



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

Issue 11

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## **And the Beat Goes On!**

**G**reetings, PDWG Team Members. Summer is here and hopefully you are enjoying good fortune and good weather. If your experience is like most you find yourself busier than you thought possible given the recent conditions and challenges.

This month's issue of the *Practitioner* highlights Minor Construction/General Plant Project pre-planning as it relates to the "CD Gate" process. We will also share what we learned about audit "independence" and related threats.

While the two subjects initially seem unrelated, they are actually extremely complementary to one another given the number of project reviews that should be taking place during the pre-planning phase of your projects. Project reviews are to ensure that all parties are on the same page and the project can perform its intended mission/function within the approved budget.

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## **Minor Construction Project Pre-Planning — Are You Making Promises You Can't Keep?**

**M**any of us have heard that Minor Construction Projects, or General Plant Projects (GPP), are "easier." Some of us have actually even heard of GPP estimates that were developed on the back of a napkin, literally. The hope is that very few of us have experienced that level of dismal, eye watering lack of process discipline and rigor. If your project pre-planning process consists of back-of-the-napkin estimating and glad-handing with the customer, you may be making promises you can't keep in terms of cost and mission performance. Let's take a look into what 413.3B provides in the way of pre-planning activities for all projects. Let's start with the 413.3B "Purpose" statement:

*To provide the Department of Energy (DOE) Elements, including the National Nuclear Security Administration (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.*

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# Minor Construction Project Pre-Planning

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With the "Purpose" clearly understood, let's now look at the "Departmental Applicability" statement:

*The requirements identified in this Order are mandatory for all DOE Elements (unless identified in Paragraph 3.c., Equivalencies/Exemptions) for all capital asset projects having a Total Project Cost (TPC) greater than \$50M, except that during the project development phase, Under Secretaries may reduce the threshold to \$10M for nuclear projects or complex first-of-a-kind projects. Any reference to a Program Secretarial Officer (PSO) in this Order is also applicable to the Deputy Administrator/Associate Administrators for the NNSA.*

*The principles (see Appendix C, Paragraph 1.a.-l.) as set forth in this Order apply to all capital asset projects. They also apply to General Plant Projects (GPPs) for which the approved total estimated cost does not exceed the minor construction threshold, using a tailored approach.*

Notes regarding "Tailoring": Major tailored elements, such as consolidating or phasing CDs or delegation of Project Management Executive (PME) duties, must be specified in the Project Execution Plan (PEP) or the Tailoring Strategy and approved by the PME. Tailoring does not imply the omission of requirements in the acquisition process or other processes that are appropriate to a specific project's requirements or conditions.

Having laid the foundation with the "Purpose" and "Applicability" of 413.3B, let's now look at pre-planning aspects of the CD gate process.

## CD-0, Approve Mission Need

The Initiation Phase begins with the identification of a mission-related need. A Program Office will identify a credible performance gap between its current capabilities and capacities and those required to achieve the goals articulated in its strategic plan.

### Prior to CD-0

- Perform Pre-Conceptual Planning activities:
- ▶ Strategic Goals/Objectives
  - ▶ Safety Planning, Design
  - ▶ Development of Capability Gaps, Project Parameters, ROM Cost Range, Schedule Estimates
  - ▶ Independent Cost Review (ICR)

### Post CD-0

- Perform Conceptual Planning activities:
- ▶ Initiate Quarterly Project Reviews (QPR)
  - ▶ Conduct a Project Peer Review
  - ▶ Proceed with Conceptual Planning and Design to develop alternative concepts and functional requirements

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# Minor Construction Project Pre-Planning

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The cost range provided at CD-0 should be Rough-Order of Magnitude (ROM) and is used to determine the PME authority designation. It does not represent the PB, which will be established at CD-2.

## CD-1, Approve Alternative Selection and Cost Range

CD-1 approval marks the completion of the project definition phase and the conceptual design. This is an iterative process to define, analyze, and refine project concepts and alternatives. This process uses a systems engineering methodology that integrates requirements analysis, safety strategies, risk identification and analysis, acquisition strategies, and concept exploration in order to evolve a cost-effective, preferred solution to meet a mission need (refer to DOE G 413.3-1 for more information). The recommended alternative should provide the essential functions and capabilities at an optimum life-cycle cost, consistent with required cost, scope, schedule, performance, and risk considerations. It should be reflected in the site’s long-range planning documents as well. Approval of CD-1 provides the authorization to begin the project Execution Phase and allows PED funds to be used.

### Prior to CD-1

- ▶ Approve an Acquisition, ISM, QAP, S&S, NEPA, Environmental Comp Strategy
- ▶ Approve a preliminary Project Execution Plan (PEP)
- ▶ Include Tailoring Strategy, if applied
- ▶ Establish and Charter an Integrated Project Team to include a responsibility matrix...include in the PEP
- ▶ Develop a Risk Management Plan
- ▶ Conduct a Design Review (DR)

- ▶ Complete a Conceptual Design with Report
- ▶ Conduct an Analysis of Alternatives

### Post CD-1 Approval

- ▶ Begin expenditure of Project Engineering Design (PED), Major Items of Equipment (MIE), or Operating Expense (OE) funds for the project design
- ▶ Establish and report against DOE Financial Handbook \$2M Design threshold
- ▶ Develop an Acquisition Plan, if applicable
- ▶ Annually conduct Project Peer Reviews (PPR)
- ▶ Continue Quarterly Project Reviews

## CD-2, Approve Performance Baseline

Completion of preliminary design is the first major milestone in the project Execution Phase. The design must be sufficiently mature (refer to Appendix C, Paragraph 7) at the time of CD-2 approval to provide reasonable assurance that the design will be implementable within the approved PB. The document signed by the CE or PME approving

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# Minor Construction Project Pre-Planning

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CD-2 must clearly specify the project's approved PB, which includes the TPC, CD-4 date (month and year), scope and minimum Key Performance Parameters (KPPs) that must be achieved at CD-4.

### **Prior to CD-2**

- ▶ Update the Acquisition Strategy
- ▶ Establish a Performance Baseline
- ▶ Approve Updated PEP
- ▶ Prepare a funding profile
- ▶ Approve Long Lead Procurements
- ▶ Develop a Project Management Plan, if applicable
- ▶ Perform a Performance Baseline Independent Project Review (IPR)
- ▶ Develop an Independent Cost Estimate (ICE) to support the PB
- ▶ Designs shall be sufficiently mature to prepare a project baseline with 80-90% confidence

- ▶ Conduct a design review
- ▶ Conduct a Project Definition Rating Index (PDRI) Analysis
- ▶ Employ an Earned Value Management System (EVMS) compliant with EIA 748C, or as required by the contract
- ▶ Issue a Preliminary Design Report and Incorporate Sustainability Requirements

### **Post CD-2 Approval**

- ▶ Submit all CD documents, and if there are changes to the PB, submit BCP documents to PM
- ▶ Obtain PME endorsement on any changes to the approved funding profile that negatively impacts the project.
- ▶ Continue QPRs with the PME or their designee

## **CD-3, Approve Start of Construction/Execution**

CD-3 is a continuation of the execution phase. The project is ready to complete all construction, implementation, procurement, fabrication, acceptance and turnover activities.

### **Prior to CD-3**

- ▶ Approve updated CD-2 Project Documentation that reflects major changes from Final Design, the PEP, PB, AS, and PDS/funding documents for MIE and OE funds.
- ▶ Employ a certified Earned Value Management System compliant with EIA-748C, or as required by the contract. (Refer to DOE G 413.3-10A.)
- ▶ Perform an Independent Project Review by the appropriate PMSO for Non-Major System Projects unless justification is provided and a waiver is granted by the PME.
- ▶ Update the Hazard Analysis Report for facilities that are below the Hazard Category 3 nuclear facility threshold as defined in 10 CFR Part 830, Subpart B, based on new hazards and design information.
- ▶ Prior to start of construction, prepare a Construction Project Safety and Health Plan in accordance with 10

CFR Part 851, Appendix A, Section 1(d). This plan must be kept current during construction.

- ▶ Update the Quality Assurance Program for construction, field design changes, and procurement activities. (Refer to 10 CFR Part 830, Subpart A, DOE O 414.1D, and DOE G 413.3-2.)
- ▶ Finalize the Security Vulnerability Assessment Report, if necessary. (Refer to DOE O 470.4B and DOE G 413.3-3A.)

### **Post CD-3 Approval**

- ▶ Commit all the resources necessary, within the funds provided and within the TPC, to execute the project.
- ▶ Conduct EVMS surveillance to ensure compliance with EIA-748C, or as defined in the contract. Contractor must conduct the surveillance annually.
- ▶ Continue QPRs with the PME or their designee.

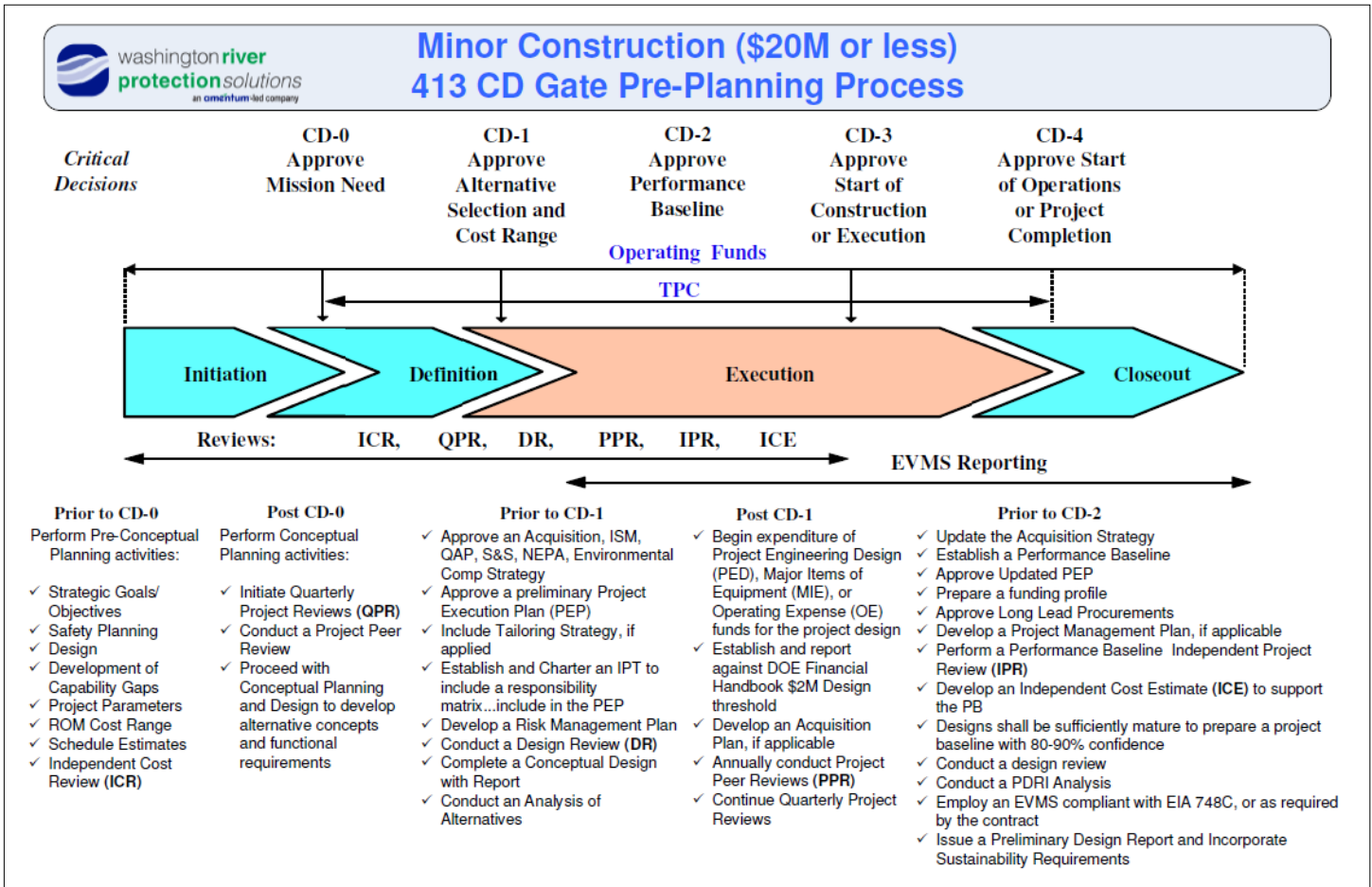
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# Minor Construction Project Pre-Planning

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So, in looking at the pre-planning activities leading up to project execution (CD-3), it is difficult to identify those activities that, if properly performed, would not add value to any project. Suffice it to say that if you follow the prescribed path for your project, you have a recipe for success. If, on the other hand, you attempt to “wing it” or make it up as you go when it comes to pre-planning, you will find yourself making promises you cannot keep!!!

Below is a look at the 413.3B pre-planning activities aligned with the CD Gate process.



## PDWG Goings-On

### Upcoming events:

📅 An EVMS Maturity Development Pilot Workshop (tentatively Tuesday, July 7, from 10 a.m. to 1 p.m. PDT)

📅 An EVMS Environment Development Pilot Workshop (tentatively Thursday, July 9, from 10 a.m. to 1 p.m. PDT)

The EVMS Maturity and Environment Total Rating (EVMS METR) is an assessment mechanism being developed as part of a DOE-sponsored Joint Research Study led by the Arizona State University (ASU) and representing 15+ government and industry organizations. The envisioned tool will assess a spectrum of EVMS maturity and environment issues centered around the 32 EIA-748 EVMS Guidelines, inclusive of compliance expectations.

# **Reviewing your Minor Construction Project During the Pre-Planning Phase — Are Your Project Reviews Impacted by Audit Independence?**

One of the keys to pre-planning success is the array of independent reviews from CD-0 through CD-3, which are intended to flush out project design fit, form, and function weakness that could impact the prime directive 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...". This typically includes the following types of reviews: Independent Cost Review (ICR), Quarterly Project Reviews (QPR), Design Review (DR), Project Peer Reviews (PPR), Independent Project Review (IPR), and Independent Cost Estimate (ICE).

These reviews come to us in the form of self-governance, which is relatively new to government agencies and its contractors. Typically, government agencies and contractors do not scrutinize themselves to the same level as an external entity would, simply due to the inherent bias that comes with self-governance. For those new to self-governance, it is not uncommon for management to desire control of the narrative of internal reviews to lessen the burden of elevating bad news to the field office/client. It is also not uncommon to see management attempt to balance a review team with project staff to ensure the project perspective is not overshadowed and the message coming from a review team is not too pointed, edgy, harsh, or painful, or perceived as unfair to the project.

The Government Accountability Office issued GAO-20-639R "Inspectors General Independence", a report on "Independence Principles and Considerations for Reform" citing; "Accountability — for both the use of public resources and the exercise of government authority — is key to our nation's governing processes and to achieving national goals. Independent government audits, in turn, provide essential accountability and transparency over government programs and operations by providing objective analysis and information to decision-makers and the public. Given the current challenges facing the federal government, the oversight provided through independent government audits and investigations is more critical than ever."

Ensuring threats to project review team independence and results must be an industry priority. Failure to protect the independence of project reviews will lead to ineffective identification and resolution of systemic issue root causes. Without management's overt and unyielding insistence and support for the absolute independence of review team process and results, clients, contractor staff, and external audit entities may question the validity and integrity of reviews performed under these environmental conditions. Commitment to independent review process and result transparency is key to demonstrating a genuine interest in custodial management of taxpayer resources.

Oversight without independence will not yield the results which are best for the project, project stakeholders, or the owners. Oversight which lacks independence also lacks credibility and effectiveness. The ability to report review results free of influence or interference is paramount to mitigation of downstream project impacts due to inadequate pre-planning. Killing the message or the messenger will only delay bad or unfavorable project news that, if reported earlier, may have been resolved.

# It is Not One World — What We Do and How We Do it Matters! Construction Failures: One of the Worst and What We Can Learn

## HURRICANE KATRINA – NEW ORLEANS LEVEE SYSTEM (AUGUST 2005)

In late August 2005, more than 50 levees and flood walls protecting New Orleans and suburbs failed following passage of Hurricane Katrina which made landfall in Mississippi.

The failures caused flooding in 80 percent of New Orleans (Orleans Parish), all of St. Bernard Parish (southern edge of New Orleans region), and took the lives of nearly 1,900 people. Additionally, more than 100,000 homes and businesses were flooded, causing billions of dollars in property damage.

*[Note: In Louisiana, a parish is equivalent of a county in other states.]*

### FAILURE CAUSE

Shortly after the mass levee failure, blame based on misinformation was placed on a number of culprits.

It wasn't until ten years later that a team of experts defined the elements that led to the failure in an article published in *Water Policy*, a peer-reviewed journal. The lead author was J. David Rogers, a professor at Missouri University of Science and Technology.

The article placed the main fault on the U.S. Army Corps of Engineers' misinterpretation of a full-scale load test it carried out several years prior in the Atchafalaya Basin, which is located in south central Louisiana.

After these tests, it was determined that flood walls within the city, built in the 1990s and early 2000s, should be installed at a depth of 17 feet, instead of the initially-suggested depths of 31 feet to 46 feet.

This decision was made with the city's budget in mind. Misinterpretation of the test results occurred because a heavy cloth tarp covered the gap that formed between the sheet pile supports and the ground during testing.

The tarp was present as a safety measure and the impacts of the tarp were not accounted for during the tests.

In short, engineering oversights occurred. **These oversights may have been prevented if the Corps had utilized an external peer review board to double-check test findings and the design of the new flood walls.**



City of New Orleans Ground Elevations  
From Canal St. at the Mississippi River to the Lakefront at U.N.O.  
*Vertical cross-section of New Orleans, showing maximum levee height of 23 feet (7 m) at the Mississippi River on the left and 17.5 feet (5 m) at Lake Pontchartrain on the right.*

*Photo credit: Alexdi at English Wikipedia*

— Article excerpted from [PileBuck.com](http://PileBuck.com)

# 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), and actor Morgan Freeman (1937) and singer Alanis Morissette (1974) were born.



2 — Martha Washington—the first First Lady—was born (1731), PT Barnum’s circus made its U.S. debut (1835), 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 (1808) and TV newsman Anderson Cooper (1967) were born.

4 — The first recorded solar eclipse occurred (780 BC), and actress Angelina Jolie was born (1975).

5 — Mexican revolutionary Pancho Villa (1878) and sax player Kenny G (1956) were born, and Sen. Robert F. Kennedy was assassinated (1968).

6 — 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.

8 — Architect Frank Lloyd Wright (1867), football star and Supreme Court Justice Byron “Whizzer” White (1917), First Lady Barbara Bush (1925), actor Jerry Stiller (1929) and comedian Joan Rivers (1937) were born.

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), 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, and the movie E.T. The Extra-Terrestrial was released (1982).



12 — The first perfect game in baseball was pitched (1880), 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 (1953), and twin actresses Mary-Kate and Ashley Olsen (1986) were born.

14 — The U.S. Army was organized (1775), sandpaper was patented (1834), singer/actor Burl Ives (1909) was born, Walt Disney’s Bambi was released (1942), and President Donald Trump (1946) and singer Boy George (19161) were born.

15 — Country singer Waylon Jennings (1937), actor Jim Belushi (1954), Hall of Fame baseball player Wade Boggs (1958), actresses Helen Hunt (1963) and Courtney Cox (1964), and rapper Ice Cube (1969) were born.

16 — Boxing champ Roberto “No mas” Duran was born (1951).

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 — Musician Paul McCartney was born (1942), and Sally Ride became the first woman in space (1983).

19 — 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 — **The first jet plane was tested** (1939), and 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.



21 — Actress Meredith Baxter and actor Michael Gross were born (1947).

22 — Doughnuts were invented (1847), and outlaw John Dillinger (1903), singer Kris Kristofferson (1936), and actress Meryl Streep (1949) were born.

23 — The Secret Service was created (1860), and Supreme Court Justice Clarence Thomas was born (1948).

24 — Boxing champ Jack Dempsey (1895) and musician Mick Fleetwood (1942) were born.

25 — Gen. George Custer and the 7th U.S. Cavalry were wiped out in the Battle of Little Big Horn (1876), and singer Carly Simon was born (1945).

26 — Baseball inventor Abner Doubleday (1819) and singer George Michael (1963) were born.

27 — The “Happy Birthday” song was first sung (1859), and deaf/mute/blind author/lecturer Helen Keller (1880) and **Bob “Captain Kangaroo” Keeshan** (1927) were born.



28 — The Treaty of Versailles was signed, officially ending World War I (1919), and Hall of Fame quarterback John Elway (1960) and actor John Cusack (1966) were born.

29 — Actor Gary Busey was born (1944).

30 — French acrobat Blondin crossed over Niagara Falls on a tightrope (1859), and boxing champ Mike Tyson was born (1966).

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