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## ***Configuration Management***

### **A Back-to-Basics View**

**By Paul Ferrante, DRS Precision Echo, Inc.**

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Production, support, and improvement of products require an awareness of what the product currently consists of, whether planned or actual. Configuration Management (CM) is essentially a product-oriented discipline which directs itself at satisfying the need to know exactly what a product consists of, functionally and physically, as it evolves from concept through obsolescence. CM is a product of the dynamics of its three fundamental elements, Configuration Identification, Configuration Control, and Configuration Accounting.

In CM, each of the three fundamental elements exists only in the context of the other two. The first step in controlling anything is to identify it. To identify an item is to differentiate it from other items, and to enable control of the item independent of, and in relation to, other items. Identification enables control. Accounting is the means by which the actions of identification and control are made meaningful and communicated. The three fundamental elements are really three aspects of the same thing - Configuration Management.

The primary instrument of CM is product documentation. Product documentation is the means by which the configuration of a product, (its functional and physical characteristics), is identified, controlled, and communicated. There are two primary categories of product documentation - product requirements documents, and design disclosure documents. Product requirements documents are the basis of design disclosure documents. Examples of product requirements documents include, Product and System Specifications, Interface Control documents, and System Schematic diagrams. Design disclosure documents implement product requirements by defining the functional and physical implementation (configuration) of an item, and establishing a unique identification (also known as a part number) for each configuration defined. Examples of design disclosure documents include Assembly drawings, Parts Lists, and Fabrication drawings. Product documentation identifies, controls, and communicates the configuration of products throughout their life-cycle.

## CM Highlights -- *From the Chair of the CM Desk* *CM Versus DM*

*by Fred J. Bahrs - ACDM National CM Chairman*

In this issue I promised to focus on Data Management (DM) and its relationship to Configuration Management (CM). I usually also provide a dump on the latest happenings in the Standards development arena, however, in this issue, Al Lager has graciously provided an article to keep us abreast of what is going on regarding standardization, and believe me, it is a lot.

First let me clarify that my reference to the DM discipline in this article is derived from the traditional definition of the term developed by the Department of Defense. DoD Manual 5010.12-M, Procedures for the Acquisition and Management of Technical Data, provides the processes, procedures, terms and definitions for identification, control, acquisition, quality assurance and distribution for deliverable data on a DoD contract. DM is the process of applying a management system to accomplish those requirements. I am sure you can already see the close relationship between the CM and DM disciplines. Even though the line is not straight or as clear as we would like, the following definitions are from a CDM course I presented.

*CM provides the necessary, identification, control, accounting and auditing of documentation to design, build and maintain a product. In short "Technical Data".*

*DM provides the necessary, identification, control, accounting and auditing of documentation to manage and support a product. In short "All Data Including Administrative Data".*

A good example of CM documentation based on this scenario is an Engineering Drawing Package, even though the drawing package may be deliverable under the contract by the DM organization, it is a CM development and maintenance responsibility. An example of DM controlled documents which do not concern CM are Financial Reports and Program Schedules even though CM may provide input to these type documents.

A pretty good definition of DM is *"The analyzing, scheduling, interface, control and submission of data between various generators and users of data"*. The latest definition of CM as stated in EIA-649 is *"A management process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design and operational information throughout its life"*. You see the similarities, but only CM focuses on the technical information and products themselves whereas DM focuses on all data.

The latest version of DoD 5010.12-M is May 1993, however, it is under major revision by the Office of the Secretary of Defense (OSD) Continuous Acquisition and Life Cycle Support (CALs) office. Also the CALs office has issued a contract to Al Lager to develop a DM Handbook (MIL-HDBK-XX), which will be similar in style to the almost released CM Handbook, MIL-HDBK-61.

If you have any questions, clarifications or additional information you want to share or just want to discuss CM stuff, please feel free to contact me.

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## CM the Solution by Steve Easterbrook

What is your workplace like? Are people moseying down the hallways whistling “Zippity Do Da”? or... do you have a lot of meetings and company-funded stress management classes?

Companies that have implemented ISO, TQM, BPR, CMM, MRP, JIT, PDM, etc...are not realizing the full benefits of these performance improvement initiatives. Companies that have the best engineers, the finest programmers, are ISO certified, and have macho QA budgets, are still in the corrective action mode. In a majority of organizations, employees spend the better part of their workday “fighting fires”. Did you ever hear of a workplace where everything seems “urgent”? This is the corrective action mode. Many managers actually believe expediting and putting out fires is continuous improvement. It is not.

Imagine being in the forestry business. Your forest is being cut for lumber in accordance with a plan to stay in business and you are continually planting new trees for future existence. This is continuous improvement. But imagine a competitor whose forest is always on fire, where are they going to find the time to improve what they have? This is corrective action. I would venture to say that in reality more lumber companies are in the continuous improvement mode, than hardware and software manufacturers.

In any organization, all processes have to be working first (in order to achieve consistent conformance) before there is true continuous improvement. Given that many companies are in the corrective action mode, how does one explain that many of these same companies get excellent products out the door, and often on schedule? Well, they do it with a lot of muscle, stress, and extra cost - that’s how! But sooner, or later, that extra cost is going to affect their market position as well as employee morale.

And how much of that extra cost does management account for? Not as much as you think. A lot of the corrective action cost is hidden in overhead (evaluating fixes, implementing changes to fix items, meeting time, costs to “rework” documentation, etc.). The cost is felt, by management, but is not seen. All they know is costs are too high and they need to come down. So, this is what many do:

### **Solution 1: Hire Smoky the Bear**

Hire fire-fighters, expeditors, and “just-do-it” managers. Fire fighting is the accepted management methodology. Successful firefighters are more often promoted to management positions than qualified process improvement experts. As a result, real continuous improvement is not possible, or occurs at a slow pace.

### **Solution 2: Beef Up the Automated Systems**

Many managers believe that automating the existing processes will automatically increase productivity. Although automation has the potential for enormous benefits, it often allows individuals to make bad decisions quicker. And it often introduces a new set of problems associated with the automated system itself. Computers and software can be great, but their success is first dependent on the effectiveness and efficiency of the company’s processes.

### **Solution 3: Increase the QA Effort**

Checking to see if you follow your poor procedures and checking to see if the product matches it’s poor documentation, is just telling you what you already know - you’re in the corrective action mode. Spending tens or hundreds of thousands of dollars on certification, and recertification, still won’t keep a company out the corrective action mode. Although ISO shows a commitment to a base level of quality awareness, two companies making the same product, and both ISO 9001 certified, can have differing levels of quality in their products and different bottom lines.

### **Solution 4: Hire A Consultant**

Companies often hire high paid consultants who are supposed to come in and turn things around. Management believes that because the consultant comes from a well known accounting firm and wears a \$1000 suit, he or she, must be an expert. Not necessarily true (don’t get me wrong, there are good consultants around). And when the smoke clears, the consultant submits a report telling the company what most of the employees already know - that things need to be improved. It’s funny that management doesn’t often believe it’s employees. It seems you can’t be a guru in your own country!

*Continued on Page 4. See SOLUTION.*

### **Solution 5: Deck the Halls...**

So, here you stand, in the corporate lobby, filled with photos of all the famous consultants the company has hired, with an ISO certification flag draped across the building, with a VP of Quality Assurance on the same floor as the CEO, with mottoes and slogans stating the company's commitment to quality... and the company is handing out pink slips because it isn't cutting the bottom line.

### **The Real Bottom Line**

Wouldn't everyone be better off going to work each day, kicking their feet up on the desk, and saying "What shall I enhance today?" It can happen with an effective and efficient enterprise-wide CM process in place. It is happening right now. Some big name commercial companies are beginning to establish CM as a core, value-added cross-functional business process. They recognize CM as the solution to getting out of the corrective action mode and into the continuous improvement mode. CM is fundamental to eliminating corrective action and ultimately achieving consistent conformance. Consistent conformance is a prerequisite for continuous improvement. All improvements go through change. Consistent conformance and continuous improvement cannot be achieved without CM.

It's time for management to start looking for the **right** solution. It lies within the **right** CM process.

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*Steve was a CM Manager involved in various U.S. Navy programs; and a CM Manager for a large manufacturing firm involved in government and non-government products. He now spends 35+ weeks a year teaching, consulting, and lecturing with commercial companies and international government agencies. Steve holds a B.S. and MBA, CMII certification, holds the first certification ever awarded as a "CM Process- Lead Assessor Training", holds certification as a Professional Quality Assurance and Software QA Auditor. He is also past President of ACDM, and member of various CM associations. He has also published numerous articles on the subject of CM in various journals and newsletters.*

**"Keep those cards and letters coming....."**  
By Connie Pitcher

ACDM has recently received the sad news that fellow ACDM member and devoted Board member Hans Ebner is terminally ill and may only be with us for a couple more months. For those of you who know Hans you will realize that Hans does not give up very easily...the fight will continue.

Hans is home on disability and is anxious to hear from all of you. Here is an excerpt from his recent letter to me....

"Also, please let all ACDM members know that I welcome all forms of communications. Pray for me. I believe in the power of prayer. Thanks and Love, Hans."

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Hans would love to hear from all of you, keep those cards and letters coming.....

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## **Wanted: ACDM Journal Editor**

Do you need a creative outlet? Do you like using word processors or desktop publishing applications? Would you like to see your name in print (fine print - see box below)?

Then the ACDM needs **you!** We are looking for a new volunteer Editor for the ACDM Journal, which is published quarterly.

If interested, please contact Sandra Crowley at: 216-433-2427 or Email: acdm4sandy@aol.com.

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Configuration Identification: All product documents are assigned an identification number or “document number.” The part number of an item is based on the document number of the design disclosure document that defines its configuration. Part numbers may be the same number as the document number, or may be the document number with a appended “dash number” which distinguishes different configurations of an item defined in the same document. Although a part number may be the same number as a document number, it is not the same thing as a document number. Part numbers identify parts. Document numbers identify documents. The revision level of each product document is established through a formal review and approval process that culminates in “release” of the document. When documents (or document revisions) are released, many things happen at once. The document identification and revision level are established. The document original is placed in a secure location to prevent unauthorized changes; and, the document becomes subject to formal change control. The document revision level indicates the current state of a document, and does not identify the configuration of an item. The configuration of an item is identified by its part number. Only the release of a design disclosure document (or revision thereto) establishes the unique identification (part number) of the item defined by the document.

Configuration Control: Configuration Control is the element of CM that ensures that when changes to documents are implemented, the parts defined by the documents are identified or re-identified properly according to the nature of the change. All parts identified by the same part number are required to be fully and completely interchangeable with each other in terms of their functional and physical characteristics. If a change to a product document impacts the Interchangeability of an item with respect to existing items of the same part number, the item defined by the changed document is re-

identified (identified by a different part number than existing items). The process that implements Configuration Control is called Change Control. Change Control has been called “the engine of CM.”<sup>1</sup> It is an apt description because the change control process provides the motive force that integrates the three fundamental elements.

Configuration Accounting: Configuration Accounting is the element of CM that records and reports, or communicates the configuration of an item as established by the elements of Configuration Identification and Configuration Control. Configuration Accounting records include the released product documents themselves as records of the established configuration of an item, change control records such as approved change requests and change notices, and approved deviations and waivers. If Change Control is thought of as the engine of CM, Configuration Accounting records may be described as “the truck,” that continually delivers the current Configuration Identification “payload.”

Implementation of Configuration Management is more art than science because of the nearly infinite number of environments to which it is applicable. The elements of Identification, Control, and Accounting are universally applicable and fundamental to achieving the objective of Configuration Management, i.e., to know exactly what a product consists of in terms of its functional and physical characteristics, throughout its life-cycle. The fundamentals of Configuration Management are applicable to products as simple as a light bulb, as complex as a spacecraft, or as abstract as a software product. The fundamental elements of CM are an absolute necessity in any environment where products with consistent quality, and predictable, repeatable performance are required while minimizing life-cycle costs.

<sup>1</sup> Bill Brummer in ACDM Journal, 2<sup>nd</sup> Qtr, 1997

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## *Changing DoD Standards on CM/DM and Other News from Inside the Washington Beltway* by Alan Lager, MLR Associates

Several recent events have resulted in a major shift in the configuration management perspective of the Department of Defense. A major on-going effort by the DoD Configuration Management Advisory Group (CMAG) (under the direction of Linda Burgher-Fowble, the OSD focal point for CM and Data Management) and the Electronics Industries Association (EIA) G-33 Committee on Configuration and Data Management, will shortly culminate in a set of standards and a handbook geared to new realities and poised to embrace 21st century technology.

On 7 May 1997, the Defense Specifications and Standards Improvement Council (DSIC) approved MIL-STD-2549, "Configuration Management Data Interface" for publication. This standard which will be available in PDF format in July, establishes a standard set of configuration management data elements. It also defines all of the configuration management and product data relationships in a fully articulated IDEF-1X data model. Furthermore it provides the mechanism for defining digital delivery of all product information, configuration control, and status accounting data.

Why is this such a landmark event in the history of DoD CM standardization? Because, for the first time there is a standard to which any automated system can map. It means that the first giant step has been taken toward the ability to universally exchange configuration information among trading partners (both Government and industry) without ambiguity. It means that all CM product vendors will have a proven common set of consistent business rules as a basis for development of future products and upgrade of existing ones. If you don't think that is significant, consider that the major reason for the disappointing performance of CM automation efforts both within DoD, and in private industry, has been the lack of a business rules design-basis.

Time and time again, enormous expenditures of time, money and resources in trying to achieve data sharing have yielded less than satisfactory results. Now, each trading partner will be able to map to the MIL-STD-2549 Model, rather than to five or six or more different trading partner's unique systems. Furthermore, the Service components of DoD, as well as any other enterprise will be able to evolve their automated information system(s) for the next century on a logical and consistent basis that will facilitate shared data and the elusive integrated data

environment. Why is 2549 universally valid for both industry and Government? A major reason is that it is based on, and is fully consistent with, EIA Standard 649 "National Consensus Standard for Configuration Management." Another reason is that it imposes no requirements on a contractor outside of specific selected data deliverables. Its "requirements" section is simply an English language articulation of the business rules upon which the data model is based.

EIA Standard 649 has been revised from the Interim Standard version released by EIA in 1995, as a first step in moving it toward ANSI approved status. The IS-649 version was official endorsed by the DoD and also by the IRS (for use in the upgrade of their computer systems). When the current draft ANSI standard version is published in July after the EIA committee ballot process is completed, it will be made available for public review. ACDM will be a vital and respected part of the ANSI ballot review process. Naoma ShROUT is a member of the Multi-Association Advisory Group that will oversee the process and assure that all comments have been adequately addressed and dispositioned, and an ACDM review team is being established.

In addition to the ACDM representation, other members of the 649 Multi-association Advisory Group include Mike Daniels representing ADPA/NSIA and SOLE, Harvey Schock representing ASQC, and Ron Berlack representing IEEE. The DoD stake in this standard is represented by Linda Burgher-Fowble; EIA interests by Chris Denham, Director of Technical Programs. Alan Lager (yours truly) is the EIA task leader and principal author of 649.

How does the ANSI draft differ from the earlier interim version of 649? Without changing its essential character as a document that explains the basic principles underlying good CM practices, the current 649 provides a suggested methodology for selecting those principles that are applicable to a given type of product, or to a given phase of the product life cycle. It provides guidance in tailoring a principle, where necessary to apply it in a less rigorous environment. It also acknowledges baselines that reflect information of concern to product operation, support and maintenance. EIA 649 remains a guidance document written in terminology that is as neutral as possible, which identifies many aliases for the terms used.

*Continued on Page 8. See BELTWAY.*

The intent of the standard is to articulate the basic principles and allow their translation into the unique language used within any industry and their application on a selective basis.

Another recent landmark event was the release of Military Handbook 61 by the CMAG for formal review and coordination in May 1997. The comments to this document, prepared under contract by MLR Associates, were due by 30 June and are expected to be resolved and incorporated by early fall. MIL-STD-61 provides DoD personnel with the guidance and reference activity guides to establish and maintain effective robust CM systems within the DoD components and to effectively interface and evaluate the performance of contractors. It is objective oriented and fully accommodates the performance-based acquisition approach which DoD has embraced to bring the Defense and Commercial industrial bases together. The handbook contains templates covering each phase of the life cycle from initial concept studies to final disposal. The templates contain CM objectives, activities, decision criteria, benefit/risk factors, and metrics keyed to the objectives. They also refer to the sections of the handbook which describe the principles and concepts associated with the major CM functions and the many graphic and tabular activity guides which provide detailed guidance. MIL-HDBK-61 also contains a primer on how to interpret and apply MIL-STD-2549.

On the Data Management front, the Data Management Advisory Group (DMAG) has been re-activated and is busy reviewing a new streamlined draft of DoD Data Management Manual (5010.12-M). This manual contains the DoD data management policy and the mandatory requirements associated with data acquisition, distribution, storage and retrieval. The difference between this version and the prior manual, which is more than 10 years old, is that the current version reflects the ascendancy of digital information over paper and film. The manual will be supplemented later this year with a comprehensive Data Management Handbook providing detailed guidance and how-to instruction for Government data managers.

You can keep abreast of developments in the DoD CM/DM arena and will be able to access the PDF version of MIL-STD-2549 at <http://www.acq.osd.mil/CALS/>. You may download the coordination draft of MIL-HDBK-61 at <http://www.magicnet.net/~noble/eia/>. In addition, as announced at the ACDM conference, EIA has extended their member rate to any ACDM'ers registering for their annual technical management workshop to be held this year on September 22-26 at the Doubletree (Downtown) Hotel in Nashville, TN. For details call Angela Davis, (703) 907-7568 or e-mail her at [AngelaD@eia.org](mailto:AngelaD@eia.org).

ASI Advertisement  
here



**CMII Conference Denver,  
Colorado April 29-May 2, 1997  
by Sam Packer**

Welcome to Denver! No it did not snow, but with 180 plus people attending, we were very busy in the conference with workshops, presentations, course training, and last but not least the vendors we all need to interview and possibly add to our company's tool portfolio.

There were 6 workshops covering CMII processes: numbering conventions for hardware and software, process automation, CM metrics, and business re-engineering with CM expectations. All had an audience, though one had a very small audience, but the best report out, you had to be there. The subjects proved to be very interactive and each of the various industries represented had a slightly different need for the workshop. It is interesting to note that CM is not known as CM in many businesses, yet the processes and concepts are there.

The CMII conference included a trial of the Denver International Airport baggage system. An obvious spoof on a tool that does not work well; yet, as the trial concluded, had Denver applied good CMII principles, it would have. The defendants were the mayor, BAE (baggage system maker) and United Airlines. With powdered wigs and much pomp and circumstance, the verdict was a hanging. Not the jury, the defendants. Unfortunately, as we who live here in the Denver metro area know, the numbers of dollars and delays will keep the city of Denver in a large debt position for years to come.

Of course, the most important part of any conference is the speeches, with today's technology, we still see many presentation methods, each works as effectively as the

others; handsomely detailed view foils, slick computer projected pictures, hand carried models, films, and of course the handwritten view foil. A computer wired into a projector was the most used, but the one man show with hand written view foils kept the audience's attention. When one is ready to use a laptop with one's presentation inside, verify before you leave home, it works. The recovery obviously educated us all, if one process fails, have a plan.

Subjects presented were the classical, from 'what I did with CMII' to 'how to configuration manage the job hunting/interview process;' as well as, 'CALs in Japan,' 'PDM and its relation to CM,' 'merging of CM and QA to better the product life cycle,' and many others.

We did have good vendors, we should have had more. The products covered CM tools, logistics and life cycle management tools, PDM tools, process management tools, and a straightforward server based document control system.

Conferences for Configuration Management are extremely important to our profession. The need to network and to interact face to face with peers to solve issues, pose philosophical questions, and to be able to see the tools available in the marketplace is a necessary part of good business practice for all of us. I am glad I attended. ACDM needs members like us to attend these conferences and share the information presented. Writing articles and being open to discussions is key to maintaining C&DM as an integral part of every industry and product.

## Using ISO 10007 to Implement ISO 9001 "Guidelines" by Neil Steeman

ISO 9001, "Quality Systems - Model for Quality Assurance in Design/Development, Production, Installation and Servicing", contains the basic quality system guidelines that manufacturers must satisfy in order to gain "recognition".

Configuration management elements are found in many clauses of ISO 9001.

The most important relationships are found in clauses 4.3, Contract review, 4.4, Design control, 4.5, Document control, and 4.8, Product identification and traceability.

To develop the relationship let's first take a look at ISO 9001, and specifically clause 4.3, Contract review.

4.3.1, General, states "The supplier shall establish and maintain documented procedures for contract review and for the coordination of these activities".

4.3.2, Review, goes on to give three reasons for the review:

- a) to ensure that the requirements are adequately defined and documented,
- b) to ensure that any requirements differing from those in the contract are resolved and,
- c) to ensure that the supplier has the capability to meet contract requirements.

ISO 10007, clauses 5.2.2, 5.2.3, 7.2.2 and 7.2.3 provide details to implement the requirements.

5.2.2, Documentation of configuration items, states "All the necessary functional and physical characteristics of a configuration item including interfaces, changes, deviations and waivers should be contained in *clearly identified documents*."

These are the documents that contain the requirements mentioned in 4.3.2 a), b) and c) of 9001.

5.2.3, Numbering, goes on to state that *numbering conventions* should be established and applied to the identification of *documents*.

7.2.2, Documentation of configuration items, sets forth details of document types as *specifications, design documents, lists, software data and manuals for operation and maintenance*.

It also stipulates the extent of documentation; "Documentation required for a CI depends on the level of control needed. However, *all documentation* should include relevant information on change and traceability"

7.2.3, Numbering conventions, spells out the details of the numbering conventions mentioned in 5.2.3.

So, we can see that the need for 10007 in relation to 9001 for contract review is to spell out the details of document content, types, and identification that need to be applied in order to implement the "contract review" guidelines.

Next we see that 4.4, Design control, of 9001 contains requirements that are implemented by 5.2.1 and 7.2.1 of 10007.

4.4.4, Design input, states; “Design input requirements relating to the product, ...shall be *identified, documented* and their selection reviewed by the supplier for adequacy”.

5.2.1, Product structure and selection of configuration items, states; “The product structure should describe the relationship and the position of configuration items in the breakdown of the product”.

These *configuration items* provide the context for *identifying and documenting* the design input requirements because they can be individually tested and supported.

7.2.1, Selection of configuration items (CI's), sets forth the process for dividing the total product structure into logically related [units] of hardware, software, processed materials, services. It also provides details of when and how to select higher level and lower level CI's.

It states: “The main criteria is to select those items whose performance parameters and physical characteristics (*i.e. design input requirements*) can be separately managed to achieve the overall end-use performance of the item”.

We can see here that the need for 10007 in relation to 9001 for design input is to spell out the details of product identification and selection of configuration items within the product that need to be applied in order to implement the “design input” guidelines.

4.4.6, Design output, of 9001 is implemented by 5.2.1 and 7.2.1 of 10007

4.4.6 states: “Design output shall be documented and expressed in terms of requirements that can be verified. Design output shall

- a) meet the design input requirements;
- b) contain or reference acceptance criteria;
- c) identify those characteristics of the design that are crucial to the safe and proper functioning of the product;
- d) include review of design output documents before release”.

Those requirements are implemented by 5.2.1 and 7.2.1 of 10007 because the *configuration items* provide the context for *identifying and documenting* the design output requirements since they can be individually tested and supported.

The requirements in 4.4.7, Design verification, and 4.4.8, Design validation, of ISO 9001 are implemented using the detailed guidelines in 5.5, Configuration audit (CA), and 7.6, Configuration audit procedures, of ISO 10007.

4.4.7 states: “ At appropriate stages of design, design verification shall be performed to ensure that the design stage output meets the design stage input requirements.

4.4.8 states: “ Design validation shall be performed to ensure that product conforms to defined user needs and requirements”.

*Continued on Page 12. See GUIDELINES.*

ISO 10007 clause 5.5, Configuration audit (CA), establishes the configuration audit as the means to perform design verification and validation. It mentions the FCA and PCA.

ISO 10007 clause 7.6, Configuration audit procedures, goes on to specify how and when the FCA's and PCA's are conducted.

The requirements in 4.4.9, Design changes, of ISO 9001 are implemented by 5.3, Configuration control, 7.3, Configuration board (CB), and 7.4, Configuration control procedure, of ISO 10007.

4.4.9 states: "All design changes and modifications shall be identified, documented, reviewed and approved by authorized personnel before their realization".

ISO 10007 clause 5.3 states: "Configuration control involves the following activities, which should be documented in detail in a *change control procedure*."

- document and justify the change;"
- evaluate consequences of the change;"
- approve or disapprove the change;"
- implement and verify the change;"
- process deviations and waivers."

ISO 10007 clauses 7.3 Configuration board (CB), and 7.4 Configuration control procedure, specify the details of implementing the *change control procedure*.

Next, let's take a look at ISO 9001, clause 4.5, Document control. It includes 4.5.2, Document approval and issue, and 4.5.3, Document changes.

4.5.2 discusses review and approval of documents and use of a master list.

Although document control is necessary for all relevant quality related documents, the control of *configuration documents* is specified in 5.2.2., 5.2.3, 7.2.2 and 7.2.3 of ISO 10007, as I mentioned earlier.

4.5.3 states "Changes to documents shall be reviewed and approved by the same functions/organizations that performed the original review and approval unless specifically designated otherwise.

The procedure for processing *configuration document* changes is thoroughly discussed in 5.3 and 7.4 of 10007.

Finally, let's look at ISO 9001, clause 4.8, Product identification and traceability.

4.8 states: "... the supplier shall establish and maintain documented procedures for identifying the product by suitable means from receipt and during all stages of production, delivery and installation".

Where ..... traceability is a specified requirement, the supplier shall establish and maintain documented procedures for unique identification of individual product or batches. This identification shall be recorded."

ISO 10007 clauses 5.4, Configuration status accounting (CSA), and 7.5, Procedures for configuration status accounting (CSA), are used to implement the above clauses.

5.4 states: "CSA should provide information of all configuration identifications and all departures from the specified configuration baselines. It thus enables changes to configuration baselines to be *traceable*."

7.5.2, Recording, states: "CSA records selected data during the configuration identification and control processes. This allows *visibility and traceability* for the efficient management of the evolving configuration."

## SUMMARY

Hopefully, you now understand that the CM document was written to provide a means for suppliers to consistently apply guidelines for implementing the ISO 9001 clauses relating to product configuration.

What were the four most important relationships? Contract review, Design control, Document control, and Product identification and traceability.

And how were these related between ISO 9001 and ISO 10007?

Contract review is based upon *clearly defined documents* referenced in the contract. The application of configuration management requires that all the necessary functional and physical characteristics of a configuration item including interfaces, changes, deviations and waivers should be contained in *clearly identified documents*.

Design control is based upon (1) the documentation of design input requirements and design output requirements, (2) the verification and validation of those requirements and (3) the control of changes to the requirements.

Document control is based on identifying the document, controlling changes to the document, and relating the document to a specific process or part. The means to control configuration documents is a basic part of the CM guidelines.

Product identification and traceability is based upon specific guidelines for identifying the product and accounting for changes to the product. Configuration management provides these guidelines.

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**Check the ACDM World Wide Web site often for updates**

**[www.acdm.org](http://www.acdm.org)**

**If you have suggestions for it, send email to Frobi at:**

**[frobi@kami.com](mailto:frobi@kami.com)**

## '98 Conference Planning Begins! *By Connie Pitcher, Conference Chair*

The planning for our '98 National Conference is well underway. Thanks to many volunteers I now have a robust conference team.

I am also looking for volunteers to hold workshops. If you have workshop ideas and/or would like to facilitate a workshop please contact me soon.

I am currently working with a conference planning company to determine the location of the next conference. We have found the Phoenix area to be a bit crowded and a bit pricey during the March timeframe. More information on exact location and dates will be published on our home page as the plans are finalized, check the web often at [www.acdm.org](http://www.acdm.org). The tentative date is the week of March 15, 1998.

One major change we are looking into is to shift the conference from a Sunday-Wednesday format to a Monday-Thursday format. All conference survey results from '97 have been carefully reviewed and many suggestions will be incorporated into the '98 conference. We appreciate the feedback so that we can constantly improve our offerings to you.

Our conference theme is "CM/DM: Building Strategic Advantage", thanks to Mary Shack for the theme idea. As you think about workshops and presentations keep this theme in mind, CM/DM is the foundation for many other business processes and helps businesses succeed by building strategic advantage.

Please feel free to contact me directly with conference ideas, comments, concerns at [cpitcher@intellistor.com](mailto:cpitcher@intellistor.com) or call during business hours at (303) 682-6577.

### ACDM Job Bank

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- Software Engineer in Configuration Management in Alexandria, VA.
- Group Leader for Software Configuration Management in Parsippany, NJ.
- Mid-Level CM Positions in the Washington D.C. metro area.

Coming soon:

The ability to register a job opening or submit your resume via the ACDM web page.