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# Recommendation for RCC Document 382-94

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# Background

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At the 2017 RCC meeting at WSMR, NASA/MSFC (EV44) agreed to review RCC Document 382-92 '*A Guide for Quality Control of Surface Meteorological Data*' to assess the following:

1. Should the document be retained as an RCC reference document?
2. If retained, what needs to be updated?
3. If updated, what effort would be required?

Portions of the document are well within EV44's area of expertise, but other sections fall more under the expertise of the NOAA/NWS Sterling Field Support Center (SFSC).

Jennifer Dover and Michael Hicks of SFSC have graciously agreed to assist in this effort and have provided valuable comments to support the current assessment.

# Document Contents

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| <b>Chapter 1</b>  | <b>Quality Control General Principles:</b> Basic issues with QC of range instrumentation data, definition of terms, and relevance to mission and test applications. |
| <b>Chapter 2</b>  | <b>Error Sources:</b> Missing data, acquisition and transmission noise, environmental hazards, alignment errors, calibration inadequacies, time synchronization.    |
| <b>Chapter 3</b>  | <b>Real-Time Quality Control:</b> Operational QC checks, basic statistics of meteorological variables, sample representativeness, real-time predictors.             |
| <b>Chapter 4</b>  | <b>Post-Processing Quality Control:</b> Post-processing basics, spike/noise filters, interpolation, objective analysis, spectrum analysis, smoothing.               |
| <b>Appendix A</b> | <b>Instrument Fault Conditions:</b> Discussion of fault conditions by instrumentation type.                                                                         |
| <b>Appendix B</b> | <b>Instrument Quality Control Checks:</b> Specific guidance for QC by instrumentation type.                                                                         |

# Should the document be retained?

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Clearly, all range instrumentation data should be quality controlled to guarantee acceptable accuracy and precision in order to adequately support range operations. The document provides a standardized reference for quality control procedures, covering a full range of topics. Therefore it is recommended that document 382-94 should be retained as an RCC reference.

# What needs to be updated?

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For continued usage a number of inadequacies exist in the current document need to be updated, including:

- Typical typographical errors.
- Lack of clarity and detail in certain discussions.
- Reference to obsolete or superseded external reference documents.
- Discussions of obsolete instrumentation types and outdated data storage and communication methods.
- Some disconnects between equations presented and associated text description.

# What effort will be required?

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After initial review, most of the necessary corrective actions have been identified. The effort to update the basic content of the document is significant. However, SFSC has already identified a number of obsolete external reference documents and provided current replacement citations.

A major effort will be converting the pdf format of the Xeroxed hardcopy document into an editable computer file.

EV44 proposes to take the lead in the update effort, with the understanding that we will lean on SFSC, with their expertise in instrumentation characteristics and calibration methods, to assist in the reworking of specific sections of the document.

# What effort will be required?

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|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 1  | Minor Level of Effort (LOE) for re-writing and inclusion of additional data. EV44 can take lead on this section, with additional inputs from SFSC.               |
| Chapter 2  | Moderate LOE required to adapt for more current instrumentation. SFSC is more qualified to take lead on this section, with EV44 providing some assistance.       |
| Chapter 3  | Moderate LOE required to update, particularly to generate equations. EV44 can take lead on this section, with additional inputs from SFSC.                       |
| Chapter 4  | Moderate LOE required to update, particular to generate equations and supporting graphics. EV44 can take lead on this section, with additional inputs from SFSC. |
| Appendix A | Minor re-writing with some additional LOE required to adapt for more current instrumentation. SFSC is more qualified to take lead on this section.               |
| Appendix B | Moderate LOE required to adapt for more current instrumentation. SFSC is more qualified to take lead on this section.                                            |