



**US Army Corps
of Engineers®**

ENGINEERING AND CONSTRUCTION BULLETIN

No. 2012-2

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Subject: Additional Engineering and Construction Management Controls for USACE Mega-Projects

Applicability: Directive

1. This ECB provides initial guidance on additional management controls for projects designated by HQUSACE Civil Works and Military Programs Directors as “Mega-Projects”.
2. The objective of this ECB is to provide initial guidance and solicit initial feedback and lessons learned. As experience is gathered with the application of these additional controls for these special projects, policies will be refined and a formal Engineering Regulation will be published articulating final USACE policy on management controls for mega-projects.
3. Enclosure 1 lists the initial projects designated for mega-project management by the Director of Civil Works and Emergency Operations and the Director of Military Programs and International Operations. Enclosure 2 lists the typical attributes of a mega-project and was the basis for project/program selection. Enclosure 3 lists the required additional management controls for mega-projects. Enclosure 4 is a draft Engineering Regulation for what was formerly called Design and Construction Evaluations (DCEs).
4. MSCs are required to implement the management controls at enclosure 3 for the listed projects/programs effective immediately. HQUSACE E&C will initiate scheduling and implementation of HQ led DCE evaluations of these projects effective immediately.
5. The implementation point of contact for this action James Moore, 570-650-3055.

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Enclosures

Mega Projects List

January 2012

No.	MSC	Project Name	MSC Programs Director	Project Phase
1.	CESPD	JFP-FOLSOM	Mr. Calcara	Construction
2.	CESPD	UTAH DATA CENTER	Mr. Calcara	Construction
3.	CENWD	FT. RILEY HOSPITAL	Mr. Ponganis	Construction
4.	CESWD	FT. HOOD HOSPITAL	Mr. Fallon	Construction
5.	CESWD	FT. BLISS HOSPITAL	Mr. Fallon	Construction
6.	CESAD	FT. BENNING HOSPITAL	Mr. Dixon	Construction
7.	CESAD	PORTUGUESE DAM	Mr. Dixon	Construction
8.	CESAD	HERBERT HOOVER DIKE	Mr. Dixon	Construction
9.	CESAD	EVERGLADES RESTORATION (CERP)	Mr. Dixon	Various
10.	CELRD	OLMSTED LOCK AND DAM	Mr. Eto	Various
11.	CEMVD	FARGO/MOOREHEAD FRM PROJECT	Mr. Belk	Design
12.	CENAD	MAYWOOD SUPERFUND	Mr. Leach	Various
13.	CENAD	LANDSTUHL MEDICAL CENTER	Mr. Leach	Design
14.	CENAD	INTEGRATED CYBER CENTER	Mr. Leach	Design

Typical Attributes of a Mega Project

1. Cost and Duration -- The cost of the project or program is one of the most significant attributes of a mega-project. Very large dollar value projects and programs (over \$500M) generally include more risk in achieving project objectives. Performance periods are generally longer (in excess of three years) subjecting the project to more risks over longer performance periods.
2. Uniqueness -- One of a kind projects or projects involving unique and highly complex systems, processes and technical challenges may be characteristic of mega-projects. Unique means not typical, but distinctive and exceptional in the primary characteristics of the project.
3. Delivery Method – The contract compensation method allocates financial risk between the contracting parties. Firm Fixed Price (FFP) contracts place a maximum of the financial risk (and potential reward) on the contractor. Other contract pricing methods such as cost-reimbursable contracts allocate increasingly more financial risk to the Government. Use of Early Contractor Involvement (ECI) and cost reimbursable contracts may be characteristic of mega-projects.
4. National Significance – Projects or programs of national or international significance may be characteristic of mega-projects.
5. Critical Nature of Completion Date -- Projects or programs with completion dates established in law or treaty may be characteristic of mega-projects.
6. Coordination of Multiple Prime Contractors – Projects or programs that require USACE coordination of multiple prime construction contractors conducting significant construction operations concurrently on a project site may be characteristic of mega-projects.
7. Coordination of multiple design agents – Projects or programs requiring the coordination of multiple design agents, multiple USACE Districts or multiple Federal agencies may be characteristic of mega projects.

Mega- Project Management Controls
January 2012

1. Establish Disciplined and Focused Supplemental Governance Structure

A three-tiered governance structure will be established for mega-projects in order to achieve needed accountability, visibility, understanding, and timely decision-making in order to assure effective communication and issue resolution at appropriate levels. CII defines project culture as “the degree to which (1) project leadership is defined, effective, and accountable; (2) communication within the team and with stakeholders is open and effective; and (3) the team fosters trust, honesty, and shared values”.

- The senior level is the Senior Executive Board composed of senior leaders from all stakeholders. The typical member is a GS-15/SES and the contractor’s corporate senior vice president or equivalent. HQUSACE Senior Leaders and HQUSACE Engineering and Construction senior engineers will serve in an oversight and advisory role to the mega-project’s Senior Project Executive.
- The mid-level Executive Leadership Team is composed of GS 13/14 and corporate vice president level staff. This team is composed of the senior leaders responsible for day to day operations at the project site. They are responsible and accountable to make decisions and apply resources to solve problems that rise above the typical day-to-day management of the project.
- The working-level Project Leadership Teams are the working level teams assigned to each major phase of the project. This is the level where the typical day-to-day management and engineering work is performed.

This three-tiered governance structure for designated mega-projects will be incorporated in program management plans (PgMPs) and project management plans (PMPs) and recognized and supported by the entire vertical team for the mega-project. The governance structure may be adjusted to accommodate differences in programs, command structures, and funding between Civil Works, Military, Host Nation etc. Programs.

2. Facilitated Partnering -- Professionally facilitated formal partnering will be an integral element of this mega-project governance process. The Unified Facilities Guide Specifications (UFGS Section 01 30 00) will be revised by HQUSACE to reflect this requirement for USACE managed mega-projects. The following elements of partnering are vital and will be developed and documented at the initial partnering workshop for all mega-projects:

- A Facilitator Report, summarizing the workshop activities, including goals, issues, and action plans identified.
- A hierarchical Dispute Resolution Matrix, depicting (by name and title) the lead stakeholder representative at each level, and the amount of time allowed for resolution at that level. It may be necessary to create separate dispute resolution matrices for internal and external disputes, technical or fiscal/time issues, etc.

- A Project Charter, summarizing the common goals and objectives of the stakeholders.

Follow-up workshops will be periodically scheduled to indoctrinate new members, update issues lists, etc. While professional facilitation is recommended, stakeholders may be capable of self-facilitating the follow-up workshops.

3. Project Quality Evaluations – Conduct periodic Project Quality Evaluations (PQE) (formerly Design and Construction Evaluations) in accord with draft ER 415-1-13 to independently ascertain quality of project execution. Across USACE, there are a number of leaders and senior staff who have hands on technical and managerial experience on managing successful mega-projects. PQE teams will be organized by HQUSACE and assigned the task to perform reviews of selected mega-projects. The PQE teams will be multi-discipline and will evaluate procurement, engineering, construction, and project management processes for compliance with USACE policy and their effectiveness in achieving desired project outcomes. PQE teams will meet with the appropriate customer, prime contractor(s) and stakeholder(s) to obtain a 360 degree perspective of the project. For mega-projects, these PQEs will be conducted at a minimum on a twice a year basis, and are intended to provide regional and HQUSACE senior staff with a second “line of sight” for critical project decisions, and ensuring that USACE products and services are technically excellent, on schedule and within budget . PQEs will also be planned in advance of critical project milestones, such as:

- 6 months in advance of any design or construction contract award
- Semi-annually after award of any major construction contract, until substantial completion is achieved
- during the formative stages of any request for funding or schedule increase

4. Enhanced Project Management Plans – These documents will be annually reviewed by the PDT and PQE Team. The PMP Acceptance Sheet shall be signed by the MSC Programs Director. Special emphasis will be placed on well reasoned and thorough Quality Management Plans, Change Management Plans Risk Management Plans including Cost and Schedule Risk Analyses. PMPs must be regularly reviewed by the original signatories or their successors and revised as appropriate for relevance and soundness of the plan going forward. This is particularly important for longer term projects, where several rotations of command or leadership are likely to occur. Plans will reflect the customer as an active member of the PDT with team members authorized and capable to make decisions consistent with their hierarchical representation on the team as discussed herein.

5. Enhanced Project Delivery Team (PDT) – Assign a multi-disciplined PDT early in the project design phase to be responsible and accountable for the project until completion. The team will be chosen by the executing District(s) leadership and approved by the MSC Programs Director who will establish and validate minimum team member competencies, organizational structure, size etc. Selection of team members will be based on MSC Programs Director established

competencies and may require resourcing the PDT from outside the District or Region. Non-technical competencies will be recognized as equally important to technical competencies. The identity, roles, and responsibilities of a technical Lead Engineer (see ER 1110-2-1150 and ER1110-2-1156) will be described in the PMP irrespective of program (MP, CW, Host Nation, IIS etc). Team building and partnering exercises will initiate early and often in the project life cycle.

6. Use of Lessons Learned – HQUSACE will compile any available lessons learned from projects over \$500M completed in the last 3 years and will prepare an EC or ETL to document best practices. These best practices will be used to inform the development of future mega-project PMPs in particular and the USACE Project Management Business Process in general. PDTs will populate the Enterprise Lessons Learned (eLL) system on a regular and recurring basis for all projects with special emphasis on mega-projects.

7. Project Senior Executive –The appropriate MSC Director of Programs is the USACE Project Senior Executive responsible for PDT performance. This leader will provide guidance and mentoring to the PDT. The PDT shall be held accountable to the Project Senior Executive.

8. In-Progress Reviews (IPRs) – the Project Senior Executive will establish the format and timing and will chair IPRs. These reviews will serve as both information and decision-making forums. Meeting minutes will be provided to the Director of Military Programs and the Director of Civil Works after each MP and CW mega-project IPR respectively. PQE team input, if it exists, will also be briefed at these reviews.

9. Integrated Master Project Schedule and Cost Estimate – USACE mega-project teams must have a trained and experienced scheduler recognized by the E&C and Project Management Communities of Practice as a Subject Matter Expert (SME) in network scheduling - on staff at the early stage of the project life cycle to prepare and status an integrated master project schedule. The integrated schedule will include planning, programming, procurement, design and construction phase activities and will be updated with actual dates and remaining durations at least monthly. As project phases become more certain (e.g., contracts awarded, milestones missed/met, baselines adjusted, etc.) the integrated schedule will provide a hierarchical “rolling window” focus on details which are important and understandable to the three-tiered mega-project management structure. The master schedule will inform the entire team about activities that are on and near the critical path each month. See ER 1105-2-100, ER 1110-2-1302 and ER 1110-3-1300 for basic cost and schedule estimate requirements. Mega-project cost estimates and schedules will be integrated utilizing the Earned Value Management System (EVMS) capabilities of P2 (as outlined in the PM Business Process) or other stand alone COTS software programs for monitoring and reporting cost and schedule metrics during the entire project/program life cycle.

10. Project Controls Sub-Team - Establish a project controls sub-team within the project team. This sub-team will be staffed with experienced personnel responsible for managing project and integrated program schedules; project and program budget; document and communication controls. The sub-team composition will change over time and will include staff with specialized expertise in project control functions including cost and schedule risk analysis. At least 2 members of this sub-team will be Government employees recognized by the E&C Community of Practice as SMEs in cost and schedule risk analysis, cost estimating and network scheduling. The Senior Project Executive will set metrics for monitoring and evaluating performance of all phases of the mega-project, and will ensure timely and accurate reporting by the Controls Team. Cost and schedule metrics will be in Earned Value format and technical metrics will follow existing program requirements. Existing District, Region, and HQUSACE management and monitoring elements (RMB, RIT, PID, etc.) will retain their administrative and reporting responsibilities, but will participate in and be guided by the Governance Structure and the Project Senior Executive.

11. Enhanced Recruitment and Staffing of Project Team Members– A mega-project will adversely impact any District’s manpower and personnel management when the project office is stood up and when it shuts down. Standard HR processes are not designed for standing up and closing down a large office in a timely and orderly fashion. As the PgMP, PMP and PDT are developed and matured, the best and brightest from across the Command should be recruited, selected and assigned in a manner similar to how we deploy staff for contingency operations on long term TDY or TCS with return rights to the home District. Participation and communication across the Command, by Regional and HQUSACE leaders, may be required to ensure that sufficient incentives are in place to attract and retain these individuals for the life of the mega-project. Examples of staffing challenges and plans from past mega-projects will be published in Enterprise Lessons Learned (eLL).

12. Certified Project Managers – The Project Manager must be: certified as a Project Management Professional by the Project Management Institute; certified Level II pursuant to the USACE Program and Project Management Career Development Plan; and must have sufficient technical experience in the appropriate engineering and/or construction function. These minimum qualification levels will be demonstrated by certification, licensure, and experience as determined by the MSC Programs Director.

CECW-CE

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

ER 415-1-13

Regulation
No. 415-1-13

XX Jan 2012

Engineering and Construction
PROJECT QUALITY EVALUATION (PQE)

1. Purpose.

This regulation provides general policy and prescribes an evaluation process through which USACE validates the quality of execution and delivery.

2. Applicability.

This regulation applies to HQUSACE elements, major subordinate commands (MSC), Districts, Laboratories, Centers of Standardization, Centers of Expertise, Design Centers, Production Centers and other field operating activities providing products and services in all program areas including, but not limited to, Military, Civil Works, International and Interagency Services; planning, programming, and project management, acquisition, design, construction, safety, operation and maintenance.

3. References.

- a. Engineer Regulation (ER) 5-1-11, U.S. Army Corps of Engineers Business Process
- b. ER 5-1-13, U.S. Army Corps of Engineers Policy on Regional Business Centers (RBCs)
- c. ER 415-1-16, Fiscal Management
- d. ER 1110-1-12, Quality Management
- e. ER 1180-1-6, Construction Quality Management
- f. ER 5-1-14, USACE Quality Management System
- g. MSC Quality Management Business Processes

4. Policy.

USACE is committed to delivering world class quality services and products safely, on schedule, and within budget. Project Quality Evaluation (PQE) is a quality assurance evaluation process

through which USACE ensures that project execution and delivery is completed in accordance with prescribed requirements (Department of Defense criteria, USACE regulations, Quality Management System Processes, applicable codes, etc). PQEs evaluate and document Project Delivery Team (PDT) compliance with project execution and delivery processes including but not limited to planning, programming & project management, acquisition, design, construction, and safety. HQUSACE, Chief of Engineering & Construction (E&C) has the responsibility to oversee and monitor the Corps-wide PQE program. In accordance with ER 5-1-13 and USACE Project Management Business Process (PMBP), the MSC is charged with the responsibility and accountability for quality assurance in the planning and execution of assigned programs.

5. Requirements for MSC-led PQE.

a. Each MSC is responsible for executing annual PQE inspections to all subordinate districts. Each MSC shall develop a business process that prescribes in detail how it will execute PQEs and coordinate with other MSC and District-level efforts. Each MSC shall coordinate these evaluations and share results with HQUSACE. Districts, Laboratories, Centers of Standardization, Centers of Expertise, Design Centers, Production Centers, and other field operating activities shall comply with the MSC's Quality Management System process or business process for quality evaluation coverage. Additional PQE evaluations may be performed when deemed necessary by the MSC Director of Regional Business, when funding is available.

b. The PQE effort, under the overall direction of the MSC Director of Regional Business, shall be sufficient to evaluate activities and documentation during major phases of selected projects, or any focus areas in between as determined by the Regional Business Director. The requirement for PQEs may be coordinated with and may be satisfied through other quality assurance efforts accomplished through other MSC activities such as Command Assistance Visits, Procurement Management Reviews, quality management system audits, MSC participation in District QA activities, etc., or as deemed appropriate by the MSC Director of Regional Business. The overall objective is to assess compliance with USACE requirements, identify non-compliance items, opportunities for improvement, and successes, with the overarching goal of our continuous improvement in the delivery of quality products. Where funding for such evaluations is limited, the MSC Director of Regional Business shall determine which districts will be evaluated.

c. PQE team composition shall include appropriate subject matter experts based on the scope and focus areas of the PQE. Typical PQE teams should represent a cross section of the PDT to include Project Management, Engineering and Construction, and others depending on the scope and focus areas.

d. Funding for PQEs: MSCs shall provide labor funds for MSC personnel. Per ER 415-1-16, project funds shall not be used to cover labor costs for MSC or HQUSACE evaluation team members. However, project funds may be used to cover travel costs for MSC or HQUSACE personnel when their efforts are dedicated to project-specific work. Host Districts shall provide travel and labor funds for host District personnel or personnel from another District involved in the PQE. Districts may use Supervision & Administration (S&A) funds to assist funding travel

costs for PQE team members from the MSC or other Districts, provided the effort involves performance of project specific construction quality assurance work. Districts may also use Planning & Design (P&D) funds to assist funding travel costs for PQE team members from the MSC or other Districts, where the PQE team performs project specific design quality evaluations. Program or Project funds for Civil Works projects and International and Interagency Services projects may also be used as appropriate.

e. Evaluation will be done through assessment of project documentation and execution activities performed by the PDT. The PQE Evaluation team shall identify opportunities for improvement, deficiencies, best practices, successes, and mission excellence contributors, and provide a basis for quality assurance improvements through feedback and distribution of evaluation information. The PQE Evaluation team shall document quality issues from planning, failure to properly execute plan, management of the design effort, deficiencies in design to include omissions to catch the error during quality control or quality assurance efforts, error during construction, etc. An in-briefing shall be given at the start of a PQE, and an out-briefing shall be given at the conclusion of the PQE to the appropriate District leadership. The PQE report will include the team composition, projects evaluated and visited, focus areas of the evaluation, and highlights of both positive and negative findings. MSC business processes shall provide guidance on report format, timing, content, and follow-up. The final PQE report is to be accessible electronically to other subordinate Districts within the region for information only. A copy of the final report shall be furnished to HQUSACE.

f. In performing the evaluation, the PQE team will take direction from the Regional Business Director. In addition to published USACE guidance, the following specific areas shall be considered:

(1) Planning, Programming, and Project Management: PDT formation, project planning, and development of project management plan, PDT activities, and interaction.

(2) Acquisition: Effective integration of E&C, Program and Project Management (PgPM), and Contracting personnel in all acquisition activities and processes.

(3) Design: Quality management of the design process including Architect-Engineer (A-E) contract documents or in-house development of the design documents; operation and maintenance considerations; and evaluation of PDT integration and activities. Contract administration activities and documentation; quality assurance activities and documentation by the PDT to include verification of proper quality control by the designer and enforcement of the A-E contract; and A-E Responsibility Program activities; Value Engineering, Cost Engineering, and eGIS activities shall also be considered for evaluation.

(4) Construction: All phases of construction execution. Contract administration activities and documentation, quality assurance activities and documentation by the PDT will be considered for evaluation.

(5) Safety: All aspects of Safety associated with Design, Construction, Operation, and Maintenance.

g. MSCs shall prepare an annual summary of PQE findings including strengths, weaknesses, and lessons learned. These findings shall be entered into the Enterprise Lessons Learned System.

6. HQUSACE-led PQE.

HQUSACE may elect to participate in MSC led PQEs. In addition to participating in MSC-led PQEs, HQUSACE may elect to schedule and lead a PQE for a specific program, regions, projects, or focus area. In preparation for a HQUSACE-led PQE, the HQUSACE Chief of E&C will coordinate with other HQUSACE elements. A Charge Memorandum (Encl. 1) will be issued by HQUSACE Chief of E&C, addressed to the Chief of Construction Management Community of Practice and to the Director of Regional Business at the cognizant MSC(s). The memorandum will list the location, program, purpose, and intent of the proposed PQE, along with a time frame and objective of the evaluation. The memo will go on to list potential "lines of inquiry", which are a series of broad topics and related questions which will help determine the size and composition of the team, and guide the team in their overall approach.

FOR THE COMMANDER:

Encl. 1 Sample Charge Memorandum