



# PERSEREC

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## Tier 1 and Tier 3 eAdjudication Business Rule Validation

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Office of People Analytics*



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<p>ABSTRACT: This report documents the validation of business rules for the Office of Personnel Management's Tier 3 (T3), Tier 3 Reinvestigation (T3R), and Tier 1 (T1) investigation products. The Defense Personnel and Security Research Center collaborated with an interagency working group of personnel security and suitability experts on business rule development for T3 and T3R. The results of rule development and validation provided useful evidence that the proposed T3/T3R rules, while very conservative, could safely electronically adjudicate clean cases. The Security and Suitability Executive Agents approved T3/T3R business rules in September 2016 and DoD's Consolidated Adjudications Facility subsequently implemented them. Following development of T3 rules, the working group requested that the Defense Personnel and Security Research Center assist in developing rules for T1 electronic adjudication (eAdjudication). The results of validation indicated that the T1 eAdjudication business rules could successfully eAdjudicate both Suitability and Homeland Security Presidential Directive 12 case types. The executive agents approved the business rules in March 2017.</p>				
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## PREFACE

The Defense Personnel and Security Research Center has conducted a program of research to develop business rules for electronic adjudication (eAdjudication) of personnel security and other types of background investigations for over a decade. The implementation of eAdjudication has resulted in adjudication cost avoidance and improved the consistency of adjudication determinations.

DoD originally developed eAdjudication with the specific focus of developing eAdjudication business rules for National Agency Check with Local Agency and Credit Check investigations. More recently, and as documented in this report, efforts shifted to developing and validating business rules for investigations that adhere to the tiered Federal Investigative Standards of 2012 (specifically Tier 1, Tier 3, and Tier 3 Reinvestigations).

In addition, the Defense Personnel and Security Research Center and other DoD groups collaborated with an interagency working group to develop and test new eAdjudication business rules with the goal of establishing eAdjudication as an Executive Branch shared service. As a shared service, additional government agencies can benefit from the efficiencies offered by eAdjudication.

Eric L. Lang, Ph.D.  
Director, PERSEREC

## EXECUTIVE SUMMARY

DoD began using electronic adjudication (eAdjudication) to screen Office of Personnel Management (OPM) National Agency Check with Local Agency and Credit Check (NACLIC) investigations in 2010 (Youpa, Leggitt, & Lang, 2012). According to the DoD Consolidated Adjudications Facility (CAF), implementation of these rules resulted in the cost avoidance of salaries for over 28 full-time personnel—nearly \$3.2 million (Defense Information System for Security, 2012). In October 2015, the Federal Investigative Standards Tier 3 (T3) and Tier 3 reinvestigation (T3R) replaced NACLIC. Since T3 investigations share many, but not all, of the investigative items (i.e., leads) as NACLIC, a review of the existing rules and development of new eAdjudication business rules was required. The present report documents the validation of business rules for OPM T3/T3R and Tier 1 (T1) investigation products.

First, the Defense Personnel and Security Research Center (PERSEREC) collaborated with an interagency working group of personnel security and suitability experts on business rule development for T3 and T3R. The working group included representatives from DoD, OPM, Office of the Director of National Intelligence, and the Performance Accountability Council. The results of rule development and validation testing provided useful evidence that the proposed T3/T3R rules, while very conservative (i.e., the rules flagged cases that normally would receive favorable human determinations), could safely eAdjudicate clean cases. The Security and Suitability Executive Agents approved T3/T3R business rules in September 2016 and DoD CAF subsequently implemented them.

Following development of T3 rules, the working group requested that PERSEREC assist in developing rules for T1 eAdjudication. The T1 investigation replaces the National Agency Check with Inquiries investigation for both Suitability and Homeland Security Presidential Directive 12 credentialing determinations. This rule development process largely relied upon the rules created for T3 and T3R eAdjudication, as T1 rules are a subset of the former. The results of validation testing indicated that the T1 eAdjudication business rules could successfully eAdjudicate both Suitability and Homeland Security Presidential Directive 12 case types. Executive agents approved the business rules in March 2017.

PERSEREC makes the following recommendations based on the results of this analysis.

- Conduct additional research with cases at all issue seriousness levels that resulted in an unfavorable human determination to test for eAdjudication misses and correct rejections.
- Research ways to safely approve more cases through eAdjudication. PERSEREC has established a business rule test environment that can be used to evaluate new rules independent of the production system (i.e., business rule engine being used at DoD CAF).

## EXECUTIVE SUMMARY

- Perform regular eAdjudication audits to ensure proper functioning. This will require additional human adjudication of cases that pass eAdjudication. However, the sample size may be relatively small to minimize costs. For example, after implementing NACLC eAdjudication, a one percent random sample of cases was audited periodically to verify that eAdjudication outcomes matched human determinations.

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## INTRODUCTION

In the personnel security, suitability, and credentialing context, adjudication refers to the process of reviewing background investigations to determine whether an individual meets the criteria for access to classified information, suitability for employment in a civil service position, or logical or physical access to federal facilities. Generally, adjudication is a complex, time-consuming, and resource-intensive task and becomes more so as the numbers and types of potential issues increase. As a strategy for reducing those resource requirements and allowing for a focus on more complicated cases, DoD implemented an automated process for screening and approving clean cases called electronic adjudication (eAdjudication).<sup>1</sup> The eAdjudication process consists of applying a set of business rules to the results of background investigations to identify cases that contain derogatory information. Cases with derogatory information are then routed to human adjudicators for review. If no derogatory information is found (i.e., the case is clean), the business rules generate an automated favorable eligibility determination.

DoD has used eAdjudication to successfully screen Office of Personnel Management (OPM) National Agency Check with Local Agency and Credit Check (NACLC) investigations since 2010 (Youpa, Leggitt, & Lang, 2012). According to the DoD Consolidated Adjudications Facility (CAF), implementation of these rules allowed for the cost avoidance of nearly \$3.2 million, or the salary equivalent of over 28 full-time personnel (Defense Information System for Security [DISS], 2012). In October 2015, the Federal Investigative Standards (FIS) Tier 3 (T3) investigation and the Tier 3 reinvestigation (T3R) replaced NACLC. T3 and T3R shared many, but not all, of the same investigative items (i.e., leads) as NACLC. These differences necessitated a review of the existing rules and development of new eAdjudication business rules, where required. Following validation of the T3 and T3R rules, the business rules were further modified and tested using Tier 1 (T1) cases. T1 consists of a subset of the investigative items that appear in T3, and the T3 rules served as a valuable starting point for finalizing the T1 rules. This report documents the validation of business rules for OPM T3/T3R and T1 investigation products.

## LEGACY EADJUDICATION

The Defense Personnel and Security Research Center (PERSEREC) conducted a program of research, dating back to 2003, to develop business rules for eAdjudication of personnel security and other types of background investigations. The purpose of this effort was to reduce costs and improve the consistency of access eligibility determinations. Initially, the research focused on developing business rules for NACLC investigations. It then shifted to other types of national

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<sup>1</sup> Executive Order 12968 of August 2, 1995, was amended by Executive Order 13467 of June 30, 2008, to authorize appropriate automated procedures for determining eligibility for access to classified information. eAdjudication is currently being established as an Executive Branch shared service.

## INTRODUCTION

security and employment suitability investigations. This work was instrumental in the creation of effective eAdjudication procedures for DoD. The NACL business rules became the federal standard following approval by the Security Executive Agent (Office of the Director of National Intelligence; see the Assistant Deputy Director of National Intelligence's eAdjudication business rules memorandum [2010]). eAdjudication was incorporated into the vision of national clearance reform, and it was the first major implementation of that effort to show beneficial results in support of transformation.

### **NACL eAdjudication Process**

The DoD production (i.e., implemented) version of NACL eAdjudication applied the Security Executive Agent-approved business rules to identify "clean" investigations. The investigation elements checked by the rules included the Case Closing Transmittal (CCT), Standard Form 86 (SF-86; Electronic Questionnaires for Investigations Processing), and credit report. The CCT summarizes the information provided in the report of investigation (ROI), to include a case seriousness code. Prior to closing an investigation, OPM assesses the significance of potential concerns and assigns a code to indicate the overall seriousness of the issues identified. The most common case seriousness codes include: 'G – No Issues', 'R – No Actionable Issues', 'A – Minor', 'B – Moderate', 'C – Substantial', and 'D – Major.' The CCT also lists the investigative items conducted and a summary of their results.

Figure 1 shows the basic steps in the NACL eAdjudication process. OPM sent ROIs electronically to the adjudication facility where they were ingested by the case management system and pre-checked for eAdjudication eligibility. To be eligible, case files had to be machine-readable, be labeled by OPM with case seriousness code 'G – No Issues' or 'R – No Actionable Issues', and include the subject's full name and Social Security Number (SSN). Next, the CCT was checked to ensure that all of the items required for a basic NACL investigation were listed (i.e., investigation scope check). Then the OPM credit score, Local Agency Check (LAC) results, and SF-86 items were checked for permissible values. Prior to rendering an outcome, the eAdjudication engine queried DoD security incident databases to check for incident reports associated with the subject of the investigation. If the various checks did not generate eAdjudication flags, the case was automatically granted Secret access eligibility. Otherwise, it was routed for human adjudication (HA).

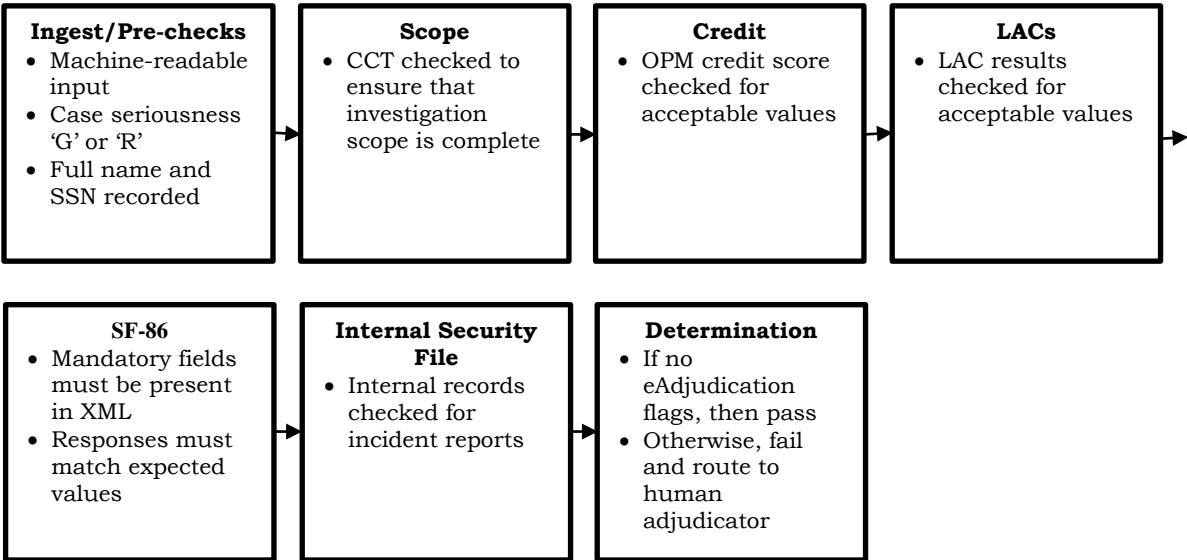


Figure 1 Basic Steps in the NACLCL eAdjudication Process

### T3 BUSINESS RULE DEVELOPMENT

PERSEREC collaborated with an interagency working group of personnel security and suitability experts on business rule development for T3/T3R investigations. The working group included representatives from DoD, OPM, Office of the Director of National Intelligence, and the Performance Accountability Council. The NACLCL business rules and process flow served as the basis for development of the T3 and T3R rules.

The NACLCL rules were reviewed in the context of the new FIS to account for differences in investigative scope items and any other new requirements. The working group met on a regular basis to determine acceptable results for required and conditional items that comprise the T3/T3R investigation. Rule development also benefited from close participation by OPM representatives knowledgeable about the specific item result codes used to indicate the outcome of investigative items. This in-depth understanding allowed expansion of acceptable item results (i.e., results indicating no issues were found) and may contribute to a greater eAdjudication pass rate for clean investigations.

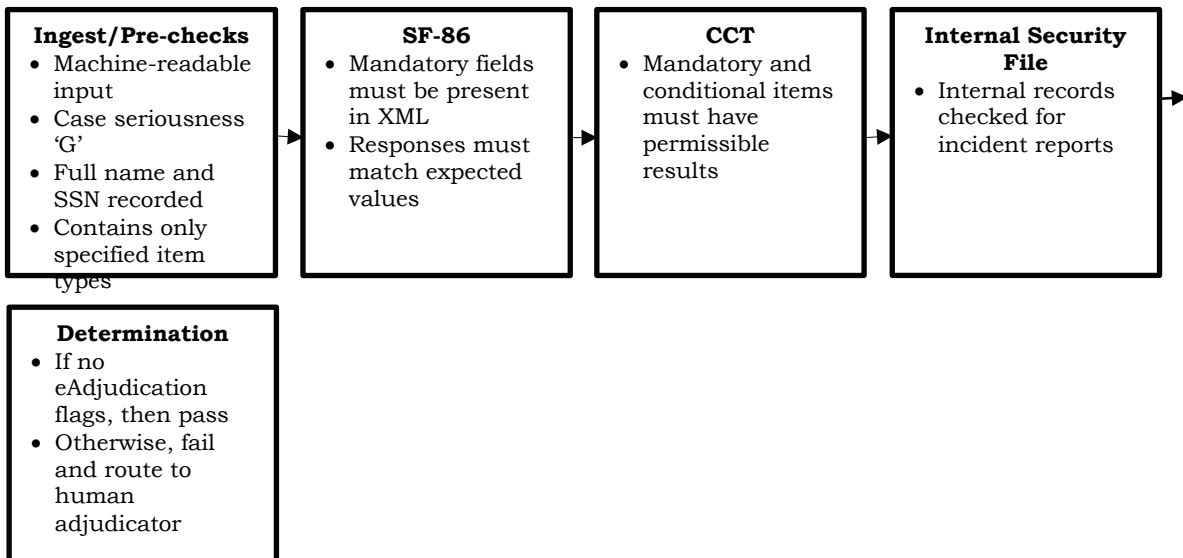
The initial results of the rule development process were documented using natural language in the same manner as NACLCL rules (Assistant Deputy Director of National Intelligence Memo [2010]). The DoD team responsible for DISS coded the rules into the DISS test environment that would be used for rule validation.

### T3 eAdjudication Process

As can be seen in Figure 2, T3 eAdjudication involves five steps (*Electronic Adjudication of Tier 3 Investigations and Tier 3 Reinvestigations Business Rules Document*, 2016). First, the business rule engine conducts pre-checks to determine

## INTRODUCTION

if the case is eligible for eAdjudication. Then expected values from the SF-86 are compared to the subject's responses. If a SF-86 field is not found in the extensible markup language (XML), or the value of a field does not match the expected value, the field fails and the case is flagged for human review. Next, the system inspects the CCT XML for required items and permissible results. The case is flagged for human review and adjudication if a mandatory item cannot be found or an item result is not defined as permissible. Also, if an unexpected item is located in the CCT, the case fails eAdjudication. After processing the CCT, the system checks internal security files to determine whether any incidents were reported after the start of the investigation. The case is flagged and fails eAdjudication if subject-related security incidents are found. If the ROI meets all of the requirements during eAdjudication processing, then the case automatically receives a favorable eligibility determination. If the ROI fails any of the checks, the case fails eAdjudication and is routed to a human adjudicator.



**Figure 2 Basic Steps in the T3 eAdjudication Process**

### Differences Between T3 and NACLC Business Rules

While the general screening approach remains similar, the eAdjudication business rules for T3 and T3R cases differ in some key ways from the NACLC eAdjudication rules. One of the notable differences is that only 'G – No Issues' cases are considered eligible for T3, T3R and T1 eAdjudication (i.e., 'R – No Actionable Issues' cases are not eligible). The Suitability Executive Agent (i.e., OPM) required the rule change because T3 is used for civilians who are newly hired into federal positions and must be adjudicated for suitability as well as personnel security. This more conservative approach will limit eAdjudication eligibility to cases characterized as devoid of potential suitability concerns. Excluding cases with non-actionable issues from eAdjudication will reduce the number of T3 cases automatically approved.

Another important difference is the inclusion of additional business rules and more detailed lists of acceptable values for CCT items, as mentioned previously. OPM's participation in the interagency working group provided more in-depth information about acceptable values for item results and this information was factored into the T3 and T3R business rules. Thus, the T3 approach includes business rules for all possible scope items and acceptable result combinations. The NACLC rules, on the other hand, included a relatively small number of CCT item result checks combined with checks of critical law enforcement, credit, and SF-86 items. This approach was based on research that showed 'G' and 'R' cases rarely, if ever, contained actionable personnel security concerns.

### **T1 BUSINESS RULE DEVELOPMENT**

Following the development of T3 rules, the working group requested PERSEREC assist in the development of rules for T1 eAdjudication. T1 replaces the National Agency Check with Inquiries investigations for both Suitability and Homeland Security Presidential Directive #12 (HSPD-12) determinations. The rule development process relied largely upon the rules created for T3 and T3R eAdjudication. T1 rules were, in general, simply a subset of those T3/T3R rules. The process of electronically adjudicating T1 cases is the same as the one shown in Figure 2 and described above.

### **T3, T3R, AND T1 BUSINESS RULE VALIDATION**

In addition to supporting the development of new business rules, PERSEREC tested the new rules to validate functioning. Validation was an important part of the development process to ensure that the new business rules function properly in a production environment. Even though it is desirable to approve automatically as many clean cases as possible to reduce costs, the eAdjudication rules must route all cases with potential concerns for HA to maintain security and suitability standards. The validation process involved rational assessment of proposed rules and outcome comparisons between electronic and HA to ascertain that cases with derogatory information were properly routed to human adjudicators.

## **METHOD**

### **METHOD**

The eAdjudication validation testing was conducted in multiple cycles for each set of business rules. The research team analyzed the data produced by the programming team; the method for producing the data is therefore not covered in detail. The testing cycles, data received, and other components of the methodology are described in the sections below.

### **TESTING CYCLES**

This report focuses on the four testing cycles that used T3 and T3R ‘G – No Issues’ cases. Business rules for T3R cases were introduced in the last two cycles.<sup>2</sup> For each of the four cycles that used T3 and T3R cases, the eAdjudication programming team ran the cases through the business rule engine and sent the results to PERSEREC for analysis. The analysis included a total of 3,726 ‘G – No Issues’ cases (T3 = 2,466 and T3R = 1,260) across the four testing cycles. Some of the cycles included cases that were analyzed in a previous cycle in order to increase the size of the convenience sample. Following the validation tests for T3 and T3R business rules, PERSEREC repeated the process for validation of the T1 rules. Again, this validation used a convenience sample of T1 cases (n = 1,547) that were assigned a case seriousness code of ‘G – No Issues.’

### **DATA**

For each test cycle, the programming team provided the eAdjudication results to PERSEREC analysts in a Microsoft Excel workbook containing three spreadsheets: basic case information, overall eAdjudication results, and specific issue flags including descriptions. PERSEREC also maintained spreadsheets for CCT and SF-86 rules, which served as a reference when exploring the issue flags generated in each cycle of testing. Flags occur when the values in a case file data element do not match the list of acceptable values in the eAdjudication business rules for that element. A case with one or more flags will fail eAdjudication and be routed to an adjudicator for a human determination.

### **ANALYSIS**

Upon receipt of the results for each testing cycle, PERSEREC documented the number of cases that passed or failed eAdjudication, as well as the number of cases flagged by each of the business rules. Then the rules were examined to ensure that they were working properly. This was accomplished by looking at relevant details to determine if flags were applied as intended. If potential problems were found, modifications were documented and proposed to the working group for

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<sup>2</sup> While many of the business rules applied to both T3 and T3R investigations, it was necessary to develop and test separate T3R rules for items that are conducted in reinvestigations only.

consideration. Each testing iteration resulted in changes to the eAdjudication business rule engine. In addition to eAdjudication results, the last two T3/T3R cycles included human eligibility determinations as a way to validate eAdjudication outcomes.<sup>3</sup> The human eligibility determinations served as the criterion for eAdjudication accuracy. That is, this analysis classified eAdjudication outcomes as accurate to the extent they were consistent with the human determination.

## **EADJUDICATION OUTCOME VALUES**

The results in all testing cycles included the following eAdjudication outcomes: Case Closed and HA. Case Closed was a favorable outcome because it indicated that the case passed eAdjudication (i.e., there were no flags during eAdjudication processing). HA was an unfavorable outcome because the case failed eAdjudication due to one or more flags and must be routed to an adjudicator for human determination.

## **HUMAN DETERMINATION OUTCOME VALUES**

Human determination results varied slightly depending on the investigation type (T3/T3R versus T1). DoD CAF provided human determinations.

### **T3 and T3R Human Determination Values**

Human determination outcomes (i.e., access eligibility determinations) were categorized as either favorable or unfavorable. Favorable indicates that eligibility was granted, whereas unfavorable indicates either denial or revocation of eligibility. The complete sample included the following favorable human determination outcomes: Top Secret, Secret, Position of Trust, and Favorable. As expected, there were no obviously unfavorable eligibility determinations for these OPM-designated “No Issues” cases. As such, there were no data available to verify that eAdjudication correctly rejected cases that received clearly unfavorable human determinations.

The sample also included cases where the determination was Loss of Jurisdiction or No Determination Made.<sup>4</sup> These outcomes do not fall neatly into either the favorable or unfavorable category. The CAF verified that these cases were, in fact, clean and would have been granted Secret access eligibility; however, they were dropped from the final analysis because they did not provide a clear criterion for assessing eAdjudication accuracy.

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<sup>3</sup> Human eligibility determinations are the outcome of adjudication by a trained human adjudicator. For example, the outcome of a T3 case may be Secret access eligibility.

<sup>4</sup> “No Determination Made” indicated that a human adjudicator had reviewed and closed the case but did not make a final determination to grant or deny access eligibility. “Loss of Jurisdiction” meant that the subject was no longer within the adjudication facility’s jurisdiction.

## METHOD

### T1 Human Determination Values

Just as with T3 and T3R outcome values, T1 outcome values were classified as favorable, unfavorable, or requiring more information. For T1 cases, the human determination result indicated whether the case was favorably adjudicated either for suitability/fitness or HSPD-12, or if a transfer of jurisdiction (TOJ) was made. DoD CAF only makes favorable determinations for suitability and HSPD-12; any case of potential concern is transferred back to the office that submitted the request for investigation.

None of the cases that had favorable eAdjudication outcomes should have had TOJ results for HA determination. However, a number of cases did have TOJ results. DoD CAF personnel reviewed these cases and found that all should have been granted a favorable determination. They found that, for these cases, human adjudicators were mistakenly determining that they were childcare cases and had to be returned to the component and should have received a favorable determination. In addition, a number of cases had NULL results for both the Suitability and HSPD-12 determination. DoD CAF personnel reviewed these cases as well and determined that most of them should have been granted a favorable determinations.

### HUMAN AND EADJUDICATION OUTCOME COMPARISONS

The analysis categorized the combined human determination and eAdjudication outcomes for each case as hits, correct rejections, false alarms, or misses. As shown in Table 1, hits and correct rejections each indicated agreement between eAdjudication and human determination outcomes (i.e., eAdjudication met the criterion set by HA). Misses and false alarms indicated disagreement.

**Table 1**  
**Interpretation of eAdjudication Results with Human Determination as Criterion**

<b>eAdjudication Outcome</b>	<b>Human Outcome</b>	
	<b>Favorable</b>	<b>Unfavorable</b>
Favorable	<i>Hits</i>	<i>Misses</i>
Unfavorable	<i>False Alarms</i>	<i>Correct Rejections</i>

Hits occurred when both eAdjudication and human determination outcomes were favorable. Correct rejections occurred when both eAdjudication and human determination outcomes were unfavorable. Hits and correct rejections both support the efficacy of the eAdjudication business rules.

Misses and false alarms indicated a lack of agreement between eAdjudication and human determination outcomes (i.e., eAdjudication did not meet the criterion set by HA). Misses are a favorable eAdjudication outcome and an unfavorable human determination, which represents a failure of the eAdjudication business rules. In the event of a miss, the eAdjudication business rules failed to identify potentially



adverse information that should require human review. The present analysis did not identify any misses.

False alarms (i.e., an unfavorable eAdjudication outcome and a favorable human determination) indicated that the eAdjudication business rules used overly conservative screening criteria and failed a case that could have passed. In other words, the information that caused the case to fail eAdjudication was not of sufficient concern to result in an unfavorable human determination. In-depth analysis of false alarms has the potential to identify changes to the business rules to increase the number of cases that pass eAdjudication.

## RESULTS

### RESULTS

Analyses were performed over multiple cycles of testing for each set of business rules. After each round of analysis the results were reported to the working group to identify strategies for resolving any issues identified such as revising the coding of the business rule or the pool of acceptable values for the rule. In some cases, it was necessary to perform additional research to determine the exact nature of the problem by reviewing the ROI. The following sections describe the cycles of analysis and outcomes for each set of business rules.

#### TIER 3 AND TIER 3R RESULTS

A total of five testing cycles were completed for T3/T3R rule validation; however, only the results for the four eAdjudication testing cycles that used T3/T3R cases are summarized below. The first T3 cycle used NACLC and Access National Agency Check with Inquiries 'G' cases because a sufficient number of Tier 3 cases had not yet been completed. The effort was made to use these cases because they included many of the same investigative checks. While somewhat useful, the differences among the investigation types (NACLC, Access National Agency Check with Inquiries, and T3) were too significant, so the first cycle of results are not included in the analysis.

##### **Cycle 2 Part 1 (Data Received 12/22/2015)**

This was the first test of the T3 business rules with T3 investigations. There were 314 'G' cases in this sample, including 256 T3 and 58 T3R investigations. Note that there were no separate rules for T3R cases at this time; therefore, this cycle only tested T3 business rules. The number of T3R cases in this sample is reported for documentation purposes only. All of the cases in the sample failed eAdjudication (i.e., they were flagged by at least one of the eAdjudication rules).<sup>5</sup> Almost all of the 256 T3 cases were flagged by the 'FBIF' rule in this test (see Appendix A for a list of OPM item types).<sup>6</sup> Table 2 shows the number of T3 flags for each pertinent eAdjudication rule (flags based on T3R investigations are not included). Additional information about the business rules can be found in the *Electronic Adjudication of Tier 3 Investigations and Tier 3 Reinvestigations Business Rules Document (2016)*.

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<sup>5</sup> Failing eAdjudication means that the case contained one or more potential concerns and would have to be reviewed by a human adjudicator.

<sup>6</sup> The rules are described by the scope item only because the actual rules have a document control designation of For Official Use Only.

**Table 2**  
**Cycle 2 Part 1 T3 eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
FBIF	ADJ_CHECK_441	255
EDUC	ADJ_CHECK_423	32
EMPL	ADJ_CHECK_422	21
MILR	ADJ_CHECK_414	7
OTHER ITEMS-Absent	ADJ_CHECK_440	6
SESE	ADJ_CHECK_439	2
INVA	ADJ_CHECK_415	1
Civil Court Actions	ADJ_CHECK_087	1
Employment-Dismissals	ADJ_CHECK_028	1
Employment-Fired	ADJ_CHECK_027	1

### **Summary of Business Rule and Other Modifications**

The 'FBIF' rule was modified based on the results of this cycle. Additional business rule modifications were postponed pending receipt of additional T3 and T3R data. T3 business rule development was prioritized over development of T3R rules at this time, and it was noted that there will be some rules that only apply to T3R cases, which would be developed in subsequent cycles.

### **Cycle 2 Part 2 (Data Received 1/2/2016)**

There were 1,926 'G' cases in the Cycle 2 Part 2 sample, which included 1,342 T3 and 584 T3R investigations. All of the T3R cases again failed eAdjudication because there were no T3R-specific business rules at this time. A total of 935 (70%) T3 cases passed and 407 (30%) failed eAdjudication in this cycle. Most of the T3 flags in this test were due to the 'EDUC' and 'EMPL' business rules. Table 3 shows the number of T3 flags for each pertinent eAdjudication rule (flags based on T3R investigations are not included).

## RESULTS

**Table 3  
Cycle 2 Part 2 T3 eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
EDUC	ADJ_CHECK_423	180
EMPL	ADJ_CHECK_422	117
Selective Service	ADJ_CHECK_014	80
OTHER ITEMS-Absent	ADJ_CHECK_440	32
MILR	ADJ_CHECK_414	18
SESE	ADJ_CHECK_439	15
Relative Citizenship	ADJ_CHECK_036	8
Foreign Travel-Threats	ADJ_CHECK_058	5
Foreign Travel-Police	ADJ_CHECK_053	5
Foreign Travel-Military	ADJ_CHECK_054	5
Foreign Travel-CI	ADJ_CHECK_055	5
Foreign Travel-Interest	ADJ_CHECK_056	5
Foreign Travel-Information	ADJ_CHECK_057	5
Illegal Drugs	ADJ_CHECK_064	3
Cohabitant SSN	ADJ_CHECK_340	3
Police Record	ADJ_CHECK_061	3
Current Spouse SSN	ADJ_CHECK_337	2
LAWE	ADJ_CHECK_412	2
INVA	ADJ_CHECK_415	2
Applicant Citizenship	ADJ_CHECK_023	2
Military History	ADJ_CHECK_017	2
Civil Court Actions	ADJ_CHECK_087	1
Government Foreign Travel	ADJ_CHECK_102	1
Applicant POB	ADJ_CHECK_104	1
Applicant SSN	ADJ_CHECK_410	1
Spouse Citizenship	ADJ_CHECK_033	1
Employment-Dismissals	ADJ_CHECK_028	1
Employment-Fired	ADJ_CHECK_027	1

### **Summary of Business Rule and Other Modifications**

The working group began establishing separate business rules for T3R investigations during this test cycle. In addition, during this cycle, researchers noticed that cases were flagged erroneously because “Pending” results were not populating the XML version of the CCT. This resulted in cases failing eAdjudication for checks in which “Pending” was an acceptable result.<sup>7</sup> Subsequently, OPM began

<sup>7</sup> “Pending” is an OPM item result that means completion of the investigative item is unfinished. For some items, “Pending” was considered an acceptable result because they often are incomplete when cases are forwarded from OPM to the agency for adjudication.

researching the problem. The following business rules also were modified based on the results of this cycle: Selective Service (ADJ\_CHECK\_014), SESE (ADJ\_CHECK\_439), Foreign Travel (ADJ\_CHECK\_53-57), Government Foreign Travel (ADJ\_CHECK\_102), Employment-Fired (ADJ\_CHECK\_27), Employment-Dismissals (ADJ\_CHECK\_28), MILR (ADJ\_CHECK\_414), Spouse Citizenship (ADJ\_CHECK\_033), and Current Spouse SSN (ADJ\_CHECK\_337). Rule modifications were meant to ensure that the business rules functioned as intended.

**Cycle 3 (Data Received 2/1/2016)**

The sample for the Cycle 3 test included 1,935 ‘G’ cases: T3 = 1,349 and T3R = 586. A total of 983 (73%) T3 cases passed and 366 (27%) failed eAdjudication in this test cycle. All of the T3R cases failed eAdjudication because this test did not include T3R-specific business rules. The ‘EDUC’ and ‘EMPL’ business rules were responsible for most of the flags in this test. Note that many of the same cases were run against similar sets of business rules in each cycle. Consequently, the results for some of the rules were similar in each iteration. Table 4 shows the number of T3 flags for each pertinent eAdjudication rule (flags based on T3R investigations are not included).

**Table 4  
Cycle 3 T3 eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
EDUC	ADJ_CHECK_423	180
EMPL	ADJ_CHECK_422	117
Selective Service	ADJ_CHECK_014	53
OTHER ITEMS-Present	ADJ_CHECK_429	32
OTHER ITEMS-Absent	ADJ_CHECK_440	32
MILR	ADJ_CHECK_414	11
Relative Citizenship	ADJ_CHECK_036	8
SESE	ADJ_CHECK_439	7
Cohabitant SSN	ADJ_CHECK_340	3
Illegal Drugs	ADJ_CHECK_064	3
Police Record	ADJ_CHECK_061	3
INVA	ADJ_CHECK_415	2
LAWE	ADJ_CHECK_412	2
Military History	ADJ_CHECK_017	2
Applicant Citizenship	ADJ_CHECK_023	2
Civil Court Actions	ADJ_CHECK_087	1
Applicant POB	ADJ_CHECK_104	1
Applicant SSN	ADJ_CHECK_410	1
Current Spouse SSN	ADJ_CHECK_337	1

## RESULTS

### **Summary of Business Rule and Other Modifications**

OPM Technical Services approved a change request to include a 'PE – Pending' result in the XML for all case types, but the completion date for this change was unknown at the end of the test cycle. This change would solve the "Pending" problem identified in the previous cycle. The following business rules were modified based on the results of this cycle: Military History (ADJ\_CHECK\_017), MILR (ADJ\_CHECK\_414), and Applicant SSN (ADJ\_CHECK\_410).

### **Cycle 4 (Data Received 2/11/2016)**

There were 3,014 cases in this sample: T3 = 2,245 and T3R = 769. A total of 1,311 (58%) T3 cases passed and 934 (42%) failed eAdjudication. The lower percentage of cases that passed eAdjudication in this cycle may have been due, in part, to persons who failed the MILR check because they were attending a military academy. Persons attending an academy would not have a military record unless they were prior service, and, therefore, would fail the eAdjudication MILR check if they indicated military service in the Electronic Questionnaires for Investigations Processing. Additionally, many T3 cases were flagged unnecessarily due to pending item results for education and employment checks that did not appear in the XML item index. As mentioned above, OPM was working toward a solution to this problem. This cycle also included eAdjudication business rules specifically for T3R investigations. A total of 582 (76%) T3R cases passed and 187 (24%) failed eAdjudication based on this set of rules. Tables 5 and 6 show the number of flags for each pertinent eAdjudication rule in T3 and T3R cases respectively.

**Table 5**  
**Cycle 4 T3 eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
EMPL	ADJ_CHECK_422	378
EDUC	ADJ_CHECK_423	320
Selective Service	ADJ_CHECK_014	152
MILR	ADJ_CHECK_414	149
OTHER ITEMS-Present	ADJ_CHECK_429	93
OTHER ITEMS-Absent	ADJ_CHECK_440	93
INVA	ADJ_CHECK_415	15
Relative Citizenship	ADJ_CHECK_036	14
SESE	ADJ_CHECK_439	13
Applicant POB	ADJ_CHECK_104	12
Foreign Contacts	ADJ_CHECK_037	12
Applicant Citizenship	ADJ_CHECK_023	12
Illegal Drugs	ADJ_CHECK_064	10
Cohabitant SSN	ADJ_CHECK_340	5
Foreign Conferences	ADJ_CHECK_047	4
Current Spouse SSN	ADJ_CHECK_337	4
Police Record	ADJ_CHECK_061	3
Foreign National Sponsored	ADJ_CHECK_049	2
LAWE	ADJ_CHECK_412	2
Civil Court Actions	ADJ_CHECK_087	2
Foreign Passport	ADJ_CHECK_025	1
Military History	ADJ_CHECK_017	1
Foreign Financial Interests	ADJ_CHECK_038	1
Foreign Job Offers	ADJ_CHECK_045	1
Foreign Government Contacts	ADJ_CHECK_048	1
Foreign Travel-Police	ADJ_CHECK_053	1
Delinquent Accounts	ADJ_CHECK_083	1
Applicant SSN	ADJ_CHECK_410	1
Illegal Drug Use	ADJ_CHECK_065	1

**Summary of Business Rule and Other Modifications (T3)**

During this cycle, researchers found that deleted and canceled items were not showing up on the CCT but were passed through in the XML.<sup>8</sup> To avoid invalid eAdjudication flags for these items, OPM's technical team began work to ensure that deleted and canceled items are no longer present in the XML. In addition, in reviewing the results of this cycle, the working group decided against altering the

<sup>8</sup> Deleted and canceled items are investigative leads that OPM no longer intends to conduct.

## RESULTS

Selective Service business rules. As a result, some cases will fail eAdjudication if the subject claims that he was not registered with Selective Service even when the check returns a result that the subject was registered. Contact method 'R' (Record) for employment checks was added to the business rules. Employment contact method 'R' will have the same permissible results as contact method 'T' (Telephone). The code will be updated to include 'PE' (Pending) as an acceptable value for completion method 'T' (Inquiry) after years 1 – 3 of the employment record.

**Table 6**  
**Cycle 4 T3R eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
OTHER ITEMS-Present	ADJ_CHECK_448	94
OTHER ITEMS-Absent	ADJ_CHECK_449	94
INVA	ADJ_CHECK_415	33
Applicant POB	ADJ_CHECK_104	14
Military History	ADJ_CHECK_017	12
Selective Service	ADJ_CHECK_014	11
Current Spouse SSN	ADJ_CHECK_337	11
FNCN	ADJ_CHECK_446	7
Civil Court Actions	ADJ_CHECK_087	6
Applicant Citizenship	ADJ_CHECK_023	5
Foreign Conferences	ADJ_CHECK_047	4
Cohabitant SSN	ADJ_CHECK_340	4
Relative Citizenship	ADJ_CHECK_036	3
Foreign Contacts	ADJ_CHECK_037	3
FBIF	ADJ_CHECK_441	3
Foreign Travel-Police	ADJ_CHECK_053	2
Foreign Financial Interests	ADJ_CHECK_038	2
Foreign Countries Visited	ADJ_CHECK_103	2
LAWE	ADJ_CHECK_412	2
MILR	ADJ_CHECK_414	2
FBIF	ADJ_CHECK_442	2
Delinquent Accounts	ADJ_CHECK_083	2
Foreign Travel-Military	ADJ_CHECK_054	1
Foreign Government Contacts	ADJ_CHECK_048	1
SIIC	ADJ_CHECK_403	1
Foreign Advice/Support	ADJ_CHECK_043	1
FBFN	ADJ_CHECK_406	1
Spouse Citizenship	ADJ_CHECK_033	1
Employment-Fired etc.	ADJ_CHECK_026	1
EDUC	ADJ_CHECK_444	1



**Summary of Business Rule and Other Modifications (T3R)**

The T3R business rules were not modified as a result of this test cycle. However, the working group agreed to discuss the possibility of additional T3R testing after the T3 results from this cycle were incorporated into the source code.

**Cycle 5 (Data Received 3/22/2016)**

There were 713 cases in this sample: T3 = 221 and T3R = 492. A total of 48 (22%) T3 cases passed and 173 (78%) failed eAdjudication. Roughly one half of the eAdjudication flags for T3 cases were due to the previously noted XML item index “pending” problem for education and employment checks. This cycle also included eAdjudication business rules specifically for T3R investigations. A total of 284 (58%) T3R cases passed and 207 (42%) failed eAdjudication based on this set of rules. One T3R case in this sample was case status “OC – Investigation Completed.” Tables 7 and 8 show the number of flags for each pertinent eAdjudication rule in T3 and T3R cases respectively.

## RESULTS

**Table 7**  
**Cycle 5 T3 eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
EMPL	ADJ_CHECK_422	98
MILR	ADJ_CHECK_414	58
EDUC	ADJ_CHECK_423	54
OTHER ITEMS-Present	ADJ_CHECK_429	26
OTHER ITEMS-Absent	ADJ_CHECK_440	26
Foreign Contacts	ADJ_CHECK_037	6
Relative Citizenship	ADJ_CHECK_036	5
Selective Service	ADJ_CHECK_014	5
Applicant POB	ADJ_CHECK_104	5
Cohabitant SSN	ADJ_CHECK_340	4
Applicant Citizenship	ADJ_CHECK_023	4
INVA	ADJ_CHECK_415	4
Foreign Conferences	ADJ_CHECK_047	2
Civil Court Actions	ADJ_CHECK_087	1
Military History	ADJ_CHECK_017	1
Foreign Financial Interests	ADJ_CHECK_038	1
Foreign Real Estate	ADJ_CHECK_040	1
Employment-Fired etc.	ADJ_CHECK_026	1
Foreign Government Contacts	ADJ_CHECK_048	1
Foreign Travel-Searches	ADJ_CHECK_052	1
Illegal Drugs	ADJ_CHECK_064	1
Delinquent Accounts	ADJ_CHECK_083	1
Current Spouse SSN	ADJ_CHECK_337	1
SIIC	ADJ_CHECK_403	1
FBFN	ADJ_CHECK_406	1
SESE	ADJ_CHECK_439	1
Illegal Drugs-Counseling	ADJ_CHECK_069	1

### **Summary of Business Rule and Other Modifications (T3)**

Programming changes for pending items/blank XML and deleted/canceled items on the CCT were in progress during this cycle. There were no other modifications to report as a result of this testing cycle.

**Table 8**  
**Cycle 5 T3R eAdjudication Flags**

<b>Rule Description</b>	<b>Rule Code</b>	<b>Flag Count</b>
OTHER ITEMS-Present	ADJ_CHECK_448	148
OTHER ITEMS-Absent	ADJ_CHECK_449	147
Applicant POB	ADJ_CHECK_104	15
Selective Service	ADJ_CHECK_014	15
INVA	ADJ_CHECK_415	12
Current Spouse SSN	ADJ_CHECK_337	12
FNCN	ADJ_CHECK_446	11
Applicant Citizenship	ADJ_CHECK_023	11
Relative Citizenship	ADJ_CHECK_036	9
FBIF	ADJ_CHECK_441	7
Civil Court Actions	ADJ_CHECK_087	5
Cohabitant SSN	ADJ_CHECK_340	5
Former Spouse Citizenship	ADJ_CHECK_034	4
Foreign Conferences	ADJ_CHECK_047	3
MILR	ADJ_CHECK_414	3
EMPL	ADJ_CHECK_445	2
Spouse Citizenship	ADJ_CHECK_033	2
EDUC	ADJ_CHECK_444	2
Foreign Contacts	ADJ_CHECK_037	2
Foreign Government Contacts	ADJ_CHECK_048	2
OPF	ADJ_CHECK_420	2
Delinquent Accounts	ADJ_CHECK_083	1
Foreign National Sponsored	ADJ_CHECK_049	1
Police Record Offenses	ADJ_CHECK_062	1
FBIF	ADJ_CHECK_442	1
Foreign Passport	ADJ_CHECK_025	1
SIIC	ADJ_CHECK_403	1
Foreign Financial Interests	ADJ_CHECK_038	1

**Summary of Business Rule and Other Modifications (T3R)**

The development team conducted initial testing on the programming changes for pending items/blanks and deleted/canceled items during this cycle. Also, both FBIF and FBFN are conditional for T3R cases, but at least one should be present. The rules were revised to say that either FBIF or FBFN must be present; this addresses the concern that some cases may be closed without either a FBIF or FBFN. That is, the eAdjudication business rules will flag cases that do not have one or the other item present.

## RESULTS

### Outcome Comparisons for Cycles 4 and 5 Data Combined

In order to test the accuracy of eAdjudication results, researchers combined data from Cycles 4 and 5 and obtained the human determination results as a criterion. This allowed researchers to determine how frequently eAdjudication results were accurate, as described above.

#### T3 Cases

A total of 1,359 (55%) T3 cases passed and 1,107 (45%) failed eAdjudication in the combined sample. The T3 human determination outcomes in this sample included favorable determinations for Secret eligibility (n = 2,436), Position of Trust (n = 5), and Favorable (n = 3). There were no unfavorable determinations, but the sample included Loss of Jurisdiction (n = 13) and No Determination Made (n = 9) cases, all of which were dropped from further analysis because no final determination was made by DoD CAF.<sup>9</sup>

The eAdjudication and human determination matches in this sample were considered hits. The hits (n = 1,349) demonstrated the efficacy of the eAdjudication business rules for determining cases to the same favorable outcome as human adjudicators. The sample also included 1,095 (45%) false alarms, which could suggest that the eAdjudication business rules were too stringent. While false alarms represent potential inefficiencies in the business rules, they are not an obstacle to implementing the rules because they do not represent a security concern (i.e., nobody is incorrectly granted eligibility). Table 9 shows the frequency and percentage of hits, misses, false alarms, and correct rejections in this sample.

**Table 9**  
**Frequency and Percentage of Hits, Misses, False Alarms, and Correct Rejections for T3 Cases (n = 2,444)**

eAdjudication Outcome	Human Outcome	
	Favorable	Unfavorable
<i>Favorable</i>	Hits: 1,349 (55%)	Misses: 0 (0%)
<i>Unfavorable</i>	False Alarms: 1,095 (45%)	Correct Rejections: 0 (0%)

#### T3R Cases

A total of 866 (69%) T3R cases passed and 394 (31%) failed eAdjudication. The T3R human determination outcomes in this sample included favorable determinations for Secret eligibility (n = 1,243), Position of Trust (n = 12), and Top Secret (n = 1). There were no unfavorable determinations, but the sample included Loss of Jurisdiction (n = 4) cases, all of which were dropped from further analysis because no final determination was made. The eAdjudication and human determination

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<sup>9</sup> DoD CAF verified that these cases were clean, but with no final human determination, they did not make a clear criterion for eAdjudication because their access eligibility was not determined.

matches were considered hits (n = 863). The sample also included 393 (31%) false alarms. Table 10 shows the frequency and percentage of hits, misses, false alarms, and correct rejections in this analysis.

**Table 10**  
**Frequency and Percentage of Hits, Misses, False Alarms, and Correct Rejections for T3R Cases (n = 1,256)**

<b>eAdjudication Outcome</b>	<b>Human Outcome</b>	
	<b>Favorable</b>	<b>Unfavorable</b>
<i>Favorable</i>	Hits: 863 (69%)	Misses: 0 (0%)
<i>Unfavorable</i>	False Alarms: 393 (31%)	Correct Rejections: 0 (0%)

**T1 RESULTS**

Just as with T3 and T3R rule development, T1 rule development proceeded in a series of cycles. Here, each cycle of data was a superset of the prior data set, and therefore, included all previous cases. As a result, the findings presented here are based only upon the final set of data, which includes all T1 cases received by PERSEREC.

In total, there were 1,547 cases used for T1 rule development. Of these, 234 (15.1%) were HPSD-12 cases, and 1,313 (84.9%) were Suitability cases. Just as with T3 cases, Table 11 below shows the percentage of hits, misses, false alarms, and correct rejections in this analysis.

**Table 11**  
**Frequency and Percentage of Hits, Misses, False Alarms, and Correct Rejections for T1 Cases (n = 1,547)**

<b>eAdjudication Outcome</b>	<b>Human Outcome</b>	
	<b>Favorable</b>	<b>Unfavorable</b>
<i>Favorable</i>	Hits: 733 (47%)	Misses: 0 (0%)
<i>Unfavorable</i>	False Alarms: 714 (46%)	Correct Rejections: 100 (6%)

The results in Table 11 above suggest that T1 eAdjudication business rules function extremely conservatively, with approximately equal rates of hits and false alarms. The relatively high false alarm rate and absence of misses indicate that the rules for T1 eAdjudication are therefore extremely low-risk of erroneously approving a case that would receive an unfavorable human determination.

## **DISCUSSION**

### **DISCUSSION**

The results of validation testing support the implementation of T3, T3R, and T1 eAdjudication business rules. Adding T1 rules to the eAdjudication capability allows for successful eAdjudication of not only Secret eligibility cases, but also both Suitability and HSPD-12 cases. Next steps for eAdjudication include making it a shared service that will be available to any Executive Agency that chooses to participate.

While a majority of the cases passed eAdjudication and could have received an automatic favorable determination, the stringency of the business rules resulted in the eAdjudication failure of many cases that received favorable human determinations. This demonstrates that the eAdjudication rules are conservative and ensures that human adjudicators have an opportunity to review cases that have any possibility of containing information of concern. However, it also indicates that there may be revisions that could improve the eAdjudication pass rate and increase the benefits associated with eAdjudication.

The conservative nature of the rules is further supported by very few, if any, 'G' cases ever receiving a negative human eligibility determination. However, this also makes it difficult to test for misses and correct rejections. In the future, the rules could be tested against cases that received a denial or revocation regardless of the cases seriousness code (i.e., other than G cases) to verify that the business rules flag such cases.

### **OVERALL EADJUDICATION PASS RATE**

The data available for validation testing were not appropriate for estimating overall pass rates; that requires information about the total number of each case type and the percentage of the total that are 'G' cases. At the time of testing, the new investigation case types were implemented recently and too few cases were available to produce reliable estimates of these numbers.

In addition, subsequent to validation testing, OPM completed programming changes to modify the way pending, deleted, and cancelled cases appear in the data, and this will affect eAdjudication pass rates. As a result of these changes, deleted and canceled items no longer appear in the data and the result for pending items changed from blank to 'Pending.' Both of these issues caused unnecessary eAdjudication failures, so approval rates should increase and false alarms decrease as a result.

### **BUSINESS RULE APPROVAL**

Before eAdjudication can be implemented it must be approved by the Security and Suitability Executive Agents as it falls within their spheres of oversight. This also helps ensure eAdjudication procedures are uniform throughout the Federal Government. The Executive Agents approved the T3/T3R business rules in

September 2016 and DoD CAF is using them successfully. Executive agents approved the T1 business rules in March 2017 and DoD CAF will be implementing them soon.

### RECOMMENDATIONS

PERSEREC makes the following recommendations based on the results of this analysis.

- Conduct additional research with cases at all issue seriousness levels that resulted in an unfavorable human determination to test for eAdjudication misses and correct rejections.
- Research ways to safely approve more cases through eAdjudication. PERSEREC has established a business rule test environment that can be used to evaluate new rules independent of the production system.
- Perform regular eAdjudication audits to ensure proper functioning. This will require additional HA of cases that pass eAdjudication. However, the sample size may be relatively small to minimize costs. For example, after implementing NACLIC eAdjudication, a one percent random sample of cases was audited periodically to verify that eAdjudication outcomes matched human determinations.

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## REFERENCES

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**APPENDIX A:  
OPM ITEM TYPES**

APPENDIX A

**Table A-1  
OPM Item Types**

<b>Item Type</b>	<b>Description</b>
BAR	BAR Check Inquiry
BVS	Bureau of Vital Statistics
CGIN	Coast Guard Intelligence
CIAO	CIA Operations Search
CIAS	CIA Security Search
CRED	Credit Search
DCIF	DCII File Request
DCII	DCII Search
DISC	DISCO Search
DMV	Driving Record
EDUC	Education
EMPL	Employment
FBFN	FBI Fingerprint Name
FBIF	FBI Fingerprint Search
FBIN	FBI Name Search
FBNF	FBI Name File Request
FINL	Financial Records – Loan Records
FMSP	Former Spouse
FNCN	FINCEN
GENL	General Coverage
INS	INS Search
INSF	INS File Request
INVA	Investigative Agency
LAWE	Law Enforcement
MEDI	Medical Records
MILR	Military Records
NACP	NAC/PAC
NATG	National Guard
NCIC	Interstate Identification Index
OPF	Official Personnel File
OUTS	Outside USA
PERI	Periodicals
PRSI	Personal Interview
PUBH	Public Health Service
PUBR	Public Record
REFE	References
RESI	Residences

<b>Item Type</b>	<b>Description</b>
SCHR	State Criminal History Repository
SCIO	Spouse/COHAB CIA Operations Search
SCIS	Spouse/COHAB CIA Security Search
SDCF	Spouse/COHAB DCII File Request
SDCI	Spouse/COHAB DCII Search
SECF	Security File
SESE	Selective Service
SFBN	Spouse/COHAB FBI Name Search
SFNF	Spouse/COHAB FBI Name File Request
SFPN	Spouse FP Name Check
SII	SII Search
SIIF	SII File Request
SINF	Spouse/COHAB INS File Request
SINS	Spouse/COHAB INS Search
SPIN	Special Interview
SSIF	Spouse/COHAB SII File Request
SSII	Spouse/COHAB SII Search
STPA	State Department Passport
STSC	State Security Office
SUBS	Substance Involvement