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Highlights

AIR TRAFFIC CONTROL

System Management Capabilities Improved, but More Can Be Done to Institutionalize Improvements

Why GAO Did This Study

Since 1981, the Federal Aviation Administration (FAA) has been working to modernize its aging air traffic control (ATC) system. Individual projects have suffered cost increases, schedule delays, and performance shortfalls of large proportions, leading GAO to designate the program a high-risk information technology initiative in 1995. Because the program remains a high risk initiative, GAO was requested to assess FAA's progress in several information technology management areas. This report, one in a series responding to that request, has two objectives: (1) to evaluate FAA's capabilities for developing and acquiring software and systems on its ATC modernization program and (2) to assess the actions FAA has under way to improve these capabilities.

What GAO Recommends

GAO is making recommendations to the Secretary of Transportation to address specific weaknesses and to institutionalize FAA's process improvement initiatives by establishing a policy and plans for implementing and overseeing process improvement initiatives.

In commenting on a draft of this report, agency officials generally agreed with GAO's recommendations. They also provided technical corrections, which were incorporated as appropriate.

What GAO Found

FAA has made progress in improving its capabilities for acquiring software-intensive systems, but some areas still need improvement. GAO had previously reported in 1997 that FAA's processes for acquiring software were ad hoc and sometimes chaotic. Focusing on four mission critical air traffic projects, GAO's current review assessed system and software management practices in numerous key areas such as project planning, risk management, and requirements development. GAO found that these projects were generally performing most of the desired practices: of the 900 individual practices evaluated, 83 percent were largely or fully implemented. The projects were generally strong in several areas such as project planning, requirements management, and identifying technical solutions. However, there were recurring weaknesses in the areas of measurement and analysis, quality assurance, and verification. These weaknesses hinder FAA from consistently and effectively managing its mission critical systems and increase the risk of cost overruns, schedule delays, and performance shortfalls.

To improve its software and system management capabilities, FAA has undertaken a rigorous process improvement initiative. In response to earlier GAO recommendations, in 1999, FAA established a centralized process improvement office, which has worked to help FAA organizations and projects to improve processes through the use of a standard model, the integrated Capability Maturity Model. This model, which is a broad model that integrates multiple maturity models, is used to assess the maturity of FAA's software and systems capabilities. The projects that have adopted the model have demonstrated growth in the maturity of their processes, and more and more projects have adopted the model. However, the agency does not require the use of this process improvement method. To date, less than half of FAA's major ATC projects have used this method, and the recurring weaknesses we identified in our project-specific evaluations are due in part to the choices these projects were given in deciding whether to and how to adopt this process improvement initiative. Further, as a result of reorganizing its ATC organizations to a performance-based organization, FAA is reconsidering prior policies, and it is not yet clear that process improvement will continue to be a priority. Without a strong senior-level commitment to process improvement and a consistent, institutionalized approach to implementing and evaluating it, FAA cannot ensure that key projects will continue to improve systems acquisition and development capabilities. As a result, FAA will continue to risk the project management problems—including cost overruns, schedule delays, and performance shortfalls—that have plagued past acquisitions.

United States Government Accountability Office