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INSTITUTE FOR DEFENSE ANALYSES

Projecting Personnel Security Investigations (PSI) Requirements: Current Issues, Challenges and a Viable Approach

J. R. Magwood, Project Leader

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PREFACE

The Institute for Defense Analyses (IDA) conducted this study in response to a request from the Director of Security in the Office of the Deputy Under Secretary of Defense for HUMINT, Counterintelligence and Security (ODUSD(HUMINT, CI&S)). Dr. Eric L. Lang of the Defense Personnel Security Research Center, supported by Dr. Leissa C. Nelson, served as Project Officer, on the behalf of ODUSD(HUMINT, CI&S), for the study. We gratefully acknowledge their considerable efforts on our behalf.

The project team is also pleased to acknowledge the insightful and constructive guidance provided by the IDA Review Committee, which was chaired by Dr. Steve Warner, Director of IDA's System Evaluation Division, and included Dr. Eric A. Adelizzi, Mr. Michael H. Anstice, Mr. Windsor W. Lin, and Dr. Robert V. Uy. Additionally, Ms. Suzanne S. Jackson, from the IDA Security Operations Office, provided valuable information, for which we are most appreciative.

The project team also acknowledges the contribution of several civilian and military personnel from the Defense Security Service and the Air Force with whom we interacted during the course of the study. Their open and in-depth responses to our numerous inquiries added measurably to our understanding of the investigative and adjudicative phases of the clearance-granting process.

The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

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EXECUTIVE SUMMARY

Improving projections for upcoming personnel security investigations is essential for effectively managing the security clearance-granting process. During the first half of fiscal year (FY) 2006, the Department of Defense (DoD) underestimated the number of required investigations by 60 percent. A continuing trend of underestimating security investigation requirements contributed to an investigative and adjudicative backlog. The Office of Management and Budget's (OMB) Security Clearance Oversight Group reported that the investigative backlog included about 62,000 cases that were more than 1 year old during that same FY2006 period. Because an investigations backlog is viewed as posing a national security risk, the Intelligence Reform and Terrorism Prevention Act (IRTPA), signed into law in December 2004, included performance metrics for completing security clearance investigations and adjudications: initial clearances must be completed within 90 days, on average, for 80 percent of the requests; and the adjudication process must be completed in under 30 days, on average. The head of the Office of Personnel Management's Federal Investigative Services Division testified before Congress that meeting those IRTPA performance metrics requires the DoD components to project investigations within five percent of actual submissions.

The Under Secretary of Defense for Intelligence (USD(I)), in his role as the principal staff assistant to the Secretary of Defense regarding intelligence, counterintelligence, and security matters, responded to this OPM pronouncement by issuing a memorandum in August 2007 directing the DoD components to provide annual projections for personnel security investigations (PSIs) to the Defense Security Service (DSS) beginning in July 2008. The memo also mandates that those projections be within five percent of actual submissions. The Services, with the exception of the Air Force, and the defense agencies generally project PSI requirements by calculating the average of prior annual submissions and adding a small percent delta. The mandate to project investigations within five percent of actual submissions, and to validate those projections, suggests the need for a more rigorous approach. The Air Force uses a model that takes into consideration manning requirements, attrition, assignment turnover, and security

policies to predict investigations requirements up to 2 years in advance. The remaining military Services and defense agencies are not able to easily adopt the Air Force model because of the model's narrowly tailored input requirements. IDA has developed an alternative, supplemental approach that the Army, Navy, Marine Corps, and the defense agencies can easily implement. The Air Force Model and the IDA-proposed supplemental approach are discussed below.

A. WIDER ADOPTION OF THE AIR FORCE MODEL

The Air Force PSI Requirements Model is an Excel spreadsheet with embedded iThink modules. iThink is a commercial software application offered by isee Systems that uses the "systems thinking" computer modeling technique to simulate the behavior of a complex system—the Air Force personnel security program—by using interlinked causal loop diagrams to capture the interdependencies between the component elements: manpower, personnel, assignment, and investigation.

The model works by using manpower data to subdivide the force into personnel inventories by occupational specialty. Those personnel inventories are then binned into a two-family structure based on the percentage of top secret billets. Family 1 represents those occupational inventories with a high-percentage of top secret billets (greater than 80 percent). The remaining occupational inventories are designated as belonging to Family 2. The model then projects investigation requirements for each family. The assignment and investigations input parameters include: tour length, the likelihood of reassignment to a top secret billet, and clearance reinvestigation periods. The Air Force Central Adjudication Facility (AFCAF) reports the model projects initial single-scope background investigations (SSBIs) within 1 percent of actual submissions; but overestimates SSBI reinvestigations by about 20 percent. The AFCAF attributes the SSBI reinvestigation projection margin to the failure of security managers to submit requests within the 5-year reinvestigation timeframe.

The current design of the model takes advantage of the Air Force practice of coding each authorized billet listed in the unit manpower document (UMD) with the appropriate occupational specialty and security access requirement (SAR). However, the Navy, Army, Marine Corps, and defense agencies do not currently code billet positions with a SAR code. Moreover, funds have not been made available to undertake an effort to code billets with the correct SAR code for those organizations.

IDA explored an approach to work around those resource constraints that focused on generating the input requirements for the Air Force PSI model using data from the Joint Personnel Adjudication System (JPAS). We found the occupation field of the JPAS dataset is not well populated, especially for the defense agencies and the Army. A possible solution to address the missing JPAS data is to use the personnel databases maintained by the Defense Management Data Center (DMDC). The personnel data from a DMDC dataset can be linked to JPAS to produce a third dataset sufficient for building personnel inventories by occupational specialty and for binning those inventories in accordance to the Air Force model family structure. This can occur provided a relationship between the JPAS and DMDC datasets can be established through the introduction of an identical primary key to both datasets generated by scrambling an individual's social security number. The lack of a common key prevented IDA from fully exploring the viability of using JPAS data in conjunction with the Air Force model.

B. IDA ALTERNATIVE MODEL CONCEPT

The IDA proposed concept for projecting investigation requirements relies on JPAS data—the most comprehensive DoD information source on the topic of who holds a security clearance. We used a JPAS dataset that contains records for investigations opened between FY2003 and FY2007. To assess the accuracy and completeness of the JPAS dataset, we compared the JPAS data to the data presented in OMB summary reports showing the number of investigations requested by the Services and the defense agencies for FY2006 and FY2007. In addition, we compared the number of JPAS records for each Service and the defense agencies to authorized manpower levels for FY2006 and FY2007, keeping in mind the dataset we received does not include records for investigations opened prior to FY2003. We found the numbers of investigations opened in JPAS agree reasonably well with the submissions data reported by OMB. In addition, we concluded the JPAS coverage of DoD components is sufficient to divide the military and civilian populations of the Services and defense agencies into three groups: percent of the population with no or pending clearances, the percent with secret or confidential clearances, and the percent with top secret or sensitive compartmented information (SCI) clearances, as shown in Figure ES-1. This JPAS-based distribution of clearances held within and across the Services allows an assessment of how clearances are managed by the DoD components and establishes the baseline pool of cleared personnel needed to project reinvestigation requirements.

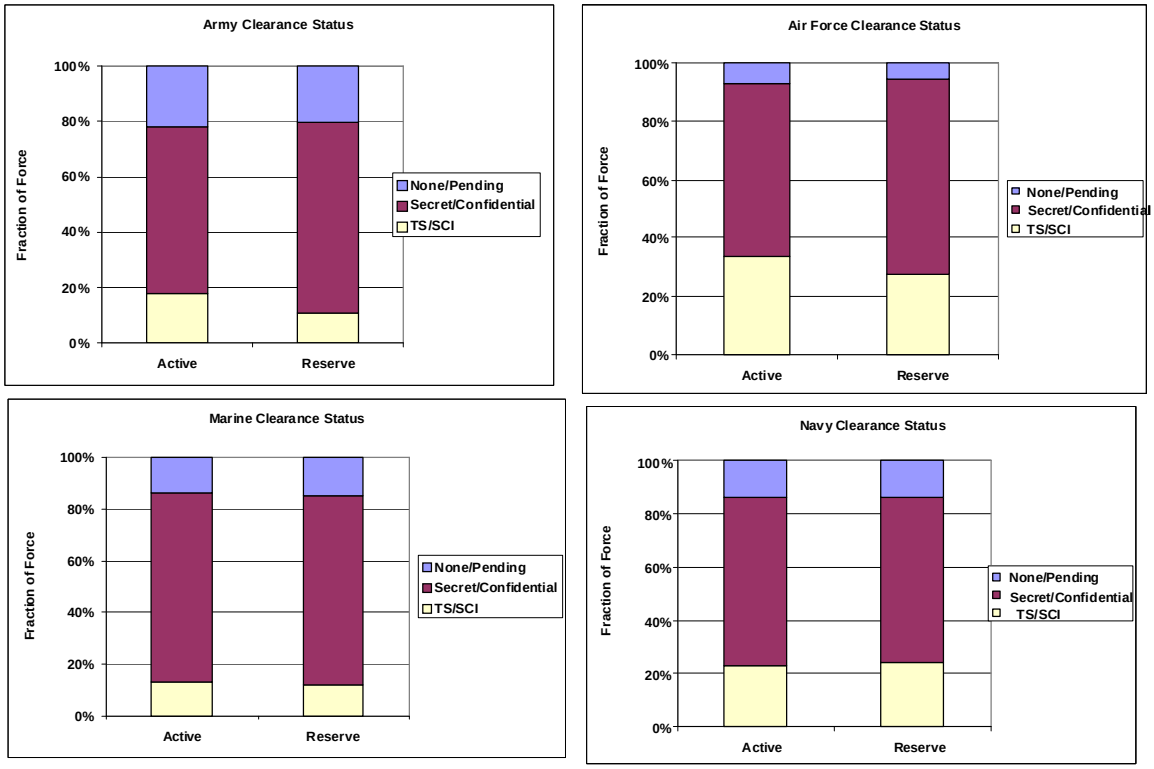

Figure ES-1. Distribution of Clearances Held by Military Service

The IDA approach also uses the information generated by the DoD components, as part of their annual budget submissions, reflecting force-level trends within DoD. Each 2-year budget shows the actual situation for the previous year, a projection for the current year, and a second-year projection for the following year. In those budget reports the Services make careful note for their personnel gains of who has prior service—those individuals may already be cleared—and who has no previous experience. A portion of the incoming non-prior service pool will require an initial security investigation. Those budget submissions also document personnel losses and track personnel flows between active duty and reserve forces. In addition, the total numbers of people entering or leaving the DoD civilian work force can be determined from DMDC personnel data compared across end-year snapshots.

We compared our estimates for National Agency Check with Local Agency and Credit Check (NACLC) initial investigations and reinvestigations (for a secret clearance) to the JPAS FY2007 data. NACLC investigations are also referred to as record-check investigations by the personnel security community. Table ES-1 shows that when considering the four Services and the defense agencies in aggregate, our estimates are 29

percent lower than the initial record-check investigations opened in JPAS for FY2007. However, our approach projects record-check reinvestigations at about 45,000 for FY2007, whereas JPAS showed that only about 1,400 record-check reinvestigations were opened in FY2007 (Table ES-2.) We later learned that security managers have stopped distinguishing between an initial NACLC and a NACLC reinvestigation when entering records into JPAS. The data field still exists in JPAS to reflect a NACLC reinvestigation, but it seems to have fallen into disuse. Additionally OPM appears not to make a distinction in its reporting. On this basis, one might suspect that 30,000 to 45,000 of the NACLC investigations opened in JPAS might have really been for reinvestigations. When the JPAS data in Table ES-1 are accordingly adjusted, our projection falls within 14 percent of the actual cases opened.

Table ES-1. IDA Initial NACLC Prediction vs. JPAS (FY2007)

Estimates

FY07 data	Record-Check Clearances/ Non Prior Svc (NPS) Entries			Total
Service	Active	Reserves	Civilian [a]	
Army	67,689	51,746	18,113	137,548
Navy/ MC Civ	38,678	4,871	12,299	55,848
Marines	36,751	6,098		42,849
Air Force	31,322	10,260	12,371	53,953
Agency			3,971	3,971
Total				294,169

[a] Actual Cviilian Requests in JPAS

Observation

FY07 data	Initial Record-Check Clearances in JPAS	Ratio to Turn-Over Case	Ratio to NPS case
Service			
Army	203,482	1.36	1.48
Navy/ MC Civ	68,656	0.93	1.23
Marines	32,074	0.77	0.75
Air Force	71,327	0.92	1.32
Agency	3,971	0.26	1.00
Total	379,510	1.06	1.29

With regard to SSBI investigations, Table ES-3 shows the IDA approach predicts initial SSBI investigations within eight percent of the JPAS cases for FY2007. For SSBI reinvestigations, Table ES-2 shows the number of records in JPAS is about 70 percent of the number estimated by the IDA approach. This is a promising result considering AFCAF SSBI-PR (periodic reinvestigation) projections with the Air Force model have a 20-percent margin, which the agency attributes to security managers being somewhat lax in submitting reinvestigation request within the 5-year window.

Table ES-2. IDA NACLC and SSBI Reinvestigations Prediction vs. JPAS (FY2007)

FY07 Data	Model Estimates SSBI Periodic Reinvestigation				SSBI Periodic Reinvestigation Requests in JPAS	
Service	Active	Reserves	Civilian	Total		Ratio
Army	11,124	6,453	3,018	20,595	10,900	0.53
Navy/MC Civ	9,115	1,535	3,286	13,936	10,226	0.73
Marines	2,569	231		2,800	1,669	0.80
Air Force	14,659	6,733	3,209	24,601	16,730	0.68
Agency			1,849	1,849	5,250	2.84
Total				63,781	44,775	0.70

FY07 Data	Model Estimates Record-Check Periodic Reinvestigation				Record-Check Periodic Reinvestigation Requests in JPAS	Max Annual Requests FY03-07
Service	Active	Reserves	Civilian	Total		
Army	6,376	6,082	6,433	18,890	102	837
Navy/MC Civ	4,573	353	5,179	10,196	19	4,317
Marines	1,900	196		2,097	6	1,063
Air Force	4,572	4,455	4,176	13,202	781	8,810
Agency			754	754	487	1,478
Total				45,049	1,395	

Table ES-3. IDA Initial SSBI Investigations Prediction vs. JPAS (FY2007)

Model Estimates					Observations		
FY07 Data	Initial SSBI Clearances/Turnover Replacement			Total	FY07 Data	Initial SSBI Investigation Requests in JPAS	Ratio to Turnover Case
Service	Active	Reserve: Civilian			Service		
Army	7,630	5,325	2,627	15,582	Army	17,192	1.10
Navy/MC Civ	8,512	2,772	2,090	13,375	Navy/MC Civ	12,216	0.91
Marines	2,925	1,306		4,231	Marines	4,025	0.95
Air Force	10,890	5,050	2,366	18,266	Air Force	14,490	0.79
Agency			2,436	2,436	Agency	1,594	0.67
Total				53,889	Total	49,517	0.92

C. FINDINGS

We found that reviewing annual trends for the numbers cleared using JPAS data can give important insights without other assumptions about changes in the DoD work force. Further, in a steady-state manpower situation, the size of the pools of cleared personnel can be projected for at least a year or two in the future using the IDA concept to predict investigation requirements. Data should be requested from DMDC and from the Services in their budget submissions to greatly improve the accuracy of those workforce and personnel flow projections relevant to the clearance-granting process. This can lead to more reliable calculations and offers the potential to provide 1 to 2 years warning of major shifts to the distributions of clearances held across the force.

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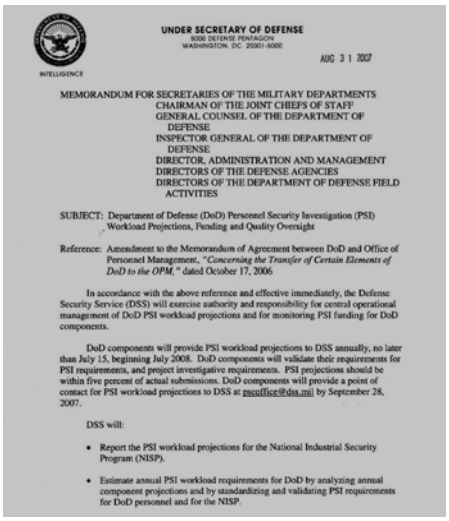
Current Situation

- **USD (I) issued a memo on 31 Aug 2007 requiring the DoD components to provide PSI projections to DSS annually beginning in July 2008**
  - **The USD(I) memo specifically directs the DoD components to: ". . . validate their requirements for PSI requirements, . . ."**
  - **The USD(I) memo states: "PSI projections should be within five percent of actual submissions."**
- **The Defense Personnel Security Research Center[1] (PERSEREC) identified the Air Force Service PSI Projection model as a means for providing accurate and validated PSI projections.**



UNDER SECRETARY OF DEFENSE
5000 DEFENSE PENTAGON
WASHINGTON, DC 20301-5000

INTELLIGENCE

AUG 31 2007

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DEPARTMENT OF DEFENSE FIELD ACTIVITIES

SUBJECT: Department of Defense (DoD) Personnel Security Investigation (PSI) Workload Projections, Funding and Quality Oversight

Reference: Amendment to the Memorandum of Agreement between DoD and Office of Personnel Management, *"Concerning the Transfer of Certain Elements of DoD to the OPM,"* dated October 17, 2006

In accordance with the above reference and effective immediately, the Defense Security Service (DSS) will exercise authority and responsibility for central operational management of DoD PSI workload projections and for monitoring PSI funding for DoD components.

DoD components will provide PSI workload projections to DSS annually, no later than July 15, beginning July 2008. DoD components will validate their requirements for PSI requirements, and project investigative requirements. PSI projections should be within five percent of actual submissions. DoD components will provide a point of contact for PSI workload projections to DSS at psoffice@dss.mil by September 28, 2007.

DSS will:

- Report the PSI workload projections for the National Industrial Security Program (NISP).
- Estimate annual PSI workload requirements for DoD by analyzing annual component projections and by standardizing and validating PSI requirements for DoD personnel and for the NISP.

1 A component of the Defense Human Resources Activity (DHRA) under the Office of the Under Secretary of Defense (Personnel and Readiness) charged to conduct long-term programmatic research for the security community and to develop innovative tools and job aids for security professionals.

I. INTRODUCTION

A. BACKGROUND

The Under Secretary of Defense for Intelligence (USD(I)), in his role as the principal staff assistant to the Secretary of Defense regarding intelligence, counterintelligence, and security matters, issued a memorandum in August 2007 directing the Department of Defense (DoD) components to provide annual projections for personnel security investigations (PSIs) to the Defense Security Service (DSS) beginning in July 2008. The USD(I) memo requires the defense components to validate their PSI projections and establishes a performance metric for the components to meet: "PSI projections should be within five percent of actual submissions."

The Department of the Army, the Department of the Navy, and the defense agencies reportedly project PSI requirements by calculating the average of prior annual submissions and adding a small percent delta. The mandate to project investigations within five percent of actual submissions, and validate those projections, suggests the need for a more rigorous approach. The Air Force developed a Service PSI

Requirements model to provide a capability to predict the number of security investigation requirements for the budget year plus two. The positive reports on the model's performance made by both the Air Force and DSS led the Defense Personnel Security Research Center (PERSEREC) to identify the model as a means for providing accurate and validated PSI projections.

What Prompted This Action?

- **Overall, the DoD has mixed record for projecting annual PSI requirements.**
  - **From FY01 through FY03, DoD incorrectly estimated the number of investigation requests by 90,000 to 150,000 cases per year (GAO-06-747T, 17 May 2006)**
  - **DoD actual PSI submissions exceeded annual projections by 59 percent during the first half of FY06[a]**
  - **1QFY08 Projections vice Submissions (OMB Clearance Granting Agency Report)**
    - **Within 3% for Initial SSBI investigations (Top Secret)**
    - **Within 13% for Secret/Confidential Investigations**
    - **Within 9% for SSBI-Periodic Reinvestigations**
- **The resulting investigative and adjudicative backlogs were viewed as posing a national security threat.**
- **Consequently, the Intelligence Reform and Terrorism Prevention Act of 2004 (IRTPA) specifies timeliness metrics for the investigative and adjudicative phases of the clearance eligibility granting process.**
- **Compliance to IRTPA mandates requires the DoD components to project annual investigations within 5% of annual submissions in order to properly staff the OPM investigations program[a]**
- **Improving PSI workload projections is one of four areas viewed as critical to effectively managing the security clearance process[b]**

[a] Testimony of Kathy Dillaman, Associate Director, Federal Investigative Services Division (U.S. Office of Personnel Management) before the Senate Oversight of Government Management, the Federal Workforce and District of Columbia Subcommittee (17 May 2006)

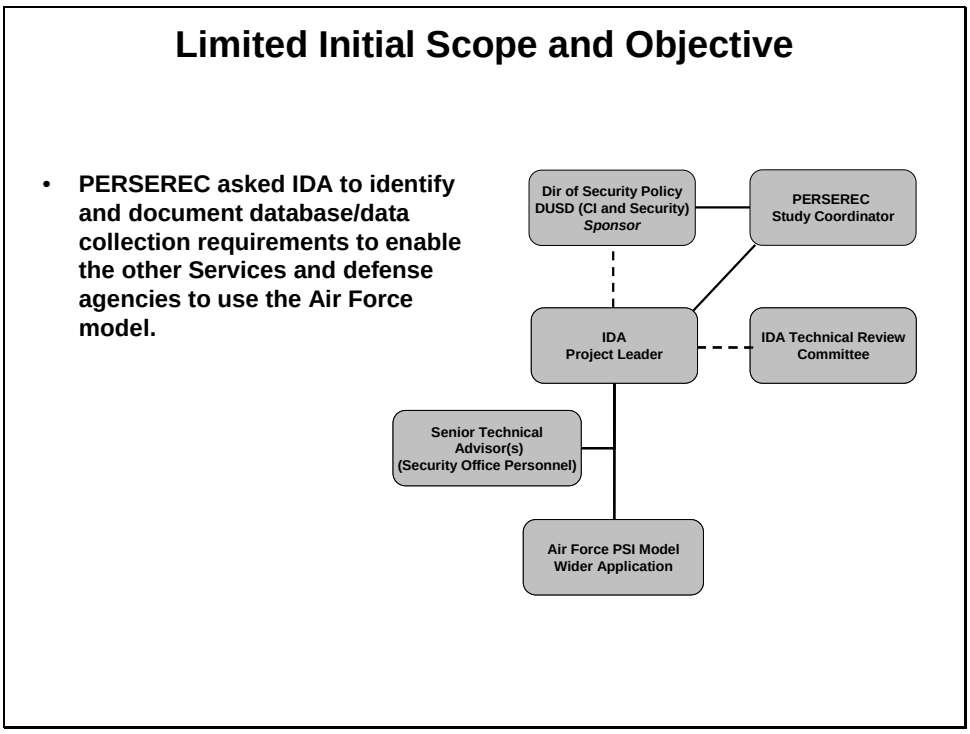
[b] Statement of Kathy L. Dillaman before the House subcommittee on Readiness (13 February 2008)

The DoD has exhibited a mixed record for projecting PSI requirements. The Government Accountability Office (GAO) reported that from fiscal year (FY) 2001 through FY2003 the DoD incorrectly projected the number of investigations by 90,000 to 150,000 cases per year. Further, the Office of Personnel Management (OPM), responsible for conducting the majority of security investigations for the DoD, reported that for the first half of FY2006, the actual PSI submissions for the DoD exceeded projections by about 60 percent. The PSI submissions for confidential and collateral secret clearance investigations were not within five percent of projections for the first quarter in FY2008. In addition, the DoD overall did not meet the five percent objective for single-scope background investigation (SSBI) reinvestigations, required to retain a top secret clearance, during the same time period.

Underestimating investigation requirements contributed, in part, to longstanding investigative and adjudicative backlogs, which were viewed as posing a national security risk. The Office of Management and Budget's Security Clearance Oversight Group reported that in the second quarter FY2006 OPM's investigative backlog included about 62,000 cases more than 1 year old. The backlog was reduced to 48,000 cases by the second quarter FY2007. The backlog of initial investigations was not eliminated until OPM increased its investigative staff by 1,600 people in January 2008.

As a consequence of those national security concerns, the Intelligence Reform and Terrorism Prevention Act (IRTPA) of 2004 included performance metrics for completing security clearance investigations and adjudications. The IRTPA mandates that investigations for initial clearances must be completed within 90 days, on average, for 80 percent of the requests; and the adjudication process must be completed in under 30 days, on average.

OPM testified before Congress that meeting those IRTPA performance metrics requires the DoD components to project investigations within five percent of actual submissions and that improving PSI workload projections is one of four critical areas for effectively managing the security clearance process.

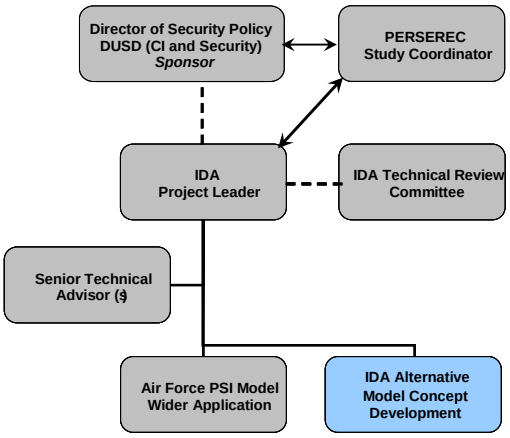


B. SCOPE AND OBJECTIVES

PERSEREC initially asked IDA to identify and document the data collection and database maintenance activities required by the remaining Services and the defense agencies to facilitate wider application of the Air Force model across the DoD.

IDA Proposed Broader Scope

- **Identify database/data collection requirements to enable other Services and defense agencies to use the Air Force Model.**
- **Survey available data to understand the current reality of clearance requirements across the DoD.**
- **Develop alternative approach to supplement the Air Force Model based on readily available data.**



IDA saw the opportunity to undertake a broader scope by focusing on readily obtainable, historical manpower and security clearance data for the DoD components. The objectives of the data review are two-fold. First, IDA was able to gain insight as to the current reality of clearance requirements and management across the DoD. Next, an alternative, supplemental approach to the Air Force model stemmed from this understanding of the DoD clearance requirements and management situation.

We confirm the viability of our proposed alternative approach and discuss conceptually how this approach may be implemented across the DoD. The scope of this study does not include the delivery of a fully coded model to the sponsor for immediate execution.

Organization of Paper

Executive Summary

I. Introduction

- **Current Situation**
- **Study Scope and Limitations**

II. Analyses

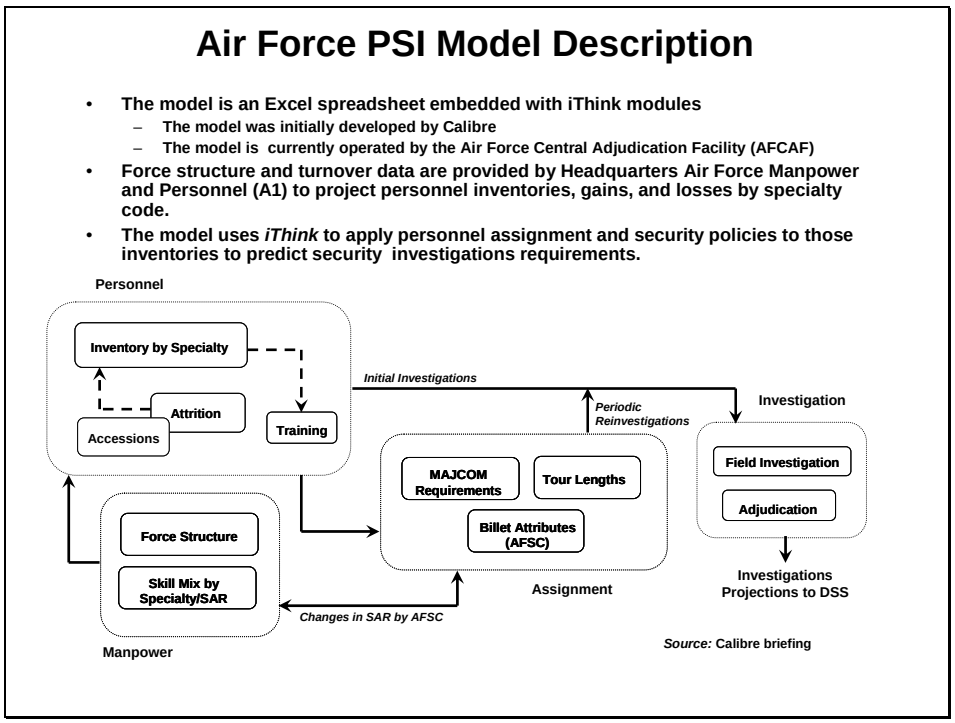
→

- **Overview of the Air Force Model**
- **Wider Application of Air Force Model**
- **Alternative Approach**
- **Way Forward**

Appendix A—Distribution of Clearances by Grade/Career Point

II. ANALYSES

This chapter presents, in some detail, the approach and findings of the study beginning with a description of the Air Force PSI Requirements Model.



A. DESCRIPTION OF THE AIR FORCE PSI REQUIREMENTS MODEL

IDA did not obtain an executable copy of the Air Force model for a hands-on assessment. Instead we reviewed the Model and Database Users Manual and received a demonstration of the model at the AFCAF. The manual and demonstration enabled the IDA team to learn enough about the model for the purposes of this study. The model is intended to be used as a security investigations budgeting tool. Therefore, the model separately projects investigation requirements for the nine major commands, two direct reporting units, three field operating agencies, Headquarters Air Force, the Air National Guard, and Air Force civilians. The model then applies the OPM rates for performing investigations—both initial and periodic reinvestigations—to set the annual security investigations budget for each of those Air Force organizations.

The model is an Excel spreadsheet with embedded iThink modules. An input tab for each of the above Air Force organizations lists the Air Force Specialty Codes (AFSC) for personnel assigned to those organizations, and the number of secret and top secret billets associated with each occupational specialty. AFCAF extracts the list of specialty codes and the numbers of secret and top secret billets directly from the Air Force Manpower Data System (MDS) data files provided by the Directorate of Manpower and Personnel (Headquarters U.S. Air Force). The MDS is the official source of manpower

authorization data for active Air Force, Air National Guard, Air Force Reserve, and civilian and contractor personnel. A component of the MDS is the unit manpower document (UMD), which identifies the current authorized positions and the future positions to be authorized or deleted over a period of 2 years for an Air Force unit. These data are used by the model to group the AFSC personnel inventories into two AFSC families based on the number of top secret billets.

The model applies attrition factors, also provided by the Manpower Directorate, and uses iThink modules to simulate personnel assignment policies and practices, and security policies for the AFSC families to project security investigations requirements.

The personnel assignment input parameters include:

- The length of a non-top secret assignment (default value of 3 years)
- The length of a top secret assignment (default value of 3 years)
- The percentage of Family 1 personnel reassigned to a top secret billet (default value of 10 percent)
- The percentage of Family 2 personnel reassigned to a top secret billet (default value of 60 percent).

The security policy input parameters are the reinvestigation periods for the secret and top secret clearances, 10 and 5 years respectively.

According to Air Force and DSS personnel, it took 1 year and about $1 million to develop the Air Force model.

Air Force Model AFSC Families

- The Air Force codes each authorized billet position on the UMD with the appropriate Air Force specialty code (AFSC) and security access requirement
- Any changes in AFSC manning are captured across the FYDP.
- These data establish the demand for the number of clearances by type across the Air Force—initially treated by the model as follows:

Group	TS Billets (%)	Model Treatment
AFSC Family 1	80 – 100%	All Billets Treated as TS
AFSC Family 2	<80%	Billets Treated as TS: Actual + 10%

- To facilitate use of the model the Air Force updated Instruction 31-501, Personnel Security Management Program, to direct units to accurately identify and update the security access requirement for each position in the unit manpower document (UMD).
- The instruction also lists the officer and enlisted AFSCs with a mandatory Single Scope Background Investigation (SSBI) requirement.
- A February 05 Headquarters Air Force memo updates the lists of officer and enlisted AFSCs requiring a mandatory SSBI.

The other 3 Services and the defense agencies do not code billet positions with a security access requirement.

The current design of the model takes advantage of the Air Force practice of coding each authorized billet listed in the UMD with the appropriate occupational specialty and security access requirement (SAR). Initially, AFSC Family 1 consisted of those AFSCs having a high percentage of top secret billets (80 percent or higher). The remaining AFSCs are binned into Family 2, the low-percentage, top secret billet family.

The utility of the model depends on the extent to which SAR codes are accurately reflected in the UMD. Consequently, the Air Force updated Instruction 31-501—The Personnel Security Management Program—to direct units to accurately identify and update the SAR code for each position in the UMD. The instruction also lists the officer and enlisted AFSCs with a mandatory SSBI requirement. In other words, personnel in those career fields require a top secret or sensitive compartmented information (SCI) security level. The SSBI-mandated AFSCs listed in the instruction, later updated in a 2005 memo, now compose the Air Force model AFSC Family 1.

However, the Navy, Army, Marine Corps, and the defense agencies do not currently code billet positions with a SAR code.

Air Force Model Performance Results

- **AFCAF reports the Air Force Model projects initial SSBI requirements within 1 percent of actual submissions[a]**
- **The Air Force model overestimates the SSBI-PR investigation requirement by about 20 percent.**
- **AFCAF attributed this overestimate of SSBI-PR investigations to the "human element."**
  - **Security managers are sometimes lax in submitting PR requests in a timely manner.**
  - **Assumes broader adoption of an USD(I) memo (July 2006) stating personnel security clearances for industry do not "expire" within the Services and defense agencies.**

[a] The IDA project team met with AFCAF personnel assigned to the Personnel Security Support Division on 1 February 2008.

AFCAF is generally satisfied with the performance of the Air Force PSI Requirements Model and reports that the model projects initial SSBI requirements within one percent of actual submissions. The Air Force model overestimates the number of SSBI Periodic Reinvestigations (SSBI-PR) by about 20 percent. The AFCAF attributes this margin to the "human element": the tendency for security managers to submit periodic reinvestigations requests outside the 5-year reinvestigation timeframe.

Because the model is intended primarily as a budgeting tool, AFCAF focuses on the model's performance relative to SSBI projections. The reason for this is the cost difference between investigations for a top secret clearance compared to a secret clearance. The FY2008 rate OPM charges for a SSBI is between $1,800 and $3,800 depending on whether it's an initial or periodic reinvestigation. In comparison, the rate for a National Agency Check with Local Agency and Credit Check (NACLC) investigation for a secret clearance is $210.

Calibre (the model's developer) reports that when considering both SSBI and NACLC investigations, the model projects requirements within three percent of actual submissions.

Manning Assumptions Effect on SSBI-PR Projection

- **Air Force PSI Projection Model assumes 100 percent manning to the unit level manning document.**
- **A number of military occupational specialties are understrength or overstrength, including those SSBI mandatory occupational specialties.**
- **There are 64 enlisted and officer occupational specialties designated as a SSBI-mandatory AFSC.**
- **Does manning strength have a negligible effect on predictions for SSBI?**

Stricter adherence to personnel security policies will address the human element contributing to overestimating SSBI-PR projections. However, in addition to the human element, a contributing factor leading to overestimating SSBI-PRs may be the underlying assumption of the model of 100-percent manning for each career field. IDA was able to obtain data to explore the potential effect of understrength or overstrength occupational specialties on projections.

As stated earlier, the Air Force mandates that certain AFSCs require a SSBI for enlisted personnel and commissioned officers. According to the Air Force, 27 AFSCs for enlisted personnel require a SSBI, and 37 AFSCs for officers require a SSBI. IDA explored the effects of manning strength for those 64 AFSCs on SSBI projections.

Air Force Manning Strength Data

- **"Stress levels" assigned to AFSCs are driven by manpower, manning, and deployments.**
- **An AFSC is "stressed" when there are not enough people in the occupational field to adequately carry out the assigned mission.**
  - **A stress level of 1.0 means that there is no manning shortfall.**
  - **A stress level greater than 1.0 means that there is a manning shortfall.**
  - **A stress level less than 1.0 means that there is a manning surplus.**
- **Stress rating serves as an indicator of a potential problem—especially when the occupational specialty has a very high operations demand.**
- **The Air Force has a goal of trying to achieve a stress level of 1.2 or less for each AFSC.**

Each year, the Air Force assigns a "stress level" to select AFSCs for enlisted and commissioned officers. Stress levels are driven by three primary fators: manpower, manning, and deployments. When an AFSC is "stressed," it means insufficient people are in the occupational field to adequately carry out the assigned mission. A stress level of 1.0 means there is no manpower shortfall. A stress level greater than 1.0 indicates a manpower shortfall, resulting in position authorizations going unfilled. The Air Force expresses the shortfall as a percentage of assigned personnel. For example, a stress-level rating of 1.2 means that each person at home station is doing the work of 1.2 people. Similarly, a stress level less than 1.0 signifies that there is a manpower surplus. The Air Force has a goal of trying to achieve a stress level of 1.2 or less for each AFSC. Those career fields that are most stressed are targeted for actions to correct understrength situations, including focused retention bonuses and recruitment.

Enlisted SSBI-Mandated AFSC Stress Levels

AFSC	Career Field	Stress
1A0	In-Flight Refueling	0.91
1A3	Airborne Communications and Electronics Systems	1.07
1A5	Airborne Missions Systems	1.1
1A6	Flight Attendant	1.06
1A8	Airborne Cryptologic Linguist	2.15
1C3	Command Post	0.91
1N0	Intelligence Applications	1.24
1N1	Imagery Analysis	1.34
1N2	Com Signals Intelligence Production	0.97
1N3	Cryptologic Linguist	0.87
1N4	Network Intelligence Analysis	1.18
1N5	Electronic Signals Intelligence Exploitation	1.19
1N6	Electronic System Security Assessment	0.74

AFSC	Career Field	Stress
2E2	Com, Network, Switching & Crypto Systems	1.21
2MO	Missile and Space Systems/Facilities	0.9
2W2	Nuclear Weapons	0.91
3C0	Communication-Computer Systems	0.94
3C2	Communication-Computer Systems Control	0.77
3E8	Explosive Ordnance Disposal	1.17
3H0	Historian	0.84
3N2	Premier Band	1.02
7S0	Special Investigations	1.37
8E0	Research and Development Technician	N/A
8P0	Courier	N/A
8P1	Defense Attaché	N/A
9C0	Chief Master Sergeant of the Air Force	N/A
9S1	Technical Applications Specialist	N/A

< 1.2 man power
> 1.2 man power

We examined the lists of enlisted and commissioned officer stressed fields reported by the Air Force for 2005 and found that 22 of the 27 SSBI-mandated AFSCs for enlisted personnel were assigned a stress rating.[1] The stress levels for the 27 AFSCs for enlisted personnel that require a SSBI are listed in the tables above along with the career field descriptions. AFSCs that had a stress level of 1.2 or less, thereby meeting the Air Force stress-level goal, are colored green. AFSCs that had a stress level greater than 1.2 are colored red. Specialty codes that did not have a stress level are not colored. The majority (63 percent) of the enlisted AFSCs had a stress level less than 1.2, while 18.5 percent of the SSBI-mandated AFSCs had a stress level greater than 1.2, and 18.5 percent were not assigned a stress level at that time.

[1] *Air Force Stressed Jobs Listing* (About.com, 11 March 2005).

Officer SSBI-Mandated AFSC Stress Levels

AFSC	Career Field	Stress
10C	Operations Commander	1.02
11B	Bomber Pilot	1.06
11F	Fighter Pilot	1.18
11G	Generalist Pilot	1.46
11R	Recce/Surv/Elect Warfare Pilot	0.95
11S	Special Operations Pilot	1.23
11T	Tanker Pilot	N/A
12B	Bomber Navigator	1.04
12F	Fighter Navigator	1.11
12G	Generalist Navigator	1.12
12R	Recce/Surv/Elect Warfare Navigator	1.03
12S	Special Operations Navigator	1.15
12T	Tanker Navigator	N/A
13B	Air Battle Manager	0.99
13D	Control and Recovery	1.23
13S	Space & Missile	0.96
14N	Intelligence	1
15W	Weather	1

AFSC	Career Field	Stress
16F	Foreign Area	1.06
16G	Air Force Operations Staff Officer	1.44
16R	Planning & Programming	1.25
20C	Logistics Commander	1.04
21B	Maintenance	1.22
21M	Munitions and Missile Maintenance	0.57
33C	Communications Commander	N/A
60C	Program Director	N/A
65A	Audit	N/A
71S	Special Investigator	0.94
84H	Historian	N/A
85G	United States Air Force Honor Guard	N/A
86P	Command and Control	N/A
88A	Aide-De-Camp	N/A
90G	General Officer	N/A
91W	Wing Commander	N/A
92T0	Pilot Trainee	N/A
92T1	Navigator Trainee	N/A
97E	Executive Officer Above Wing Level	N/A

< 1.2 man power

> 1.2 man power

The stress levels for the 37 AFSCs for commissioned officers that require a SSBI are listed in the tables above along with the AFSC descriptions. AFSCs that had a stress level of 1.2 or less, thereby meeting the Air Force stress level goal, are colored green. AFSCs that had a stress level greater than 1.2 are colored red. Specialty codes that did not have an assigned stress level are not colored. Of the 37 AFSCs for officers that require a SSBI, 46 percent of the AFSCs had a stress level less than 1.2, 16 percent had a stress level greater than 1.2, and 38 percent were not rated a stress level.

Overstaffed/Understaffed Enlisted SSBI-Mandated AFSCs

Enlisted AFSC	Stress Level	Total Billets	Overstaffed/ Understaffed
1A0	0.91	627	62.0
1A3	1.07	1031	-67.4
1A5	1.1		
1A6	1.06	197	-11.2
1A8	2.15	1112	-594.8
1C3	0.91	2003	198.1
1N0	1.24	2851	-551.8
1N1	1.34	1657	-420.4
1N2	0.97	1389	43.0
1N3	0.87	1881	281.1
1N4	1.18	1667	-254.3
1N5	1.19	740	-118.2
1N6	0.74	169	59.4
2E2	1.21	2296	-398.5
2MO	0.9	1432	159.1
2W2	0.91	596	58.9
3C0	0.94	7904	504.5
3C2	0.77	1904	568.7
3E8	1.17	952	-138.3
3H0	0.84	127	24.2
3N2	1.02	54	-1.1
7S0	1.37	979	-264.4
8E0	n/a	50	
8P0	n/a	93	
8P1	n/a	111	
9C0	n/a	1	
9S1	n/a	481	
Total:		***31,568***	***-861***

- **The total number of enlisted, SSBI-mandatory billets are understaffed by about 3%.**
- **Several enlisted career fields have a relatively larger number of authorized billets:**
  - **1C3–Command Post**
  - **1N0–Intelligence Applications**
  - **2E2–Computer, Network, Switching and Cryptographic Systems**
  - **3C0–Communications (Computer Systems Operations)**
  - **3C2–Communications (Computer Systems Control)**

The overstaffing/understaffing of SSBI-mandated AFSCs for enlisted personnel is shown in the table. The table shows the SSBI-mandated AFSCs, the stress level for each AFSC, and the total number of SSBI billets for each AFSC. The total number of billets shown in the table are extracted from data provided by the Manpower Directorate (Headquarters Air Force) to IDA. The data reflect the number of authorized billets for active duty military personnel for each AFSC. A positive number in column 4 indicates the career field is overstaffed and a negative number means the career field is understaffed. The chart shows that, in aggregate, the total number of enlisted AFSCs with mandatory SSBI are understaffed by 3 percent.

Several AFSCs require a large number of SSBI, for TS/SCI access including Command Post (1C3), Intelligence Applications (1N0), Computer, Network, Switching and Cryptographic Systems (2E2), communications related to Computer Systems Operations (3C0), and communications related to Computer Systems Control (3C2).

Overstaffed/Understaffed Officer SSBI-Mandated AFSCs

Officer AFSC	Stress Level	Total Billets	Overstaffed/ Understaffed
10C	1.02	259	-5.1
11B	1.06	687	-38.9
11F	1.18	3092	-471.7
11G	1.46	316	-99.6
11R	0.95	696	36.6
11S	1.23	956	-178.8
11T	n/a		
12B	1.04	800	-30.8
12F	1.11	582	-57.7
12G	1.12	167	-17.9
12R	1.03	785	-22.9
12S	1.15	539	-70.3
12T	n/a		
13B	0.99	1282	12.9
13D	1.23	170	-31.8
13S	0.96	2707	112.8
14N	1	3851	0.0
15W	1	608	0.0
16F	1.06	212	-12.0
16G	1.44	434	-132.6
16R	1.25	1177	-235.4
20C	1.04	155	-6.0
21M	0.57	289	218.0
21B	n/a		
33C	n/a		
60C	n/a		
65A	0.94	94	6.0
71S	n/a		
84H	n/a		
85G	n/a		
86P	n/a		
88A	n/a		
90G	n/a		
91W	n/a		
92T0	n/a		
92T1	n/a		
97E	n/a		
Total:	***19,858***		***-1025***

- **The total number of officer, SSBI-mandatory billets are understaffed by about 5%.**
- **Several officer career fields have a relatively larger number of authorized billets:**
  - **11F–Fighter Pilot**
  - **13B–Air Battle Manager**
  - **13S–Space and Missile Operations**
  - **14N–Intelligence**
  - **16R–Planning and Programming**

Likewise, by knowing the stress level for each AFSC and the number of authorized billets, it is possible to determine the overstaffing/understaffing of SSBI-mandated officer AFSCs, which is shown in the table. The total number of officer AFSCs with mandatory SSBI are understaffed by 5 percent.

Several AFSCs require a large number of SSBI clearances including Fighter Pilot (11F), Air Battle Manager (13B), Space and Missile Operations (13S), Intelligence (14N), and Planning and Programming (16R).

Manning Effect to SSBI-PR Projections

- **The Air Force PSI Projection Model assumes 100% manning for each career field – does not take into account undermanned or overmanned fields.**
- **Review of officer and enlisted mandatory SSBI career fields shows active duty and civilian billets are understaffed by 5% or less of authorized billets.**
- **While the number of people affected seems small (1,886 assigned personnel), the effect on investigations predictions could be relevant.**
  - **SSBI projections could be overestimated by between 1 and 1.5 percent.[a]**
  - **USD(I) mandate is to project requirements within 5% of submissions.**

[a] (manning difference) x (% due for reinvestigation) x (1-attrition factor)^5 → 1,886 x 20% x (1-.11)^5
Assumes percentage of population due for reinvestigation each year is evenly distributed over 5 year-reinvestigation period or 20% per year

The Air Force PSI Projection Model assumes 100-percent manning for each career field. However, we found that SSBI mandatory career fields for enlisted personnel and officers are understaffed by 5 percent or less of authorized billets for a total of 1,886 assigned people. IDA received an Excel snapshot of the Air Model showing the input and output tabs. The data contained in the workbook indicated that the average annual attrition rate for Family 1 is 11 percent.

So a difference of 1,886 assigned people represents a difference of about 210 initial SSBIs, based on attrition. OPM reports that the agency conducted about 14,700 initial SSBIs for the Air Force in FY2006. Thus, the potential effect of undermanning/overmanning of career fields on investigation projections could translate into an initial SSBI overestimate of between 1 to 1.5 percent. For SSBI-PRs, a rough estimate of the effect of the undermanning/overmanning of career fields can be found as follows:

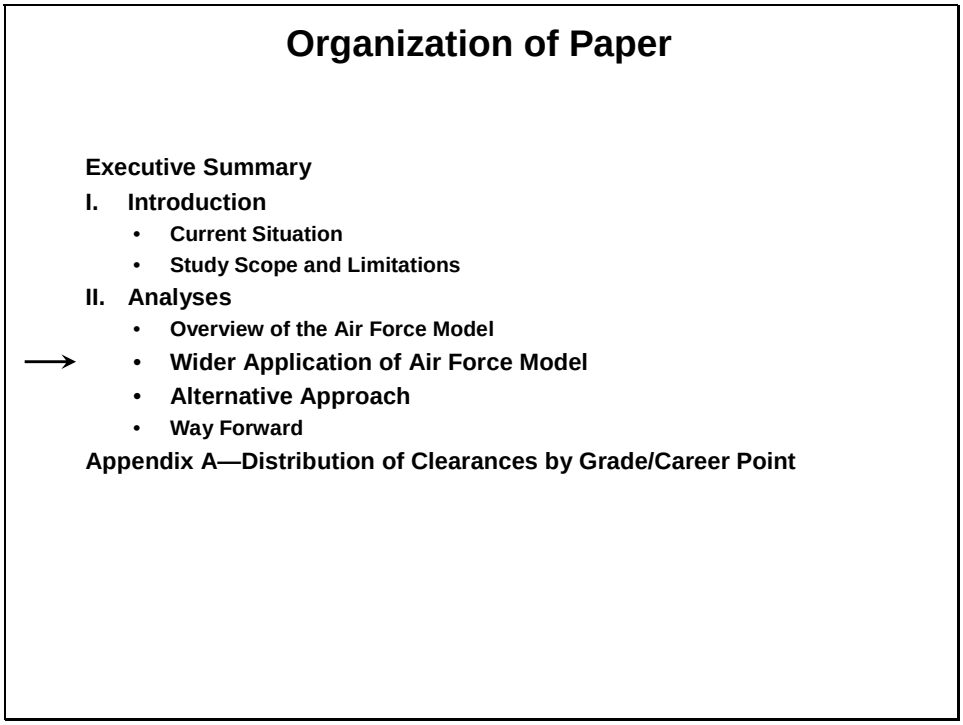
$$\text{(manning difference)} \times (20\%) \times (1\text{-attrition factor})^5$$

The result is an overestimate of about 210 SSIB-PRs. In FY2006 the Air Force submitted requests for 13,848 SSBI periodic reinvestigations to OPM. Similar to the initial SSBI case, the potential effect of undermanning/overmanning of career fields on

investigation projections could translate into an SSBI-PR overestimate of between 1 to 1.5 percent.

Because the Air Force must now meet a 5 percent projection margin, this apparently small effect on the number of investigations now becomes relevant, particularly if the Air Force is able to effectively address the issue of submitting requests for SSBI-PRs in a timely manner to overcome the "human element" postulated by the AFCAF.

If the Air Force model is widely adopted across DoD, the Services and the defense agencies should consider incorporating manning strength effects to establish clearance requirements to improve the model's investigations predictive accuracy.



B. WIDER DOD APPLICATION OF THE AIR FORCE MODEL

This section discusses a potential path for generating the data input necessary to enable the three remaining Services and defense agencies to use the Air Force model.

JPAS Feasibility to Generate Model Input

- **Key to the Air Force model is the accurate reflection of security access requirement codes for each authorized UMD billet position to establish the demand for the number of investigations by type.**
- **The Army, Navy, Marine Corps, and defense agencies currently do not code billets with security access requirements information.**
- **Resource constraints have, thus far, prohibited the Army, Navy, and Marine Corps from undertaking an effort to code billets with a security access requirement.**
- **Generating input requirements for the PSI model using JPAS data may provide a path for wider application of the model across the DoD.**

As stated earlier, the key to the Air Force model is accurate identification of SAR codes on Air Force unit manpower documents. However, the Navy, Marine Corps, Army, and defense agencies do not code UMD billets with SAR codes. Moreover, resource constraints have prohibited those organizations from initiating an effort to code positions with the appropriate SAR. So it makes sense to explore other options for generating input data in a format compatible with the Air Force model. Toward this end, the study team investigated the feasibility of using data from the Joint Personnel Adjudication System (JPAS) to build the required AFSC families data structure for the Air Force model.

Percentage of Inconsistent JPAS Records

DoD Component	Occupation Data Field Blank	Clearance Type Data Field Blank	Dual Active/ Reserve Personnel Group (PGroup) Status	Duplicate Records
Air Force	5	5	9	18
Army	73	15	11	18
Navy	7	7	13	18
Marine Corps	3	8	23	13
Defense Agencies	44	9	0	12

We received a JPAS dataset from PERSEREC for investigations opened FY2003 or later. In February 2003 JPAS became the system of record for personnel security investigation, adjudication, and eligibility verification and history. Prior to JPAS fielding, the DSS used the Case Control Management System (CCMS) to manage security actions and to store and disseminate investigation and adjudication data. DSS experienced problems exporting clearance records from CCMS to JPAS due to system configuration challenges. Consequently, PERSEREC opted not to provide IDA with JPAS records having an investigation open prior to FY2003 because of potential data integrity issues.

The current JPAS dataset shows a few data consistency problems:

- The occupation field is not well populated, especially for the defense agencies and the Army (44 percent and 73 percent blank, respectively).
- Some records have no data entered in the clearance/eligibility level field.
- Many of the individuals represented in JPAS have duplicate records.
- Some individuals are shown as being on both active duty and reserve status at the same time.

Possible Solution

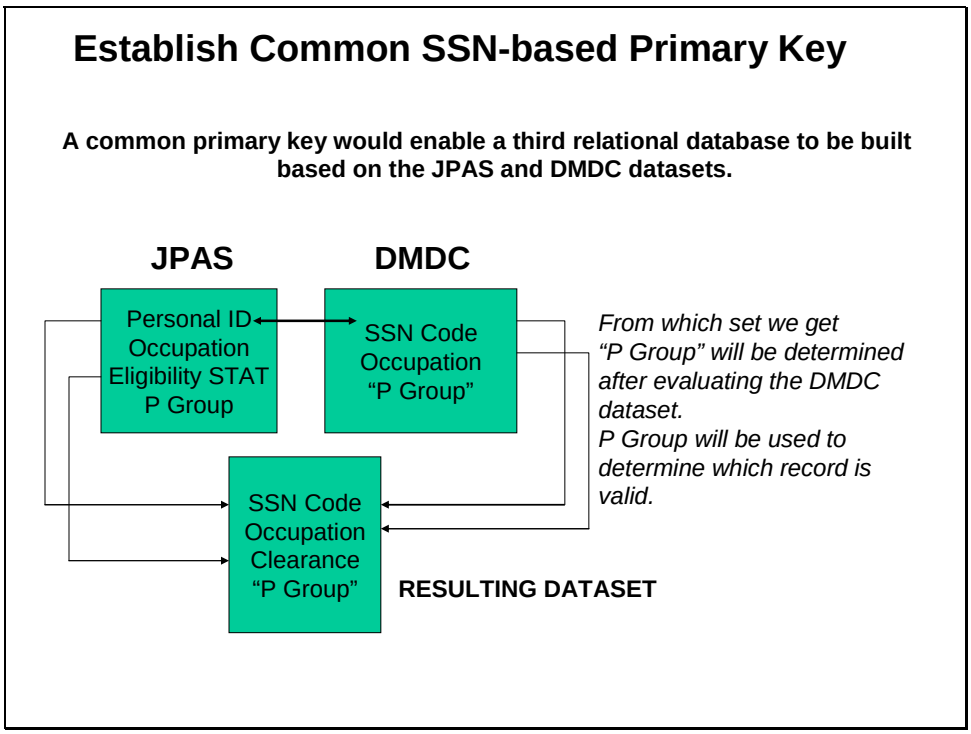
- **Crosswalk the JPAS dataset with personnel databases maintained by the Defense Manpower Data Center (DMDC)**
  - **DMDC provides Occupational data (100% populated) and Personnel Group Status (Reserve or Active).**
  - **This will help clean up JPAS data and fill in the blanks.**
  - **The DMDC doesn't have Clearance Status data to apply to small number of records in JPAS missing clearance data.**
- **Lack of a common primary key field between the two sets of data prevented IDA from conducting the cross reference.**
- **Due to timing constraint, IDA was not able to get the full set of DMDC data for testing out the crosswalk.**

A possible solution to address the missing JPAS data is to use the personnel databases maintained by the Defense Management Data Center (DMDC). For past personnel resources-related studies, IDA has requested and received personnel records datasets from DMDC. A review of those datasets shows that the primary and duty occupational specialty data fields are 100 percent populated. In addition, the DMDC data reliably indicate to which personnel group an individual belongs (active duty, reserve, or civilian). We believe personnel data from the DMDC dataset can be linked to JPAS to produce a third dataset for generating personnel inventories by occupational specialty and to enable the Services to bin those inventories in accordance to the Air Force model family structure. In addition, the relevant personnel group data field in the DMDC dataset would help to determine which records in JPAS are problematic and can be repaired programmatically. It should be noted that DMDC does not have clearance status data to address the small number of records in JPAS missing clearance data.

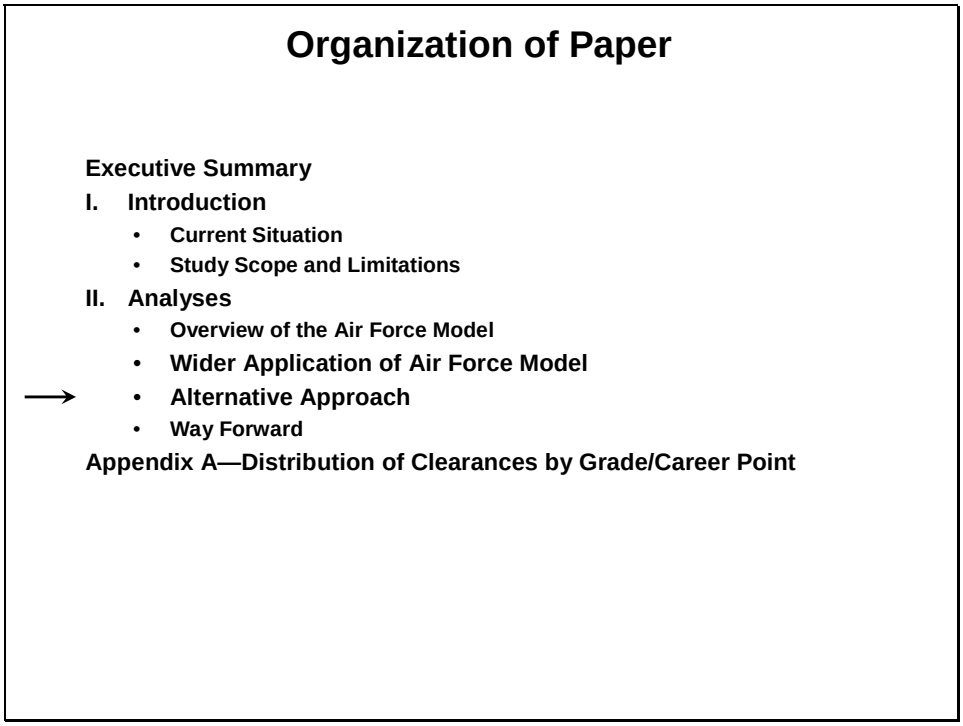
However, the cross reference between JPAS and DMDC could not be performed for this study because of the lack of a common unique primary key field between the two sets of data. The JPAS system generates a <Personid> field intended to be a unique identifier for each individual included in the JPAS database. The DMDC datasets IDA receives have a scrambled SSN-based primary key. Appending a SSN-based primary key

field that follows the DMDC scrambling algorithm to JPAS in order to conduct the crosswalk between the two datasets should be pursued.

Due to timing constraints, IDA was not able to obtain a set of DMDC data for testing the validity of the crosswalk approach should a primary key relationship between the DMDC and JPAS datasets be established. Although we know the DMDC occupational code and personnel group fields are fully populated, the approach should also examine the consistency of command name and unit identification data fields. This would enable the other Services and agencies to project PSI requirements across the major commands like the Air Force. Our review of the DMDC data dictionary indicates the existence of data fields for those information elements.



Assuming a relationship is established between the JPAS and DMDC datasets through a primary key, the above diagram demonstrates how to build a third dataset. The resulting dataset can be used to subdivide the force structure for the Army, Navy, Marine Corps, and defense agencies into occupational specialty inventories. Those inventories can be binned in accordance with the Air Force model AFSC family structure after examination of the clearance types within each occupational inventory.



C. ALTERNATIVE APPROACH

This section describes the methodology, output, and utility of an alternative PSI prediction concept developed by the study team.

IDA-Proposed Alternative Approach

- **Intended to supplement the Air Force PSI model**
- **Relies on readily available data already captured or reported by the Services and agencies.**
- **Consider the role JPAS could play in projecting PSI requirements.**
  - **JPAS is the system of record for maintaining collateral and SCI personnel security adjudication and clearance history for DoD employees and contractors.**
  - **JPAS is the official DoD record of security access level eligibility.**
- **As such, JPAS data can aid in understanding the current reality of clearance requirements across the DoD.**
- **This understanding forms the basis for estimating investigation requirements.**

The alternative model concept developed by IDA relies on data readily available to the Services and agencies; namely, this model concept considers the role JPAS could play in projecting PSI requirements.

This model concept is intended to supplement, not replace, the Air Force model.

JPAS Data Summary

- **JPAS- DoD system to consolidate Service and Agency Central Adjudication Facilities (CAFs) data lists and distributes security clearance information among DoD organizations**
  - **Primary focus on non-SCI (i.e., collateral level) clearances**
  - **TS and SCI clearances are listed for many individuals**
- **Data set provided to IDA by PERSEREC contains those records for which an investigation was opened during the indicated year for DoD personnel**
  - **Years FY03 through FY07 were provided**
  - **New records are generated when a person in a DoD organization initiates a request for a clearance investigation**
- **Data elements provided to IDA on JPAS records**
  - **Personal ID**
  - **Dates when clearance investigations opened and closed**
  - **Types of investigations requested**
  - **Clearance levels approved**
  - **Whether person is active, reserve, civilian, or industry**
  - **Service, organization and, in some cases, UIC**
  - **Pay grade, at the time an investigation was opened**
  - **Military operational specialty (MOS) for at least some individuals**

The most comprehensive DoD information source on the topic of who holds what security clearance is the JPAS. This is a DoD program of record for consolidating security clearance data from the Service and agency central adjudication facilities (CAFs) and distributing this security clearance information among DoD organizations. The primary purpose of JPAS is to control "collateral" information, as this information is the responsibility of DoD, but JPAS information shows SCI clearances for many individuals. SCI information is the primary responsibility of the Intelligence Community, under the Director for National Intelligence. People in intelligence agencies not associated with DoD may choose to have their clearances posted in JPAS to facilitate attending DoD meetings, but they are not required to do so.

IDA requested that our sponsors send a snapshot of the JPAS database, current as of the end of FY2007 on September 30, 2007. The dataset provided contains records of actions where security clearance investigations were opened for DoD personnel. JPAS began operational use in FY2003, and thus the dataset shows data for investigations opened between FY2003 and FY2007. Each of these records contain a number of IDA-requested data elements, including:

- Personal ID
- Dates when clearance investigations are opened and closed

- Types of investigations requested
- Clearance levels approved
- Whether person is active, reserve, civilian, or industry
- Service, organization and, in some cases, unit identification
- Pay grade at the time an investigation was opened
- Operational specialty for at least some individuals.

JPAS Datasets FY03 Through FY07

Counts of records within IDA JPAS Data Set

Organization	Active	Civilian	Reserve Component	Industry	Blank	Grand Total
Army	489,706	167,257	478,465	636		1,136,064
Navy	420,763	100,234	94,955	526		616,478
Marines	204,184	3,338	57,338	58	4,707[a]	269,625
Air Force	411,183	103,465	200,372	2,042		717,062
Agency	216	61,750	3	2,762	27	64,758
Industry		5,847		281,210		287,057
Non-DoD	873	1,988	572	32		3,465
Blank[b]	59	14		6		79
Grand Total	1,526,984	443,893	831,705	287,272	4,734	3,094,588

[a] Can't tell whether active or reserve—leave as is.

[b] Originally several thousand elements with Service left blank; assigned to Service or agency by CAF association.

One quick way to summarize the contents of a database is to create a "pivot table," where entries are counted (summarized) on the basis of their association within the database. The above table summarizes the elements of the database in terms of the Service organization to which an individual belongs (i.e., Army, Navy, Marine Corps, Air Force, defense agency, industry, or non-DoD) and the personnel group of the individual (i.e., active duty, civilian, reserve component, or industry). In each case some records are blank, primarily because of omissions on the part of those entering the data. The table indicates that our snapshot of JPAS contained over 3 million records.

Because our intent was to assess the current state of DoD clearance holders, some attempt was made to "clean-up" the data by minimizing the number of blank associations in our tallies. In the original data, there were 4,000 to 5,000 records with no Service association, but in many cases we could tell by examining the records which Service CAF adjudicated the clearances. In those cases we inferred the Service of the individual from the Service of the CAF that did the adjudication. Although personnel mobility across DoD is such that many have clearances adjudicated by a different Service, the overwhelming majority of those in the Army are adjudicated by the Army CAF. With that adjustment, fewer than 100 records remained unassociated. A similar problem arose within the Marine Corps. For nearly 5,000 records it was clear that the people were Marines, but it was not clear whether they were in active-duty or reserve status.

While the table serves to characterize the entire JPAS database, it does not directly characterize the DoD population well because many people have multiple records within the database, thus leading to multiple counts within the totals reflected. The study had to address the issue of duplicate records in the JPAS dataset.

Duplicate JPAS Personnel Entries

Limit to One per Person per Personnel Component

Organization	Active	Reserve Component	Civilian	Industry	Blank	Total
Army	407,769	390,837	128,148	562		927,316
Navy	330,782	84,425	90,130	496		505,833
Marines	178,799	51,009	2,946	51	1,3181	234,123
Air Force	331,912	158,651	93,894	1,826		586,283
DoD-Wide	206	3	54,367	2,592	3	57,171
Total	1,249,468	684,925	369,485	5,527	1,321	2,310,726

Several kinds of reasons exist for duplicate records. First, a component may request multiple clearance investigations for a single individual. An individual may first receive a collateral secret-level clearance. If the component later assigns the individual to a position requiring a higher security access, a request for a SSBI for a top secret or SCI clearance is submitted. Additionally, multiple records may reflect the multiple stages in the adjudication of a single investigation. For example, a single request for a SSBI investigation may result in a record for an interim secret clearance. From the same SSBI request, a JPAS record may also be entered indicating approval of a final secret clearance. Another record may be entered when the top secret clearance is finalized. A third reason for having multiple records is that most people in the reserve components treat reserve duty as a second job, and they may have full-time work as either DoD civilians or in the defense industry. Other combinations, such as active-reserve or active-civilian, are difficult to understand as valid data, but they can reflect transition of a person from one status to another without careful data management to keep the JPAS database up to date.

Like the previous table, the one above was a pivot table, but the counting rules were such that a record for one person could count at most once per personnel group within a Service component. Thus a person could count as both civilian and reserve. It would have been preferable to associate those with both civilian and active records with

the current personnel group, but it was not readily possible within the database to determine which of the two groups was current. The record selection was made by determining which records to "keep," and care was taken to ensure that the "keeper" record had the highest security clearance authorization for each person to facilitate further analysis.

After accounting for duplicate records, the table shows that the JPAS dataset used by IDA covers about 2.3 million individuals across the DoD holding clearances. Individuals shown in the table as being DoD-wide are associated with defense agencies, with the Office of the Secretary of Defense, or with joint commands, such as the Joint Staff. It is generally reported by the DoD, that of the 3.2 million individuals assigned to the DoD, about 2.5 million hold clearances. Therefore, the size of the IDA JPAS dataset appears to be sufficient for follow-on assessments and analyses.

Issues With the JPAS Data

- **Multiple entries per person in the database**
  - **Individuals may have multiple clearance investigations or adjudication actions**
  - **Some dual associations are expected (e.g., civilian-reserve; industry-reserve)**
  - **Some dual associations may reflect ambiguity of current status (e.g., active-reserve)**
  - **Numbers of entries in some cases (e.g., up to 33 per person) may reflect ineffective data management**
- **Population of some secondary fields is inconsistent**
  - **In some cases, uncertainty whether person is active, reserve, or civilian**
  - **Inconsistent use of MOS and UIC fields**
  - **Entries time-stamped only through the year investigation opened**
  - **Non-standard entries for grade level (nearly 600 different civilian pay grades)**
- **Coverage for Joint (DoD-wide/non-Service) agencies partly unknown**
  - **Both DoD-wide agencies and intelligence agencies have cleared personnel**
  - **DMDC personnel data do not include intelligence agencies**

In the course of preliminary examination of the JPAS data, three primary issues with the JPAS data became evident:

- The database contains multiple entries per person, some clearly outdated or unnecessary.
- The population of some secondary fields is inconsistent.
- The coverage DoD-wide (joint/non-Service agencies) is at least partly unknown.

Multiple records per person arise for several reasons, some reasonable and others not so reasonable. Individuals may have multiple clearance investigations when they receive a full secret or confidential clearance, and later have a request submitted for a SSBI with the goal of getting a top secret or SCI clearance. Multiple records may also reflect the documentation of multiple stages in the adjudication of a single SSBI request. Also, some dual associations are expected (e.g., civilian-reserve; industry-reserve) and indeed common. However, other dual associations appear to reflect ambiguity of current status (e.g., active-reserve or active-civilian), and there are thousands of such dual associations in the database. The numbers of entries in some cases (e.g., up to 33 per person) may indicate ineffective data management.

The population of secondary fields is also inconsistent. By secondary fields, we mean fields that are not essential for the basic purpose of JPAS, which is to maintain

clearance status of persons associated with DoD. In some cases, the presence of blank fields or fields with ambiguous entries leads to uncertainty about whether a person is active, reserve, or civilian. Some 4,000 records with blank Service association were resolved by looking at the organization that performed the adjudication for the clearance request—in the majority of cases this is the same Service to which the people are assigned. The occupational specialty field and the unit identification code fields are useful to consider because they often correlate with the operational need for the person to get the clearances.

The Air Force included these codes for most people, but the other Services and agencies were far less consistent in filling the fields. Having a time stamp would have made addressing multiple overlapping entries per person easier, but these were not available within the data provided to IDA. Entries were time-stamped only by the year an investigation was opened, although, in this case, time stamps could have been available but simply not requested by IDA. Non-standard entries for grade level also complicated analysis. Nearly 600 different civilian pay grades exist, and conventions such as E1 or E01 are used interchangeably throughout.

A final issue that will limit insights into a portion of the data is that we do not have a consistent set of personnel data for the defense agency JPAS data. For the Services we have JPAS data for year-end of FY2007 and full personnel data for at least active and civilian personnel for year-end FY2007. Both DoD-wide agencies and intelligence agencies have cleared personnel listed in JPAS, but the DMDC personnel data for defense-wide agencies do not include personnel from intelligence agencies, and these data may not be available in an equivalent form.

Final Aggregate JPAS Dataset

Active Component

Service	In JPAS	Authorized Endstrength	Fraction Included
Army	407,769	482,400	0.85
Navy	330,782	340,700	0.97
Marines	178,799	180,000	0.99
Air Force	331,912	334,200	0.99

Reserve Components

Service	In JPAS	Authorized Endstrength	Fraction Included
Army	390,837	550,000	0.71
Navy	84,425	73,100	1.15
Marines	51,009	39,600	1.29
Air Force	158,651	181,900	0.87

DoD Civilians

Service	In JPAS	DMDC Data	Fraction Included
Army	128,148	248,437	0.52
Navy/ MC Civ	93,076	175,730	0.53
Air Force	93,894	158,540	0.59
Agency	54,367	92,241	0.59

The series of tables above shows how the numbers of personnel in JPAS compare to the expected numbers of personnel authorized in the active, reserve, and civilian components of DoD, respectively.

For the active components, the authorized endstrength for the Army increased from the actual FY2006 value (shown in the table) to somewhat over 500,000 for FY2007. However, even from the FY09 budgetary submissions, it was difficult to tell whether the Army actually expanded to meet its increased authorized endstrength during FY2007—and thus, the FY2006 value is used for this calculation. If the larger number had been used, it would accentuate the trend shown in the table that the number of people reflected for the active-duty Army component in the JPAS falls significantly short (by 15 percent) of the authorized endstrength. For each of the three other Services, the authorized endstrength in the table is the FY2007 actual endstrength. The numbers of people in JPAS corresponds to the authorized endstrength.

A similar comparison for the Reserve components (the Selected Reserves for each Service, including the Army National Guard and the Air National Guard) shows a similar trend. The authorized endstrength figures for each Service reflects the Selected Reserves in each case. The fact that the numbers of Reserves in JPAS exceed the authorized endstrength for the Navy and Marine Corps can simply reflect inclusion of clearances from individuals who have transitioned from the Selected Reserves to the Individual

Ready Reserve (IRR) or other mostly inactive component. The Army and Air Force also probably contain inactive reserves within their total (the specific reserve component is difficult to determine), but like the active-duty Army, it appears that the full population is entirely represented in JPAS.

For the civilian components, the populations reflected in JPAS appear to be around 50 to 60 percent of the authorized endstrength. This suggests two factors. First, all civilians may not be applying for security clearances. Certainly in the past, many DoD civilians have not had immediate need to access classified information. However, increasingly, it is preferred that all persons near the handling of classified information be cleared, and vetting to improve the physical security of personnel may be a factor increasing the need for civilians to have at least some level of collateral security clearance. Another factor may be that persons who have clearances but handle classified information only as support staff at their home location have not felt a need to be entered into JPAS. The main advantage of listing in JPAS would be to facilitate verification of clearance away from their home base, and that may have limited utility for some workers.

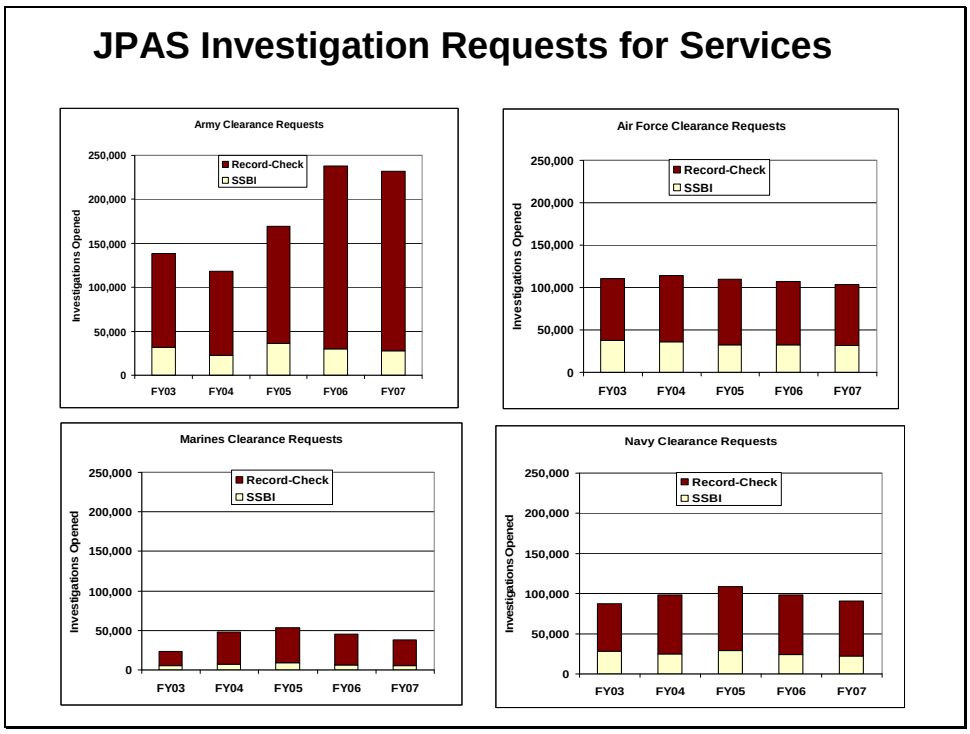
JPAS Coverage of DoD Components

- JPAS population is smaller than several key components
  - Active Army
  - All Civilian components
  - Army and Air Force Guard and Reserves
- Some JPAS records appear to remain active after they cease to be valid
  - DSS describes distributed data management across DoD components
  - Multiple inconsistent associations for some persons (e.g., Active-Reserve or Active-Civilian)
- Sponsors indicate IDA has most of the relevant JPAS data, current as of end-year FY07
  - Records in JPAS are entered as personnel request investigations
  - IDA JPAS data do not include investigations started prior to FY03, the JPAS IOC
  - Operational JPAS data from prior to FY03 were imported from the previous system and may not be consistent with current JPAS data
  - Based on examination of the IDA JPAS, the data fill appears incomplete for some groups

One of the key issues in understanding JPAS data is to determine whether the set reflects all DoD personnel with clearances, or only a portion of them. Given the system's purpose, one would think the goal is to cover all, but because the system has been in operation for only a bit more than 5 years, the coverage may remain in a starting transition. We assume here that virtually all active and reserve military personnel (aside from foreign nationals) at least apply for some kind of record-check clearance investigation and that most civilians do also. If that is even approximately true, several things indicate that coverage remains incomplete. First, the JPAS population is significantly smaller than the authorized force for the active Army, all civilian components, and the Army and Air Force National Guard and Reserves. Also, even where the numbers are close to the same between JPAS and the authorized force, the numbers of multiple inconsistent associations within the database (e.g., the active-reserve or active-civilian associations) would reduce the valid coverage to below the authorized levels.

In exploring this issue with our partners at PERSEREC, we determined that IDA has the most relevant of existing JPAS data, current as of the end-year FY 2007. The records in the IDA JPAS data were entered when personnel from the DoD components requested clearance investigations. IDA JPAS data do not include any records of investigations started prior to FY03, the JPAS initial operational capability (IOC) date.

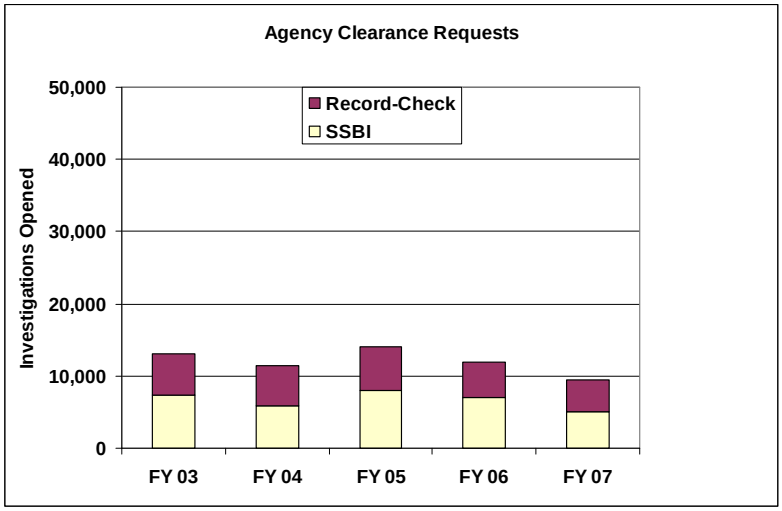
As stated earlier, PERSEREC indicated that the full JPAS does have some operational data from prior to FY2003 that were imported from the previous system and may not be fully consistent with current JPAS data. Overall, based on examination of the IDA JPAS, the data fill appears incomplete, at least for some groups of personnel.



The figures above summarize the records for each of the Services requesting clearance investigations over the past 5 years. Two types of clearance requests are shown for each Service, NACLC (often referred to as record-check investigations) and SSBI. The record-check investigations cover national-level law enforcement databases, local law enforcement records from the locations where each applicant has resided in the recent past, and credit agency checks. The SSBI investigations are far more thorough, requiring agents to go to the key locations reported on the clearance applications and interview neighbors and other references for each individual. The data shown in each case include both requests for initial clearances of each of the two types and reinvestigations, and they include all of the component populations relevant for each Service (e.g., active, civilian, National Guard and reserve).

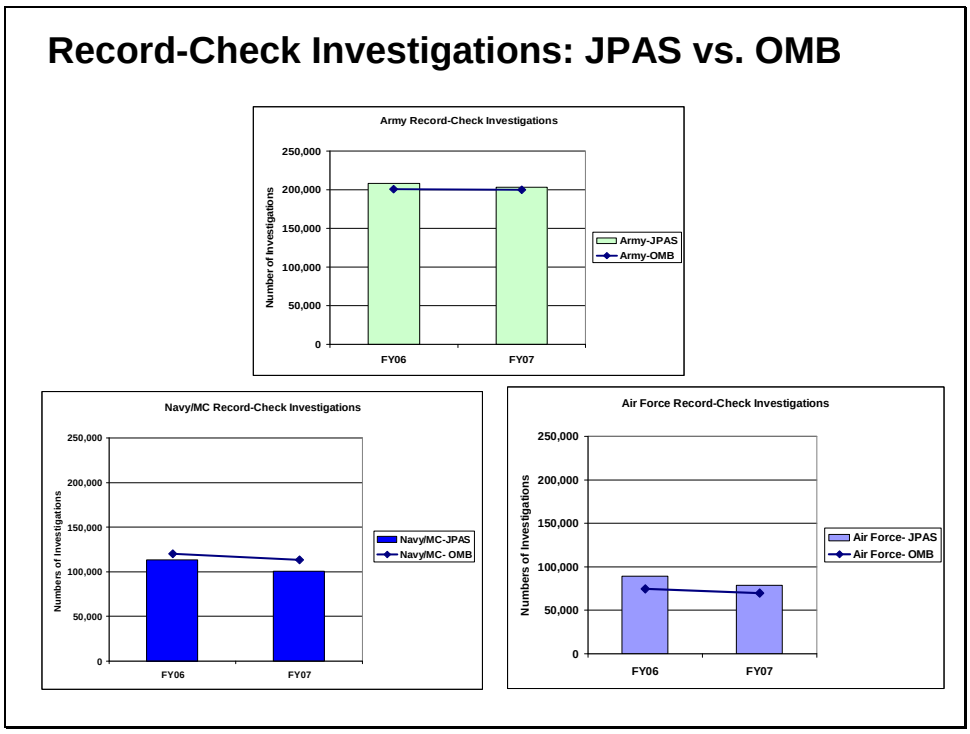
The data for each of the Services are plotted on the same vertical scale, so the charts show most clearance requests are from the Army and the least from the Marines. Record-check requests are far more numerous (4:1 or 5:1 ratio) than SSBI requests. Also, whereas the Army and Marine Corps show a marked starting transition, with strong differences year to year for the first 3 years, the other Services have been relatively consistent in their numbers of requests.

JPAS Investigation Requests for Agencies



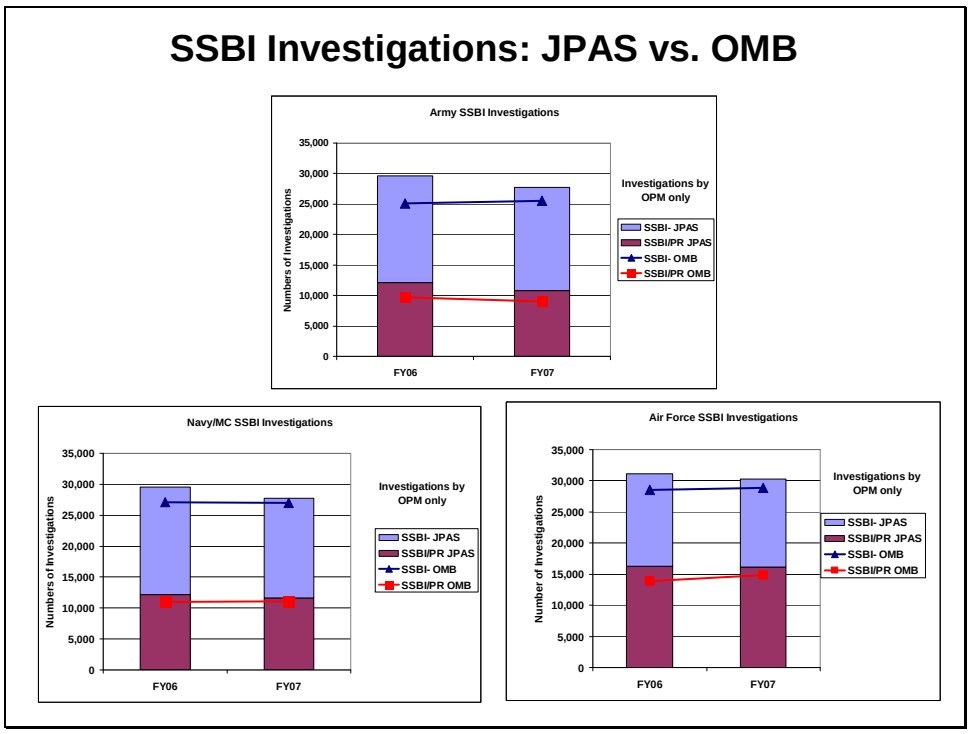
*Note: Vertical scale is substantially lower than for Services

The above chart shows the DoD-wide agency clearance requests in a form corresponding to the Service requests on the previous page. These requests are primarily civilian as the military requests are normally counted with each member's Service even when assigned to a DoD-wide agency. Two marked differences from the Service records are, first, that the overall numbers are much lower than for the Services (even though the total population base remains comparable), and second, that the numbers of requests for SSBI investigations each year are actually larger than the numbers of record-check investigation requests. This is one of the first indications that the personnel processes and clearance needs of the Defense-wide agencies are not like just another Service component of persons.



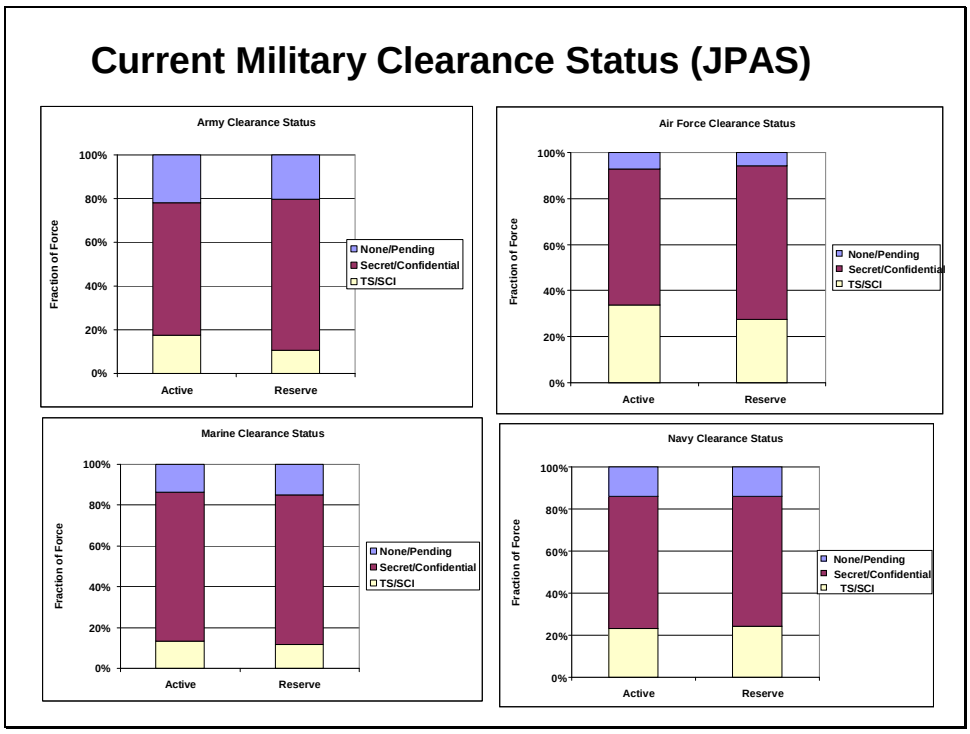
In assessing the accuracy and completeness of the JPAS data set, it is useful to compare some measures from JPAS to an independent data source, such as the Office of Management and Budget (OMB) clearance agency summary reports. The charts above show summaries of record-check investigation requests in both JPAS and the OMB data. The OMB data were provided to that office by OPM, which has responsibility for Government-wide security clearance investigations. In the charts, the solid bars represent the JPAS data (record-check investigations opened in JPAS), and the dot-and-line symbols show the OMB data for the corresponding cases of opened investigations of this type. For the DoD data in JPAS, OPM did virtually all of the record-check investigations with an insignificant number of exceptions. Since the criteria for "start" differed in some detail between JPAS and OPM views of the process, some differences in totals may be reasonable.

The charts show quite good agreement, particularly for the case of the Army.



The charts above show the same comparison of JPAS and the clearance agency reports from OMB for the SSBI investigations, here making the distinction between initial clearances and reinvestigations. The JPAS data are shown in the bars and the OMB/OPM data in the line symbols, with the initial clearances on the top. Here the results are generally consistent, with the JPAS showing a somewhat greater number of investigations.

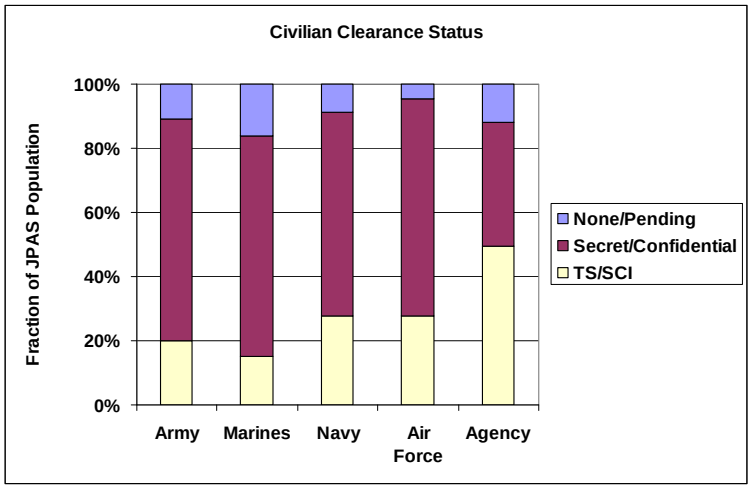
One factor that may have caused such discrepancy is DoD's use of some internal investigation capacity for TS and SCI clearance investigations, particularly by the intelligence agencies. This is done very rarely for record-check investigations, but more often for SSBI investigations supporting the TS or SCI clearances. JPAS indicates the investigation agency in each case, and it shows a few percent of the SSBI investigations by organizations other than OPM. Since the OMB data most probably came from OPM, we removed the investigations by organizations other than OPM from the above charts in calculating comparable numbers. Still, the comparison of JPAS to OMB remained within reason.



Clearance status for each of the Services' military personnel, comparing the active and reserve components, is shown in the above series of charts. The full JPAS population (100 percent) in each case is divided into three groups: those with no clearance (whether a request is pending or whether the request has been denied or revoked), those with secret or confidential clearance, and those with top secret or SCI clearance. In terms of the previous set of clearance requests, a record-check investigation and a positive result in the adjudication process of assessing the results of the investigation is required for a secret or confidential clearance, and an SSBI investigation with a positive adjudication would be required for either a top secret or SCI clearance. For the Army and Air Force, the National Guard and Reserves are grouped together in the reserve component plotted on the chart.

The charts show that the active and reserve components have approximately the same proportions of people at each of the three clearance-level groups, with somewhat more marked differences from Service to Service. The fractions with TS or SCI clearances are much larger for the Air Force and Navy than for the Army and Marine Corps.

Current Civilian Clearance Status (JPAS)



The distribution of clearance status for civilian personnel is shown on the chart above. For each Service, the general proportions of clearance types for civilian personnel are similar to that for the military personnel, but the proportions vary somewhat across the military components. The defense-wide agencies show a markedly different pattern, with a higher percentage of TS/SCI clearances than for the other populations. This is perhaps an indication of significant intelligence agency population of the JPAS data set.

Observations on JPAS Data

- **Numbers of clearance applications in JPAS agree reasonably well with OPM data reported by OMB**
- **Distribution of types of clearance (none, secret/confidential, TS/SCI) is relatively similar between active and reserve components of each Service, with somewhat greater differences across Services and civilian components**
- **Working assumption is that all persons, active, reserve, and civilian, at least apply for a record-check clearance**
  - **Figures can be adjusted if we learn of policies to clear fewer than all of some components**
  - **Only some (15-40%, depending on component) apply for SSBI**
- **Given uncertainties in coverage of JPAS and persistence of old records in the database, moving forward, the best estimate of current numbers of cleared personnel is:**
  - **(Known End-Strength) x (Fraction of JPAS pool with the clearance)**

The examinations of clearance requests, clearances held within and across the Services, and the comparison of JPAS data to some OMB reports showed points of significance.

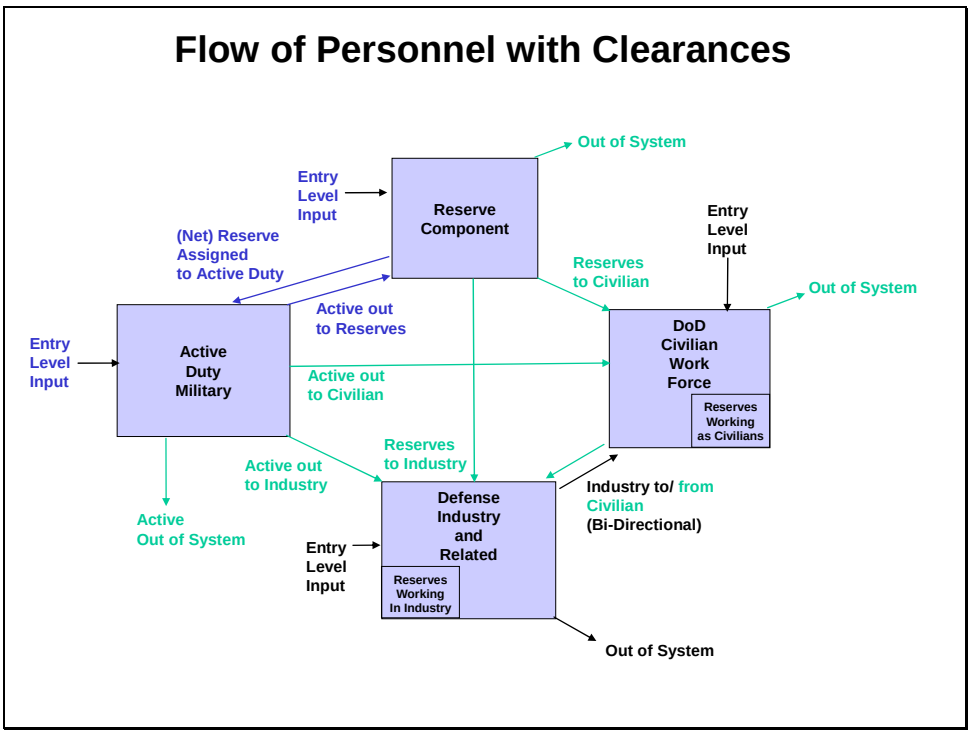
First, the numbers of clearance applications in JPAS agree reasonably well with OPM data reported by OMB. Thus we seem to be working with a reasonable data source for DoD clearance processes.

Second, the distribution of types of clearance (none, secret/confidential, TS/SCI) is relatively similar between active and reserve components of each Service, with somewhat greater differences across Services and civilian components. This should mean that as personnel transfer from active to reserve components, they are unlikely to generate new demands for clearances to any great extent.

Third, we now have a basis for postulating some general norms for holding clearances across DoD. Our current working assumption is that all persons, active, reserve, and civilian, at least apply for a record-check clearance unless some unusual circumstance exists such as for persons who are not U.S. citizens within DoD. This working assumption can be adjusted if we learn of policies to clear fewer than all of some components. Also, only some (15-40 percent, depending on component) apply for SSBI investigations. One of the ideas developed in this study is that it can be useful to know

and track the numbers of cleared personnel within each Service and component. Once a person is cleared, he or she will remain a cleared person within that component until that person leaves the Service. When these people do leave, they will need to be replaced, causing new clearance requests, or if they are not replaced, a shortage of cleared people is likely to complicate operations for that component within a relatively short period of time. Thus the preferred situation is to stabilize the numbers of people within DoD components holding clearances. Given uncertainties in coverage of JPAS and persistence of old records in the database, the best estimate of current numbers of cleared personnel is:

Total Clearances held = (Known End-Strength) x (Fraction of JPAS pool with the clearance.)



In addition to knowing the numbers of cleared personnel within each component, it should be possible to predict whether the need for new clearances will increase or decrease based on force-level trends within DoD. A great deal of effort already goes into modeling and projecting such force-level trends in order to stabilize DoD force levels across components. The delay between the time new policies are formulated and the time new policies can affect force component gains and losses decreases the stability of the process and requires a great deal of attention for effective management. Each 2-year budget shows the actual situation for the previous year, a projection for the current year, and a second year projection for the following year. In recent budget displays (e.g., for FY2005 and FY2007), year-to-year changes have ranged up to and beyond 20 percent for some force components, a clear indication that they are not simply getting "straight-line" projections.

The above chart shows four key DoD personnel components, the active military, the reserve component containing Reserves and National Guard, the DoD civilian work force, and the defense industry. The active and reserve components are structured in that everyone enters as either a new enlisted troop (E-1) or a new officer (O-1) level. Some enlisted troops go through officer commissioning programs to become officers, but these numbers are carefully noted and documented. Also, as people leave and sometimes re-enter the military, the Services make careful note for their gains of who has prior service

and who has no previous experience. When people leave the military, some are no longer associated with DoD, but others enter either the defense industry or the DoD civilian work force, taking their clearances with them. Thus whereas the entry level input is well-defined for the military, it is less clear for civilians and the defense industry. Personnel flows between the defense industry and the DoD civilian work force are also not well-documented. However, total numbers of people entering or leaving the DoD civilian work force can be determined if annual personnel data containing consistent personnel identifiers for each record are compared across end-year snapshots.

Using available data from previous studies, new data provided for this study by DMDC, recent budget displays for the FY2007 and FY2009 budgets, and Defense Manpower Requirements Report for FY2008 IDA collected enough data to project expected clearance trends for initial investigations and reinvestigations for both record-check and SSBI investigations.

Estimating Initial Record-Check Investigations

- **Estimate 1: Clearances for new entries**
  - **Active: New commissioned officer gains + non-prior service enlisted gains, less product of enlisted commissioning programs**
  - **Reserve: Same as active**
  - **Civilian: Not knowing the clearance status of personnel gains, these are estimated by numbers of civilian record-check clearance requests in JPAS**
- **Estimate 2: Replacement and turnover of military or civilians leaving the DoD work force**
  - **Active: Net losses to military, offset by prior Service gains**
  - **Reserve: Same as active**
  - **Civilian: Turnover observed in DMDC civilian end-strength data (because of hiring already-cleared personnel, only some of these should need clearances)**
  - **Primary source of uncertainty: Some budgetary displays may include transfers to IRR in the same group as "transfers to other components"**

The first type of clearance request investigated was the number of initial record-check clearance requests. In fact, the available data provide two independent means of projecting the need for new clearances: one based on the number of new persons with no prior experience entering DoD, and the other based on the numbers of people leaving DoD and therefore needing immediate or near-term replacement. Ideally in a steady-state world, the two estimates should balance, but differences between results based on people leaving and people entering can give an insightful measure of "turbulence" in the system.

Clearances based on the new entries are estimated as follows:

- Active: Sum the newly commissioned officer gains and the non-prior service (NPS) enlisted gains. Then the numbers of new officers produced by enlisted commissioning programs should be subtracted from the total because all of the enlisted troops in those programs would generally have the needed clearances, unlike the non-prior service entries.
- Reserve: Same calculation as for the active component.
- Civilian: Since we did not know the clearance status of personnel gains, we could have calculated new entries but they would not necessarily correspond to new clearance requests. Instead, these are estimated in the tables below by numbers of actual civilian record-check clearance requests in JPAS.

For the second estimate of the need for record-check clearances, based on turnover and replacement of military or civilians leaving the DoD work force, the following procedures were used:

- Active: Sum the net losses to military (excluding transfers to other components). These totals are offset by the numbers of prior-service personnel entering the military. Since most of these prior-service gains will be already cleared, they will reduce what would otherwise be a need to clear new people. The prior-service gains are subtracted from the net losses to the military.
- Reserve: Same calculation as for the active component.
- Civilian: In the tables presented below, this estimate is based on the turnover observed in civilian end-strength data DMDC provided to IDA and contain consistent personnel identifiers from year to year. The table will present these results as if all needed clearances. However, as discussed above, one would expect this to be an overestimate of the need for new clearances because of hiring already-cleared personnel.

Throughout all of these estimates, and particularly for the turnover-based estimate, a primary source of uncertainty is ambiguity in budget displays in the "all other losses" or "losses to other reserve components." We would like to ignore transfers to other active or selected reserve components, but we would like to count as turnover the personnel transfers to the Individual Ready Reserve or other inactive reserve components. These effects remain uncertain for this study and these calculations, but they could be eliminated in the future with explicit instructions to the Services in preparing such estimates.

Initial Record-Check Investigation, FY07

Estimates				
FY07 Data	Record-Check Clearances/Non-Prior Service (NIPS) Entries			Total
Service	Active	Reserves	Civilian[1]	
Army	67,689	51,746	18,113	137,548
Navy/MC Civ	38,678	4,871	12,299	55,848
Marines	36,751	6,098		42,849
Air Force	31,322	10,260	12,371	53,953
Agency			3,971	3,971
Total				294,169

[1]Actual civilian requests in JPAS.

Estimates				
FY07 Data	Record-Check Clearances/Turnover Replacement			Total
Service	Active	Reserves	Civilian	
Army	56,918	69,359	22,798	149,075
Navy/MC Civ	50,540	10,010	13,100	73,650
Marines	32,789	9,009		41,798
Air Force	47,872	14,689	14,857	77,418
Agency			15,663	15,663
Total				367,604

Observation			
FY08 Data	Initial Record-Check Clearances in JPAS	Ratio to Turnover Case	Ratio to NPS Case
Service			
Army	203,482	1.36	1.48
Navy/MC Civ	68,656	0.93	1.23
Marines	32,074	0.77	0.75
Air Force	71,327	0.92	1.32
Agency	3,971	0.26	1.00
Total	379,510	1.06	1.29

Several significant points are apparent when comparing the two estimates for record-check clearances to the observation in JPAS. They will be discussed here and summarized in the following chart.

First, consider the total numbers DoD-wide in the two estimates and in the observation. The non-prior service estimate is out of balance with the turnover-based estimate; it is nearly 20 percent low in FY07. The imbalance is similar for most Services, but the Marines actually have more non-prior service gains than turnover losses. This level of imbalance is not uncommon in DoD personnel projections, and it is an interesting measure of turbulence to anticipate in future clearance request rates.

The second point is the comparison of estimates for civilians. As discussed previously, estimates in the tables above represent the actual requests for civilians in JPAS in the NPS entry column and all civilian turnover in the turnover replacement estimate. Whereas we would expect only a relatively small fraction of those turning over would need new collateral clearances because of a presumed predominance of hiring civilians who already have clearances, the numbers for civilians are very similar. Only the Defense-wide agency rows show the expected trend. Two possibilities might explain this. First, since a large fraction of the DoD civilian work force is not apparently covered in JPAS, this might indicate that many people with clearances are applying for new clearances to become represented in JPAS. A fundamentally similar alternative reason

might be that people are no longer using the record-check reinvestigation category of clearance requests, and that many clearance reinvestigations are entering the systems as new initial collateral clearance requests. In any case the overall numbers of civilian clearance requests are sufficiently small that they do not affect the overall trends for the totals.

Observations: Initial Record-Check Investigations Estimates

- **The non-prior service estimate is out of balance with the turnover-based estimate: 20% low in FY07**
  - **This level of imbalance is not uncommon in DoD personnel projections**
  - **This type of imbalance is likely to lead to turbulence in future clearance request rates**
- **For Service civilians the two estimates represent actual applications and a turnover-based estimate where everyone needs a new clearance. These are unexpectedly similar in size**
- **Numbers of requests for new record-check clearances is 30% larger than the numbers of new, non-prior service gains**
  - **DoD should understand: Who is getting these clearances?**
  - **Most apparent in the Army component**
  - **Could be a starting transient effect: long-time employed personnel with clearances entering JPAS for the first time**
    - **People may be going into JPAS by applying for new clearances, even when they may already have a clearance**
  - **A substantial number may actually be reinvestigations; but not coded as such in JPAS**
  - **May represent a backlog of investigations**

The main point to consider in assessing the estimates and observations for record-check clearances is that the numbers of requests for new record-check clearances is 30 percent larger than the numbers of new, non-prior service gains. Our initial reaction was to ask the question: Who is getting these clearances?

We postulated several reasons as to why the number of requests for new record-check clearances in JPAS is larger than the numbers of new, non-prior service personnel gains as shown.

Estimating Initial SSBI Requests

- **Estimate 1: Clearances for new entries, with the fraction TS/SCI cleared equivalent to the JPAS pool for the component**
  - **Similar to initial record-check estimate**
- **Estimate 2: Replacement of turnover leaving military or civilian work force**
  - **Similar to initial record-check estimate**
- **For the turnover estimate, personnel were broken down by officer/enlisted and entry/career levels and civilians by pay-grade, for both numbers of current clearances and turnover rates**

The second type of clearance request to consider is for initial SSBI investigations. Since we have established above the fractions of each force component holding TS or SCI clearances (from 15 to 40 percent, depending on the Service and component), we can use the known endstrengths for each force component to estimate how many people hold these clearances. If we assume that holding such a clearance does not strongly affect whether an individual chooses to leave the military, we can estimate the numbers of steady-state requests for the TS/SCI clearances in much the same way that we estimated initial record-check clearances, with just proportionately smaller numbers for both the non-prior service entrants and for the turnover replacements.

We noted that turnover can vary substantially with component (particularly active-guard-reserve) and that turnover is expected to be high for first-term enlisted forces, particularly in the Army and Marine Corps. Therefore we calculated the distributions of the TS/SCI clearance holders by entry-level, career-level, and warrant officer status for military personnel and by pay grade for civilians from the JPAS data. Those distributions are shown in Appendix A. We then estimated the corresponding turnover rate for each of those groups based on the losses of personnel from each Service rank and civilian pay grade.

Initial SSBI Requests, FY07

Estimates				
FY07 Data	SSBI Clearances/Non-Prior Service (NIPS) Entries			Total
Service	Active	Reserves	Civilian[1]	
Army	11,816	5,589	2,212	19,619
Navy/MC Civ	8,910	1,184	2,205	12,299
Marines	4,931	713		5,644
Air Force	10,574	2,821	1,797	15,192
Agency			1,594	1,594
Total				54.348

[1]Actual civilian requests in JPAS.

Estimates				
FY07 Data	Initial SSBI Clearances/Turnover Replacement			Total
Service	Active	Reserves	Civilian	
Army	7,630	5,325	2,627	15,582
Navy/MC Civ	8,512	2,772	2,090	13,374
Marines	2,925	1,306		4,231
Air Force	10,890	5,010	2,366	18,266
Agency			2,436	2,436
Total				53,889

Observation		
FY08 Data	Initial SSBI Investigation Requests in JPAS	Ratio to Turnover Case
Service		
Army	17,192	1.10
Navy/MC Civ	12,216	0.91
Marines	4,025	0.95
Air Force	14,490	0.79
Agency	1,594	0.67
Total	49,517	0.92

The results of the two types of initial SSBI estimates and the observations are presented above in the same form as was done previously for initial record-check clearances. The results will be discussed both below and associated with the summary chart that follows.

First, the balance between non-prior entry people and exiting turnover estimates is much more even than for the record-check clearances. The NPS entries are roughly in balance with the turnover replacement, and both are in reasonable agreement with the observation.

Observations: Initial SSBI Estimates

- **The balance between non-prior entry people and exiting turnover estimates is much more than for the record-check clearances**
- **Initial SSBI estimates for the Services based on non-prior service entries or personnel turnover agree reasonably well with JPAS data**
- **In making agency estimates, for SSBI investigations, it was decided NOT to correct the numbers of people holding TS/SCI clearances for the fact that authorized end-strengths for civilians is much larger (~x2) than the pool of civilians in JPAS**
  - **Most holders of TS/SCI clearances should have taken some clearance action (new or reinvestigation) between FY03 and FY07**
  - **This is inconsistent with the assumption of treating JPAS as a "sampling pool," but possibly in better agreement with the current situation**

The convention for representing the civilian estimates was also similar to what was used for the initial record-check case. Again the NPS estimates for civilians was the actual number of clearance requests, and the corresponding estimate for the turnover replacement was all of the turnover pool, with the presumption remaining that many or most would be already cleared. However, because of uncertainties in the basic coverage of DoD by the IDA set of JPAS data, a key assumption was adjusted in estimating the numbers of civilians with TS/SCI clearances.

For all of the other estimates in this analysis, the basic underlying assumption is that the current numbers of cleared personnel is the known endstrength times the percent of people with the clearance in question. For most of these cases, the total number of clearances was close to that in JPAS because the total records in JPAS were close to the authorized totals. However, in making civilian estimates, for SSBI investigations, it was decided NOT to correct the numbers of people holding TS/SCI clearances for the fact that authorized end-strengths for civilians is much larger (~x2) than the pool of civilians in JPAS. Had we made the consistent projection, the numbers of civilians in the turnover replacement case would have roughly doubled.

It is unclear what the correct answer really is. Most holders of TS/SCI clearances should have taken some clearance action (new or reinvestigation) between FY03 and FY07, and thus all with TS/SCI clearances should have initiated a clearance request to

enter the IDA JPAS data set. However, this is inconsistent with the assumption of treating JPAS as a "sampling pool," but is possibly in better agreement with the current situation. Also, if our expectation was that a small fraction of the turnover replacement-based estimate should really need to obtain new clearances because many have been previously cleared in their former military or defense industry positions, revised estimates would be more in line with those expectations. Clearly a better understanding of JPAS coverage and the dynamics of the civilian work force would be helpful here.

Estimating Reinvestigation Requests

- **Policy for clearance reinvestigation**
  - **Record-Check: Revisit after 10 years of holding the clearance**
  - **SSBI: Revisit after 5 years of holding the clearance**
- **Formulas:**
  - **Definition: P= turnover rate (fraction of force per year), not corrected for prior-service gains or other factors**
  - **For record-checks, # reinvestigation requests = (# persons with secret clearances) x (10%) x (1-P)^10**
  - **For SSBI, # reinvestigation requests = (# persons with TS/SCI clearances) x (20%) x (1-P)^5**
- **Limitations of calculations**
  - **Baseline numbers of people with clearances should correspond as much as possible to the actual numbers at the time the baseline established (5 or 10 years ago)**
  - **Turnover rates will vary annually, and actual numbers should be used**
  - **Current estimates (all FY07 values) are appropriate only in an idealized "steady-state" situation**
  - **It would be preferable to calculate turnover for those leaving all of DoD, not the military or DoD civilian groups individually**

The final types of investigation requests are for reinvestigation. Here we have two types of clearances and two different policies. For record-check investigations, the policy is to revisit the investigation after 10 years of holding the clearance. For the SSBI investigations the policy is to revisit the investigation after 5 years of holding the clearance.

The two different policies lead to two different formulas. For both of these we define the term P as the turnover rate, defined as the fraction of force replaced per year. This is similar to the turnover used for the record check clearances, but in this case we focus on individuals holding clearances for a fixed number of years, and the rates are not adjusted for prior-service gains or other factors. The two equations are

For record-checks, # reinvestigation requests = (# persons with collateral only) x (10%) x $(1\text{-}P)^{10}$.

For SSBI, # reinvestigation requests = (# persons with TS/SCI clearance) x (20%) x $(1\text{-}P)^{5}$.

For the data available for these estimates, the formulation is clearly a steady-state idealization. The baseline numbers of people with clearances should correspond as much as possible to the actual numbers at the time the baseline was established (5 or 10 years ago); here we can only presume it was at about the current levels. The turnover rates will

vary annually, and actual numbers should be used; here we have only the current rates. The estimates developed here (all using FY2007 values) are appropriate only in an idealized “steady-state” situation. This is a reasonable approximation, but it is clearly not going to be precisely correct. It would also be preferable to calculate turnover for those leaving all of DoD, not the military or DoD civilian groups individually because the reinvestigation policies are applied on a Government-wide basis.

Reinvestigation Requests, FY 07

FY07 Data	SSBI Periodic Reinvestigation			Total	SSBI Reinvestigation Requests in JPAS	Ratio
Service	Active	Reserves	Civilian			
Army	11,124	6,453	3,018	20,595	10,900	0.53
Navy/MC Civ	9,115	1,535	3,286	13,936	10,226	0.73
Marines	2,569	231		2,800	1,669	0.60
Air Force	14,659	6,733	3,209	24,601	16,730	0.68
Agency			1,849	1,849	5,250	2.84
Total				63,781	44,775	0.70

FY07 Data	Record-Check Periodic Reinvestigation			Total	Record-Check Reinvestigation Requests in JPAS	Max Annual Requests FY03-07
Service	Active	Reserves	Civilian			
Army	6,376	6,082	6,433	18,890	102	837
Navy/MC Civ	4,573	353	5,179	10,106	19	4,317
Marines	1,900	198		2,097	6	1,063
Air Force	4,572	4,455	4,176	13,202	781	8,810
Agency			754	754	487	1,478
Total				45,049	1,395	

The above display shows both types of reinvestigations: SSBI and record-check reinvestigations. The top chart shows the estimates and observations for the SSBI reinvestigations. The data show that, for the four Services, the number of actual SSBI reinvestigation requests was only around 60 to 70 percent of the number that the steady-state mathematical model described above projected were needed. It is not clear why such a discrepancy would exist. Partly, it is an idealization, and actual numbers for the intervening years and more accurate (representative) numbers for the yearly turnover might make a difference. However, it is also possible that significant numbers of people are not getting reinvestigations initiated at the prescribed rate. Recall AFCAF SSBI-PR projections with the Air Force model have a 20-percent margin, which the agency attributed to security managers being somewhat lax in submitting reinvestigation requests within the 5-year window.

In examining the data in the SSBI table, it is also clear that DoD-wide agencies are showing significantly different patterns than the rest of DoD. We have seen distinctive trends for many of the other estimates for DoD-wide agencies in this analysis, so this is not surprising. SSBI reinvestigation is also quite possibly an area where the activity is dominated by intelligence agencies, and the data used to infer turnover and total numbers of population contain other DoD-wide agencies but not the intelligence agencies.

Observations: Periodic Reinvestigations Estimates

- **Despite the limitations of the estimates, it appears that not all DoD SSBI clearances are being submitted on schedule**
- **The dynamics of clearance reinvestigations for DoD agencies is clearly different from other DoD components**
  - **This can be explained if SSBI periodic reinvestigation requests are being entered by people in intelligence agencies to get into JPAS, and the actual turnover of these people is not reflected, particularly in the DMDC turnover data for defense agencies**
- **People seem to have stopped using the record-check reinvestigation requests**
  - **Patterns may have been disrupted by early reapplication for collateral clearances to enter JPAS**
  - **Numbers are currently down far below just a few years ago, so this may be a "trend" in security management**

The second table on the previous chart shows the estimates and observations for the record-check reinvestigations. Here the steady-state model with the current DoD turnover rates suggest there should have been around 45,000 reinvestigation requests, but actually only 1,400 were entered into JPAS. In this case, people seem to have stopped using the record-check reinvestigation requests. Terminology in JPAS still exists to reflect it, but the data field seems to have fallen into disuse. OPM actually conducts both the initial and the reinvestigation requests, and since the record check is the same for both, OPM makes no distinction. The patterns may have been disrupted by early reapplication for secret clearances to enter JPAS, if indeed this has been going on. On this basis, one might suspect that 30,000 to 45,000 of the 380,000 initial record-check investigation requests contained in JPAS might have really been for reinvestigations.

Because the numbers dropped to such a low level, the table in the chart also shows the maximum number of reinvestigation requests, which generally occurred in the years FY2003, FY2004, or FY2005. Numbers are currently down far below only a few years ago, so this may be a "trend" in security management.

Linking Policy Reinvestigations Requirements

Policy	Initial Investigation Requests	Expected Reinvestigation Requests	Ratio of Reinvestigations to Initial Requests
5-year Reinvestigation (SSBI case)	54,000	64,000	119%
10-year Reinvestigation (Record-Check Case)	358,000	45,000	13%

In managing the DoD security-clearance investigation system, most of the initial clearance requests are not readily subject to policy control because they are driven by the overall force-level management processes in each of the DoD components and by an operational need to have cleared personnel. Thus the system can respond by anticipating changes in numbers of clearance requests and trying to accommodate them in the investigative processes.

However, the reinvestigations could be placed more easily under policy control, and these could be adjusted to stabilize the investigative work load. The two cases we have considered in this analysis are summarized in the above table with round numbers taken from the presented estimates. The results show that for a NACLC investigation, the number of reinvestigations is a small fraction of the initial investigations, and for the SSBI reinvestigation, the number of expected reinvestigations can actually exceed the number of initial investigations. These results, based on simple mathematical models of the turnover process suggest that small adjustments in reinvestigation rates can make significant differences in the overall work load.

Potential Control Principles for Managing DoD Clearances

- **For secret/confidential clearances:**
  - **Ensure that all new personnel with no clearances and all former-Service personnel with expired clearances at least apply for record-check investigations**
- **For TS/SCI-level clearances:**
  - **Stabilize the numbers of DoD personnel in each component with TS/SCI clearances**
  - **FY07 data on current numbers are estimated to be as follows:**

Military with TS/SCI Clearances					
	Army	Navy	Marines	Air Force	Total
Active	87,469	79,651	24,205	116,315	307,639
Reserves	24,373	17,143	4,627	35,141	81,284
National Guard	28,214			17,785	45,999
Civilians with TS/SCI Clearances					
	Army	Navy/MC	Air Force	Agency	
Civilians	25,753	25,267	25,897	18,323	95,240
Total					530,162

The linkages explored in this study suggest a strategy for managing the DoD security clearance process, based on the principles outlined above:

- For secret/confidential clearances: Ensure that all new personnel with no clearances and all former-Service personnel with expired clearances at least apply for record-check investigations. Our JPAS-based analysis on initial record-check investigations shows this appears to be occurring. The military departments appear to be trying to avoid the situation where the number of positions for Service members requiring a secret clearance do not exceed the number of cleared personnel. It is noted that this practice sometimes leads to having large numbers of individuals holding clearances while assigned to billets with no required access to classified information. However, this approach would clearly tie initial investigations to personnel gains projections, making it easier to predict investigation requirements.
- For TS/SCI-level clearances: Stabilize the numbers of DoD personnel in each component with TS/SCI clearances.

The table above presents the best current estimate of the numbers of people in each DoD component holding TS/SCI clearances. This is a rough first cut, but it can represent a starting point. If this process is redone for next year, better estimates may be obtained for both FY2007 and FY2008. It is reasonable to assume that the numbers will vary from year to year. The right level for stabilizing the population can be found by

observing trends and soliciting feedback from organizations that use people with these clearances on the adequacy of the population of cleared personnel.

Once assessments are made for anticipating the expected load of clearance requests, several actions are available to control the DoD/Government response:

- Adjusting the work force associated with both record-check and SSBI investigations
- Adjusting the anticipated schedules for work on these clearances
- Possibly adjusting the revisit periods for reinvestigations of either record-check or SSBI investigations to adjust the anticipated loads to within the available capacities, while not sacrificing national security.

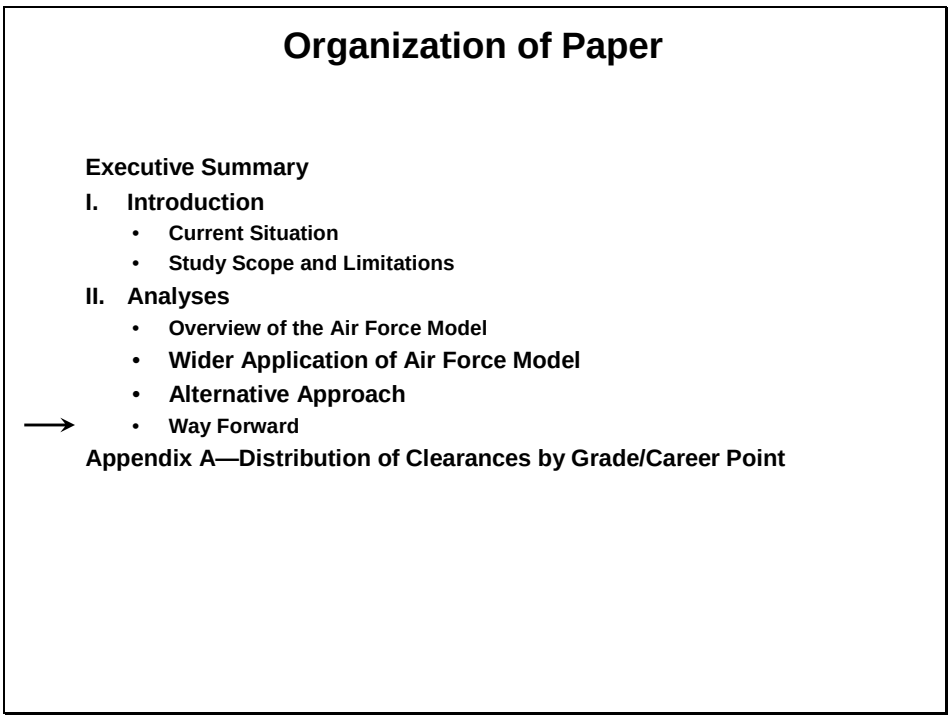
Conclusions from JPAS Analysis

- **Monitoring the current numbers of persons across DoD holding secret and below or TS/SCI clearances can give important insights for managing the cleared work force and anticipating changes in demand for clearance investigations**
  - **Annual trends for the numbers cleared, in themselves, can give important insights without other assumptions about changes in the DoD work force**
  - **Consistent shortfalls will lead to significant changes in the relative abundance of cleared personnel and ultimately strong reaction from DoD components**
- **Data can be requested from DMDC and from the Services in their budget submissions to greatly improve the accuracy of work-force projections relevant to clearances**
  - **This can lead to more reliable calculations**
  - **This has potential to provide 1-2 years warning of major shifts**
  - **Changes in policy on reinvestigation rates can be adjusted to mitigate the effect of anticipated shifts in clearance requests**
- **Use of JPAS data for active management of the clearance process may lead to more careful data management, as is appropriate for a major element of DoD information protection infrastructure**

First, monitoring the current numbers of persons across DoD holding secret and TS/SCI clearances can give important insights for managing the cleared work force and anticipating changes in demand for clearance investigations. Reviewing annual trends for the numbers cleared, in themselves, can give important insights without other assumptions about changes in the DoD work force. This will be true because consistent shortfalls in numbers of available cleared personnel will lead to significant changes in the relative abundance of cleared personnel and ultimately strong reaction from DoD components in relatively short periods of time.

Second, because of predictable trends in DoD force levels that drive initial clearance requests, the size of the pools of cleared personnel can be projected for at least a year or two in the future through the techniques employed in this analysis. Also, data can be requested from DMDC and from the Services in their budget submissions to greatly improve the accuracy of work force projections relevant to clearances. This can lead to more reliable calculations. It has potential to provide 1-2 years' warning of major shifts. Also, changes in policy on reinvestigation rates can be adjusted to mitigate the effect of anticipated shifts in clearance requests.

Finally, use of JPAS data for active management of the clearance process may lead to more careful data management for the system, as is appropriate for a major element of DoD information protection infrastructure



D. THE WAY FORWARD

The final section contains a brief description of recommended follow-on activities for the study's sponsor to consider.

The Way Forward

- **Take the appropriate steps to conduct the JPAS-DMDC crosswalk in order to facilitate use of the Air Force model for the Navy, Army, and Marine Corps.**
- **To use JPAS as a tool for active management of the clearance process, tighten JPAS end-user procedures to ensure:**
  - **Proper coding of investigation requests paying particular attention to accurately indicate type of investigation and whether initial or a periodic reinvestigation.**
  - **Improving the accuracy of Service and personnel group status.**
  - **Deleting records for separated personnel in a timely manner.**
- **To better implement the IDA-proposed modeling approach**
  - **Instead of using personnel flow rates/numbers found by combining data from DMDC, budget reports and year-end, high-level Service personnel reports, the Services and agencies should generate personnel flow data from the past year (or averaged over several years).**
  - **The Services and agencies should project any changes to the distribution of clearances within each component at the time those components submit planned 2-year endstrength projections.**

First, take the steps necessary to conduct the JPAS-DMDC crosswalk described in Section B. This requires that DMDC operations and support personnel share the algorithm used to scramble the SSN with DSS to establish a primary key relationship between the two databases.

Second, to leverage JPAS as a tool for active management of the clearance-granting process requires issuing authoritative guidance regarding JPAS data entry and records management to improve the integrity of the database. JPAS users should be directed to properly indicate when NACLC investigations are initial investigations or periodic reinvestigations. Users already appear to properly indicate initial or reinvestigation for SSBIs. Users should be directed to correctly indicate the personnel group status of individuals in the database. Procedures should be developed to ensure that the JPAS database is not populated by duplicate or superfluous records when individuals change personnel group status, transfer between DoD components, separate from Service, or terminate civilian employment.

Third, an advantage of the IDA-proposed approach is that it is implementable in Access/Excel without any added, specialized software. Also, it is a feasible high-level approach that does not require force structure to be broken down into small populations based on occupational specialty. But steps should be taken to improve the quality of the input data beyond JPAS. Specifically, the Services should generate the personnel transfer

data used by the model. To explore the feasibility of our approach, we estimated the numbers of non-prior service gains and personnel turnovers by combining data from several sources, primarily budget submissions. The Services and agencies should be requested to record and report specific personnel flow numbers relevant to this approach. We believe the data are already collected, but the fidelity is lost when the information is rolled-up to produce year-end budget and personnel reports. Those organizations could also be asked to project shifts to the distribution of clearance types across the organization due to known workforce changes: phasing out or increasing the numbers of individuals in a career field or changing the SAR for some career fields.

Appendix A
DISTRIBUTION OF CLEARANCE BY GRADE/CAREER LEVEL

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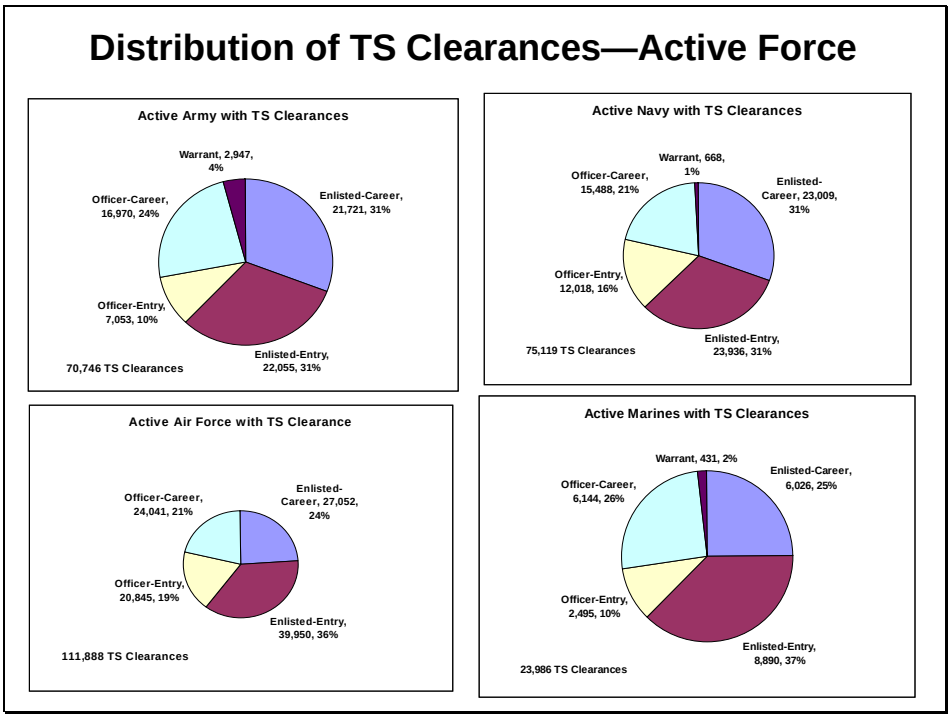
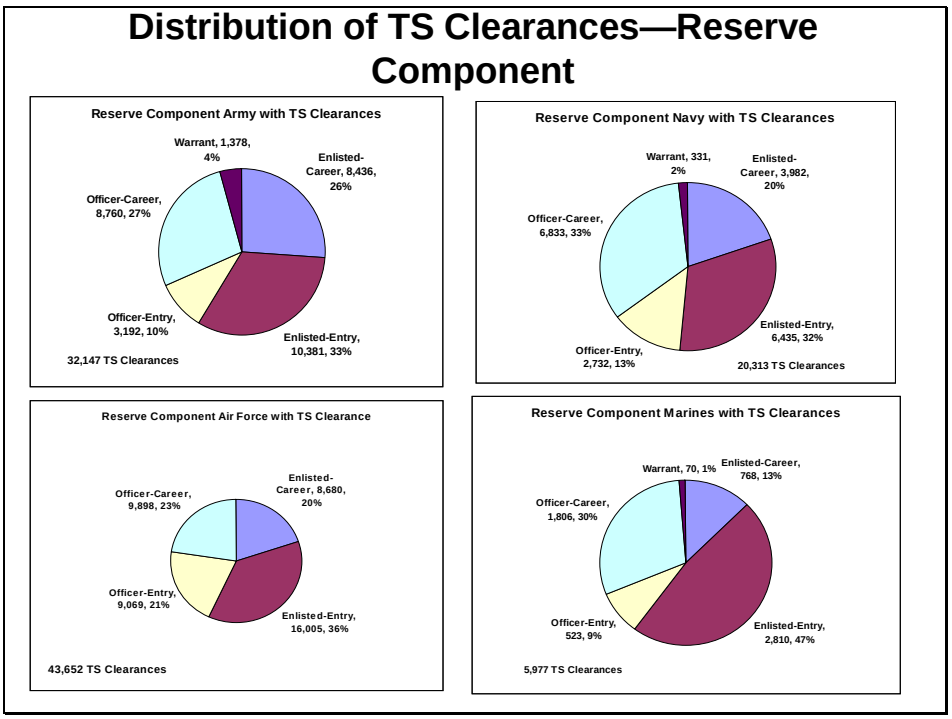
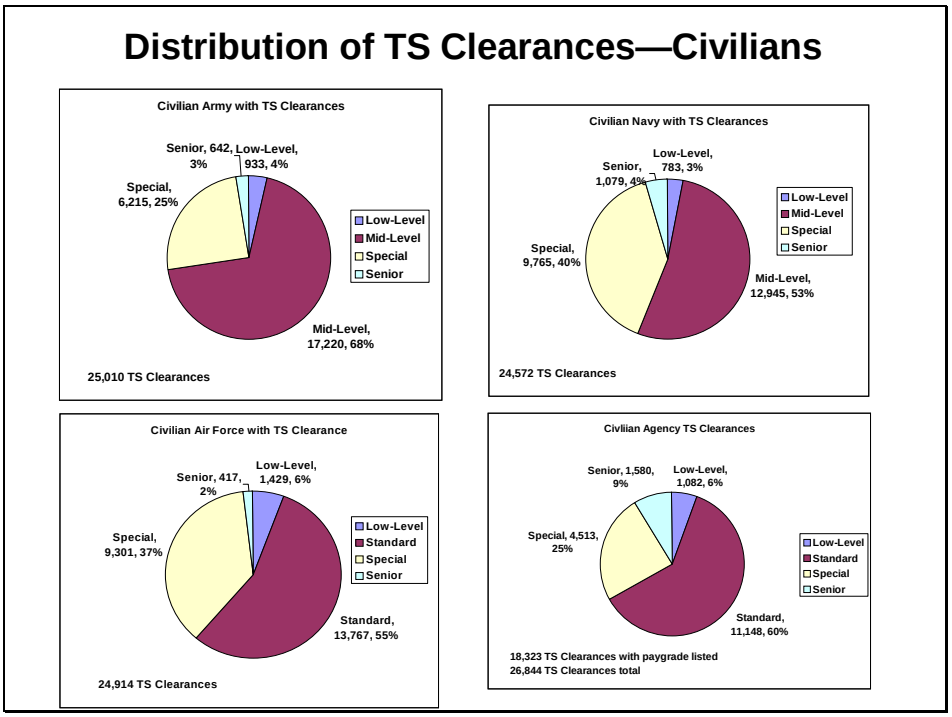
DISTRIBUTION OF CLEARANCE BY GRADE/CAREER LEVEL

The next three charts show the distribution of clearance type by grade and career point for active forces, the reserve component, and DoD civilians, respectively.



We consider commissioned officers as becoming career Service members upon achieving the 0-4 rank, generally corresponding to the rank reached by the end of the first service term. Similarly, the break between enlisted-entry and enlisted-career occurs when enlisted personnel reach the rank of E-6.





A low-level civilian is defined by this study as working at the General Service (GS) pay scale of 3 or below. The study categorizes a civilian as senior level at a pay

grade of GS-15 or GS-16 and above. Standard is used to describe civilian employees between GS-4 and GS-14. Those civilians who do not map into the GS scale fall into the Special group.

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Appendix B
GLOSSARY

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GLOSSARY

AFCAF	Air Force Central Adjudication Facility
AFSC	Air Force Specialty Codes
CAF	Central Adjudication Facility
CCMS	Case Control Management System
DHRA	Defense Human Resources Activity
DMDC	Defense Management Data Center
DoD	Department of Defense
DSS	Defense Security Service
FY	fiscal year
GAO	Government Accountability Office
HUMINT	human intelligence
IDA	Institute for Defense Analyses
IOC	initial operational capability
IRR	Individual Ready Reserve
IRTPA	Intelligence Reform and Terrorism Prevention Act
JPAS	Joint Personnel Adjudication System
MDS	Manpower Data System
MOS	military operational specialty

NACLC	National Agency Check with Local Agency and Credit Check
NPS	non-prior service
ODUSD(HUMINT, CI&S)	Office of the Deputy Under Secretary of Defense for HUMINT, Counterintelligence and Security
OMB	Office of Management and Budget
OPM	Office of Personnel Management
PERSEREC	Personnel Security Research Center
PR	periodic reinvestigation
PSI	personnel security investigation
SAR	security access requirement
SCI	sensitive compartmented information
SSBI	single-scope background investigation
SSN	social security number
UIC	unit identification code
UMB	unit manpower document
USD(I)	Under Secretary of Defense for Intelligence

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13. SUPPLEMENTARY NOTES

14. ABSTRACT

Minimizing the discrepancy between projected and actual personnel security investigations is essential to staffing the investigations program responsibly, thereby, increasing the efficacy of the security clearance-granting process. Accordingly, the Under Secretary of Defense for Intelligence directed the military departments and the defense agencies and field activities to generate validated predictions for annual investigations that fall within five percent of actual requests. IDA was asked to explore the wider adoption across the Department of Defense of an Air Force model that takes into consideration manning requirements, attrition, and personnel assignment and security policies to accurately predict the numbers of investigations up to 2 years in advance. We found the model's narrowly tailored input requirements—stemming from the Air Force's unique policy of coding each authorized billet with a security access requirement—prohibit seamless embracement by the remaining military departments, agencies, and field activities. IDA developed and showed the viability of an alternative model concept that relies on data readily available from the Joint Personnel Adjudication System (JPAS), which the Defense components can more easily implement.

15. SUBJECT TERMS

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