



CA-QP7301
Baseline
26 February 2002

Maintenance Center, Albany
Marine Corps Logistics Base, Albany, GA 31704-0325

MCA QUALITY PROCEDURE

CODE 882

ENGINEERING DESIGN & DEVELOPMENT

SIGNATURE/APPROVAL

The signature and date below indicates approval of this procedure for implementation at the Maintenance Center, Albany.

S. H. FOREMAN
Commander, Maintenance Center, Albany

26 February 2002
DATE

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4.2 Design and Development Planning.

4.2.1 Upon receipt of a request for engineering design and development, engineering personnel shall discuss the issue/problem with the reporting individual(s). This is necessary to gain a better understanding of both the issue/problem and the expectations of the customer. It may be necessary to consult additional functions/departments/personnel to validate the need for new design and development. The interfaces between the different functions/departments/personnel involved in the development are managed to ensure effective communications and clear assignment of responsibility.

4.2.2 Engineering Department develops functional/operational specifications or drawings, drafts any project timelines or milestones that may be needed, and, if necessary, determines reviews, tests or validations that are appropriate at various stages in the development.

4.2.3 The specifications, drawings, draft project plans and in-process validations, if any, are reviewed against the planned requirements, and approved by relevant Engineering personnel.

4.3 Design/Development Inputs.

4.3.1 **System or component related inputs shall be determined and recorded.** These inputs shall include those that will facilitate the needs and expectations of the customer/end user, and those that will ensure the safe and intended functioning of the component/system. These inputs shall also be considered, as needed, in the development/determination of: material types/specifications, material lists, interface/mounting and mating considerations, (appropriate hardware, connections, etc.); operating limitations, clearances and interferences; dimensional and geometric tolerances; weld and finish requirements, etc. Some examples of inputs that are considered during the design and development are as follows

4.3.1.1 Operating Procedures, Policies, or Objectives.

4.3.1.2 Supplier capabilities.

4.3.1.3 System operation, performance, installation, and application.

4.3.1.4 Operating environment and physical parameters.

4.3.1.5 Feedback information from past experiences or lessons learned.

4.4 Design/Development Outputs:

4.4.1 The design and development outputs shall be provided in a form that will enable the product/component to be verified and validated against the planned inputs. Typically, this output shall be provided as engineering drawings and/or technical data packages. These outputs shall be reviewed against the design inputs to ensure that the initial design requirements of the product/component are met. They shall also be approved by relevant Engineering personnel prior to release.

4.4.2 Engineering Drawings.

4.4.2.1 Design output, such as engineering drawings, shall be developed in accordance with all applicable government and industry specifications and drawing practices. The layout and level of detail for each drawing package shall be the minimum necessary to fabricate, assemble, install, test, operate or procure the

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product/component. In order to ensure that the product/component can be verified against the planned inputs, the drawings or technical data packages should include information such as product/system specifications, (which may include acceptance criteria), or testing and performance requirements.

4.4.2.2 Engineering drawings shall be catalogued/logged in, and sequentially numbered in such a way that each drawing package is uniquely identified and accurate data retrieval and archiving can be accomplished. Drawings developed by the Engineering Department for in house (local) use shall also contain the following distribution control statement.

THIS DOCUMENT IS REQUIRED FOR OFFICIAL USE OR FOR ADMINISTRATIVE OR OPERATIONAL PURPOSES. DISTRIBUTION IS LIMITED TO US GOVERNMENT AGENCIES ONLY AND SHALL NOT BE RELEASED OUTSIDE THE GOVERNMENT. NO DUPLICATION, IN WHOLE OR IN PART, FOR MANUFACTURE OR PROCUREMENT, WITHOUT THE WRITTEN PERMISSION OF THE ENGINEERING DEPARTMENT, MAINTENANCE CENTER, MARINE CORPS LOGISTICS BASES, ALBANY, GEORGIA 31704, IS PERMITTED. USE, DUPLICATION OR DISCLOSURE HEREON SHALL BE SUBJECT TO THE FOREGOING LIMITATIONS. THIS LEGEND SHALL BE MARKED ON ANY REPRODUCTION HEREON, IN WHOLE OR IN PART.

4.5 Design Reviews. At suitable stages in the design/development process reviews shall be carried out to ensure that the planned objectives, and design requirements are met. These reviews shall also serve to identify problems and provide an opportunity to propose corrections. Design reviews may be carried out by representatives of each function concerned with the design/development. **Records of these reviews, and any action taken as a result of these shall be maintained.**

4.6 Design/Development Verification. Verification shall be performed to ensure that system/product design and development has met the planned objectives. Verification is usually performed at the end of the development process, but it may also occur at any stage. **Record of the results of system/component validation, and any actions taken, shall be maintained.**

4.6.1 Approved preliminary drawings/technical data packages may be released for the development of prototypes in order to verify that the component/product has met the input requirements. All preliminary drawings released for prototype purposes shall be identified by the "preliminary" statement provided below and have the appropriate approval signature in the "Approved By" block. These preliminary drawings shall then be released to Program Management personnel, or their designated representative, and are authorized for a duration not to exceed that of the prototype development, or 30 days as stated below. All preliminary drawings released for prototype purposes shall be returned to the Engineering Department. *Any changes made to the drawing package shall be recorded, maintained, and incorporated into the drawing package.*

PRELIMINARY

THIS IS A PRELIMINARY DRAWING FOR USE OF PROTOTYPE FABRICATION ONLY. SHOP PERSONNEL ARE RESPONSIBLE FOR CONTACTING THE ENGINEERING DEPARTMENT WHEN CHANGES ARE NECESSARY, OR FOR NOTING THE CHANGES MADE TO THE PART/PARTS DURING PROTOTYPING IN ORDER TO ENSURE PROPER FABRICATION; WITH THE END RESULT BEING A CORRECTLY FUNCTIONING ITEM. ONCE PROTOTYPING IS COMPLETE, THIS DRAWING WILL BE RETURNED TO THE ENGINEERING DEPARTMENT, VIA CD/M, WITHIN THE ALLOTTED TIME FRAME FOR ITS TRANSFORMATION FROM A PRELIMINARY DRAFT TO A FINAL APPROVED DRAWING. THIS PRELIMINARY DRAWING IS VALID FOR A MAXIMUM OF THIRTY (30) DAYS AFTER ITS RELEASE DATE FROM CONFIGURATION DATA MANAGEMENT.

4.6.2 Verification activities for the output of the design and development process may be achieved by any procedure that will provide evidence that the design output meets the design intent. Examples of verification

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activities are comparisons of the output to the input requirements, testing, simulations or trials to demonstrate compliance with the input requirements, physical assembly and operational verification, or evaluation against past processes and lessons learned.

4.7 Design and Development Validation. Validation shall also be performed to ensure that system/product design and development has met the planned objectives. Validation is completed before delivery, installation or implementation of the product or component. When that is not possible, system/component verification is conducted jointly between engineering personnel, the end user/customer and any additional interested parties. **Record of the results of system/product validation, and any actions taken, shall be maintained.** *Validation of an acceptable design shall be annotated in the technical documentation, drawings, etc.*

4.8 Design/Development Changes. **Records of design and development changes shall be maintained.** All changes shall be reviewed, verified, and approved, as appropriate, prior to design implementation. Revisions and changes to engineering drawings shall be conducted in accordance with applicable government and industry standards. During the above review and change processes, consideration shall be given to the effect of the change on previous designs and products. Drawing revisions are done per MCA-QP4230.

5. NOTES. None.

6. DATA, FORMS AND REPORTS. None.

7. QUALITY RECORDS. Records will be maintained in accordance with MCA-QP4240, Control of Records.

Final Bid Document, Design Reviews, Design/Developed Verification Record, Design/Developed Validation Records, and Design/Developed Changes

Storage Location:	Engineering Office
Indexing:	Sequential Number
Access:	Engineering Personnel
Filing:	As generated
Storage Medium:	Paper
Maintenance:	Project Folder in File Drawer
Disposition:	Recycle/Shred
Retention:	Until Revised, Superseded, or Replaced

8. FLOW DIAGRAM. None.