Business Plan and Convener’s Report
ISO/IEC JTC 1/SC 22/WG 14 (The Programming Language C)

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ISO/IEC JTC 1/SC 22/WG 14 N1952

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PERIOD COVERED:

SUBMITTED BY:
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1. MANAGEMENT SUMMARY

1.1. JTC 1/SC 22/WG 14 STATEMENT OF SCOPE
Development and maintenance of ISO/IEC Standards related to the programming language C.

1.2. PROJECT REPORT

1.2.1. COMPLETED PROJECTS
JTC 1.22.20.01 – Programming Language C (Revision of ISO/IEC 9899:1999), this project was delivered by the publishing of ISO/IEC 9899:2011.

JTC 1 NP 18037, Extensions for the programming language C to support embedded processors. This is a Technical Report type II.

JTC 1 NP 19769, Specification for Additional Character Data Types to the Programming Language C. This is a Technical Report type II.

JTC 1 NP 24731, Extensions to the C Library, — Part I: Bounds-checking interfaces. This is a Technical Report type II.

JTC 1 NP 24731, Extensions to the C Library — Part 2: Dynamic Allocation Functions. This is a Technical Report type II.

JTC 1 NP 24732, Extensions for the programming language C to support decimal floating point arithmetic. This is a Technical Report type II.
JTC 1 NP 24747, Extensions for the C Standard Library to Support Mathematical Special Functions. This is an International Standard.

JTC 1 NP 17961, C Secure Coding Rules. This is a Technical Specification.

JTC 1 NP 18661-1, Floating-point extensions for C. This is part one of a five part Technical Specification.

JTC 1 NP 18661-2, Floating-point extensions for C. This is part two of a five part Technical Specification. (Published date 2015-05-15)

1.2.2. PROJECTS UNDERWAY
JTC 1 NP 18661-(3, 4, and 5), Floating-point extensions for C.

1.2.3. CANCELLED PROJECTS
None over this period.

1.2.4. COOPERATION and COMPETITION
Where appropriate, WG 14 has established active liaisons with other SC 22 working groups. A category C liaison has been established with the MISRA C working group. There is no apparent direct competition with any other current SC 22 working group.

2. PERIOD REVIEW

2.1. MARKET REQUIREMENTS
WG 14 feels that the committee is responding to the C user community concerns and to the C implementers’ issues when the ISO/IEC 9899:1999 standard was updated ahead of published schedule, in 2011. WG 14 believes that the ISO/IEC 9899:2011 standard answered many concerns and keeps the International Standard for the C programming language current.

WG14 believes the publication and maintenance of TS 17961 addresses important security issues that affect the entire C community. The document is in active use in the industry.

WG14 is currently working on TS 18661 parts 3, 4, and 5. A C binding to the new IEEE Floating-point, see SC 22 N4796.

WG 14 is currently studying how best to incorporate parallel programming into the C language.

WG 14 is currently working on how best to deal with the mandated ISO (Live Link/Open Text) e-committee package.
2.2. ACHIEVEMENTS

- WG 14 is currently working on 30 open defect reports logged against 9899:2011 and 1 open defect report on TS 17961.
- WG 14 published the Technical Specification 18661 part II.
- WG 14 successfully moved Technical Specification 18661 part III to the final publication stage, and publication is imminent.
- WG 14 successfully moved Technical Specification 18661 part IV to the final publication stage, and publication is imminent.
- WG 14 has a study group to study approaches to adding parallel programming to the language.
- WG 14 has incorporated ISO e-committee into its workflow, and is trying to make this system work.

2.3. RESOURCES

WG 14 meets two times per year in co-located technical sessions with the US Task Group INCITS PL22.11. Over the past several years, WG 14 has timed at least one of its yearly technical sessions to coincide with WG 21, allowing those technical experts that would like to attend both technical sessions the opportunity to do so without extra travel. The WG 14 Convener would like to thank the WG 21 Convener for the extended effort it takes to coordinate common meeting locations and liaison between the two working groups.

Next year, WG 14 and WG 23 are timing their April meetings to coincide with each other. The WG 14 Convener would like to thank the WG 23 Convener for his coordination effort.

Over the last several years WG 14 has made Web conferencing capabilities available for those that are finding it difficult to travel. WG 14 would like to thank ISO for the Web conferencing support.

In the past years, fourteen countries participate by attending these meetings or by being involved in the technical discussions that take place over the e-mail reflector. The countries are: Australia, Canada, Denmark, France, Germany, Italy, Ireland, Japan, Netherlands, Norway, Russia, Sweden, UK, and the USA. However, with the new system forced upon us by ISO, only Canada, Denmark, Italy, Netherlands, Russia, UK and US will be able to participate.

WG14 has been monitoring the cross-language standards activities, and are using the ISO/IEC JTC 1/WG 20 guidelines on extended characters. WG 14 also keeps apprised of the requirements of the LIA-1, 2 standards.
WG14 Convener’s Report

WG14 liaison appointments are:

<table>
<thead>
<tr>
<th>Group</th>
<th>Name/Type</th>
<th>Person(s) assigned</th>
</tr>
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<tbody>
<tr>
<td>WG 21</td>
<td>C++</td>
<td>Group liaison assigned¹</td>
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<tr>
<td>FSG</td>
<td>Free Standard Group</td>
<td>Nick Stoughton</td>
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<td>WG 23</td>
<td>Vulnerabilities</td>
<td>Tom Plum</td>
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<tr>
<td>MISRA-C</td>
<td>Category-C Liaison</td>
<td>Clive Pygott</td>
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3. **FOCUS NEXT WORK PERIOD**

WG14 will focus on:

- Working on how to make the mandated ISO e-committee system (Live Link/Open Text) work for WG 14.
- Developing TS 18661 parts 3, 4, and 5
- Studying parallel programming

The Committee has discussed several other possible new work items, and is currently studying the possibilities for a Technical Specification on parallel programming.

3.1. **DEVELOPABLES**

None.

3.2. **STRATEGIES**

WG14 believes that routine handling will suffice to complete the progress desired.

3.3. **RISKS**

A decrease in participation due to being forced to comply with a mandate from ISO, see JTC 1/N 12032.

3.4. **OPPORTUNITIES**

None.

3.5. **WORK PROGRAM PRIORITIES**

WG 14 will respond to any Defect Reports logged for the current ISO/IEC 9899:2011 Standard and the currently active published Technical Reports TR 18037, TR 24731-2, TS 17961 and IS 24747. WG 14 will work on the development of the Technical Specification 18661.

4. **OTHER ITEMS**

4.1. **POSSIBLE ACTION REQUESTS AT FORTHCOMING PLENARY**

WG 14 discussed the systematic review of ISO/IEC TR 19769:2004. The consensus was that this TR should be withdrawn because it is subtly different

¹ Intel, Oracle, Plum Hall, and Perennial.
from what eventually went into the standard, and keeping the TR can only accomplish confusion. Later when the ballot was held, Canada, Japan, and the US proposed withdrawal and the rest of the national bodies voted to confirm. WG 14 would like SC 22 to reconsider at Plenary and requests a vote to withdraw.

4.2. PROJECT EDITORS
The following individuals have been appointed project editors and backup project editors:

JTC 1.22.20.01, Programming Language C (Revision of ISO/IEC 9899:2011)
Larry Jones (Project Editor), David Keaton (Backup Project Editor).

JTC 1 NP 18037, Extensions for the programming language C to support embedded processors.
Willem Wakker (Project Editor)

JTC 1 NP 19769, Specification for Additional Character Data Types to the Programming Language C.
None. Incorporated into the C standard and not intended to be maintained.

JTC 1 NP 24731, Extensions to the C Library – Part I: Bounds-checking interfaces
None. Incorporated into the C standard and not intended to be maintained.

JTC 1 NP 24731, Extensions to the C Library – Part 2: Dynamic Allocation Functions.
David Keaton (Project Editor)

JTC 1 NP 24732, Extensions for the programming language C to support decimal floating point arithmetic
Edison Kwok (Project Editor)²

JTC 1 NP 24747, Extensions for the Standard Library of the Programming Language C to Support Mathematical Special Functions
David Keaton (Project Editor)

JTC 1 NP 17961, C Secure Coding Rules
Robert Seacord (Project Editor)³

JTC 1 NP 18661, Floating-point extensions for C
James Thomas (Project Editor)

² Currently not listed in the ISO global directory.
³ Currently not listed in the ISO global directory.
4.3. ELECTRONIC DOCUMENT DISTRIBUTION

WG 14 has conducted some of its detailed technical discussion using an e-mail reflector provided by the Danish UNIX Users Group, Copenhagen University College of Engineering and Keld Simonsen.

WG 14 also has an ftp and Web site provided by courtesy of the Copenhagen University College of Engineering, Danish UNIX Users Group and Keld Simonsen. WG 14 has also placed its documents on the ISO mandated site, and updates the site with each new document.

WG 14 uses a secure wiki setup and maintained by Keld Simonsen. This wiki is used for quick exchange of documents during and between meetings eliminating the need for paper during the meeting.

WG 14 is providing all the appropriate committee documents on the Committee Web site, eliminating the need for paper mailings.

WG 14 also now provides Web conference capabilities allowing technical experts that are not able to travel to participate.

WG 14 would like to call attention to the following deficiencies of e-committee that need to be addressed before the system can meet the needs of working groups in general, and WG 14 in particular.

- Access to isotc.iso.org is fragile. The initial e-mails to new members sometimes do not appear, and at other times are not understood by the recipients. Consequently, not all members have the access they need to the working group’s site. One member sent e-mail to helpdesk@iso.org for help and his messages were lost, possibly due to spam filtering. Some new members do not realize that their account has already been created, and the “I don’t have an account yet” link could help by detecting this.

- The e-committee documents do not appear to be searchable by search engines. The C community has benefited greatly from WG 14 documents being available as search results.

- The URLs of documents in e-committee do not appear to be predictable. The defect report log, agendas, and document log all need to point to easily predictable and understandable URLs to keep errors to a minimum.

- The document names and descriptions are not useful because they are truncated. On the external WG 14 site, this problem is avoided by having a document log with the description of each document and the name of its submitter. The file names are the N numbers of the documents, making the URLs predictable and simple.

- A corrupted file was uploaded to e-committee by accident and the system would not let us replace it. The previous time that this occurred, it took two weeks of e-mail exchanges with ISO to get it fixed. Therefore, this time we left the corrupt file alone and updated the external site, which was easy to revise.
### 4.4. **RECENT MEETINGS**

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