Report from the Convenor of WG5 to the 9th Plenary Meeting of SC22 23-27 September 1996, London, England

Work Items:

22.02.01	Programming Language Fortran Maintenance of IS 1539:1991 Revision of IS 1539:1991 (to become IS 1539-1)
22.02.01.01	TR on Floating Point Exception Handling
22.02.01.02	TR on Interoperability Between Fortran and C
22.02.01.03	TR on Enhanced Derived Type Facilities
22.02.02	Varying length character strings Maintenance of IS 1539-2:1994 Partial Revision of IS 1539-2:1994

Attachments:

1. Resolutions of the WG5 meeting held in San Diego, NV, USA, 6-10 November 1995 (WG5 N1163)
2. Resolutions of the WG5 meeting held in Dresden, Germany, 22-26 July 1996 (WG5 N1219)
3. SC22 Project Information (WG5 Standing Document 3 – WG5 N1222)

1. Summary of WG5 activity in 1995-96

The major activity during this year has been the processing of the ballot comments on the CD for the revision of IS 1539:1991, known informally as Fortran 95, and the production of the draft DIS. Other major activities have been the development of the three Technical Reports approved at the 1995 SC22 Plenary and the development of requirements for the next revision of the Fortran standard, known informally as Fortran 2000.

1.1 Revision of IS 1539:1991

WG5 met in San Diego, USA, in November 1995 to process the CD ballot comments. A total of 597 comments were received, mostly editorial, but some discussing significant technical issues. All ballots were for approval, except for that of the United States, which identified 20 specific reasons for its non-approval. All comments were addressed during the meeting and, in particular, all 20 US NO issues were satisfactorily resolved. However, there was not time to resolve a handful of items submitted by the UK which raised significant technical

issues, and these were referred to WG5's primary development body (ANSI/X3J3) to deal with in conjunction with the UK member body. All these issues had been satisfactorily resolved by the end of the February meeting of X3J3, and the resulting document was then further reviewed (electronically) by the complete WG5 membership before forwarding to JTC1 for DIS balloting. The formal Disposition of Comments report is WG5 N1200.

A third, and final, Technical Corrigendum to IS 1539:1991 was also prepared which, amongst other things, reflected all interpretations and corrections made to that standard which had already been incorporated in the Fortran 95 DIS. At the suggestion of the SC22 Secretariat, this was submitted for SC22 balloting several weeks before the DIS was submitted to ITTF; this ballot is due to close on 3rd October 1996.

1.2 Type 2 Technical Reports

The TR on Floating-Point Exception Handling was developed by email during the period from May 1995 to July 1996, with an interim review during the San Diego meeting in November 1995. It is now ready for submission to SC22 for PDTR balloting as soon as the final electronic review by the WG5 membership has been completed.

The TR on Interoperability Between Fortran and C was slower to start, due to the originally identified editor having been unable to continue with any standardization activities. As an interim step, the Convenor nominated himself as Editor when the project was put to SC22 for approval; a permanent editor was subsequently identified shortly before the San Diego meeting. This TR, therefore, has only been under development since November 1995, and is expected to be completed by December 1996. It was reviewed by WG5 during its July meeting in Dresden, which meeting confirmed its support for the approach described in the draft document. It is expected to be ready for submission to SC22 for PDTR balloting in March 1997, as soon as the final electronic review by the WG5 membership has been completed.

The TR on Enhanced Data Type Facilities was initially the subject of some controversy. In accordance with SC22 Resolution 95-5, WG5 reviewed its proposed content at its meeting in San Diego in November 1995, and decided to split the proposed TR into two parts. The first of these two parts contained everything in the approved scope except parameterized derived types, while the second contained only parameterized derived types. Steve Morgan (UK) was appointed by WG5 to progress the latter part and, following extensive discussions with the membership of WG5, as well as with X3J3, a document was submitted to

the Dresden meeting for a decision on how to proceed. At this meeting, WG5 determined that parameterized derived types should be a firm requirement for inclusion in Fortran 2000, but that they did not meet the criteria for submission as a Type 2 TR which have been laid down by WG5. The TR for the remainder of the original scope, however, is now ready for submission to SC22 for PDTR balloting as soon as the final electronic review by the WG5 membership has been completed.

1.3 Proposed Part 3 of the Fortran Standard

At its meeting in San Diego, WG5 also determined that the multi-part Fortran Standard should consist of a single mandatory part (Part 1 – the base standard), and a number of additional, optional, parts, and embodied this policy in its strategic plan (WG5 N1151 – Standing Document 4). This decision was in accord with the existing status of Part 2 (IS 1539-2:1994 Varying Length Character Strings).

At the same meeting WG5 also confirmed its Tokyo decision to develop a specification for conditional compilation facilities, and appointed David Epstein (USA) as interim editor, charged with bringing two alternative proposals to the next meeting. At its meeting in Dresden, WG5 discussed the two alternative approaches and determined its preference; it further resolved that the preferred approach should form the basis of a third (optional) part of the multi-part Fortran standard, subject to approval from SC22.

1.4 Requirements for Fortran 2000

The other major activity during 1995-96 has been determining the proposed content of the *next* revision of Fortran, informally known as Fortran 2000. This process began in San Diego, but due to lack of time there was only a brief discussion of the topic, and an initial ordering of the higher priority items from the WG5 Repository of Requirements (Standing Document 5).

Following the submission by member bodies of a considerable number of additional requirements during the period immediately preceding the Dresden meeting, WG5 spent over one third of that meeting examining the total set of requirements, and attempting to determine the broad direction of the 2000 revision. In the event, WG5 identified two major themes for that revision:

- a language for high performance numerical, scientific and engineering programming

- a modern language with high quality data abstraction and user extensibility features

In addition, WG5 identified five major requirements consistent with those themes, in addition to those already addressed by the three TRs which are guaranteed inclusion in Fortran 2000, and requested its primary development body to start work on these items at its next meeting (insofar as it had not already done so) together with various minor technical enhancements.

WG5 also established two subgroups to develop the remaining requirements in these two areas, together a third subgroup to identify any other achievable requirements which do not directly fit into one of these areas. These subgroups are charged with working by electronic mail in order to produce their recommendations by the end of the year. The reports produced by the subgroups will be the major input for the final definition of the content of Fortran 2000 at the joint WG5/X3J3 meeting in Las Vegas in February 1997.

2. SC22 Action Items

In accordance with the decisions made during the WG5 meetings in San Diego (NBovember 1995) and Dresden (July 1996), SC22 is asked to approve the following proposals:

- Appoint Michael Hennecke (Germany) as Project Editor for project 22.02.01.02 (Type 2 Technical Report on Interoperability Between Fortran and C), replacing Miles Ellis.

- Modify the scope of project 22.02.01.03, as recommended by WG5 Resolutions S11 and D7 (in accordance with the procedures laid down in SC22 Resolution 95-5 N1970), and to change the title of the project to Enhanced Data Type Facilities TR (Type 2).

- Subdivide project 22.02.01.01 to create a subproject for the production of Part 3 of the multi-part Fortran Standard (IS 1539) on the subject of Conditional Compilation in Fortran, as recommended by WG5 Resolution D8, and to appoint David Epstein (USA) as Project Editor; also to conduct simultaneous Registration and Approval Ballots on the CD for this project.

- Conduct simultaneous Registration and Approval Ballots on the PDTR on Floating Point Exception Handling (project 22.02.01.02)

- Conduct simultaneous Registration and Approval Ballots on the PDTR on Interoperability Between Fortran and C (project 22.02.01.03)

- Conduct simultaneous Registration and Approval Ballots on the PDTR on Enhanced Data Type Facilities (project 22.02.01.04)

3. Electronic Distribution of Documents

At its Tokyo meeting in April 1995, WG5 resolved to move to an electronic distribution system, with the proviso that any member body may request a single set of all documents in paper form (for additional copying and re-distribution within that country, if required), and that all members would receive paper copies of four key, meeting-related documents, namely meeting announcements and preliminary agendas, minutes of meetings and resolutions approved at meetings.

The electronic distribution is based on an ftp server operated on behalf of WG5 by NAG Ltd in Oxford, England, with mirror sites operated by NCSA in Illinois and NASA in California. After a settling-down period this is now working reasonably well, although some technical issues still remain to be resolved. After some initial experimentation, the format of documents has been finalised as PostScript, Acrobat (pdf) and Text (ASCII), with all files larger than 8K being gzipped to reduce their size.

The file server is complemented by WG5's own set of World Wide Web pages (http://www.etrc.ox.ac.uk/wg5.html) and an email list server operated by the Danish Standards Institute. Various supplementary email list servers are operated for technical, or other, subgroups of WG5 by NCSA.

During the last year WG5 has carried out the development of three new TRs totally by electronic means, in addition to the regular discussion of a wide variety of technical and other issues. There is no doubt that the increasingly easy accessibility of working and other documents from both official and private file servers has contributed greatly to this process.

In addition there are other Fortran-related email list servers, quite independent of any Standards organisation, which, nevertheless, raise issues of direct relevance to the Fortran Standards community.

It was with some dismay, therefore, that WG5 heard of the proposals by ISO to restrict the free availability of working documents to members of the relevant Working Groups. Quite apart from the difficulty of enforcing such restrictions

(domain restrictions are clearly inappropriate and yet many servers cannot keep a list of valid users, many legitimate users operate from a variety of email addresses in any case, and password control is of marginal use when hundreds of people all over the world are entitled to know the username/password combination), WG5 members feel very strngly that their ability to develop standards in a timely and efficient manner would be seriously damaged if access to the documents was restricted in the manner proposed, as this would cut off a valuable source of additional reviews, comments and proposals. At its meeting in Dresden, therefore, WG5 unanimously passed a Resolution stating that it believed that ISO copyright should not apply to its working documents before the DIS stage (D2).

4. Future WG5 Meetings

WG5 has resolved (initially as an experiment) to hold alternate meetings as joint meetings with its primary development body (ANSI/X3J3). In accordance with this resolution, the next four meetings are provisionally scheduled as follows:

10-14 February 1997 Las Vegas, NV, USA (jointly with X3J3)
This meeting will primarily be concerned with finalising the remaining requirements for Fortran 2000, and working on the technical details of those items already determined as firm requirements for Fortran 2000.

21-25 July 1997 Vienna, Austria (subject to confirmation)

February 1998 USA (jointly with X3J3)

June/August 1998 Trollhättan, Sweden (subject to confirmation)