

# **GAO's Cost and Schedule Assessment Guides**

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**U.S. Government Accountability Office**

**Applied Research and Methods**

**Cost Engineering Sciences**

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# Agenda

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- The role of GAO
- GAO Cost Guide and the characteristics of a reliable cost estimate
- GAO Schedule Guide and the characteristics of a reliable schedule
- How is the government performing?
- Proposed updates to the Cost Guide
- Reliability assessment example for a large-scale infrastructure project

# The Role of GAO in Government

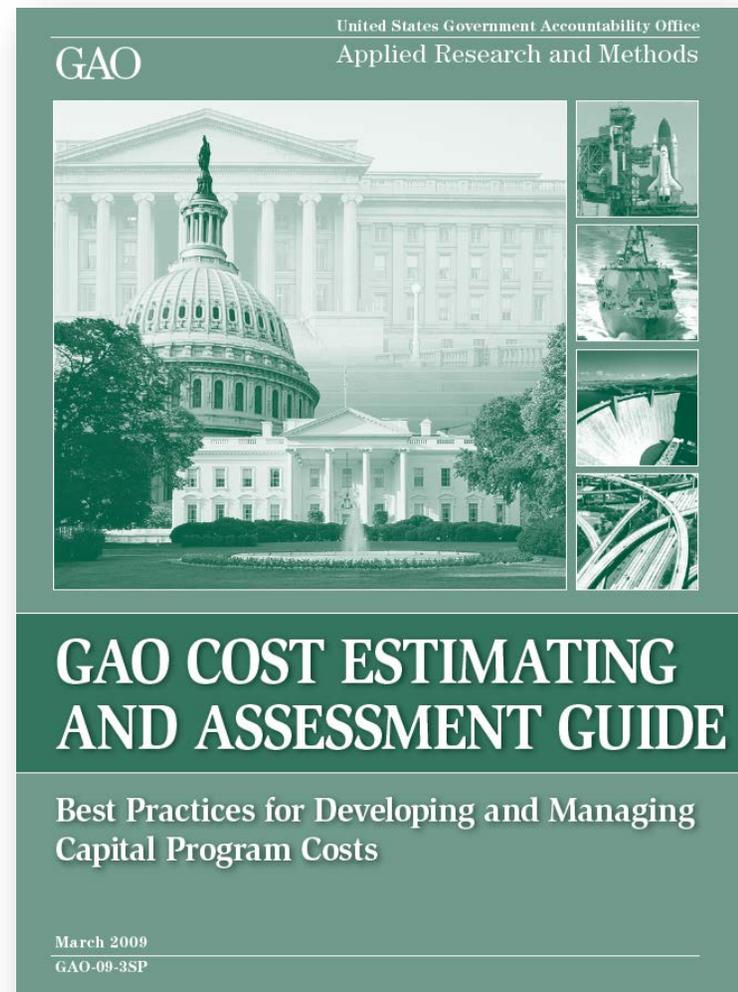
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Known as the investigative arm of Congress, GAO exists to support Congress in meeting its constitutional responsibilities. To that end, GAO works to

- Help improve the performance of federal government
- Ensure government agencies and programs are accountable to the American people
- Examine the use of public funds, and
- Evaluate federal programs by providing analyses and recommendations to help Congress make informed oversight and funding decisions

## Cost Estimating and Assessment Guide

- Drafted 2005-2007, published in 2009
- Outlines GAO's criteria for assessing cost estimates during audits
- Contains 20 chapters with supporting appendixes
- Chapters 1-17: developing credible cost estimates and the 12-step cost estimating process for developing high quality cost estimates
- Chapters 18-20 address managing program costs once a contract has been awarded and discuss Earned Value and risk management
- Also provides case studies of prior GAO audits to show typical findings related to the cost estimating process



# A Reliable Process for Developing Credible Cost Estimates

## Initiation and research

Your audience, what you are estimating, and why you are estimating it are of the utmost importance

## Assessment

Cost assessment steps are iterative and can be accomplished in varying order or concurrently

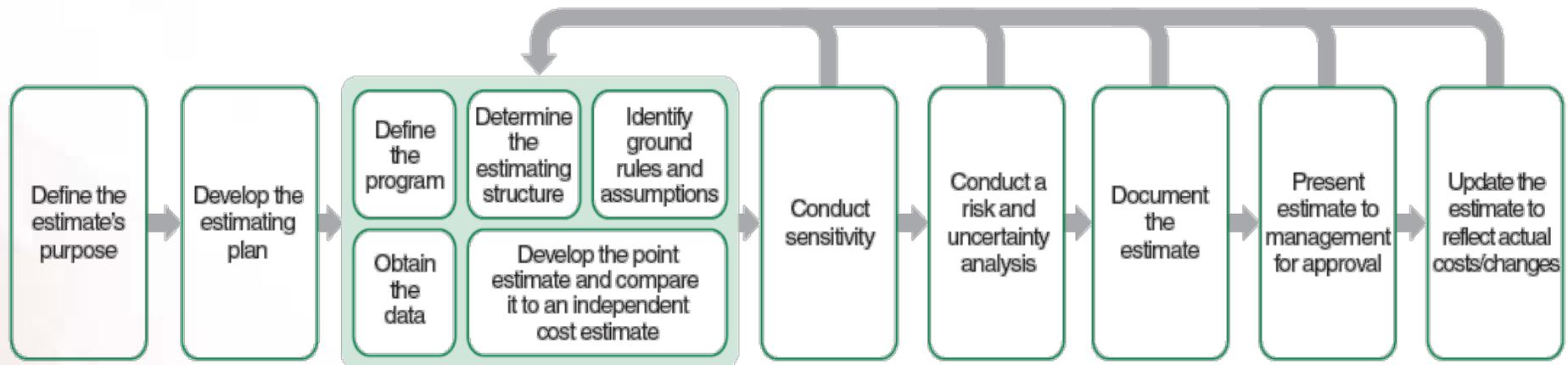
## Analysis

The confidence in the point or range of the estimate is crucial to the decision maker

## Presentation

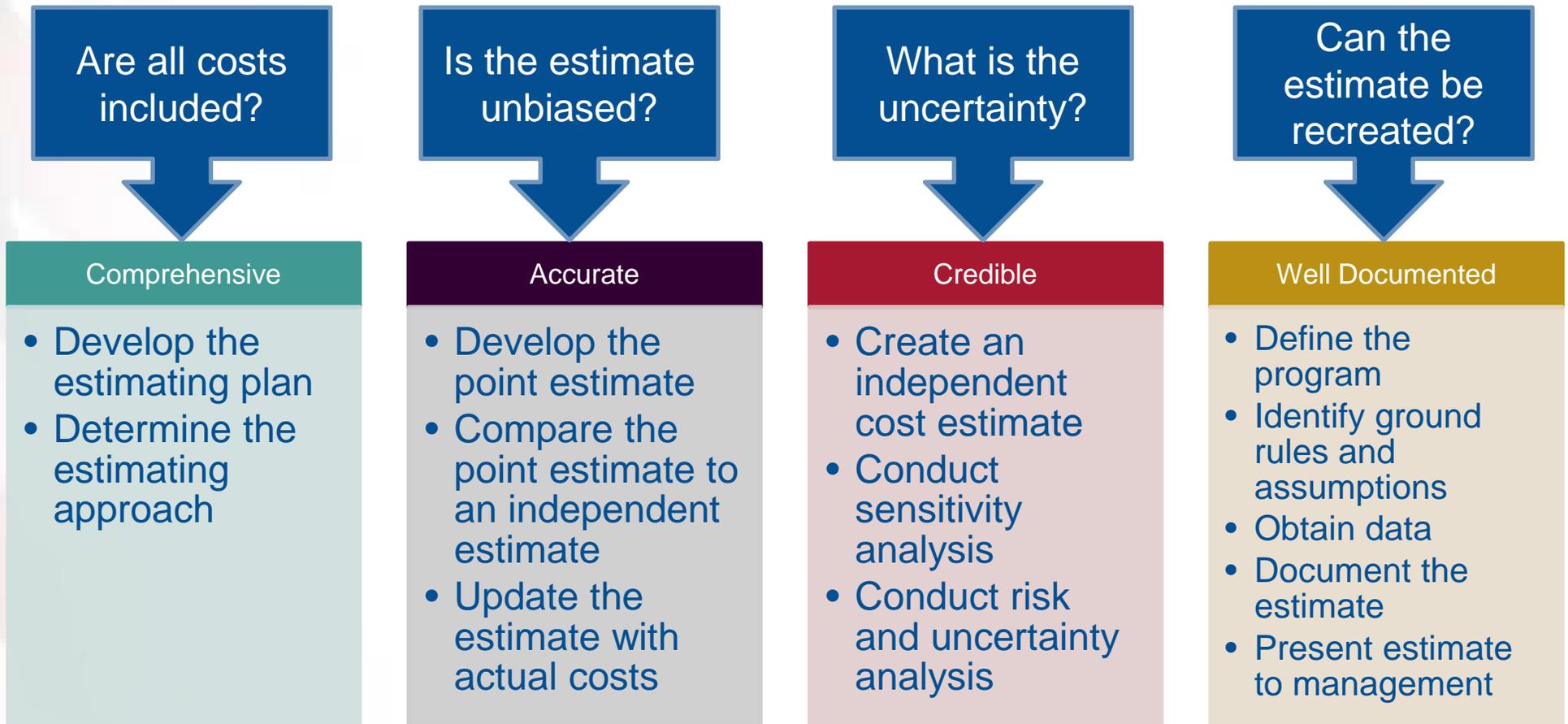
Documentation and presentation make or break a cost estimating decision outcome

Analysis, presentation, and updating the estimate steps can lead to repeating previous assessment steps



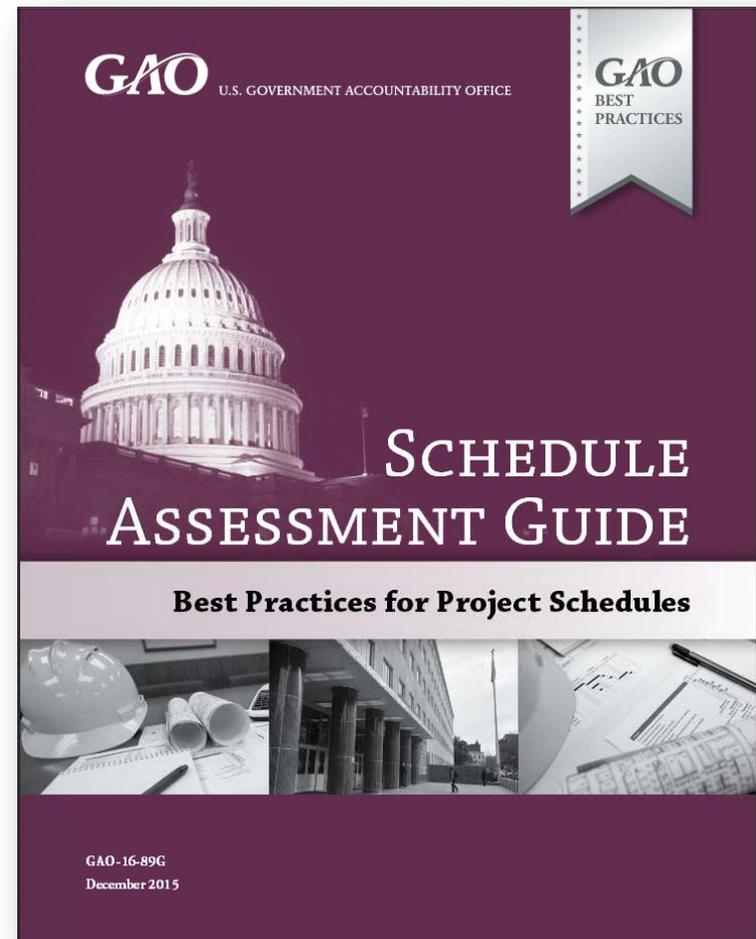
Source: GAO.

# Characteristics of Reliable Cost Estimates

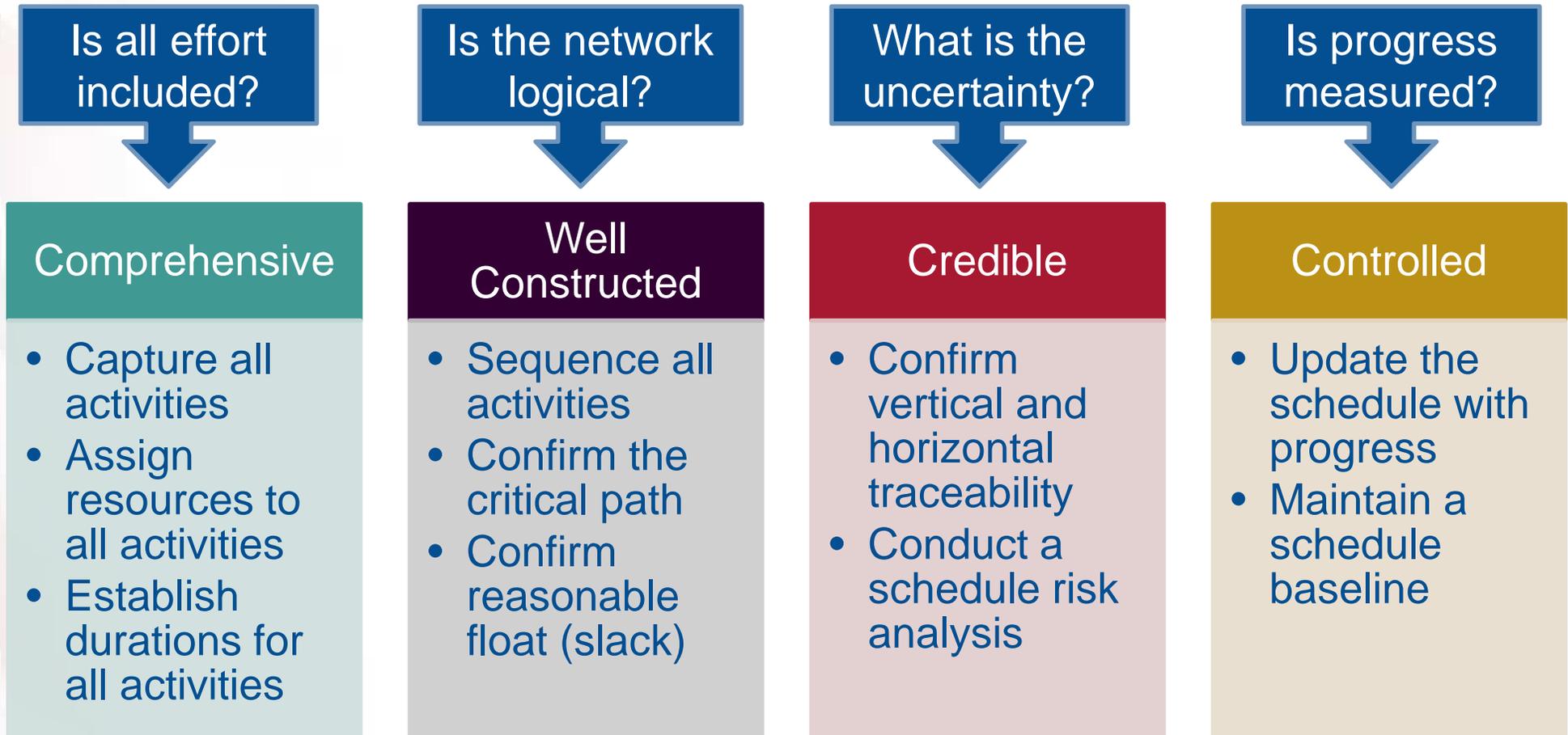


## Schedule Assessment Guide

- Drafted 2010-2015, exposure draft published May 2012
- Final publication December 2015
- Outlines GAO's criteria for assessing master schedules
- Contains chapters for each of the 10 best practices plus supporting appendixes
- Also provides case studies of prior GAO audits to show typical findings related to the scheduling process



## Four Characteristics of a Reliable Schedule



## **How Is the Government Performing?**

**The extent to which agencies are adhering  
to cost and schedule best practices**

# How is the government performing in developing cost estimates?

	Comprehensive	Well Documented	Accurate	Credible
Veterans Affairs (VA)	Substantially	Substantially	Minimally	Minimally
DOT	Substantially	Substantially	Substantially	Minimally
DOD	Substantially	Substantially	Substantially	Partially
Missile Defense (MDA)	Partially	Minimally	Minimally	Not Met
IRS	Substantially	Partially	Partially	Minimally
DHS	Substantially	Substantially	Substantially	Partially
DOE	Substantially	Substantially	Partially	Minimally
Agriculture	Minimally	Not Met	Not Met	Not Met
Commerce	Substantially	Minimally	Partially	Not Met



# How is the government performing in developing and maintaining schedules?

	BP 1 All effort	BP 2 Logic	BP 3 Resources	BP 4 Durations	BP 5 Traceable	BP 6 Critical Path	BP 7 Float	BP 8 Risk	BP 9 Statusing
Veterans Affairs (VA)	Fully Met	Fully Met	Fully Met	Fully Met	Fully Met	Fully Met	Fully Met	Not Met	Fully Met
DOT	Partially	Minimally	Minimally	Substantially	Partially	Minimally	Minimally	Not Met	Partially
DOD	Substantially	Partially	Partially	Substantially	Partially	Partially	Partially	Minimally	Substantially
Missile Defense (MDA)	Minimally	Minimally	Partially	Substantially	Partially	Partially	Partially	Minimally	Substantially
DHS	Minimally	Partially	Minimally	Substantially	Partially	Minimally	Minimally	Not Met	Minimally
DOE	Fully Met	Substantially	Partially	Substantially	Substantially	Substantially	Minimally	Partially	Substantially
NASA	Fully Met	Partially	Not Met	Substantially	Partially	Substantially	Partially	Not Met	Fully Met

Fully Met	Substantially	Partially	Minimally	Not Met
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# Some Proposed Cost Guide Updates

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- Integration with and references to the
  - GAO Schedule Assessment Guide (GAO-16-89G)
  - GAO Standards for Internal Control (GAO-14-704G)
  - GAO Technology Readiness Assessment Guide (expected summer 2016)
  - GAO Federal Agile Software Guide (issue date TBD)
- Improved definitions and descriptions of several best practices and their mappings to the 12 steps and 4 characteristics
- Applicability of best practices to all types of capital programs
- Appendixes: risk breakdown structures, spreading contingency dollars through the WBS; updated laws and guidance



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## Invitation to Participate in Further Updates and Discussion about Best Practices

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GAO invites interested parties to meet with us and other experts to discuss further updates to the cost and schedule guides so that the guides continually reflect best practices.

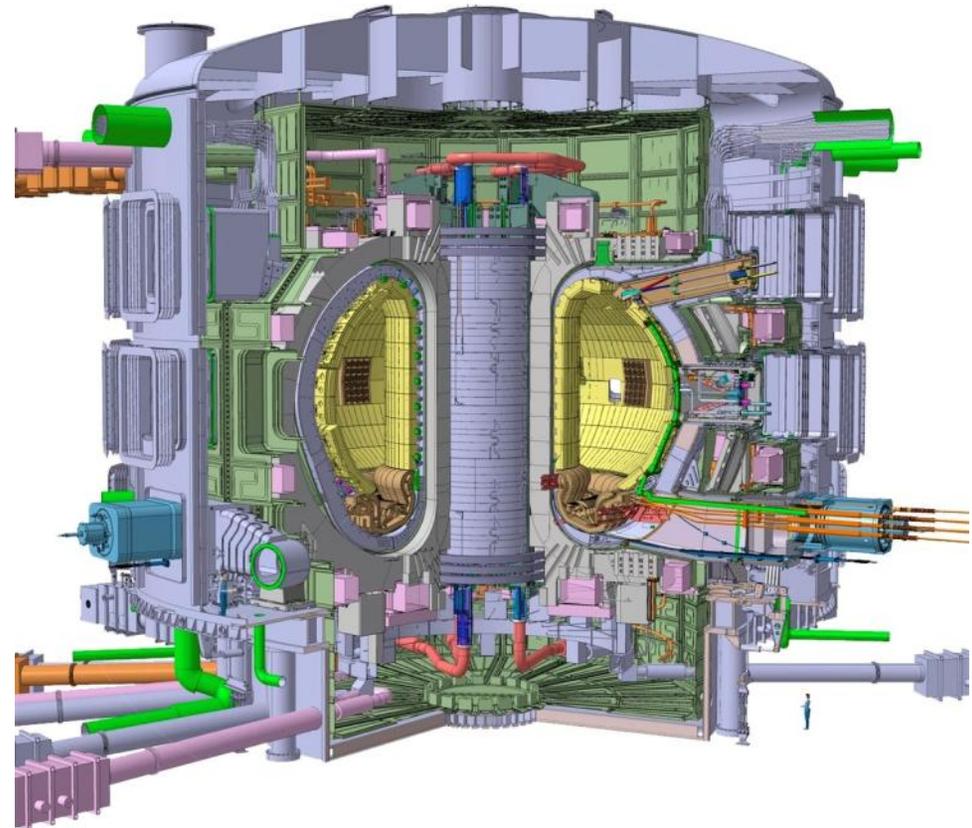
If interested, please e-mail your contact information to:

Jason T Lee – [leejt1@gao.gov](mailto:leejt1@gao.gov)

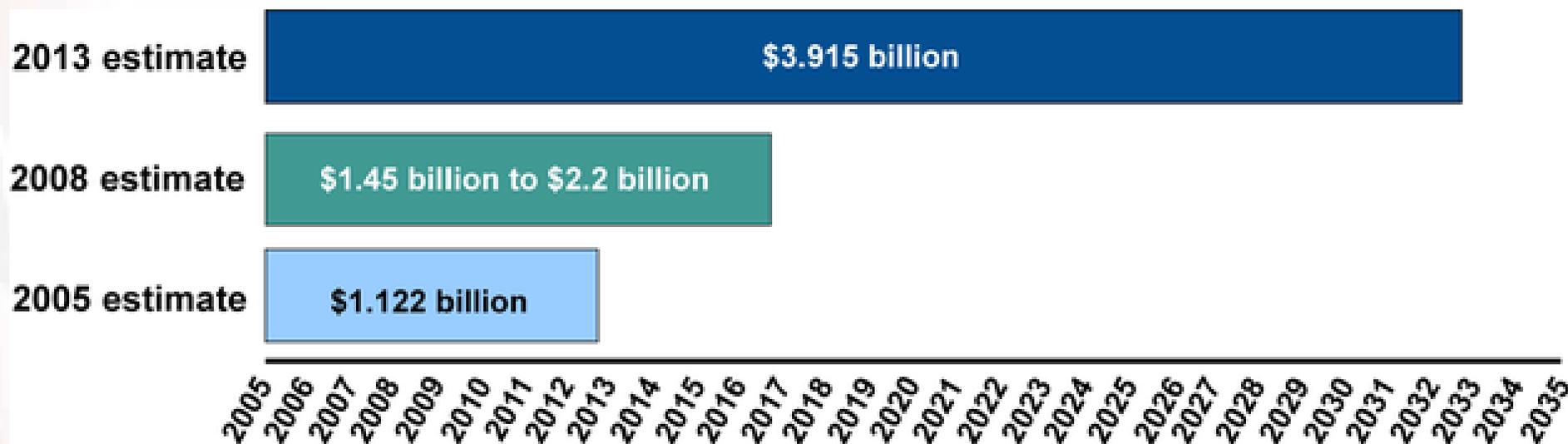
Karen Richey - [richeyk@gao.gov](mailto:richeyk@gao.gov)

## International Thermonuclear Experimental Reactor (ITER) Project: Background

- ITER is an international research facility being built in France to demonstrate the feasibility of fusion energy.
- Other countries involved in ITER include Russian Federation, Japan, European Union, People's Republic of China, Republic of Korea, and India.
- The United States has committed to providing about 9 percent of ITER's construction costs through contributions of hardware, personnel, and cash, and DOE is responsible for managing those contributions, as well as the overall U.S. fusion program.
- GAO reviewed costs and schedules in 2014 (GAO-14-499)



# ITER: Cost estimates of U.S. Contribution



Source: GAO analysis of DOE data. | GAO-14-499

## ITER: Key Findings

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- **Cost:** Estimate of U.S. contribution has grown by almost \$3 billion
- **Schedule:** Estimated completion date has slipped by 20 years
- **Causes:** 1) refined design and requirements of U.S. hardware; 2) changes to the international schedule; 3) changes to ITER design; 4) U.S. funding constraints and associated inflation; 5) increased ITER construction costs
- Assessment:
  - U.S. schedule estimates substantially meet best practices
  - U.S. cost estimates substantially meet best practices, but only partially meet Credible because they did not develop a sensitivity analysis or independent cost estimate
  - DOE has been unable to set a cost and schedule baseline in part because the international schedule has not been set

## ITER: Recommendations

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- Revise U.S. ITER Project Office to develop a sensitivity analysis for the cost estimate and compare to an independent cost estimate
- Develop proposal describing what actions are necessary to create a reliable international schedule and improve ITER Organization program management
- Once ITER Organization creates a reliable master schedule, use that schedule to update the U.S. schedule
- Develop strategic plan to address DOE's fusion program priorities

## Conclusion

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- The GAO Cost Guide and Schedule Guides provide criteria to evaluate many types projects
- The GAO Cost Guide and Schedule Guides can serve as the basis for agency project control guidance
- GAO recommendations have been aimed at improving oversight to keep projects on cost and schedule.

# Thank you- Any Questions?

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Guides Available Online:

- GAO Cost Estimating and Assessment Guide:  
<http://www.gao.gov/products/GAO-09-3SP>
- GAO Schedule Assessment Guide:  
<http://www.gao.gov/products/GAO-16-89G>