

# THE PRACTITIONER

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



Issue 45

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## Project Management Resources

As a Project Manager you are constantly on the hunt for the best resources to complete your project. Your resources will primarily include labor, materials, subcontracts, and the compliant guidance to execute the project. While the guidance must always start with the requirements of your contract and procedures, the foundation for Department of Energy (DOE) projects is well established in the DOE orders and guides represented under the Office of Project Management “Directives” webpage, shown below (you can visit the site by clicking on the graphic below). These directives contains project management-related orders and guides that allow federal project directors and project teams to comply with applicable laws and regulations while putting in place most effective project management practices that increase probability of project success.

These DOE Directives represent the minimum requirements a DOE contractor must follow when executing a project and should be common knowledge to any project manager and their project team. Once we consistently demonstrate we have the fundamentals well in hand, we can begin to introduce innovation into our processes. Innovation may materialize in varying a compliant approach, applying different or new technologies or simply looking at the best practices of how others achieve success.

The Construction Industry Institute (CII) is a great resource for project managers to seek innovation and best practices.

### CII History

CII was established in October 1983 with the purpose of improving the competitive position of U.S. business in the global market. Its 28 charter members were responding to the recommendations from a study by The Business Roundtable entitled the Construction Industry Cost Effectiveness (CICE) Project. That five-year study of the industry and its problems specifically recommended that an organization be created to take a leadership role in construction research. The CICE participants – including more than 250 industry leaders, practitioners, and academicians – recognized this particular recommendation as an opportunity for companies and academia to work together for the improvement of the industry. Since its establishment at The University of Texas at Austin in 1983, CII has pursued a

NUMBER	TITLE	DESCRIPTION	LAST UPDATED
DOE O 413.3B (Chg 8) (Mn/Chg) IT	Program and Project Management for the Acquisition of Capital Assets	The Order provides DOE and NNSA with program and project management direction for the acquisition of capital assets with the goal of delivering projects within the original performance baseline (PB), cost and schedule, and fully capable of meeting mission performance, safeguards and security, and environmental, safety, and health requirements unless impacted by a directed change; implements OMB Circulars A-11, A-123 and A-131; Supersedes Chg 5 (Mn/Chg), dated 4-12-2018.	1/12/2021
DOE G 413.3-87	Managing Design and Construction Using Systems Engineering	This Guide provides the Department of Energy's federal project directors with the methodologies and tools needed to plan, implement and complete assigned projects using a Systems Engineering approach in accordance with the requirements of DOE O 413.3A.	10/22/2015
DOE G 413.3-207	Quality Assurance Guide for Project Management	This Guide provides acceptable approaches for implementing the Quality Assurance requirements and criteria of DOE O 413.3A related to the development and implementation of a Quality Assurance Program for the project.	10/22/2015
DOE G 413.3-3A17	Safeguards and Security for Program and Project Management	The Guide provides a methodology for implementing the safeguards and security requirements of DOE O 413.3B.	10/22/2015
DOE G 413.3-4A17	Technology Readiness Assessment	The Guide assists individuals and teams involved in conducting Technology Readiness Assessments (TRAs) and developing Technology Maturation Plans (TMPs) for the DOE capital asset projects subject to DOE O 413.3B.	10/22/2015
DOE G 413.3-5A17	Performance Baseline	This Guide identifies key PB elements, development processes, and practices; describes the context in which DOE PB development occurs; and suggests ways of addressing the critical elements in PB development.	10/22/2015

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# Project Management Resources

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research agenda defined by its Board of Advisors, which is composed of one representative and an alternate from each member company. Volunteers from member companies are the core of the effort by CII in all of its activities.

CII was conceived as a three-way partnership among owners, contractors, and academia. This partnership was based on the premise that each party would contribute from its experience and competence to the overall work of the Institute. The academic community could play a major role in CII by bringing its knowledge of the research process and by providing a credible, neutral voice in the CII process. For practical experience, owners and contractors would provide the knowledge that comes from first-hand and in-the-field experience. Together, the three would form an owner–contractor–academia triad that would lend itself to conducting world-class research whose findings could be applied immediately.

**Resources** - CII sponsors research to discover practices that will improve project performance, then provides training on how to implement them.

**Groups** - A key benefit of membership at CII is the opportunity to participate in a wide variety of ongoing activities. The core processes provide a framework for group activities.

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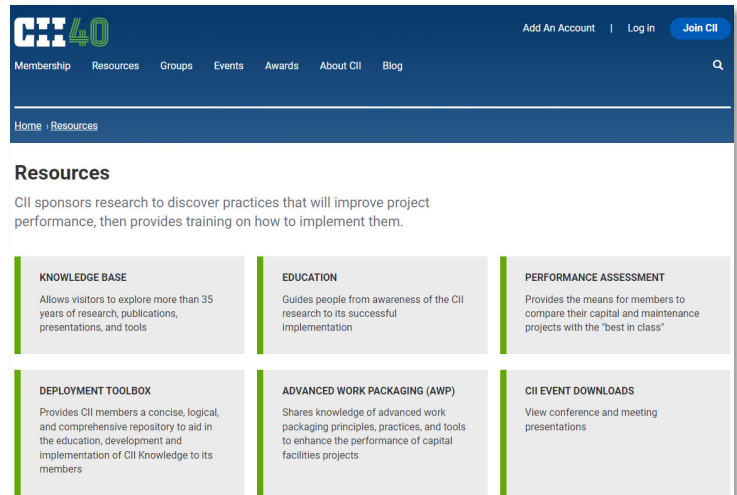
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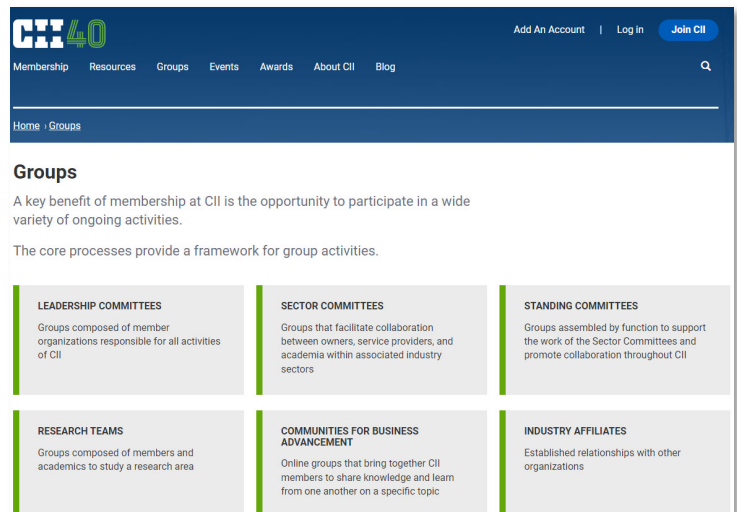
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So if you are a project manager that has mastered the fundamentals of the applicable DOE orders and guides governing your project, but you are looking to add to your toolkit, check-out the CII webpage for insight to how others approach project management. Remember, you can also access the CII webpage through your [EF-COG PDWG Webpage Project Delivery Working Group – EF-COG.org](#).



Click on the screenshots to go to the CII Resources and Groups pages.



# Did You Know: PDWG Project Peer Review Process

**P**art of our PDWG mission and annual work plan is to support DOE-PM in providing EFCOG resources to perform various reviews. The desired qualifications are generally provided to the PDWG Peer Review Team Lead (Tim Heath), by the requesting entity, typically DOE-PM. To identify potential candidates to support the reviews, we typically solicit expressions of interest (EOI) and qualifications (resume) from the PDWG Team through communication from the PDWG distribution list. Once EOI's are received, the Peer Review Team Lead reviews each candidates' qualifications to best match the request and then contacts the candidate(s) to confirm availability. This process is iterative for each review where support is requested. Note: cost for supporting all reviews are covered by the entity supplying the resource under the D.B. Poneman Memorandum.

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**Current, Accurate,**

**Complete,**

**Repeatable,**

**Auditable and**

**Compliant<sup>®</sup>?**


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The Deputy Secretary of Energy  
Washington, DC 20585

April 12, 2011

MEMORANDUM FOR DISTRIBUTION

FROM: DANIEL B. PONEMAN 

SUBJECT: Project Peer Reviews

In my March 4, 2010 memorandum on the Department of Energy's (DOE) project management principles, and in recently released DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, I directed that peer reviews be conducted at least once a year for large (i.e., Total Project Cost of \$100M or greater) or high visibility projects, and more frequently for more complex projects or those experiencing performance challenges. These reviews evaluate technical, managerial, cost, scope, and other key aspects so that necessary course corrections can be identified and projects can be delivered within the original scope, cost, and schedule.

During the recent contract and project management summit, it became clear that much work is required to fully implement this practice throughout the Department. I expect that review teams will be established with our most talented project, contract, and technical staff from across the complex. This includes both Federal and contractor personnel from within and across Program Offices. We all benefit from this cross-fertilization by learning from each other.

To build a culture in which peer review is valued and integral to project success, the National Nuclear Security Administration and the Office of Environmental Management should participate in the Office of Science (SC) peer reviews to observe their protocol and process. Likewise, SC peer review veterans should take part in the largest peer reviews in other programs. SC has refined the peer review process over decades; DOE, as an institution, needs to adopt it. We will follow the SC model which fully integrates compliance with all applicable laws.

Finally, and to clarify the existing policy, we must approach peer reviews as a departmental team. There should be no contractual or budgetary impediments to accomplishing these cross program reviews, which are fundamental to the professional development of each and every member of both the project team and the project peer review team. The knowledge and lessons learned that our project management professionals gain with each review is invaluable. Project management professional development and departmental knowledge management is the ultimate result; enhancements to project execution performance over time is the by-product. Indirect accounts at the contributing sites should cover these allowable costs.



This policy clarification is effective immediately. Your personal leadership and support is needed to improve the peer review process across the DOE complex. The Office of Engineering and Construction Management will work with your offices to facilitate the implementation of this policy, and will codify it in the next update of DOE Order 413.3.

#### DISTRIBUTION

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# It Is Not One World

## Five Amazing Construction Projects Around the World

— By Kevin Forestell

CEO and co-founder of DOZR

An architect's dream can sometimes present the impossible. It falls to construction and engineers to take those plans and make them come true. Among modular construction practices and cookie-cutter-houses, brilliant feats of construction continue to rise up around the globe.

Through imagination and technology, what may have been impossible has long become within reach. It's important to remember the role that construction plays in turning plans into reality and to celebrate that.

With celebration and awe in mind, here are 5 amazing construction projects from around the world.

### Gotthard Base Tunnel, Switzerland

Taking 20 years to complete, The Gotthard Base Tunnel is the longest and deepest railroad tunnel in the world. In order to expedite the construction process, four separate entrances were used so construction could take place at a variety of stages along the project.

A variety of contractors were involved in the project, each responsible for a portion of the tunnel. The contract for the ventilation system within the tunnel was worth \$45 million alone.

The project cost \$12.3 billion, with connecting tunnels and stop-points bringing that number to \$23 billion. The tunnel was seen as worth the cost as it would finally break down the barrier the Alps created for trade between European countries.

The project stole the title of "longest underground rail tunnel in the world" from the Seikan tunnel in Japan by 5 kilometers.



### Mjøstårnet by Voll Arkitekter in Brumunddal, Norway

Completed in 2019, the Mjøstårnet building in Norway became the world's tallest wooden building. Mjøstårnet is made up of 85.4 meters of cross-laminated timber – a popular material in sustainable and green construction.

As concerns about sustainability and green construction practices grow, cross-laminated timber is becoming more and more recognized for its strength, diversity and ability to replace other conventional construction materials such as steel and concrete.

The title of the tallest wooden building was previously held by a building in Vancouver, Canada. Mjøstårnet beats out the Canadian building by over 30 meters.

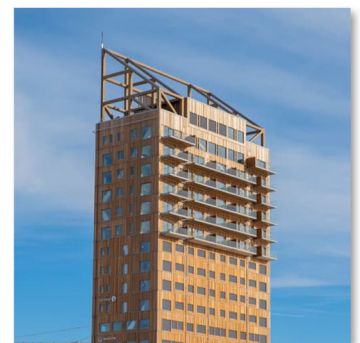


Image borrowed from Dezeen

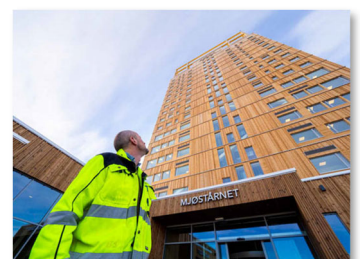


Image borrowed from Design Build Network.

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# Five Amazing Construction Projects

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## One Thousand Museum, Miami

A high rise condo building in Miami may not sound like something that should be on a list of amazing builds. But, take a look at it and you'll understand why.

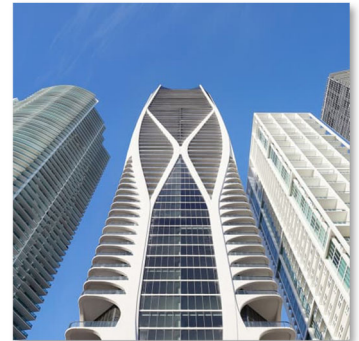
Designed by Pritzker Prize-winning architect Zaha Hadid, this condo sits across from Museum Park on Biscayne Boulevard. Hadid won the Pritzker Prize in 2004 and was the first woman to be honored with the title.

The 62-story skyscraper condo features a helipad and private aquatic center. The building showcases a beautiful exoskeleton-type structure made of 5,000 pieces of glass-fiber-reinforced concrete to keep it standing. The exoskeleton makeup reduced the need for columns in the interior of the building, making for unique condo spaces.

Plaza Construction had the honor of completing the build and has dealt with a variety of other high-profile projects from the residential and commercial to the entertainment industry.



*Images borrowed from Miami Residential Group*



## Winsun 3D Printed Sea Wall

3D printing continues to challenge the standards in the construction world and redefine project possibilities. China just completed the world's largest 3d printed structure – a sea wall in Suzhou which stands at over 500 meters long.

3D printing has been growing in popularity in construction since it can help to reduce waste, decrease building time and is more environmentally and budget-friendly. Of course, the ability to use 3D printing technology depends entirely on the specific project.

Suzhou has been revitalizing itself from an old mining town into a tourist destination. Old mines have been transformed into green spaces and the river became the focus of a revitalization project. Using 3D print technology to build an eco-friendly riverbank reinforcement structure allowed the city to work directly with the makeup of the existing river. The wall helps the land maintain its structure by fitting in with it while traditional reinforcement techniques often interrupt the ecosystem. Maybe eco-building for rivers and lakes is another construction sphere where 3D printing will change the game.



*Image borrowed from Winsun 3D Builders*



*Image borrowed from Futurism*

## The International Space Station

Soaring through the sky 408km above our heads, the International Space Station isn't often considered when looking at amazing construction projects. Although it's technically not on our planet, it is still worth the attention.

Our interest in outer space is growing and the possibilities of building on other planets and in space becoming more real. Even Caterpillar is helping NASA



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# Five Amazing Construction Projects

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build a space future by developing technology that will help astronauts build on Mars. It may be time for the construction industry to start paying attention to all the space above our heads.

The International Space Station – ISS – was built in stages with the help of 15 countries. The first section of the station was launched in 1998 when a control module was launched in a Russian rocket. Two weeks later, a space shuttle called Endeavor met with the Russian rocket – Zarya – in orbit. A crew attached the control module to a Unity node that was in the American rocket. Over the next two years, more pieces were added until it was considered inhabitable. The International Space Station was born.

The ISS takes modular construction to a whole new level. Pieces were constructed on earth, loaded into a spaceship and sent out to space. The complete construction of the space station took place from 1998 to 2011 and included over 18 different launches.

The living and working space on the ISS is larger than a six-bedroom house. It even has a gym! It can house a crew of 6 people, plus any visitors, and has an international crew onboard working at all times. Including the solar panels, the International Space Station covers the space of a football field, including the end zones.

The creation of space-specific tools, of adapting to use while wearing a spacesuit, and even the creation of the Canadarm – a crane-type machine that allows for construction in a way far more complex than any typical crane or life on earth – indicate the level of technology and adaptation needed to make space construction possible. It's incredible to think about the level of technology needed in the early 2000s to make the International Space Station possible. It makes the possibilities of on-earth Construction Tech seem even vaster.

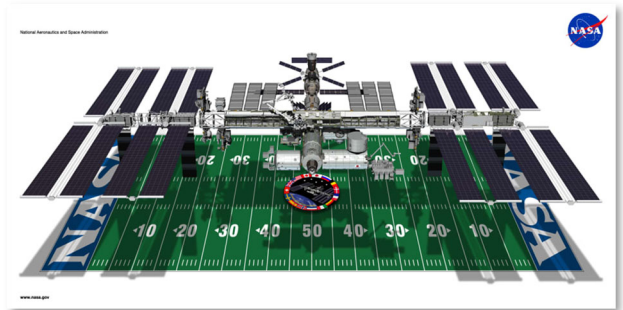
We often say that construction is the industry that builds our world. It might sound obvious, but the deeper connection is there – the way we build, how projects look and the technologies that go into building new projects shape our planet. The more care, time and creativity that goes into the construction process to make beautiful, green and unique buildings will ultimately do the same for our world.

These five examples of amazing construction projects around the world are a microscopic sample of the amazing projects around the world.

— From [DOZR.com](https://www.dozr.com)



*Living quarters of NASA astronaut Scott Kelly in 2015. Image borrowed from NASA*



*Image borrowed from NASA*

## Check out the latest DOE Project Management newsletter!

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## Just for Fun: April's Notable Events and Famous Birthdays

1 — Cigarette ads on TV and radio were banned (1970), the first Major League Baseball strike began (1972), Apple Computers was founded (1976), and NCAA men's basketball champions were crowned in 1985 (Villanova), 1991 (Duke), 1996 (Kentucky), 2002 (Maryland), and 2007 (Florida).

2 — Singer Marvin Gaye (1939), and actor Dana Carvey (1955) were born, and Argentina invaded the Falkland Islands (1982).

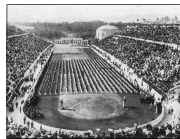
3 — **The Pony Express began mail service** (1860), and actors Marlon Brando (1924) and Alec Baldwin (1958), comedian Eddie Murphy (1961), and Olympic champion skier Picabo Street (1971) were born.



4 — The North Atlantic Treaty Organization (NATO) was signed (1949), actor Robert Downey Jr. was born (1965), Martin Luther King Jr. was assassinated (1968), the World Trade Center opened (1973), and Microsoft was founded (1975).

5 — Actors Spencer Tracy (1900), Bette Davis (1908), and Gregory Peck (1916) were born, Kareem Abdul-Jabbar broke the all-time NBA scoring record (1984), and grunge rocker Kurt Cobain committed suicide (1994).

6 — The Mormon church was established (1830), **the first modern Olympic games opened** (1896), explorers Matthew A. Henson and Robert E. Perry reached the North Pole (1909), the U.S. officially entered World War I (1917), Twinkies were introduced (1930), and country singer Merle Haggard (1937) was born.



7 — Jazz singer Billie Holiday (1915) was born, the World Health Organization was founded (1948), actors Jackie Chan (1954) and Russell Crowe (1964) were born, and Frank Robinson became Major League Baseball's first Black manager (1975).

8 — Siddhartha Gautama, founder of Buddhism (563 BC), and former First Lady Betty Ford (1918) were born, and Hank Aaron broke Babe Ruth's home run record (1974).

9 — The Civil War ended with the Confederate surrender to the Union (1865), publisher Hugh Hefner was born (1926), and the first American astronauts were introduced (1959).

10 — The American Society for the Prevention of Cruelty to Animals was established (1866), the PGA was formed (1916), sportscasters John Madden (1936) and Don Meredith (1938) were born, and Paul McCartney announced the official breakup of the Beatles (1970).

11 — Napoleon abdicated the throne of France and was exiled for the first time (1814), and a boxing match was the first live sporting event broadcast on radio (1921).

12 — The American Civil War began (1861), President Franklin D. Roosevelt died (1945), author Tom Clancy and TV personality David Letterman were born (1947), and **Russian cosmonaut Yuri Gagarin became the first person in space** (1961).



13 — 3rd U.S. president Thomas Jefferson (1743) and wild west outlaw Butch Cassidy (1866) were born, the first nonstop flight from Europe to North America was completed (1928), Sidney Poitier became the first African-American to win the Best Actor Oscar (1964), and Tiger Woods won his first of five Masters golf tournaments (1997).

14 — President Abraham Lincoln was assassinated (1865), and country music legend Loretta Lynn (1932), baseball star Pete

Rose (1941), and actors Brad Garrett (1960) and Sarah Michelle Gellar (1977) were born.

15 — Artist/inventor Leonardo da Vinci was born (1452), the Titanic sank (1912), and Jackie Robinson broke Major League Baseball's color barrier (1941).

16 — Aviator Wilbur Wright (1867), actor Charlie Chaplin (1889), and basketball Hall of Famer Kareem Abdul-Jabbar (1947) were born, and 32 people died in a shooting at Virginia Tech University (2007).

17 — American statesman Benjamin Franklin died (1790), the Bay of Pigs invasion began (1961), the Ford Mustang debuted (1964), Apollo 13 returned to Earth after an accident six days earlier (1970), **actress Jennifer Garner was born** (1972).



18 — The Great San Francisco earthquake struck (1906), and baseball Hall of Famer Catfish Hunter (1946), actor Rick Moranis (1953), and TV talk host Conan O'Brien (1963) were born.

19 — The Revolutionary War began (1775), actors Dudley Moore (1935), Ashley Judd (1968) and Kate Hudson (1979) were born, the Branch Dividian siege ended (1993); and the Federal Building in Oklahoma City was bombed (1995).

20 — Nazi leader Adolf Hitler (1889) and singer Luther Vandross (1951) were born, and the mass shooting at Columbine High school in Littleton, Colorado, took place (1999).

21 — The first movie projector was demonstrated in the U.S. (1895), Queen Elizabeth II of England was born (1926), China's Tiananmen Square protest began (1989), and music superstar Prince died (2016).

22 — The first National League baseball game was played (1876), **rock star Peter Frampton was born** (1950), and the first Earth Day was observed (1970).



23 — Playwright William Shakespeare (1564), 15th U.S. president James Buchanan (1791), actress Shirley Temple (1928), and singer Roy Orbison (1936) were born.

24 — The Library of Congress was established (1800), singer/actress Barbara Streisand (1942) and singer Kelly Clarkson (1982) were born.

25 — Jazz singer Ella Fitzgerald (1918) and actor Al Pacino (1940) were born, the United Nations was organized (1945), and actress Renee Zellweger was born (1969).

26 — Naturalist John James Audubon (1785) and entertainer Carol Burnett (1933) were born, and the world's worst nuclear disaster occurred at Chernobyl (1986).

27 — Telegraph inventor Samuel Morse (1791), and Civil War general and 18th U.S. president Ulysses S. Grant (1822) were born, and the first Social Security checks were distributed (1937).

28 — 5th U.S. president James Monroe (1758), former Iraqi president Saddam Hussein (1937), and TV personality Jay Leno (1950) were born.

29 — Jazz bandleader Duke Ellington (1899) was born, the zipper was patented (1913), and race car legend Dale Earnhardt (1951), comedian Jerry Seinfeld (1954), and actresses Michelle Pfeiffer (1957) and Uma Thurman (1970) were born.

30 — Country singer Willie Nelson (1933) and basketball Hall of Famer Isiah Thomas (1961) were born, the Vietnam War ended with the fall of Saigon (1975), and actress Kirsten Dunst was born (1982).