The Teachers/Appraisers

Mr. Andrea MUSONE has more than twenty years' experience in software engineering and software quality. Initial C developer, then he contributed to the definition of software standards for some Space programs. Consultant to Industry and International Organizations. Teacher of ECSS and DO-178B/C standards.

Team member for CMMI® appraisals. He has also technical experience in GIS, Earth Observation, and Avionics. Several years consultant to the Italian Air Navigation Services Provider in the frame of a European Project. Training Manager in Intecs.

The Company

Since 1974, INTECS has been operating at the forefront of the software market, where safety, reliability, innovation, and quality are essential for success. INTECS provides leading-edge software technologies to support the major European and Italian organisations in the design and implementation of advanced electronic systems for Defence, Space, and Civilian markets.

Intecs is ISO-9000 certified since 1994. Currently it holds **ISO 9001:2008** quality certification for software development in Defense, Space, and Civilian domains. Moreover Defence, ATC, and Railways Divisions have been positively appraised at **CMMI® Maturity Level 3**. On 2015, Intecs has been equally qualified at **Level 3** according to **Automotive Spice®**.

General Information

Location

Upon request, courses may be held at Customer premise.

Contact:

Mrs. Silvia Mazzini
Intecs SpA
Via Umberto Forti, 5
I-56121 Montacchiello (Pisa), ITALY
Phone: +39 050 9657513 (direct)
Phone: +39 050 9657411 (operator)
Fax: +39 050 9657400
Email: silvia.mazzini@intecs.it
Web: http://www.intecs.it/

intecs
the Brainware company

MISRA C:2012 Training

A one-day intensive course

MISRA C:2012 Guidelines define a subset of the C language in which the opportunity to make mistakes is either removed or reduced. Many standards for the development of safety-related software require, or recommend, the use of a language subset, and MISRA

C:2012 Guidelines have become the de-facto standard for C in all these safety-critical domains.

The Course

The Course presents first a brief history of the C language, from the founding Kernighan & Ritchie C to last ISO/IEC 9899:1999 (C99). Then the known strengths (e. g. power and flexibility) and weaknesses in particular of the language itself are presented. Among the weaknesses, it's worth citing the ISO C implementation dependencies, where the compiler behavior results unspecified or undefined. Such dependencies, if not accordingly handled, can let the code behave as not expected and/or make it not portable to different targets/environment. Same for some implementation-specific extensions (e.g. for providing access to specific peripherals).

These C implementations' features, together with compile-time and runtime limited checks, have a particular safety relevance, and represent the MISRA C historical background, since its first appearance (1998).

The comprehensive one-day course, making basis on the above-cited C weaknesses, provides participants with all the major features of the MISRA C:2012 Guidelines. Those are presented and weighted according to their Type (Directives, Rules), and Category (Mandatory, Required, Advisory). The main difference with respect to former MISRA C:2004 edition is also highlighted, together with the few changes introduced by the "security" concerns (as per MISRA C:2012 Amendment 1, April 2016).

Lastly, the course provides an overview of the approach to be followed for claiming (project) compliance to a given MISRA C edition. The matter has resulted troublesome in the years, and it is now covered by the specific guidance "*Achieving compliance with MISRA coding guidelines*" dated April 2016. In particular, it is presented if and how MISRA guidelines may be tailored, how violations have to be collected, and the (possible) resulting deviations allowed.

Intended audience

Software Engineers (Development and Verification), Quality Engineers, Configuration Managers, Test Engineers, Design Team Leaders, and Project Managers.

Leading and final parts of the course (i.e., MISRA overall presentation and claiming Compliance) are meant for all intended audience, while core part (actual survey of Guidelines) requires essential familiarity with embedded C programming.

Material

All the participants are provided with a printable PDF copy of the course handouts.

- Brief history of C language (from K&R to ISO 1999), and its current advantages and disadvantages.

- Brief history of MISRA C (1998, 2004, 2012), and intro to MISRA C:2012 (alias C3).

- Survey of the 159 MISRA C:2012 Guidelines:
  - o 10 Mandatory (0 Directives, 10 Rules)
  - o 110 Required (9 Directives, 101 Rules)
  - o 39 Advisory (7 Directives, 32 Rules)

- Survey of the 14 additional MISRA C:2012 Security Guidelines:
  - o 6 Mandatory (0 Directives, 6 Rules)
  - o 8 Required (1 Directives; 7 Rules)
  - o plus 1 (modified) Required Rule

- Achieving compliance with MISRA C (according to specific Guidance).