$ digits in the significand of the source type. A smaller $p$ might suffice depending on the implementation’s scheme for determining the digit to the left of the decimal-point character.

Problem 1: The notation in the footnote is not consistent with the rest of the standard. The precision $p$ in the footnote refers to a formatting precision (in the footnote anchor) which the standard denotes with $P$. The footnote uses $n$ to refer to what in the C model is the type precision $p$, and $p$ is used further down in the paragraph containing the footnote anchor. (The difference between the characters $P$ and $p$ is clear enough in N2478.)

Problem 2: The sufficiency inequality can be relaxed. It is based on the property:

$$B^{p-1} > b^n$$

implies base-$B$ numbers of precision $P$ distinguish base-$b$ numbers of precision $p$.


$$[-]h.h...hp±d$$

where each $h$ represents a hexadecimal digit, $d$ is a decimal integer power of 2, and the $h$ to the left of the decimal point character is nonzero (but otherwise unspecified). Where $P$ is the formatting precision, i.e., the number of hexadecimal
digits to the right of the decimal point character, the hexadecimal form can represent at least all binary numbers with precision \(4P+1\).

Using the property above,

\[2^{(4P+1-1)} > b^p\]

or

\[16^p > b^p\]

is sufficient for the hexadecimal output to distinguish base-\(b\) numbers of type precision \(p\). (The footnote anchor is referring to \(b\) not a power of 2, so we needn’t improve the inequality further for that case.)

The following suggested change addresses both of these problems.

**Suggested change:**

1. Replace footnote 300 in 7.21.6.1 #8 with:

300) The **formatting** precision \(P\) is sufficient to distinguish values of the source type if \(16^p > b^p\) where \(b\) (not a power of 2) and \(p\) are the base and precision of the source type (5.2.4.2.2). A smaller \(P\) might suffice depending on the implementation’s scheme for determining the digit to the left of the decimal-point character.