

DAM SAFETY MODIFICATION STUDIES

PCoP WEBINAR SERIES

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US Army Corps
of Engineers®



OBJECTIVES

- What is the Dam Safety Program and why does it matter to me?
- What are the Tolerable Risk Guidelines?
- How are Dam Safety Modification Studies different than other Civil Works Planning Studies?





ENGINEER REGULATION 1110-2-1156



Never heard of it

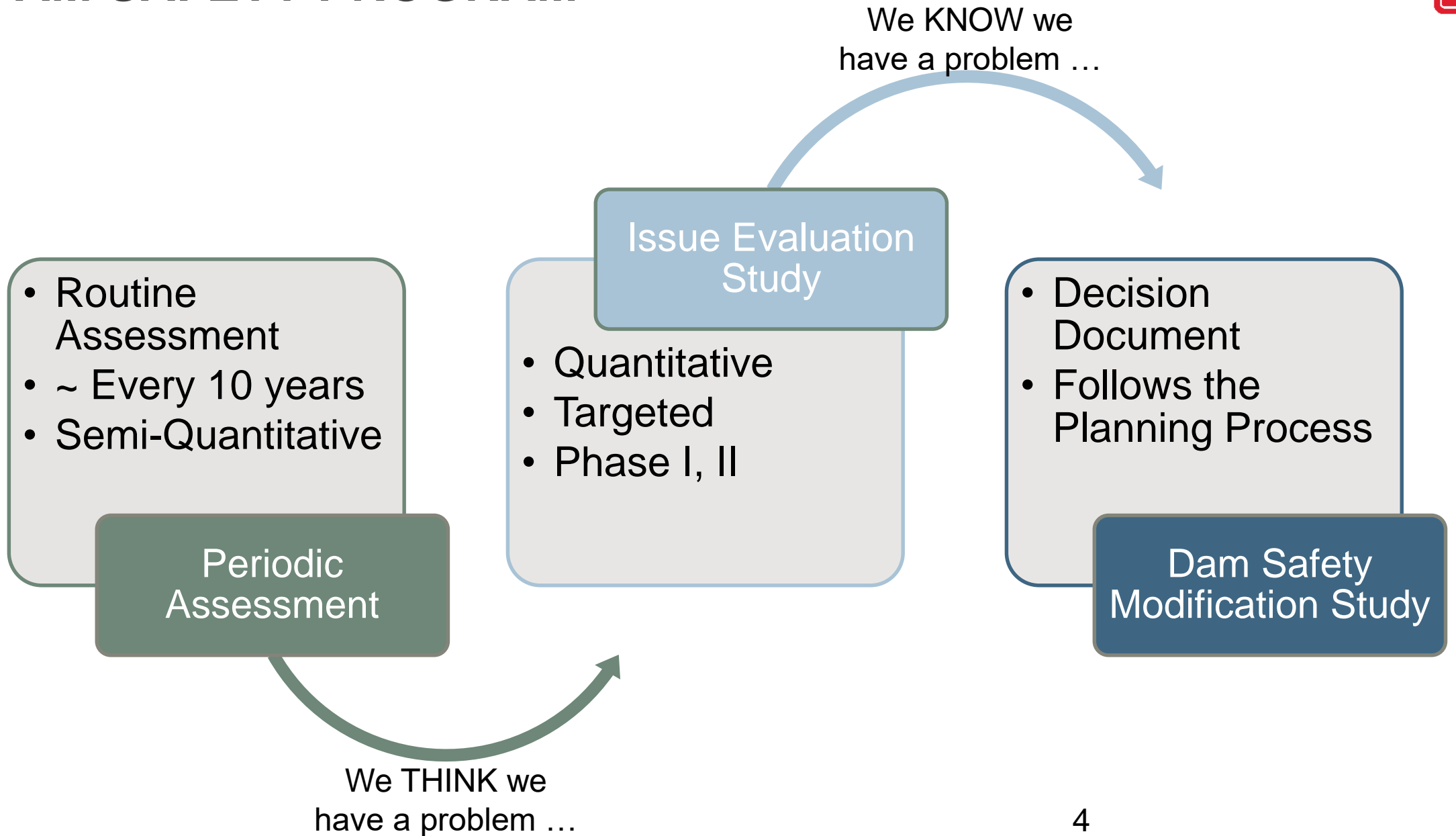
Don't Engineers use it?

Got it memorized

- Implementation of risk-informed dam safety program and a dam safety portfolio risk management process within USACE.
- Echoes P&G 1983 6-Steps, 4 Evaluation Criteria and 4 Accounts – Specific to Dam Safety Modification Studies.
- Establishes Tolerable Risk Limit Guidelines.



DAM SAFETY PROGRAM





KEY CONCEPTS – THE PLANNING PROCESS



ER 1110-2-1156 Safety of Dams - Policy

Identify Dam Safety Issues & Opportunities

Estimate Existing & Future without Action Condition Risks

Formulate Alternative Risk Management Plans

Evaluate Alternative Risk Management Plans

Compare Alternative Risk Management Plans

Select a Risk Management Plan

Principles & Guidelines 1983

Specify Problems & Opportunities

Inventory & Forecast Conditions

Formulate Alternative Plans

Evaluate Effects of Alternative Plans

Compare Alternative Plans

Select a Plan Based on Comparison

40 CFR 1500-1508 NEPA Requirements

Public Scoping

Purpose and Need

Alternatives, Including Preferred

Affected Environment

Environmental Consequences

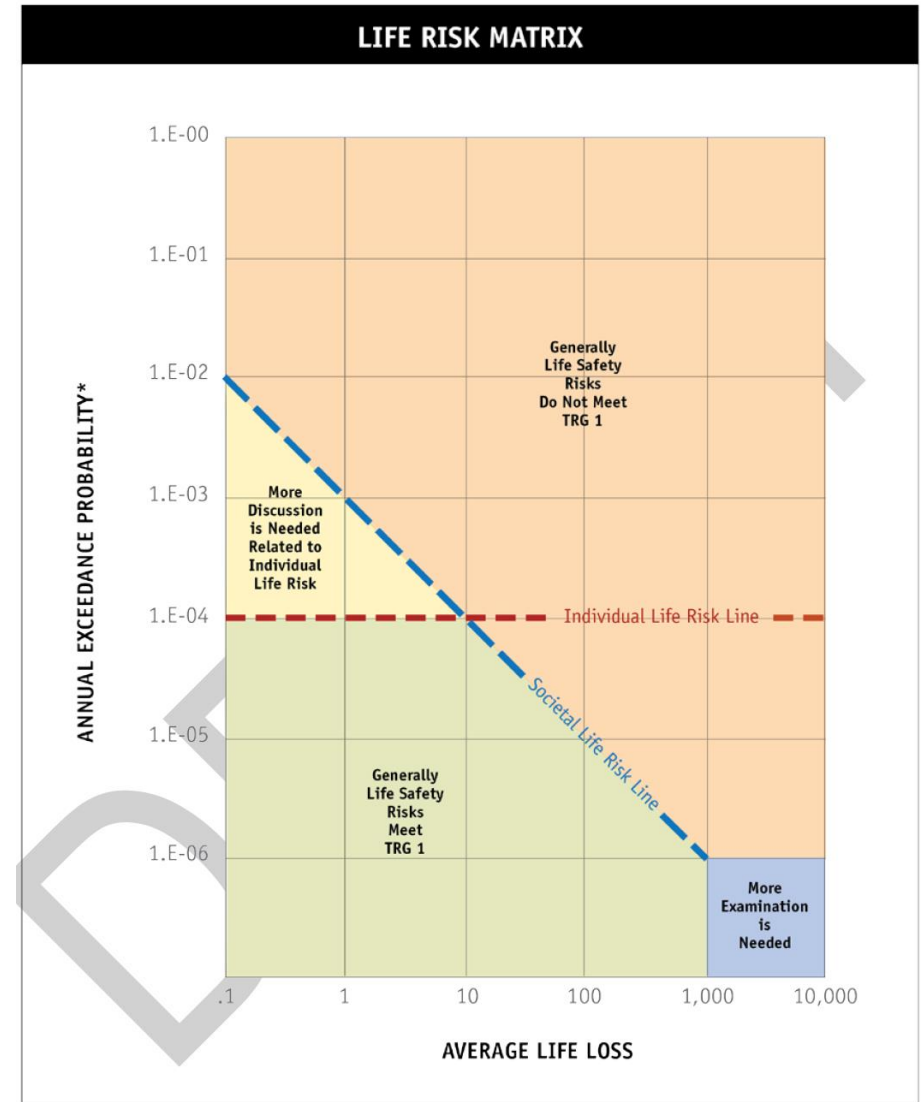
Public Comments



TOLERABLE RISK GUIDELINES

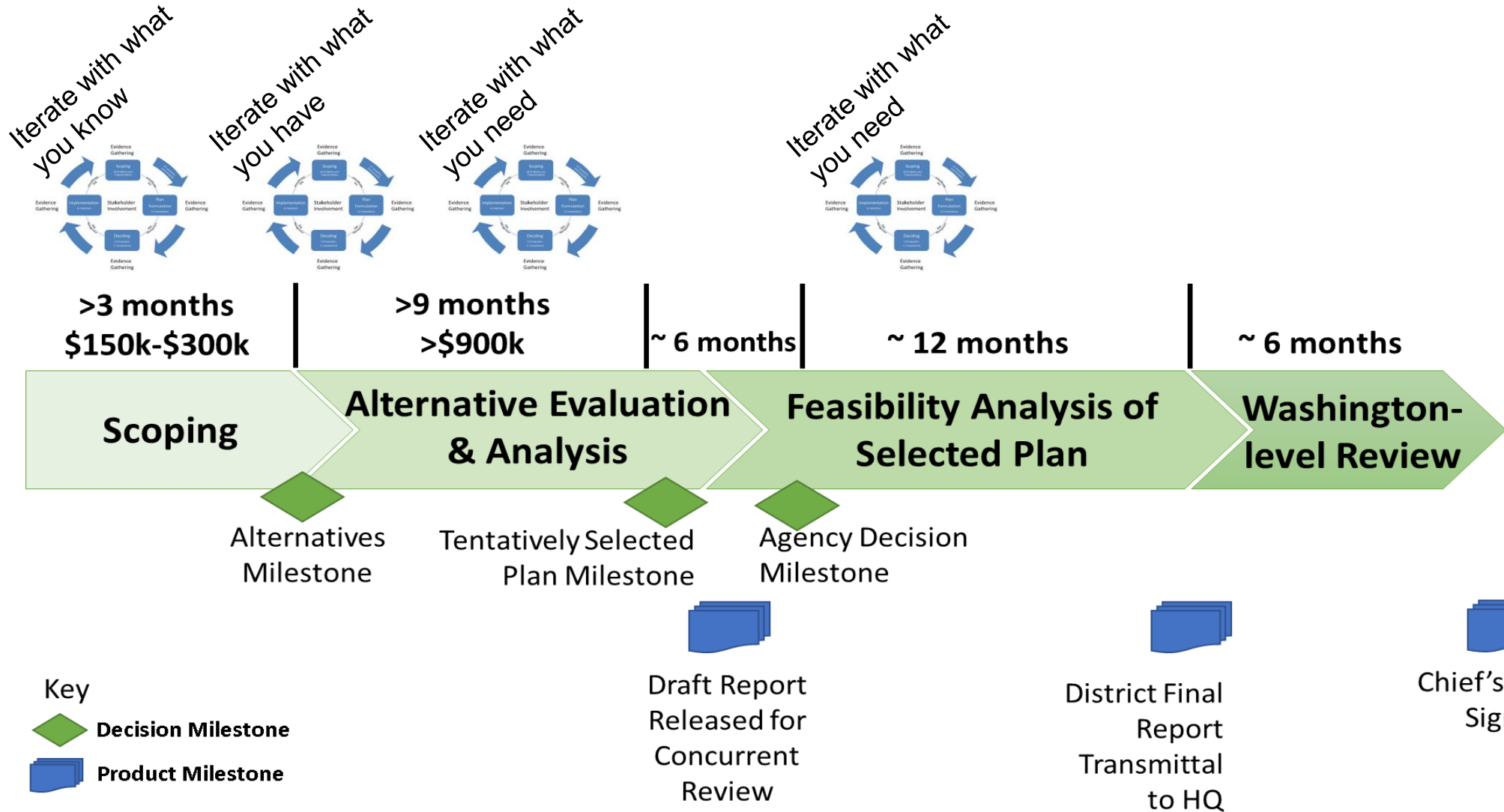


- **TRG 1 – Understanding the Risk**
 - Are the risks commensurate with the benefits?
- **TRG 2 – Building Risk Awareness**
 - Do the emergency managers have access to and are they aware of the best available risk information?
 - Have flood risk (residual risk) and potential changes to flood risk over time been communicated to the community?
- **TRG 3 – Fulfilling Daily Responsibilities**
 - Are we acting as a reasonable dam owner?
- **TRG 4 – Actions to Reduce Risk**
 - Have appropriate actions been taken to reduce risks?
 - Could any actions reasonably be taken that would reduce risks further?
 - What is the cost to reduce the risk and how much is the risk reduced?



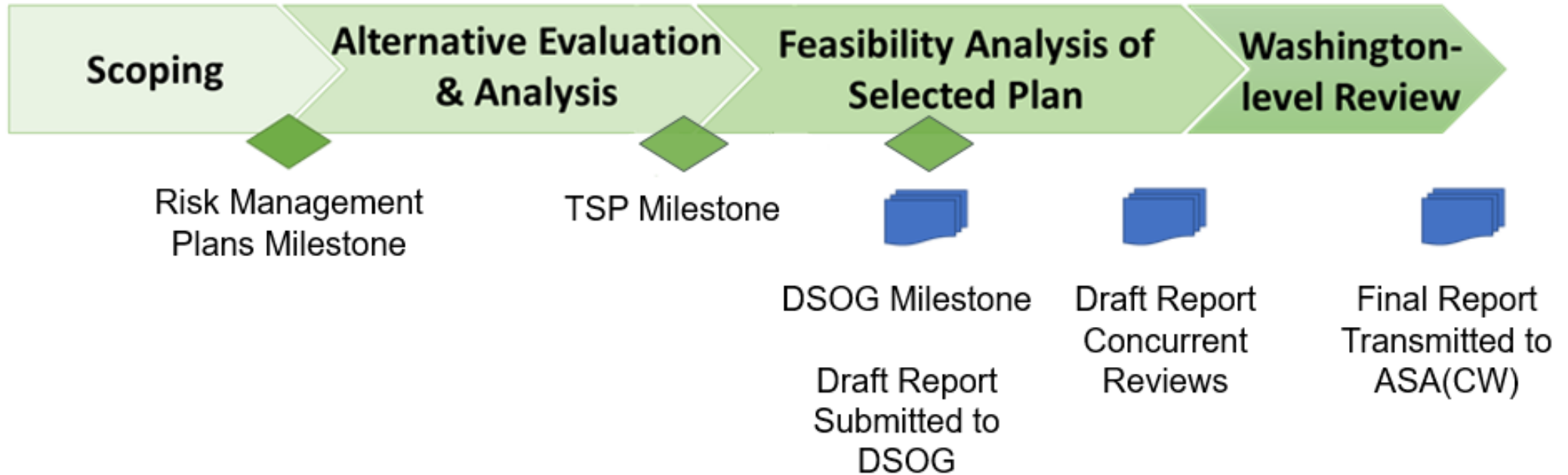


ITERATIVE PLANNING





ITERATIONS IN DAM SAFETY MODIFICATION STUDIES





OBJECTIVES FOR IMPROVING DSMS EXECUTION



REDUCE TIME & COST

- Complete **most** DSMS's in **less than 2 years** for under **\$3M**

MAINTAIN COMPLIANCE

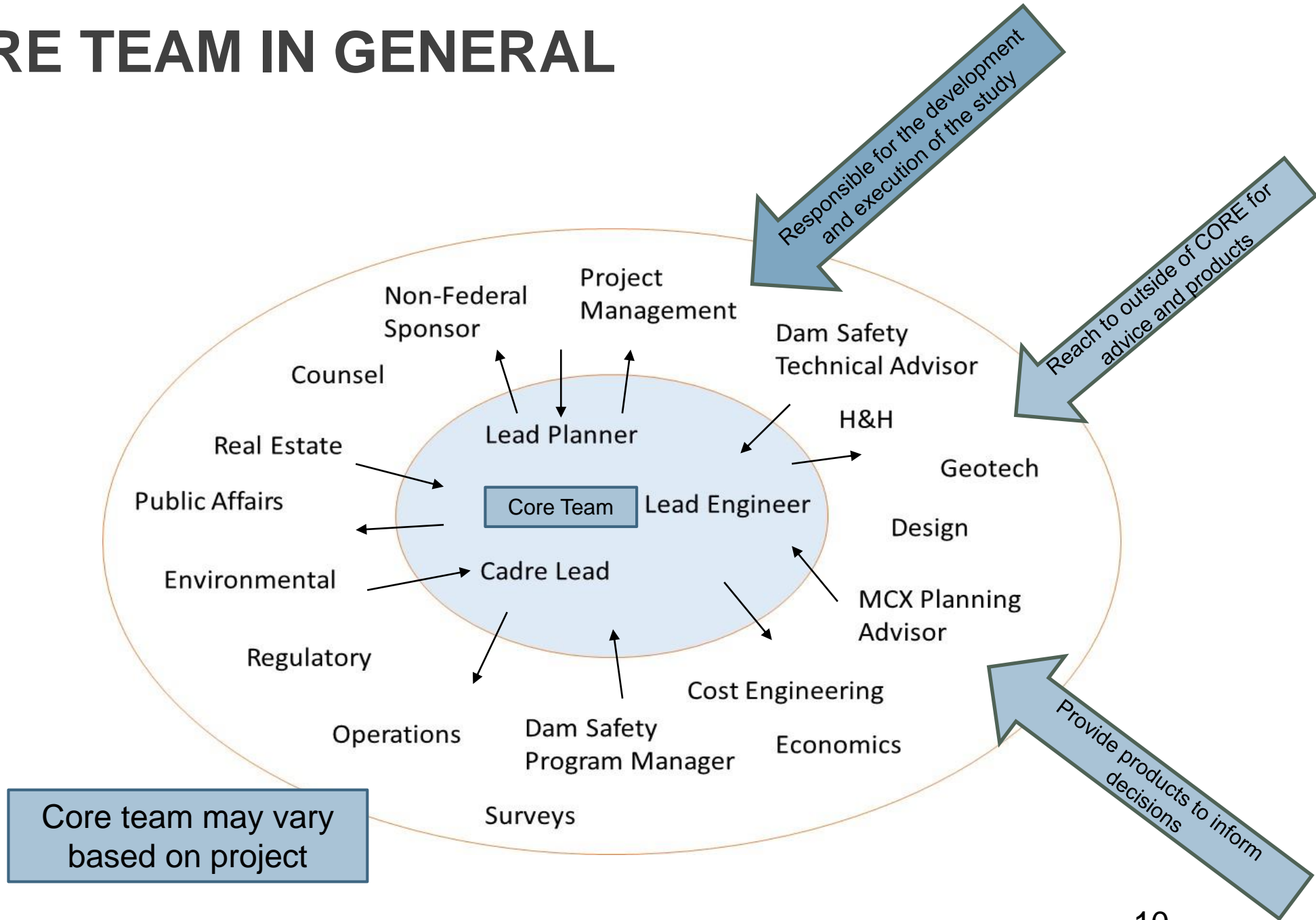
- **Maintain compliance** with policy and/or guidance related to Dam Safety and Planning, including ER 1110-2-1156 and the Planning Manual Part II

EXPERIENCED RESOURCES & STREAMLINED PROCESS

- Engage a **small group of experienced Dam Safety Engineering and Planning team members** early in the process to provide expertise in scoping and executing the project
- **Strategically reduce uncertainty** while focusing on information necessary to make the next decision
- **Repurpose Kickoff Meeting** to focus on gaining input and buy-in from Vertical Team on scope, schedule, and budget of the DSMS

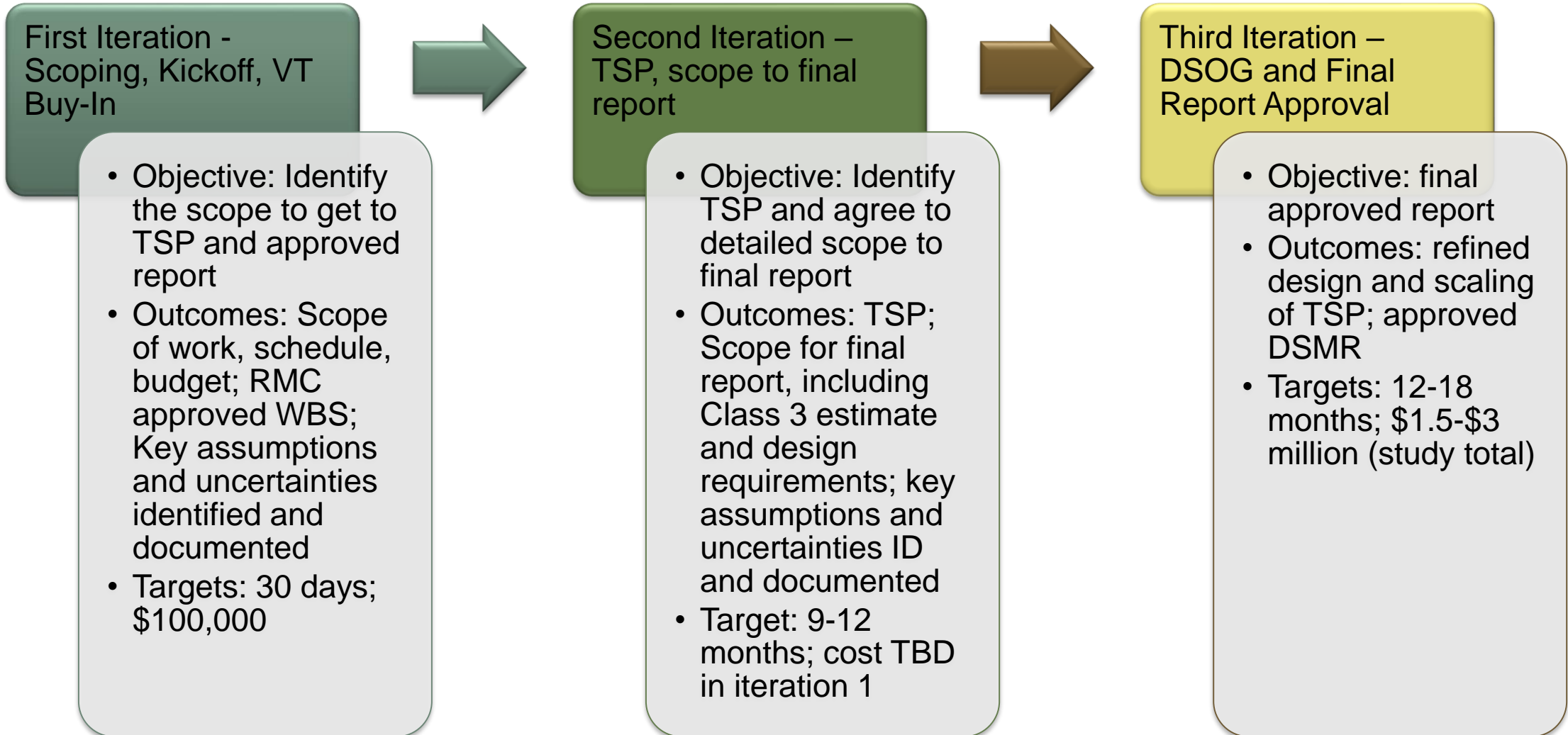


CORE TEAM IN GENERAL





ITERATIONS IN DAM SAFETY MODIFICATION STUDIES





FIRST ITERATION IN PRACTICE



First Iteration

- Objective: Identify the scope to get to TSP and approved report
- Outcomes: Scope of work, schedule, budget; RMC approved WBS; Key assumptions and uncertainties
- Targets (internal): 30 days; \$100,000

Day 1	RMC sends funding to study team
1st Week	Dam Safety Design Engineer, MCX Planning Advisor, and RMC Dam Safety Program Manager coordinate scoping meeting with team leads
2nd Week	<p>2 – 3 day Scoping meeting with CORE TEAM, where they complete one iteration of the 6-step planning process</p> <p>Lead Engineer Lead Planner Dam Safety Design Engineer MCX Planner (Meeting Facilitator) Cadre Lead or RMC Risk Advisor from IES Cost Engineer DSMS Program Manager (RMC) Environmental Planner</p> <p>Other disciplines as needed</p> <p><u>Product: draft detailed scope (including preliminary alternatives, deliverables needed, key milestones)</u></p>
3rd – 4th Week	CORE Team coordinates development of Scope with relevant team members
30 Days	<u>Kick-off Meeting</u> : CORE Team briefs Vertical Team and receives input on Scoping Decisions



SECOND ITERATION IN PRACTICE



Second Iteration

- Objective: Identify TSP and agree to detailed scope to final report
- Outcomes: TSP; Scope for final report, including Class 3 estimate and design requirements; key assumptions and uncertainties ID and documented
- Target: 9-12 months; cost TBD in iteration 1

Design	<ol style="list-style-type: none"> 1. Narrative description to 1 – 3 drawings per alternative 2. Combined Constructability & Cost-risk analysis meeting
Cost	<ol style="list-style-type: none"> 1. Class 4 cost estimate; ranges per alternative 2. Combined Constructability & Cost-risk analysis meeting
Risk Assessment	Order of magnitude risk reduction estimate on final array
Planning	Key assumptions and uncertainties identified and documented
Project Management	Scope to get to final report
Vertical Team	Briefing to VT and concurrence on TSP



THIRD ITERATION IN PRACTICE



Third Iteration

- Objective: final approved report
- Outcomes: refined design and scaling of TSP; approved DSMR
- Targets: 12-18 months; \$1.5-\$3 million

Design	<ol style="list-style-type: none"> 1. Refined design of TSP to support Class 3 Cost Estimate 2. More design on uncertain or large cost items (potentially to a Class 2 level), less design on more certain information
Cost	<ol style="list-style-type: none"> 1. Class 3 cost estimate 2. More design on uncertain or large cost items (potentially to a Class 2 level), less design on more certain information
Risk Assessment	Quantitative risk reduction estimate on TSP
Planning	Qualitative Risk Assessment on TSP – identifying decision, implementation, and outcome risks associated with the TSP
Reviews	<ul style="list-style-type: none"> • Formal DQC • ATR • QCC • SOG prior to IEPR • IEPR • NEPA Public Review (if necessary)
Vertical Team	Briefing to DSOG of Draft DSMR



EXAMPLES

15



Pipestem Dam DSMS

- 1st iteration resulted in final array
- From project initiation to agency decision miles (DSOG) in 9 months

Keystone Dam DSMS

- From project initiation to TSP in 10 months
- Risk informed decision making - a lot of remaining uncertainty associated with TSP
 - Identified and characterized, communicated to vertical team

Magnolia Levee DSMS

- First iteration scoping meeting late May

Lessons Learned:

- Ensure the right resources are there or on call
- Doing homework
- Identify tasks to reduce uncertainties
- Utilizing MCX Advisors – process orientation

Questions?

Type questions in the chat box.
We will answer as many
as time allows.

This webinar will be posted to the
Planning Community Toolbox:
<http://www.corpsplanning.us>



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