N2035

MISRA C – WG14 Liaison Report

WG14 Meeting, London

11th-14th April 2016

Andrew Banks

BSc IEng MIET FBCS CITP

Frazer-Nash Research Limited, and
Chairman, MISRA C Working Group

1. MISRA Project Management
2. Where are we now?
    a. MISRA Compliance
    b. Amendment 1 for C-Secure
    c. Technical Corrigendum 1
    d. Next Steps
3. The Standard Library
    a. Freestanding v Hosted
    b. Annex K

MISRA
Project Management

MISRA C Project Management (1)

- The minutes of the Kona meeting [N1978] report, at 2.6:
  - “The company that supports MISRA has been taken over by a for-profit organisation. Situation not clear.”
- For reassurance, and for the avoidance of doubt:
  - The MISRA Consortium
    - MISRA is coordinated by a Steering Committee of the member companies.
    - This is unchanged.
  - Project Management
    - The project management of MISRA has been provided by MIRA Limited, from the initial establishment of the Consortium.
    - MIRA Limited was a for-profit organisation...
    - The transfer of MIRA Limited into HORIBA-MIRA Limited has no effect on the ongoing operation of MISRA.

MISRA C
Where are we now?

MISRA C SitRep (1)

- MISRA Compliance
  - Provides enhanced guidance on the *process* of complying with the MISRA language guidelines, especially in the documentation of *deviations*.
  - To be issued as a standalone PDF
  - Issue date: end of April 2016

MISRA C SitRep (2)

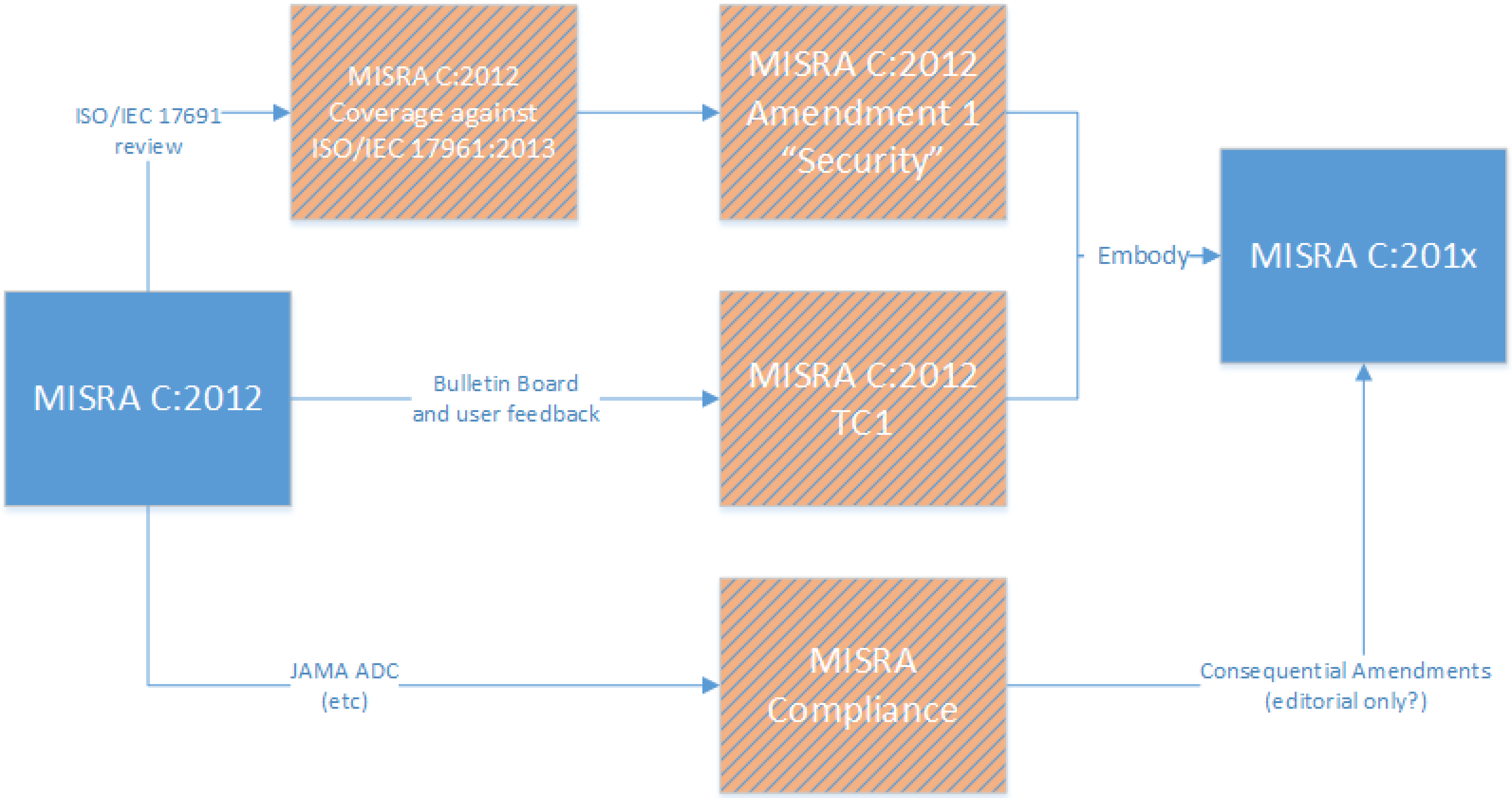
- C Secure
  - MISRA C:2012 v ISO/IEC 17691 Matrix
    - Ready to be issued (imminently) as a standalone PDF report
    - MISRA will share with WG14
    - Feedback and comments welcome
  - MISRA C:2012 Amendment 1
    - Adds a small number of new Rules to cover gaps in coverage... mostly these are in areas of the *hosted* Standard Library that MISRA C has traditionally not considered.
    - To be issued as a standalone PDF
    - Issue date: end of April 2016

MISRA C SitRep (3)

- Bulletin Board Questions (and other feedback)
  - MISRA C:2012 Technical Corrigendum 1
    - Work In Progress
    - To be issued as a standalone PDF, Q2/Q3 2016

MISRA C – Next Steps

- MISRA C:2012 is published
- Technical Corrigendum 1
  - To incorporate into the Core Document
- Amendment 1 (Security)
  - To incorporate into the Core Document
  - Some consequential amendments (eg to scope of Rule 21.8)
- MISRA Compliance
  - Core Document to be revised to reference, and remove duplication
- **Proposal: To publish consolidated Core Document as MISRA C:201x**



ISO/IEC 17691 review

MISRA C:2012 Coverage against ISO/IEC 17961:2013

MISRA C:2012 Amendment 1 "Security"

MISRA C:2012

Bulletin Board and user feedback

MISRA C:2012 TC1

Embody

MISRA C:201x

JAMA ADC (etc)

MISRA Compliance

Consequential Amendments (editorial only?)

Published

To publish (as PDF only?)

Consolidate?

MISRA C – What Next?

- CERT C Coverage
  - Compiling coverage matrix
  - No plans to directly address CERT C rules

- Review of C99
  - Review of the C99 rules, in particular where a more targeted approach is possible, and appropriate.

- C11 new features
  - Review of new features for undesirable behaviours
    - Undefined
    - Unspecified
    - Implementation Defined
    - etc

The Standard Library

Freestanding v Hosted

Conformance: Freestanding v Hosted

- Chapter 4 of the ISO Standard defines the following:
  - A *conforming freestanding implementation* shall accept any strictly conforming program in which the use of the features specified in the library clause is confined to the contents of the standard headers:
    - **<float.h>**
    - **<iso646.h>**
    - **<limits.h>**
    - **<stdarg.h>**
    - **<stdbool.h>**
    - **<stddef.h >**
    - **<stdint.h>**
- MISRA C:2012 has no explicit library-specific restrictions on these headers

Conformance: Freestanding v Hosted

- MISRA C:2012 places major restrictions (including out-right prohibition) on many of the remaining standard headers:

<assert.h>	**Implicit restriction**	**<signal.h>**	**Shall not be used**
<complex.h>	**Implicit restriction**	**<stdio.h>**	**Shall not be used**
<ctype.h>		**<stdlib.h>**	**Major restrictions**
<errno.h>		**<string.h>**	
<fenv.h>	**Major restrictions**	**<tgmath.h>**	**Shall not be used**
<inttypes.h>		**<time.h>**	**Shall not be used**
<locale.h >	**Major restrictions**	**<wchar.h>**	**Shall not be used**
<math.h>		**<wctype.h>**	
<setjmp.h>	**Shall not be used**		

- The restricts are due to the extent of the undefined, unspecified and/or implementation defined behaviour, and the functionality is mostly associated with accessing the external environment.

Standard Library in MISRA C:20xx

- Review of Exclusions
  - Review the blanket bans of standard library functionality that is essential to the operation of Hosted code
    - eg use of getenv(), signal()
  - Consider relaxing the restrictions on use of Dynamic Memory Allocation
    - eg to permit dynamic memory use during initialisation phase

- Freestanding v Hosted
  - Where necessary, maintain separate Rules pertaining to Standard Library header files permitted in Freestanding applications from those pertaining to header files only used in Hosted applications (none yet?).

Annex K

- MISRA C notes:
  - the proposal to deprecate Annex K (introduced in C99)
  - the rationale, and the limited take-up of Annex K implementations
  - the “don’t break existing code” mantra of WG14
- MISRA C had proposed (in early C11 work drafts) to encourage adoption of Annex K functions and deprecate the unbounded functions
- MISRA C is of the view that:
  - bounds checking is a necessary facility in safety and security related code
  - it would have been desirable for EXISTING functions to have been modified with optional additional parameter(s), rather than a new _*s* set added
- MISRA C would like to support (and take part in) future discussions in this area