



Project Reviews for Capital Asset Projects (DOE G 413.3-9A) - Part 2

In the second part of our three-part series on the purpose, and scope of the various types of reviews and assessments performed on Department of Energy (DOE) projects, we examine a handful more of these reviews and assessments. As a reminder, they are defined through the aperture of DOE G 413.3-9A "Project Reviews for Capital Asset Projects" Guide.

Independent Cost Review (ICR) and Independent Cost Estimate (ICE)

What: An ICR is a review of the project team's estimate to examine the reasonableness of the estimate considering quality, ground rules and assumptions, and risks. An ICE is a new estimate performed by an organization independent of the project sponsor using the same detailed technical and procurement information used by the project team.

Prior to CD-0, a DOE PM analyst will lead an ICR for all projects with an anticipated TPC greater than or equal to \$750M and for any other projects selected by the CE or PME. This ICR evaluates the reasonableness of the project's initial rough order of magnitude (ROM) cost estimate based on mission need statement in order to roughly indicate future resource requirements.

For projects with an anticipated TPC greater than or equal to \$100M prior to CD-1, DOE PM will determine whether to perform an ICR or an ICE based on confidence in the quality of the project team's range estimate. Either approach will give the Project Management Executive (PME), DOE leadership, and Congress confidence that the project cost range, alternative selected, and processes used in support of CD-1 are reasonable.

An ICE supports the following milestone approvals:

- CD-1 (if factors such as risk and complexity create a significant cost exposure for DOE; or as required by appropriations acts (e.g., 50 USC §2537(b) requires an ICE before CD-1 and before CD-2 for each new nuclear facility within the nuclear security enterprise that is estimated to cost more than \$500M))
- CD-2 (required by appropriations acts)
- CD-3 including CD-3A (required by appropriations acts)
- Baseline Change Proposal (BCP)

The results of an ICR for projects with a TPC at or above \$100M, appear in a report that the director of PM (PM-1) endorses and forwards to the PME for review and action. The ICR report will include findings and recommendations made by the review team regarding the schedule, cost estimate, and risks developed by the project team. The ICR report will recommend to the PME schedule and cost ranges for the project germane to that particular critical decision.

Project Reviews for Capital Asset Projects

Continued from previous page

The results of an ICE for projects with a TPC at or above \$100M, appear in a report that PM-1 endorses and forwards to the PME for review and action. The ICE report will include findings and recommendations regarding the project team's schedule and cost estimate and will provide an independently generated schedule and cost estimate. If the ICE supports CD-2 approval, the EIR team will base its review of the PB on it.

Why: ICRs and ICEs are required at CD-2 and CD-3 by the Consolidated Appropriations Act of 2012 (Public Law 112-74) and subsequent appropriations. Independent estimates provide PMEs and program managers additional information to help them understand the uncertainty associated with cost and schedule estimates. When: DOE O 413.3B requires the development of an ICR prior to CD-0 for projects with a TPC equal to or greater than \$750M and an ICR or an ICE for all projects with a TPC equal to or greater than \$100M prior to CD-1, CD-2 and CD-3. ICEs are also performed prior to approving a BCP.

Who: Program Office and PM - For all projects greater than \$100M, the ICR or ICE required by DOE O 413.3B will be developed by PM in coordination with the program offices.

Where: ICEs and ICRs normally are performed at the project site. However, they could be performed at an offsite location, if sufficient information and personnel to support the review process are available.

For additional information refer to:

[GAO-16-89G, GAO Schedule Assessment Guide: Best Practices for Project Schedules](#)

[GAO-09-3SP, GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs](#)

THE PRACTITIONER

Published monthly for the
EFCOG's Project Delivery
Working Group by:

Craig Hewitt

(writer/editor)
(509) 308-2277

[Craig T Hewitt@rl.gov](mailto:Craig_T_Hewitt@rl.gov)

Adam Russell

(writer/publisher)
(509) 376-5742

Adam_Russell@rl.gov

Tony Spillman

(managing editor)
(509) 372-9986

[Anthony W Spillman@rl.gov](mailto:Anthony_W_Spillman@rl.gov)

For questions, comments,
story ideas or other
correspondence, call or e-
mail Craig Hewitt at the
contact information above.

Independent Project Review (IPR)

What: IPRs are conducted by a non-proponent body to determine whether the scope of programs, projects, or activities can be accomplished within the established cost and schedule baselines. IPRs examine the underlying assumptions regarding technology and management; safety and security; and risks to ensure they are valid and credible. IPRs assist with managing risk by identifying existing and potential problems and recommended resolutions with minimum adverse impacts to the project baselines. IPRs may meet a specific objective such as validating a budget, assessing nuclear safety and security or technology readiness, or fulfilling a CD precondition. The scope of an IPR varies with the complexity, cost, and status of the project.

One type of IPR is the Technical Independent Project Review (TIPR) which is conducted to ensure early integration of safety into the design process and discussed separately in this guide.

The results of the IPR appear in a report that the PMSO completes and forwards to the PME for review and action. The IPR report will include findings and recommendations. The Program Office tracks findings and recommendations that require follow up actions and then determines the successfulness of implemented corrective actions at the next project review. Findings from IPRs conducted in support of a critical decision may require resolution prior to approval of the critical decision.

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Project Reviews for Capital Asset Projects

Continued from previous page

Why: An IPR identifies technical and programmatic risks and uncertainties along with activities that would mitigate the risks.

When: DOE O 413.3B requires IPRs prior to CD-1 (in the form of a TIPR) for Hazard Category 1, 2, and 3 nuclear facilities and prior to CD-2 (to validate the PB) for projects with a TPC less than \$100M when the program has a PMSO. Although not required by the Order, PMSOs perform IPRs at other points throughout the project lifecycle according to program policy.

Who: Program Office – DOE O 413.3B requires PMSOs to conduct IPRs to validate the PB for projects with a TPC less than \$100M and when otherwise directed by the Program Secretarial Officer (PSO). Non-proponents of the project, outside of the project and its program, conduct an IPR. The CE, PSO, PME, site or field office manager, program managers, and federal project directors may authorize an IPR. The teams consist of senior-level technical personnel and subject matter experts from the project as well as outside experts, as appropriate.

Where: An IPR normally occurs at the project site. However, they could be performed at an offsite location, if sufficient information and personnel to support the review process are available.

For additional information, refer to:

[NNSA Business Operating Procedure \(BOP\)-06.04, Project Reviews](#)

[DOE Office of Science, Independent Review Process Handbook](#)

Mission Validation Independent Review (MVIR)

What: The MVIR is unique to Major System Project (MSPs). It is conducted prior to CD-0 to independently examine the mission need developed by the program. It evaluates whether the project has clear objectives strongly linked to mission; identifies major risks; evaluates the acquisition and conceptual planning relative to those risks; and evaluates the funding request. This review is one of the first steps in the identification and initiation of a DOE MSP and is used, in part, to properly designate the appropriate PME. The review includes an examination of the following:

- Mission need statement – to verify that the documented deficiency or capability gap described in the MNS could hinder or prevent the Department from achieving a strategic goal.
- Program/mission requirements – to assess whether high-level requirements are sufficiently defined to support identifying potential alternatives.
- Cost range – to review the rough order-of-magnitude (ROM) cost to determine whether this range reasonably bounds the cost and schedule of alternatives under consideration.
- Schedule range – to assess consistency with strategic requirements for key milestones including the project's completion and, when closely linked to other projects, its integration with the other projects.

Why: The purpose of the MVIR is to provide an independent review of the mission need for MSPs. It is an extra step to ensure that the mission need outlined is valid and that achievement of the mission supports DOE's overarching strategic goals and objectives. Per DOE O 413.3B all MSPs have this review.

When: The MVIR should be completed prior to CD-0 approval.

Who: Program Office - The MVIR is completed by an independent review team designated by the PSO. All mission need statements are reviewed by the program office and submitted to the PSO for approval.

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Project Reviews for Capital Asset Projects

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Where: The MVIR can be held at the project site or at a location determined by the Program office.

For additional information regarding Mission Need Statement document refer to:

[DOE G 413.3-17, Mission Need Statement Guide](#)

[NNSA Business Operating Procedure \(BOP\)-06.04, Project Reviews](#)

National Environmental Policy Act (NEPA) Review

What: The NEPA review provides an early assessment, concurrent with and coordinated with the Analysis of Alternatives (AoA) process, of the actions required to comply with the National Environmental Policy Act of 1969 (NEPA).

The review leads to a determination of whether an environmental impact statement (EIS) with a record of decision (ROD), a supplement analysis (with or without an amended ROD), an environmental assessment (EA) with a finding of no significant impact (FONSI), a categorical exclusion (CX), or a determination of “no further NEPA action required,” are necessary to comply with the statute.

This review is conducted to fully inform the program of the range of NEPA impacts for each alternative considered. Depending on the actions required, NEPA-driven study and analysis can require long timeframes and incur significant costs.

For these reasons, it is important to conduct the review early enough to both inform decision making and allow for adequate planning to complete the required NEPA actions.

Why: The National Environmental Policy Act of 1969 (NEPA) requires federal agencies to analyze the potential impacts of major federal actions prior to deciding whether to move forward with that action. DOE P 451.1 delegates responsibility to Heads of Departmental Elements to comply with NEPA. DOE O 413.3B requires project teams to complete a NEPA Strategy prior to CD-1. The strategy documents the project team’s intended approach to comply with the law.

When: The NEPA Review is conducted prior to CD-1 and begins with the development of the project team’s NEPA Strategy. The team works with the appropriate NEPA Compliance Officer (NCO) to assess the proposal and realistic alternatives. Depending on the level of NEPA action required, the required actions may not be completed prior to CD-1. According to the legislation, all NEPA actions must be completed prior to a federal decision whether to approve the project, prior to CD-2, and prior to construction start.

Who: Departmental Elements’ NEPA Compliance Officers (NCOs) perform the NEPA review in conjunction with the program office.

Where: NEPA reviews are conducted at the headquarters, site, or other location as determined by the Departmental Element.

For additional information refer to:

[DOE NEPA Guidance, Revised Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements \(the Green Book\)](#)

[DOE P 451.1, National Environmental Policy Act Compliance Program](#)

[DOE Office of NEPA Policy and Compliance website](#)

[NNSA Policy 451.1, National Environmental Policy Act Compliance Program](#)

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Project Reviews for Capital Asset Projects

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Operational Readiness Review (ORR)/Readiness Assessment (RA)

What: Readiness reviews are grouped into two types: ORRs and RAs. An ORR or RA is conducted in accordance with DOE O 425.1D and DOE-STD-3006-2010. DOE O 425.1D provides criteria to determine whether an ORR or an RA is required.

An ORR is an in-depth independent evaluation of the readiness of completed facilities, systems, equipment, procedures, personnel, and supporting and interfacing systems and organizations to begin facility operation. In the case of a facility project, the review focuses on the readiness details associated with turning the facility over to the user, including but not limited to startup, testing and balancing mechanical systems. Because of the importance of this activity, ORR planning is initiated early in a project's lifecycle.

An RA is an assessment that uses a graded approach to the tenets of ORR requirements as specified in DOE O 425.1D to determine a facility's readiness to startup or restart when an ORR is not required or when a contractor's standard procedures for startup are not judged by the contractor or DOE management to provide an adequate verification of readiness.

Why: DOE O 425.1D requires that every startup or restart of a nuclear facility, operation, or activity be evaluated to determine the required level of readiness review (i.e. ORR or RA). The Readiness Review process was developed to provide a high degree of confidence that new and restarted DOE nuclear facility operations will be conducted as intended by the design and safety basis. A graded independent review approach is used. Independence was deemed necessary to avoid conflicts of interest that could compromise reviewer ability to objectively determine the status of the proposed operation. ORRs and RAs are not intended to achieve readiness, but to provide independent verification of readiness.

When: DOE O 413.3B outlines that an ORR or RA for Hazard Category 1, 2, and 3 nuclear facilities be conducted in accordance with DOE O 425.1D and DOE-STD-3006-2010 prior to CD-4.

Who: Program Office - In cases when an ORR or RA is required, the contractor and DOE program office conduct the review. The DOE ORR may not start until the contractor ORR has been completed, the identified findings are resolved or addressed by an approved corrective action plan, and a formal Readiness to Proceed Memorandum has been submitted to DOE. In the case of an RA, there is more flexibility as to whether it is conducted only by a contractor, jointly (when approved), or both by a contractor and DOE (in that sequence). DOE field office management prepares implementing procedures and concurs with contractor implementing procedures in accordance with the Contractor Requirements Document (CRD) in DOE O 425.1D. The Startup Authorization Authority may approve startup or restart after prestart findings are resolved.

Where: ORRs and RAs are conducted at the project site.

For additional information regarding ORRs and RAs, refer to:

[DOE O 425.1D Verification of Readiness to Start Up or Restart Nuclear Facilities](#)

[DOE-STD-3006-2010 Planning and](#)

[Conducting Readiness Reviews](#)

In next month's edition, we will conclude this series with a look at more reviews and assessments.

Mark your calendar!

2023 DOE Project Management Workshop

Washington DC April 11-12, 2023* Registration Begins in February

* Plus: Optional Project Controls Session April 13, 2023

The PM Workshop overlaps with the National Cherry Blossom Festival (March 20 – April 16, 2023) so book your hotel early and enjoy Washington DC in the Spring! Ctrl+Click to follow the hotel link:

[2023 DOE Project Management Workshop Room Block_Hilton Washington DC National Mall](#)

It Is Not One World

Ten of the World's Biggest Construction Projects of 2022 – Part 2

The world is building state-of-the-art infrastructure at a breakneck speed and a booming construction industry across the globe brings some incredible construction projects into the spotlight. In the second installment of this three-part series, we take you through 3 more of the 10 largest construction projects that are starting, ongoing, or nearing completion in 2022.

LaGuardia International Airport

Estimated Cost: \$8 Billion (USD)

Location: New York, NY

Phase: Finishing Touches

“A Whole New LGA”

This is the phrase that coins the latest development at one of the world's largest international airports, LaGuardia. Closing out at \$8B in total cost, this massive overhaul has been one of the biggest construction projects in the world for several years. The goal of the campaign is really to forget the notions and conceptions that people have of the LaGuardia airport, which (historically) has a bad reputation.

“The old airport, which was probably one of the most hated airports in the country will quickly transform into one of the best” – Rick Cotton, Executive Director of the Port Authority for NY/NJ.

A whole new LaGuardia airport means \$8 Billion dollars invested into a modern, airy, and vibrant travel experience when landing in New York's second-largest airport. Arrive in style with world-class amenities, iconic art, enhanced security, and quick access to additional taxiways to reduce the likelihood of flight delays. The project boasts 30% MWBE (minority/women-owned business enterprise) participation, which means it employs many minority staff both during the construction phase and as the airport operates.

The newest terminal B is LEED Silver certified, so it is built to be energy efficient while offering passerby traffic with the latest amenities. The completion of Terminal B is set to wrap up in Spring of 2022, completing a 7-year process of restoring the image of one of the world's busiest airports.



Samsung Semiconductor Factory

Estimated Cost: \$17Billion (USD)

Location: Austin, Texas

Phase: Planning & Preparation

The entire globe relies on semiconductors in the modern world. Cars, computers, smartphones,



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World's Biggest Construction Projects

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televisions, and medical equipment all rely on semiconductors to function. What happens when we cannot produce all the goods we consume? Well, we run into a global supply shortage where demand far exceeds the amount of production that the globe can handle.

The Samsung Semiconductor Factory is set to start construction in late 2022 and is currently in the planning phase. The goal with this factory and other “Made in the USA” production facilities is to enable the United States to join the global supply efforts manufacturing semiconductors. 70% of the global manufacturing for semiconductors is currently being done in Taiwan and South Korea, yet the entire world relies on the technology. With American semiconducting manufacturing, North American based companies can rely on faster lead times and fewer disruptions in the supply chain.

At a budget of \$17B, this facility will be one of the largest construction projects in the world for years to come. Look for more news and updates in relation to American semiconductor production in 2022, you might be surprised how often this topic is talked about and you will quickly realize the importance of a massive project like Samsung’s efforts in Austin, Texas.

Intel Semiconductor Project – Two Factories

Estimated Cost: \$20 Billion (USD)

Location: Chandler, Arizona

Phase: Active Construction

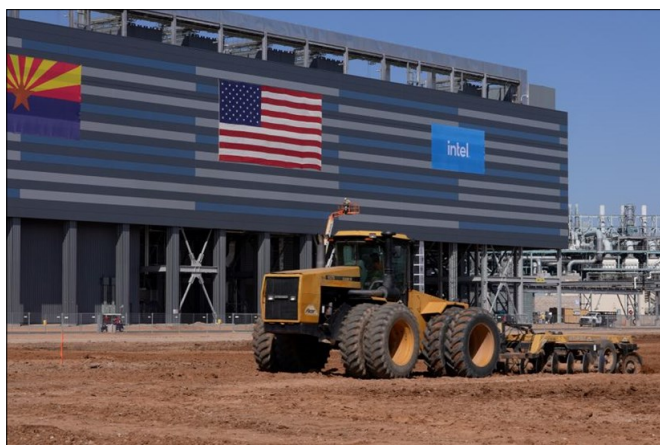
Wait a second, another semiconductor facility? If the previous section about the semiconductor plant in Texas was not enough foreshadowing, there is a desperate need for the world to keep up with semiconductor demand. America is well-positioned to become a global leader in production with state-of-the-art facilities popping up like weeds.

The United States has broken ground and can expect two new semiconductor facilities close to Intel’s Chandler, Arizona, campus. The facility will take 2 years to build and will require around-the-clock work to ensure the deadlines proposed are met. Set to open in 2024, these facilities will bring 3,000 construction jobs, 3,000 intel employees, and create an additional 15,000 indirect jobs in the local communities surrounding Chandler.

The project is expected to be 670,000 square feet once completed and will be three times larger than Intel’s old facility in Arizona. With Intel’s existing campus and connection to Arizona, this project solidifies Intel as one of the largest employers in the state; already taking top honors for largest employer in Chandler.

Next month, we will conclude the series by exploring the world’s top three largest construction projects.

— From mycomply.net



FROM ALL OF US AT THE PRACTITIONER: *Happy Holiday and a Prosperous New Year*

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

1 — The first moving assembly line went into operation (1913), actor/director Woody Allen (1935), comedian Richard Pryor (140), and singer Bette Midler (1945) were born, and Rosa Parks began the Montgomery bus boycott (1955).

2 — Napoleon was crowned emperor of France (1804), the Monroe Doctrine was declared (1823), **Enrico Fermi** produced the first nuclear chain reaction (1942), Archie Griffin won his second Heisman Trophy (1975), pop singer Britney Spears was born (1981), Enron filed for bankruptcy (2001), and the first hydrogen fuel-cell cars were introduced in the U.S. (2002).

3 — Illinois became a state (1818), rocker Ozzy Osbourne was born (1948), the first human heart transplant was performed (1967), and 2,000 people were killed in an explosion at a pesticide plant in India (1984).

4 — President Woodrow Wilson became the first U.S. president to travel to Europe (1918), actresses Marisa Tomei (1964) and Tyra Banks (1973) were born, and American exchange student Amanda Knox was convicted of murdering her roommate in Italy (2009).

5 — President Martin Van Buren (1872), General George Custer (1839) and animator Walt Disney (1901) were born, Prohibition ended (1933), and anti-apartheid activist Nelson Mandela (2013) died.

6 — The Washington Monument was completed (1884), the worst U.S. mining disaster occurred when 361 coal miners were killed in an explosion in West Virginia (1907), the largest manmade pre-atomic explosion — nearly 8 million tons of TNT — occurred at Halifax Harbor when two ships collided (1917), and Jerry Rice broke the NFL's all-time touchdown reception record with his 101st (1992).

7 — Delaware became the first state (1787), **Japan attacked Pearl Harbor** (1941), baseball Hall of Famer Johnny Bench (1947) and basketball Hall of Famer Larry Bird (1956) were born, the first execution by lethal injection took place in Texas (1982), and two earthquakes killed 60,000 people in Armenia (1988).

8 — Entertainer Sammy Davis Jr was born (1925), the biggest defeat in NFL history occurred when Chicago beat Washington 73-0 in the championship game (1940), the U.S. declared war on Japan (1941), singer Jim Morrison was born (1943), John Lennon was shot and killed (1980), the first nuclear arms reduction treaty between the U.S. and Soviet Union was signed (1987), and NAFTA was signed into law (1993).

9 — Actors Kirk Douglas (1916) and John Malkovich (1953), and singer Donny Osmond (1957) were born, and U.S. Marines landed in Somalia (1992).

10 — Wyoming became the first state to allow women to vote (1869), the Spanish-American war ended (1898), the first Nobel Prizes were awarded (1901), singer Otis Redding was killed in a plane crash (1967), and **LaDainian Tomlinson broke the NFL single-season touchdown record with his 29th** (2006).

11 — Germany declared war on the U.S. (1941), UNICEF was founded (1946), singer Sam Cooke was shot to death (1964), and Russia invaded Chechnya (1994).

12 — The first trans-Atlantic radio transmission was conducted (1901), entertainer Frank Sinatra (1915) and TV game show host Bob Barker (1923) were born, Gayle Sayers scored an NFL record-tying six touchdowns in one game (1965), one of Leonardo da Vinci's notebooks sold for \$5.1M (1980), and GM announced its phase-out of Oldsmobile (2000).

13 — New Zealand was discovered (1642), actor Dick Van Dyke (1925) and rocker Ted Nugent (1947) were born, the highest scoring NBA game was played when Detroit beat Denver 186-184 (1983), and Iraqi dictator Saddam Hussein was captured (2003).

14 — Prognosticator Nostradamus was born (1503), George Washington died (1799), Gen. James Doolittle was born (1896), the first study of quantum theory was published (1900), Roald Amundsen reached the South Pole (1911), and the Sandy Hook school shooting occurred (2012).

15 — The Bill of Rights was ratified (1791), Sioux chief Sitting Bull was killed (1890), the rotary engine was patented (1896), funnyman Tim Conway was born (1933), bandleader Glenn Miller's airplane disappeared (1944), and **actor Don Johnson was born** (1949).

16 — Composer Ludwig van Beethoven was born (1770), the Boston Tea Party took place (1773), the greatest series of earthquakes in U.S. history occurred in Missouri (1811), the Battle of the Bulge began (1944), and OJ Simpson became the first NFL player to rush for over 2,000 yards in one season (1973).

17 — The Wright brothers successfully flew the first airplane (1903), Stan Barrett became the first person to break the sound barrier on land (1979), and Terrell Owens caught an NFL-record 20 passes in one game (2000).

18 — The Mayflower arrived at Plymouth (1620), the first national day of thanksgiving was celebrated (1777), the 13th Amendment abolishing slavery was formally adopted into the Constitution (1865), baseball legend Ty Cobb was born (1886), and director Steven Spielberg (1946), actor Brad Pitt (1964) and singer Christina Aguilera (1980) were born.

19 — Charles Dickens' "A Christmas Carol" was published (1843), the NHL began its first season

(1917), late football Hall of Famer Reggie White was born (1961), the last Apollo lunar-landing mission ended (1972), the blockbuster movie Titanic premiered (1997), and President Bill Clinton was impeached (1998).

20 — The French surrendered Orleans to the U.S. (1803), Elvis Presley was drafted into the Army (1957), actor Kiefer Sutherland was born (1966), hockey star Guy Lafleur scored his 500th goal (1983), and the U.S. invaded Panama (1989).

21 — Soviet dictator Joseph Stalin (1879), TV talk show host Phil Donahue (1935), actress Jane Fonda (1937) and rocker Frank Zappa (1940) were born, Gen. George Patton died in a car accident (1945), funnyman Ray Romano (1957) and Olympic champion sprinter Florence Griffith Joyner (1959) were born, Apollo 8 launched as the first manned mission to the moon (1968), and a jetliner exploded over Scotland, killing all 243 passengers (1988).

22 — Beethoven's Fifth Symphony premiered (1808), the first Mercedes was sold (1900), and the L.A. Lakers broke the pro sports winning streak record with its 27th consecutive win (1971).

23 — Mormon Church founder Joseph Smith was born (1805), Franco Harris caught the Immaculate Reception in the AFC championship game (1972), and Philadelphia, the first major Hollywood movie about AIDS, was released (1993).

24 — The War of 1812 ended (1814), the KKK was founded (1865), rich guy Howard Hughes was born (1905), **President Coolidge lit up the first national Christmas tree at the White House** (1923), TV host Ryan Seacrest was born (1974), and the Soviet Union invaded Afghanistan (1979).

25 — Scientist Sir Isaac Newton (1642) and actor Humphrey Bogart (1899) were born, Bing Crosby first sang "White Christmas" (1941), singer Jimmy Buffett and football Hall of Famer Larry Czonka (1946) were born, Soviet president Mikhail Gorbachev resigned (1991), young beauty queen JonBenet Ramsey was murdered (1996), and New Mexico kicker Katie Hnida became the first female to play in a Division I college football game (2002).

26 — Jack Johnson became the first black heavyweight boxing champ (1908), Kwanzaa was first celebrated (1966), President Harry Truman died (1972), and an estimated 230,000 people died from a tsunami in Southeast Asia (2004).

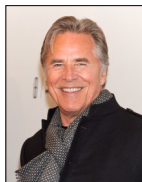
27 — Radio City Music Hall opened in New York City (1932), and Peyton Manning broke the NFL's single-season touchdown passing record with his 49th (2004).

28 — President Woodrow Wilson was born (1856), the first Labor Day in the U.S. was observed (1869), the first commercial movie was screened in Paris (1895), the worst-ever earthquake in Europe killed an estimated 100,000 people (1908), and actor Denzel Washington was born (1954).

29 — President Andrew Johnson was born (1808), Texas became a state (1845), the massacre at Wounded Knee took place (1890), actress Mary Tyler Moore (1937) and actor Ted Danson (1947) were born.

30 — The border between the U.S. and Mexico was established (1853), more than 600 people were killed in a fire at a Chicago theater (1903), the USSR was established (1922), and baseball Hall of Famer Sandy Koufax (1935) and golfer Tiger Woods (1975) were born.

31 — Thomas Edison demonstrated the first incandescent light (1879), actor Anthony Hopkins (1937), singers John Denver (1943) and Donna Summer (1948), and actor Val Kilmer (1959) were born, baseball star Roberto Clemente (1972) and singer Rick Nelson (1985) were killed in plane crashes, and Panama took possession of the Panama Canal from the U.S. (1999).



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