IEEE Task P854

Minutes, 1 March 1985

The radix-free floating-point working group of the Microprocessor Standards Subcommittee of the IEEE Computer Society met from 10:25 a.m. to 6:50 p.m. at the IBM Palo Alto Scientific Center. Eighteen people attended.

Minutes from the 15 November 1984 meeting were approved.

<u>Announcements.</u>

Three hundred reprints of the article from the August 1984 <u>Micro</u> had been requested in October from the IEEE. The order had apparently been lost and was thus re-placed on February 22.

The plates from the above article have been forwarded to the <u>SIGNUM</u> <u>Newsletter</u> for publication in the second issue of 1985.

Further to the discussion at the November meeting on Leland Wilkinson's paper comparing P754 with "ANSI arithmetic", Cody has been in touch with Wilkinson and has obtained a diskette containing test programs and a copy of the paper. The paper will be included in the next mailing. It turns out that Wilkinson had come to believe that IBM-style hexadecimal arithmetic had become an ANSI floating-point standard. He has put his conclusions on hold awaiting further word from Cody.

David Hough would like to make a mailing list purge. He announced his intention to send a purge notice with the next mailing and to discuss non-responses on a case-by-case basis at the next meeting to ensure that nobody is inadvertently dropped who should not be. He was given unanimous approval in this plan.

<u>Status</u> <u>of</u> <u>P754.</u>

Draft 10.1 has been forwarded to the Standards Committee of the IEEE for action at the next meeting (believed to be mid-March). The changes from 10.0 to 10.1 were all described as "cosmetic", but may be interpreted by some as making explicit what had been commonly assumed but unstated. (The most salient example of this is additional language which specifies that the sign of the result of the round floating-point number to integral value operation is the sign of the operand; particularly significant when -0 is involved.) The most striking textual change is the separation of the definitions of "should" and "shall" from one sub-section to two. It is believed that no meanings have been changed and no paragraph numbers have been altered.

If the Standards Committee determines that all procedures have been correctly followed, P754 could become an IEEE standard in March 1985!

Changes to P854 Draft 1.0 corresponding to the changes made in bringing P754 Draft 10.0 to 10.1 have been incorporated in P854 Draft 1.1, distributed at the meeting. With David Stevenson's concurrence, copies of P754 Draft 10.1 will be distributed in the next mailing.

<u>Balloting.</u>

Cody distributed an attendance summary from which one concludes that there are at least 25 individuals who would be entitled to vote on a P854 draft had one emerged from the meeting (which did not happen). Since eligibility is determined by attendance at two or more meetings, with at least one attendance in the previous four, there may be a couple more eligible since attendance at three meetings in August 1982, December 1982, and March 1983 were not taken into account. Ris has supplied Cody with attendance records for the meetings question.

Correspondence.

Ris distributed a copy of some electronic communication between Doug Baird of IBM Boca Raton and himself concerning x rem y where x is finite and y is infinite. While it was not entirely clear whether to regard the interchange as an internal company query or as public comment, the committee agreed that if it was regarded as the latter the answer was adequate; a copy will appear in the next mailing.

Other letters were considered at some length, with Cody drafting replies which were in each case unanimously agreed. Copies of the correspondence in both directions will appear in the next mailing. The letters were from:

John Gosling (Manchester University, UK) on nomenclature concerns surrounding "subnormal" and "division by zero exception", on whether conversions to integer should raise the inexact exception, and on implementation questions regarding exponentiation and the remainder operation.

D. B. Brumm (Michigan Technological University) on two typographical infelicities from the Micro article.

James C. Brakefield (Technology Incorporated, San Antonio) on a scheme for "gradual overflow", allowing values modestly above the overflow threshold to be represented with decreasing relative precision as the magnitude increases.

Jerzy J. Klaczak and Zdzislaw Jarzebowski (University of Warsaw, Poland) on seventeen specific points related to Draft 1.0. As a result of consideration of this letter, the second paragraph of Section 8.1 was amended to read "When a system traps, the trap handler invoked should be able to determine ..."

Ulrich Kulisch (Karlsruhe University, Germany) on whether exact products from double-precision operands should be required.

Conferences.

Attention was drawn to conferences at the University of Delaware (May), Southern Methodist University (May), the University of Illinois (June), and Grenoble (December). Literature will be forthcoming in the next mailing.

Ris had been approached by Bill Aimes (Georgia Tech) to provide a panel member for a conference in Oslo the week of August 5. Kahan agreed to attend if financial support could be arranged, and Ris agreed to negotiate with Aimes on this basis.

Next Meeting.

Fairchild in Palo Alto, Friday April 12, 1985, starting at 9:30.

Upward Compatibility from P754.

Jim Thomas initiated a discussion about whether P854 ought to be precisely upward compatible with P754, either through a grandfather clause or through removal of any known requirements which must be met by a P854 implementation but not by a P754 implementation. The principal known divergence is the P854 requirement that the default system action on encountering an "unrecognizable" input string on external conversion be to deliver a NaN.

The discussion re-iterated all the points which had been made when the provision was first instituted: the belief that P754 had overlooked an important issue, the desire that conforming to P754 and P854 should not be made mutually exclusive (i.e., conforming to one would automatically preclude being able to conform to the other), and what was the value of conforming to multiple standards simultaneously.

The consensus was that the offending provision would remain in P854, but that wording would be added to the forward that the only known problem for conforming P754 implementations was attention to that provision. This spot in the forward (not a part of the standard) would then become the collection point for other such difficulties if and when uncovered.

Signs of Zeros on Conversion.

It was observed that the draft standard did not explicitly make provision for the sign of a zero result arising from conversion operations (precision conversions, integral value, integer format, and decimal string). While it was agreed that the intent in both P754 and P854 is to preserve the sign of zero wherever possible, it might be possible to interpret the standard to conclude that the sign did not matter in these cases and therefore wording should be supplied to remedy this potential defect.

Accordingly, wording was added to section 5.6 as follows: "Conversions shall be monotonic and preserve the sign including the sign of zero."

Additionally, Paragraph 6.3 was entirely rewritten (many times!); the resulting draft will be numbered 1.2 and distributed in the next mailing for further consideration at the April 12 meeting.

Unattempted Business.

Discussion of whether inexact should be raised on round floating-point number to integral value (Kahan) was deferred to the next meeting.

A proposal to make the selection of rounding style explicitly with the operation rather than through a rounding mode (Ris) was likewise deferred.

Other proposals for change seem likely to be raised on April 12.

F. N. Ris
10 March 1985