



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

Issue 25

August 2021

## **Project management through the eyes of construction**

**G**reetings, PDWG members! This month's *Practitioner* explores the broader horizons of project management by looking beyond our own confines of the EFCOG world and introducing the perspective of the "Construction Industry Institute" (CII).

CII has an impressive member list of "Owners" (including our client, the Department of Energy), "Contractors" (many of whom we recognize and or work for), and "Service Providers" (also easily recognizable as industry leaders).

So sift through the article for nuggets of information/links that may be valuable to your perspective and project.

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## **Construction Industry Institute**

<https://www.construction-institute.org/>



### **About CII**

CII, based at The University of Texas at Austin, is a consortium of more than 140 leading owner, engineering-contractor, and supplier firms from both the public and private arenas. These organizations have joined together to enhance the business effectiveness and sustainability of the capital facility life cycle through CII research, related initiatives, and industry alliances.

### **Overview of CII**

A learning organization with a wealth of knowledge and information, CII is unique in the engineering and construction industry.

### **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 –

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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 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.

## CII Mission, Vision, and Core Values

### Mission

The mission of CII is to provide a research and development platform to create and drive innovative solutions that tangibly improve business outcomes through an academically-based, disciplined approach.

### Vision

CII envisions an efficient capital projects industry that builds predictable value for member organizations, society, and stakeholders. Leveraging new ideas, unique forms of collaboration, and knowledge across the project lifecycle, CII provides unmatched advocacy for the built environment.

### CII Core Values

The organization is a reflection of its members – driven to achieve improved total lifecycle performance through the specific initiatives undertaken. CII values its ability to collaborate broadly across a diverse group of stakeholders. Paramount to CII’s success is a strong focus on safety, productivity, predictability, and efficiency. The institute and its members aspire to the highest levels of social and environmental responsibility, integrity, and ethics.

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(Click on the banner below)



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2. Just press SEND – Do not edit anything.
3. Click the provided link in the confirmation email you receive.

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Membership:

Member List: Note the **Department of Energy** (below)

Owner, Contractor, and Service Provider Organizations



Owners		
<a href="#">AdvanSix</a>	<a href="#">ExxonMobil Corporation</a>	<a href="#">Petronas</a>
<a href="#">Air Products</a>	<a href="#">General Electric Company</a>	<a href="#">Phillips 66</a>
<a href="#">Albemarle Corporation</a>	<a href="#">GlaxoSmithKline</a>	<a href="#">Public Service Electric &amp; Gas Company</a>
<a href="#">American Transmission Company LLC</a>	<a href="#">Global Infrastructure Partners</a>	<a href="#">Reliance Industries Limited (RIL)</a>
<a href="#">Anheuser-Busch InBev</a>	<a href="#">Honeywell International Inc.</a>	<a href="#">SABIC - Saudi Basic Industries Corporation</a>
<a href="#">Aramco Services Company</a>	<a href="#">INEOS Group Holdings S. A.</a>	<a href="#">Shell Global Solutions US Inc.</a>
<a href="#">Archer Daniels Midland Company</a>	<a href="#">Johnson &amp; Johnson</a>	<a href="#">Smithsonian Institution</a>
<a href="#">Architect of the Capitol</a>	<a href="#">Koch Industries, Inc.</a>	<a href="#">Southern Company</a>
<a href="#">Ascend Performance Materials</a>	<a href="#">Los Alamos National Laboratory</a>	<a href="#">TC Energy</a>
<a href="#">BHP Billiton</a>	<a href="#">LyondellBasell</a>	<a href="#">Tennessee Valley Authority</a>
<a href="#">Cargill, Inc.</a>	<a href="#">National Aeronautics &amp; Space Administration</a>	<a href="#">The Dow Chemical Company</a>
<a href="#">Chevron</a>	<a href="#">Naval Facilities Engineering Command</a>	<a href="#">The Procter &amp; Gamble Company</a>
<a href="#">ConocoPhillips</a>	<a href="#">New York Power Authority</a>	<a href="#">The Williams Companies, Inc.</a>
<a href="#">Consolidated Edison Company of New York</a>	<a href="#">NOVA Chemicals Corporation</a>	<a href="#">U.S. Army Corps of Engineers</a>
<a href="#">Covestro LLC</a>	<a href="#">Nuclear Decommissioning Authority</a>	<a href="#">U.S. Department of Commerce/NIST</a>
<a href="#">DTE Energy</a>	<a href="#">Nutrien</a>	<a href="#">U.S. Department of Energy</a>
<a href="#">DuPont</a>	<a href="#">Occidental Petroleum Corporation</a>	<a href="#">U.S. Department of State</a>
<a href="#">Eastman Chemical Company</a>	<a href="#">ONEOK, Inc.</a>	<a href="#">U.S. General Services Administration</a>
<a href="#">Energy Corporation</a>	<a href="#">Ontario Power Generation</a>	<a href="#">Zachry Corporation</a>
Contractors		
<a href="#">Alfred Miller Contracting</a>	<a href="#">Fluor Corporation</a>	<a href="#">POWER Engineers, Inc.</a>
<a href="#">APTIM</a>	<a href="#">H+M Industrial EPC</a>	<a href="#">Primus Builders, Inc.</a>
<a href="#">Baker Concrete Construction Inc.</a>	<a href="#">Hargrove Engineers + Constructors</a>	<a href="#">Richard Industrial Group</a>
<a href="#">Barton Malow Company</a>	<a href="#">Hatch</a>	<a href="#">Samsung C&amp;T</a>
<a href="#">Bechtel Group, Inc.</a>	<a href="#">JGC Corporation</a>	<a href="#">Techint Engineering &amp; Construction</a>
<a href="#">Black &amp; Veatch</a>	<a href="#">KBR</a>	<a href="#">Technip Energies</a>
<a href="#">Burns &amp; McDonnell</a>	<a href="#">Kiewit Corporation</a>	<a href="#">thyssenkrupp Industrial Solutions (USA), Inc.</a>
<a href="#">Chiyoda Corporation</a>	<a href="#">MasTec Power Corporation</a>	<a href="#">Toyo Engineering Corporation</a>
<a href="#">CRB</a>	<a href="#">Matrix Service Company</a>	<a href="#">United E&amp;C, Inc.</a>
<a href="#">Day &amp; Zimmermann</a>	<a href="#">McCarthy Building Companies, Inc.</a>	<a href="#">Victaulic</a>
<a href="#">Digital Construction Works</a>	<a href="#">McDermott International, Inc.</a>	<a href="#">Wood</a>
<a href="#">Emerson</a>	<a href="#">PCL Constructors, Inc.</a>	<a href="#">Worley</a>
<a href="#">Faithful+Gould</a>	<a href="#">PLH Group</a>	<a href="#">Zachry Group</a>
Service Providers		
<a href="#">Accenture</a>	<a href="#">Detect Technologies</a>	<a href="#">Oracle USA, Inc.</a>
<a href="#">ASITE, LLC</a>	<a href="#">DyCat Solutions</a>	<a href="#">Pathfinder, LLC</a>
<a href="#">Atlas RFID Solutions</a>	<a href="#">ePM</a>	<a href="#">PTAG, Inc.</a>
<a href="#">Autodesk, Inc.</a>	<a href="#">Group ASI</a>	<a href="#">SkyCam Aviation, Inc.</a>
<a href="#">AVEVA Solutions Ltd.</a>	<a href="#">Hilti Corporation</a>	<a href="#">T. A. Cook Consultants Inc</a>
<a href="#">AWP University</a>	<a href="#">I.M.P.A.C.T.</a>	<a href="#">Trillium Advisory Group Ltd</a>
<a href="#">Construct-X, LLC</a>	<a href="#">iConstruct</a>	<a href="#">Valency Inc.</a>
<a href="#">Continuum Advisory Group</a>	<a href="#">Insight-AWP Inc.</a>	<a href="#">Verum Partners</a>
<a href="#">Dassault Systèmes SE</a>	<a href="#">Layher, Inc.</a>	<a href="#">Zurich</a>
<a href="#">Deloitte</a>	<a href="#">O3 Solutions</a>	

## Best Practices:

A CII Best Practice is a process or method that, when executed effectively, leads to enhanced project performance. CII Best Practices have been proven through extensive industry use and/or validation.

You can get detailed information on each of the CII Best Practices by visiting [this link](#) on the web.

“Front End Planning” (below) is opened to view the typical content:

- Advanced Work Packaging
- Alignment
- Benchmarking & Metrics
- Change Management
- Constructability
- Disputes Prevention & Resolution
- **Front End Planning**

The essential process of developing sufficient strategic information with which owners can address risk and make decisions to commit resources in order to maximize the potential for a

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successful project. FEP is often perceived as synonymous with front-end engineering design (FEED), front end loading (FEL), pre-project planning (PPP), feasibility analysis, programming and conceptual planning.

- All Front End Planning Topic Summaries (14)
  - Feasibility (14)
  - Concept (14)
  - Detailed Scope (14)
  - Detailed Design (Engineering) (1)
  - Procurement (0)
  - Construction (0)
  - Commission & Startup (0)
  - Handover & Close-out (0)
- Implementation of CII Research
- Lessons Learned
- Materials Management
- Partnering
- Planning for Modularization
- Planning for Startup
- Project Risk Assessment
- Quality Management
- Team Building
- Zero Accidents Techniques

Dial up the CII “Front End Planning” best practice as shown below to see if there is something you can use on your project.

*Note the consistency of the CII “Front End Planning” Best Practice with the DOE O 413.3B Appendix C - Chg 6 (LtdChg): 01-12-2021 language below:*

“Project Definition Rating Index. The project team will perform comprehensive front-end project planning to an appropriate level before establishing a PB at CD-2. The PDRI model assists the IPT in identifying key engineering and design elements critical to project scope definition. PDRI is to be implemented and used for projects with a TPC of \$100M or greater, as appropriate. This will be accomplished by the FPD. While not mandated, it is strongly encouraged for use by Programs for projects with a TPC less than \$100M. See DOE G 413.3-12 for additional information.”

### **PDRI Tool for Small Infrastructure Projects (Best Practice)**

*RT-314a Topic Summary*

## UPCOMING EVENTS



### AACE International

<https://web.aacei.org/resources/online-learning/seminars>

#### Advanced Project Controls from the Owner's Perspective

August 30 — September 1, 2021; 11 am — 3:30 pm EDT



### Dan Melamed: Application of EVM to Operations Activities

<https://bit.ly/3A2UjXu>

September 2, 2021, 11 a.m.—12 p.m.

Teams Meeting



### Decommissioning Strategy Forum

<https://na.eventscloud.com/ereg/newreg.php?eventid=566519&>

September 20 – 21, 2021



### EFCOG Project Controls Working Group Annual Meeting

Monday, September 20, 2021, 8 a.m.—5 p.m., EDT

WEBEX

The Project Controls Working Group will hold their annual meeting to review the accomplishments from FY21 and discuss FY22 plans. We will also have a discussion on the updated DOE data test metrics and challenges that we have had implementing them; recommendations for training the sites on conducting the tests. Due to the cancelling of the Empower Users Group meeting this meeting will be held virtual this year. Contact Lisa Cazalet ([lisa.cazalet@cns.doe.gov](mailto:lisa.cazalet@cns.doe.gov)) if you have any questions or requests for agenda items. Agenda to be issued separately.



### Rad Waste Summit

<https://na.eventscloud.com/ereg/index.php?eventid=566517&>

September 22 – 24, 2021



### Empower User's Group Workshop & Training

Due to the increase in cases of the COVID-19 variants and further restrictions of non-essential travel for many of our attendees, we have decided to postpone the upcoming EUG Workshop.

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## Overview

The Project Definition Rating Index (PDRI) – Small Infrastructure Projects is a powerful and easy-to-use tool that offers a method to measure project scope definition for completeness. The tool provides descriptions of each critical element allowing project teams to quickly identify project risk factors related to the desired outcomes for cost, schedule and operating performance. The PDRI is designed for use during front end planning, which includes feasibility, concept and detailed scope definition.

The PDRI–Small Infrastructure offers a comprehensive checklist of 40 scope elements in a score sheet format. Each element is weighted based on its relative risk and importance to the other elements, illuminating areas that need further work for a successful project.

A significant feature of the PDRI–Small Infrastructure Projects is that one can quickly go through an assessment and evaluate scope definition on people and freight, fluids, and energy projects. The PDRI–Small Infrastructure Projects functions as:

- a checklist that a project team can use for determining the necessary steps to follow in defining the project scope
- a listing of standardized scope definition terminology for small infrastructure projects
- an industry standard for rating the completeness of project scope definition to facilitate risk assessment and prediction of escalation potential for disputes
- a means to monitor progress—when used successively—at various stages of the front end planning effort
- a partial forensic assessment tool for evaluating design and construction readiness
- a tool that promotes communication and alignment between owners, designers/engineers, and construction contractors by highlighting poorly defined scope

IR314a-2 includes the following tools:

- Unweighted Project Score Sheet
- Weighted Project Score Sheet
- Element Descriptions
- Macro enabled excel project assessment spreadsheet
- Logic Flow Diagrams
- Facilitation Instructions
- Provide Feedback?
- Key Findings and Implementation Tools

## 1 : PDRI Tool Elements

Forty elements sufficiently define the scope of a small infrastructure project. These elements are organized into three main sections, each broken down into a series of categories and then elements.

*Reference: (IR314a-2)*

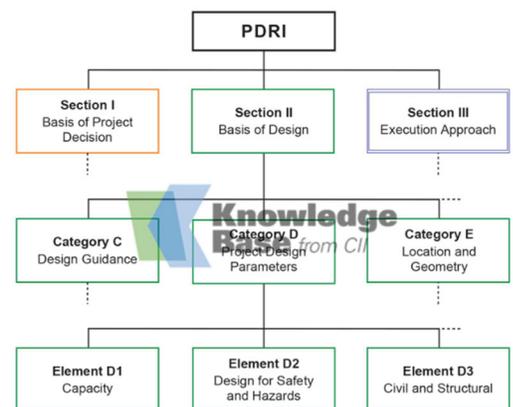


Figure 1.3. Partial PDRI Hierarchy

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## 2 : Implementation Tool #1

### IR314a-2: PDRI—Small Infrastructure Projects

The Project Definition Rating Index (PDRI) is a powerful, easy-to-use tool that identifies and precisely describes each critical element in a scope definition package. It also enables project teams to identify quickly the project risk factors related to desired outcomes for cost, schedule, and operating performance. By using the PDRI method, teams can capture mitigation action items and evaluate the completeness of scope definition at any point prior to detailed design and construction.

- Macro-enabled Excel spreadsheet for assessment
- Unweighted Project Score Sheet (Appendix A)
- Weighted Project Score Sheet (Appendix B)
- Element Descriptions (Appendix C)

*Reference: (IR314a-2)*

## 3 : Proven Success of Projects with a PDRI Score below 300

PDRI—Small Infrastructure Projects use has proven that projects with a PDRI score <300 tend to perform better than those >300.

*Reference: (IR314a-2)*

## 4 : PDRI Application Points

Employ the PDRI at optimal times based on project size, complexity, and duration.

PDRI Early Review – high level assessment of the project following feasibility, typically at the initial kick-off meeting. PDRI Section I, Basis of Decision, should be well defined. FOCUS: Align team around project objectives, communication and stakeholder expectations. Typical PDRI score: 400-800

PDRI Final Review – final assessment of the project, at the end of front end planning. The project team has identified risk issues and is developing or has put mitigation plans in place. Typical PDRI Score: 150-400, with a target of 300 or below.

*Reference: (IR314a-2)*

## Key Performance Indicators

Improved quality, improved cost, improved schedule, more predictable cost and schedule outcomes.

Table 4.1. Project Performance Based on PDRI Score

Performance	PDRI Score	
	< 300	> 300
Cost (N=51)	3% below budget (N=29)	24% above budget (N=22)
Schedule (N=43)	4% behind schedule (N=23)	5.5% behind schedule (N=20)
Change Orders* (N=53)	7% of budget (N=29)	12% of budget (N=24)

\* The absolute value of change orders did not vary substantially due to concurrency of design and construction, along with scope changes typical of small projects.

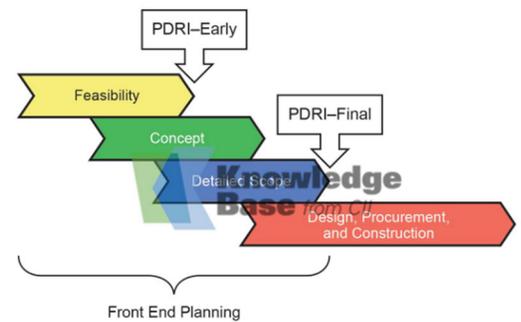


Figure 3.1. Employing the PDRI—Application Points

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

1 — Explorer William Clark (1770) and national anthem author Francis Scott Key (1779) were born, World War 1 began (1914), the first Six Flags amusement park opened in Texas (1961), and MTV made its debut (1981).

2 — The Declaration of Independence was signed (1776), Pres. Warren G. Harding died (1923), the Vietnam War began (1964), and Iraq invaded Kuwait (1990).

3 — Christopher Columbus set sail from Spain (1492), Calvin Coolidge became president (1923), entrepreneur Martha Stewart was born (1941), the NBA was founded (1949), and quarterback Tom Brady was born (1977).

4 — **Champagne was invented** (1693), and jazz musician Louis Armstrong (1900), President Barack Obama (1961), and racecar driver Jeff Gordon (1971) were born.



5 — The first federal income tax was imposed (1861), the first traffic light went into service in (1914), astronaut Neil Armstrong was born (1930), actress Marilyn Monroe was found dead (1962), and the NBA and ABA merged (1976).

6 — The first execution by electric chair was carried out (1890), comic actress Lucille Ball (1911) and pop artist Andy Warhol (1928) were born, the first atomic bomb was dropped on Japan (1945), and African-Americans were guaranteed the right to vote (1965).

7 — The Purple Heart was created (1782), Earth was first photographed from space (1959), and actress Charlize Theron was born (1975).

8 — Actor Dustin Hoffman was born (1937), and **President Richard Nixon announced his resignation from office** (1974).



9 — Cartoon character Betty Boop debuted (1930), actor Sam Elliott was born (1944), the second atomic bomb was dropped on Japan (1945), singer Whitney Houston (1963) and athlete Deion Sanders (1967) were born, and Gerald Ford became president (1974).

10 — Missouri became the first state west of the Mississippi River (1821), President Herbert Hoover was born (1874), the electric guitar was patented (1937), and *Red Dawn* premiered as the first movie with a PG-13 rating (1984).

11 — Wrestler Hulk Hogan was born (1953), hip-hop was created (1973), the longest major league baseball strike began (1994), and actor Robin Williams died (2014).

12 — Filmmaker Cecil B. DeMille was born (1881), the Spanish-American War ended (1898), and *The Wizard of Oz* premiered (1939).

13 — Filmmaker Alfred Hitchcock was born (1899), Cuban president Fidel Castro was born (1926), and baseball legend Mickey Mantle died (1995).

14 — The Social Security Act was signed (1935), comedic actor Steve Martin was born (1945), the Whiffle Ball was patented (1953), and basketball star Magic Johnson (1959) and actress Halle Berry (1968) were born.

15 — French emperor Napoleon Bonaparte (1769) and chef Julia Child (1912) were born, the Panama Canal opened (1914), construction began on the Berlin Wall (1961), **the Woodstock Music Festival opened** (1969), and actor Ben Affleck was born (1972).



16 — The Klondike Gold Rush began (1896), baseball legend Babe Ruth died (1948), TV personality Kathy Lee Gifford (1953) and singer Madonna (1958) were born, the punk rock revolution began (1974), and singer Elvis Presley died (1977).

17 — Lou Gehrig became baseball's ironman (1933), and actor Robert De Niro was born (1943).

18 — Explorer Meriwether Lewis (1774), baseball legend Roberto Clemente (1934), and actors Robert Redford (1937) and Patrick Swayze (1954) were born, and basketball legend Larry Bird retired (1992).

19 — Aviator Orville Wright was born (1871), the first race was held at the Indianapolis Motor Speedway (1909), *Star Trek* creator Gene Roddenberry was born (1921), Adolph Hitler became president of Germany (1934), and President Bill Clinton (1948) and actors Matthew Perry and Christian Slater (1969) were born.

20 — President Benjamin Harrison was born (1833), the National Football League was organized (1920), and the Soviet Union invaded Czechoslovakia (1968).

21 — Oldsmobile was founded (1897), basketball legend Wilt Chamberlain (1936) and singer Kenny Rogers (1938) were born, Hawaii became the 50th U.S. state (1959), **the Ruby Ridge standoff began** (1992), and swimmer Michael Phelps won a record 8th Olympic gold medal (2004).



22 — The first America's Cup yacht race was held (1851), the International Red Cross was founded (1864), and Nolan Ryan recorded his 5,000th strikeout (1989).

23 — The tire chain was patented (1904), basketball star Kobe Bryant (RIP) was born (1978), baseball legend Pete Rose was banned for life (1989), and the first case of West Nile virus in the U.S. was reported (1999).

24 — Mt. Vesuvius erupted, instantly burying two cities (79), British troops set the White House on fire (1814), the waffle iron was patented (1869), and baseball ironman Cal Ripken Jr. was born (1960).

25 — The first person swam across the English Channel (1875), actor Sean Connery (1930) and TV personality Regis Philbin (1933) were born, *The Wizard of Oz* debuted (1939), and Paris was liberated by Allied troops (1944).

26 — Women gained the right to vote (1920), **the first televised baseball game aired** (1939), and aviator Charles Lindbergh died (1974).



27 — Krakatoa erupted in the world's most powerful volcanic blast (1883), President Lyndon B. Johnson (1908) and Mother Teresa (1910) were born, and the first edition of "The Guinness Book of Records" was published (1955).

28 — Martin Luther King, Jr. made his "I have a dream" speech (1963).

29 — The Soviet Union detonated its first nuclear test bomb (1949), singer Michael Jackson was born (1958), and Hurricane Katrina made landfall on the Gulf Coast (2005).

30 — Baseball legend Ted Williams was born (1918), and Thurgood Marshall became the first African-American Supreme Court justice (1967).

31 — The first solar-powered car was demonstrated (1955), and boxing legend Rocky Marciano died in a plane crash (1964).