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Superseding ARP935A

Control Plan/Technical Construction File

**RATIONALE**

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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### 1. SCOPE:

This document contains a "sample" Control Plan with explanations as to the intended content of various sections. It also can serve as a sample technical construction file as specified by the European EMC Directive.

### 2. REFERENCES:

DID DI-EMCS-80199A, 11 Jan. 1993, Electromagnetic Interference Control Procedures

MIL-STD-461D, 11 Jan. 1993, Requirements For The Control Of Electromagnetic Interference Emissions And Susceptibility

89/336/EEC, 3 May 1989, Council Directive regarding Electromagnetic Compatibility

### 3. RATIONALE/BACKGROUND:

An EMC Control Plan has been a significant requirement of EMC programs. It has also been the source of much debate since its purpose has been less than well defined. The SAE AE-4 Committee has put together this ARP to define and clarify the contents of the plan.

A Control Plan should be prepared early in the program. It has three main functions. 1) The requirements should be identified and listed. Much misunderstanding occurs because there is not a common understanding of what the exact requirements are. This document provides the manufacturer the opportunity to define the requirements as they understand them. 2) The proposed design approaches are identified. This provides the manufacturer the opportunity to explain what design considerations are being investigated and used on the program that will allow the equipment to comply with the EMC requirements. 3) The analysis of the design is presented to justify that the approaches being used are adequate to meet the program requirements.

### 3. (Continued):

The control plan needs to be submitted early enough that the customer can review the document and determine 1) if the requirements are understood, 2) if appropriate and logical considerations are being planned in the design, and 3) if proper analyses are being used to be able to clearly demonstrate that the equipment will satisfy the EMC requirements. Reality dictates that some time will elapse before the design really gets underway and EMC engineers really get involved. Thus, a two part submittal is recommended. The first submittal should clearly cover item 1 as listed above with summary coverage of items 2 and 3. The second submittal should more completely cover items 2 and 3 as described above.

Updated Control Plans are often specified. An "as built" document may be useful for the future in understanding the EMC characteristics of an equipment. Likewise, intermediate versions may be useful to see if the design ideas still make sense later in the program, and to see if the analysis still shows compliance with the requirements. But this is actually an expanded function of the original control plan and more rightly should be called out as a separate project status report document. This function is normally handled as part of project or design reviews.

Many items for the commercial European market don't fit exactly in the definitions or requirements of existing specifications. In this case the manufacturer prepares a "technical construction file" (TCF). This outline can be used as the basis for a TCF. The contents of the file are officially, but briefly defined in Article 10.2 of the EMC Directive and can be related to the paragraphs of this document as:

- 3.0) The equipment is described.
- 4.0) The explanation or rationale for the applicable requirements is presented.
- 5.0) The design and considerations used to provide compliance with the applicable directives.
- 6.0) The analysis, in this case, will usually consist of actual test results.

The AE-4 committee has reviewed documentation about TCF's and generic TCF's in the preparation of this ARP. Thus, ARP935A represents a good starting point, but may need tailoring after review by a specific competent body. The EMC Directive requires that the technical construction file be submitted to a competent body for evaluation and concurrence. Based on their background and experience, they may require that the content and format be adjusted.

With this philosophy in mind, an outline and discussion of contents of a control plan are as shown in Appendix A.