Guidelines for CaRDS *Mission Need or Requirement Request* document

Title   **-** The title for CaRDS requests should reflect the need or the high level requirement. <u>The title should not specify a solution</u> unless mandated or the need is limited to the specified solution.

Preferred	**Common National Capability for Event Reviews, Case Studies and Displaying Experimental Datasets.**
Not-so-good. Reason: Solution limited.	**Implement the Weather Archive and Visualization Environment (WAVE) program developed by Western Region in AWIPS.**

Preferred	**High Data Rate Upgrade for GOES Telemetry Systems to address FCC mandate.**
Not-so-good. Reason: Solution limited, other components may need upgrading.	**Modify GOES Data Collection System Receivers in the Colorado Basic to support higher data rates.**

Preferred	**NWS Standardized Local Storm Reporting Application and Format**
Not-so-good**. Reason: Solution limited, describes how, not what.	**Improve Local Storm Reporting application (either AWIPS LSR GUI, ECLAIRS, or IRIS) so that we have one system with improved formatting for use by all WFOs.**

**Please note that the "Not-so-good" examples are 'made-up' they were not actual original titles.

Section 1.1 – Mission Need or Requirement.

This section should provide a brief description of the request, addressing the proposed requirement.

It is important and beneficial to state the basic requirement concisely (see sample below) rather than just burying it within paragraphs of technical information.

1.1 Mission Need or Requirement

> Concise requirement. Should be no longer than one paragraph – Ideally 1-3 sentences.

<u>Need / Requirement statement:</u> Provide the capability for separate Hail and Snow Measurement Reporting for the Climate Record. The capability would address separate measurements from the reporting at COOP sites*, to ingest and archival at National Centers of Environmental Information (NCEI).

The National Weather Service (NWS) record thousands of manual observations each day. These are primarily taken at NWS Cooperative Observer (COOP) sites. When hail occurs, the measurements are recorded in the same field as snow and other frozen precipitation. This contaminates the climate database for frozen precipitation, mainly snow. It also confuses the users of the data when they see snow amounts during the warm months of the year. It has been made clear by the National Data Stewardship Team (NDST) that there is a need to separate hail measurements from snow. The NDST consists of members from the NWS, the National Centers of Environmental Information (NCEI), Regional Climate Centers, and State Climatologists. All of these entities are stakeholders in the use of this data.

*This requirement would only be necessary at observing stations that take manual observations, primarily for climate. It is not intended to change any existing METAR requirements.

Note that where you place the statement (beginning or end of 1.1) is not important so long as a clear, concise requirement can be readily found without having to read multiple paragraphs in order to find out, or guess *what* is being requested.

Basic Guidelines for Writing Requirements

Although we can start by documenting the *need*, it helps if we can 'translate' the *need* into the underlying *requirement*.

Here is another example of a hypothetical need, and how it may written as a requirement:

> **Need:** NWS sites (WFO/Centers/Regions) need to have improvements made to the Content Management System (CMS) because it is too slow in updating content, including briefings and other information used operationally and for IDSS with Emergency Managers and FAA.

> **Requirement:** Capability for posting and updating individual site content to support operational and IDSS needs.

> Note that this is only the requirement Title, and at a <u>high level</u>. The actual requirement, scope and concept documents would provide details. The requirement is not constrained to the one solution in the original need statement (fixing CMS).

Tips for writing Requirements:

Suggestion	Description / Tips	Example
State **what**, not **how**.	Requirements state *what* is needed, not how to provide it. Refrain from using specific implementation or a specific solution. In this example, 4-wire solution was dictated because it provides better accuracy if the sensor is located a significant distance from the rest of the circuit (Assumption). What the requester really needed high accuracy. Let the designer/developer determine how to meet the real requirement: accuracy.	**Incorrect** (tells how, assumes solution)**:** The system shall use a 4-wire RTD to measure the temperature. **Correct:** The system shall measure temperature with an accuracy of +/- 0.1 Celsius.
	Eliminate operation descriptions in requirement statements. Requirements that state "the user shall", "the forecaster shall", or "the operator shall" are almost always *operational* descriptions, not requirements. Note: the descriptions are valuable and should be included as background and in any subsequent documentation.	**Incorrect**: The user shall be able to adjust the amplifier volume. **Correct:** The stereo amplifier shall have a control for setting the volume level.

Suggestion	Description / Tips	Example
Use correct, unambiguous terms and good grammar.	There must be one, correct understanding of a requirement. Ambiguous requirements cause budget and schedule problems and may not satisfy the real need. Poor writing can obscure the most necessary requirement. Ambiguous terms to avoid: *Support, but not limited to, etc., and/or, may, could.*	**Incorrect:** The stereo amplifier shall support additional speakers. [Support how? On top? How many? - Impacts design and cost] **Correct:** The stereo amplifier shall provide outputs for two additional speakers at full-rated power.
	Refrain from using general adjectives as they are vague and success is difficult to measure. This includes terms like: easily, fast, faster, quickly, accurately, and timely. Disclaimer: Adjectives may be acceptable at a very high level; however if possible it is best to define or specify the need.	**Incorrect:** The system should quickly and accurately display the temperature readings when it is turned on. **Correct:** The system shall display the temperature reading to an accuracy of +/-0.5 Celsius within 5 seconds of power-on.

Points to remember:

- Ensure title is concise and solution independent if possible.
- Clearly define *WHAT* is needed in a concise statement.
- Do not make assumptions. Most developers are not meteorologists/hydrologists. Any assumptions you make may not be understood by the developer. You are an SME, but others will not have same knowledge base (or even speak the same 'language').
- You may mention a solution (or the specific system which needs the new requirement) in the CaRDS Mission Need or Requirement Request as part section 1.3 - Existing Operational Gaps, or in section 4 - Estimate Resource Needs.
- Consider if the requirement applies to other service areas or stakeholders. Ensure the scope understood and well defined.