

THE PRACTITIONER

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



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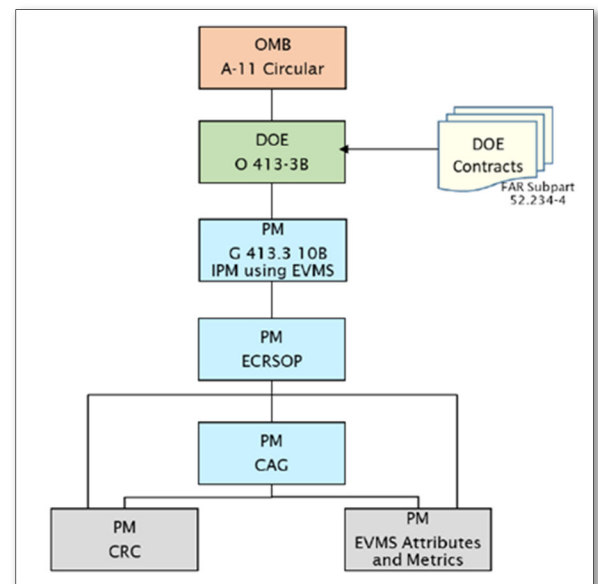
Coming to an Earned Value Management System Review Near You:

Integrated Program Project Management (IP2M) Maturity and Environment Total Risk Rating (METRR)

Last month, the Office of Project Management (PM) Project Controls and Policy Division (PM-30), Arizona State University (ASU), Energy Facility Contractors Group (EFCOG) Project Delivery Working Group (PDWG) and various other government agencies and industry contractors met face-to-face in Washington, D.C., and virtually, to close on the last three years-plus of research, workshops, and painstaking effort to modernize and optimize compliance reviews for the implementation of FAR Subpart 34.2 and the EIA-748 Earned Value Management System (EVMS) Standard, in accordance with the Office of Management and Budget's (OMB) Circular A-11.

This data-driven approach is used to efficiently test the reliability of ten core management processes from initial implementation and continually afterward to reduce the risk of failure during a project's life cycle. The capability to remotely test a contractor's EVMS data reduces and may eliminate the need for multiple government assessments, and the labor and travel costs associated with numerous visits to a contractor's site.

The review approach now includes acknowledgement and review of the environmental conditions which an EVMS is operating in. Environments that are EVMS friendly/supportive are more likely to use an EVMS as designed, allowing the intended purpose of providing early warning where deviations to the plan are occurring. A supportive EVMS environment allows the free flow of performance information for both good and unwelcome news to all stake holders alike. Ideally, this allows all stake holders to collaboratively resolve program/project impacts caused by deviations to the plan.



Hierarchy of DOE issuances used in EVMS Compliance Review Process

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IP2M METRR

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The elements shown below are categorically used look at the “**Environment for System Implementation.**”

1. **Culture** is, by definition, the display of behaviors. Organizational culture is a system of common assumptions, values, and beliefs (or the lack thereof) which govern how people behave and interact with one another inside of a project. Organizational values and beliefs align with the development and outcomes of a successful EVMS. The project culture can promote or hinder EVMS effectiveness.
2. **People** denotes the individuals who represent the interests of their respective stakeholders—project business manager, project control analyst, project schedule analyst, acquisitions or subcontracts personnel, control account managers (CAM), IPT or line/resource management, contracting officers, etc.—and are adept in the relevant subject matter to contribute to the implementation of the EVMS to achieve favorable project outcomes.
3. **Practices** are internal and external procedures and processes that can help or hinder desired project outcomes. Internal business practices and methods, including internal standards, requirements, and best practices, are specific to a given organization. External business practices, regulations, requirements, procedures, and methods span organizational boundaries (government to contractor, software provider to contractor, subcontractor to prime, and so forth).
4. **Resources** address the availability of key tools, data, funding, time, personnel, and technology, including software, to support the EVMS subprocesses.

“**Management Processes and Attributes for System Maturity and Effectiveness,**” are assessed through the following ten subprocesses:

- | | |
|--|--------------------------------------|
| A. Organizing | F. Analysis and Management Reporting |
| B. Planning and Scheduling | G. Change Control |
| C. Budgeting and Work Authorization | H. Material Management |
| D. Accounting Considerations | I. Subcontract Management |
| E. Indirect Budget and Cost Management | J. Risk Management |

Each attribute is assessed on a 1-to-5 maturity scale: “1” means that work on this attribute has not yet started, and “5” means best in class. Attributes that are mature enough for an EIA-748–compliant EVMS receive a maturity level of “4.” Those that are not yet mature receive scores of “2” or “3,” depending on their levels of maturity as determined by the assessment.

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IP2M METRR

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The maturity levels for each of the fifty-six attributes are detailed to enable an informed assessment. The definitions of the maturity levels (1 through 5) are additive, meaning that level 5 includes everything in level 4, level 4 already includes everything in level 3, and so on. Attributes deemed not applicable (N/A) for the project/program under consideration are marked “N/A” and do not affect the final

maturity score. A clear justification is added to explain why an attribute is considered N/A.

IP2M METRR helps projects and stakeholders execute their roles and responsibilities for meeting their collective goal of completing projects on time and within budget, while achieving quality, safety, and technical performance objectives using the EVMS.

Projects are encouraged to implement an EVMS designed for their unique management and reporting needs.

While this is just a glimpse of the IP2M METRR approach to EVMS reviews, you can learn more by accessing the following references from the “Project Management Library”:

<p>A. ORGANIZING</p> <p>A.1. Product-Oriented Work Breakdown Structure (WBS)</p> <p>A.2. Work Breakdown Structure (WBS) Hierarchy</p> <p>A.3. Organizational Breakdown Structure (OBS)</p> <p>A.4. Integrated System with Common Structures</p> <p>A.5. Control Account (CA) to Organizational Element</p> <p>B. PLANNING AND SCHEDULING</p> <p>B.1. Authorized, Time-Phased Work Scope</p> <p>B.2. Schedule Provides Current Status</p> <p>B.3. Horizontal Integration</p> <p>B.4. Vertical Integration</p> <p>B.5. Integrated Master Schedule (IMS) Resources</p> <p>B.6. Schedule Detail</p> <p>B.7. Critical Path and Float</p> <p>B.8. Schedule Margin (SM)</p> <p>B.9. Progress Measures and Indicators</p> <p>B.10. Time-Phased Performance Measurement Baseline (PMB)</p> <p>C. BUDGETING AND WORK AUTHORIZATION</p> <p>C.1. Scope, Schedule and Budget Alignment</p> <p>C.2. Over-Target Baseline (OTB) Authorization</p> <p>C.3. Summary Level Planning Packages (SLPPs)</p> <p>C.4. Work Authorization Documents (WADs)</p> <p>C.5. Work Authorization Prior to Performance</p> <p>C.6. Elements of Cost (EOC)</p> <p>C.7. Work Package Planning, Distinguishability, and Duration</p> <p>C.8. Measurable Units and Budget Substantiation</p> <p>C.9. Appropriate Assignment of Earned Value Techniques (EVTs)</p> <p>C.10. Identify and Control Level of Effort (LOE) Work Scope</p> <p>C.11. Identify Management Reserve (MR) Budget</p> <p>C.12. Undistributed Budget (UB)</p> <p>C.13. Reconcile to Target Cost Goal</p> <p>D. ACCOUNTING CONSIDERATIONS</p> <p>D.1. Direct Costs</p> <p>D.2. Actual Cost Reconciliation</p> <p>D.3. Recording Direct Costs to Control Accounts (CAs) and/or Work Packages (WPs)</p> <p>D.4. Direct Cost Breakdown Summary</p>	<p>E. INDIRECT BUDGET AND COST MANAGEMENT</p> <p>E.1. Indirect Account Organization Structure</p> <p>E.2. Indirect Budget Management</p> <p>E.3. Record/Allocate Indirect Costs</p> <p>E.4. Indirect Variance Analysis</p> <p>F. ANALYSIS AND MANAGEMENT REPORTING</p> <p>F.1. Calculating Variances</p> <p>F.2. Variances to Control Accounts (CAs)</p> <p>F.3. Performance Measurement Information</p> <p>F.4. Management Analysis and Corrective Actions</p> <p>F.5. Estimates at Completion (EAC)</p> <p>G. CHANGE CONTROL</p> <p>G.1. Controlling Management Reserve (MR) and Undistributed Budget (UB)</p> <p>G.2. Incorporate Customer Directed Changes in a Timely Manner</p> <p>G.3. Baseline Changes Reconcilable</p> <p>G.4. Control of Retroactive Changes</p> <p>G.5. Preventing Unauthorized Revisions to the Contract Budget Base (CBB)</p> <p>H. MATERIAL MANAGEMENT</p> <p>H.1. Recording Actual Material Costs</p> <p>H.2. Material Performance</p> <p>H.3. Residual Material</p> <p>H.4. Material Price/Usage Variance</p> <p>H.5. Identification of Unit Costs and Lot Costs</p> <p>I. SUBCONTRACT MANAGEMENT</p> <p>I.1. Subcontract Identification and Requirements Flow Down</p> <p>I.2. Subcontractor Integration and Analysis</p> <p>I.3. Subcontract Oversight</p> <p>J. RISK MANAGEMENT</p> <p>J.1. Identify, Analyze and Manage Risk</p> <p>J.2. Risk Integration</p>
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Maturity Subprocesses and 56 Attributes of EVMS

DOE-PM	SOP	ECRSOP	<p>EVMS Compliance Review Standard Operating Procedure (ECRSOP)</p>	<p>The EVMS Compliance Review Standard Operating Procedure (ECRSOP) provides detailed guidance for Department of Energy (DOE) Office of Project Management (PM) staff and contractors performing Earned Value Management System (EVMS) compliance reviews. DOE Order (O) 413.3B, Program and Project Management for the Acquisition of Capital Assets, requires that PM establish, maintain and execute a documented EVMS compliance assessment process in accordance with established dollar threshold levels to ensure full compliance with applicable Federal Acquisition Regulations (FAR) and Office of Management and Budget (OMB) EVMS compliance requirements. This SOP applies only to PM personnel and PM-led or initiated review teams responsible to determine EVMS compliance. It provides specific guidance for the consistent assessment of compliance and evaluation of the efficient implementation of a contractor’s EVMS as part of PM-led reviews. An updated list of supporting documents is maintained here.</p>
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***Note: to access PM Max, go to [MAX.gov Login](#) and “Register for a MAX Account”

MAX.GOV LOGIN
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Project Manager ‘Training Express’

Last month we introduced the PM “Training Express” which provides an effective blend of verbatim training slides on the complete suite of DOE 413 , user friendly, condensed training slides. Consistent with our previous commitment, here is the balance of the training material.

- DOE G 413 3-1 MD&C Using System Engineering
- DOE G 413 3-5A Performance Baseline Guide
- DOE G 413 3-7A Chg 2 Risk Management
- DOE G 413 3-9A Project Reviews for Capital Asset Projects
- DOE G 413 3-12 Chg 1 PDRI Guide
- DOE G 413.3-13 Acquisition Strategy
- DOE G 413.3-15A Project Execution Plans
- DOE G 413.3-17 Mission Need Statement
- DOE G 413.3-18A Integrated Project Team
- DOE G 413.3-20 Change Control Management
- DOE G 413.3-21A Cost Estimating Guide
- DOE G 413.3-22 Analysis of Alternatives Guide
- DOE G 413.3-24 Planning and Scheduling

[Follow this link](#) to access the PM “Training Express” material

It Is Not One World

6 Types of Construction Technology You Will Use in the Future

— Posted by Brett Long, [Device Magic](#)

According to Deloitte’s 2021 engineering and construction industry outlook, 76 percent of engineering and construction executives indicated that they are planning to invest in digital technology this year. Investing in the latest construction technology is helping business owners facilitate digital transformations and stay a step ahead of the competition.



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Future Construction Technologies

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There are real, practical applications and benefits to modernizing your current processes. And if your construction company wants to maintain a competitive edge, you'll need to find ways to integrate new approaches into your strategy and workflows.

These cutting-edge technologies are drastically changing how the industry operates and how future projects will be completed.

Types of Construction Technology Impacting the Industry:

- Data Collection Apps
- Drones
- Building Information Modeling (BIM) Software
- Virtual Reality and Wearables
- 3D Printing
- Artificial Intelligence

1. Data Collection Apps

Apps are becoming more of the norm in construction, and for good reason. The increased portability of tablets and smartphones allows for greater communication and the ability to work from anywhere. More specifically, data collection apps are helping construction companies gather faster, more accurate and higher quality data from the jobsite. Integrating this type of technology into your current processes is simple and requires a smaller upfront investment while still providing major benefits, including:



- **Significant time savings & reduced data entry errors.** Data collection app users have reported more than 20 field and administrative hours saved each week, along with a 50 percent reduction in data entry errors. Helpful tip: Estimate your ROI potential by using our free online calculator.
- **Enhanced workflows.** You can automate data collection workflows so the submission of one form triggers another form to be sent, and so on, until a particular task is completed with all necessary sign-offs and collected data. Additionally, some data collection applications offer mobile forms and web forms apps so your team can submit forms on their smartphones, tablets, laptops, desktops – basically any digital device.
- **Improved safety compliance.** Data collection apps can facilitate everything from daily equipment inspections to near miss reporting to a comprehensive job safety analysis.
- **Instant reporting.** Whether you need daily job reports, quick turn-around on client deliverables or fast access to legal documentation, a data collection app is going to help you streamline reporting. You can also easily customize reports based on your business needs.

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Future Construction Technologies

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2. Drones

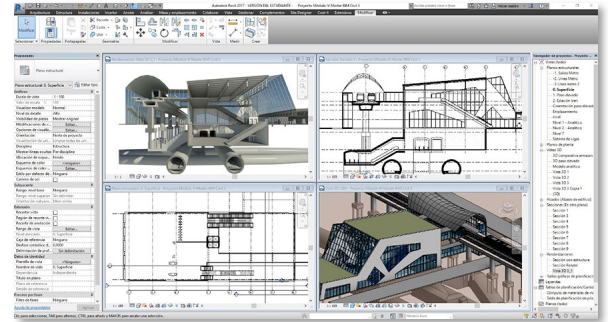
Drones are the most widely used emerging construction technology. They can conduct site surveys more quickly and accurately than a crew on the ground and are cheaper than aerial imaging. Their high resolution cameras and the data collected can create interactive 3D or topographical maps and models, and take volume measurements.

Another benefit of using drones is the ability to inspect hard to reach places such as bridges or around tall buildings, and to do it safely. You can also use them to monitor progress on a job site and see how people are working.



3. Building Information Modeling (BIM) Software

The use of BIM provides space for better collaboration because each person and expertise area can add their piece to the same model, instead of broken out onto multiple versions of a 2D paper drawing. This way, the model evolves immediately as people contribute, streamlining the process and increasing efficiency. BIM also helps with problem solving in the design and planning stages of a project, by automating clash detection and providing a more complete picture of the project.



We're seeing more and more global government initiatives to make BIM a compulsory procedure for large-scale facilities projects, including in India, Hong Kong, France, South Korea, Germany and Italy. In the United Kingdom, BIM is already mandatory for government construction projects. According to Research and Market's 2021 Building Information Modeling Market Report, emerging trends that will have a direct impact on the industry include AI development in BIM, increased demand for BIM-based cloud collaboration, and modular construction and prefabrication.

4. Virtual Reality and Wearables

Virtual reality technology is often used in conjunction with BIM to help better understand complex projects. Think of the potential: you create a building design with BIM and then are able to use VR to actually walk around it. Pretty cool, right? This will give your team, or the client, an even more realistic idea of what the project will look like once completed. Having a more complete grasp



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Future Construction Technologies

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on the project before it begins gives you the opportunity to avoid big changes and expensive change orders mid-way through.

Wearables are a construction technology that are not only making a positive impact on safety, but also productivity. AsphaltPro published a recent article on the topic, reporting that wearable technology in the construction industry can increase productivity by 8.5 percent and workplace satisfaction by 3.5 percent. The article also highlighted some notable products on the market, including XOEye Smart Glasses, Spot-r Wearable Sensor and Redpoint Positioning Safety Vest Sensors.

5. 3D Printing

3D printing as a construction technology has the potential to change material sourcing. For prefabrication, materials for a project can be printed and then transported to the job site, ready for use immediately. This can allow you to get materials faster and streamline the process by removing extra steps in the middle.

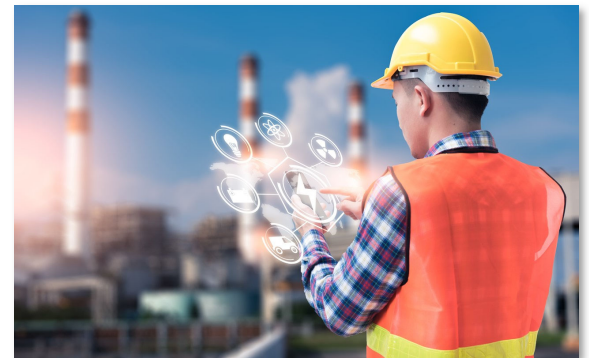
3D printing makes it possible to print materials right on site, reducing waste and further saving on transportation and storage costs. However, one of the current challenges with adoption of this technology is limitations with mass production. Although some 3D printers can produce on a larger scale, they are expensive.



6. Artificial Intelligence

For years, artificial intelligence (AI) has provided benefits to construction projects through increased safety, improving workflows, and getting jobs done faster and better. However, many construction companies continue to navigate and learn how to best apply this complex technology within their organization.

Some larger firms have started to build out their own AI programs to help with internal decision-making processes and operations. While others are relying on third parties, such as AI advisors and solutions providers, to audit their current practices and identify opportunities for AI and/or machine learning implementation.



What's Next?

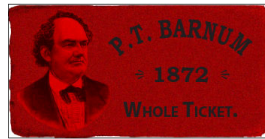
Investing in the latest construction technologies is undoubtedly a smart business move. The key is finding the tech tools that can help you reach your company's goals.

— From the [DeviceMagic.com](https://www.devicemagic.com) blog

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

1 — Mormon leader Brigham Young (1801), and actors Andy Griffith and Marilyn Monroe (1926) were born, the *Superman* comic was first published (1938), actor Morgan Freeman (1937) and singer Alanis Morissette (1974) were born, and CNN made its debut (1980).

2 — The Civil War officially ended (1865), **P.T. Barnum's circus made its debut** (1871), Grover Cleveland became the first U.S. president to marry while in office (1886), and actor/comedian Dana Carvey was born (1955).



3 — Confederate President Jefferson Davis was born (1808), Ed White became the first American to walk in space (1965), and TV newsman Anderson Cooper was born (1967).

4 — The first recorded solar eclipse occurred (780 BC), World War II's Battle of Midway began (1942), actress Angelina Jolie was born (1975), and the Tiananmen Square Massacre took place in China (1989).

5 — Sax player Kenny G was born (1956), the Six Day War between Israel and an Arab coalition began (1967), Sen. Robert F. Kennedy was assassinated (1968), and President Ronald Reagan died (2004).

6 — President Andrew Jackson became the first president to ride a train (1833), the first drive-in theater opened (1933), spiritual leader The Dalai Lama was born (1935), and World War II's D-Day began as the Allies invaded the north coast of France (1944).

7 — Actor Liam Neeson (1952) and musician Prince (1958) were born, and Texas became the first state to make Juneteenth an official holiday (1979).

8 — First Lady Barbara Bush (1925), actor Jerry Stiller (1929) and comedian Joan Rivers (1937) were born, and the NFL and AFL announced their merger (1966).

9 — **Donald Duck debuted** (1934), and sportscaster Dick Vitale (1940), and actors Michael J. Fox (1961), Johnny Depp (1963) and Natalie Portman (1981) were born.



10 — Benjamin Franklin discovered electricity (1752), singer/actress Judy Garland was born (1922), Alcoholics Anonymous was founded (1935), the ballpoint pen was patented (1943), and Olympic figure skating champ Tara Lipinski was born (1982).

11 — Undersea explorer Jacques Cousteau (1910), legendary football coach Vince Lombardi (1943), actor Gene Wilder (1935) and Hall of Fame quarterback Joe Montana (1956) were born, actor John Wayne died (1979), and the movie *E.T. The Extra-Terrestrial* was released (1982).

12 — The first perfect game in baseball was pitched (1880), the Philippines declared its independence from Spain (1898), and President George H.W. Bush (1924), Holocaust survivor and author Anne Frank (1929), and sportscaster Marv Albert (1943) were born.



13 — Comedian Tim Allen was born (1953), the Miranda rights were established (1966) Thurgood Marshall was appointed to the Supreme Court (1967), and **twin actresses Mary-Kate and Ashley Olsen were born** (1986).

14 — The U.S. Army was organized (1775), Congress adopted the Stars and Stripes as America's flag (1777); sandpaper was patented (1834), Walt Disney's *Bambi* was released (1942), and President Donald Trump (1946) and singer Boy George (1961) were born.

15 — The border between the U.S. and Canada was established (1846), and country singer Waylon Jennings (1937), actor Jim Belushi (1954), baseball Hall of Famer Wade Boggs (1958), actresses Helen Hunt (1963) and Courtney Cox (1964), and rapper Ice Cube (1969) were born.

16 — The first roller coaster in America opened (1884), the Ford Motor Company was incorporated (1903), boxing champ Roberto "No mas" Duran was born (1951), and **cosmonaut Valentina Tereshkova became the first woman in space** (1963).



17 — The Statue of Liberty arrived in New York City from France (1885), and entertainer Dean Martin (1917), singer Barry Manilow (1946), actress Phylicia Rashad (1948), and tennis star Venus Williams (1980) were born.

18 — The War of 1812 began (1812), Napoleon was defeated at Waterloo (1815), musician Paul McCartney was born (1942), and Sally Ride became the first American woman in space (1983).

19 — The first Juneteenth celebration was observed in Texas (1866), **baseball Hall of Famer Lou Gehrig** (1903) and dancer/singer Paula Abdul (1963) were born, and the Civil Rights Act was passed by Congress (1964).



20 — West Virginia became a state (1863), the first jet plane was tested (1939), singers Brian Wilson (1942), Anne Murray (1945) and Lionel Richie (1950), actor John Goodman (1952), singer Cyndi Lauper (1953), and actress Nicole Kidman (1967) were born, and the movie *Jaws* premiered (1975).

21 — The U.S. Constitution was ratified (1788), and actress Meredith Baxter and actor Michael Gross were born (1947).

22 — Donuts were invented (1847), and singer Kris Kristofferson (1936), and actress Meryl Streep (1949) were born.

23 — The Secret Service was created (1860), Supreme Court Justice Clarence Thomas was born (1948), and the anti-discrimination Title IX education act went into effect (1972).

24 — Boxing champ Jack Dempsey (1895) and musician Mick Fleetwood (1942) were born, and the Soviet Union began a blockade of West Germany (1948).

25 — **Gen. George Custer and the 7th U.S. Cavalry were wiped out in the Battle of Little Big Horn** (1876), singer Carly Simon was born (1945), the Korean War began (1950), and pop star Michael Jackson died (2009).



26 — Baseball inventor Abner Doubleday was born (1819), the first U.S. troops arrived in France in World War I (1917), the United Nations was chartered (1945), the Berlin Airlift began (1948), and singer George Michael was born (1963).

27 — The Smithsonian Institution was established (1829), Mormon church founder Joseph Smith was killed (1844), the "Happy Birthday" song was first sung (1859), deaf/mute/blind author/lecturer Helen Keller (1880) and Bob "Captain Kangaroo" Keeshan (1927) were born, and President Truman ordered U.S. troops to Korea (1950).

28 — The Treaty of Versailles was signed, officially ending World War I (1919), Hall of Fame quarterback John Elway was born (1960), the first U.S. offensive of the Vietnam War began (1965), and actor John Cusack was born (1966).

29 — Actor Gary Busey was born (1944), and the Supreme Court ruled the death penalty as unconstitutional (1972).

30 — **Daredevil Charles Blondin became the first person to cross Niagara Falls on a tightrope** (1859), the novel *Gone With the Wind* was published (1936), and boxing champ Mike Tyson was born (1966).



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