The PRACTITIONER

A monthly newsletter of the Energy Facility Contractors Group's Project Delivery Working Group

Issue 15 October 2020

EVMS: The Future Is Now!

Greetings PDWG Team Members. In this month's *Practitioner*, we look at the future of how earned value maturity and its environmental factors may be rated. This "study" kicked off in May 2019, and is currently on track for process "training" to begin in September 2021. Please read on to get a project status and a good look at the future of EVMS.

The EFCOG Project Delivery Working Group (PDWG) partnered with the Department of Energy's Office of Project Management (PM) and other industry and agency representatives to develop an Earned Value Management System (EVMS) Maturity and Environment Total Rating (EVMS METR) process/tool.

At a recent Civil Agency Industry Working Group* (CAIWG) meeting, Mr. Melvin Frank, Director, Project Controls Division (PM-30), Office of Project Management (PM) provided the status (below).

**The CAIWG (pronounced kay-wig) provides a forum for the open exchange of government and industry views on performance-based systems, including Earned Value Management (EVM).*

EVMS Maturity and Environment Total Rating (EVMS METR)

— Mel Frank, PM-30

EVMS Research:

The Aims and Objectives of EVMS research are to elevate the worth and utility of the EVMS through unbiased scientific research; to develop a scalable EVMS Maturity and Environment Model inclusive of EIA-748 requirements that can accommodate the unique missions, program and project types of the DOE, DoD, NRO, NASA, and other agencies, as well as commercial ventures requiring disciplined scope, schedule, and cost management; and to develop a weighted EVMS Maturity and Environment Scoring Method that provides insights into implementation risks and opportunities.

The target audience includes individuals with the necessary EVM experience, technical background, and training in the relevant subject matter to provide an informed opinion and contribute to the decision-making process based on acceptable best practices, recognizable standards, and methods.

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EVMS Maturity and Environment Total Rating (EVMS METR)

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Progress:

To date, the following tasks have been accomplished:

- ☑ Conducted an industry survey on EVMS with 291 responses
- ☑ Drafted EVMS Maturity assessment
- ☑ Drafted EVMS Environment assessment
- ☑ Conducted 6 testing workshops to date:
  - ► 73 workshop participants
  - ► 1186 comments received
  - ► 914 comments addressed to date (77%)
- ☑ Testing Maturity Attributes and Environment Factors in Surveillance Review (now)
- ☑ Two additional Maturity workshops planned in November (11/5 and 11/17)
- ☑ Established EVMS Environment Factors and Finalizing Weightings
- ☑ Established EVMS Maturity Attributes and Finalizing Weightings

EVMS METR Milestones:

05/08/19 Team kick-off
06/30/20 Developed Maturity and Environment assessments
07/09/20 Maturity Workshop #1
07/16/20 Environment Workshop #1
08/05/20 Maturity Workshop #2
08/12/20 Environment Workshop #2
09/10/20 Environment Workshop #3
09/15/20 Environment Workshop #4
11/05/20 Maturity Workshop #3
11/17/20 Maturity Workshop #4
02/15/21 Finish conducting additional workshops to collect data
08/31/21 Finalize research, publications, and software
09/01/21 Start training

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EVMS Maturity and Environment Total Rating (EVMS METR)

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Typical Large and Complex Projects/Programs:

Industrial Energy Defense Aerospace Manufacturing Infrastructure

Definitions:

Earned Value Management (EVM): The use of performance management information, produced from the EVMS, to plan, direct, and control the execution and accomplishment of contract/project cost, schedule, and technical performance objectives

Earned Value Management System (EVMS): An organization's management system for project/program management that integrates a defined set of associated work scopes, schedules and budgets for effective planning, performance, and management control

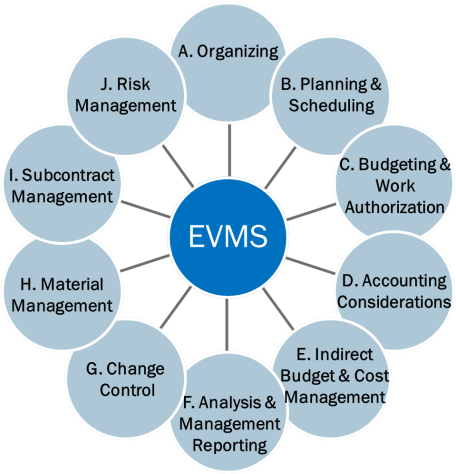
EVMS Maturity: The degree to which an implemented system, associated processes, and deliverables serve as the basis for an effective and compliant EVMS

EVMS Environment: The conditions (i.e., people, culture, practices, and resources) that enable or limit the ability to manage the project/program using the EVMS, serving as a basis for timely and effective decision-making.

Ten EVMS Processes:

EVMS Maturity Attributes can have a significant impact on the efficacy of the EVMS. The team identified 56 attributes making up the 10 EVMS processes. Each attribute can be assessed a maturity level from 1 to 5, with 5 being highest maturity. The 10 processes are demonstrated in the graphic below.

The entire presentation can be found here.



EVMS Process

A series of interrelated tasks that, together, transform inputs into a system to achieve Earned Value Management (EVM)

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It is Not One World — What We Do and How We Do it Matters!

The Concorde supersonic jet's only accident in its history was due to a series of bad decisions

— Written by Adam Russell, WRPS EVMS Compliance & Reporting

On July 25, 2000, the only accident in the quarter-century history of the Concorde airliner occurred when Air France Flight 4590 crashed into a hotel outside of Paris following a labored takeoff, not only claiming the lives of 123 people but also signaling the end of the jetliner's existence. Just three years after the Air France Flight 4590 tragedy, the Concorde went out of service for good; experts couple this incident with the decline in air travel following the 9/11 attacks for the airliner's demise. Either way, the novelty of supersonic air travel began to wear off with the public.

In the aftermath of the accident, criminal charges were filed against Continental Airlines, which operated the airliner, and a maintenance worker who failed to secure a piece of metal on another aircraft that fell off onto the runway. Later, charges against both were dropped on appeal.

The errant piece of metal was initially thought to have caused the airplane to veer off the runway when a tire was punctured and exploded, sending a large piece of rubber hurtling toward the wing's fuel tank. The fuel tank ruptured and a large fire ensued when leaking fuel was ignited by hot gases coming from the engines. After taking off prematurely, moments later the plane lost control and crashed into a nearby hotel, killing all 109 passengers and crew along with four others on the ground.

However, subsequent investigation and expert testimony revealed it wasn't just the blown tire and the events that followed that caused the plane to crash.

"Basically, it's like any aircraft crash — it was a whole series of things that led to the final tragedy," said John Hutchinson, a former Concorde captain, in a recent online interview. "It was not just one single thing that caused it. Typical aircraft accident."

The chain of events began a couple of days earlier while the aircraft was undergoing routine maintenance. A problem was discovered in the left wing undercarriage and the whole assembly was taken apart. But during the reassembly, a spacer that separates the two pairs of wheels in the landing gear was left off. That part keeps the wheels in alignment with each other.

Then on the day of the flight, the captain, Christian Marty, authorized the refueling crew to override the automated system to allow the fuel tanks to be filled to full capacity with no air space, in addition to an exorbitant amount of taxi fuel.

Then, a mechanical issue was discovered that Marty correctly insisted be repaired, which led to the flight being delayed by at least an hour. Most of the flight's passengers were German tourists heading to New York to join a cruise ship there, so timeliness was critical.

Following the repairs, Marty was informed that 19 luggage bags were being left behind

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because the aircraft was overweight. But, he ordered that the bags be put on the plane anyway, which he also was warned would skew his center of gravity. He insisted that the bags were necessary because the cruise ship was headed to Sydney, Australia, for the Summer Olympics and the passengers needed their luggage.

Another bit of information that may or may not have factored into the accident was that Marty requested permission to use a part of the runway that was technically closed for resurfacing. But the captain knew the plane was very heavy and needed the extra length to get it off the ground. Then, with the plane already extremely overweight with excess baggage and fuel, the flight was cleared for takeoff just as the wind shifted to the rear of the plane.

"So here is this airplane that's over the maximum of structural takeoff weight, with a center of gravity that is over its aft limits, cleared for takeoff with a tailwind," Hutchinson explained. "This effectively put the airplane about seven or eight tons over the weight it should have been at."

Taking off with a tailwind is usually acceptable when the aircraft meets its normal specifics for weight, and can even be achieved with excess weight using updated calculations. In the Air France Flight 4590's case, changing takeoff direction would not only have eliminated the additional downforce on the plane's tail section but also would have allowed it to burn off more of the additional fuel it carried. But none of the control tower or flight crew challenged the decision to take off with a tailwind.

It appears that also allowing the plane to take off on a runway that was partly under repairs was a poor decision. Remember the missing landing gear spacer, and the part of the runway that was being resurfaced? Speculation is that a fairly high "ledge" between the two runway surfaces caused the wheels to go out of alignment because of the missing spacer. A pilot in another plane waiting on the ground reported seeing smoke coming from those tires long before the Concorde ever caught fire, an indication that the tires were skidding along the surface rather than rolling.

Then, when the tires hit the errant piece of metal on the ground, one of them burst and sent a very heavy piece of rubber upward at high velocity into the wing section where one of the fuel tanks was located. The investigation concluded that the fuel tank didn't rupture from the force of the rubber hitting it, but rather from an internal shockwave that had nowhere to displace because of its overfilled status. Arcing electrical wires from the damaged undercarriage ignited the fuel and created a spectacular-looking "flame-thrower" from the bottom of the left wing.

Now about the fire. Hutchinson surmised that the fire would have eventually gone out once the fuel in that particular tank had burned off. But it couldn't have in this situation because the captain had authorized a booster pump and transfer valve that moves fuel from the rear tank to the wings and are normally off during takeoff were actually functional. This is because Marty knew his aft center of gravity was over limit and ordered the system to be turned on in order to

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The Concorde supersonic jet's only accident in its history was due to a series of bad decisions

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move fuel from the overweight rear of the plan toward the front. This decision resulted in the continual flow of fuel into the ruptured tank, thereby providing a constant ignition source for the fire that erupted.

With the plane in distress, the situation was compounded when it began to veer off of the runway and hit a light. Debris entered one of the engines and further damaged it, having already been compromised by bits of rubber from the exploded tire.

Now the captain was forced to send the ailing plane aloft because it was getting dangerously close to colliding with a plane waiting on an adjacent runway waiting to cross after the Concorde had taken off. With less than adequate speed to get an overweight aircraft off the ground properly, and with the handicap of a wayward landing gear, Marty had not choice but to get the plane off the ground to avoid an even greater disaster than the one that was about to happen.

Shortly after the plane left the runway, a fire alarm for the second engine on the left side sounded in the cockpit. Without any discussion with the captain, the flight engineer decided to conduct a "fire drill" on the alarming engine and effectively shut it down — now the aircraft had no power on the left side during a time when full power was crucial. Later, it was determined that the engine had not caught fire, but was overheating from the fire that was coming from the fuel tank next to it. Had the flight engineer followed procedure, he would have cleared the alarm and sent "contingency power" to that engine, thereby maintaining enough power to get the Concorde aloft and giving it enough time to make an emergency landing at a nearby airport.

As it was, none of that was possible because of the cascading number of poor decisions and lack of a questioning attitude that began a few days before the accident occurred.

The tragedy of Air France Flight 4590 is a grim reminder, as are most tragic accidents, of the importance of sound decision-making and following strict conduct of operations. Taking the time to double-check completed work for errors or omissions, adhering to regulations and not allowing time constraints to influence decisions, and complying with established procedures all factor into either the success or failure of a project or task.

You can see Hutchinson's entire interview here.

Another informative article can be read at www.askthepilot.com

Just for Fun: October's Notable Events and Famous Birthdays

1 — Yosemite National Park was established (1890), President Jimmy Carter was born (1924), the People's Republic of China was established (1949), Roger Maris broke Babe Ruth's single-season home run record with his 61st (1961), and 58 people were killed in a mass shooting in Las Vegas (2017).

2 — The Texas Revolution began (1835), Bob Gibson set the World Series single-game strikeout record with 17 (1968), TV personality Kelly Ripa was born (1970), and actor Rock Hudson died of AIDS (1985).

3 — Thanksgiving became an official holiday (1863), Iraq became an independent nation (1932), Britain successfully tested an atomic bomb (1952), and O.J. Simpson was acquitted of murder (1995).

4 — President Rutherford B. Hayes was born (1822), construction of Mount Rushmore began (1927), **the Soviet Union launched *Sputnik*, the first artificial satellite, into orbit** (1957), and Pope Paul VI became the first pope to visit the U.S. (1965).

5 — President Chester Arthur was born (1829), President Harry Truman delivered the first televised presidential speech (1947), the New York Yankees won a record fifth consecutive World Series title (1953), the first NC-17 film rating was given for Henry & June (1990), and Apple founder Steve Jobs died (2011).

6 — The first train robbery in the U.S. was staged (1866), and the Yom Kippur War between Israel and Egypt/Syria began (1973).

7 — The assembly line made its debut in a Ford factory (1913), East Germany was established (1949), rock star John Mellencamp (1951) and music judge Simon Cowell (1959) were born, and Operation Enduring Freedom began in Afghanistan (2001).

8 — Automobile inventor Frank Duryea was born (1869), **the Great Chicago Fire began** (1871), civil rights leader Jesse Jackson (1941) and actor Chevy Chase (1943) were born, Don Larsen pitched the only perfect game in World Series history (1956), actor Matt Damon was born (1970), and impeachment proceedings against President Bill Clinton began (1998).

9 — Hoover Dam began transmitting electricity (1936), and Beatle John Lennon was born (1940).

10 — The U.S. Naval Academy was established (1845), the first major operation of the Vietnam War began (1965), quarterback Brett Favre was born (1969), and stock car racer Dale Earnhardt Jr. was born (1974).

11 — Quarterback Steve Young was born (1961), the first manned Apollo mission launched (1968), and Saturday Night Live debuted (1975).

12 — Christopher Columbus reached the New World (1492), and singer John Denver died in a plane crash (1997).

13 — The Continental Navy was established (1775), the cornerstone of the White House was laid (1792), singer/songwriter Paul Simon (1941) and rocker Sammy Hagar (1949) were born, Bill Mazeroski hit the first ever World Series-winning walkoff home run (1960), and football Hall of Famer Jerry Rice was born (1962).

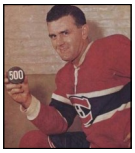
14 — General and President Dwight Eisenhower was born (1890), USAF Capt. Chuck Yeager broke the sound barrier (1947), the Cuban Missile Crisis began (1962), and rapper/singer Usher was born (1979).

15 — TV chef Emeril Lagasse was born (1959), and Wayne Gretzky broke the NHL career scoring record with 1,851 points (1989).

16 — Dictionary author Noah Webster was born (1758), China successfully tested its first nuclear bomb (1964), **"Baby Jessica" was rescued from a well on live TV** (1987), and 84 people died in a stampede at a World Cup match in Guatemala (1996).

17 — Motorcycle daredevil Evel Knievel (1938) and rapper Eminem (1972) were born, OPEC enacted an oil embargo on the U.S. and other nations (1973), and a 7.1 magnitude earthquake hit the Bay Area, postponing Game 3 of the World Series for 10 days (1989).

18 — The Mason-Dixon Line was established (1767), the U.S. took possession of Alaska (1867) and Puerto Rico (1898), singer Chuck Berry (1926), and NFL coach Mike Ditka and JFK assassin Lee Harvey Oswald (1939) were born.



19 — The American Revolutionary War ended with the British surrender at Yorktown, Va. (1781), and **Maurice Richard became the first NHL player to score 500 goals** (1957).

20 — The Louisiana Purchase was ratified (1803), baseball Hall of Famer Mickey Mantle (1931), rocker Tom Petty (1953) and rapper Snoop Dogg (1972) were born, and three members of Lynyrd Skynyrd died in a plane crash (1977).

21 — Jazz trumpeter Dizzy Gillespie (1917) and actress Carrie Fisher (1956) were born, and about 100,000 antiwar protesters marched on the Pentagon (1967).

22 — Actor Christopher Lloyd was born (1938), the U.S. suffered its first casualties in Vietnam (1957), President John F. Kennedy ordered a blockade of Cuba (1962), and Lance Armstrong was stripped of his 7 Tour de France titles (2012).

23 — TV personality Johnny Carson (1925) and musical parodist Weird Al Yankovic (1959) were born, and a car bomb exploded at the U.S. Marines barracks in Beirut, Lebanon, killing 241 (1983).

24 — The first transcontinental telegraph line was completed (1861), the United Nations was formally established (1945), Toronto won Canada its first World Series title (1992), and **the supersonic Concorde jet made its last flight** (2003).

25 — Artist Pablo Picasso was born (1881), and the U.S. invaded Grenada (1983).

26 — The Erie Canal opened (1825), the Shootout at the OK Corral occurred (1881), TV gameshow host Pat Sajak and politician Hillary Clinton (1947), and actor Dylan McDermott (1962) were born, and President George W. Bush signed the Patriot Act (2001).

27 — President Theodore Roosevelt was born (1858), New York's subway system began operation (1904), the Cuban Missile Crisis ended (1962), and the Boston Red Sox won their first World Series title in 86 years (2004).

28 — **The Statue of Liberty was dedicated** (1886), Congress overruled President Wilson's veto and enacted Prohibition (1919), rich guy Bill Gates was born (1955), actress Julia Roberts was born (1967), and the Digital Millennium Copyright Act was signed (1998).

29 — The stock market crashed, touching off the Great Depression (1929), actor Richard Dreyfuss was born (1947), the Suez Crisis began when Israel invaded Egypt (1956), and guitarist Duane Allman died in a motorcycle crash (1971),

30 — President John Adams was born (1735), "The War of the Worlds" was broadcast, causing a nationwide panic (1938), actor Henry Winkler was born (1945), and Muhammad Ali beat George Foreman for the heavyweight title in the "Rumble in the Jungle" (1974).

31 — Nevada became a state (1864), Magician/escape artist Harry Houdini died (1926), Earl Lloyd broke the color line in the NBA (1950), rapper Vanilla Ice was born (1967), and Indian prime minister Indira Gandhi was assassinated (1984).