CMTrends

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When Change Goes Bad

by **Suzanne Marvin**
US Air Force

Configuration Management ensures that the design and build of a system is good and trustworthy. Changes to a system are inevitable and driven by many things: parts obsolescence, necessary enhancements, upgrades that affect the interfaces within the system, or simply to keep up with the fast pace of technological advances of our allies and our adversaries.

The worst circumstance for making changes is when it is the result of an emergency or when a catastrophic event occurs. The worst reasons for making changes are when they are done in haste to simply save money.

In April 2010, the Deepwater Horizon Oil Rig blew, killing 11 workers and causing a major oil spill.

According to the New Orleans Times-Picayune news, five days before the accident, BP had asked for the government's permission to change the well design three times in a span of twenty-four hours. Each request was immediately approved by the U.S. Department of the Interior, some within minutes. The rush to make changes quickly in an effort to save costs was only one of several errors. Additionally, there were tests that were not done and tests that were misread, which lead to the massive oil spill in the Gulf. This emphasizes the importance of having a formal change control process and executing to that process.

Change control is a formal process that ensures changes to a system are brought about in a disciplined, systematic way. Your Configuration

Manager ensures the appropriate levels of experts are aware of all major proposed changes and are authorized per the Configuration Control Board Charter. Your Configuration Manager ensures there is a historical record of all proposed changes and that specifications/documents are updated to include all approved changes.

Why is this important? By following a formal change process, the configuration community ensures the cost and schedule impacts of all changes have been scrutinized and are understood, the change is appropriately documented and classified, no unnecessary changes are made, and resources are used efficiently. The Configuration Manager also ensures the change is reviewed by all appropriate multi-functional experts; Test experts are aware of and can decipher what and when tests need to be done; program support experts can check for parts availability; financial managers can determine cost feasibility; Contracts can review for contract impact; engineers can determine the impact to other interfaces within the system; and Safety and Environmental experts can review to determine the risk to the users and the environment.

Your program configuration manager is the key to determining changes to a system are not done in haste without first ensuring each functional expert has reviewed and coordinated. Through a "checks and balances" system, the guesswork is removed and your Configuration Manager safeguards the process so that any changes made to a system are positive and necessary, and the system baseline remains true and trustworthy.

Suzanne Marvin is a Configuration/Data Specialist for the United States Air Force. She has been working in Configuration and Data Management since 1990. She has Level II certification in Manufacturing, Production and Quality Assurance and holds CM certification at the Advanced Level from the Configuration Management Training Foundation. Suzanne has published articles for the AFLCMC/EN Engineering Newsletter and the Tampa Bay Tribune and has received numerous commendations over the years for her work on various Government programs, including the Exemplary Civilian Award for her support on the KC-46 Tanker program. She graduated from Park University with a major in Management: Logistics.

SUZANNE MARVIN

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Summing Up – ITAR and IT Security CM

by Jon M. Quigley, Kim Robertson, & Joe Townsend
Value Transformation LLC

Rewind

Akio Akiyama had spent many long sessions with Mike Tarquist in 2015 discussing the possible acquisition of various startups they had funded that were developing promising technologies, including one called QuBitics.

"I believe that the technology base being developed by QuBitics is going to give a market advantage to anyone that can acquire and leverage it forward," Mike stated.

Akio shook his head and replied, "Acquisition of QuBitics may not be advisable. I believe that someone there may be involved with contravention of the International Traffic in Arms Regulations."

Mike looked startled. "ITAR violations! What haven't you told me?"

Akio took off his glasses and rubbed his eyes. "When we were assessing the hardness of the BGS IT infrastructure, we discovered that their IT systems had been infected by a very sophisticated virus. The virus differed from those we were experienced with, in that it was not a back door into BGS. Instead, it systematically transmitted data that met set parameters to a non-authorized destination. Since their technology has military application, BGS contacted the Department of Homeland Security Investigations department to let them know

that there was a possible ITAR violation.

"They disclosed that they had not filed a voluntary disclosure of the ITAR violation and asked if they should hold off and wait for direction before doing so. The Department of Homeland Security Investigations pulled in the FBI and Special Agent Sandra Davis was assigned to look into the matter.

"Sandra also was liaison with the rest of the export enforcement community. When the firewall came down at BGS, the first thing across the interface was the Pepé program, which is used to assess the hardness of the BGS systems. The virus sent the Pepé program across the interface.

"The government has a no-hack back policy. Mitsikara and BGS had to explain what had happened to the Defense Department's Defense Innovation Unit Experimental. Fortunately, it was done inadvertently as the test of IT system hardness was done against BGS. BGS simply did not know they
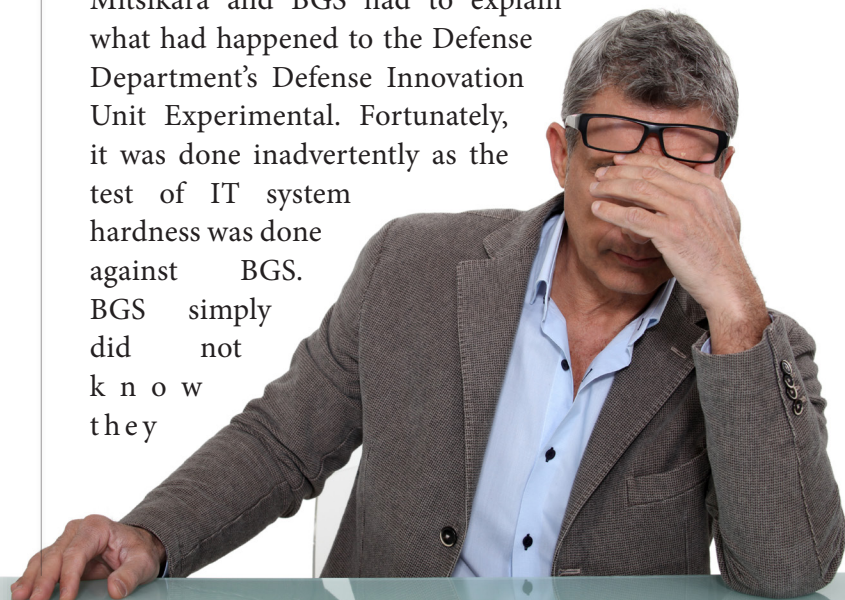
were infected.

"Sandra and her team have determined that data was sent to a location they are not disclosing, via a link through the QuBitics extranet. As it turns out, BGS had hired QuBitics a few months before to build some specialty algorithms for them. The virus was found to have been embedded in those algorithms."

Mike picked up his cup of cold coffee and stared out of the window. It was a pleasant fall evening. He took a sip and then replied, "How well do you know Special Agent Davis?"

"Well enough to know she is solid and discrete," Akio replied. "Do you want to meet with her?"

Mike nodded. "Most definitely. We need to have Gabriel Sanderson from Reddick there, as well. This is bigger than we are and we can't do it alone."

The Rozzers and the Red Queen

Two weeks later found Mike and Akio inside of the FBI facility on Lord Baltimore Drive. The meeting was surprisingly relaxed for such a formal setting. Gabriel Sanderson, Genesis's major competitor, acknowledged Mike's nod. Before they could talk, a loud tapping on the conference table called the meeting to order. A trim, middle aged woman wearing a business suit and holding a Baltimore Bandits hockey puck in her hand stood at the end of the table. Prematurely grey hair framed a pair of Steve Jobs-esque glasses.

Sandra Davis got straight to the point. "We first became aware of the fact that controlled data was being made available to non-U.S. persons by Cindy Delacour, CEO of BGS. The results of operation Pepé have left a trail of circumstantial evidence that point to QuBitics as the cause of the data breach and source of the virus discovered at BGS. This is reinforced by QuBitics' recent server crash. We will assume, for the moment, that this is a result of the Pepé program. Despite the financial difficulties QuBitics is undergoing at the moment, its CEO Erika Muller has shown signs of unusual affluence. This is a rare thing in a start-up company, where the trend is for the principles to be heavily invested in their firms.

"We also have concerns that the person or persons of interest at QuBitics may be reaching out to other customers for their data. Mr. Akiyama, can you fill us in on the events that transpired between Ms. Delacour and Mitsikara?"

Akio looked up and smiled. "Mitsikara International was approached by Ms. Delacour with an inquiry about the possibility of investing in QuBitics. That request was channeled to me, as I had some knowledge of the firm. It was common knowledge that NASA AMES's Quantum Artificial Intelligence Laboratory, or 'QuAIL', was in the process of acquiring access to a D-Wave systems quantum computer.

"I reached out to Special Agent Davis, who had one of her people get back to Ms. Delacour posing as a representative of Mitsikara with a polite refusal to invest and a strong hint that Mitsikara might be receptive to acquiring all data relative to their work for D-Wave. This was done with full knowledge of Mitsikara and its legal team."

Sandra resumed, "What was not common knowledge was that the Los Alamos National Laboratory was acquiring a D-Wave system. This alone influenced

our investigation. Not only did we receive a response indicating that it was indeed possible, but it was followed by a query about the possible interest of Mitsikara in acquiring data from other firms. We used a phrase from an old poem called the Mole Catcher to indicate that the money transfer had taken place and subsequently we received the D-Wave information.

"We have enough proof to indicate that a virus similar to that found at BGS was also embedded in the D-Wave information, but we want to let things play out for a little longer. As you know, D-Wave is a Canadian firm which, combined with Ms. Delacour's reaching out to Mitsikara, makes this of multinational concern. In cooperation with our counterparts in Japan, Canada, and D-Wave, we have isolated a strain of the virus at D-Wave and protected Los Alamos from infection.

"That is where Genesis Test Equipment and Reddick come in. Both of you provide simulators and test equipment to the U. S. Government. Both of you are interested in acquiring QuBitics. You have volunteered to help and we accept. We are setting up what the media refers to as a 'sting' operation and here is how we envision it playing out."

By the Numbers

Mike watched the group in his office with interest. "While you are at it, would you mind taking a look at this and giving me your opinion?"

Erika's face went pale. "The words are from the Mole

Catcher. This proves we have someone inside feeding our IP through the firewall to our competitors! This happened once, not long before we joined with Genesis. It took down our servers and cost us big time."

"Are you sure?" Mike asked. He couldn't help noticing Fred Keating, head of Genesis IT, hitting a key on his laptop and then shutting it with a wry smile on his face.

Erika fumed. "This couldn't have been done by an external threat. Zubin is right; we need to find the mole!"

Mike stared out the window. "Say nothing about this breach or the analogue system to anyone. I'm going to see if we can engage Akio and Zubin for a week or so and set up a remote hub so no one knows we are looking for them. Meanwhile, get busy on that RFP. Let's meet back in my office in two weeks to see where we are."

The team gathered together again and presented inconclusive results in their search for the mole. A dozen people unknown to the rest of the team were present. One of them, a middle aged woman with glasses, smiled.

Fred Keating, head of Genesis IT, summed up the findings, "If there is a mole, they certainly have covered their tracks. We can find no trace of a data leak from any of our IT locations."

Mike looked tired as he took a set of documents from his brief case and slid them across the table to Fred and Erika. "I would like you to look at this and tell me again that we do not have a leak. I think you will find the data to be a rather compelling argument countering your assertions."

The color drained from Fred's face and tears started to run down his cheeks. Erika simply shrugged and in a voice laced with venom said, "You can't blame a girl for trying!"

"Ah," said Special Agent Sandra Davis. "But we can."

Mike stood up as Fred Keating and Erika Muller were taken into custody and escorted out saying, "I'd like the rest of you to stay for a few minutes."

A sense of shock and disbelief permeated the conference room. Mike dialed in as the host to a prearranged net meeting. "Sorry to keep you waiting; the Red Queen is no longer in play!"

Gabriel Sanderson's graveled voice was heard to say, "Roger that. I'm not sure I could have pulled it off."

Zubin Rhumba chimed in, "Chalk one up for International Cooperation. Cyber security impacts us all."

Zuberi Sumbako's deep chuckle rumbled from the speakers, followed by Akio's calm voice. "I'm sure that some there at Genesis are in the dark, so let me fill them in."

The meeting lasted for another hour.

A Good Year

The senior staff of Genesis Test Equipment gathered in the firm's board room the afternoon before their annual year end celebration. Each department head was prepared to present their accomplishments and goals for the next year.

Mike had indicated that he might be late, so Sangita Morales started by presenting a summary of the company's successful acquisition and roll out of the new SW CM solution.

"Last quarter, it was determined that the need for a new software tool suite was impacting both development and integration of QuBitics with the rest of Genesis. I'm happy to report that the new suite is in place and exceeding expectations. This has been combined with a critical upgrade to our IT infrastructure that hardens us against both external and internal threats. I'll call on Samantha Vandonagan to fill us in on developments in our business pursuits."

Sam looked around the room and smiled.

"It has been a great year on the new business front for Genesis. I won't go into detail, but here are the highlights:

"We have teamed with Tech Xplore to work on noise reduction in a memory-crunching computer prototype, known as 'Memcomputer'. Memcomputers

are a non-Turing paradigm of computation that uses interacting memory cells to store and process information on the same physical platform.

"NASA AMES's Quantum Artificial Intelligence Laboratory, or 'QuAIL', has acquired a D-Wave systems quantum computer. We have a small contract with AMES to assist in algorithm development.

"Analytic Systems has given us a contract to help develop their non-base two computing systems. They are seeking venture capital to expand their base five system to a base 32 system, believing that it will present a more attractive alternative to their intended markets. In the interim, Genesis will assist in defining the system architecture and verification methods.

"In addition…"

Mike Tarquist walked into the meeting and held up his hand. "I'm sorry to be late. I finished testifying in the proceedings against Fred Keating and Erika Muller late yesterday. Both will be indicted, along with several foreign nationals."

Sam continued, "On the subject of Fred Keating and Erika Muller; while we hear much these days of data breaches by outside sources, we have found out the hard way that data can be compromised just as easily from the inside. I'd now like to turn things over to Sean Ironist, our Director of Finance, to go over the year end EBIT and current backlog."

Sean grinned. "I'm happy to report that there will be a 100% stock match this year, due to the excellent performance across all of our business sectors. I won't go into detail, but it looks like 2016 will be a strong year for us. Here is what our financial picture looks like…"

Mike filled his coffee cup and as he waited for it to cool, he started framing what he was going to say at the party later in the day.
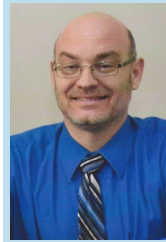
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