



**US Army Corps  
of Engineers®**  
ENGINEERING AND DESIGN

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# **ROLES AND RESPONSIBILITIES OF THE INLAND NAVIGATION DESIGN CENTER MANDATORY CENTER OF EXPERTISE**

**ENGINEER REGULATION**

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

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Engineering and Design  
ROLES AND RESPONSIBILITIES OF THE INLAND NAVIGATION DESIGN  
CENTER MANDATORY CENTER OF EXPERTISE

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MANDATORY CENTER OF EXPERTISE

1-1. Purpose. This regulation establishes the roles and responsibilities of the Inland Navigation Design Center (INDC) Mandatory Center of Expertise (MCX). Command-and-control is the responsibility of the Mississippi Valley Division (MVD). The Center has two geographic locations located in Rock Island District (MVR) and Pittsburgh District (LRP). The overall leadership for the INDC MCX resides within MVR. This regulation has been prepared in compliance with the requirements of Engineering Regulation (ER) 1110-1-8168 "Corps-Wide Centers of Expertise Program."

1-2. Applicability. This regulation applies to USACE Commands responsible for Civil Works projects. The user of this ER is responsible for seeking opportunities to incorporate the Environmental Operating Principles (EOPs) wherever possible.

1-3. Distribution Statement. Approved for public release; distribution is unlimited.

1-4. References.

- a. ER 1110-1-8158, Corps-Wide Centers of Expertise Program.
- b. Inland Navigation Design Center Framework, 30 April 2012.
- c. Engineering Circular (EC) 1165-2-214, Civil Works Review.
- d. CECW-ZA Memorandum, Subject: Civil Works Transformation – Methods of Delivery – Inland Navigation Design Center Recommendation, 3 October 2012.
- e. CECW Memorandum, Subject: Programmatic Review Plan for Routine Operations and Maintenance Products, 20 December 2012.
- f. CECW-CE Memorandum, Subject: Inland Navigation Design Center Process, 30 January 2012.
- g. CECW-CE Memorandum, Subject: Inland Navigation Design Center Process, 25 March 2012.

1-5. Background. In August 2007, the National Technical Competency Team was established to determine the technical competencies needed to meet future USACE

needs, to analyze gaps in technical competency, and to make recommendations to enhance and maintain technical competency and professionalism. One recommendation was that USACE establish a design center for inland navigation projects – new designs, lock replacement designs, and major rehabilitations. Establishment of this center was approved by the USACE Command Council and directed by a 3 October 2012 memorandum from the DCG (CEO). The concept is that one Center, using two locations, will exercise command-and-control through MVD. The two geographic locations are the Rock Island District and the Pittsburgh District. The establishing memorandum also created an Inland Navigation Design Oversight Committee (INDOC). The INDOC consists of representatives from Headquarters, U.S. Army Corps of Engineers (HQUSACE), navigation Major Subordinate Commands (MSCs), and the Engineering Research and Development Center (ERDC) as nominated by the MSCs and selected by the HQUSACE Chief of Engineering and Construction. INDOC is an enduring committee and its chairperson will serve as the USACE proponent for the INDC MCX (hereinafter referred to as “the Center”).

1-6. Guiding Principles. The mission of the Center is to provide engineering, design, analysis and review services for studies, new locks, new navigation dams, 1 major rehabilitation of existing inland navigation locks and dams, and significant inland navigation lock and dam Operations & Maintenance (O&M) projects. The INDC will promote quality design, and consistency in design and technical competency. The following goals support this mission:

a. Goal 1. Develop, Maintain, and Strengthen Technical Competency.

(1) Lead a coordinated effort to develop, maintain, and strengthen technical competency within the engineering and design community for inland navigation and to build an Inland Navigation Design Community of Practice (CoP).

(2) Collaborate and coordinate with national and international interests, such as PIANC,<sup>2</sup> in the development of engineering standards and transfer of knowledge for inland navigation projects.

(3) Support research and update relevant USACE guidance documents.

b. Goal 2. Deliver Quality Products and Services.

(1) Collaborate with inland navigation design/analysis customers to ensure delivery of products and services that meet expectations.

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<sup>1</sup> Work on navigation dams will be coordinated among the INDC MCX, the USACE Dam Safety Modification Mandatory Center of Expertise and its related Production Centers, and the Risk Management Center.

<sup>2</sup> PIANC – [World Association for Waterborne Transport Infrastructure](#). Formerly named the Permanent International Association of Navigation Congresses.

(2) Conduct rigorous, independent, and high quality reviews in accordance with USACE regulations, policy, and guidance (see Appendix A).

(3) Maximize the use of standardized designs while appropriately considering new technologies.

(4) Implement risk-informed approaches for design, analysis, and decisionmaking frameworks.

(5) Provide dedicated engineering and design services to customers and stakeholders through the Center's leadership, subject matter experts, standardized processes, centralized knowledge, etc.

(6) Provide engineering support to USACE infrastructure strategy, management, and maintenance efforts.

1-7. Policy. USACE will use the expertise of the Center to maintain quality, reliability, and cost effectiveness of inland navigation structures. MSCs, districts, laboratories, and Field Operating Activities are required to engage the Center for mandatory functions. Paragraph 1-8 and Appendix B define roles and responsibilities, including mandatory functions.

1-8. Roles and Responsibilities. The Center will provide various functions related to the design/analysis and infrastructure management of inland navigation projects/initiatives. Appendix B includes a comprehensive listing of roles and responsibilities for the Center. Responsibilities requiring additional detail are:

a. Engineering and Design. The Center will serve as the national center of expertise that provides technical advice, oversight, and design production during planning, design, analysis, construction, and O&M of all aspects of inland navigation design projects across USACE. Note that the Center shall be contacted directly to assist in determining the need and level of its involvement (see Appendix B for clarification of mandatory requirements). The Center's mailbox is [INDC-MCX@usace.army.mil](mailto:INDC-MCX@usace.army.mil). To determine the Center's the level of involvement, work types are divided into three categories:

(1) Category 1. This work is defined as engineering and design services for major capital projects such as new locks, new navigation dams, and major rehabilitation of existing locks and navigation dams. The Center will be the designer of record, will assign and approve the lead engineer, and will provide engineering and design services as stipulated in this regulation. See Appendix B, Table B-3 for the Center's roles and responsibilities.

(2) Category 2. This work is defined as engineering and design/analysis services for significant ( e.g., lock and dam gate design/analysis, dam pier and lock monolith analysis and stabilization, lock wall refacing, mechanical and electrical systems, etc.) inland

navigation lock and dam O&M projects. The home district retains autonomy for its O&M program including overall leadership, management, budgeting, and operational management. Engineering production for this work may be performed by a home district's engineering staff or in combination with staff from the Center if the home district does not have the capacity or expertise. It is the home district's Chief of Engineering's discretion to determine the level of involvement of the Center. The Center will perform an Agency Technical Review (ATR) on all Category 2 projects and will assist in other types of reviews as requested by the home district. See Appendix B, Table B-4 for roles and responsibilities of the Center.

(3) Category 3. This work is generally defined as engineering and design/analysis services in support of routine maintenance in accordance with the National Programmatic Review Plan, 20 December 2012 (ref. e.). The Center's involvement could be as minor as its involvement in contributing to, or drawing from, the Center's lessons learned/knowledge database. It is the home district's Chief of Engineering's discretion to involve the Center. See Appendix B, Table B-4 for roles and responsibilities of the Center.

b. Execution.

(1) The primary method to deliver inland navigation project designs is to use MVD and LRD's in-house technical expertise for design and/or review of Category 1 and 2 work. Expert resources from across the Corps will be engaged if the workload demand or specialization dictates. To this end, the Center will develop and use an inland navigation design community of practice, and will provide it with an agile and flexible workforce able to execute projects across a broad range of workload demands.

(2) The Center will use the latest and most appropriate design, construction, and contracting methods and knowledge to carry out its mission. The Center will use Design Charrettes as required to enhance pre-planning efforts, to more fully understand issues, and to provide better scoping of projects to its customers. The Center will actively seek and compile lessons learned and will develop and employ a "best practices" list.

(3) The Center will be USACE's primary point of contact for all inland navigation engineering and design related issues and resource needs. The Center will manage relationships (e.g., Memorandums of Understanding) and convene as needed with appropriate directors/managers of other key centers and groups with inland navigation interests such as: ERDC; Institute for Water Resources; Risk Management Center; Planning Center of Expertise for Inland Navigation; Dam Safety Modification Mandatory Center of Expertise; Walla Walla Cost Engineering Center of Expertise (Cost MCX); Asset Management Team; Welding and Metallurgy Technical Center of Expertise; and other organizations.

(4) Architect-Engineer (A-E) Services. A-E firms will be used as needed to supplement the Center's production capacity, to provide unique capabilities, and to provide consultation.



c. Inland Navigation Policy. The Center will provide HQUSACE with a single POC to deliver engineering services in support of relevant national and regional policies and issues.

d. Knowledge Management. The Center will develop strategies and processes to identify, capture, organize, implement, and share USACE's inland navigation design and related intellectual assets to enhance its performance and technical competency. This information forms the basis for enterprise lessons learned and will be the building blocks for current and future designs. The Center will actively maintain a Technical Excellence Network/SharePoint web site to promote these concepts. The Center will lead the Inland Navigation Design CoP.

e. Lead Engineer. A Lead Engineer will be assigned to each project including studies, designs, analysis, plans and specifications, and engineering during construction. The lead engineer will be approved by the Director of the Center. Candidates will be highly qualified personnel from the Center, the Home District, or the Inland Navigation Design CoP. Appendix C lists the Lead Engineer's primary roles and responsibilities to a project.

f. USACE Inland Navigation Infrastructure Management Strategies and Tools. The Center will support USACE infrastructure management and investment strategies (e.g., Inland Marine Transportation System Capital Projects Business Model, 2010) for inland navigation infrastructure. This includes risk-informed, reliability-based, and life-cycle oriented maintenance, repair, replacement, or project addition initiatives and strategies.

g. Design Guidance Related to Inland Navigation Design and Engineering. The Center will be responsible for maintaining and developing USACE guidance pertaining to the design/analysis and engineering of inland navigation structures. The Center shall participate in the updating of related guidance to ensure consistency within the mission for inland navigation engineering.

h. Reviews. The Center shall ensure quality and comprehensive independent review of all new construction, major rehabilitations, and significant O&M for inland navigation lock and dam projects in accordance with USACE regulations, policy, and guidance. See Paragraph 1-9, Reviews and Approvals, for additional discussion on reviews.

i. Technical Skill Development and Maintenance. The Center will be responsible for strengthening and maintaining technical skills that are required for the engineering and execution of complex inland navigation lock and dam projects.

j. International Support. The Center will support HQUSACE by providing services to, and by its participation in, international based organizations in the field of inland navigation lock and dam engineering.

k. Research and Development. The Center will collaborate with ERDC to assist with aligning and developing its research areas within the inland navigation lock and dam engineering mission.

1-9. Reviews and Approvals. Reviews and approvals will be in accordance with the requirements of EC 1165-2-214 (or its successor document), ER 1110-2-1150, ER 1110-1-12, ER 11-1-321 (Change 1) and ER 415-1-1. Appendix A includes a review workflow diagram.

a. Civil Works Review. EC 1165-2-214 (or its successor document) defines review requirements for work performed by Centers such as the INDC, work performed by USACE districts, and work performed by an A-E.

(1) Review Plan (RP). Preparation of RPs is the responsibility of the home district responsible for the project or work product in coordination with the INDC, the Project Manager, and Lead Engineer. The MSC that has command oversight of the district that has responsibility for the work is responsible for RP review and recommendation for approval by the MSC commander. Before submitting the RP to the MSC, the INDC will review the RP and will provide an endorsement of the RP to the MSC.

(2) Review Management Organization (RMO). The RMO functions and guidance remain as per the guidance in EC 1165-2-214 (or its successor document). When the INDC is involved, the RMO will coordinate with the Center as needed for work such as development of the Review Plan and staffing needs.

(3) District Quality Control/Quality Assurance (DQC). The DQC functions and guidance remain as per the guidance in EC 1165-2-214 (or its successor document). The INDC will support the home district with this function as needed.

(4) Agency Technical Review (ATR). ATR is mandatory for all decision and implementation documents and may be applicable for other work products. Management of ATR reviews is dependent on the phase of work and is managed by the RMO. The RMO is responsible for identifying and assembling the ATR team. The RMO is also responsible for developing the ATR Charge (i.e., Statement of Work [SOW]). In all cases, the ATR lead shall come from outside the home division responsible for the overall project or work product. ATR team members shall come from outside the organization, or entity, that produces the work. ATR team members can come from within INDC so long as the INDC staff member has not been, is not, or will not be a participant in the design or study effort. All ATR team members will be Corps of Engineers Reviewer Certification and Access Program (CERCAP) certified.

(5) Independent External Peer Review (IEPR). The IEPR functions and guidance remain as per the guidance in EC 1165-2-214 (or its successor document).

(6) Special Cases IEPR. The Special Cases IEPR functions and guidance remain as per the guidance in EC 1165-2-214 (or its successor document).

(7) A-E or Sponsor Work. All work by sponsors and A-E's shall adhere to the functions and guidance in EC 1165-2-214 (or its successor document).

b. Design Quality. ER 1110-2-1150, Engineering and Design for Civil Works Projects, describes the various engineering phases and design quality topics.

c. Quality Management. ER 1110-1-12, Quality Management, describes Quality Plans, Quality Control, Quality Assurance, Design Responsibility, Construction Quality, and other topics related to quality management.

d. Value Engineering (VE) shall be conducted in accordance with ER 11-1-321 (latest edition). The Center will support VE for inland navigation design projects.

e. Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review. BCOES reviews shall be conducted in accordance with ER 415-1-11. The Center will support BCOES reviews as needed.

1-10. Command and Control, Collaboration and Coordination. See Appendix D.

a. HQUSACE Proponent. The HQUSACE proponent for the Center is the Chief of the Civil Works Branch, CECW-CE.

b. INDOC. INDOC is an enduring committee that provides oversight and guidance to the Center. The chairman is the Chief of the Civil Works Branch, CECW-CE. The co-chairman is the HQUSACE Chief of the Navigation Branch, CECW-CO-D. Other members include HQUSACE- approved MSC-level representatives from MVD, LRD, SWD, SAD, NWD, POD, NAD, and ERDC. The INDOC advises the HQUSACE Chiefs of Engineering and Construction, and Operations on engineering issues related to inland navigation. The INDOC monitors the Center's performance through established metrics to ensure that intended goals are met. The INDOC makes recommendations on the Center's configuration, mission, and span of control.

c. Command and Control. The Center is under direct command and control of MVD and its commander. The Director of the Center is located in MVR and the Deputy Director is located in LRP.

1-11. Funding. The Center is a reimbursable organization. Funding for all activities of the Center will be provided through HQUSACE or project funds. Some centralized funding will be required for non-project related activities.

1-12. Upward Reporting. The Center will establish customer service and performance metrics. These metrics will be approved by the INDOC. The Center will use these metrics to track performance and to produce a quarterly report of all significant program activities. This report will be forwarded to the HQUSACE proponent and will be shared in a manner transparent to all of USACE. Monthly metrics will also be reported at the MVR and LRP Project Review Board meetings. The INDOC will review the

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performance of the Center and recommend improvements as needed. Evaluation and recertification of the Center shall be in accordance with ER 1110-1- 8158.

1-13. Conflict Resolution. In the event that a conflict arises between the INDC and another entity, the INDOC will make a recommendation through the appropriate command chain for further action.

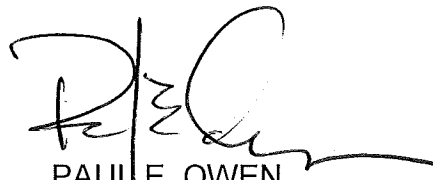
1-14. Exceptions. A request for an exception to the requirements of this regulation will be fully justified and submitted to HQUSACE (CECW-CE) in accordance with ER 1110-1-8158.

1-15. Recertification. The INDC will be recertified as an MCX every 5 years according to the appropriate requirements of ER 1110-1-8158. Six months before its recertification date, the INDC shall provide the HQUSACE proponent with a draft evaluation of the continuing need for the MCX against the performance statements.

1-16. Agency Representation. The INDC is authorized to represent USACE on industry technical committees related to inland navigation design.

FOR THE COMMANDER:

5 Appendices  
Appendix A– INDC Review Responsibilities  
Appendix B– Roles and Responsibilities Matrices  
Appendix C– Lead Engineer Roles and Responsibilities  
Appendix D– Command and Control, Collaboration, and Coordination  
Appendix E– Acronyms and Abbreviations



PAUL E. OWEN  
COL, EN  
Chief of Staff

Appendix A

INDC Review Responsibilities

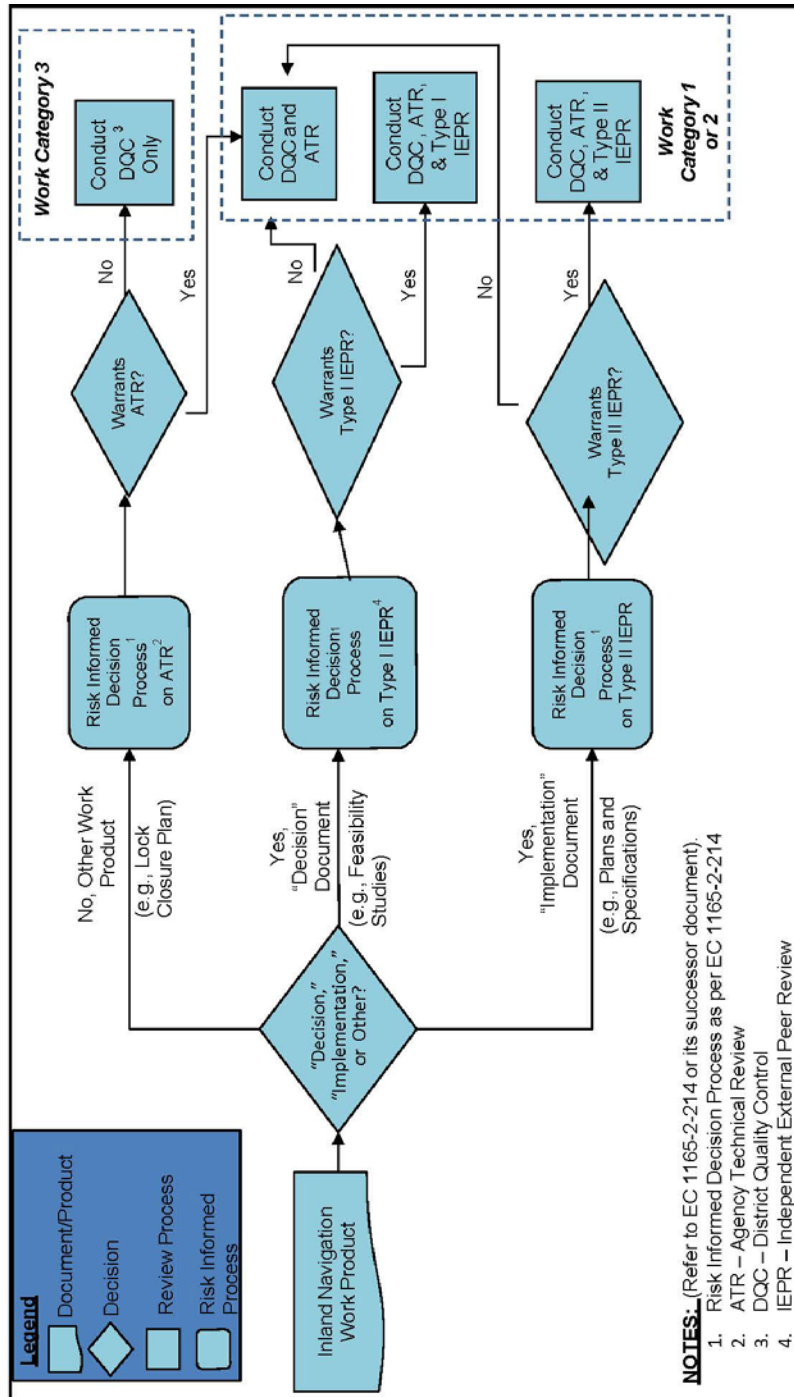


Figure A-1. INDC Roles and Responsibilities.

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Appendix B

Roles and Responsibilities Matrices

This appendix contains the USACE INDC MCX Roles and Responsibilities. Mandatory requirements are noted. Tables B-1 and B-2 list role and organizational symbols. Tables B-3 to B-5 list specific roles and responsibilities.

Table B-1. Role Symbols.

Symbol	Meaning
P	Primary - primarily executes the role/task.
O	Oversight - oversees execution of the role/task.
S	Support - This organization would be expected to be involved in supporting this activity on a regular basis (It is noted that all the organizations will support every function as necessary, but the "S" indicates the expectation of a more routine and higher level of support.)
M	Mandatory - This is a mandatory role/function for this organization due to the advent of the Center. Other mandatory requirements that are located within other USACE guidance are generally not repeated herein. For mandatory items, USACE organizations must use the Center and the Center must maintain this capability/function.
A	Approval – Approval authority for this item/function.

Table B-2. Organizational Symbols.

Symbol	Meaning
HQ	Headquarters, U.S. Army Corps of Engineers
MSC	Major Subordinate Commands (Regions/Divisions)
District	Local Geographic Corps of Engineers District, Home District
INDOC	Inland Navigation Design Oversight Committee
INDC MCX	Inland Navigation Design Center Mandatory Center of Expertise
IMTS	Inland Marine Transportation System
RMC	Risk Management Center
ERDC	Engineering Research and Development Center
PCXIN	Planning Center of Expertise for Inland Navigation
Cost MCX	Walla Walla Cost Engineering Center of Expertise.
DSMMCX	Dam Safety Modification Mandatory Center of Expertise
DSOG	Dam Safety Senior Oversight Group

Table B-3. Inland Navigation Design Center Overall Program Management.

Responsibilities	District	INDC MCX	MSC	IMTS	INDOC	HQ	RMC	DSM MCX	DSOG	ERDC	PCXIN
Periodic Review/Approval of the Center		S	O		O	P					
Select/Appoint/Approve INDC Director and Deputy Director		S	M		O	O					
Develop and Sustain National SMEs in Inland Navigation Design	S	M	O		O	O					
Quality Management for INDC Products		M	O		O	O					
Knowledge Management	S	M	O		O	O			S		
Lead the Inland Navigation Design CoP	S	M	O		O	M				S	
Dam Safety Program	S	S	S		O	S	M	P	M		S
Budget Development for the INDC	S	M	O	S	O	O					
Policies/Procedures	S	P	O	S	O	M	S		S1		
Initiate and Manage Strategic Partnerships		M	O	S	O	O	S	S	S	S	S
Infrastructure Management and Investment Prioritization Efforts	S	S	S	S	S	P	S	S	S	S	S
Asset Management	S	S	P	S		O	S				S
R&D		S		O	O	P/S				P	
Maintain National A-E Contracts for Navigation Engineering	S	M	S		O						
Project Risk Communication	P	S	O		O	O	S	S	S		

<sup>1</sup>The DSOG roles regarding policies and procedures pertaining to inland navigation dams are for dam safety issues.

Table B-4. Major Rehabilitation & Capital Improvement, Inland Navigation Locks & Dams.

Responsibilities <sup>1</sup>	District	INDC MCX	MSC	IMTS	INDOC	HQ	RMC	ERDC	PCXIN	COST MCX
<b>PLANNING</b>										
Major Rehabilitation Study Projects										
Main Report	P	S	A		O	A			S	
Lead Engineer	S	M/A			O					
Engineering Appendix										
Engineering and Reliability	S/P	M					S		S	
Alternative Strategies	S/P	M					S		S	
Consequences	S/P	M					S		S	
Cost Estimating Appendix										
MCACES	P	S								O
CSRA	S/P	S/P								P
Value Management	P	S	O		O					O
Quality Management										
<i>Project Review Plan</i>	P	S	A						O	
<i>DQC</i>	P	S	O							
<i>ATR</i>	S	M	O						P	S

<sup>1</sup> The risk assessment, study, design, repair, and construction activities for navigation dams will be coordinated among the RMC, DSMMCX, and INDCMCX to determine roles and responsibilities.



<b>Responsibilities<sup>1</sup></b>	<b>District</b>	<b>INDC MCX</b>	<b>MSC</b>	<b>IMTS</b>	<b>INDOC</b>	<b>HQ</b>	<b>RMC</b>	<b>ERDC</b>	<b>PCXIN</b>	<b>COST MCX</b>
<i>IEPR Type I</i>	S	S							P	
<b>Feasibility Study for New Locks<sup>2</sup></b>										
Main Report	P	S	A		O	A			S	
Lead Engineer	S	M/A			O					
Engineering Alternatives Analysis	S/P	P/S							S	
Engineering Appendix	S	M								
Cost Estimating Appendix										
MCACES	P	S								O
CSRA	S/P	S/P								P
Value Management	P	S	O			O				O
Quality Management										
<i>Project Review Plan</i>	P	S	A						O	
<i>DQC</i>	P	S	O							
<i>ATR</i>	S	M	O						P	S
<i>IEPR Type I</i>	S	S							P	
<b>DESIGN</b>										
Design Charrette	S	M	O	S	O					S
DDR	S	M	O					S		
Designer of Record Documentation	S	M								
Lead Engineer	S	M/A			O					
Special Studies	S/P	M	O		O					
Plans and Specs	S/P	M	O		O					
Current Working Estimate	P/S	P/S								O
Independent Government Estimate	P/S	P/S								
Engineering Considerations and Instructions to Field Personnel	P/S	P/S								
Value Management	P	S	O			O				S
Quality Management										
<i>Project Review Plan</i>	P	S	A				S		O	
<i>DQC</i>	P	S	O							S
<i>ATR</i>	S	M	O							S
<i>IEPR Type I</i>	S	S	O				P			
NCOES	P	S								
Contracting										
<i>Acquisition Strategy</i>	P	S								
<i>Proposal Evaluation</i>	P	S								
<i>Advertise and Award</i>	P	S								
<b>CONSTRUCTION</b>										
Lead Engineer	S	M/A			O					
EDC	S	P								
Special Studies	S/P	M	O		O					
QA	P	S								
Construction Documents	P	S								

<sup>2</sup> The INDC can assist with Reconnaissance Reports at the Home District's discretion.

Responsibilities <sup>1</sup>	District	INDC MCX	MSC	IMTS	INDOC	HQ	RMC	ERDC	PCXIN	COST MCX
Engineering Documents	S	P								
O&M Manuals	S	P								
IEPR Type II	S	S	O				P			

Table B-5. Operation and Maintenance, Inland Navigation Lock and Dam Projects.<sup>3</sup>

Responsibilities	District	INDC MCX	MSC	IMTS	INDOC	HQ	RMC	ERDC	PCXIN	COST MCX
<b>DESIGN</b>										
Design Charrette	P	S	O							
DDR	P	S	O							
Lead Engineer	P	S								
Plans and Specs	P	S	O		O					
Special Studies	P	S/P	O		O					
Cost Engineering										
<i>Current Working Estimate</i>	P/S	P/S								O
<i>Independent Government Estimate</i>	P	S								
Engineering Considerations and Instructions to Field Personnel	P	S								
Value Management	P	S	O							
Quality Management										
<i>Project Review Plan</i>	P	O	A							
<i>DQC</i>	P	S	O							
<i>ATR Lead</i>	S	M/S	O							
<i>ATR Team</i>	S	M/S								
<i>BCOES</i>	P	S								
Knowledge Management	S	M								
Contracting										
<i>Acquisition Strategy</i>	P	S	O							
<i>Proposal Evaluation</i>	P	S	O							
<i>Advertise and Award</i>	P	S	O							
<b>CONSTRUCTION</b>										
Lead Engineer	P	S								
EDC	P	S								
Special Studies	P	S/P	O		O					
Contract Administration	P	S								
QA	P	S								
Construction Documents	P	S								
Engineering Documents	P	S								
O&M Manuals	P	S								

<sup>3</sup> It is a goal of the Center to support projects and studies in the O&M program, work categories 2 and 3, as needed in coordination with the home district. This matrix displays roles and responsibilities when the Center is involved. Knowledge Management is listed as a Mandatory role of the Center as it greatly contributes to increasing technical competency, knowledge, and promotes standardized designs. ATR for Category 2 work is mandatory for ATR Lead and ATR Team.

## Appendix C

### Lead Engineer Roles and Responsibilities

Duties shall include, but not be limited to, the following activities:

1. Leading the technical development of the study, design, and plans and specifications for the project.
2. Coordinating with the resource providers for the establishment of the engineering team members to ensure that competent and capable personnel are resourced to the project.
3. Providing the general oversight and having primary control and responsibility for the technical development of all engineering products produced by the Product Delivery Team and for engineering support during construction.
4. Working in close coordination with the Project Manager for the development of project schedules and funding requests.
5. Serving as the technical point of contact with the home district Engineering Product Delivery Team members for the coordination of project development and product reviews.
6. Assisting with the development of assumptions to be submitted to the cost estimating team in support of cost estimates that are prepared for the various levels throughout the Preconstruction, Engineering, and Design (PED) phase.
7. Identifying during the PED phase those submittals that require review and comment by a specific engineering discipline.
8. Facilitating a coordination meeting before the start of PED to ensure that the entire project team fully understands the project scope and design intent.
9. Preparing an engineering considerations and instructions document to be distributed to the field personnel. This document includes limitations, risks, roles, and responsibilities of the staff, and other issues that could have an effect on the project.
10. Ensuring that construction activities are in compliance with the design intent. Key activities include, but are not limited to, shop drawing review, participation in pre-construction meetings, and review of Requests for Information and contract modifications.
11. Conducting technical workshops for the field inspection personnel and appropriate construction management staff to ensure that there is a good understanding of the

monitoring requirements and their design implications for projects that include special features such as load tests, pile driving monitoring, miter gate setting, etc.

12. Ensuring that there is emphasis on the review of contractor submittals for contractor-designed or performance-specified features.
13. Providing assistance to the resident construction staff during construction.
14. Reviewing critical changes in field conditions to evaluate any impact they might have on the design.
15. Ensuring the proper inspection and approval of all critical foundation systems, critical design features, fracture critical members, critical joints, etc. in coordination with the Resident Engineer.
16. Developing and maintaining a close working relationship with the Resident Engineer.
17. Ensuring that lessons learned are entered into the appropriate forum: the USACE Enterprise Lessons Learned, the Engineering & Construction CoP and/or Inland Navigation Design CoP site on the Technical Excellence Network, or another accepted web site.

Appendix D

Command and Control, Collaboration, and Coordination

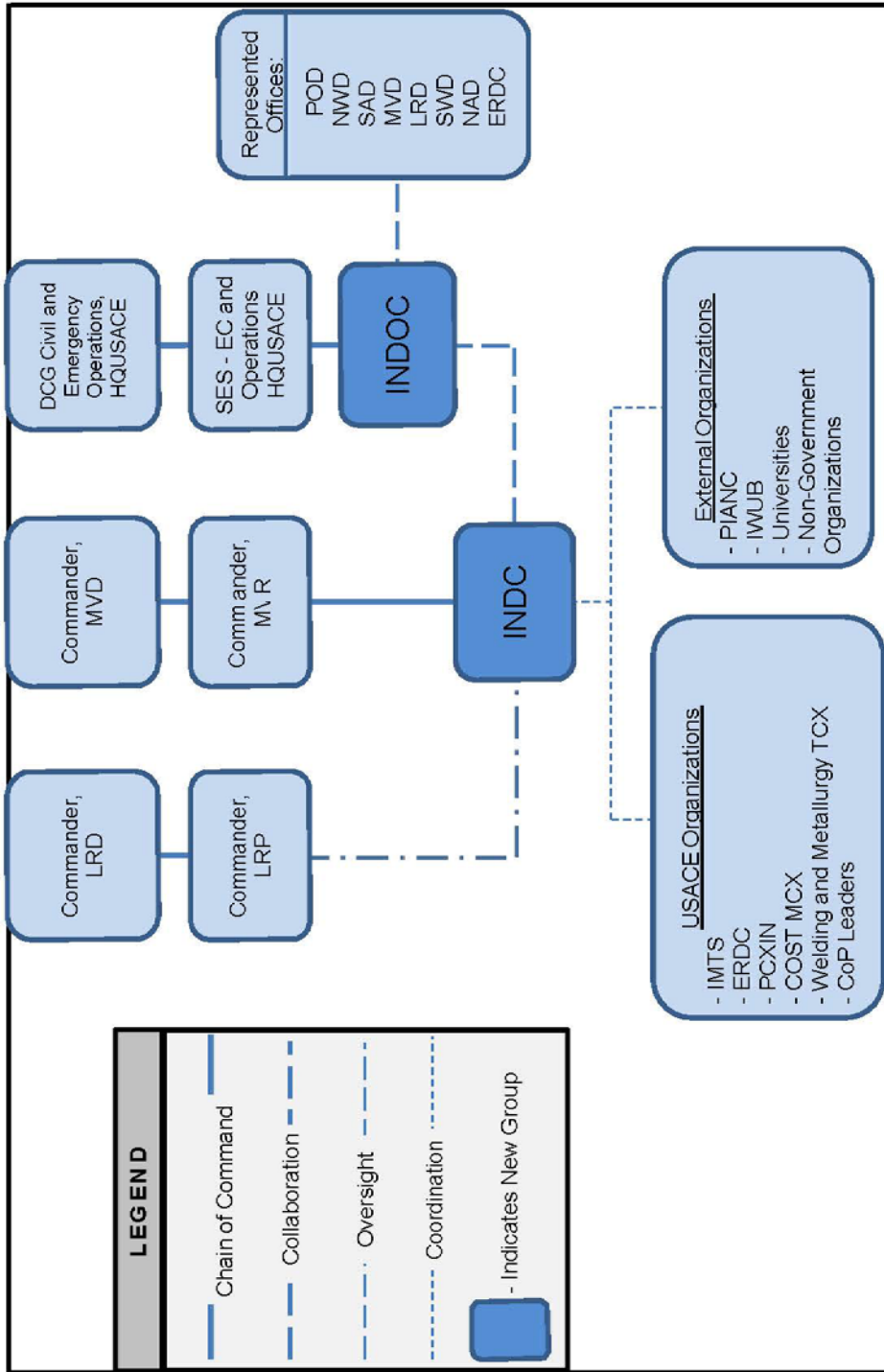


Figure D-1. Command and Control, Collaboration, and Coordination.

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Appendix E

Acronyms and Abbreviations

<b>Term</b>	<b>Definition</b>
A-E	Architectural - Engineering Firm
ATR	Agency Technical Review
BCOES	Biddibility, Constructability, Operability, Environmental, and Sustainability
CEO	Corporate Executive Officer
CoP	Community of Practice
DCG	Deputy Commanding General
DQC	District Quality Control
DSMMCX	Dam Safety Modification Mandatory Center of Expertise
DSOG	Dam Safety Senior Oversight Group
EC	Engineer Circular
ER	Engineer Regulation
ERDC	U.S. Army Engineer Research and Development Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers
IEPR	Independent External Peer Review
INDC	Inland Navigation Design Center
INDC MCX	Inland Navigation Design Center Mandatory Center of Expertise
INDOC	Inland Navigation Design Oversight Committee
LRD	Great Lakes and Ohio River Division
LRP	Pittsburgh District
MCX	Mandatory Center of Expertise
MSC	Major Subordinate Command
MVD	Mississippi Valley Division
MVR	Rock Island District
NAD	North Atlantic Division
NWD	Northwestern Division
O&M	Operations & Maintenance
PED	Preconstruction, Engineering, and Design

<b>Term</b>	<b>Definition</b>
PIANC	<a href="#">World Association for Waterborne Transport Infrastructure</a> . (formerly named the Permanent International Association of Navigation Congresses)
POD	Pacific Ocean Division
RMC	Risk Management Center
RMO	Review Management Organization
RP	Review Plan
SAD	South Atlantic Division
SWD	Southwestern Division
US	United States
USACE	U.S. Army Corps of Engineers
VE	Value Engineering