

I'm not robot!

By: Frederic P. Hartwell, Hartwell Electrical Services Contents Metrication Trade Sizes Numbering Lists Editorial Changes References Extracts Annexes Acknowledgements EC-Online — your inside source for NEC information — brings you advance information on what's happening as work begins on the 2002 NEC. Over the next few weeks, we'll tell you — in a multipart series — what happened at the Hilton Head, S.C. meetings this past January. These results reflect the preliminary votes at the panel meetings, and not the written ballot. Only the written ballot reflects the official panel position. We'll revisit this information after the Technical Correlating Committee meeting in May. Some results may change at that point. For example, a proposed change in the Code with a majority — short of the required two-thirds — will be reported as rejected. Normally, the NEC Style Manual only excites Code specialists. However, this time it's an entirely new Style Manual, and you'll immediately notice an entirely new "feel" to the NEC. Here are the major changes you'll see as soon as you crack open the book: Metrication (Back to top) In an effort to increase global acceptance of the document, you'll see metric (SI) measurements as the principal measurement, with the English system measurement in parenthesis, as a hard conversion. This last point is very controversial. Hard conversion means the exact opposite of what most of you would intuitively expect it to mean. It means a rounded, approximate conversion. One way to think of it is as a "serious" conversion, that is, the conversion you'd expect if you were writing the document from the beginning as a metric system application. You'd use a round number as the metric dimension — with the English system value in parenthesis to approximate the metric value. This couldn't have anything to do with the Code — of course — if it didn't have exceptions. Code writers can use soft conversions in certain cases, which again (counterintuitively), is the exact conversion. If a size represents a standard industry practice, you'll still see the soft (exact) conversion. For example, Type FCC (flat conductor) cable goes under carpet squares whose English sizes won't be changing anytime soon. Accordingly, the first sentence of what is now Sec. 328-10 will read "Floor-mounted Type FCC cable, cable connectors, and insulating ends shall be covered with carpet squares not larger than 914 mm (36 in.) square." Code writers can also use soft conversions if a hard conversion would diminish safety. Code Making Panel (CMP) 9 insisted on soft (exact) conversions in a number of its tables. Table 384-36 covers minimum spaces between live parts, and the panel refused to round the existing 1 in. dimension down from 25.4 mm to 25 mm. CMP 1 rejected the hard conversion of the 30-in. minimum work space width in Sec. 110-26(a)(2) to 750 mm, because that's a half-inch smaller than the soft conversion of 762 mm — which the panel judged critical for safety. Trade Sizes (Back to top) Closely related to metrication problems, trades size designations proved a major headache. Because of their inherently inexact nature, the NEC never required conversions for trade size measurements. How do you make the document relevant in a metric world? The answer is to use designations that don't imply close dimensional equivalence. This will be somewhat awkward for us to get used to. Essentially, the 2002 NEC will use a "metric designator" ahead of a "trade size" in parentheses — with no dimensional units attached to either. Here, for example, is the way you'll see the first sentence of Sec. 325-22: "The conduit shall be a medium density polyethylene identified as suitable for use with natural gas rated pipe in metric designator 53, 78, or 103 (trade size 2, 3, or 4)." Confused? Now consider CMP 9's problem with Sec. 370-28. This section sets pull box dimensions based on entering raceway trade sizes. If the trade size has no unit of measurement, then the rules following become meaningless. The solution? CMP 9 inserted the following sentence in the parent language of the rule: "Where an enclosure dimension is to be calculated based on the trade diameter of entering raceways, the trade diameter shall be the trade size expressed in the units of measurement employed." For example, if using English measurements on a 4 (trade size) raceway for a straight-across pull, the pull box would need to be 32 in. If using the metric system on the same (metric designator 103) raceway, the pull box would need to be 824 mm. Probably, for consistency, the panel will further modify this section to use the expression "metric designator (trade size)" instead of "trade size. Numbering (Back to top) Like the metrication changes, you'll see numeration changes on every page of the book. Article parts won't have letters anymore, but Roman numerals instead. Sections will have Arabic numerals — as before — but the word "section" goes away, and say goodbye to the "dash". It's a "dot.com" world out there, after all. For example, present Sec. 370-16(1) includes the following reference within the first sentence: "as described in Section 370-5." In the 2002 edition, that passage will read "as described in 370.5." Below the section level, subsections will be lettered as before, but using bold capital letters instead of lower case. That paragraph on conduit bodies will be 370.16(1). The next level down uses bold Arabic numerals, and the third level down uses lower case letters in parentheses, but in normal weight text. The first two sublevels must have titles, which should be a significant improvement in readability. In another readability improvement, panels now have to restructure their material so no section is subdivided below the third level. Lists (Back to top) This concept — introduced in the 1999 NEC and used sporadically before that — now has the force of the Style Manual behind it. The idea is that some sublevels merely complete a rule rather than state a rule. As such, they are supposed to be given Arabic numbers in normal weight and parentheses — regardless of the level on which you find them. All three levels may include lists. This means that list items directly under a full section number (bold Arabic number) also have Arabic numbers in parentheses, but not bold. For example, the rule allowing flexible metallic tubing to be used in dry locations is "349-4(1)" (although this section number will change, see below). This is a simple concept, but it will provoke major editorial rearrangements when panels come to terms with the implications (not yet, apparently). Many existing sublevels in the Code contain both list items and full rules — all on the same level. For example, Sec. 340-4 contains several legitimate list items ("for power, lighting, control, and signal circuits" and "for Class 1 circuits as permitted in Article 725.") It also contains [in (6)] a three paragraph numbered item containing multiple rules for using this wiring method in the open. Even the TCC task group working on section organization completely overlooked this problem in their proposal on this section, but it will have to be addressed. Another provision in the Style Manual suggests all items in a given list use parallel construction ("same verb tense, using phrases or sentences but not a mix"), which countless lists in the NEC, including this one, don't come close to observing. (Click here for an example of the new numbering system.) Editorial Changes (Back to top) Those are the immediately obvious changes. For less obvious editorial changes, click here for more details in the editorial realm — no less significant in the long run. References (Back to top) When the NEC refers to subject material in another article, it's supposed to be specific enough that the cross-reference conveys useful information. How many times, throughout the Code Book, do we see "shall be grounded in accordance with Article 250." This should be ending. The new Style Manual requires such references to be to a specific section, or, at a minimum, to a specific part of an article. The reference rule also requires panels to stop placing pointless references already covered by Section 90-3. Chapters 1-4 of the Code apply generally. Requirements to apply "the applicable provisions of Article 300" (or other similar language pointing to similar generic articles) should be removed, except in Chapter 8 (which stands alone unless other articles are directly referenced). In addition, Chapter 5, 6, and 7 provisions automatically amend or supplement Chapter 1-4 provisions. The exceptions we see throughout the opening chapters to specific applications covered in the later chapters should be deleted. Extracts (Back to top) NEC use of material extracted from other NFPA standards isn't new. This is allowable as long as there isn't any difference in the technical content— editing for style consistent with the NEC is OK if approved by the committee responsible for the parent document. The extract must represent a complete thought, and it must not be taken out of context. New for the 2002 NEC, however, is how you'll recognize the extracted material. Instead of the old superscript "x", you'll see a direct reference to the paragraph and the name of the source document in brackets at the end of the NEC section. At the beginning of the article, you'll see a more extensive note with the number, title, and edition of the source document, along with a direct statement that any differences between the source document and the NEC are purely editorial. With this done, former Appendix A, which included all the information on the source locations for extracted material, is being deleted. Annexes (Back to top) Code appendices are to be no more; the NEC is adopting international conventions and calling them annexes. They have the same status — namely — they include material of an explanatory nature. They have the status of fine print notes. They can't contain any mandatory text. This article doesn't begin to cover the entire NEC Style Manual, which is 34 pages long. We've focused on areas where there are extensive changes that directly affect how you view and use the Code. This current edition includes the most sweeping changes since its introduction in 1969. In prior code cycles, the manual wasn't easy to obtain, but now NFPA has it publicly available for download as a PDF file available at Usability Task Group/necstylemanual.pdf This is the first part in a multipart series on the upcoming 2002 NEC changes. Look to the next few weeks for EC Online to bring more information regarding the 2002 NEC. Acknowledgements (Back to top) The designations "National Electrical Code" and "NEC" refer to the National Electrical Code, which is a registered trademark of the National Fire Protection Association. About the author... (Back to top) EC Online columnist and nationally recognized NEC expert Fred Hartwell is widely recognized as one of the most prolific contributors to the NEC, with nearly one thousand proposals and comments over the years making it into print. He has three code cycles experience on one of the code making panels. He has many years of contracting experience in Illinois and Massachusetts. He also served as an electrical inspector for fifteen years and he was head electrician on a college campus.

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