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CMTrends

News and Perspectives for CM Professionals

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SAE Standard EIA-649-1
CM Requirements For Defense Contracts

by Steve Easterbrook
CMPIC LLC

SAE EIA-649-1 was released November 2014. It is entitled "Configuration Management Requirements For Defense Contracts". This is ***not*** a replacement for SAE ANSI/EIA-649B. It is an additional defense specific standard that is a stand alone "supplement" to what will become (my opinion) a "649 CM series".

The standard's rationale section states:

> "This is a defense unique standard to the non-government standard, *ANSI/EIA-649B Configuration Management Standard*, that generates, manages, and is controlled by the non-government standard body with Defense membership to provide requirements specific for Defense contracts. This standard is for placing tailored Configuration Management requirements on Defense contracts."

SAE EIA-649-1 addresses the acquirer/supplier relationship similar to those described in the cancelled mil-standards, but applies more modern 649 principles as its basis. It is hoped that it will help standardize CM requirements and interactions between the DoD and their contractors.

CMPIC now offers the NEW **Course 10**, "SAE/EIA-649-1 CM Requirements for Defense Contracts," a University of Houston sponsored SAE/EIA-649-1 certification course (3 days, 2.4 CEUs). This course will address the full -1 standard and provide you with a free, licensed PDF copy of the standard. Visit www.CMPIC.com to learn about upcoming courses.

What is the Difference Between 649B & 649-1?

SAE ANSI/EIA-649B, "Configuration Management", is the best known industry standard for configuration management. It covers the full scope of CM. It explains CM and provides the rationale for the various CM processes. It is applicable to commercial and government environments. It addresses overall

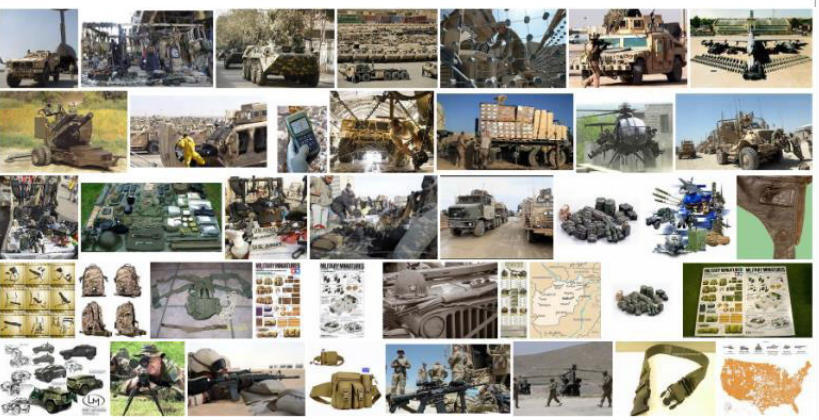
requirements for best CM practices but does not mandate the use of specific approaches on how CM should be implemented in any particular environment.

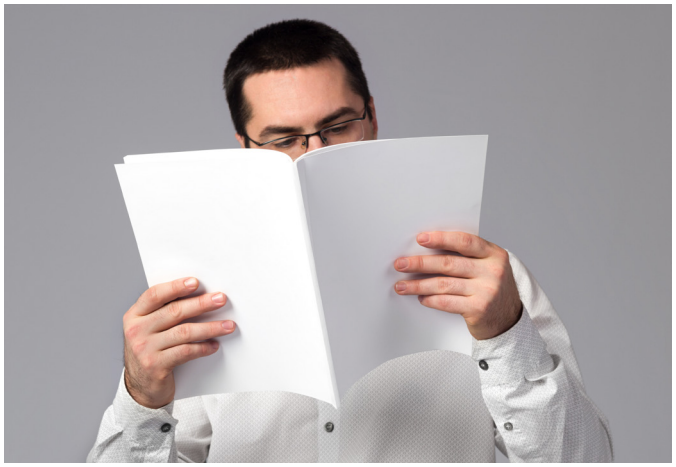
SAE EIA-649-1, "Configuration Management Requirements for Defense Contracts" is not an ANSI approved standard and does not explain overall CM processes to the detail found in ANSI/EIA-649B. This 649-1 standard specifically addresses Acquirer/Supplier CM requirements in the DoD. It was meant for the DoD environment only. The purpose of EIA-649-1 is to provide a variety of standardized CM requirements that can be specified, and written into defense contracts. Example: If 649-1 requirements are specified in a contract the contractor would then have to use DoD approved forms, and use DoD approved DIDs etc… just like cancelled Mil-Std-973. The 649-1 standard was written by the same committee that wrote the SAE ANSI/EIA-649B Configuration Management standard.

SAE ANSI/EIA-649B is the "parent" level standard, to the defense specific SAE EIA-649-1 standard.

Keeping both with the "649" identifier has caused confusion, but the 649 committee wanted to do this to show that the 649-1 requirements, specific to DoD contracting, are based on best practices found in SAE ANSI/EIA-649B.

I have recently been told that NASA is considering





writing a similar standard for its contracts with its contractors. It will be based on ANSI/EIA-649B and they may call it…. can you guess…EIA-649-2. There is even a rumor that the FAA is looking into creating EIA-649-3!

So the 649 based 'dash series' represent additional standards associated with Acquirer/Supplier contractual relationship, for specific environments, and are based on the ANSI/EIA-649B standard. They do not duplicate the content of the SAE ANSI/EIA-649B standard itself.

I would appreciate any comments, opinions. questions, etc. from those who will be impacted by this standard. If you are dealing with DoD you will be affected… better start studying.

Updates like this are published online in CMPIC's Configuration Management Trends Linkedin group, an online community and discussion group for those working with configuration management processes. Click below to join for free.

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The Fly Fisher's Son

A Lesson on the Nature of Knowledge

by Rick St. Germain
CMPIC Canada

Burned Again

"I'll be over tomorrow afternoon to discuss our future business relationship". Click.

Fred Burton's words echoed in my ears. He'd done it to us again, but this time it was more serious. He was our best customer, so for every project I'd send our most experienced business analyst over to document the requirements. But by the time we delivered, though, Fred had changed his mind and wanted something different. The rework costs were killing us.

Dad has risen through the ranks in the CM department and deeply understood the importance of solid requirements and managing change. When I joined the company after college, he had insisted that I do the same. But Fred's mercurial behaviour wasn't consistent with that approach.

That behaviour had to stop, and it looked like Fred had come to the same conclusion.

Somehow, my late father had had always been able to suss out what Fred really wanted, but with his passing last year, Dad's skill died with him. The company was mine now, and I had to make it work. I knew I needed Fred Burton's business to make that happen. If only he could express his requirements better…

Standing at the window, I looked down at the box of Dad's personal effects I had packed up after the funeral, sealed with blue packing tape. I just couldn't bring myself to take it out of this office that had been his for so many years.

"So what do I do now?" I asked it silently.

Madge, my secretary, knocked softly and entered with letters for signature, giving me a knowing look. She's been here for almost as long as my father and had been his executive assistant for over thirty years. She could read me like a book.

"You know, at times like this," she offered, nodding to the window, "your father would go for a walk. Fresh air clears the mind."

"I'll think about it", I grumbled as she closed the door behind me. She was right, of course. I needed time to reflect on what to do.

Twenty minutes later, I came out and said, "Madge, could you…"

"…move your one o'clock meeting to three-thirty?" she replied. " Already done. Conference room C. Don't forget your jacket, it can be cool down by the water."

Sigh. "Thanks Mom," I teased, heading down the stairs.

She smiled and shook her head.

Fly Fishing

There was a hint of fall in the air as I walked down the path behind the plant. At the bottom of the hill, the familiar wooden trestle bridge greeted me like an old friend. So many boyhood memories here, fishing. I leaned on the railing for a time, watching the water flow by beneath my feet. Listening to the sounds of the water. Thinking.

My reverie was interrupted by voices behind me. I turned and walked over to the other side of the bridge. There, down on the river stood a man and a boy, knee-deep in the water. Both sported hip waders and fishing garb. The boy wore a baseball cap, the man, an old fishing hat with lures all over it — and on the front, a bright red fly, for luck. He was teaching his son the fine art of fly fishing.

They were facing away so I quietly observed.

With great patience, the man explained the river to his son. He pointed out the boulders and how the water would carve deep pools behind them where the fish liked to gather. He showed him their hiding spots in plant beds and roots. And he taught him about the insects that fish liked to eat, each kind in their season, and how to select the flies that would mimic their food.

The father showed the boy how to hold the rod and to cast the line. Strong hands guided uncertain, wrists locked, forearms doing the work. Rod tip back to 12 o'clock. Pause to let the line follow. Forward to 10. Pause. Repeat. I watched the sinuous line weave smooth arcs in the air. On the final cast, the line draped onto the water, depositing the delectable morsel at its tip just upstream of a boulder. It drifted with the current over the boulder, then…

BAM! The rod arced forward, straining against a struggling trout. The boy squealed with delight. The father helped him reel in the line, maintaining tension yet not allowing the fish to break the surface and escape.

As it got close, the man grasped the exhausted fish with two strong hands and removed the barbless hook from its

mouth. The two admired the fish for a moment, then with great reverence, the father lowered the fish back into the water facing upstream, letting water flow through the gills. As the fish recovered, he relaxed his grasp until the fish wriggled free and was gone.

Revelation

Suddenly, I understood.

What I had just witnessed was an interaction, not an event. The boulders, roots, fish, even the fishermen interact with the flow of the water. All are part of a complex, unpredictable environment. The fisherman and the fish engage in a dance of skill and strategy, interacting with each other and their environment. And while the results are never certain, there are things the fisherman can do to improve his chances, like using lures as attractors. "To catch a fish", my Dad would say, "you have to think like a fish".

As a boy, I would sit on this bridge and drop my line into the water to "catch" a fish. That would rarely work and I'd sometimes shout out my frustration at the stubborn behaviour of the fish.

That's exactly what I was doing with Fred. We'd "fish" for his requirements then go off to implement them. We didn't realize that we were dealing with a complex, changing environment where everything interacts with everything else. Requirements knowledge is like that water — it's not a fixed thing, but a flow that changes and interacts with our environment.

To work in this environment, Fred and I would have to flow with it. Together. Trying to change Fred's behaviour won't work — I need to change the nature of our interaction instead. That kind of interaction requires proximity and communication.

At that very moment, the man turned around and looked me straight in the eye, the red fly on his hat dazzling in the sun. He smiled broadly and nodded. Then both he and the boy vanished.

Going with the Flow

My meeting with Fred went better than expected. Turns out that Fred is an avid fisherman. So when I explained yesterday's experience down at the river, he immediately grasped the concepts of our complex interactions and the continuously changing flow of knowledge between us.

He was particularly pleased when I suggested we set up a liaison position for him on our development team so we could keep each other abreast of his changing requirements and our capabilities.

Proximity and communication. We were back in business, and for the better.

Back in my office, I knelt down beside the box and slit the blue packing tape. I slowly opened the flaps, took a deep breath and sat back. Right there on top was Dad's old fishing hat with lures all over it — and on the front, a bright red fly, for luck.

"Thanks, Dad", I whispered.

Rick St. Germain is a CM researcher, consultant, trainer, and coach with over 30 years experience in implementing military and commercial CM processes for both hardware and software. He is President and Managing Director of Nouvella Consulting Services based in Ottawa, Canada, and is Chief of Canadian Operations for CMPIC Canada. He can be reached at rstgermain@rogers.com

RICK ST. GERMAIN

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This 2.5-day event is great for anyone responsible for configuration management or process improvement within their organization. All experience levels and backgrounds are welcome! CM Trends attracts an international array of attendees from both commercial and governmental organizations. CM Trends' diverse attendance is what makes this event great for networking and learning from other's experiences.

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Every year CMPIC hosts discounted CM certification and training courses to celebrate a successful CM Trends event. These courses (typically $1275) will be offered at $995 to the public or only $800 in addition to your CM Trends 2015 registration. Register now to learn more about one of the following:

Course 5, "CM for IT & Software Development" certification class
Course 9, "CM Standards & Practices Update" refresher class
Course 10, "SAE/EIA-649-1 CM Requirements for Defense Contracts" class

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i-infusion / CMPIC, A. Larry Gurule - "Operation of Acquisition System CM and the "-1""

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usb GmbH, Harald Schwabe - "CM Identification and Status Accounting Based on a Development Plan and Breakdown Structure"

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* Above information is subject to change.

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Register Now

U.S. Military Radar Stations Secure with CM

by Rob McAveney
Aras Corporation

The United States began developing the Ballistic Missile Early Warning System military radar installations around the world in the mid-1950's, with the majority of locations in continuous operation since inception. Most sites were developed independently, with little consistency across systems and processes. Missile systems information, including drawings, manuals, technical specifications and other documents existed only in paper format or as scanned images stored in a variety of database formats, which included Oracle, Microsoft Access and SQL, on a wide range of mini and mainframe legacy computers.

The USAF/ITT had no centralized access or visibility into this mission critical information and any planned maintenance required significant site downtime, which is extremely undesirable given the nature of these vital systems. Historical configuration data was either unavailable or unreliable, system changes were tracked manually and all changes were made by hand, with redline drawings stapled to previous versions and stored in file cabinets. The simple act of referencing the wrong drawing or the wrong version of that drawing before conducting repairs or planned maintenance could cost valuable time and money or jeopardize security.

Using a data migration and validation methodology to ensure data integrity, numerous data sources were migrated into Aras where a baseline of the related US military radar installations around the world was created. A new data model was developed and published as a secure WSDL (Web Services Discovery Description Language) along with forms, permissions, lifecycles and workflows, and comprehensive configuration management business logic, including product structure management, document management, change management and Bill of Materials (BOM) management capabilities, have been applied to the now-vaulted and controlled data.

Configuration Management – Enables USAF to track, manage, compare, and report on common radar site designs and individual radar sites. Product structure

includes versionable parts with properties such as Units of Measure, Make/Buy designation, Vendor Model Number and Special Handling instructions. Each part is tagged with a unique Commercial and Government Entity (CAGE) code.

Document Management - Military radar installations feature over 30 different types of documents, including specifications, drawings and manuals, each with differing requirements for tracking, permissions and approvals. All document types include properties to track security classification, data rights, and distribution and handling instructions. Currently over 50,000 drawings, 2,000 documents, 300 specs and 1,000 manuals are tracked and maintained in Aras.

Change Management – Introduces automated online change control and change authorization for specifications, documents, drawings and parts lists. Lifecycle states include Preliminary, In Work, In Drafting, In Review, In Government Review, Released and Cancelled. These capabilities support requirements for the Technical Document Package (TDP).

Bill of Materials Management – Multi-level, Multi-type BOM provides complete view of product structure. A single BOMs contains 25,000 unique drawings, 130,000 BOM records and 15 levels of indenture.

20 Locations including Hanscom and Peterson Air Force Bases have secure access with more sites planned to come online over time. A unified process is in place for change management and revision tracking, and 700 individual users across the UASF and authorized defense contractors. Each person has Need-to-Know level security logons for vital drawings, parts lists and mission critical information. What's more, reporting capabilities provide valuable insight and business intelligence, such as mission data, program information and logistics to program stakeholders.

By unifying the configuration and change management process and using automation technology from Aras, the USAF has achieved better control and coordination on the Ballistic Missile Early Warning System military radar installations. In addition, better global visibility has improved maintainability, streamlined operations and saved tax dollars while delivering more reliable security for citizens around the world.

Rob McAveney is chief architect at Aras, a global provider of enterprise PLM solutions for configuration & change management, requirements management, engineering and supply chain processes. Rob has over 15 years in the design, development and implementation of CM systems. He started his career at Boeing in engineering process development and systems integration.

ROB MCAVENEY

ANNOUNCING:

CMPIC Europe 2015

ANNOUNCING: CMPIC 's European partner, usb Management Consulting and System Development GmbH, will be sponsoring the first ever CMPIC European Configuration Management Conference

26 - 27 October 2015
Dorint Hotel Augsburg
Imhofstraße 12
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GERMANY

Adapted to the European market, experts and colleagues will meet in Augsburg on October 26th and 27th 2015 to get up to date and discuss the latest trends and developments of CM. Many interesting presentations from the wider area of CM and Product Lifecycle Management will provide an indepth view of how other companies handle challenges.

Grab this opportunity to take useful information to your company and get yourself up to date on CM!

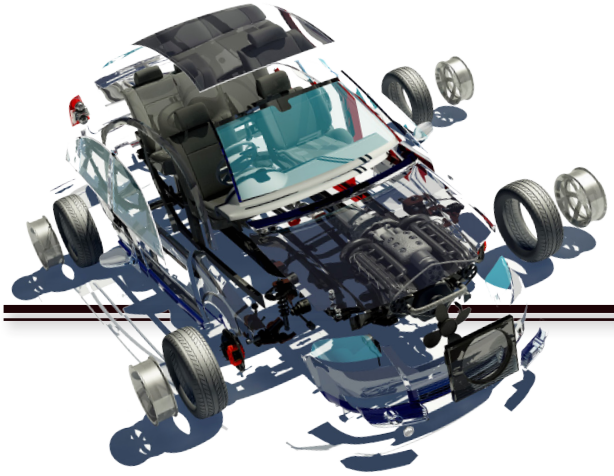
We invite all of you to participate and explore new trends in configuration management. In addition to high-class speakers and workshops, attendees will have the opportunity to network with fellow CM professionals and take advantage of the many educational opportunities offered during the conference.

The conference will be open to all points of view, there is no focus on one particular methodology. It will address various environments: Hardware, Software, Operational IT, Facilities etc. as well as many industries: Automotive, Medical, Aerospace, Defense, Energy, IT and more. The presentations will also cover the full product life cycle elements (e.g. Development, Production, Deployment, Operation & Maintenance and Decommissioning). The status of industry standards for CM, and related requirements for CM, will also be addressed.

The conference is an exciting way to keep current on the what is happening in the world of CM, so we do hope you plan to attend.

More information about this event can be found at http://www.cmpic.eu

Spoon Feed the Audience



by Leo Clark
CMPIC LLC

I was working with an automobile company in the midwest. They had a continuously moving assembly line. Different models of vehicles passed by, suspended from overhead.

An assembler stood on a moving sled. The sled traveled up to the line and moved past at the same speed. A basket with the correct number of correct parts moved to his left hand. Another basket with the correct air wrench and socket moved to his right hand. The correct instructions for mounting the parts appeared on a flat screen monitor where he could easily see them.

The assembler elegantly completed his job. The sled moved away from the line. It then indexed back to the starting point. The assembler was ready for the next model as the correct parts, tools, and instructions were spoon feed to where the job could be completed correctly and seamlessly.

Point of Production

When I worked implementing Manufacturing Execution Systems (MES), we talked about PoP - the point of production. All work for all employees is focused on PoP; parts assembled, tools loaded and ready, coolant flowing, chips flying, and even software built and loaded. That is where the true work of an organization's purpose lies.

Everyone else, including engineering, marketing, HR, procurement and finance, even management, need to focus on PoP. The product, sold to the customer, generates the revenue that funds everyone's paycheck.

It becomes essential to make sure that the PoP is served, all obstacles removed, all dilemmas resolved and the necessary parts, tools, measurement devices, and especially information spoon fed where and when they are scheduled. That is the reason that processes need to exist and be continuously improved.

What Audience?

Now let's expand the question. If it is imperative to spoon feed everything an assembler needs to do their job correctly, what about every other person who performs work? Modern management theory says to serve the customer, to exceed their expectations. Theory also tells us that internal customers should be thrilled to the same level as our external customers. The artifacts of previous process steps should be correct and available to the next step in the process so that work can be performed correctly the first time.

In that case, everyone who does work is an audience. Everyone needs materials, tools, metrology, and

information to do their job correctly the first time and every time. Everyone is at a PoP. We should thrill these internal customers as well as our external customers.

The Reality

Unfortunately, some configuration management processes fail to serve the audience. If someone needs information to perform some work, the instructions usually go like this:

"Check the Outlook thread with the Subject line Re: IMPORTANT because three months ago I broadcast an all hands email with a Word document attached that has the meeting minutes from the CCB that explains where to find the Sharepoint folder with the spreadsheet that lists the latest version of the scanned CAD file converted to a PDF. Print out that file and check with the manufacturing supervisor to see if there are any approved redlines that haven't been incorporated yet. Then check with procurement for the alternate material to use because we ordered parts too late and all the right stuff is on backorder."

And we expect to be world class, ready to compete in a global economy with the Big Dogs. Good luck with that.

A Better Idea

I have a better idea. The purpose of the CM process is to populate the Project Management plan. All change involves tasks to be performed. The work that anyone does is to the exclusion of all other work and all other performers.

We should know who is going to do what work when. We need to create processes that spoon feed all of the essentials to every PoP.

If a design engineer needs to incorporate three changes in to a drawing, they should simply click on that task on their outlook To Do list. The correct CAD tool should open, automatically check out the correct drawing, the three correct change packages should open in a cascade on their workstation and the implementation should be completed correctly and seamlessly.

It's 2015. We are deep into the 21st century. If your organization is not already performing this way, or at least has plans to move in that direction, you are not ready to compete in the cold, cruel global economy where customers don't care how hard you have to work. They only care if you did things correctly.

And if you ain't ready to run with the Big Dogs, better stay on the porch or get out of the dogfight altogether.

Leo Clark has over 25 years of CM and related QA experience and ten years with the Institute of Configuration Management. He has taught configuration management to thousands of students and consulted on CM, SCM and QA implementations for over 1000 companies. Leo has consulted with PDM/PLM software tool providers to improve workflows & functionality, and taught and consulted extensively on SPC, CIM, DNC, MES, ERP, preventive maintenance. He is the author of numerous articles, papers and presentations on SCM, SPC and management methodologies. Leo is a graduate of Marquette University, CMPIC Certified, CMIIC, CM Lead Assessor Certification, U.S. Marine Corps, member ACDM, and ASQ. Leo once played banjo for the Commandant of the Marine Corps. He also helped Andy Warhol digitize Debbie Harry.

LEO CLARK

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