

Systems Delivery and Project Portfolio Management (SDPPM)

AFIS Renewal

ANNEX B TO APPENDIX A: AFIS DETAILED REQUIREMENTS

Last Updated Date: 2016-06-21

Status: Final

Version: 2

RDIMS Document No.: 42268v14b



TABLE OF CONTENTS

1. INTRODUCTION.....	1
1.1 General.....	1
1.2 AFIS Renewal Concept.....	1
1.3 Document Organization	1
1.4 Definitions.....	2
1.5 Composite Requirement	3
2. AFIS RENEWAL ARCHITECTURE AND WORKFLOW.....	4
2.1 AFIS Renewal Detailed Architecture.....	4
2.1.1 NNS/AFIS INTERFACE	4
2.1.2 AFIS LOAD BALANCING TO FINGERPRINT SEARCH CAPABILITIES	5
2.1.3 AFIS INTERFACE TO VSS	5
2.1.4 AFIS WORKSTATION USER INTERFACE TO AFIS SERVERS	5
2.1.5 AFIS VIRTUAL LOCAL AREA NETWORK (VLAN).....	5
2.2 AFIS Renewal Workflow	6
2.2.1 CRIMINAL TEN PRINT SUBMISSION (CAR) Y WORKFLOW	7
3. GENERAL AFIS REQUIREMENTS.....	12
3.1 AFIS COTS Compliance	12
3.2 Paperless Environment.....	13
3.3 Logging of Transaction Activities	13
3.4 Workflow Management and Related Services	16
3.4.1 WORK IN PROGRESS.....	16
3.4.2 WORKFLOW RULES.....	17
3.4.3 PRIORITY OF WORK.....	17
3.4.4 ORDER OF PROCESSING	17
3.4.5 OPERATIONAL CONTROL AND WORKLOAD MONITORING.....	18
3.4.6 WORK QUEUE FEATURES.....	19
3.5 Operational Reporting and Statistics.....	23
3.6 Volumetrics and Service Delivery	40
3.7 AFIS User Interface Feature	47
3.8 Administrative Capabilities.....	53
4. TEN PRINT PROCESSING	55
4.1 General.....	55
4.2 Extract and Save	57
4.3 Electronic Quality and Sequence Check.....	58
4.4 Ten Print Manual Quality Control.....	59
4.5 One-to-One Ten Print Search.....	61
4.6 One-to-Many Ten Print Search	62
4.7 Ten Print Verification.....	63
4.8 Ten Print Certification	65
4.9 Search Conclusion.....	67

4.10	Ten Print Amend	69
4.11	Ten Print Delete	70
4.12	Fingerprint Image Request	71
4.13	Special Search and File Requests	72
4.14	Retention of Fingerprints and Photos.....	72
4.15	Fingerprint Endorsement	73
5.	LATENT FINGERPRINT PROCESSING	75
5.1	Latent Workflows	75
5.1.1	CENTRAL LATENT WORKFLOW	78
5.1.2	REMOTE LATENT WORKFLOW	86
5.2	Latent Fingerprint Search Request	90
5.3	Encoding and Latent Searching.....	90
5.4	General Latent User Interface Features.....	92
5.5	Latent Verification	93
5.6	Latent Cancellation Handling	94
5.7	Latent Certification	95
5.8	Search Conclusion.....	97
5.9	Reverse Search	97
5.10	Unsolved Latent Delete/Amendment	98
5.11	ULF Purge and Retention	99
5.12	International Latent Fingerprint Features Search Requests.....	100
5.13	Special Search and File Requests	101
5.14	Management of Remote Sites	101
6.	AFIS DIRECT FILING/SCANNING REQUIREMENTS	104
6.1	General	104
6.1.1	UNIQUE IDENTIFIERS AND LOGGING	105
6.1.2	FORMATS AND SCANNING	105
6.1.3	RESOLUTION.....	106
6.1.4	SEGMENTATION	106
6.1.5	USER INTERFACE.....	107
6.2	Direct Filing.....	107
6.3	Direct Scanning	108
7.	PALM AND EXTRACTION REQUIREMENTS	109
7.1	Palm Print Searching	109
7.2	AFIS Data Extraction for Reporting.....	110
8.	AFIS TECHNICAL REQUIREMENTS.....	112
8.1	Configurable Parameters	112
8.1.1	THRESHOLDS.....	112
8.1.2	QUALITY MEASURE	113
8.1.3	OUT OF SEQUENCE	114
8.1.4	LIST LIMIT PARAMETERS	114

8.1.5	REGIONS.....	115
8.1.6	REPOSITORIES	116
8.1.7	TIME RELATED PARAMETERS	117
8.1.8	TOGGLE RELATED PARAMETERS.....	117
8.1.9	SIZE BASED PARAMETERS.....	118
8.1.10	TABLE BASED PARAMETERS.....	118
8.1.11	RATED CONFIGURABLE PARAMETERS.....	119
8.2	User Management and Role Based Access Controls (RBAC).....	119
8.2.1	ROLE BASED ACCESS CONTROLS	120
8.2.2	ROLES, GROUPS AND OBJECTS.....	122
8.2.3	USER MANAGEMENT DATA CONVERSION	125
8.3	Subject with Multiple Files and Composites.....	125
8.4	NIST Packet Viewer.....	126
8.5	Availability / Reliability.....	126
8.6	System Response Times for Local Workstations.....	129
8.7	NPSNet Network Architectural Constraints.....	130
8.7.1	LOCAL AREA NETWORK CONNECTIVITY	132
8.8	Confidentiality and Integrity.....	132
8.9	Auditing.....	133

FIGURES

FIGURE 2-1: CURRENT AFIS / VSS DETAILED ARCHITECTURE.....	4
FIGURE 8-1: CORE RBAC MODEL CONCEPTS	121

TABLES

TABLE 2-1: CARY WORKFLOW	7
TABLE 3-1: AFIS RENEWAL SOLUTION SIZING DESIGN VOLUMES – 2019	41
TABLE 3-2: BUSINESS HOURS, PRIORITIES AND TURNAROUND TIMES FOR SEARCHES	44
TABLE 3-3: DATA VOLUMES	46
TABLE 3-4: AFIS USER INTERFACE FEATURES.....	48
TABLE 5-1: CENTRAL LATENT WORKFLOW	78
TABLE 5-2: REMOTE LATENT WORKFLOW	87
TABLE 8-1: UNPLANNED SYSTEM OUTAGES.....	127
TABLE 8-2: REDUCED SYSTEM CAPACITY	128
TABLE 8-3: GUI RESPONSE TIMES FOR SELECT USER FUNCTIONS	129

1. INTRODUCTION

1.1 General

1. This Annex B to the Appendix A SOW describes the detailed requirements to renew the Automated Fingerprint Identification System (AFIS). This is in addition to the high-level requirements stated throughout the SOW and its accompanying documents. (I)
2. This document identifies what the Contractor's AFIS must provide in order to satisfy the RCMP's requirements for processing prints found on criminal, refugee, immigration, civil, latent and RCMP employee submissions received by RCMP's Canadian Criminal Real Time Identification Services (CCRTIS). It describes the functional and technical requirements that must be provided by the Contractor's AFIS renewal solution to support the business, interfaces, capacity, security and quality requirements of the RCMP. (M)

1.2 AFIS Renewal Concept

1. From a high-level architecture perspective, AFIS is like a replaceable black box for RTID. AFIS interfaces with NNS. NNS controls the overall flow and processing of NPS-NIST submissions. The AFIS ICD defines the interface between NNS and AFIS. Any AFIS that fully supports the AFIS ICD and supports the sequence of activities controlled by the NNS should be able to replace the existing AFIS for submissions processing. There are more AFIS requirements than submission processing; however, this explains the black box concept for the AFIS within the RTID architecture. (I)
2. The AFIS renewal solution must support the AFIS ICD for all communications between NNS and AFIS as well as the sequence of activities for every RTID workflow. The NNS controls all RTID workflows. The AFIS renewal solution must also support the user interface (UI), the interface with the Verification Subsystem (VSS) and all other requirements stated throughout this SOW and its accompanying documents. (M)

1.3 Document Organization

1. The detailed architecture within which the AFIS renewal solution must operate is explained herein along with a description of the workflow applicable to the AFIS renewal solution. (M)
2. The workflow shows the sequence of processing that the AFIS renewal solution must support. Only a few example workflows are explained in detail to ensure an understanding of the process. These examples show Ten Print, Central Latent and Remote Latent workflows in detail, which are the three (3) most critical and most used workflows. It is expected that the Contractor can use the examples and the AFIS ICD to understand all other workflows. (M)
3. The detailed functional requirements to be supported by the AFIS renewal solution are presented following the detailed architecture and workflow. These requirements are presented under various headings, such as General, Ten Print (TP), Latent and Direct Filing. (I)

4. There are technical requirements included with the functional requirements to ensure clarity concerning the requirements. However, most of the detailed technical and implementation requirements are presented in the sections following the functional requirements. (I)

1.4 Definitions

1. A “production administrator” (aka prod admin) is a non-technical AFIS user who monitors the system, sets up new users, produces reports, sets configurable parameters and performs a variety of AFIS support functions. An operational administrator is not a technical support person and as such uses a GUI to carry out tasks on the system. (I)
2. A “technician” is a fingerprint technician who uses AFIS to perform specific AFIS production functions such as Ten Print Quality Control, Verification, Certification, and so on. A latent technician is an experienced fingerprint technician specializing in the identification of crime scene prints. The term “technician” is sometimes used within the context of the specific function they are performing (e.g.: QC technician). (I)
3. A “supervisor” is an AFIS production user who supervises a group of fingerprint technicians. Ten Print and Latent supervisors also deal with high priority searches and difficult transactions. Latent Supervisors also perform all other latent functions. (I)
4. A “remote operator” is a fingerprint technician located at a remote AFIS site who is performing latent and tenprint searches against the RCMP TPF and ULF. This operator has been trained and is regularly monitored by the RCMP. (I)
5. An “uncertified remote operator” is an individual who is going through the training period allowing the Remote Network Search Coordinator to monitor their work. (I)
6. The “Remote Network Search Coordinators (RNSCs)” are senior latent technicians located at the RCMP who are responsible for coaching and monitoring remote operators. (I)
7. “Operator” and “user” are used interchangeably in these requirements and always refer to production users. The Role Based Access Controls (RBAC) defined herein provide the details for the access privileges for each type of user. (I)
8. “Operational Support” (OPS) is a 24/7/365 user in the RCMP/SSC data center responsible for monitoring server alarms and taking action, based on predefined guidelines, to recover from whatever failure might occur. Since the Contractor is responsible for AFIS support, OPS typically contacts the Contractor AFIS resources to alert them of any failures and the Contractor AFIS resources resolve the issue. (I)
9. “Composite” is a common fingerprint term used to identify the best individual prints selected from multiple sets of prints on file for the same subject, under the same file number. (I)
10. “System Administrator” (aka Sys Admin and Administrator) is the Contractor’s on-site resource that has system administrative privileges. Refer to on-site resources responsibilities included in Appendix A, SOW for details concerning these resources. (I)

11. “AFIS Program Analyst” are highly knowledgeable and experienced fingerprint technicians that have been senior fingerprint technicians for many years. They are a specialized group that generally has the broadest user access privileges of any user group on AFIS and NNS. They have a wide range of responsibilities as subject matter experts and are typically involved in the resolution of any issues related to AFIS and/or RTID, oversee all AFIS system functionality, measure the efficiency and effectiveness of AFIS, perform system testing and recommend changes to improve service delivery. (I)

1.5 Composite Requirement

1. There are many mandatory requirements stated throughout this Annex B, the SOW and its accompanying documents concerning composites. If the Contractor’s solution uses composites, then the mandatory requirements stated throughout this Annex B, the SOW and its accompanying documents must be supported. If the Contractor’s solution does not use composites, the mandatory requirements stated throughout this Annex B, the SOW and its accompanying documents concerning composites must be supported without the use of composites. That is, not using composites cannot be used as a method to not satisfy the requirements stated throughout this Annex B, the SOW and its accompanying documents. For example, the RCMP have many subjects with over 50 sets of fingerprints / palm prints and approximately 10,000 subjects with over 10 sets of fingerprints / palm prints; therefore, the Contractor must still meet all the performance requirements by searching all sets of prints, regardless of the number of prints filed under a subject, if they do not use composites. If composites are not used, the Entire AFIS renewal solution must be designed to support searching all set of prints (i.e. all prints including rolled, plains and ID Flats for all sets of prints). That is, configuration parameters that may reduce the total number of prints to search will not be considered. (M)
2. The Contractor’s solution should support composites. Composites are used by the RCMP and external agencies for various purposes and they are an integral part of the ICDs. (R)

2. AFIS RENEWAL ARCHITECTURE AND WORKFLOW

2.1 AFIS Renewal Detailed Architecture

- The following diagram (Figure 2-1) depicts a detailed view of the current AFIS architecture. The Contractor's AFIS renewal solution must operate within this architecture and support the RTID interfaces and technical requirements that provide a secure, efficient and effective solution. (M)

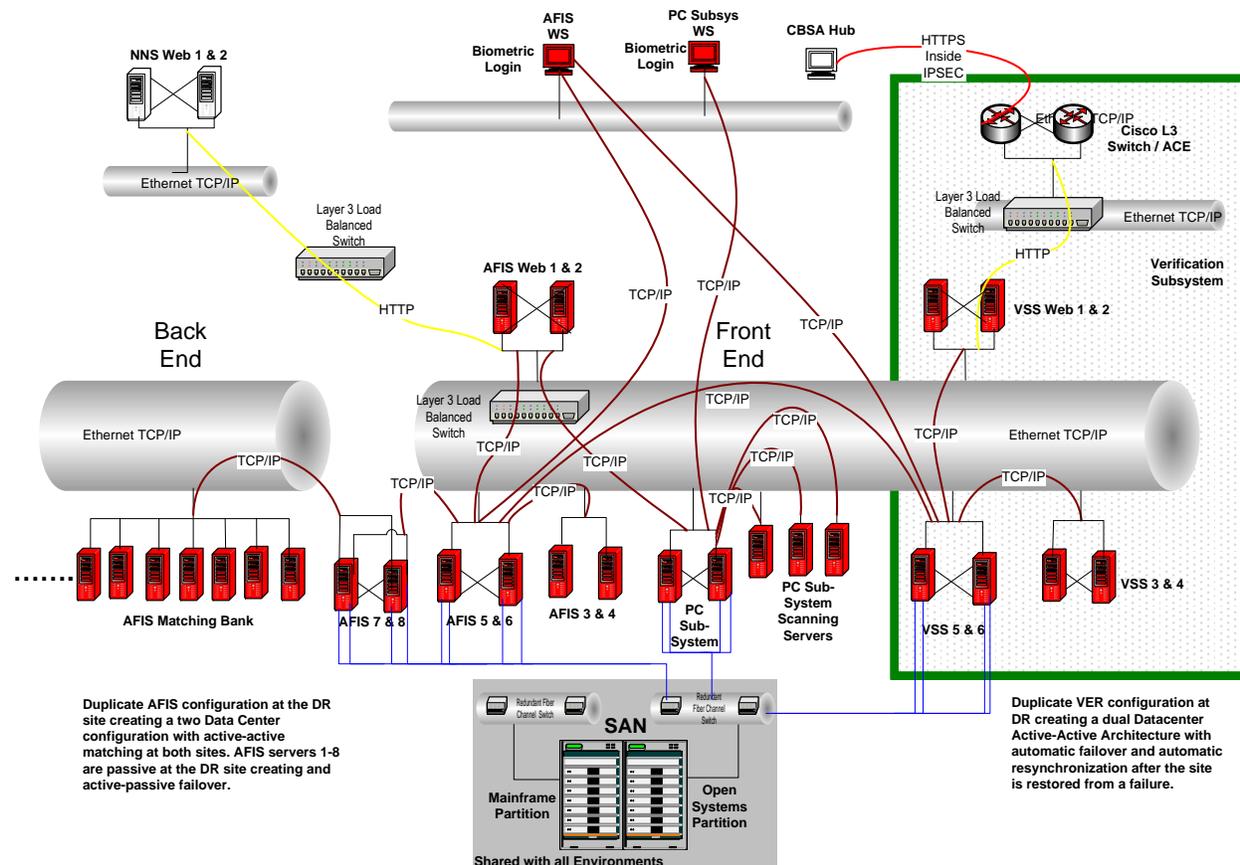


Figure 2-1: Current AFIS / VSS Detailed Architecture

2.1.1 NNS/AFIS INTERFACE

- The NNS/AFIS interface is an asynchronous HTTP interface which is load balanced in both directions. The Contractor's AFIS renewal solution must support this interface. This WSDL/SOAP HTTP interface is described in detail in the Web Service Transport Description document. The following describes the interaction between the NNS and AFIS that must be supported by the Contractor's AFIS renewal solution: (M)
 - NIST packets are sent to a LB module load balanced address where the LB module provides HA capabilities for the AFIS Web servers;
 - The AFIS completes the required processing based on the NIST packet; and

- c. The AFIS sends a response NIST packet to a LB module load balanced address where the LB module provides HA capabilities for the NNS Web servers.

2.1.2 AFIS LOAD BALANCING TO FINGERPRINT SEARCH CAPABILITIES

1. The AFIS renewal solution must support load balancing to the AFIS fingerprint search capabilities. That is, the AFIS renewal solution must be architected in a manner that enables additional components to be added to increase the matching capacity. Load balancing to additional components is a common method to increase capacity without requiring replacement components. The Contractor must explain how the proposed AFIS renewal solution supports the ability to increase capacity horizontally. (M)

2.1.3 AFIS INTERFACE TO VSS

1. The AFIS renewal solution must provide a guaranteed delivery capability that ensures transactions that must be sent to the VSS are delivered and processed. This guaranteed delivery capability must be a proven method currently operating in at least one large (over three (3) million prints on file) AFIS site that includes both AFIS and VSS capabilities. (M)
2. All Immigration (aka TRB) related transactions received by AFIS must include AFIS processing and guaranteed delivery to VSS. Refer to the AFIS ICD for the details concerning NIST packets that include Immigration related transactions. (M)

2.1.4 AFIS WORKSTATION USER INTERFACE TO AFIS SERVERS

1. The AFIS workstations must fully support all UI capabilities required to support all requirements stated in this SOW and its accompanying documents. (M)
2. The AFIS workstation must also support all VSS UI capabilities. These capabilities are described in VSS detailed requirements. (M)

2.1.5 AFIS VIRTUAL LOCAL AREA NETWORK (VLAN)

1. The AFIS servers and workstations are secured in a separate VLAN. Communication into and out of this VLAN is limited to the minimum required for AFIS interaction. The AFIS renewal solution must satisfy all requirements in the SOW and its accompanying documents while operating in this environment. This minimum communication includes: (M)
 - a. From the NNS Web servers to the load balanced Virtual IP address (VIP) for the AFIS Web servers;
 - b. From the AFIS Web servers to the load balanced VIP for the NNS Web servers;
 - c. To a File Transfer Protocol (FTP) server where statistical reporting data is sent daily/weekly;
 - d. From WSUS updates;
 - e. From ePo updates;

- f. From Spectrum Monitoring reading SNMP traps to monitor server and file system health;
 - g. To and from AFIS workstations;
 - h. From the VSS LB/SSL to the load balanced VIP for the VSS Web servers; and
 - i. From the VSS Web servers to the load balanced VIP for the VSS LB/SSL.
 - j. Note: The load balanced VIPs are also secured with only the designated communication being allowed. This AFIS VLAN includes the DR site servers.
2. All AFIS and VSS servers can communicate to each other within the VLAN. It is preferred that the AFIS renewal solution limits access to within the VLAN to only communications that are required. For example, a common security practice is to create non-routable segments which further secure a specific set of servers within a VLAN. (R)
3. The Contractor must explain how the proposed AFIS renewal solution supports security that limits access within the VLAN. (M)
4. AFIS workstations must be limited to designated servers. This will limit the possible activities that can be performed from an AFIS workstation to only what is required by the AFIS user. The Contractor's AFIS renewal solution must explain how the proposed solution limits AFIS user access within the VLAN. (M)
5. Any additional communication required by the Contractor's AFIS renewal solution must be approved by the RCMP prior to proposal submission or the Contractor's proposal may be considered non-compliant. (M)
6. The purpose of these security related requirements is to ensure the AFIS renewal solution is not exposed to unacceptable risk. For example, if the Contractor's proposed solution required communication to the Internet to access data required for normal operations, the solution would be unacceptable. Transcoders are part of the Entire AFIS renewal solution; however, Transcoders have no ability to directly access anything within the AFIS VLAN. Transcoders are submission devices to NNS. (I)

2.2 AFIS Renewal Workflow

1. This subsection presents a list that identifies an example workflow and sequence of activities that occur between NNS and AFIS to support a TP Criminal (CAR Y) submission that identifies to an existing set of prints. Since the AFIS renewal solution must support load balancing and NNS supports load balancing, the sequence of activities may not always be processed in the same order. The combination of the workflows, the AFIS ICD and the requirements stated in this SOW and its accompanying documents identify the sequence of processing that must be completed by the AFIS renewal solution. (M)
2. Annex G includes a matrix of AFIS ICD transactions to show examples of the circumstances under which the transaction is used and the most common flow of transactions. These are provided to help the Contractor understand the RTID workflow from an AFIS perspective. Annex G does not attempt to identify every combination and permutation that could affect the workflow. The AFIS ICDs identify every

transaction that must be received and processed by the AFIS renewal solution as well as every transaction that must be created by the AFIS renewal solution while processing any workflow. The AFIS ICDs take precedence over anything in Annex G. (M)

3. The LCMC detailed requirements in Annex E identify the modified workflow that must be supported by the AFIS renewal solution. The sequences of activities in the modified workflow are expected to effectively satisfy the new requirements identified in this SOW and its accompanying document. However, if necessary and only for the modified portion of the workflows in support of the new requirements, the RCMP may allow adjustments to the workflow. It is at the sole discretion of the RCMP whether to allow any adjustment to the modified portion of the workflows required to support the new requirements. (M)
4. There will be no changes allowed to the existing workflows, unless specifically stated in this SOW or its accompanying documents. The NNS is fully operational and already supports the workflows with a specific sequence of activities. The NNS will not be changed to adjust to the AFIS renewal solution unless specifically agreed to in writing by the RCMP. (I)

2.2.1 CRIMINAL TEN PRINT SUBMISSION (CAR) Y WORKFLOW

1. The following Table 2-1 shows the sequence of activities for an existing TP CAR Y submission. Following this table is an explanation of the activities and transactions included in the workflow related to understanding the workflow applicable to the AFIS renewal solution. The AFIS renewal solution must receive and correctly process each AFIS ICD NIST transaction sent to the AFIS renewal solution as well as respond back to NNS with the required AFIS ICD NIST transaction correctly populated with the data required by the NNS in the sequence required for each workflow. (M)
2. Note: The generic term AFIS is used in the following workflow explanation since it is describing the existing workflow. The AFIS renewal solution must support all the processing and workflow indicated generically with the term AFIS. (M)

Table 2-1: CARY Workflow						
Line #	Activity	Transaction	From System	To System	Op ID	Outcome
1.	Received	CARY	Agency	NNS		Passed
2.	High-Level Validation	CARY	NNS	NNS		Passed
3.	ICD Validation	CARY	NNS	NNS		Passed
4.	Image Validation	CARY	NNS	NNS		Passed
5.	Business Exception Processing	CARY	NNS	NNS		No Exception

Table 2-1: CARY Workflow						
Line #	Activity	Transaction	From System	To System	Op ID	Outcome
6.	Transformation	CARI	NNS	NNS		From: CAR To: CARI
7.	Query Immigration Subject Name Search	Name Search	NNS	NNS		No Candidates
8.	Created and Archived	LABI	NNS	NNS		
9.	Log DOC ID Event	LABI	NNS	CREMMS		DOC_ID: ##### Start tracking #####
10.	Query QCNI	Name Search	CPIC	NNS		Candidates
11.	Send to AFIS	TPRI	NNS	AFIS		
12.	Automated Ten Print QC	TPQCI	AFIS	NNS		
13.	Received	ACKI	CREMMS	NNS		In Response to: LABI
14.	Ten Print QC Received	TPQCI	NNS	NNS		Passed
15.	Created and Archived	ACKT	NNS	NNS		
16.	Sent	ACKT	NNS	Agency		
17.	Ten Print Search	TPREI	AFIS	NNS		1System declared hit(s) #####
18.	Automated Certification	TPREI	NNS	NNS	AFIS System user: 99	Ident to: Criminal #####
19.	TP Enroll	TPREI	NNS	NNS		
20.	Reverse Search (Fingers)	TPULI	AFIS	NNS		Result: Non-Ident
21.	Process AFIS Response	TPREI	NNS	NNS		Ident

Table 2-1: CARY Workflow						
Line #	Activity	Transaction	From System	To System	Op ID	Outcome
22.	Send M SC to CPIC	CRIFI Search	NNS	CPIC		
23.	Information Fetch CPIC Information	CRIFI Search	CPIC	NNS		File Number Fetched: #####
24.	Information Fetch ADS Flags	CRIFI Search	NNS	ADS		File Number Fetched: #####
25.	Send to Subsystem (240)	FOLI	NNS	CREMMS		
26.	Received	FOLRI	CREMMS	NNS		
27.	Information Fetch Folio Docket	CRIFI Search	NNS	CREMMS		File Number Fetched: #####
28.	CRIFI Completed	CRIFI Search	CREMMS	NNS		
29.	Created and Archived	LABI	NNS	NNS		
30.	Log DOC ID Event	LABI	NNS	CREMMS		DOC_ID: #### Stop tracking ##### Start tracking #####
31.	Reverse Search (Palms)	TPULI	AFIS	NNS		Result: Non-Ident
32.	Received	ACKI	CREMMS	NNS		In Response To: LABI
33.	Processed Business Rules	CARI	NNS	NNS		R#90000
34.	Generating/Populating Criminal Print Queue	CARI	NNS	NNS		C216 – Charges Overflow, C216 CARY
35.	Ready for Printing	CARI	NNS	NNS		

Table 2-1: CARY Workflow						
Line #	Activity	Transaction	From System	To System	Op ID	Outcome
36.	Created and Archived	CARI	NNS	NNS		
37.	Populate CRS	CARI	NNS	CREMMS		
38.	Send to CJIM	CARI	NNS	CJIM		
39.	Created and Archived	SREI	NNS	NNS		
40.	Prepare SRE (172)	SREI	NNS	NNS		Release Rule Type: SRE
41.	Transformation	SRE	NNS	NNS		From SREI To: SRE
42.	Created and Archived	SRE	NNS	NNS		
43.	Sent	SRE	NNS	Agency		Destination Agency: AB#####
44.	Received	ACKI	CREMMS	NNS		In Response To: CARI
45.	TP-UL / Wait for Verify 1 st Certify	STI	AFIS	NNS		
46.	Reverse Search Verification – Fingers	TPULI	AFIS	NNS	AFIS User: 92	
47.	Criminal Forms Printed	CARI	NNS	NNS	NNS user: 1227	Product Type: C216 – CARY, C216 – Charges
48.	Completion of Service	CARI	NNS	NNS		

- The above table shows all activities for a CARY submission to reflect the other non-AFIS activities that also occur throughout this process. These non-AFIS activities allow a better understanding of the overall business processing, shows how the data that will be sent to the AFIS renewal solution is derived and how the data received from the AFIS renewal solution would be used. The following focusses on the activities

that must be supported by the AFIS renewal solution in the above example CARY submission: (M)

- a. Line #11 shows NNS sending a TPRI NIST transaction to AFIS;
- b. AFIS will process the TPRI which will include a quality check and a response to NNS concerning the quality check with the TPQCI NIST transaction;
- c. Line #12 shows the TPQCI NIST transaction sent from AFIS to NNS;
- d. NNS will process the TPQCI to determine if the fingerprints passed the quality check (Lines 14–16). If successful NNS will respond to the contributor with an ACKT NIST Transaction to acknowledge that the submission has been validated and can be processed;
- e. Line #17 shows the TPREI NIST transaction sent from AFIS to NNS. Note that there must be continuous processing on AFIS from the TPRI sent earlier in the workflow;
- f. NNS will process the TPREI NIST transaction and create additional entries in the activity log, line #18 and 19, to show key information from the TPREI. Line #18 shows the AFIS operator was the AFIS system operator 99 reflecting a System Declared Hit and Line #19 shows AFIS enrolled the prints. As well, NNS shows an Ident in Line #21;
- g. Line #20 shows the TPULI Transaction sent from AFIS to NNS indicating that the reverse search for finger was submitted and awaiting processing. Again note that this must be continuous processing on AFIS from the TPRI sent earlier in the workflow. All CARY submissions automatically include a reverse search against the Unsolved Latent File (ULF) fingers. At this stage, an AFIS user must disposition the reverse search before any other AFIS communication will occur on this finger reverse search.
- h. Line #31 shows the TPULI Transaction sent from AFIS to NNS indicating that the reverse search for palm was submitted and awaiting processing. Again note that this must be continuous processing on AFIS from the TPRI sent earlier in the workflow. All CARY submissions automatically include a reverse search against the Unsolved Latent File (ULF) palms, if palms have been included in the search submission. At this stage, an AFIS user must disposition the reverse search before any other AFIS communication will occur on this palm reverse search.
- i. Line #45 shows the STI transaction from AFIS to NNS for the reverse search on fingers indicating some processing has been completed and therefore has a change in status;
- j. Line #46 shows the TPULI transaction sent from AFIS to NNS indicating that the reverse search on fingers has been dispositioned and includes the dispositioning data in the TPULI NIST packet;
- k. Line #48 shows completion of service; however, AFIS activity will still be received, processed and recorded in the NNS activity log. For example, the reverse search for palms could be processed at a later time.

3. GENERAL AFIS REQUIREMENTS

3.1 AFIS COTS Compliance

1. The AFIS renewal solution must be a Commercial Off-the-Shelf (COTS) software product. (M)
2. The AFIS renewal solution to the greatest extent possible should satisfy the AFIS Renewal solution requirements through the COTS product. (R)
3. This COTS product must be customizable to modify, extend, expand and/or introduce new functionality to the COTS product to support the AFIS renewal solution. (M)
4. This COTS product must be configurable to support changes or additions made to the base set of data values of the COTS product to reflect the requirements of the RCMP. These application configuration changes should not include modifying existing or adding new, programming code, or changing the application architecture or data structure. (M)
5. The Contractor shall migrate RCMP-specific functionality as the AFIS COTS baseline evolves over the life of the contract. RCMP must have the ability to upgrade the COTS as upgrades become available. (M)
6. The Contractor should describe in detail its strategy for migrating RTID-specific functionality as the AFIS COTS baseline evolves over the life of the contract addressing the extent to which it will include custom features into its COTS product and to what extent that the Contractor's strategy will minimize disruption in terms of availability if RCMP chooses to implement an upgrade. (R)
7. The AFIS renewal solution shall capture and store the following images: (M)
 - a. Ten Print Card (Rolled & Plain);
 - b. Ten Print ID Flats;
 - c. Latent Fingerprints;
 - d. Palm Prints;
 - e. Latent Palm Prints;
 - f. Latent Object shots;
 - g. Photos; and
 - h. Any associated information required to support the above.
8. The AFIS renewal solution shall support the following searches: (M)
 - a. Ten Print Card (Rolled & Plain) to Ten Print Card (Rolled & Plain);
 - b. Ten Print ID Flat to Ten Print Card (Rolled & Plain);
 - c. Ten Print Card (Rolled & Plain) to Ten Print ID Flat;

- d. Ten Print ID Flat to Ten Print ID Flat;
- e. Ten Print Card (Rolled & Plain & Palm) to Unsolved Latent File (ULF (Finger & Palm));
- f. Ten Print ID Flat to Unsolved Latent File (ULF Finger);
- g. Ten Print Palm to Unsolved Latent File (ULF Palm);
- h. Latent (Finger or Palm) to Ten Print Card (Rolled, Plain & Palm);
- i. Latent Finger to Ten Print ID Flats; and
- j. Latent (Finger or Palm) to Latent (Finger or Palm).

3.2 Paperless Environment

1. The AFIS renewal solution is intended to be a paperless environment. There is paper processing required with Direct Filing and Direct Scanning, which is described in this Annex. All other paper processing is intended to be on an exceptional basis only, using RCMP internal Cardscans. (I)
2. The AFIS renewal solution must support paper processing from an AFIS workstation to allow paper processing using either a scanner (flat bed or hand held) or a camera. The paper processing requirements that must be satisfied are identified throughout this Annex, this SOW and its accompanying documents. (M)
3. Every AFIS workstation must be able to support paper processing with a scanner and/or camera. (M)
4. The initial implementation of the AFIS renewal solution must include at least ten (10) AFIS workstations configured with a flat-bed scanner (GFE, or provided by the Contractor). (M)
5. The initial implementation of the AFIS renewal solution must include at least twenty-five (25) AFIS workstation configured with a camera (provided by the Contractor). These cameras are used by the AFIS workstation for paper certification, to scan a DCN on a paper C216 to retrieve the set of prints on file, view prints on the paper and other uses as stated throughout this SOW and its accompanying documents. (M)
6. The initial implementation of the AFIS renewal solution must include at least thirty (30) AFIS workstations configured with a hand held scanner (GFE, or provided by the Contractor). These hand held scanners can be used to initiate a fetch using the barcode on the paper C216. After this fetch the user might view, delete or start a verification with the fetched prints. (M)

3.3 Logging of Transaction Activities

1. The AFIS renewal solution shall, in an automated fashion, log all activity performed as a result of the receipt and processing of transactions received from the NNS as well as any activities initiated within the AFIS environment. (M)

2. The purpose of this Transaction Log is to retain an administrative record of the complete processing history of a request for service, including each wait state, each activity, who performed the activity, and which actions were taken. The AFIS renewal solution must ensure all events associated with AFIS data are recorded; and that it is verifiable that the recorded events resulted in whatever action was taken concerning an individual's prints or ULF prints. The AFIS renewal solution needs to record when, where and why, whatever happened and by whom, related to any request processed on the AFIS renewal solution. (M)
3. For fingerprints that have been processed, the AFIS renewal solution shall retain Transaction Log entries for a period of time, as indicated in the configurable parameters subsection 8.1, after the transaction has been serviced. (M)
4. The AFIS renewal solution shall not allow modification of the information recorded in the Transaction Log, as it provides a true representation of activities that occurred at a specific point in time. (M)
5. The AFIS renewal solution shall make the Transaction Log entries available on screen through a series of queries and/ or reports that will allow users to view and print some or all entries – based on the filters selected, the query specified and the user's security-level access profile. (M)
6. The Transaction Log entries must be available for the authorized user to query as part of the operational data until the administrative archive period has been reached. Once the administrative archive period has been reached the data can be moved to an audit log state, where only users authorized to access the audit log will have access the Transaction Log data. (M)
7. The AFIS renewal solution Transaction Log shall include, as a minimum, all the fields identified in the TP and Latent reporting requirements as well as the activity/event type, associated status change caused by the activity/event (see list below #8), file numbers/subject ID/latent file number/latent image ID to which the Entry certified to and internal priority. If the activities/events have abbreviated forms, the AFIS renewal solution must allow the user to view the full list of all activities/events with a description of the abbreviated form. (M)
8. For the purposes of logging, the following activity/event types are identified to show an example of the extent to which the AFIS renewal solution must be logging. This allows the earlier requirements, which indicate all activities must be logged (refer to #2 above), to be more clearly understood. Consequently, this list includes what must be included by AFIS renewal solution, but not be limited to, the following Activity Types: (M)
 - a. Internal Activities:
 - i. Ten Print Manual QC,
 - ii. Ten Print Manual Verification,
 - iii. Ten Print Certification,
 - iv. Ten Print Auto QC,
 - v. Ten Print Auto Certification,

- vi. AFIS One-to-One (1:1) Match,
- vii. AFIS One-to-Many (1:N) Search,
- viii. Latent Editing,
- ix. Latent Verification,
- x. Latent Certification,
- xi. Latent to Latent Search,
- xii. Latent to TP Search,
- xiii. Latent Manual Encoding,
- xiv. Latent Insert,
- xv. Automated Latent Encoding,
- xvi. Error/Rejection,
- xvii. FBI Latent Encoding,
- xviii. FBI Latent Verification,
- xix. FBI Latent Certification,
- xx. Reverse Search,
- xxi. Reverse Search Verification,
- xxii. Reverse Search Certification,
- xxiii. Fetch TP,
- xxiv. Fetch Latent,
- xxv. Rescan,
- xxvi. Scanned (hardcopy or softcopy),
- xxvii. Text Conversion,
- xxviii. QC of Scanned Document Image,
- xxix. QC of Scanned Fingerprint Image,
- xxx. TP Amend,
- xxxi. TP Purge,
- xxxii. Latent Purge,
- xxxiii. Print,
- xxxiv. Terminate / Cancel,
- xxxv. Reset, and

- xxxvi. Change Search Parameters;
- b. Exception Processing;
- c. Update Activities at the Subject Level, File Level, Fingerprint Set Level, Field Level: amend, creation, purge (including image adjustments); and
- d. Update Activities for Work In Progress (WIP) at the Fingerprint Set Level, Field Level: amend, purge, status changes (including image adjustments and priority changes).

3.4 Workflow Management and Related Services

3.4.1 WORK IN PROGRESS

1. The concept of Work In Progress (WIP) is applied throughout the requirements. When a fingerprint transaction arrives, the transaction logically becomes Work In Progress (WIP) until such time as the Fingerprint Identification process is complete, the Subject has certified to one or more Subject Files, or it has been determined that no match has been found and that a new Subject needs to be created. The AFIS WIP is not intended to be a physical partitioning of the database. The AFIS WIP is a transaction state. (I)
2. The AFIS renewal solution should minimize the possibility of a miss due to transactions in WIP or queued for processing. (R).
3. The Contractor shall describe in detail its mechanisms for preventing misses as a result of two submissions for the same subject being processed within a short time of one another (e.g.: a civil submission arrives shortly after a criminal submission). The Contractor shall describe how its solution manages Work In Progress. At a minimum all WIP states must be searched to ensure no misses occur and duplicate DCNs are identified. (M)
4. The AFIS renewal solution shall use the search thresholds to limit the number of candidates for TP-TP WIP searches (refer to configurable parameters Section 8.1.1). For example, if the number of candidates returned by the application of the thresholds is three (3), then the number of candidates to be produced for the TP-TP WIP view is three (3) candidates. When these three (3) candidates are completed searching and enrolled (when enrolment is requested) then the submission shall move out of Wait 4 WIP view and proceed to the next workflow step. (M)
5. The AFIS renewal solution shall enable a user to save partial work. For example, a latent technician might wish to save a partial encoding, go on lunch break, retrieve the work, proceed to finish the encoding after lunch and submit the latent for search. The latent technician might also set aside work on a routine search to complete an urgent search request. The AFIS renewal solution must allow a different user to process the transaction with the saved partial work (e.g.: if the user that set aside the transaction was off sick); however, under normal work conditions the set aside work would show assigned to a user which would inform all other users that this transaction is being worked on. (M)

6. The AFIS renewal solution shall provide a user interface feature that ensures that a user can set aside a transaction for later (e.g.: need clarification from another technician). This feature must hold the transaction and exclude the transaction when a next transaction is selected by another user. This hold remains until the transaction is released. The transaction may be released by a different user (i.e. the AFIS renewal solution must not prevent a different user from releasing a transaction on hold). (M)
7. When work has been set aside for later, the AFIS renewal solution shall enable the user to process other work and come back to the work set aside. (M)

3.4.2 WORKFLOW RULES

1. The AFIS renewal solution shall be flexible enough to support different workflow instructions provided to the AFIS in the internal transactions. The NNS will set these parameters differently depending on the information received with the transaction (e.g.: FPS Number, repository to search, Type of External Transaction: Criminal with Add (CAR Ret=Y), Criminal Record Inquiry (CAR Ret=N), Immigration (IMM Ret=Y), Civil with Add (RCMP Employee), Civil without Add (MAP), Latent (Finger or Palm) Search). The internal parameters might indicate, for example, that a 1:N Search is to be performed, that a Certification is to be performed where a hit is found, that a Reverse Search is to be performed against fingers and palms, that a reverse search is to be performed against fingers only and so on. Refer to the AFIS ICD for a detailed description of transactions between the AFIS renewal solution and NNS. (M)

3.4.3 PRIORITY OF WORK

1. The AFIS renewal solution shall use the priority setting specified in the internal transaction (AFIS ICD), to set the priority of the transaction. (M)
2. The priority setting of 1 will be used to place emergency transactions to the top of the queue. A priority setting of 2 or 3 is for urgent transactions. A priority setting of 4 or greater is for routine transactions. (M)
3. Priority 1 is reserved for RCMP internal use only. Priority 1 transactions are deemed to be critical. (I)
4. Priority 1 Turnaround Times shall be less than any other Turnaround Time available within any other given priority for that particular transaction type such that these transactions are placed at the top of the search queue. (M)
5. The AFIS renewal solution shall enable authorized users to change the priority of any transaction within the AFIS environment. (M)
6. The Turnaround Times required for each priority are defined for each transaction type under subsection 3.6. (I)

3.4.4 ORDER OF PROCESSING

1. The AFIS renewal solution shall perform an automatic re-sequencing of work to ensure that all work meets its service delivery objective. (M)

2. The Work Queues shall display the criteria used in making order of processing and routing decisions which shall include, as a minimum: Internal Priority, External TCN, DCN (for Ten Print) / Latent ID (for latent), Arrival Date and Time, External Transaction Type and Retention Code, Status, Role, Originating Agency ID. (M)

3.4.5 OPERATIONAL CONTROL AND WORKLOAD MONITORING

1. The AFIS renewal solution shall provide underlying workflow management capabilities that will: (M)
 - a. Automatically route work to the appropriate process;
 - b. Forward notifications (e.g.: forward to supervisor);
 - c. Make work available to enabled users in the appropriate Role, User Profile, Service and State of Readiness;
 - d. Control the loading of the operations by monitoring and control of WIP and backlog for each external transaction type;
 - e. Track the Status of transactions;
 - f. Enable users in the authorized role to view summary statistics;
 - g. Enable users to use filters to view specific types of transaction in the work queue to monitor activities. The filters, which must include as a minimum, Internal Priority, External TCN, DCN (for Ten print) / Latent ID (for latent), Arrival Date and Time, External Transaction Type and Retention Code, Status, Role, Originating Agency ID; must allow the user to filter appropriately for their role. For example, a supervisor must be able to view with filters so they see only transactions forwarded to them for review (i.e. there must be an indicator/attribute that can be used to filter on); and
 - h. Identify overdue transactions and enable users in the authorized role to view same (i.e., a transaction that is not being serviced within the turnaround time requirements described in subsection 3.6).
2. The AFIS renewal solution shall support the operational control and monitoring of workloads. The following types of capabilities must be provided within the AFIS renewal solution to further enhance control and monitoring of workloads: (M)
 - a. Presentation of summary statistics overall and by queue (total number of transactions in queue, earliest date/time received, latest date/time received, number overdue and for each External Transaction Type: total number of transactions in queue, earliest date/time received, latest date/time received, total number overdue, total number at each priority).
 - b. Provision of monitoring work queues, view the contents of a transaction selected from the work queue list, view summary statistics.
 - c. Enable printing of the above statistics.

3.4.6 WORK QUEUE FEATURES

1. For the purpose of these requirements, a Work Queue is defined as a user interface feature enabling a user to view all work in process and enabling them to initiate work on a specific item. Except where explicitly stated, these requirements apply to both Ten Print and Latent. (I)
2. The AFIS renewal solution shall enable a user to display all contents of a selected transaction, including all data in all record types, from a single user action on the work queue user interface. (M)
3. The Work Queue capability shall enable a user to loop forward and backward through the list of outstanding transactions. (M)
4. The work queue shall function without having to return to the Work Queue to select the next transaction to be worked on. There must be a next button to present the next transaction or if the current transaction has been completed, the next transaction must be presented automatically. The AFIS renewal solution must also allow a user to process through a filtered range. If a filter range of transactions has been selected, then the queue must function in the same manner with the filtered transaction. That is, the next button can be used to present the next transaction in the filtered list or if the current transaction has been completed, the next transaction in the filtered list must be presented automatically. (M)
5. The Ten Print user interface and Latent user interface shall provide a Work Queue that can be filtered as stated in this Annex and limit what is viewable in the work queue according to the RBAC. (M)
6. As a minimum, the work queues shall display: (M)
 - a. External Transaction Type and Retention Code;
 - b. Date of Arrival;
 - c. DCN (Ten Print);
 - d. Latent ID, (Latent);
 - e. Agency ORI;
 - f. Status;
 - g. Internal Priority;
 - h. Reason work is on the queue (i.e., work related note);
 - i. User Role;
 - j. User ID (of user working on an item);
 - k. Contractor's unique transaction number;
 - l. Transaction Attribute Codes (i.e.: N – Note Attached, R – Requires Supervisor review); and

- m. Total transactions in the queue and in the queue hierarchy. For example, total TP transactions and total transaction in a particular state:
 - Central Ten Print Region
 - TP Transaction (500)
 - Manual QC (20)
 - Immigration Region (100)
 - Certification (10)
7. The AFIS renewal solution shall automatically remove Work from the Work Queues and Work In Progress (WIP) when the services requested in the internal transaction are fully delivered. (M)
8. The AFIS renewal solution shall only allow users in the authorized role to delete transactions from a Work Queue and Work in Progress. (M)
9. The AFIS renewal solution shall enable a user in the authorized role to change the Priority of a transaction on the work queue. (M)
10. The AFIS renewal solution shall enable a user to release work back to a general pool of work or to assign a specific item of work to a supervisory role and specify the reason in a work-related note (both Latent and Ten Print). (M)
11. The AFIS renewal solution shall enable a user to add a 5000 character work-related note to a transaction in work in progress. (M)
12. The AFIS renewal solution shall provide the following functionality pertaining to work related notes: (M)
 - a. Retain the note and automatically record the User ID that created the note, date and time created along with the note.
 - b. Enable a user to view the notes along with user name, date and time created from the main work queue, and during the following states of processing; Verification, Certification, Manual Segmentation, Quality Check and Sequence Check, Latent Lasso, Latent Edit, Latent Verification, Latent Certification1, Latent Certification 2, Latent 3rd Certify, Latent Insert, Latent Search and UL Search.
 - c. Enable an authorized user to discard / purge a note created by the same authorized user. That is, a note created by one user cannot be deleted by a different user.
 - d. Support word wrap and carriage return within a note.
 - e. Enable a transaction to have at least 5 notes attached to it.
 - f. Support these functions from the work queue, from the TP Verification, TP Certification, TP Manual Segmentation, TP Quality Check, TP Sequence Check, Latent Lasso, Latent Edit, Latent Verification, Latent Certification 1, Latent Certification 2, Latent 3rd Certify, Latent Insert, Latent Search and UL Search user interfaces.

13. The AFIS renewal solution shall enable a technician to forward a transaction to a supervisory role and add a note if desired. (M)
14. The AFIS renewal solution must allow the supervisor to remove the forward to supervisor role indicator/attribute, which will return the transaction to the main work queue. (M)
15. When a transaction is assigned to a supervisory role on the Work Queue, the AFIS renewal solution shall display a reason on the Work Queue. (M)
16. In some cases, the reason why an item is identified as an exception for the supervisor will be generated by the AFIS renewal solution. In other cases, the user forwarding the external transaction will enter the reason. (M)
17. The AFIS renewal solution shall permit an authorized user to filter the work queue to locate work in progress based on one or a combination of the following parameters, as a minimum, and to search with wildcard characters or character sub-strings: (M)
 - a. Transaction number;
 - b. Transaction status;
 - c. Transaction creation date;
 - d. Transaction attribute;
 - e. DCN or Doc ID (TP only);
 - f. File number;
 - g. Latent File Number (Latents only);
 - h. Latent Identifier (Latents only);
 - i. Latent Image Identifier (Latents only);
 - j. Internal TCN;
 - k. External TCN;
 - l. Agency ORI;
 - m. User ID;
 - n. Submission number; and
 - o. Internal priority;
18. The AFIS renewal solution response to a find query shall indicate which service/function (e.g.: Ten Print QC, Ten Print Verification, Ten Print Certification, Latent Encoding) has the transaction on their queue, the status of the transaction, the date received of the transaction, the name/Human Resources Management Information System (HRMIS) # (i.e. unique number associated to an RCMP employee/contractor) of the individual that is presently servicing the transaction. (M)
19. The AFIS renewal solution shall automatically make work available to the appropriate role. (M)

20. The AFIS renewal solution shall have a trainee role, whereby the work performed by a trainee is logged and the work is re-assigned to a supervisory role upon the trainee's completion of the work. For Ten Print Training transactions the AFIS renewal solution shall not advance the transaction to the next process (where Ten Print processes are defined as Manual QC, Verification, and Certification) upon completion of the trainee's work without the supervisor performing the work themselves. For Latent training transactions the AFIS renewal solution shall not advance the transaction beyond the Verification process upon completion of the trainee's work without the supervisor performing the work themselves. The AFIS renewal solution shall enable the supervisor to review the work of the trainee and perform the work themselves to advance the transaction to the next process. (M)
21. The AFIS renewal solution shall provide the capability for a user to view the complete contents of a transaction, including all data in all record types, in work in progress within the AFIS renewal solution. (M)
22. The AFIS renewal solution shall provide a view that lists the status history of a transaction that can be selected from the work queue or search function. (M)
23. The AFIS renewal solution must provide the ability for a user to view the complete history of a transaction from the queue (e.g.: right mouse click): (M)
 - a. The date of arrival;
 - b. All users who worked on the transaction;
 - c. Each activity performed by a specific user;
 - d. The role of the user while performing an activity;
 - e. The start and end time related to each activity that was performed;
 - f. The total actual time spent working on the transaction within a particular activity;
 - g. The status changes and priority changes of the transaction and their associated dates and time; and
 - h. The wait time in queue.
24. By default, the AFIS renewal solution shall sort the work queue by Internal Priority and Date of Arrival. (M)
25. The work queue should be designed so that a large number of transactions in the queue can be processed in a timely manner. (R)
26. An authorized user, such as a Program Analyst or Prod Admin (typically no more than 10 users) who has a broad set of responsibilities, should be able to view all transactions in all regions/queues at the same time. (R)
27. As a minimum, all transactions from the TP region and IMM region must be viewable and usable for all transaction processing as stated in this SOW and its accompanying documents. (M)

3.5 Operational Reporting and Statistics

1. The AFIS renewal solution shall enable authorized users to use reporting capabilities that must provide the ability to filter any query on all fields that are available for reporting; and be able to print the report or export the resulting report to at least PDF, Comma-Separated Value (CSV) and XML file types. The AFIS renewal solution shall have a predefined format for these reports. (M)
2. Any fields listed in the search criteria for any report listed herein must have a drop-down pick list for any fields that have values that are available for a pick list (e.g.: list of TOTs, list of ORIs, activity/event type). (M)
3. All reports listed herein must have a final row at the bottom of the report showing totals for any columns in the reports, unless totals are not applicable (e.g.: a total for ORI is not applicable). (M)
4. The AFIS renewal solution shall provide at least the following predefined reports, including but not limited to the data/fields identified herein for each report (the Contractor will determine any additional data/fields details to be included in collaboration with the RCMP after contract award): (M)
 - a. Hourly Statistics Reporting:
 - i. Hourly Number Of Transactions Report – For a past period based on specified start date/time and end date/time for all TP and Latent transaction within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by hour, agency ORI, TOT, number of transactions for each of received, processed, overdue, rejected and exceptions.
 - ii. Processing Time For Hourly Transactions Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transaction within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by hour, agency ORI, TOT, average processing time, minimum processing time, maximum processing time, average exception time and total exception time.
 - iii. Hourly Search Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transaction within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by hour, agency ORI, TOT, with totals for 1:1 searches, 1:N searches, TP-latent,

Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.

- iv. Hourly Hit Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transaction within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by hour, agency ORI, TOT, with totals for the following searches and totals for identifications for each type of search: 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.
- b. Daily Statistics Reporting:
- i. Daily Number Of Transactions Report – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by day, agency ORI, TOT, number of transactions for each of received, processed, overdue, rejected and exceptions.
 - ii. Processing Time For Daily Transactions Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by day, agency ORI, TOT, average processing time, minimum processing time, maximum processing time, average exception time and total exception time.
 - iii. Daily Search Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by day, agency ORI, TOT, with totals for 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.
 - iv. Daily Hit Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search

criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by day, agency ORI, TOT, with totals for the following searches and totals for identifications for each type of search: 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.

c. Monthly Statistics Reporting:

- i. Monthly Number Of Transactions Report – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by month, agency ORI, TOT, number of transactions for each of received, processed, overdue, rejected and exceptions.
- ii. Processing Time For Monthly Transactions Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by month, agency ORI, TOT, average processing time, minimum processing time, maximum processing time, average exception time and total exception time.
- iii. Monthly Search Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by month, agency ORI, TOT, with totals for 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.
- iv. Monthly Hit Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by month, agency ORI, TOT, with totals for the following searches and totals

for identifications for each type of search: 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.

d. Yearly Statistics Reporting:

- i. Yearly Number Of Transactions Report – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by year, agency ORI, TOT, number of transactions for each of received, processed, overdue, rejected and exceptions;
- ii. Processing Time For Yearly Transactions Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by year, agency ORI, TOT, average processing time, minimum processing time, maximum processing time, average exception time and total exception time.
- iii. Yearly Search Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by year, agency ORI, TOT, with totals for 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.
- iv. Yearly Hit Statistics Reporting – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI(s) and TOT(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT or date. The fields to be included in the report must be at least the following: date organized by year, agency ORI, TOT, with totals for the following searches and totals for identifications for each type of search: 1:1 searches, 1:N searches, TP-latent, Latent-TP, latent-latent, TP palm-TP palm, TP palm-latent palm, latent palm-TP palm and latent palm-latent palm.

e. Repository Reports:

- i. TP Repository Report – For a past period based on specified start date/time and end date/time for all TP fingerprint data within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, or TOT. The fields to be included in the report must be at least the following: repository number, repository name, TOT, file number prefix, number of unique subject IDs, number of unique file numbers, number of cards, number of composites; and total number of cards and composites.
 - ii. Palm Repository Report – For a past period based on specified start date/time and end date/time for all TP palm data within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, or TOT. The fields to be included in the report must be at least the following: agency ORI, TOT and total number of palms.
 - iii. Latent Repository Report – For a past period based on specified start date/time and end date/time for all Latent finger data within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, or TOT. The fields to be included in the report must be at least the following: agency ORI, TOT and total number of latent fingers.
 - iv. Latent Palm Repository Report – For a past period based on specified start date/time and end date/time for all Latent palm data within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, or TOT. The fields to be included in the report must be at least the following: agency ORI, TOT and total number of latent palms.
- f. Transaction Logging.
- i. Transaction Summary statistics – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI and TOT(s). The fields to be included in the report must be at least the following: agency ORI, TOT and total number of transactions per TOT.
 - ii. Transaction Log statistics – For a past period based on specified start date/time and end date/time for all TP and Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT, transaction number, DCN, transaction status, workstation and/or user. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, DCN, workstation

- or user. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, DCN, transaction priority, transaction start time, transaction end time, transaction duration and user for each transaction.
- iii. TP Transaction Log Detailed statistics – For a past period based on specified start date/time and end date/time for all TP transactions within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT, transaction number, TCN, external TCN, DCN, file number, transaction status and/or document ID. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, TCN, external TCN, DCN, file number or document ID. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, priority, TCN, external TCN, DCN, file number, document ID, subject ID, transaction start time, transaction end time and transaction duration for each transaction.
 - iv. Latent Transaction Log Detailed statistics – For a past period based on specified start date/time and end date/time for all Latent transactions within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT, transaction number, external TCN, transaction status, latent file number, latent ID and/or latent image ID. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, latent file number, latent ID and/or latent image ID. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, priority, external TCN, latent file number, latent ID, latent image ID, transaction start time, transaction end time and transaction duration for each transaction.
- g. Transaction Event Logging:
- i. TP Activity/Event Transaction statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT, transaction number, TCN, DCN, file number, activity/event, workstation and/or user. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, TCN, DCN, file number, activity/event, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, activity/event, activity/event start time, activity/event end time and activity/event duration for each activity/event workstation and user for each activity/event.
 - ii. Latent Activity/Event Transaction statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, activity/event, workstation and/or user. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria:

agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, activity/event, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, latent file number, latent ID, latent image ID, activity/event, activity/event start time, activity/event end time and activity/event duration for each activity/event workstation and user for each activity/event.

h. User Activity/Event Logging:

- i. User Activity/Event Summary statistics – For a past period based on specified start date/time and end date/time for all TP and Latent transaction within the date/time range, select transactions using at least the following search criteria: user and activity/event. The fields to be included in the report must be at least the following: user, activity/event, total number of transactions processed and average time to process.
- ii. User Activity/Event TP Detail statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, DCN, file number, activity(ies)/events, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number, activity/event, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, activity/event, workstation, activity/event start time, activity/event end time and activity/event duration for each activity/event.
- iii. User Activity/Event Latent Detail statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, latent file number, latent ID, latent image ID, activity(ies)/events, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, activity/event, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, latent file number, latent ID, latent image ID, activity/event, workstation, activity/event start time, activity/event end time and activity/event duration for each activity/event.

i. Verification Logging:

- i. TP Auto Verification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, DCN, file number, disposition, and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number or user. The fields to be included in the report must be at least the following: agency ORI, TOT, user, transaction number, TCN, DCN, file number, verification start time,

- verification end time, candidate TP card, candidate file number, score and disposition for each transaction.
- ii. TP Manual Verification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, DCN, file number, disposition, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, user, transaction number, TCN, DCN, file number, verification start time, verification end time, candidate TP card, candidate file number, score and disposition for each transaction.
 - iii. TP Reverse Search Verification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, DCN, file number, disposition, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, user, transaction number, TCN, DCN, file number, verification start time, verification end time, candidate TP card, candidate file number, score and disposition for each transaction.
 - iv. Latent To TP Verification statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, latent file number, latent ID, latent image ID, disposition, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, user, transaction number, TCN, latent file number, latent ID, latent image ID, verification start time, verification end time, candidate TP card, candidate file number, score and disposition for each transaction.
 - v. Latent To Latent Verification statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, latent file number, latent ID, latent image ID, disposition, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, user, transaction number, TCN, latent file number, latent ID, latent image ID, verification start time, verification end time, candidate latent card, candidate latent image ID, score and disposition for each transaction.

j. Certification Logging:

- i. TP To TP Certification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT, transaction number, external TCN, external TOT, DCN, file number, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, external TOT, DCN, file number, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, external TOT, workstation, user, transaction number, retention flag, TCN, DCN, file number, certification start time and certification end time for each transaction.
- ii. TP To Latent Certification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, external TOT, DCN, file number, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, external TOT, DCN, file number, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, external TOT, workstation, user, transaction number, activity/event, TCN, DCN, file number, certification start time and certification end time for each transaction.
- iii. Latent To TP Certification statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, latent file number, latent ID, latent image ID, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, external TOT, workstation, user, transaction number, activity/event, latent file number, latent ID, latent image ID, file number, certification start time and certification end time for each transaction.
- iv. Latent To Latent Certification statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, latent file number, latent ID, latent image ID, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, latent file number, latent ID, latent image ID, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, external TOT, workstation, user, transaction number, activity/event, latent file number, latent ID, latent image ID, candidate latent card, candidate latent image ID, score, certification start time and certification end time for each transaction.

- v. TP To TP Certified To statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: transaction number, external TCN, DCN of the search prints, file number, submission number of search prints, subject ID, TCN of the file prints, DCN of the file prints, file number of the file prints and/or submission number of the file prints. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: transaction number, TCN, DCN of the search prints, file number or submission number of search prints. The fields to be included in the report must be at least the following: transaction number, TCN, DCN of the search prints, file number of the search prints (if available), submission number of search prints, certification date/time, candidate card ID, TCN of the candidate, DCN of the candidate, file number of the candidate and submission number of the candidate for each transaction.
 - vi. Latent To TP Certified To statistics – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: transaction number, external TCN, latent file number, latent ID, latent image ID, submission number of search print, subject ID, TCN of the file prints, DCN of the file prints, file number of the file prints and/or submission number of the file prints. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: transaction number, external TCN, latent file number, latent ID, latent image ID or submission number of search print. The fields to be included in the report must be at least the following: transaction number, TCN, latent file number, latent ID, latent image ID, submission number of search prints, certification date/time, candidate card ID, TCN of the candidate, DCN of the candidate, file number of the candidate and submission number of the candidate for each transaction.
 - vii. Auto Certification statistics – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, external TOT, DCN, file number, retention code, workstation and/or user(s). As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, external TOT, DCN, file number, workstation or user. The fields to be included in the report must be at least the following: agency ORI, TOT, external TOT, workstation, user, transaction number, retention flag, TCN, DCN, file number, certification start time and certification end time for each transaction.
- k. Discrepancy logs.
- i. TP To TP Discrepancies – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, external TOT, DCN of the search prints, file number, submission number and/or DCN of the file prints. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting

- from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number or submission number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, submission number, candidate ID, candidate file number, candidate score, auto confirm flag, verifier user, verification status, certifier user and certification status for each transaction.
- ii. TP To Latent Discrepancies – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, external TOT, DCN of the search prints, file number, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN, file number or submission number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, submission number, latent candidate ID, latent image ID, candidate score, auto confirm flag, verifier user, verification status, certifier user, certification status and second certifier user for each transaction.
 - iii. Latent To TP Discrepancies – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, latent file number, latent ID, latent image ID, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, latent file number, latent ID, latent image ID or submission number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, latent file number, latent ID, latent image ID, submission number of search prints, candidate card ID, candidate file number, candidate score, verifier user, verification status, certifier user, certification status, second certifier user and second certification status for each transaction.
 - iv. Latent To Latent Discrepancies – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, latent file number, latent ID, latent image ID, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, latent file number, latent ID, latent image ID or submission number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, latent file number, latent ID, latent image ID, submission number of search prints, latent candidate card ID, latent image ID, candidate score, verifier user, verification status, certifier user, certification status, second certifier user and second certification status for each transaction.
- I. Log of declines.

- i. TP To TP Declines – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT, transaction number, external TCN, external TOT, DCN of the search prints, file number, number and/or DCN of the file prints. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, DCN or file number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, external TCN, candidate ID, candidate file number, candidate score, auto confirm flag, verifier user, verification status, certifier user and certification status for each transaction.
- ii. TP To Latent Declines – For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, external TOT, DCN of the search prints, file number, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: Agency ORI, TOT, transaction number, external TCN, DCN, file number or submission number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, TCN, DCN, file number, external TCN, latent candidate ID, latent image ID, candidate score, auto confirm flag, verifier user, verification status, certifier user, certification status and second certifier user for each transaction.
- iii. Latent To TP Declines – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, latent file number, latent ID, latent image ID, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, latent file number, latent ID, latent image ID or submission number. The fields to be included in the report must be at least the following: Agency ORI, TOT, transaction number, TCN, DCN of search prints, latent file number, latent ID, latent image ID, external TCN, candidate card ID, candidate file number, candidate score, verifier user, verification status, certifier user and certification status for each transaction.
- iv. Latent To Latent Declines – For a past period based on specified start date/time and end date/time, select Latent transactions using at least the following search criteria: agency ORI, TOT(s), transaction number, external TCN, latent file number, latent ID, latent image ID, submission number and/or latent candidate ID of the file print. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, external TCN, latent file number, latent ID, latent image ID or submission number. The fields to be included in the report must be at least the following: Agency ORI, TOT, transaction number, TCN, DCN of search prints, latent file number, latent ID, latent image ID, external TCN of search

prints, latent candidate card ID, latent image ID, candidate score, verifier user, verification status, certifier user, certification status, second certifier user and second certification status for each transaction.

- m. Database activity log.
 - i. Database Summary Statistics – For a past period based on specified start date/time and end date/time for all amendments and deletions to the database within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT and file number. The fields to be included in the report must be at least the following: Agency ORI, TOT, file number, amendment/deletion action and total number of whatever action was taken.
 - ii. Database Amendments Statistics – For a past period based on specified start date/time and end date/time for all amendments to the database within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT, file number, transaction number and/or user. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, file number, transaction number or user. The fields to be included in the report must be at least the following: Agency ORI, TOT, file number, transaction number, date/time and user for each amendment.
 - iii. Database Deletion Statistics – For a past period based on specified start date/time and end date/time for all deletions to the database within the date/time range, select transactions using at least the following search criteria: agency ORI, TOT, file number, DCN, transaction number, user. TP rolled, ID flat, palm print, latent finger and/or latent palm. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, file number, DCN, transaction number or user. The fields to be included in the report must be at least the following: agency ORI, TOT, file number, DCN, transaction number, TP rolled, ID flat, palm print, latent finger, latent palm date/time and user for each deletion.
- n. AFIS Error Log Statistics:
 - i. AFIS Error Log Summary Statistics – For a past period based on specified start date/time and end date/time for all significant errors within the date/time range, select transactions using at least the following search criteria: server name, process name and/or process function. The fields to be included in the report must be at least the following: server name, process name, process function and total number of whatever error occurred.
 - ii. AFIS Error Log Detailed Statistics – For a past period based on specified start date/time and end date/time for all significant errors within the date/time range, select transactions using at least the following search criteria: server name, process name and/or process function. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: server name, process name, process function or time. The fields to be included in the

report must be at least the following: server name, process name, process function, date/time and error message.

- o. Audit Log Statistics:
 - i. Summary Audit Log Statistics – For a past period based on specified start date/time and end date/time for all logins within the date/time range, select transactions using at least the following search criteria: user and/or workstation. The fields to be included in the report must be at least the following: user, workstation and total number of logins.
 - ii. Detailed Audit Log Statistics – For a past period based on specified start date/time and end date/time for all logins within the date/time range, select transactions using at least the following search criteria: user and/or workstation. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: user, workstation or time. The fields to be included in the report must be at least the following: user, workstation, login time and logout time.
 - iii. Unsuccessful Login Statistics – For a past period based on specified start date/time and end date/time for all unsuccessful logins within the date/time range, select transactions using at least the following search criteria: user and/or workstation. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: user, workstation or time. The fields to be included in the report must be at least the following: user, workstation, login time and login error.
 - iv. Administrative Audit Log Statistics – For a past period based on specified start date/time and end date/time for login activity within the date/time range, select transactions using at least the following search criteria: user, workstation, user management activity and/or user account affected. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: user, workstation, user management activity, user account affected or time. The fields to be included in the report must be at least the following: user, workstation, time of activity, type of activity (e.g.: add a user, change user privileges) and user account affected.
 - v. Current User Logged In Statistics – For a past period based on specified start date/time and end date/time for all users currently logged in within the date/time range, select transactions using at least the following search criteria: user and/or workstation. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: user or workstation. The fields to be included in the report must be at least the following: user, workstation, session number and login time.
- p. Print Quality Logging.
 - i. TP Quality statistics – For a past period based on specified start date/time and end date/time, select TP data using at least the following search criteria: agency ORI, TOT, transaction number, type of print, finger/palm id,

- print quality and/or minutia count. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, transaction number, type of print, finger/palm id, print quality or minutia count. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, type of print, finger/palm id, print quality and minutia count.
- ii. Latent Quality statistics – For a past period based on specified start date/time and end date/time, select Latent data using at least the following search criteria: transaction number, type of print, finger/palm id, print quality and/or minutia count. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: transaction number, type of print, finger/palm id, print quality or minutia count. The fields to be included in the report must be at least the following: transaction number, type of print, finger/palm id, print quality and minutia count.
- q. “Miss” Consolidation Logging – The AFIS renewal solution shall generate a report identifying the miss that was reconciled and all steps that preceded the miss reconciliation that may have led to the generation of multiple subjects for the same individual once the reconciliation has taken place (after being authorized by a certification technician). For a past period based on specified start date/time and end date/time, select TP transactions using at least the following search criteria: agency ORI, TOT(s), DCN, old file number and/or new file number. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, TOT, DCN, old file number and/or new file number. The fields to be included in the report must be at least the following: agency ORI, TOT, transaction number, old file number, new file number transaction number, DCN of search prints, DCN of the file prints, old subject ID, new subject ID and consolidation date/time for each transaction.
- r. ULF Expiry Reporting.
- i. ULF Expiry Summary Report – For a future period based on specified start date/time and end date/time, list a summary of the ULF entries that will expire using at least the following search criteria: agency ORI, crime type and latent type (i.e. finger, palm). The fields to be included in the report must be at least the following: agency ORI, Latent type, crime type and total per agency ORI.
 - ii. ULF Expiry Detailed Report – For a future period based on specified start date/time and end date/time, list a summary of the ULF entries that will expire using at least the following search criteria: agency ORI, crime type, latent type (i.e. finger, palm), transaction number, case file number, latent file number, latent ID and latent image ID. As well, the desired sort criteria must be able to be selected by the user prior to executing the report by selecting from the following criteria: agency ORI, crime type, latent type, transaction number, expiry date, case file number, latent file number, latent ID and latent image ID. The fields to be included in the report must be at least the following: agency ORI, latent type, transaction number, expiry

- date, case file number, latent file number, latent ID and latent image ID, crime type and expiry date.
- iii. Each ULF contributor will receive a report of all ULF entries that their agency contributed that are about to expire (e.g.: Monthly/Yearly ULF Expiry Report) in the next month/year. For example, on Sept 1, a Police Department would receive a list of all of their latent entries on the ULF that will expire in October.
5. The AFIS renewal solution shall provide an authorized user with a COTS ad hoc report preparation capability (Report Generator) so that non-standard reports can be produced (i.e. created, saved, viewed, printed and/or export the resulting report to at least PDF, CSV and XML file types) without requiring programming or SQL code. Crystal reports 2013 is the GFE Report Generator tool that is used to generate ad hoc reports, which is available for the Contractor to use, or a replacement Report Generator tool that fully satisfies all the ad hoc reporting requirements can be provided by the Contractor as part of the Contractor's proposal. (M)
 6. The AFIS renewal solution Report Generator shall, at a minimum, enable users to access and summarize database statistics, search results, database activity, user activity, agency activity and remote site statistics. (M)
 7. The AFIS renewal solution Report Generator shall enable an authorized user to query data in the AFIS renewal solution's database using SQL-like commands in a user-friendly GUI. (M)
 8. The AFIS renewal solution must provide a read-only database view that will be used by the Report Generator to create and print ad hoc reports. This database view must include all database fields that are part of the user's operational view of AFIS renewal solution. That is, any database field that is viewable by any user, either as part of the UI or in a report, must be available in the database view. (M)
 9. The ad hoc reporting feature shall be designed to accommodate at least ten (10) reports per day. (M)
 10. The ad hoc reporting feature shall only be available to authorized users, physically located at RCMP HQ. (M)
 11. If the GFE Crystal reports will not be used as part of the Contractor's AFIS renewal solution, then the replacement tool must provide easy to use report preparation capabilities: (M)
 - a. Enable users to extract data from the database;
 - b. Enable users to export extracted data to a spreadsheet, PDF, CSV and XML file types;
 - c. Provide summary statistics, including totals, minimums, maximums, averages and medians;
 - d. Specify the start and end periods for a specific report definition;
 - e. Specify the report format for a specific report definition;
 - f. Specify the search parameter(s) for a specific report definition;

- g. Save report definitions;
 - h. Modify report definitions; and
 - i. Delete report definitions.
- 12. For the purposes of these requirements, a state refers to specific steps which correlate to an activity/event in the Ten Print or Latent process such as Ten Print QC, Ten Print Verification, Ten Print Certification, Latent Encoding, etc. (I)
- 13. The AFIS renewal solution shall enable an authorized user to generate a report of all Misses that were reconciled and all steps that preceded the miss reconciliation that may have led to the generation of multiple subjects for the same individual. (M)
- 14. The AFIS renewal solution should provide tools for analyzing misses. (R)
- 15. The AFIS renewal solution shall automatically retain a record of all the data required to support the reporting and audit logging requirements in an efficient and effective manner. That is, the data required for the reporting must be retained in a manner that allows the reports to be executed without negatively affecting the normal service delivery time for all other AFIS renewal solution processing activities. (M)
- 16. The Remote Monthly Statistics Report must include for each remote site: Number of Latent identifications made, Number of individuals identified, Number of Ten Print searches performed, Number of identifications on Ten Print searches, Number of Adds to the ULF, Number of Latent Searches submitted. (M)

3.6 Volumetrics and Service Delivery

1. RCMP has rigorously monitored and analyzed RTID volumes over the past five (5) years. This monitoring and analysis has allowed volumes and expected service delivery to be estimated with reasonable confidence. The AFIS renewal solution must be able to support the service delivery requirements stated herein based on the 2019 volumes shown in Table 3-1: AFIS Renewal Solution Sizing Design Volumes – 2019. The Contractor must explain precisely how the 2019 service delivery requirements will be met by explaining how the Contractor's design/configuration processes the volumes. The evaluation process, including benchmark testing, will be used to determine if the Contractor's AFIS renewal solution satisfies the service delivery requirement for the 2019 volume. (M)
2. The AFIS renewal solution shall be designed to accommodate the 2019 Daily Design Volume shown in Table 3-1. Since the RCMP will only have volumes as of 2016/2017 when the contract is planned for award, the 2016/2017 volumes will be used to validate that AFIS renewal solution supports the service delivery times with the 2016/2017 volumes in the production environment. The Contractor's proposal must explain how the design will be able to support the projected 2019 volumes. (M)
3. The AFIS renewal solution shall be designed to accommodate a Peak Hourly Load as shown in Table 3-1. (M)
4. The 2019 Peak Daily Design Volumes are based on the projected Annual Volume in 2019 with various factors applied depending on the type of transactions. Typically the peak daily volumes for manual intervention activities are equal to the yearly volume divided by 249 working days and for activity that does not have manual intervention, yearly volume is divided by 365 working days, and multiplied by three. The Peak Hourly Load is based on the projected peak daily average, divided by the 24 hours multiplied by a percentage estimate error of 20% to allow for volume projection errors. (I)
5. The unit of measure for the latent volumetrics is "searches". Presently there are on average two (2) set-up searches per latent image, which includes the original automatic search and one additional setup. The AFIS renewal must allow up to ninety-nine (99) set-up searches per latent. (M)
6. The same image can presently be searched with a combination of filters: probable digit, gender, repository, case type, distortion or rotation. It is preferred that searching by filters is not required. The AFIS renewal solution should be able to search with the same accuracy to find matching candidates without requiring filters. (R)

Table 3-1: AFIS Renewal Solution Sizing Design Volumes – 2019			
Type of Search	Peak Daily Design Volume Overall	Priority 1 and 2 Daily Design Volume	Peak Hourly Load 2019
Total Ten Print 1:1 Searches (AFIS)	34,600 ¹	3,400	1,600
Total Ten Print 1:N Searches	34,600	3,400	1,600
Total Latent vs Ten Print Searches	330	330	60
Total Ten Print vs Latent (finger latent) – Reverse Search (RS)	6,600	330	350
Total Ten Print vs Latent (palm latent) – RS (Note: These RS volumes reflect the number of TP submissions that include palms)	4,500	225	250
Total Latent Palm vs Ten Print Palm Searches	163	163	14
Total Latent vs Latent (finger and palm latent)	34	34	4
Ten Print Fetch (does not include those performed within the AFIS locally)	1000	1000	115
Total Ten Print 1:1 Searches (VER)	17,000	17,000	1,000

7. The AFIS renewal solution shall include sufficient workstations to meet the volumes specified in Table 3-1: AFIS Renewal Solution Sizing Design Volumes – 2019. The Contractor must explain the workstation configuration that will support the workstation volumes. As well, any workstation additions or modification to the GFE workstations required to support the Contractor’s AFIS renewal solution software and configuration must be explained. (M)
8. It is anticipated that a total of 150,000 transactions resulting in Ten Print Deletes will be received in the year 2019. In some cases, the whole file is purged and in other cases, only a single set of prints are purged. The AFIS renewal solution must support these delete requirements. (M)

¹ On average 100% of 1:N searches also have a 1:1 search

9. Approximately 20,000 Unsolved Latent Delete transactions are anticipated to be received in the year 2019. The AFIS renewal solution must support these delete requirements. (M)
10. Canadian Police Services Information Centre (CPSIC) is a special unit within RCMP HQ tasked with handling the 24x7x365 service delivery requirements in situations where the main Service does not have the staff on duty to do so. (I)
11. CPSIC will be responsible for handling all ten-print submissions that require processing within 2-hours or less, 24x7x365 and that arrive during off hours. They will also handle all latent transactions that must be serviced during off hours. They will not handle civil transactions that require manual intervention. (I)
12. The AFIS renewal solution shall enable CPSIC to process all off-hour service delivery requests according to what is authorized for CPSIC users. (M)
13. The AFIS renewal solution shall enable CPSIC staff to perform all of their fingerprint related tasks on a single AFIS workstation. (M)
14. The AFIS renewal solution shall be designed to meet the Turnaround Time Requirements in Table 3-2: Business Hours, Priorities and Turnaround Times for Searches for 95% of the transactions given the Daily Design Volume and the Peak Hourly Load indicated in Table 3-1. (M)
15. The AFIS renewal solution shall process the required volumes for Ten Print (TP) searches within the required turnaround times whether TP Rolled, Plain, ID Flat or any mix of these are received. (M)
16. The turnaround time is calculated starting from the point at which the transaction is received by AFIS until the point where certification is complete or a confirmation is received that no hit has been found and the reply transaction has been sent to the NNS. The AFIS renewal solution must provide turnaround times that are as fast, or faster, than Table 3-2 for transactions requiring no manual intervention and transactions requiring manual intervention. (M)
17. The two 8 hour shifts begin at 7am and end at 11pm Monday to Friday (i.e. 7am-3pm and 3pm-11pm). (I)
18. Where hours are indicated in Table 3-2, this is to be interpreted as business hours when human resources are available to service a particular type of external transaction. For example, a 12 hour turnaround time combined with 16x5 business hours implies that a transaction received on Friday at 2 pm is not required to complete processing until Monday at 10am. The volumes provided in Table 3-2 are average annual projections for 2019. The volumes in Table 3-1 have a multiplying factor and percentage error added; therefore, the volumes in Table 3-2 should not be used to directly correlate to Table 3-1. (I)
19. The AFIS renewal solution shall achieve Peak Hourly Load and service delivery requirements. This shall be measured based on a fully populated database and a two-hour maximum peak load production sample. (M)
20. The AFIS renewal solution shall be designed to accommodate the business hours in Table 3-2. (M)

21. The AFIS renewal solution shall perform an image quality check with ten (10) rolled, four (4) plain and six (6) palm prints in less than 2 minutes. This shall be measured from the time the request is received by AFIS from the NPS NIST Server to the time the reply (TPQCI) is returned to the NPS NIST Server. This specific performance requirement with rolled, plains and palms is used since this represents the highest number of images included in a TP transaction. All other TP image quality checks must be faster than 2 minutes. (M)
22. The AFIS renewal solution shall delete fingerprint images (Rolled & Plain, ID Flat, Palm impressions) in less than 10 seconds from the time the request is received from the NNS to the time the confirmation / reply transaction is returned to the NNS. (M)
23. The AFIS renewal solution shall update fingerprint-related file descriptors such as File Number in less than 5 seconds from the time the request (TPAI, ULAI) is received from the NNS to the time the confirmation / reply transaction is returned to the NNS. (M)
24. Priority one (1) transactions must be placed at the top of the queue for immediate processing and their turnaround time must not exceed the priority two (2) and priority three (3) turnaround times. (M)
25. Regardless of priority, an enrolment transaction, not stopped for manual processing, must be processed within ten (10) minutes. That is, if an enrolment is in the queue for longer than ten (10) minutes because of an increase in high priority search transactions, the enrolment must be automatically increased in priority or use some other method that ensures it is processed within fifteen (15) minutes. (M)
26. The AFIS renewal solution must support searching and processing Latent fingers vs TP Palms or Latent Palms vs TP finger. This is for unusual circumstances where a Latent is submitted as a finger; however, the Latent technician considers it a potential palm or where a Latent is submitted as a palm; however, the Latent technician considers it a potential finger. These volumes are not expected to exceed fifty (50) transactions per year and the performance of these searches does not need to meet the normal UI response times. (M)

Table 3-2: Business Hours, Priorities and Turnaround Times for Searches							
External Transactions	Business Hours	Annual Average Volume	Priority 1, 2, 3		Priority 4 – 9		Lights out
			% in Year 2019	Turn Around Time	% in Year 2019	Turn Around Time	Turn Around Time
Criminal Record Inquiry Submission (CAR N)	24x7x365	93,674	50%	1 hour	50%	2 hour	2 minutes
Anonymous TP Search Request (ATS)	2 shifts of 8x5	800,000			100%	24 hour	2 minutes
Criminal/Refugee Retain Submission – Electronic (CAR Y, REF)	24x7x365	670,000 +20,000 US	2%	1 hour	98%	2 hours	2 minutes
Civil Screening Submission – Electronic (MAP N)	2 shifts of 8x5	695,319			100%	24 hours	2 minutes
Immigration Retain Add Submission – Electronic (IMM)	2 shifts of 8x5	1,200,000	2%	1 hour	98%	24 hours	2 minutes
Employee Add Submission Retain – Electronic (Direct File, MAP Y)	1 shifts of 8x5	7,000			100%	12 hours	N/A
Ten Print to Latent Search (Finger and Palm reverse search) (CAR N, CAR Y, REF)	2 shifts of 8x5	820,000 60% include Palms			100%	24 hours	N/A
Central Latent to Ten Print Search (LFSNS)	2 shifts of 8x5	80,000	100%	2 minutes			N/A
Central Latent Palm to Palm	2 shifts of 8x5	20,000	100%	3 minutes			N/A

Table 3-2: Business Hours, Priorities and Turnaround Times for Searches							
External Transactions	Business Hours	Annual Average Volume	Priority 1, 2, 3		Priority 4 – 9		Lights out
			% in Year 2019	Turn Around Time	% in Year 2019	Turn Around Time	Turn Around Time
Search (LFSNS)							
Remote Latent to Ten Print Search (LFFS)	24x7x365	80,000	100%	5 minutes			N/A
Remote Latent Palm to Palm (LFFS)	24x7x365	20,000	100%	5 minutes			N/A
TP Image Request (IRQ, IRQI)	24x7x365	200,000	10%	3 minutes	90%	5 minutes	N/A
Image List Retrieval (ILRI)	24x7x365	50,000	80%	15 seconds	20%	1 minutes	N/A

27. The AFIS renewal solution shall be sized to accommodate the database volumes as outlined in Table 3-3: Data Volumes. (M)

Table 3-3: Data Volumes			
DATABASE		CONVERSION (2016)	DESIGN (2019)
Feature Sets (minutia)	Ten Print Sets (Rolled & Plain, ID Flat)	7.5 Million	10 Million
	Palm DB sets	1.1 Million	2 Million
	Latent	204,000	240,000
	Latent Palm DB	10,000	20,000
Images	Ten Print Sets (Rolled & Plain, ID Flat)	7.5 Million	10 Million
	Palm DB sets	1.1 Million	2.2 Million
	Latent	204,000	240,000
	Latent Palm DB	10,000	20,000
	Photos	200,000	600,000
Transaction Logs and Statistics		Est 100 Million	Est 100 Million
Subjects		6.0 Million	8.5 Million

3.7 AFIS User Interface Feature

1. This section contains the AFIS User Interface features that are common to most user activities performed by fingerprint technicians. (I)
2. All TP and Latent UI features must have the same look and feel with a Windows GUI. For example, a side-by-side view of two TP fingers must look the same as a side-by-side view of a latent finger and a TP finger. (M)
3. A side-by-side view must use as much of the screen as possible while still providing the user the ability to use the features that must be available on the UI. (M)
4. The AFIS renewal solution UI must allow personalized settings to be configured on a per workstation basis, as a minimum, and have those personalized settings saved and used every time the user logs into the workstation. If the AFIS renewal solution UI allows personalized settings to be configured and saved by each user regardless of workstation, as described in the next paragraphs (5, 6), this personalized settings per workstation is not required. That is, if the AFIS renewal solution UI supports the requirements in the next paragraphs (5, 6), the Contractor can show satisfying this requirement by indicating support for the requirements in the next paragraphs (5, 6). (M)
5. The AFIS renewal solution UI should allow personalized settings to be configured by each user and have those personalized settings saved and used every time the user logs in. (R)
6. These personalized settings should include as many UI features as possible from the available features. (R)
7. Additionally, the user should be able to temporarily toggle between their personal settings and the default settings through a single click mouse method (e.g.: button). (R)
8. All AFIS renewal solution TP and Latent features must be available for any AFIS user, on any AFIS workstation with restrictions based on Role Based Access Controls (RBAC). (M)
9. The Ten Print UI and the Latent UI shall provide the ability for a technician to perform the mandatory image adjustments, features and views to the submitted Ten Print/Latent fingerprint/palm print images and filed Ten Print/Latent fingerprint/palm print images as described in Table 3-4: AFIS User Interface Features. These features shall be available under all circumstances under which a Ten Print/Latent fingerprint/palm print image is viewed/compared except where noted in Table 3-4. (M)
10. In addition, the Ten Print and Latent UI should provide the ability for a technician to perform the rated features in Table 3-4: AFIS User Interface Features and other image adjustments, features and views as described in Table 3-4: AFIS User Interface Features. These features should be available under all circumstances under which a Ten Print/Latent fingerprint/palm print image is viewed/compared except where noted in Table 3-4. (R)

11. Each AFIS workstation shall provide the ability to perform all Ten Print and Latent User Interface software features and software functions. This does not imply that all workstations include each of the input devices. (M)
12. The input devices to be provided with each workstation are specified in the Technical Requirements. (I)

Table 3-4: AFIS User Interface Features		
Feature	Ten Print User Interface	Latent User Interface
Image Adjustments		
Adjust brightness (less or more)	M	M
Adjust contrast (less or more)	M	M
Rotate (+/- 180 Degrees)	M	M
Centre	M	M
Crop	R	M
Position	M	M
Revert to Default View	M	M
Segment/Block to ANSI NIST size	M	M
Recalibrate the size of the image based on a scale provided in the image	N/A	M
Change to Black and white reversal view. This view shows white pixels as black and black as white.	M	M
While in side-by-side view have the ability to move an individual image freely in any direction within its window and beyond the border of the window. This is to allow the technician to move either or both images to have the portion of the print under analysis to be as close as possible to each other to reduce the distance the fingerprint technician's eyes need to move to compare the prints (e.g.: move each image so the core of each image is displayed as close as possible).	M	M
Perform lateral image flip (image reversal). When in side-by-side view, the user must have the ability to flip each image individually.	M	M
Change to Display minutiae view. This view shows the minutiae as plotted by the technician or as saved in the database.	M	M
Display characteristics. This view shows the fingerprint characteristics.	M	M
Hide specific charting lines on/off (in side-by-side view/analysis only)	R	M
Toggle display of charting features on or off (in side-by-side	R	M

Table 3-4: AFIS User Interface Features		
Feature	Ten Print User Interface	Latent User Interface
view/analysis only)		
Zoom (magnification) in and out (up to four times its original size)	M	M
Reset the image back to its original state prior to any image adjustments (Note: This is in addition to individual image adjustment reset capabilities identified elsewhere in this SOW)	M	M
Ability to adjust the zoom factor of both images (on a side by side view/analysis) at the same time so that they are both at the same size (i.e.: parallel continuous zoom). (in side-by-side view/analysis only)	M	M
Draw a free hand closed figure on an image, edit the area, adjust brightness and contrast in the area.	M	M
Control the position of the zoom in side-by-side view to zoom each image individually or zoom both images in lock sync.	M	M
Change to Three-dimensional view. Depending on the quality of the image provided, this view gives a sense of depth to the ridge formations.	R	R
Change to Smooth Image view. This view removes the jagged edges between pixels particularly when zoom is applied.	R	R
Change to Thinned Ridge view. This view displays the ridges as thin black curves and the background including any noise in white.	R	R
Rotate both the submitted image and the candidate image in parallel as required. That is, through a single mouse click (e.g.: button) turn on/off the ability to have both images adjusted by the change. (in side-by-side view/analysis only)	M	M
Annotate points of comparison clearly with dot or some other visual annotation. (in side-by-side view/analysis only)	N/A	R
Erase points of comparison. (in side-by-side view/analysis only)	N/A	R
Ability to plot ridge tracing and flow.	N/A	M
Add drawings, notations, and marks to images	R	R
Adjust contrast and brightness to a selected part of the image (variable contrast).	R	R
Provide connecting lines between minutia (charting) as part of analyzing a search print against a file print in a side-by-side view.	R	M
Display mated characteristics (e.g.: minutiae) from the search and file print in the correct orientation automatically (i.e.: how the minutia matched between the two prints). (in side-by-side view/analysis	M	M

Table 3-4: AFIS User Interface Features		
Feature	Ten Print User Interface	Latent User Interface
only)		
Ability to selectively highlight individual mated minutiae as part of analyzing a search print and a file print (verification/certification only)	M	M
Other User Interface Features		
Enable a technician to correct fingerprint sequence (switching of rolled with rolled)	M	N/A
Enable a technician to substitute rolled with plain impressions	M	N/A
Enable a technician to define his or her own default settings for each of these image adjustments: brightness, contrast, default views, charting features on/off, verification mode on/off, display characteristics on/off.	M	M
View the transaction log for a specific transaction	M	M
Save the image in the database with the image adjustments made on the workstation and log all image adjustments performed by this change.	M	M
Display thumbnail size images while viewing/processing side-by-side images. The thumbnail size images must be selectable through a single mouse click and subsequently display the selected images.	M	M
Ability to undo and redo any user initiated action.	M	M
Fetch		
Fetch a specified image or set of images in the ULF by Latent Image Identifier or Originating Agency ID.	N/A	M
Fetch a specified Ten Print entry or set of entries in the TPF by FPS Number, Refugee File Number, Immigration File Number, Employee File Number or DCN, or other parameters to be determined.	M	M
Fetch a specified Ten Print entry or set of entries in work in progress by TCN, DCN or other parameters to be determined.	M	M
View two fetched fingerprint images (Rolled, Plain, ID Flat) or palm images for comparison from either the fingerprint or palm (if any exist) ULF or Ten Print/Palm Collection or work in progress side by side.	M	M
View any selected finger or palm from either fetched entry at the same size and scale.	M	M
View the descriptors and Fingerprint Characteristics of either of the fetched entries.	M	M

Table 3-4: AFIS User Interface Features		
Feature	Ten Print User Interface	Latent User Interface
Edit and resubmit a fetched Ten Print for search and return the response to the search to the main work queue.	M	N/A
View a list of prints on file for a given subject. If composites are part of the AFIS renewal solution, the composite must be included and highlighted in the list. From this view, enable the user to select a particular set or multiple sets of fingerprints and view the images.	M	M
Log all fetches performed by User ID, workstation ID, Subject Identifier, File Number, DCN, TCN, date and time.	M	M
Enable a certification technician to compare images from a paper set of fingerprints, using a camera to display the image from the paper, beside an image fetched from the AFIS database at a selectable rate of enlargement.	M	M
View all fingers of a fetched Ten Print on one display.	M	M
Edit and resubmit a fetched Latent for search as well as perform the following: Save this edited Latent Search as a new one Update an existing Latent image in the ULF Submit the Latent for search without saving it to the ULF Automatically add this transaction to the initiated search queue (i.e. Central Latent, RNSC).	N/A	M
Perform image adjustments, edit fingerprint characteristics (e.g.: minutiae) as well as descriptors on an image fetched from the ULF, search and save to the ULF if requested.	N/A	M
Perform image adjustments (e.g.: swap rolled and flat or swap palms), edit fingerprint characteristics as well as descriptors on an image fetched from the Ten Print database, send it for search and save the adjusted images in the database.	M	N/A
Back out of any operation through a cancellation feature.	M	M
Print		
Print out a colour/greyscale screen display of comparison quality at any point in time.	M	M
Print out a colour/greyscale screen display at any point in time for informal purposes.	M	M

- The AFIS renewal solution shall enable a technician to adjust the images during the TP and Latent processing with at least the following capabilities using a variable sizing capability with a mouse controlled method such as, hover and scroll, or slider; to finely

tune the adjustments. Additionally, there must be a reset button for each of these functions to remove the specific image adjustments: (M)

- a. Zoom in / zoom out an image;
 - b. Adjust brightness;
 - c. Adjust background brightness;
 - d. Rotate; and
 - e. Histogram equalization to adjust image intensities to enhance contrast.
14. The AFIS renewal solution should enable a technician to hover and scroll to zoom in / zoom out (i.e. hover on the image and use the mouse scroll wheel to adjust the image), since this is one of the most frequently used features. (R)
15. The AFIS renewal solution shall enable a technician to adjust the images during the TP and Latent processing with at least the following capabilities using a single mouse click method (e.g.: button, click/move): (M)
- a. Select best fit so the AFIS renewal solution determines how to display the prints;
 - b. Select actual size to display the prints in their actual size;
 - c. Size to 50% through a single mouse click;
 - d. Size to 200% through a single mouse click;
 - e. Previous pair;
 - f. Next pair;
 - g. Minutia with tail;
 - h. Minutia without tail;
 - i. Hide minutia / show matching minutia;
 - j. Ridge count off/on;
 - k. Match orientation off/on;
 - l. Move images close to each other to reduce the distance the fingerprint technician's eyes need to move to compare the prints;
 - m. White background;
 - n. Black background;
 - o. Colour background; and
 - p. Highlight a portion of the print to analyze more closely through actions the same or similar to the following:
 - i. Isolate (e.g.: box, lasso) a portion of a fingerprint on the search print and the candidate print; where lasso means allowing a user to select a region of

- interest (i.e. a circle or line to select an area inside or outside the area selected),
 - ii. Change the portion of the print isolated (e.g.: move around a box),
 - iii. Have the isolated portion of each print magnified (configurable parameter) for more detailed analysis, and
 - iv. Be able to identify specific points in one print and move the focal point of the magnified portion of the print (i.e.: move around in the magnified portion to better analyze whether the print is a match).
16. The AFIS renewal solution shall provide a means for the technician to indicate “certify” or “fail to certify”/“decline” by an explicit single user interface action (e.g.: Certify button, Decline button) with confirmation (e.g.: Are you sure?). The Certify button must be highlight in green and the Decline button must be highlighted in red using Alpha Blending or Alpha Compositing method. (M)
17. The AFIS renewal solution shall enable an AFIS user to view the NIST Packet during any state of processing. As a minimum, this shall include, viewing the packet from the work queue, from the TP quality check UI while the transaction is open for work, and similarly from TP manual segmentation, TP sequence check, TP verification, TP certification, Latent Lasso, Latent Edit, Latent Verification, Latent Certification 1, Latent Certification 2, Latent 3rd Certify, Latent Insert, Latent Search and UL Search. (M)

3.8 Administrative Capabilities

1. The AFIS renewal solution shall provide an administrative tool/capability to be used by an authorized user that shall provide, at a minimum, the following functionality: (M)
- a. Monitor all hardware and software;
 - b. Monitor the transactions in the AFIS workflow and give the transaction status, time in and time out;
 - c. Allow an authorized user to change the priority of a transaction or to push one or more transactions up or down the processing queue;
 - d. Give access to the error logs, and allow them to be searchable by, as a minimum: time error occurred, External TCN, DCN, and External Transaction Type;
 - e. Monitor databases and provide utilities to dump selected data, including all descriptors;
 - f. Monitor remote transactions;
 - g. Monitor all images stored in the Ten Print File, their corresponding minutiae and the descriptor data for a subject(s) to ensure that they are all correctly associated to one another;

- h. Monitor image quality and view all images stored in the Ten Print File (TPF), the Unsolved Latent File (ULF), and work in progress; view their corresponding descriptor data and feature sets;
 - i. Manually consolidate a set of Ten Print entries to the same Subject Identifier and File Number to reconcile misses when the consolidation of the files has not occurred, or on an as-needed basis when two subjects have been identified as a possible miss by external sources;
 - j. Provide functionality to delete entries (one by one and in batch) on the TPF, ULF and work in progress while leaving the transaction log intact and removing the entry from all work queues and candidate lists. Log all deletion activity by, as a minimum, External TCN, DCN, Subject Identifier, File Number, Latent Image Identifier (in the case of ULF only) user ID, workstation ID, date, time;
 - k. Provide access to the AFIS renewal solution statistics for reporting purposes;
 - l. Provide access to ad hoc reporting capability and predefined/canned reports as described in subsection 3.5 Operational Reporting and Statistics;
 - m. Provide functionality to amend the file number of a TPF directly and log all such actions;
 - n. Provide functionality to amend the following ULF fields directly and log all such actions: AFIS Latent ID, Latent Image ID, Offence Date and Creation Date; and
 - o. Change the Expiry Date for a specific search or group of searches saved on the ULF.
2. If there is a problem with the matching capability, then the AFIS renewal solution shall notify the administrator so that action can be taken to discontinue operations. (M)
3. The AFIS renewal solution shall provide a function that enables an administrator to select a number of transactions for which the fingerprint identification process is to be re-initiated, and to indicate the point at which these transactions are to be re-introduced into the AFIS workflow. This capability is within the AFIS renewal solution through the UI and this is not resulting from a Ten Print Work in progress Delete (TPWDI). (M)
4. Failures and errors. If the AFIS renewal solution reports a failure or error to a user or operational administrator, then the message shall include the reason why the failure or error occurred. (M)
5. The AFIS renewal solution shall log all AFIS renewal solution failures and errors as well as any error notifications issued and corrective actions taken. (M)
6. The AFIS renewal solution shall enable an operational administrator to view and print a list of transactions affected by failure or error during a specified period that indicates, as a minimum, the External TCN, DCN, Originating Agency ID, a description of the failure or error, the status of the transaction at the time of the failure or error and the date/ time the failure / error occurred. (M)

4. TEN PRINT PROCESSING

4.1 General

1. As explained in the AFIS renewal workflow subsection, NNS will send a request to AFIS to initiate a TP search based on the AFIS ICD. The Ten Print Request (TPRI) packet is used to initiate the TP search. The AFIS renewal solution must process the TP search based on the content of the TPRI and the requirements stated throughout this SOW and its accompanying documents. The AFIS ICDs and the requirements stated throughout this SOW and its accompanying documents explain the processing that must be supported by the AFIS renewal solution. NNS will use the response transactions from the AFIS renewal solution to take whatever action is required by the NNS such as update the NNS processing status of a submission, respond to the contributor and any other action that is part of NNS processing. (M)
2. The AFIS renewal solution shall: (M)
 - a. Accept requests received from the NNS;
 - b. Manage requests through the AFIS renewal solution;
 - c. Encode and verify the search requests;
 - d. Enable a technician to certify proposed identifications;
 - e. Return search results, log information and statistical information to the NNS using the internal reply transactions; and
 - f. Notify the NNS of the status of transactions.
3. Each internal Ten Print Request will have a set of parameters that must be used by the AFIS renewal solution to perform the search. Refer to the AFIS ICD for all the parameters that must be supported. For example, the parameters could indicate: Electronic Quality Check, 1:1 Ten Print Match, 1:N Search and/or auto certify upon a System Declared Hit. In addition the incoming transaction will indicate which file types and special repositories to search against. (M)
4. The workflow for fingerprint search shall be designed to support fully automated processing based on the parameters in the internal Ten Print transactions passed to the AFIS renewal solution. That is, if auto reject and auto certify parameters indicate a fully automated search, then the AFIS renewal solution must complete the processing without manual intervention. (M)
5. The Type 14 Record may contain flat images as image records 13, 14, and 15. If the Type 14 ID Flats Record does not contain the segmentation information; the transaction shall be rejected. (M)
6. Where the AFIS renewal solution finds that the quality of the prints requires manual intervention, then the AFIS renewal solution shall perform the search with the required level of manual intervention to assure the accuracy and reliability of the results. (M)
7. In the case of Ten Print transactions, the AFIS renewal solution shall process at 500 ppi. (M)

8. The AFIS renewal solution shall automatically take into consideration a possible +/- 5% adjustment in sizing when performing a search. (M)
9. The AFIS renewal solution shall automatically take into consideration a MINIMUM +/- 30 degrees rotation adjustment when performing a search. (M)
10. The AFIS renewal solution shall return an Internal Status Transaction (TOT STI) to the NNS when the transaction is queued for manual processing. The specific contents of the STI and the states are indicated in the AFIS ICD. (M)
11. Prior to certification, when two or more files numbers not under the same Subject ID are to be certified and while the AFIS renewal solution is waiting for the fingerprint technician to certify a transaction, the AFIS renewal solution shall send an internal transaction (TPCI) advising the NNS of the File Number(s) of the candidates to which the transaction is to be certified. (M)
12. The AFIS renewal solution shall enable a technician to display any two of the ten fingers simultaneously for verification/certification purposes. The fingers displayed from the candidate shall correspond to the fingers displayed in the submission. (M)
13. The AFIS renewal solution shall provide the following UI capabilities during verification/certification: (M)
 - a. The TP UI shall at all times display the TP submitted for search and the candidate TP file currently being worked on.
 - b. The TP UI shall, as a minimum, display the following fields in addition to the TP search and candidate fingerprint images while verifying/certifying the results of a TP search:
 - i. Search prints DCN;
 - ii. Candidate File Number;
 - iii. Finger number of candidate;
 - iv. Fingerprint quality of prints; and
 - v. Number of minutia.
14. During TP processing, the fingerprint technician must be able to switch from the normal single finger side-by-side view to a view with two fingers side-by-side or to view all 10 fingers for searched prints and the candidate fingerprints on the DB. This switch between views must be through a single mouse action (e.g.: button or tab). (M)
15. During the two fingers view or the 10 finger view, the UI must display which fingers are being viewed and related characteristics of the fingers including but not limited to quality and number of minutia. (M)
16. During the two fingers view or the 10 finger view, the UI must allow a single finger in the view to be selected and apply the image adjusting features available during the side-by-side view. (M)

4.2 Extract and Save

1. Retention is normally requested in conjunction with a search. This process shall include the encoding of the fingerprints and a determination by the AFIS renewal solution as to whether the feature set must be saved or not depending on the quality. However, the AFIS renewal solution shall be capable of processing a Ten Print Request with only a Retention and no search being requested, using the Direct Filing / Direct Scanning configured workstation (Section 6). (M)
2. The AFIS renewal solution shall save every image in its original state prior to any image adjustments for retention on the Ten Print File, where retention is requested. (M)
3. If the image is adjusted then the image adjustment parameters shall be saved as well so they can be re-applied to the original image to display the enhanced image. (M)
4. The AFIS renewal solution shall not save fingerprint images or their corresponding feature sets where the DCN already exists on the TPF. Where this occurs, the AFIS renewal solution shall reject the transaction with an Error Internal (ERRIN) response. The NNS performs this validation for a duplicate DCN prior to sending a request to AFIS; however, in case there is an issue with NNS, AFIS must ensure a duplicate DCN is rejected. (M)
5. Where the TPRI transaction has requested retention of the images, the AFIS renewal solution shall retain these images indefinitely until an explicit request to delete these images has been received or the defined retention period has been reached. (M)
6. The AFIS renewal solution shall automatically extract fingerprint features from digitized ten-print images and, where retention is indicated and where the quality and feature set limit have been considered, save these in the TPF. (M)
7. The AFIS renewal solution shall have the ability to extract ten-print fingerprint features with no manual intervention. (M)
8. The AFIS renewal solution shall automatically assign a fingerprint quality measurement to each impression in each submission received including Rolled, Plain, ID Flat and Palm impressions and save this measurement in the TPF, where retention is requested in the internal TPRI transaction. (M)
9. The AFIS renewal solution shall extract any descriptors (i.e.: from all record types) from the internal transaction needed to support the Contractor's Entire AFIS renewal solution and save these in the TPF. (M)
10. The AFIS renewal solution must save data in the TPF with a specific set of fingerprints to ensure all requirements stated through this SOW and its accompanying documents are satisfied. For example, AFIS Subject Identifier, File Number, DCN, External TCN, File Type Code, Date Fingerprinted, Image Resolution, Image Quality Measurement, Original Image Indicator, Originating Agency ID, Date Added, Gender, and all data required to support the LCMC requirements and the subsection 3.5 Operational Reporting and Statistics requirements. (M)
11. The AFIS renewal solution should be flexible in its ability to store and retain data in WIP and in the TPF. (R)

12. The original TPRI NIST packet for any retained transaction must be saved by the AFIS renewal solution. (M)
13. The AFIS renewal solution shall accept and store fingerprint images and palm print images in any valid resolution received (e.g.: 500 ppi, 1000 ppi), minimum 500 ppi as supported by the ANSI/NIST-ITL-1-2011. Currently, 100% of Ten Print transactions are submitted at 500 ppi. (M)
14. In the case of Ten Print and palm transactions, the AFIS renewal solution shall support encoding, search, and storage at the original image resolution received (500 ppi or 1000 ppi). The original image resolution shall be retained and made available for viewing. (M)
15. The AFIS renewal solution shall store fingerprint, palm print and photo images compliant with ANSI/NIST-ITL-1-2011 image record specifications to support the requirements stated in the RTID internal and external ICDs. (M)
16. Palm prints – The AFIS renewal solution shall retain palm print images received with Ten Print transactions and file these to the File Number assigned according to the results of their corresponding Ten Print searches. (M)
17. The AFIS renewal solution shall allow an authorized user to perform a TP fetch, swap the palms or fingers if desired/required, save the result, without affecting the original submission and then re-launch the search. (M)

4.3 Electronic Quality and Sequence Check

1. The AFIS renewal solution must support accurate automated quality assessment of rolled fingerprint impressions, plain impressions, ID Flat impressions and palm impressions that can detect distortion, incomplete impressions (pattern area missing, roll from nail edge to nail edge), uneven impressions, impressions not positioned correctly, incorrect sequence, incorrect orientation, and indistinct / insufficient characteristic detail. (M)
2. The AFIS renewal solution shall automatically assign a fingerprint quality measurement to each impression in each submission received including Rolled, Plain, ID Flat and Palm impressions and use the quality measures to determine processing of the transaction. (M)
3. Sequence Check – The AFIS renewal solution shall automatically compare the fingerprints in the plain impression area of the form with those in the rolled impression area of the form to determine if the impressions have been provided in the same sequence. Where the sequence of the rolled impressions is not consistent with the plain impressions then the AFIS renewal solution shall automatically queue the transaction for manual review if the out of sequence configurable parameter to force this review is set; otherwise, a quality error must be returned. (M)
4. Fingerprint Image Quality – The AFIS renewal solution shall provide a fully automated process to determine and record the quality of scanned and electronically received fingerprint images. The quality of each fingerprint and palm image and a graded measurement of the overall quality of the transaction shall be saved in the TPF where retention is requested and returned as and when required in the AFIS ICD transactions. (M)

5. The AFIS renewal solution shall have a configurable set of quality measures that shall be used in conjunction with automated quality checking to determine if a submission can be automatically rejected. Refer to configurable parameters subsection 8.1. (M)
6. The AFIS renewal solution must have a configurable parameter that is used, when set, to determine if the quality of the plain impressions exceeds the rolled impressions. If the quality of the plain impressions exceeds the rolled impressions by the value of this "Plain Quality Indicator" configurable parameter (Section 8.1) then the plain impressions must be used in the search instead of the rolled impression. Alternatively, the AFIS renewal solution must search using all rolled and all plain impressions. (M)
7. Where the TPRI parameters indicate that automated quality rejection is allowed and the "automatic quality rejection" measures indicate a failure, then the AFIS renewal solution shall reject the transaction by returning a TPQCI indicating rejection and including the poor quality reasons. (M)
8. Upon completion of quality control the AFIS renewal solution shall always return a TPQCI transaction indicating the outcome. (M)

4.4 Ten Print Manual Quality Control

1. Ten Print Manual Quality Control refers to the practice of having a fingerprint technician review and adjust the fingerprints for quality as part of the search process. Poor quality fingerprint handling is an important issue for the RCMP because it provides flexibility for the RCMP to process transactions that would otherwise be rejected. During user acceptance testing, every Ten Print Submission with fingerprints below a configurable parameter will be reviewed by a QC fingerprint technician for fingerprint quality. Once there is very high confidence in the quality processing of the AFIS renewal solution, the Ten Print Manual QC is intended to be an exception-based process. (I)
2. The AFIS renewal solution must allow a fingerprint technician to segment and perform other applicable image adjustments to resolve potential quality issues. For example, adjust the box or equivalent method for each print to ensure the segmentation considers the most effective portion of the print is included in the search. (M)
3. The box sizes, or equivalent method for segmentation, should be dynamic. This feature should allow different size plain fingerprints to be completely included within the box and therefore, included in the search. (R)
4. The box sizes, or equivalent method for segmentation, should have a 360 degree rotation capability with an indicator denoting the bottom of the box to allow different size prints to be completely included within the box and therefore, included in the search. (R)
5. The AFIS renewal solution shall enable a technician to view all electronic quality and sequence assessments (perform QC) made by the AFIS renewal solution, assess the quality and sequence of the rolled impressions, plain impressions, ID flats and palm impressions (where palm impressions are available in the transaction), compare the rolled fingerprint impressions to the plain impressions, and the plain impressions to the palm impressions, assess the ability to search with the plain impressions, and either: reject the transaction with selected reasons, accept the transaction or accept the

- transaction for search, but with partial/no retention of the fingerprint characteristics. (M)
6. For further clarity while performing QC (including sequence correction), the AFIS renewal solution shall enable a technician to select the fingers/plains/palms/ID Flat images for potential swap, view them side by side, and enlarge the images at the same zoom level. If the plain impressions have been changed as part of the manual QC process, such that the segmentation would no longer be valid, the AFIS renewal solution shall recreate the segmentation and continue the processing. (M)
 7. If any fingers have been swapped (i.e. Rolled to rolled, and /or plain to rolled) as part of the manual QC process, the AFIS renewal solution should verify that sequencing is correct and allow the user to correct the sequencing if it is not correct. (R)
 8. The AFIS renewal solution shall enable the technician to undo any sequence corrections using a single / double user interface action. (M)
 9. The AFIS renewal solution shall provide a mechanism for searching and handling of poor quality prints. (M)
 10. The AFIS renewal solution shall return the technician's assessment of quality, or the AFIS renewal solution assessment of quality if auto reject is indicated, in the internal reply (TPQCI) transaction. Upon completion of quality control the AFIS renewal solution shall always return a TPQCI transaction indicating the outcome. (M)
 11. The technician's assessment of quality shall include, but is not limited to: indication of transaction rejection, indication of rescan required, a selection of one or more poor quality reasons, a free text comment. (M)
 12. The AFIS renewal solution shall enable the technician to select Unsuitable/Rejection Reasons from a selection list and have the selection(s) automatically appended to the reply transaction. (M)
 13. The AFIS renewal solution shall, on an exception basis, enable a specialized and "authorized" technician to perform QC on extracted fingerprint features such as editing of Minutiae with option to save or not, correct Fingerprint characteristics. (M)
 14. The AFIS renewal solution shall, where the encoding has been manually altered, log an indication of the alteration, by whom and when. (M)
 15. The AFIS renewal solution shall, when out of sequence has been identified at any stage of processing (e.g.: Verification, Certification), enable an authorized user to have the transaction reprocessed so it returns to a state that allows the sequence to be corrected. (M)
 16. The AFIS renewal solution shall, where the sequence of fingerprints has been manually altered by a technician, perform a sequence check and enable a technician to override the outcome. (M)
 17. The AFIS renewal solution shall log all Ten Print QC activity including the nature of any adjustments performed (e.g.: minutiae editing, image rotation, sequence correction) by whom and when. (M)

18. The AFIS renewal solution shall, on an exception basis, enable a technician to copy any Finger Impression from the Plain Impressions and affix these into the Rolled Impression blocks or to segment the Plain Impressions for search against the Ten Print File Rolled Impressions. This may be required where two identical fingerprint impressions have been provided in the rolled. In this instance, one of the rolled could be removed and replaced by a plain impression for the correct finger. (M)
19. The AFIS renewal solution shall display the following information during Ten Print Manual QC in support of the rejection decisions: (M)
 - a. The Type of External Transaction;
 - b. The External Retention Code;
 - c. An indication of whether the external transaction was originally received on paper or electronically;
 - d. The Fingerprint Quality Overrides (tag 2.893); and
 - e. The Missing Fingerprint Reasons (tag 2.8084).

4.5 One-to-One Ten Print Search

1. The 1:1 Ten Print Search refers to the fully automated process of scoring an incoming set of prints against the prints on file for the specified File Numbers and determining if any of these File Numbers are worthy of consideration as a potential identification. The 1:1 Ten Print Search could be used in several situations: Submission arrives with FPS and identification needs to be confirmed prior to proceeding to certification, a Name Search candidate list (performed by NNS) needs to be filtered to determine if any name search candidates are worthy candidates for verification/certification. The Internal Ten Print Search transaction will provide a candidate list of one or more File Numbers for which a 1:1 Ten Print Search must be performed. (M)
2. The AFIS renewal solution shall provide the capability to automatically match fingerprint features in a new submission with fingerprint features contained in a specific RCMP Ten Print file based on a specified File Number. (M)
3. The AFIS renewal solution shall have a configurable 1:1 Hit Threshold or other "System Declared Hit" parameters to meet the accuracy requirements. (M)
4. The AFIS renewal solution shall give each 1:1 match a score and an assessment as a "System Declared Hit", candidate for verification or no hit. (M)
5. The AFIS renewal solution 1:1 Ten Print Search shall search against all sets on File within the same Subject File, unless configured to search the best "x" number of sets of prints based on a configurable parameter, plus the composites. Where "x" will be agreed to with the Contractor during the implementation. (M)
6. The AFIS renewal solution shall retain a record of all 1:1 scores and the AFIS renewal solution's assessment as a "System Declared Hit", candidate or negative for each File Number specified in the Internal Ten Print Request transaction. (M)
7. Where a list of multiple File Numbers (candidates) are provided, the AFIS renewal solution shall automatically filter (score and reduce) the candidate list using a 1:1 Ten

- Print Search with a 1:1 Threshold to create a short list and long list for review purposes. The short list must include only one set of prints per subject. The long list must include all prints for all subjects. (M)
8. If there is more than one candidate left after filtering, then the AFIS renewal solution shall consider these candidates as candidates for Verification. (M)
 9. If there is only one candidate left and the AFIS renewal solution has determined that this candidate is a hit and automatic certify has been indicated in the Internal Ten Print Request, then the Ten Print search shall be considered complete and the results of the search returned in the internal reply transaction. (M)
 10. Where a File Number provided in the TPRI Candidate List cannot be found in the TPF, then the specific File Number shall be ignored. This situation shall not generate an error condition. For example, this is possible if a purge occurred before the search completed. (M)
 11. On a 1:1 Search, where either the search set or the file set is below a configurable quality level, then the match shall be forwarded to manual verification even if the score is below the grey area threshold limit. (M)

4.6 One-to-Many Ten Print Search

1. A 1:N Ten Print Search refers to the automated process of searching an incoming Ten Print against a specified subset or all of the TPF and any special Ten Print repositories. (I)
2. The AFIS renewal solution shall perform a fully automated 1:N Ten Print Search and reply with the result where the Internal Ten Print Request parameters indicate that an automatic search is to be performed. (M)
3. The AFIS renewal solution shall search and score the incoming Fingerprints against the subset of the Ten Print File and special repositories, as specified by the Ten Print Request parameters (target set), in a fully automated fashion. (M)
4. The Ten Print Request (TPRI) will indicate which files and special repositories to search against. (M)
5. The AFIS renewal solution should search with the required accuracy and reliability as stated in 3.6 Volumetrics and Service Delivery using as few descriptors as necessary. (R)
6. The “File/File Number” terminology used within the AFIS context is not intended to imply a physical partition of data in the AFIS renewal solution. A subject will have a potential Criminal File Number (FPS Number), a Refugee File Number, an Immigration Number and/or an Employee File Number linked together via a unique Subject Identifier. (M)
7. The AFIS renewal solution shall search against all composite feature sets on the TPF for the same subject or all sets of prints if composites are not used. For example, if the subject is both a criminal and refugee then it shall search both the criminal composite and the refugee composite for the subject; or if composites are not used then it shall search all sets of prints in both the criminal and the refugee repositories. (M)

8. The AFIS renewal solution shall have a configurable 1:N Hit Thresholds for “System Declared Hit”, and any other parameters proposed by the Contractor to meet the accuracy requirements. (M)

4.7 Ten Print Verification

1. Verification refers to the practice of having a fingerprint technician review a list of candidates to find a matching set of fingerprints. (I)
2. The AFIS renewal solution shall perform verification with manual intervention where the AFIS renewal solution has automatically determined that there are multiple candidates worthy of consideration. (M)
3. The AFIS renewal solution must ensure all Candidates, in the short list only, are dispositioned for mandatory verification. (M)
4. The candidate list shall include the File Numbers associated to a candidate subject (e.g.: FPS Number, Employee File Number, Refugee File Number, Immigration number), the digit to be displayed and all other data identified in Section 3 general AFIS requirements. (M)
5. Where a subject has more than one File Number (e.g.: both a Refugee File Number and a Criminal File Number) then all shall be available for display at time of verification even though they are considered as one candidate. (M)
6. To ensure that verification is performed without bias, the AFIS score shall not be visible on the verification user interface, unless the user is authorized to view the score. (M)
7. The AFIS renewal solution shall display the candidates in descending order of probability. (M)
8. The AFIS renewal solution shall only display the highest scoring candidate for the same Subject on the Candidate List even though there are multiple set of prints on file or the subject has multiple files (e.g.: both a refugee file and a criminal file). (M)
9. The AFIS renewal solution shall present fingerprint images from a ten-print Submission and fingerprint images of corresponding digits from a selected candidate side by side at the same size. (M)
10. The AFIS renewal solution shall present the best matching fingerprint images (rolled or plain) for verification from a ten-print Submission search. As well, the AFIS Renewal solution shall enable the technician to select a specific finger (rolled or plain) for comparison and/or toggle to the next pair. (M)
11. Additionally, the fingerprint technician should have the option to switch from rolled impression to plain impression (or vice versa) on the candidate side of the comparison while submission side stays the same, by means of a single mouse click. (R)
12. Once verification is completed for a candidate, the AFIS renewal solution shall proceed to the next candidate without delay. UI response times are described in the Technical Requirements. (M)

13. The AFIS renewal solution shall automatically display the next submission from a technician's filtered view of the Ten Print work queue when the technician requests the next submission. (M)
14. The AFIS renewal solution shall enable a technician to loop forward and backward through a list of candidates and to select a specific candidate for display from the Candidate List without delay. The AFIS renewal solution shall stop at the end of the list and indicate to the user when the end of the list has been reached. UI response times are described in the Technical Requirements. (M)
15. The AFIS renewal solution shall provide a visual indication in the Candidate List of which candidates have already been verified. (M)
16. The AFIS renewal solution shall enable the technician to view the Rolled Impression or the corresponding Plain Impression, or ID Flat impression of the candidate in the Ten Print comparison window without delay. UI response times are described in the Technical Requirements. (M)
17. The AFIS renewal solution shall provide a visual indication to the technician of the other sets of fingerprints on file for the same subject including their resolutions, overall quality, availability of palms, indication of which sets have already been viewed and enable the technician to view any of these other sets of images (rolled and plain and palm, or ID Flat). (M)
18. The AFIS renewal solution shall enable a technician to disposition with confirmation a Submission as either ident to a candidate or non-ident. (M)
19. The AFIS renewal solution shall enable a technician to assign a transaction to a supervisory role with a work related note if they are having difficulty verifying the identification. (M)
20. If a verification technician does not confirm an AFIS renewal solution System Declared Hit above the Absolute Hit threshold, then the AFIS renewal solution shall assign the submission to a supervisory role to confirm the verification by setting a flag in the queue which shows the transaction that the supervisor is to work on. If the supervisor and AFIS renewal solution assessments are not the same, then the AFIS renewal solution shall update the Discrepancy Report with the supervisor's certification results, which the AFIS Program Analyst will review for further analysis. (M)
21. The AFIS renewal solution shall record a Discrepancy Log of all identifications (System Declared Hits) that were overturned by a verification technician. (M)
22. The AFIS renewal solution shall merge the verification candidates from 1:1 Match and 1:N such that only a single candidate list is presented for manual verification. (M)
23. The AFIS renewal solution shall enable a technician to filter the Ten Print work queue by transaction status. Depending upon the technician's role, the technician will be able to view transactions of a given status. (M)
24. The AFIS renewal solution shall enable a user to print out a comparison quality hardcopy of the verification screen image and the search and candidate information associated with the verification (e.g.: ORI, DCN, TCN, File Number, Subject ID, finger number, score, etc. – complete list to be determined with the Contractor). (M)

4.8 Ten Print Certification

1. Manual certification at the RCMP refers to the practice of having a senior fingerprint technician confirm a proposed identification. (I)
2. The AFIS renewal solution shall automatically forward all manual identifications proposed by a verification technician to Certification, where the Ten Print Request indicates that manual certification is mandatory. (M)
3. If verification is not mandatory for a particular transaction and the AFIS renewal solution has proposed a hit, then the AFIS renewal solution shall automatically forward the System Declared Hit to Certification where the Ten Print Request parameters indicate that Certification is mandatory (TPRI Certification Indicator). (M)
4. The AFIS renewal solution shall provide the capability to auto certify based on a certification request received directly from the NNS as a TPRI. In this case the certification result is automatically returned to the NNS without manual intervention, unless stated in this SOW or its accompanying documents. (M)
5. In support of the historical paper based certification, the AFIS renewal solution shall enable a Certification technician to initiate a Certification by scanning the unique barcode that was affixed to the paper fingerprint form. (M)
6. The AFIS renewal solution shall automatically display the next submission from a technician's filtered view of the Ten Print work queue when the technician requests the next submission. (M)
7. The AFIS renewal solution shall provide the capability for a fingerprint technician to certify fingerprints by enabling the certification technician to view a selected finger image from a proposed identification or specified File Number beside the corresponding finger image from the new transaction at the same size. In this case, referred to as a "cold certify" (i.e.: camera certify), the AFIS renewal solution shall enable the certifier to enter / scan from a barcode the File Number or DCN/Doc ID to fetch the File Number to certify. Subsequently, the certifier must be able to view a print using the camera to determine if it can be certified. (M)
8. The AFIS renewal solution shall enable a certification technician to view complete images of any of the fingers, plain impressions, ID Flats or palm impressions of the candidate (including all sets on file for the candidate) beside the corresponding print image for the new submission without delay. UI response times are described in the Technical Requirements. (M)
9. The AFIS renewal solution shall provide a visual indication to the technician of the other sets of fingerprints on file for the same subject including their resolutions, quality, palm availability and enable the technician to view any of these other sets of impressions. (M)
10. The AFIS score shall not be visible on the certification user interface, unless the user is configured to view the score. (M)
11. The AFIS renewal solution shall provide a means for the technician to indicate "certify" or "fail to certify" the Submission to an existing File by an explicit single user interface action (e.g.: Certify button, Decline button) with confirmation (e.g.: Are you sure?). (M)

12. The AFIS renewal solution should provide a means to indicate “unsuitable for certification” for the Submission to an existing File by an explicit single user interface action. (R)
13. Additionally, the fingerprint technician should have the option to switch from rolled impression to plain impression (or vice versa) on the candidate side of the comparison while submission side stays the same, by means of a single mouse click. (R)
14. The AFIS renewal solution shall automatically retain in the Transaction Log a record of the certifier’s User ID, the date and time of certification and the score of matching candidates. (M)
15. The AFIS renewal solution shall automatically determine and display the best matching fingers for certification. (M)
16. If a proposed identification is not certified, then the AFIS renewal solution shall retain a Certification Declined Log of the following, as a minimum: the User ID of the technicians involved, the User ID of the verification technician(s) (if verification was performed), the verification technician proposal, the System proposal, the AFIS Score, the File Number, DCN and TCN of the proposed ident, the External TCN and DCN of the Submission, the date and time that the certifiers’ decision was made. Refer to the 3.5 Operational Reporting and Statistics for additional details. (M)
17. If a certification decision overturns a verification decision, then the AFIS renewal solution shall record the details in the Certification Declined Log. (M)
18. A “System Declared Hit” decision is an identification that has been determined by the AFIS renewal solution with no manual intervention. (I)
19. If a certification decision overturns a System Declared Hit decision, then the AFIS renewal solution shall: (M)
 - a. Record the following information, as a minimum: Activity, User ID of the certification technician, the AFIS Score, the FPS File Number and DCN of the proposed ident, the TCN and DCN of the Submission, the date and time that the certification decision was made; and
 - b. Automatically log this information for monitoring purposes in the Certification Declined Log.
20. For any verification or certification overturn that is recorded in Certification Declined Log, automatically generate a report for declines and notify the AFIS Program Analyst. (R)
21. The AFIS Program Analysts will use AFIS renewal reporting to monitor the AFIS renewal solution’s matching accuracy, contributor quality, trouble shoot misses and so on. (M)
22. While certifying the search results of a Ten Print search, the AFIS renewal solution shall display the fingerprint images, and as a minimum, external TCN, file Number of the candidate, finger number and all other data as described in the general AFIS requirements (Section 3). (M)

23. The AFIS renewal solution shall enable the Certification Technician to view the new submission in its entirety, including all data in all record types. A NIST packet viewer which must be available anytime to view the submission, would be used to view the data. (M)
24. When certifying, the AFIS renewal solution shall allow the technician to: (M)
 - a. See the best quality fingers;
 - b. Once they hit the Certify button, then the next dialogue shall display all fingerprint impressions from the submission and the file print;
 - c. Select rolled, plain or ID Flat impressions from each available card stored in AFIS; and
 - d. If a problem is observed, then the technician shall have the ability to take appropriate action (Cancel or Decline) before Ident Search Conclusion takes place. Ident Search Conclusion shall only occur once the Conclude (or equivalent) button is hit.
25. When certifying, the AFIS renewal solution should allow the technician to view other rolled, plain or ID Flat impressions, for any finger and for all cards stored in AFIS as part of the process of certifying. (R)
26. Where a certification technician determines that a candidate forwarded to certification is not identical, then the technician shall have the ability to review and disposition the full list of candidates. (M)
27. In the case of a “cold certify” (i.e.: camera certify), the AFIS renewal solution shall log the following information: File Number fetched, File Number to certify, Operator ID of certification technician, Workstation ID on which certification took place, start time of certification, end time of certification. (M)
28. If the manual certification flag is turned off (AFIS renewal solution is allowed to auto certify) and if the AFIS renewal solution makes a hit in the grey zone (below the hit threshold and above the no-hit threshold), then the AFIS renewal solution shall forward the submission for manual verification and if a hit is confirmed then the submission shall be forwarded to manual certification. In addition, if the manual certification flag is turned off and the AFIS renewal solution makes multiple hits that are confirmed by a verification technician then the AFIS renewal solution shall forward the submission for manual certification. That is, auto certification cannot occur if either grey zone hits are made or multiple hits are made. (M)
29. The AFIS renewal solution shall enable a user to print out a comparison quality hardcopy of the certification screen image and the search and candidate information associated with the certification (e.g.: ORI, DCN, TCN, File Number, Subject ID, finger number, score, etc. – complete list to be determined with the Contractor). (M)

4.9 Search Conclusion

1. If no identification is made under any of the above circumstances, then: (M)

- a. If the internal TPRI transaction requested that the AFIS save the prints, then the AFIS renewal solution shall automatically assign a new Subject Identifier.
 - b. If the internal TPRI transaction requested that the AFIS save the prints, then the AFIS renewal solution shall automatically save the fingerprint images, photos and palm print images in the TPF with necessary descriptors and feature sets (as determined by the AFIS renewal solution) associated to the newly assigned Subject Identifier.
 - c. The AFIS renewal solution shall automatically return a negative response in the internal reply transaction along with the newly assigned Subject Identifier and all other information as required by the AFIS ICD.
2. When the NNS receives the internal reply transaction from AFIS, it will obtain the File Number references to be added to the TPF. The NNS will return to the AFIS an internal Ten Print Amend (TPAI) transaction to add the external File Number reference to the TPF entry. The AFIS renewal solution must associate the File Number reference to the TPF entry. An FPS Number will be assigned for criminals, an Immigration File Number for Refugee subjects, an Employee File Number for RCMP Employees or an Immigration File Number for Immigration subjects. Each of these numbers are mutually exclusive, of the same format and only one of these is assigned to any given set of fingerprints, up to 6 file types for any one subject. (M)
3. RCMP will assign the File Numbers using a 12 digit numbering convention that clearly distinguishes criminal files, refugee files, employee files and immigration files. For example, criminal files will use a 20000 prefix and refugee/immigration files will use a 50000 prefix plus a unique seven digit number within each file type. (I)
4. Once a File Number is assigned, it is generally assigned for the lifetime of the individual. The exception to this rule is the cases in which a file is fully purged and a subsequent Submission is received for the same individual. Misses also result in changes to File Numbers over time. Multiple submissions filed on the base can be associated to the same File Number over time (e.g.: repeat offenders can have several sets of fingerprints stored on the base). If an individual has both a criminal file and a refugee file, then both File Numbers will be associated to the same Subject via the internal Subject Identifier. A Subject can have up to six (6) File Numbers. For identification processing purposes, these associated files for the same subject will be treated as a single Subject File. (M)
5. The AFIS renewal solution shall automatically remove all information pertaining to a transaction with the exception of the logs and stats when the transaction has completed processing and retention is not indicated in the internal TPRI. (M)
6. The AFIS renewal solution shall include in the reply to the TPRI all parameters needed to generate the Ten Print Match Report. A list of these parameters is detailed in the AFIS ICD. (M)
7. Where a Ten Print submission hits to two or more Subject identifiers, the AFIS renewal solution shall return a Ten Print Consolidation internal transaction (TPCNI) to the NNS after certification, prior to consolidation and enrollment. (M)
8. Where consolidation is indicated in the TPCNRI, the AFIS renewal solution shall consolidate each of the files as per the following rules: (M)

- a. The logic to consolidate more than one refugee is as follows: When 2 or more Refugee File Numbers are being consolidated, and one or more has the prefix 330001 and one or more has the prefix 330008 then consolidate to the smallest File Number with prefix 330008. In all other circumstances, consolidate to the smallest of the Refugee File Numbers.
 - b. The logic to consolidate more than one criminal is as follows:
 - i. The oldest FPS Number is the smallest Number. If there is no long version Criminal FPS with a “9” in the 6th position then sort all numbers to be consolidated using the long format FPS Number. The “9” number represents pre letter suffixes currently used by the RCMP.
 - ii. If there is a single FPS Number with a “9” in the sixth position, then this one is the oldest.
 - iii. If there is more than one FPS with a “9” in the 6th position then sort only those with a “9” in the sixth position. The smallest number in this sort is the oldest FPS Number.
 - c. In all other cases, the AFIS renewal solution shall consolidate files of the same file type to the smallest/oldest file number.
 - d. Refer to the database conversion section in the SOW and the ICDs for additional clarification concerning file number processing.
9. The AFIS renewal solution shall store all consolidated fingerprints under the Subject Identifier associated with the file number that was determined to be the smallest/oldest. (M)
 10. Where consolidation is not indicated in the TPCNI, the AFIS renewal solution shall not consolidate any of the files identified under the original Ten Print Consolidation internal transaction (TPCNI). (M)
 11. Where the Ten Print Retention Code is set to “Y”, the AFIS renewal solution shall add the new prints to the file identified under the file number identified through the AFIS ICD transactions. (M)
 12. The AFIS renewal solution shall provide a standalone process that will permit an authorized user to consolidate multiple Ten Print entries directly on AFIS. This feature will allow users to consolidate files that have been identified as potential duplicates by some external source – without the need for an NNS interface. (M)

4.10 Ten Print Amend

1. The Ten Print Amend (TPAI) transaction will be used on a routine basis to send File Number assignments to be added against specific fingerprint sets and Subjects on the TPF. It will also be used to alter the priority of a transaction in WIP. When the AFIS renewal solution receives a Ten Print Amend (TPAI) request from the NNS, the AFIS renewal solution shall automatically change the Ten Print entry or the Ten Print transaction in WIP (e.g.: file references numbers, priority) as indicated. (M)

2. The AFIS renewal solution shall log all changes made to the TPF as a result of an internal Ten Print Amend transaction and also log all priority changes to the WIP initiated from within the AFIS environment. (M)
3. The AFIS renewal solution shall return a reply to the NNS acknowledging the completion of the Ten Print Amend transaction. (M)
4. This transaction is part of the normal TP search workflow when a new file number needs to be created. NNS will provide the new file number for AFIS and AFIS must save with the new file created. (M)

4.11 Ten Print Delete

1. When the AFIS renewal solution receives a Ten Print Delete (TPDI) request from the NNS, the AFIS renewal solution shall automatically delete the complete Ten Print entry(ies) associated to the specific File Number and/or DCN and make any other necessary database changes as a result of the deletion (e.g.: removing a file number reference at the Subject level). (M)
2. The complete Ten Print entry shall include the rolled, plain, ID Flat and palms print images and feature sets, descriptors, file reference numbers, photos and any other Type 2 data retained on the File for that particular set of fingerprints. (M)
3. If only a File Number is specified and no DCN is specified, then all Ten Print entries corresponding to that File Number shall be deleted with the exception of the Transaction log and statistics. (M)
4. If only a DCN is specified in the internal Ten Print Delete, then only the specific Ten Print entry corresponding to the DCN shall be deleted. The corresponding transaction log, statistics shall not be deleted. (M)
5. The AFIS renewal solution shall log all changes made to the TPF as a result of an internal Ten Print Delete transaction and also those made internally within the AFIS environment. (M)
6. The AFIS renewal solution shall return a reply to the NNS acknowledging the completion of the Ten Print Delete transaction. (M)
7. If the File Number purged corresponds to a transaction pending certification to that purged File Number (i.e., all fingerprints associated to the file are being purged), then the AFIS renewal solution shall not permit the certification to complete to that File Number, notify the Certification Technician of the purged File Number, enable the certification technician to conclude the transaction without carrying out the certification to the purged File Number, and indicate that this has occurred in the TPRED transaction. If there are other certification candidates for the same submission then these will be permitted to proceed. (M)
8. The AFIS renewal solution should ensure that purges do not disrupt the workflow. (R)
9. This transaction is used on a routine basis in conjunction with legislated purges. (I)
10. If the AFIS renewal solution receives a TPWDI, then the AFIS renewal solution shall cancel all further processing on the specified DCN in all WIP regions, remove the

submission from AFIS queues in all regions, add a record of the delete in the transaction log and leave all previous entries in the transaction log intact. The normal use of the TPWDI transaction is to delete a transaction so it can be resent by NNS. This approach is used by NNS to resolve processing issues resulting from unforeseen failures. (M)

11. The AFIS renewal solution must reply to the NNS with the results of the TPWDI in the Ten Print WIP Delete Response (TPWDRI). (M)
12. The AFIS renewal solution shall provide a standalone process that will permit an authorized user to manually delete Ten Print entries directly from AFIS. This feature will allow authorized users to delete through the AFIS renewal solution without the need for an NNS interface. The AFIS renewal solution must ensure that the TP entry is also deleted from the VSS if the TP entry also exists on VSS. (M)

4.12 Fingerprint Image Request

1. Fingerprint Image Retrieval Request (IRQI) transactions will be used by the NNS to fetch images (herein referred to as an “image fetch”) from AFIS. Image List Retrieval (ILRI) transactions will be used to return the list of prints available on the file (herein referred to as a “list fetch”). (M)
2. When the AFIS renewal solution receives an Image Retrieval Request (IRQ) image fetch, then the AFIS renewal solution shall automatically return the images requested, if any, associated to the specific File Number and/or DCN. Furthermore: (M)
 - a. The AFIS renewal solution shall return the adjusted images in response to an IRQI. That is, if a fingerprint technician has previously made image adjustments and these image adjustments were saved then the images returned in the Image Request Response Internal (IRRI) shall include the application of these saved image adjustments.
 - b. If the FPS of the DCN requested does not match the FPS in the IRQI, then the AFIS renewal solution will respond with an ERRIN.
3. The images requested might include: the fingerprints, the palm prints and/or the photos. (I)
4. In the case of an image fetch, if only a File Number is specified, then the composite set of requested images corresponding to that File Number, or best set from the images available for the File Number if composites do not exist, shall be fetched and returned along with the file descriptors. (M)
5. In the case of an image fetch, if a DCN is specified, then the Fingerprint Image Request shall return the specific set of images requested along with the file descriptors associated with that DCN. (M)
6. In the case of a list fetch (ILRI), the AFIS renewal solution shall return a list of available sets of prints on file. (M)
7. The AFIS renewal solution shall perform fetches within the AFIS environment as stated throughout this SOW and its accompanying documents. (M)

8. If the Contractor's solution does not use composites, then the best set of prints must be provided for an image fetch that does not include a specific DCN. (M)

4.13 Special Search and File Requests

1. The AFIS renewal solution shall process special low volume "search only", "search and file" or "file only" requests. (M)
2. These are typically very urgent requests handled by exceptions. The request may be received on paper. (I)
3. The Direct File/Scan services will be used for the conversion of some of these requests. (M)
4. For sensitive requests, the AFIS renewal solution shall limit physical handling and access to the electronic information including the logs to specific users with designated privileges. (M)
5. The AFIS renewal solution shall enable an authorized technician to file a new or existing set of fingerprints with a new File Number or a reactivated File Number as a new Subject without performing a search. (M)
6. The AFIS renewal solution shall enable a user to initiate a TP to TP search from a single fingerprint or whole set of fingerprints captured from a scanner within the AFIS environment. (M)
7. The AFIS renewal solution shall allow a limited set of users with the appropriate authority and privileges to file a set of fingerprint images to a reopened or new FPS number. (M)

4.14 Retention of Fingerprints and Photos

1. For those transactions where retention is indicated, the AFIS renewal solution shall retain all fingerprint images, photos and palm images until an explicit request to purge has been received from the NNS or an authorized AFIS user. (M)
2. For latent to TP searches, the AFIS renewal solution shall be capable of searching all Ten Print feature sets from rolled impressions, all Ten Print feature sets from plain impressions, all Ten Print feature sets from ID flat impressions, and all Ten Print feature sets from palm impressions per subject. (M)
3. For TP to TP searches, the AFIS renewal solution shall be capable of searching the composite rolled or composite ID flats depending on what type of fingerprints have been retained for a specific subject or if no composite is used then all sets of prints must be searched unless the best "x" number of sets of prints based on a configurable parameter for each file type and fingerprint type has been set (i.e. rolled/plain and ID Flat – refer to configurable parameters Section 8.1). (M)
4. In those situations where there are rolled and plains and the overall quality of the plain impressions exceeds the overall quality of the rolled impressions; then the plain impressions will be added to the search engine, along with the composite rolled set for

- future searching purposes. If composites are not used, all prints must be added to the search engine. (M)
5. The AFIS renewal solution shall automatically prepare a composite best set from all rolled impressions received and a composite best set from all ID Flat impressions received for a subject file type. If a subject file has a combination of the rolled, plains and ID flats (e.g.: Immigration), then two composites shall be created, one rolled and an ID flat composite. If composites are not used in the Contractor's solution, there is no requirement for the composites to be created, since all sets of prints must be searched if no composites have been provided. (M)
 6. The projected size of the feature set file is provided in Section 3.6. (I)
 7. The AFIS renewal solution must maintain the composite feature sets automatically based on the sets of fingerprints retained for each subject, if the Contractor's solution includes composites. That is, no manual intervention shall be required to constitute the best set of prints in the composite feature set. If composites are not used, then all feature sets must be maintained. (M)
 8. If a criminal file is purged or particular submissions are purged, then the AFIS renewal solution shall automatically purge all data associated with the purged submissions by file number and DCN including: the fingerprint images, photos, palm images, minutiae and other fingerprint features. All log file entries must not be affected by purging the fingerprint files. (M)
 9. The Composite Set prepared by the AFIS renewal solution shall not at any time include a fingerprint from a submission that has been purged, if the Contractor's solution includes composites. When a set of fingerprints is purged, the composite set must be updated to remove any purged fingerprints included in the composite set and replace them with the next best fingerprint for any finger purges from the composite, if the Contractor's solution includes composites. (M)
 10. The definition of purge is as follows: "To remove from the operational system in a manner that ensures the fingerprints cannot be recovered in the operational environment". This excludes log file data and data retained in RCMP backups. Log files must be retained indefinitely for audit purposes and backup files will eventually be rolled over; therefore, permanently removing the data. (M)
 11. The AFIS renewal solution shall be capable of searching up to twelve (12) composites per subject, where a subject might have six file types (e.g.: rolled composite, plain composite, ID Flat composite), if the Contractor's solution includes composites. If composites are not used, all prints must be searched. (M)

4.15 Fingerprint Endorsement

1. The use of a "Biometric Endorsement" in lieu of a signature will be used as an electronic means of capturing an applicant's approval for such things as releasing criminal record search results to a 3rd party (3rd Party Waiver) and consent to disclose pardoned offences for applicants to positions in the vulnerable sector. In order to provide automatic verification of the consent, the AFIS renewal solution must compare the endorsement fingerprint to the fingerprints provided for identification. The AFIS renewal solution will report the results of the comparison of the endorsement

- fingerprint to the identification fingerprint(s) back to the NNS in the TPQCI reply transaction. (M)
2. The AFIS renewal solution shall perform a comparison between the fingerprint image identified in the TPRI as the endorsement fingerprint (Type-14 identified by the Type-2 tag – Biometric Consent Image Designator) to the corresponding (same finger) provided for AFIS searching purposes (Type-4 record or Type-14 record) and provide indication of the results of the comparison to the NNS in the TPQCI transaction. The Type-14 Record may contain flat images as image records 13, 14, and 15. If the Type-14 ID Flats Record does not contain the segmentation information; the transaction shall be rejected. (M)
 3. If the AFIS renewal solution confirms that the endorsement fingerprint matches a fingerprint in the identification set, the AFIS renewal solution shall indicate this result in the TPQCI. (M)
 4. If the AFIS renewal solution determines that the endorsement fingerprint does not match the corresponding fingerprint provided in the identification set, the AFIS renewal solution shall compare the endorsement fingerprint to each of the other fingers provided in the identification set. (M)
 5. If the Manual Biometric Consent configurable parameter (Section 8.1) is set, any endorsement fingerprint that does not match must go to manual certification. If the technician decides that the endorsement fingerprint is identical to the corresponding fingerprint image and is certifiable, then the AFIS shall send the TPQCI indicating a biometric consent pass. (M)
 6. If the Manual Biometric Consent configurable parameter (Section 8.1) is set, any endorsement fingerprint that does not match must go to manual certification. If the technician decides that the endorsement fingerprint is not identical to the corresponding fingerprint image or is not certifiable, then the AFIS shall stop processing the transaction and send the TPQCI indicating a biometric consent failure. (M)
 7. If the Manual Biometric Consent configurable parameter (Section 8.1) is not set, any endorsement fingerprint that does not match must stop AFIS fingerprint processing and the result will be returned to the NNS in the TPQCI. (M)

5. LATENT FINGERPRINT PROCESSING

5.1 Latent Workflows

1. There are two different latent workflows, referred to as Central Latent and Remote Latent. Central latent processing starts with a Central Latent Client (CLC) site collecting the latent prints and submitting them to RTID through an LFSNS transaction. Each CLC submission can have up to ten (10) latent images. Through NNS processing, each latent image is submitted to AFIS individually. These individual latents are processed by RCMP Latent technicians at RCMP HQ. (I)
2. Each remote site collects their own latents and submits them to RTID using a Transcoder, one latent at a time through the LFFS transaction. Each remote site has Latent technicians that process each latent. RCMP HQ has a group called Remote Network Search Coordinators that provide assistance as required for the Remote Latent technicians; otherwise, these Remote Latent technicians' process their latents without assistance from RCMP HQ. (I)
3. Electronic Latent Management Operations (ELMO) is the RCMP's present Latent Case Management System that was custom-developed in 2002. The AFIS renewal solution LCMC will replace ELMO. This replacement will be completed as a second stage in the AFIS renewal implementation. To minimize the risk on the AFIS renewal, the first stage will include the AFIS renewal using ELMO for latent case management. After transition to the renewed AFIS, the second stage will include the conversion of ELMO data and implementation of LCMC. Refer to the implementation plan concerning these details. (M)
4. The AFIS renewal solution must support latent processing with ELMO in the first stage of the implementation. Since the AFIS renewal solution has no direct communication with ELMO, this support means that the existing workflow must be supported in the first stage of implementation. This also means that the LCMC requirements identified herein and throughout this SOW and its accompanying documents must be implemented in stage two (2). (M)
5. All central latent and remote latent activity must be recorded automatically in the LCMC. The LCMC detailed requirements are identified in a separate Annex within this SOW; however, it is mentioned herein to reflect the relationship between the latent processing and LCMC. For example, any identification to a TP or latent must be recorded automatically and viewable in the LCMC when a user is reviewing the case where the identification was made. As well, all data required for the LCMC, provided to the AFIS renewal solution by NNS through the various latent transactions must be recorded in the LCMC in a manner that can be effectively and efficiently used by the AFIS renewal solution users. (M)
6. The LCMC must provide the ability to launch a search directly from the LCMC. This is simply a continuation of the processing of a case at a date well beyond the initial analysis (e.g.: cold case); therefore, the AFIS renewal solution must support all the requirements stated throughout this SOW and its accompanying documents for these searches initiated from the LCMC. For example, the latent image ID numbering requirement for any latent must always be maintained by the AFIS renewal solution.

- The latent image ID is a unique value that is used by NNS, LCMC and the AFIS renewal solution. (M)
7. In stage one (1) of the AFIS renewal solution implementation an ELMO user will initiate a research using an existing latent case. Since ELMO interfaces with NNS, this will result in a Latent Image Search Request (LFSI) transaction being sent to the AFIS renewal solution which is part of the existing workflow. (M)
 8. The CLC user submits Latent Fingerprint Search (LFSNS) and Fingerprint Image Requests (IRQI) transactions to NNS. The LFSNS submission is processed through an NNS workflow that interfaces repeatedly with AFIS to process all the latent images included in the LFSNS. Refer to the Central Latent workflow below for further details on what the AFIS renewal solution must support for LFSNS processing. Refer to the AFIS ICD for details concerning the processing of the IRQI. (M)
 9. CLC is an interactive UI for users at sites that collect and submit crime screen prints to Central Latents. CLC will be used to manage the latent portion of their police incident investigation. Consequently, the AFIS renewal solution must provide a read only database view that will allow a portion of the LCMC data to be displayed to the CLC user in order to satisfy the UI response times for CLC users. The Contractor can propose an alternate approach; however, this alternate approach must support a response time that is comparable to a direct database query. The AFIS ICD asynchronous interface is not considered acceptable for the CLC UI. (M)
 10. Note that the Central Latent workflow changes required for the LCMC implementation, including this read only database view, are included in a separate Annex with the detailed requirements for LCMC. (I)
 11. The AFIS renewal solution shall process all internal latent AFIS transactions as specified in the AFIS ICD. (M)
 12. The AFIS renewal solution shall: (M)
 - a. Accept requests received from NNS;
 - b. Manage requests through the AFIS renewal solution;
 - c. Automatically encode the area identified by the Latent technician and process latent search requests that generate a search result which can be reviewed by a Latent technician;
 - d. Facilitate the manual encoding of latent search requests which will then be processed, generating a search result which can be reviewed by a Latent technician;
 - e. Enable a Latent technician to verify the latent search candidates;
 - f. Enable a Latent technician to certify proposed identifications;
 - g. Enable a supervisor or senior Latent technician to second certify the proposed identifications;
 - h. Return search results, log information and statistical information to NNS using the internal reply transactions;

- i. Notify the NNS of the status of LFSI transactions;
 - j. Create US Electronic Biometric Transmission Specification (EBTS)-compliant Latent Fingerprint Feature Search (TOT US LFFS) transactions, provide the capability to verify and disposition the results (US SRL) and return the search results to NNS using the LSRFI transaction; and
 - k. Notify the NNS when a latent image has been committed (TOT LTCl). This will either happen after a re-launch of a previously submitted search or when the original image is adjusted OR when an existing image is duplicated. A latent image may be duplicated on AFIS so that the rotation, lasso or size can be adjusted OR so that a new minutiae set or descriptor set (e.g.: finger number, fingerprint classification) can be searched and/or added to the ULF for the same image.
13. The AFIS renewal solution must support an ability to fetch any type of print against any other type of print as part of normal submission processing or through the UI. This will allow any two prints to be analysed in a side-by-side view and then follow the normal verification/certification process (e.g. a Latent user is viewing an image in a wait for lasso state and they fetch an image for comparison; and then process it in the same manner as if the comparison image from selected as a search candidate). In stage two (2) implementation, this type of scenario for Latent processing would be reflected as a "Fetch" Search Type in LCMC. Refer to Annex E LCMC Detailed Requirements for additional information on the Search Type field. (M)
14. The AFIS renewal solution must provide a Latent queue capability that allows Latent users to pull work from and/or return work to depending on their specific role. (M)
15. The AFIS renewal solution shall accept and store fingerprint images in any valid resolution (e.g.: 500 ppi, 1000 ppi), as supported by the ANSI/NIST-ITL-1-2011 or a later version. The 500 ppi is required to support legacy latents. (M)
16. The minimum resolution for latent images (fingerprints and palms) shall be 1000 ppi. (M)
17. The AFIS renewal solution must allow a user to confirm that finger/palm latent images are scaled 1:1, prior to searching (i.e. provide a UI feature where images are shown consistently at their actual size so a user can measure the ruler in the image to confirm 1:1 scaling). (M)
18. Fifty (50) percent of the latent transactions are Central transactions and the other fifty (50) percent are Remote latent transactions. The fingerprint images found in these transactions are stored at 1000 ppi. (I)
19. The AFIS renewal solution shall allow encoding and search of legacy latent images at 500 ppi and shall allow encoding and search at 1000 ppi if received at 1000 ppi. (M)
20. In the case of latents received at resolutions above 1000 ppi, the AFIS renewal solution shall support the ability for the latent examiner to rescale the image to 1000 ppi, without affecting the scale of the image (i.e. remaining 1:1). (M)
21. The AFIS renewal solution shall return an Internal Status Transaction (STI) to the NNS when the transaction is queued for manual processing, when a latent image

transaction is committed, and when a latent image transaction is ended. The specific contents of the STI and the states are indicated in the AFIS ICD. (M)

22. The following two subsections present example workflows for Central Latent and Remote latent submissions. (I)
23. Note: The generic term AFIS is used in the following workflow explanations since it is describing the existing workflow. The AFIS renewal solution must support all the processing and workflow indicated generically with the term AFIS. (M)

5.1.1 CENTRAL LATENT WORKFLOW

1. The following table shows the sequence of activities for an existing Central Latent submission. Following this table is an explanation of each activity and transaction included in the workflow related to understanding the workflow applicable to the AFIS renewal solution. The AFIS renewal solution must receive and correctly process each AFIS ICD NIST transaction sent to the AFIS renewal solution as well as respond back to NNS with the required AFIS ICD NIST transaction correctly populated with the data required by the NNS in the sequence required for each workflow. (M)
2. Note: The following example is an existing flow; therefore, there are references to ELMO. (I)

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
1.	Received	LFSNS	Agency	NNS			Passed
2.	High-Level Validation	LFSNS	NNS	NNS			Passed
3.	ICD Validation	LFSNS	NNS	NNS			Passed
4.	Image Validation	LFSNS	NNS	NNS			Passed
5.	Created and Archived	LFSI	NNS	NNS			
6.	Send to AFIS	LFSI	NNS	AFIS			
7.	Created and Archived	LFSI	NNS	NNS			
8.	Send to AFIS	LFSI	NNS	AFIS			
9.	Wait for Lasso	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-00		
10.	Wait for Lasso	STI	AFIS	NNS	ON10814-2015-TESTCAS		

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-002-00		
11.	Lasso	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	
12.	Latent Review	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	
13.	Latent Automated Encoding	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	AFIS System user: 99	
14.	LT-TP Search	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	AFIS System user: 99	
15.	LT Commit Received	LTCI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
16.	Wait for Lasso	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-00		
17.	LT-TP/Wait for Verify 1 st Certify	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
18.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01		Result: Non Disposition
19.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS E-002-01		
20.	Latent Verification	LSRI	AFIS	NNS	ON10814-2015-TESTCAS	User: 01	Number of candidates to verify: 49

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-002-01		
21.	Latent Manual Encoding	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	
22.	Latent Review	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	
23.	Wait for Latent Edit	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
24.	LT-TP Search	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	
25.	LT-TP / Wait for Verify 1 st Certify	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
26.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-002-01		Result: Non Disposition
27.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS E-002-01		
28.	Latent Verification	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01	User: 01	Number of candidates to verify: 49
29.	Wait for UL Search	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
30.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS		Result: Non-Ident

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-002-01		
31.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS E-002-01		
32.	Lasso	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	
33.	Latent Review	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	
34.	Latent Automated Encoding	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	AFIS System user: 99	
35.	LT-TP Search	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	AFIS System user: 99	
36.	LT Commit Received	LTCI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
37.	Wait for Lasso	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-00		
38.	LT-TP/Wait for Verify 1 st Certify	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
39.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01		Result: Non Disposition
40.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS		

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-001-01		
41.	Latent Verification	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	Number of candidates to verify: 50
42.	Latent Manual Encoding	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	
43.	Latent Review	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	
44.	Wait for Latent Edit	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
45.	LT-TP Search	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	
46.	LT-TP / Wait for Verify 1 st Certify	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
47.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01		Result: Non Disposition
48.	Save Search Result to ELMO	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01		
49.	Latent Verification	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01	User: 01	Number of candidates to verify: 50
50.	Wait for UL Search	STI	AFIS	NNS	ON10814-2015-TESTCAS		

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-001-01		
51.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01		Result: Non-Ident
52.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS E-001-01		
53.	Wait for Insert	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
54.	Latent Manual Encoding	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01	User: 02	
55.	Latent Review	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 02	
56.	Wait for Latent Edit	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
57.	LT-TP Search	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01	User: 02	
58.	Wait for Insert	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
59.	LT-TP / Wait for Verify 1 st Certify	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
60.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS		Result: Non Disposition

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-001-01		
61.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS E-001-01		
62.	Wait for Latent Edit	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
63.	Wait for UL Search	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
64.	Wait for Insert	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
65.	Saved to ULF	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
66.	Latent Image Transaction End(11)	STI	AFIS	NNS	ON10814-2015-TESTCAS E-002-01		
67.	Latent Verification	LSRI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01	User: 02	Number of candidates to verify: 50
68.	Wait for UL Search	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
69.	LT-TP Search Result Received	LSRI	NNS	NNS	ON10814-2015-TESTCAS E-001-01		Result: Non-Ident
70.	Save Search Result to ELMO	LSRI	NNS	ELMO	ON10814-2015-TESTCAS		

Table 5-1: Central Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
					E-001-01		
71.	Wait for Insert	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
72.	Saved to ULF	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
73.	Latent Image Transaction End(11)	STI	AFIS	NNS	ON10814-2015-TESTCAS E-001-01		
74.	Created and Archived	LSR Email	NNS	NNS			
75.	Sent	LSR Email	NNS	Agency			

3. The above table shows all activities for a LFSNS submission to reflect the other non-AFIS activities that also occur throughout this process. These non-AFIS activities allow a better understanding of the overall processing, show how the data that will be sent to the AFIS renewal solution is derived and how the data received from the AFIS renewal solution would be used. The following focusses on the activities that must be supported by the AFIS renewal solution in the above example LFSNS submission: (M)
 - a. Line #1 shows the LFSNS received, which has two (2) latent images in the LFSNS;
 - b. Line #5 shows NNS creating an LFSI using the first latent image and assigning it a "-001" suffix to the case file name provided by the contributor. The Latent ID created by NNS is ON10814-2015-TESTCASE-001;
 - c. Line #6 shows NNS sending the LFSI to AFIS for processing;
 - d. Line #7 shows NNS creating an LFSI using the second latent image and assigning it a "-002" suffix to the case file name provided by the contributor. The Latent ID created is ON10814-2015-TESTCASE-002;
 - e. Line #8 shows NNS sending the LFSI to AFIS for processing;
 - f. Line #9 shows NNS receiving an STI from AFIS indicating the receipt of the first image with the "-00" suffix for the first latent resulting in the Latent Image ID ON10814-2015-TESTCASE-001-00. The AFIS renewal solution must ensure a duplicate Latent Image ID is never created. If a duplicate is detected the AFIS renewal solution must respond with an ERRIN;

- g. Line #10 shows NNS receiving an STI from AFIS indicating the receipt of the first image with the “-00” suffix for the second latent resulting in the Latent Image ID ON10814-2015-TESTCASE-002-00;
- h. Line #11 shows NNS receiving an LSRI from AFIS indicating the User: 01 has performed a lasso on the second latent image and the AFIS renewal solution has created Latent Image ID ON10814-2015-TESTCASE-002-01. The AFIS renewal solution must increment the image id number every time the image is duplicated;
- i. Line #15 show the NNS receiving the LTCI from AFIS indicating the Latent has been committed for search by the AFIS system;
- j. Lines #18–#23 show NNS receiving the LSRI from AFIS and recording the disposition in ELMO;
- k. Lines #20–#30 show NNS receiving LSRIs and STIs from AFIS indicating the AFIS activity by User: 01 on the Latent Image ID ON10814-2015-TESTCASE-002-01;
- l. Line #31 show NNS recording the non-ident result in ELMO;
- m. Lines #32–#61 show NNS receiving various transactions from AFIS by User: 02 for processing on the Latent Image ID ON10814-2015-TESTCASE-001-01 which is virtually the same activity for Latent Image ID ON10814-2015-TESTCASE-002-01. Included in this list of activities is line #56 which indicates a non-ident received from AFIS which is recorded in ELMO by NNS;
- n. Lines #65–#66 show NNS receiving an STI indicating the Latent Image ID ON10814-2015-TESTCASE-002-01 has been saved to the ULF which ends the processing for this particular image;
- o. Lines #72–#73 show NNS receiving an STI indicating the Latent Image ID ON10814-2015-TESTCASE-001-01 has been saved to the ULF which ends the processing for this particular image; and
- p. Lines #74–#75 shows NNS using message text received from ELMO to create and send a response email to contributor concerning this submission for this file.

5.1.2 REMOTE LATENT WORKFLOW

1. The following Table shows the sequence of activities for an existing Remote latent submission. Following this table is an explanation of each activity and transaction included in the workflow related to understanding the workflow applicable to the AFIS renewal solution. The AFIS renewal solution must receive and correctly process each AFIS ICD NIST transaction sent to the AFIS renewal solution as well as respond back to NNS with the required AFIS ICD NIST transaction correctly populated with the data required by the NNS in the sequence required for each workflow. (M)

Table 5-2: Remote Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
1.	Received	LFFS	Agency	NNS	BC30330-Test-R5-01		Passed
2.	High-Level Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
3.	ICD Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
4.	Image Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
5.	Transformation	LFFSI	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: LFFS To: LFFSI
6.	Created and Archived	ACKL(LFFS)	NNS	NNS			
7.	Sent	ACKL(LFFS)	NNS	Agency			
8.	Send to AFIS	LFFSI	NNS	AFIS	BC30330-Test-R5-01		
9.	Process AFIS Response	SRLI	AFIS	NNS	BC30330-Test-R5-01		
10.	Transformation	SRL	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: SRLI To: SRL
11.	Created and Archived	SRL	NNS	NNS	BC30330-Test-R5-01		
12.	Sent	SRL	NNS	Agency	BC30330-Test-R5-01		
13.	Received	LFFS	Agency	NNS	BC30330-Test-R5-01		Passed
14.	High-Level Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
15.	ICD Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
16.	Image Validation	LFFS	NNS	NNS	BC30330-Test-R5-01		Passed
17.	Transformation	LFFSI	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: LFFS To: LFFSI

Table 5-2: Remote Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
18.	Created and Archived	ACKL(LFFS)	NNS	NNS			
19.	Sent	ACKL(LFFS)	NNS	Agency			
20.	Send to AFIS	LFFSI	NNS	AFIS	BC30330-Test-R5-01		
21.	Process AFIS Response	SRLI	AFIS	NNS	BC30330-Test-R5-01		
22.	Transformation	SRL	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: SRLI To: SRL
23.	Created and Archived	SRL	NNS	NNS	BC30330-Test-R5-01		
24.	Sent	SRL	NNS	Agency	BC30330-Test-R5-01		
25.	Received	LFSRD	Agency	NNS	BC30330-Test-R5-01		Passed
26.	High-Level Validation	LFSRD	NNS	NNS	BC30330-Test-R5-01		Passed
27.	ICD Validation	LFSRD	NNS	NNS	BC30330-Test-R5-01		Passed
28.	Transformation	LFSRDI	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: LFSRD To: LFSRDI
29.	Created and Archived	ACKL (LFSRD)	NNS	NNS			
30.	Sent	ACKL (LFSRD)	NNS	Agency			
31.	Send to AFIS	LFSRDI	NNS	AFIS	BC30330-Test-R5-01		
32.	Received	LCLO	Agency	NNS	BC30330-Test-R5-01		Passed
33.	High-Level Validation	LCLO	NNS	NNS	BC30330-Test-R5-01		Passed
34.	ICD Validation	LCLO	NNS	NNS	BC30330-Test-R5-01		Passed

Table 5-2: Remote Latent Workflow							
Line #	Activity	Transaction	From System	To System	Latent Image ID	Op ID	Outcome
35.	Transformation	LCLOI	NNS	NNS	BC30330-Test-R5-01	Remote 1	From: LCLO To: LCLOI
36.	Created and Archived	ACKL(LCLO)	NNS	NNS			
37.	Sent	ACKL(LCLO)	NNS	Agency			
38.	Send to AFIS	LCLOI	NNS	AFIS	BC30330-Test-R5-01		

2. The above table shows all activities for an LFFS submission to reflect the other non-AFIS activities that also occur throughout this process. These non-AFIS activities allow a better understanding of the overall processing, shows how the data that will be sent to the AFIS renewal solution is derived and how the data received from the AFIS renewal solution would be used. The following focusses on the activities that must be supported by the AFIS renewal solution in the above example LFFS submission: (M)
 - a. Line #8 shows NNS sending an LFFSI NIST transaction to AFIS. The Transcoder is responsible for creating the unique Latent Image ID; however, the AFIS renewal solution must ensure a duplicate Latent Image ID is never created. If a duplicate is detected the AFIS renewal solution must respond with an ERRIN;
 - b. AFIS will process the LFFSI and respond back through the NNS to the Transcoder;
 - c. Line #9 shows the SRLI NIST transaction sent from AFIS to NNS;
 - d. NNS will transform the SRLI to an SRL and send the SRL to the Transcoder (Lines #10–#12). If successful NNS will respond to the contributor with an ACKT NIST Transaction to acknowledge that the submission has been validated and can be processed;
 - e. Line #13 shows another LFFS received from the Transcoder. This implies that the Transcoder took some action on the latent and sent it again for search. Lines 13-24 are virtually a duplicate of lines #1-12 since it is showing the LFFS transaction being processed;
 - f. Line #25 shows NNS receiving the disposition NIST transaction (LFSRD) for the latent that was being processed by the Transcoder user;
 - g. Line #31 shows NNS sending a LFSRDI NIST transaction to AFIS. From an AFIS perspective this dispositions the latent being processed and no further activity will occur against this latent by the Transcoder users unless the Transcoder initiates a new submission;

- h. Line #32 shows NNS receiving the LCLO indicating the Transcoder user has finished with processing this submission. As noted in the AFIS ICD the LCLOI is not communicated to AFIS since this processing is all within the NNS; and
- i. The Contractor is also responsible for providing the Transcoder renewal solution from which the LFFS and related NPS-NIST ICD transaction originate in the above example workflow. The Transcoder detailed requirements are described in a separate Annex within this SOW.

5.2 Latent Fingerprint Search Request

1. The AFIS renewal solution shall process Latent Search Requests for Latent vs Ten Print searches and Latent vs Latent searches. (M)
2. The term “Latent Search” refers to a single set-up of a latent image. The typical terminology used by RCMP is as follows: A police occurrence results in one or more latent submissions that may be comprised of several fingerprint impressions. This is referred to as a file. The Latent File Number is associated to the set of submissions corresponding to one police occurrence. For a single submission, there may be several Latent Searches prepared as a result of multiple latent images in the submission or as a result of different set-ups (e.g.: lasso). The ULF stores individual Latent Images. The same image may occur multiple times on the ULF if it was adjusted or encoded differently. The LSRI holds a single set-up search performed for a single image. (I)
3. The AFIS renewal solution shall automatically assign a Search Creation Date equal to the present date to each Latent Search. (M)
4. The AFIS renewal solution shall augment a unique identifier (Latent Image Identifier) for each latent image committed by using the Latent Identifier submitted in the LFSI transaction and adding a two digit suffix that is incremented by one every time the same image is committed starting at “01”. (e.g.: <Latent Identifier><2 digit image instance>) If an instance of an image is retained on the ULF, then the Latent Image Identifier shall be retained with it. There can be up to 99 images for one Latent Identifier. (M)
5. The Latent Identifier passed to the AFIS in the LFSI transaction will have a 7 digit ORI prefix added by the NNS. In stage 2 implementation the AFIS renewal solution must support this complete numbering scheme for all Latents. (M)

5.3 Encoding and Latent Searching

1. The AFIS renewal solution shall allow for automatic and manual extraction of fingerprint features. (M)
2. The AFIS renewal solution shall enable a user to filter the work queue by ISF, Latent File Number and by Latent Identifier, thereby enabling a single user to process through all searches pertaining to the same image or the same latent file. The AFIS renewal solution shall enable the user to perform the encoding, verification and certification of the same image on the same workstation. (M)

3. The AFIS renewal solution shall provide the ability to save Fingerprint features of a latent image. (M)
4. The AFIS renewal solution shall enable a technician to change the encoding of an image, the search criteria for an image (i.e., set-up of a search), add a new Search for a specific image, delete a specific Search and delete a specific image or image duplicate. (M)
5. The AFIS renewal solution shall provide a single entry screen to support modification of descriptors, data fields from set-up and parameters for search. (M)
6. The AFIS renewal solution shall enable a user to edit and delete automatically extracted features from latent images. (M)
7. The AFIS renewal solution shall enable a technician to delete all minutiae inside or outside a selected area, after identifying the area with a lasso like action. (M)
8. On Latent to Ten Print searches, the AFIS renewal solution shall search the TPF including, but not limited to, the Criminal Files, Refugee Files, Immigration files and Special Repositories as specified in the Internal Latent Fingerprint Search (LFSI); or as specified by an AFIS latent technician from within the AFIS when processing images created from the original latent included in the LFSI. (M)
9. The AFIS renewal solution shall return the search results automatically to a central work queue. (M)
10. The AFIS renewal solution shall enable a user to view and select the search results from a central queue based on user defined filters. (M)
11. The AFIS renewal solution shall enable a technician to save a Latent Image or one of its duplicates to the ULF. (M)
12. The ULF will be used by Latent Operations to file Latent Images so that these can be searched as part of the reverse search or ULF to ULF searches. (M)
13. The AFIS renewal solution must save data in the ULF with a specific print to ensure all requirements stated through this SOW and its accompanying documents are satisfied. For example, Latent File Number, Ident Section File Number, Latent Image ID, Latent ID, Image Data, Finger Number(s), Palm Position(s), Fingerprint Features/Characteristics, Crime Type, Offence Date, Creation Date, Expiry Date, Originating Agency ID, Palm Indicator, Operator ID (of operator that last encoded the entry), Authority to Release Indicator and all data required to support the LCMC requirements and the subsection 3.5 Operational Reporting and Statistics requirements. (M)
14. In addition, the ULF shall distinguish between finger latents and palm latents. (M)
15. Latent searches must be full penetration searches that search all TPF finger and palm prints. Since RCMP saves multiple sets of prints for a file number, this means that all sets of prints for all subjects must be included in the latent searches. (M)
16. The AFIS renewal solution must enable a user to increase or reduce the size of the print to search by a percentage by entering a value. (M)

17. The AFIS renewal solution should have a button that allows a specific configurable percentage (i.e. configurable parameter) adjustment to the size of a print based on the most common percentage change. (R)

5.4 General Latent User Interface Features

1. Latent Search List must include: (M)
 - a. The Latent Work Queue is a list of work that must be performed by latent technicians. The Latent Technician shall be able to filter the contents of the work queue so that it includes only outstanding searches and completed searches do not appear on the list.
 - b. The Latent User Interface shall provide a work queue that can be sorted ascending / descending.
 - c. By default, the Latent User Interface (UI) shall list the searches for verification/certification in the order specified by the sequential search numbering such that all searches pertaining to the same image are grouped together on the work queue.
 - d. The UI shall enable a technician to loop forward and backward through the list of outstanding searches.
 - e. The latent UI shall automatically refresh the search list at timed intervals.
 - f. The AFIS renewal solution shall enable a user to process through a range or the entire search list without having to return to the search list to select the next search to be worked on by automatically bringing up the next search in the range or search list upon disposition of the current one.
 - g. The Latent UI shall enable a technician to remove (purge) a search from the search list. If a search is pending completion of the AFIS search, then this shall cancel the AFIS search.
 - h. The Latent UI shall allow a technician to view the outstanding searches on the work queue and filter all of the searches based on the image (Latent Identifier) they are working on. When they request additional work, the AFIS renewal solution will automatically bring forward the next item from the filtered work queue.
2. The AFIS renewal solution shall display at least the following data during the verification/certification process: (M)
 - a. The Latent UI shall at all times display the Latent Image Identifier (unique identifier associated to an image instance) currently being worked on.
 - b. The Latent UI shall, as a minimum, display the following fields in addition to the latent search image and candidate fingerprint images while verifying/certifying the results of a latent search:
 - i. Transaction number;
 - ii. Agency ORI;

- iii. Latent File Number;
 - iv. Latent Identifier;
 - v. Latent Image Identifier;
 - vi. Candidate File Number;
 - vii. Candidate DCN;
 - viii. Candidate agency ORI;
 - ix. External TCN;
 - x. Offence Date;
 - xi. Finger number of candidate;
 - xii. Fingerprint quality of prints; and
 - xiii. Number of minutia.
3. The AFIS renewal solution must ensure the Candidates, in the short list (Default Minimum Number of Latent Forward Search Candidates configurable parameter Section 8.1), are dispositioned for verification. (M)
 4. The AFIS renewal solution must allow the user to view all Candidates, in the long list (Default Maximum Number of Latent Forward Search Candidates configurable parameter Section 8.1), through a single mouse click, which will allow the user to then review the additional Candidates. (M)

5.5 Latent Verification

1. The AFIS renewal solution shall rank the candidates list in the order of most likely to least likely match and enable a technician to view the candidate list. (M)
2. The AFIS renewal solution shall provide only a single candidate for a given Subject. That is, if a subject is both a criminal and a refugee, then only the best matching candidate (regardless of file type) is to be presented. The AFIS renewal solution shall indicate the number of sets of fingerprints on file, including their resolutions, palm availability and quality, and enable the technician to view any of these other sets of impressions for each candidate subject. (M)
3. If a subject has multiple sets of fingerprints/palm prints on File or has both a Refugee File and a Criminal File, then only the best matching impression identified by the search will be used for comparison. The technician will have the option of viewing other impressions from different sets on file for the same subject. (M)
4. For finger/palm latent, the AFIS renewal solution shall include on the candidate list, as a minimum: (M)
 - a. All File Numbers pertaining to the subject (FPS Number, Refugee File Number, Immigration number); and
 - b. Matching Finger Number and/or Palm description/code.

5. The AFIS renewal solution shall not display the AFIS score on the verification user interface, unless the user is configured to view the score. (M)
6. The AFIS renewal solution shall enable a system administrator to configure the AFIS renewal solution hit threshold and the default number of top ranked candidates for latent to Ten Print searches. Refer to configurable parameters subsection 8.1 for additional information. (M)
7. The AFIS renewal solution shall enable a technician to loop forward and backward through the list of candidates and to select a specific candidate for display from the candidate list. The AFIS renewal solution shall stop at the end of the list and indicate to the user when the end of the list has been reached. (M)
8. The AFIS renewal solution shall provide a side-by-side view of the Latent fingerprint or palm image along with the corresponding single finger or palm in the matching Ten Print to support verification. (M)
9. The AFIS renewal solution shall display the unsolved latent beside the candidate Ten Print at the same size and scale, even if the resolutions differ. (M)
10. The AFIS renewal solution shall enable a technician to view complete images of any of the fingers, plain impressions, ID Flat impressions or palm impressions of the candidate (including images from any sets on file for the candidate) sized and rotated accordingly beside the latent image. (M)
11. Latent technicians generally move through the candidate list top to bottom. The AFIS renewal solution shall provide a visual indication in the Candidate List of which candidates have already been verified. (M)
12. The AFIS renewal solution shall perform verification by enabling a Latent technician to view the verification image of the candidate beside the latent search image. (M)
13. The AFIS renewal solution shall enable a technician to disposition with confirmation each Latent Search as either ident to a candidate or non-ident. For any ident (e.g.: Latent to Ten Print, Latent to Latent), the AFIS renewal solution shall include a type-16 record with the screen image of the identification. Refer to section 5.7 Latent Certification for additional details. (M)
14. The AFIS renewal solution shall enable a user to print out a comparison quality hardcopy of the verification screen image and the search and candidate information associated with the verification (e.g.: ORI, DCN, TCN, File Number, Subject ID, Latent file, Latent image ID, score, etc. – complete list to be determined with the Contractor). (M)

5.6 Latent Cancellation Handling

1. The AFIS renewal solution shall enable a technician to cancel an image at any time during Latent processing (e.g.: lasso, verification) and specify the reasons why. (M)
2. The AFIS renewal solution shall provide a pick list of configurable unsuitable/cancelled reasons that can be selected for inclusion in the internal reply transaction (LCANI). Refer to the AFIS ICD for a list of possible reasons that must be available in the pick list. (M)

3. Once cancelled the transaction must remain in the queue, in a cancelled state, until it is reviewed by another technician. For example, the additional user will delete the transaction, which would end the transaction and remove it from the queue, or relaunch the transaction for further processing. (M)
4. When a transaction is deleted within the AFIS, the response must be sent to the NNS. In implementation stage, NNS will update ELMO indicating a cancellation. In stage 2 the processing of the cancellation will be handled in AFIS/LCMC. (M)
5. Contributors can notify RCMP NPS of a cancellation of a Latent submission, or an image, by a telephone call, e-mail message or fax. The details of the cancellation must be added to the Latent File in the LCMC in stage 2 implementation. In stage 1, they are added to ELMO by RCMP technicians. The Cancellation Request will be performed in LCMC and the result of the cancellation sent to the NNS. The AFIS renewal solution will cancel the search request and delete the details from the AFIS renewal solution. (M)
6. Remote Transcoder users cancel a transaction through an LCLO. Refer to Annex C for detailed requirement on the Transcoder. (I)
7. The AFIS renewal solution must support cancelling a transaction initiated from the Transcoder. (M)

5.7 Latent Certification

1. The AFIS renewal solution shall provide the capability for a Senior Latent technician to certify every latent identification. (M)
2. The AFIS renewal solution shall perform certification by enabling a Senior Latent technician to view the certification image of the candidate beside the latent search image. (M)
3. In the case where a Senior Latent technician does not agree with the verification Latent technician's decision, a second certification process is required. The AFIS renewal solution shall automatically ensure that a configurable number of two (2) Senior Latent technicians process each latent candidate to support this specific scenario. For example, a Latent technician confirms yes to a candidate. However, the Senior Latent technician confirms no to the same candidate. In this scenario a third verification/certification process is required. As a consequence a 2nd Senior Latent technician must confirm no or confirm yes to complete the transaction. (M)
4. The AFIS renewal solution shall enable a technician to display any of the fingers, the plain impressions, ID Flat impressions or palm impressions, as well as any of these from any other submission on File for the candidate subject, for certification without delay. The UI response time requirements are described in the Technical requirements. (M)
5. The AFIS renewal solution shall enable a technician to view a list of sets of prints on file including, as a minimum: Resolution, Quality, indication of which sets on file have already been viewed and indication of which sets on file have palms. (M)

6. The AFIS renewal solution shall provide a means for the technician to indicate certification of the Submission to an existing File by a single user interface action (e.g.: on screen button) with confirmation. (M)
7. The AFIS renewal solution shall automatically retain a record of the certifier's identity, the finger(s) used for certification, Candidate File Number, DCN, Device ID, the date and time of certification, the Latent File Number, the Latent Identifier, the Latent Image Identifier and the AFIS Score in the Transaction Log. (M)
8. The AFIS renewal solution should include an indication of whether it was the rolled or flat impressions used for certification in the Transaction Log. (R)
9. Upon any certification (e.g.: Latent to Ten Print, Latent to Latent), the AFIS renewal solution shall automatically create a "screen image" as a locked comparison quality image that combines the submission latent search image and the image on the Ten Print File as viewed at the time of certification, containing the following information: the user ID of the Latent Certifier, Device ID on which Certification took place, Ten Print File Number and DCN certified to, Subject Identifier certified to, Latent File Number, Finger/Palm Number, submission latent image, Ten Print File fingerprint/palm image (indicating rolled or plain where possible), Latent Identifier as well as date and time that certification took place. The "screen image" format is defined in the AFIS ICD. (M)
10. This "screen image" shall be created and returned to NNS, in the type-16 record, for each certification against the same latent image (i.e.: where two certifications are performed on one latent image then two images shall be created; where more than two certifications are required, then each certification shall have a screen image created). (M)
11. The AFIS renewal solution shall enable a user to print out a comparison quality hardcopy of the certification screen image and the search and candidate information associated with the certification (e.g.: ORI, DCN, TCN, File Number, Subject ID, Latent file, Latent image ID, score, etc. – complete list to be determined with the Contractor). (M)
12. If an identification is not certified, then the AFIS renewal solution shall retain a Certification Declined Log of the following, as a minimum: the User ID of each Latent Certifier, the User ID of the verification technician(s) (if verification was performed), the Verification technician recommendation, the AFIS Score, the Latent File Number and Subject Identifier of the proposed ident, the Latent Image Identifier, and the date and time that the certifier's decision was made. Refer to subsection 3.5 Operational Reporting and Statistics for the full set of data that must be recorded when a certification is declined. (M)
13. The AFIS renewal solution shall enable a technician to assign a certification request to a supervisory role when the certification cannot be confirmed. (M)
14. When the second certification results are negative, the AFIS renewal solution shall enable the technician to assign the certification request to a supervisory role for a third certification. (M)
15. Where a Certification technician determines that a candidate forwarded to certification is not identical, then the Senior Latent technician shall have the ability to review and disposition the full candidate list. This will then place the submission in a state that

requires a third certification (Refer to AFIS ICD STI status code “Wait for 3rd certify”).
(M)

5.8 Search Conclusion

1. If the last Latent Search associated to an image is dispositioned as negative or the image is fully certified, then the technician shall conclude the search by ending the transaction. (M)
2. The Internal Latent Search Response (TOT LSRI, LSRLI) shall include a subset of the transaction log information as defined in the AFIS ICD. (M)
3. The AFIS renewal solution shall create and send the Latent Fingerprint Search Response (TOT LSRI, LSRLI) to the NNS at the conclusion of a single search associated to one image. (M)
4. Where no match is found and the technician indicates retention of the image on the ULF, then the AFIS renewal solution shall automatically retain the Latent image on the ULF with Expiry Date as specified in the LFSI. (M)
5. The AFIS renewal solution shall include in the LSRI and LSRLI all parameters needed to generate the Latent Print Match Report. A list of these parameters is detailed in the AFIS ICD. (M)

5.9 Reverse Search

1. The Unsolved Latent File (ULF) retains all cases for which an identification could not be found. Reverse Searching refers to the practice of searching Ten Prints / palm prints against the ULF and any other special repositories containing latent fingerprints/palm prints. (I)
2. The Internal Ten Print Request will indicate whether a Reverse Search is to be performed and which unsolved latent repositories to search against. (I)
3. Where the Internal Ten Print Request indicates that a reverse search is to be performed, then the AFIS renewal solution shall automatically initiate a Ten Print to Latent Search, (including Palm Print to Latent Palm – if requested in the TPRI) against the latent repositories specified. (M)
4. The AFIS renewal solution shall perform the search and present at Verification the reverse search candidates above a configurable reverse search threshold score. (M)
5. The AFIS renewal solution shall forward proposed identifications by a Latent Technician to Senior Latent Technician. Certification to reverse searches shall be carried out as per Latent Certification above. (M)
6. The AFIS renewal solution shall not release a reverse search result without intervention by an authorized user. (M)
7. There might be multiple identifications made on a reverse search because the ULF may hold latent impressions of the same subject active at more than one crime scene. (I)

8. When multiple identifications are made on a reverse search, then the Ten Print to Unsolved Latent response (TPULI) shall include all of the Latent File Numbers to which the Ten Print transaction identified. (M)
9. Where the reverse search is complete, then the AFIS shall return the results to the NPS NIST Server in the Ten Print to Unsolved Latent response transaction (TPULI). A separate TPULI will be sent if a palm reverse search is dispositioned. (M)
10. The AFIS renewal solution shall include in the TPULI all parameters needed to generate the Reverse Search match Report. A list of these parameters is detailed in the AFIS ICD. (M)
11. Upon certification, the AFIS renewal solution shall automatically create a “screen image” as a locked comparison quality image that combines the file latent image and the search image on the Ten Print submission as viewed at the time of certification, containing the following information: the user ID of the Latent Certifier, Device ID on which Certification took place, Ten Print File Number and DCN certified to, Subject Identifier certified to, Latent File Number, Finger/Palm Number, submission latent image, Ten Print File fingerprint/palm image (indicating rolled or plain where possible), Latent Identifier as well as date and time that certification took place. The “screen image” format is defined in the AFIS ICD. (M)
12. This “screen image” shall be created and returned to NNS, in the type-16 record, for each certification against the same latent image (i.e., where two certifications are performed on one latent image then two images shall be created; where more than two certifications are required, then each certification shall have a screen image created). (M)
13. The AFIS renewal solution shall enable a user to print out a comparison quality hardcopy of the certification screen image and the search and candidate information associated with the certification (e.g.: ORI, DCN, TCN, File Number, Subject ID, Latent file, Latent image ID, etc. – complete list to be determined with the Contractor). (M)
14. The AFIS renewal solution must support a role based privilege that allows an authorized user the ability to sort all reverse search transactions by score. This will allow an authorized user to action reverse search transactions different from the normal processing (e.g.: View/process reverse search transactions with high scores, delete reverse search transactions with low scores if the queue becomes too large). (M)

5.10 Unsolved Latent Delete/Amendment

1. **The Contractor’s LCMC solution may affect how ULF deletes/amendments are performed. Any difference must be identified while still satisfying the requirements stated throughout this SOW and its accompanying documents.** (M)
2. The AFIS renewal solution shall receive and process deletion requests (TOT ULDI) from the Remote Transcoder sites via the NNS. (M)
3. Upon receipt of a deletion request (TOT ULDI), the AFIS renewal solution shall delete the Latents as identified in the ULDI from the AFIS renewal solution. (M)

4. The AFIS renewal solution shall create the deletion response (TOT ULDR1) and send it to the Remote Transcoder site via the NNS. (M)
5. The AFIS renewal solution shall also allow the Central Latent user to delete Latents through the AFIS UI and in stage 2 implementation in the AFIS/LCMC UI. The AFIS renewal solution must delete the Latents identified by the Latent technician through the AFIS/LCMC UI. (M)
6. Contributors can notify RCMP NPS of an amendment by a telephone call, e-mail message or fax. The details of the amendment will be added to the Latent File in AFIS/LCMC. The AFIS renewal solution shall allow the AFIS/LCMC user to amend the Latent File through the AFIS UI in stage 1 implementation and in the AFIS/LCMC UI in stage 2 implementation. (M)
7. Alternatively, the Unsolved Latent Amend (TOT ULAI) will be created by the Remote Transcoder site to notify the AFIS to amend the file on the ULF. The AFIS renewal solution shall accept and process Unsolved Latent Amendments (TOT ULAI) received from the NNS. (M)
8. The AFIS renewal solution shall create the Unsolved Latent Amend Reply (TOT ULARI) and send it to the NNS. (M)
9. The AFIS renewal solution shall purge / amend at all three levels: Latent File Number, Latent Identifier and Latent Image Identifier. (M)
10. If only a Latent File Number is specified, then the AFIS renewal solution shall amend/purge all searches on the ULF associated to that Latent File Number. (M)
11. If a Latent Identifier and Latent File Number are specified then all entries on the ULF pertaining to the particular image and file shall be amended / purged. (M)
12. If a Latent Image Identifier is specified then only this particular Latent Image instance in the ULF will be amended / purged. (M)
13. If the Expiry Date precedes the present date, then the AFIS renewal solution shall remove the candidate from the search of the ULF. (M)
14. If a remote AFIS site is purging a ULF entry associated with a specific latent image and there are other entries on the ULF for that same image (same Latent File Number, same Latent Identifier, same Originating Agency ID), then the AFIS renewal solution shall automatically return a warning to the remote AFIS site advising them that they may wish to purge all entries associated with the same image. The wording of this message is to be as follows: "Please ensure that you have deleted all instances of the same image <Latent Identifier> from the RCMP ULF if the latent has been identified."
(M)
15. The AFIS renewal solution shall return this notification/warning as a Narrative Message with the acknowledgement of the purge (TOT ULDR1). (M)

5.11 ULF Purge and Retention

1. Each Internal Latent Search Request (TOT LFSI) will be received with an Expiry Date which must be properly recorded by the AFIS renewal solution. (M)

2. The AFIS renewal solution shall use the crime type expiry period for the Operating Statistics and Reporting Code (OSR) to determine the Expiry Date of when the entry will be purged automatically for Latents saved to the ULF. (M)
3. In implementation stage 2, the AFIS renewal solution shall use the crime type expiry period for the OSR and the Offence Date (provided in the LFSNSI) to determine the Expiry Date of when the entry will be purged automatically for Latents saved to the ULF. In stage 1, NNS provides the Expiry Date in the LFSI. Refer to Annex E for LCMC stage 2 implementation requirements. (M)
4. For example, murders and other serious crimes have an Expiry Period of 99 years, Breaking and Entering (B&E) might have a default expiry period of 8 years, sexual assaults 20 years and so on. (I)
5. When an entry in the ULF reaches its Expiry Date, then the AFIS renewal solution shall automatically purge the entry. (M)

5.12 International Latent Fingerprint Features Search Requests

1. The AFIS renewal solution shall prepare US EBTS-compliant Latent Fingerprint Feature Search Transactions (TOT US LFFS) and send these to the NNS for issuance to the FBI AFIS, in the US. (M)
2. The AFIS renewal solution shall enable a latent technician to initiate the preparation of a US EBTS Latent Fingerprint Feature Search Transaction (TOT US LFFS). (M)
3. The NNS supports the interface between the RCMP and FBI in the same manner as all other contributors. The key exception with the FBI is that NNS also supports sending search requests to the FBI AFIS and receiving response results automatically. (I)
4. The AFIS renewal solution must ensure the US EBTS LFFS transactions are created in a manner that ensures the FBI database can be searched. That is, the AFIS renewal solution must ensure any FBI limitation on US LFFS transactions is adhered to (e.g.: search penetration limits). (M)
5. The AFIS renewal solution should provide the ability to automatically encode, transform or both (as required) to create a US EBTS EFS compliant transaction (TOT US LFFS) with as little additional effort over and above the encoding done for the Canadian search as possible on the part of the latent technician (e.g.: adding text for fields required for the FBI search). (R)
6. The AFIS renewal solution shall receive the FBI Latent Search Results (TOT USSRL) from the NNS and forward to a Latent work queue for verification. (M)
7. The AFIS renewal solution shall enable a user to view the verification packet received from the FBI (TOT USSRL), perform the comparisons and disposition in a similar fashion as those searched against the Canadian database. (M)
8. The AFIS renewal solution shall record the disposition results from the foreign verification packet in LCMC and shall send the Internal Latent Foreign Search Reply Transaction (TOT LSRFI) the NNS. (M)

9. The AFIS renewal solution shall automatically log the activities performed to carry out Latent international exchanges and update the Transaction Log accordingly. (M)

5.13 Special Search and File Requests

1. The AFIS renewal solution shall enable a user to initiate a Latent to TP search from a single latent fingerprint captured from a latent workstation scanner within the AFIS environment. (M)
2. The Latent User Interface features will be used to adjust these images captured directly into the AFIS renewal solution and use the normal Latent workflow. This normal Latent workflow includes saving the latent to the ULF if required. Note: This is to be examined more closely with LCMC requirements. (M)

5.14 Management of Remote Sites

1. The RTID Remote Transcoder will enable Remote AFIS users to search on the national Ten Print File and ULF directly through NIST transactions, verify their search results, submit searches to be added to the RCMP ULF, disposition their latent searches, cancel searches, fetch Ten Prints or Latents and purge their Latents added to the RCMP ULF. (M)
2. The AFIS renewal solution shall process and prepare replies for the following Remote site transactions in a fully automated manner based on the AFIS ICD and workflow described in this SOW and its accompanying documents. (M)
 - a. Latent Fingerprint Feature Search (TOT LFFSI), its reply (TOT SRLI) and corresponding search disposition (TOT LFSRDI);
 - b. Unsolved Latent Delete and its reply (TOT ULDI, ULDRDI);
 - c. Unsolved Latent Retrieve and its reply (TOT ULRI, ULRRI);
 - d. Fingerprint Image Request and its reply (TOT IRQI, IRRDI); and
 - e. ULF Enroll and its reply Internal transaction (TOT ULEI, ULERI).
3. The AFIS renewal solution shall receive fingerprint search disposition information (TOT LFSRDI) from Remote AFIS sites via the NNS to support central reporting and monitoring. (M)
4. The AFIS renewal solution shall forward the Disposition response (TOT LFSRDI) to the Remote Network Search Coordinator (RNSC) when the LFSRDI indicates that the transaction must be forwarded to the RNSC (Forward to RNSC Reason Code). (M)
5. Note that the NNS will add the "Forward to RNSC Indicator" to the Disposition response (LFSRDI) based on the CPIC File Status and File Type. (M)
6. The AFIS renewal solution shall only allow Remote AFIS sites to have the ability to enrol / delete ULF entries that belong to their agency. (M)

7. The AFIS renewal solution must provide the ability to prevent an uncertified Remote Latent user from adding to the ULF database and allow the RNSC to monitor any work completed by the uncertified Remote Latent user. (M)
8. The AFIS renewal solution shall enable the RNSC to monitor Remote AFIS site activity by providing the following capabilities on the ULF and using the “Remote transaction queue”: (M)
 - a. The ability to purge Remote AFIS site searches on the ULF one at a time or by Latent File Number on the RNSC’s Latent Workstation at RCMP HQ.
 - b. The ability to re-encode or edit Remote AFIS site searches on the RNSC Latent Workstation at RCMP HQ and either amend the existing search or create a new search.
 - c. The ability to amend the Expiry Date of a Remote AFIS site search on the ULF.
 - d. The ability to amend the data descriptors of a Remote AFIS site search on the ULF.
 - e. The ability for the RNSC to resubmit Remote AFIS site Latent Searches for search against the national Ten Print File and selected special repositories.
9. The AFIS renewal solution shall enable the RNSC to obtain comparison quality hardcopy images of the display screen. That is, the RNSC must be able to certify latent matches using the print out of the screen display. (M)
10. The AFIS renewal solution shall automatically record in LCMC when an identification is made at a Remote AFIS site by an uncertified Remote operator and notify the RNSC. (M)
11. PC Duo is the remote software used by RNSC to support the Remote site Transcoder users. The AFIS renewal solution must support the ability for the RNSC to be able to continue to provide this support for Remote sites. (M)
12. The AFIS renewal solution shall enable the RNSC to perform the same functions on the RNSC Latent Workstation as specified by their role as an AFIS/LCMC user. (M)
13. The AFIS renewal solution should enable the RNSC at RCMP HQ to effectively monitor remote activity on the ULF using the RTID Latent Workstation. (R)
14. The AFIS renewal solution shall retain, in a “remote transaction queue”, all Remote latent search disposition transactions (LFSRDI) that have a “Forward to RNSC Reason Code”. (M)
15. The “Forward to RNSC Reason Code” transactions shall remain in a WIP queue (remote transaction queue) until the Remote Network Search Coordinator has explicitly deleted them from the queue or has concluded the review of the transaction. (M)
16. The “remote transaction queue” shall enable the RNSC to select an item from a filtered list of items from the queue. In addition, the RNSC shall have the ability to filter the remote transaction queue by queue heading (e.g.: Forward to RNSC Reason Code, operator id, Latent Image Identifier, and Latent File Number). (M)

17. The “remote transaction queue” shall enable the RNSC to “force close” one, a selection of items, or all filtered items from the queue. The AFIS renewal solution shall return a latent cancel (TOT LCANI) indicating the Final Search Result Code as Cancelled and the Cancelled Reason Code as “Cancelled by RNSC”. (M)
18. The AFIS renewal solution shall delete transactions that are complete from the “remote transaction queue” after a configurable period of time. In this case an LCANI is not required. (M)
19. If the RNSC authorized user deletes a latent transaction from the work queue and indicates that the AFIS renewal solution is not required to send a notification to the NNS to indicate the action, then no notification will be sent to the NNS. (M)
20. The AFIS renewal solution shall enable a technician to cancel a latent transaction on the work queue, at any stage of processing. As part of this cancellation process the AFIS renewal solution shall allow the technician to select a cancellation reason. The AFIS renewal solution shall return a latent cancel (TOT LCANI) to the NNS. (M)

6. AFIS DIRECT FILING/SCANNING REQUIREMENTS

6.1 General

1. The AFIS renewal solution must provide a direct file and direct scan capability to support special scanning services. (M)
2. These special scanning services (direct file, direct scan) must be provided on the same workstation, with the separate functions clearly identified. (M)
3. These special scanning services must be limited to authorized personnel. The minimum of five (5) workstations (redundant in case of temporary failure of one workstation) will be located in a physically separate area within RCMP HQ. As with all AFIS workstation access, the special scanning services must be controlled by two factor authentication (i.e.: biometric and password). (M)
4. These special scanning services shall be used for specialized situations such as Foreign Fingerprint Submissions, exceptional requests, and information considered sensitive. (M)
5. These special scanning services shall include image scanning and association of these images, where possible, to a specific File Number, and DCN. Five (5) GFE flatbed image scanners are already allocated to the special scanning services. If the Contractor chooses to provide a separate scanning solution, at the Contractor's expense, then the scanner must be FBI certified and support the scanning requirements identified herein. (M)
6. The AFIS renewal solution shall enable an operator to attach a work related note to these scanned images. (M)
7. The AFIS renewal solution shall make documents scanned at special scanning available for viewing immediately in the region for which these activities are assigned. (M)
8. The special scanning services shall also handle the conversion of paper (i.e.: paper C216 form) or electronic document images to internal NIST transactions. These images may be received as e-mail attachments, an image collection on Compact Disc (CD), and so on. They are received in various image formats and compressions (typically JPEG, bitmap or TIFF files). (M)
9. The special scanning services shall be designed to handle 100,000 transactions per year. (M)
10. There must be no interaction with NNS for direct filing/ scanning. (M)
11. The special scanning station will also be used to support TP palm to TP palm searches, where an individual with no fingers or other special circumstances requires this type of search. Refer to volumes in Section 3.6 for this type of search. These volumes are not expected to exceed twenty (20) transactions per year and the performance of these searches does not need to meet the normal UI response times. (M)

6.1.1 UNIQUE IDENTIFIERS AND LOGGING

1. The special scanning services shall maintain a log of assigned identifiers such that no two submissions and no two documents to be scanned have the same identifier. (M)
2. The special scanning services shall use the unique identifiers to create a NIST packet (TPSEI, TPRI) that is submitted directly to the AFIS renewal solution. Direct file/scan NIST packets do not get submitted to NNS. This NIST packet approach allows consistency with all other transactions and awareness of the process by RCMP for audit purposes. The Contractor can propose an alternate approach that provides the same or better level of security and process; however, this alternate approach must be approved in writing by the RCMP prior to the proposal being submitted by the Contractor. (M)
3. The special scanning services shall log all activities performed during processing. (M)

6.1.2 FORMATS AND SCANNING

1. The special scanning services shall be capable of converting the C-216 fingerprint form formats into an electronic NIST packet. (M)
2. The scanning equipment shall be designed and configured in such a way that documents are protected from damage, loss or marking. (M)
3. The special scanning services shall capture the document image, fingerprint images, palm images in a single pass that allows the fingerprints to be captured at 500 ppi. (M)
4. The fingerprint areas of fingerprint forms are particularly sensitive to damage or unnecessary marking. The Contractor's solution must ensure there is no damage to the forms. (M)
5. The scanning process and equipment shall be designed such that there is no loss of document integrity (e.g.: scanning part of one document to another). (M)
6. The scanning equipment shall not alter the information provided on the original submission. (M)
7. The special scanning services and its processes shall not damage or obscure information on the fingerprint form, in particular fingerprint impressions with any marking/label affixed or printed on the fingerprint forms. (M)
8. The special scanning services shall provide whatever features are provided to adjust and capture the fingerprints regardless of their placement on the form, on the front side of the document or the back side of the document as well. (M)
9. The scanned fingerprint images and palm images shall conform to the scanned fingerprint form and not exceed the ANSI NIST-ITL-1-2011 maximum size dimensions. (M)
10. The scanners must support operator adjustment of brightness and contrast and be able to display the scanner settings. (M)

6.1.3 RESOLUTION

1. The special scanning services shall apply the standard compression for fingerprint images WSQ nominal 15:1. (M)
2. The special scanning services shall capture (i.e.: “scan”) rolled and plain fingerprint impressions as well as palm impressions at 256 levels of greyscale (eight bits/pixel) and at a minimum of 500 +/- five pixels/inch, and record the resultant images at 500 +/- five pixels/inch as defined for Type-4 or Type-14 records in the NPS-NIST External ICD and ANSI/NIST standard ANSI/NIST-ITL-1-2011, Data Format for the Interchange of Fingerprint Information. If a scanning resolution greater than 500 pixels/inch is used, it shall have a tolerance of +/- one percent of the scanning resolution. (M)

6.1.4 SEGMENTATION

1. For rolled/plain impressions, the special scanning services shall capture and segment up to 14 fingerprint impressions from each fingerprint Submission, including, as a minimum, all 10 rolled impressions, both thumbs from the plain impressions and the two four-finger plain impressions. (M)
2. When a fingerprint form is prepared in the field, the correct fingerprint will be inked in each of 14 designated fingerprint blocks. The primary exception to this rule is a subject who is missing one or more fingers, or is unable to support the fingerprinting of one or more fingers for another sufficient reason (e.g.: bandaged). In this case, the fingerprint form blocks corresponding to the missing finger(s) are marked (“Amp” for amputation, or other reason) by the preparer. In the rare event that a subject has more than 10 fingers, then the technician will select 10 fingers to be used in the NIST blocks and the entire form will be scanned at 500 ppi for preservation of the complete set. (M)
3. The special scanning services shall capture images of all the fingerprint blocks present on the fingerprint form. This includes those that contain an impression, those that do not but are marked by the preparer accordingly missing, with an appropriate reason (e.g.: as “Amp” or “Bandaged”). The special scanning services shall report the missing digit(s), (amputated, bandaged or otherwise missing impressions) appropriately in the corresponding electronic Type 2 record, in accordance with the NPS-NIST External ICD. (M)
4. The special scanning services shall provide for the capture of fingerprint blocks on the front of the form as well as the back. (M)
5. Based on the ten-print fingerprint form dimensions from the C216 and C216C sample fingerprint forms, the special scanning services shall provide default positions for each of the fingerprint segmentation blocks as follows: (M)
 - a. Rolled blocks shall coincide with the pre-printed fingerprint form blocks;
 - b. The left and lower margins of the left plain four finger block shall coincide with the left and lower margins of the pre-printed block;
 - c. The right and lower margins of the right plain four finger block shall coincide with the right and lower margins of the pre-printed block;

- d. The lower margin of each plain thumb impression block shall coincide with the lower margin of each pre-printed block;
 - e. Each block shall be centered horizontally over its corresponding pre-printed block;
 - f. The same default block positioning approach shall apply to fingerprint form types that are not covered by the referenced specification;
 - g. File number barcode; and
 - h. DCN / Doc ID.
6. The special scanning services shall provide a means of shifting images that are partially out of the pre-printed block to place the segments within the image of the fingerprint area of the fingerprint form to capture as much fingerprint data as possible, even if some overlap with other blocks occurs. (M)

6.1.5 USER INTERFACE

1. The special scanning services must be configurable in the same or a similar manner as the AFIS workstation. The configurability can be limited to only the fields being processed by direct filing/scanning. (M)
2. After all fields have been entered in the UI, the special scanning services must allow a review before committing the transaction. (M)

6.2 Direct Filing

1. The direct filing process must allow all the fields on the form to be captured and/or filled; and submitted in the TPRI NIST packet with the prints. The following are the minimum fields: (M)
 - a. File number;
 - b. File type;
 - c. DCN / Doc ID;
 - d. Sex;
 - e. TOT;
 - f. Indicate whether a search is to be performed;
 - g. Select the list of repositories to search (i.e. any defined TP and/or ULF repository);
 - h. Indicate whether a manual certification is required;
 - i. Indicate whether auto reject is allowed;
 - j. Indicate whether paper certification is required;
 - k. Transaction date;

- l. Provide fingerprint quality override reasons, if necessary;
 - m. Provide fingerprint missing reasons, if necessary;
 - n. Indicate whether the transaction is to be retained; and
 - o. Date fingerprinted.
2. The Contractor will determine the default settings, for the above fields, with the RCMP prior to implementation. (M)
3. If there are no fingerprint impressions on the submission with retention requested, then the AFIS renewal solution will include palm prints being used under exceptional circumstances (e.g.: the subject has no fingers) to open a new File and search the TP palm database. If an identification is made under these circumstances then: (M)
 - a. If the internal TPRI transaction requested that the AFIS save the prints, then the AFIS renewal solution shall automatically assign the same Subject Identifier as the prints certified to.
 - b. If the internal TPRI transaction requested that the AFIS save the prints, then the AFIS renewal solution shall automatically save the fingerprint images, photos and palm print images, necessary descriptors and features sets in the TPF associated to the Subject Identifier certified to.
 - c. The AFIS renewal solution shall automatically return a positive response in the internal reply transaction along with the Subject Identifier, all File Number references associated with the Subject Identifier, an indication that the search is complete and all other information as required by the AFIS ICD.

6.3 Direct Scanning

1. The direct scanning process shall only require DCN/Doc ID and file number to be captured and submitted in the Ten Print Direct Scan and File on AFIS (TPSEI) NIST packet with the prints. The mandatory fields are identified in the TPSEI in the AFIS ICD. (M)
2. User activity/event logging must be recorded to allow reporting in the various AFIS renewal reports (refer to Section 3.5 for reporting details). (M)

7. PALM AND EXTRACTION REQUIREMENTS

7.1 Palm Print Searching

1. The AFIS renewal solution must retain palm prints received as part of a Submission where the Retain flag is positive. (M)
2. Refer to 3.6 Volumetrics and Service Delivery for the palm prints capacity requirements that must be satisfied by the AFIS renewal solution. (M)
3. The Contractor shall provide for palm print searching as stated in this SOW and its accompanying documents. (M)
4. The AFIS renewal solution shall perform the automatic segmentation and feature extraction of the palm print images. (M)
5. If the AFIS renewal solution cannot perform the automatic segmentation, the AFIS renewal solution shall stop for manual review and allow the technician to manually segment and attempt to certify the upper palms to the rolled/plain impressions. (M)
6. The AFIS renewal solution should permit a fingerprint technician to edit the automatically extracted features, rotation and perform image adjustments as part of Ten Print Manual Palm QC. (R)
7. The AFIS renewal solution shall perform the searching and comparison of latent palm prints to the palm print collection, where requested (Latent Palm to Palm). (M)
8. The AFIS renewal solution shall allow the Latent user to identify which palm position to search. Refer to AFIS ICD tag 15.013 for details. (M)
9. The AFIS renewal solution shall perform reverse search of palm prints to unsolved latent impressions for new fingerprint submissions including palms (Palm to Latent Palm). All applicable submissions (i.e. those subject to reverse search as per AFIS ICD processing) shall have the palm impressions searched against the ULF. (M)
10. The AFIS renewal solution shall store latent palm impressions with a NIST-compliant Position (tag 15.013) as a descriptor. (M)
11. The AFIS renewal solution shall search a palm-only submission against the Ten Print File through the Direct File/Scan capability. A palm-only submission is one that is not accompanied by a full set of rolled or plain impressions. (M)
12. The AFIS renewal solution shall enable a Certifier to certify the palms on a submission to palms on file for the same subject. This will result in the palms being “certified” to the file. This feature is required in cases where the subject has no fingers or the fingers are unsuitable for search. (M)
13. The AFIS renewal solution shall support the search of palm latents against a Special Repository and of palm impressions against a Special Repository. (M)
14. Where fingertips are received with upper palm impressions, the AFIS renewal solution shall automatically perform a 1:1 match of the fingertips of the palms against the rolled / plain impressions in the same submission. Where a match is found, the AFIS

renewal solution shall indicate that the palms are included in the file. If the AFIS renewal solution is unable to determine a match, the AFIS renewal solution shall enable a certification technician to “certify” the palms to the file and where the certification fails the palms shall not be retained. (M)

15. Where an electronic submission is received with a palm print, and the prints are to be stored on AFIS, the AFIS renewal solution shall indicate that the palms are included in the file. (M)
16. For clarity, the complete set of palm images shall be retained on AFIS and be searchable. This shall include the upper, lower and writer’s palms. Where a full palm is provided, the full palm images and the writer’s palms shall be retained. (M)

7.2 AFIS Data Extraction for Reporting

1. The AFIS renewal solution shall make data available for **Extract, Transform and Load (ETL)** to the RCMP’s Cognos Reporting process. The RCMP in collaboration with the Contractor will determine the data to be extracted prior to implementation. (M)
2. The AFIS renewal solution process that prepares the data for extraction must assure that only data for transactions which have been completed are prepared for extraction. (M)
3. The AFIS renewal solution must identify transactions for which no response was issued and the transaction is in a state that prevents any further processing. (M)
 - a. Any transactions that meet this criteria shall also be included in the data for extraction to the RCMP’s Cognos reporting system.
4. The AFIS renewal solution shall “push” a text file extract of the required data elements to a predetermined RCMP network area directory (location of directory shall be configurable). The text file extract must be a Comma-separated values (CSV) file. The reporting system is already designed to support a CSV file. The Secure File Transfer method identified by the RCMP (refer to compliancy documents) or equivalent secure method approved by DSB must be used. (M)
5. The AFIS renewal solution must support at least one extract per day without affecting the performance and SLA requirements. The extract time period must be configurable. (M)
6. A process running remotely (within the RCMP/AFIS renewal solution infrastructure) shall access the data source (extract) to feed the RCMP’s Reporting infrastructure. (M)
 - a. The data source access is expected to occur daily;
 - b. The AFIS renewal solution must ensure the ETL files are uniquely named and ordered to ensure each file can be retrieved in order. This is to ensure files are retrievable, in order, in case they are not retrieved before the next file is created; and
 - c. The AFIS renewal solution must provide the filename structure that supports the requirement, which will be approved during implementation stage.

7. The AFIS renewal solution shall explain how this ETL requirement will be satisfied in the Contractor's proposal including at least the following: (M)
 - a. Any negative impact to the Contractor's proposal solution by the use of an ETL strategy; and
 - b. Any impact to data retention on the AFIS renewal solution.

8. AFIS TECHNICAL REQUIREMENTS

8.1 Configurable Parameters

1. The AFIS renewal solution must be designed with an emphasis on configurable parameters to maximize the flexibility to change the solution without requiring a code change. (M)
2. As well, to the greatest extent possible, these configuration parameters should be modifiable without requiring a server restart to complete the change; therefore, the change can be effected automatically or within a thirty (30) minute outage, where specific process restarts will use the changed parameters. (R)
3. The following subsections identify configurable parameters to be supported by the AFIS renewal solution at a minimum. (I)
4. The Contractor is responsible for identifying the value of all configurable parameters as part of the evaluation process. That is, it is the Contractor's responsibility to assign values for the configurable parameters that provide the Contractor with the best opportunity to pass the benchmark testing which is part of the bid evaluation process. (I)
5. The AFIS renewal solution must effectively support all the functionality associated with the configurable parameters. For example, the time for UI inactivity before the screen is locked configurable parameter requires the AFIS renewal solution to be monitoring the user activity and when the time threshold has been met, the AFIS renewal solution must lock the user's AFIS workstation. Once locked the user must login again to access the AFIS workstation. (M)

8.1.1 THRESHOLDS

1. The following are the minimum thresholds parameters that must be configurable by the AFIS renewal solution: (M)
 - a. TP Match 1:N Thresholds – The AFIS renewal solution must provide a score threshold for a System Declared Hit and a No-Hit; where:
 - i. Any score above the System Declared Hit value indicates an ident by the AFIS renewal solution;
 - ii. Any score below the No-Hit value indicates a non-ident by the AFIS renewal solution; and
 - iii. A score between the System Declared Hit value and the No-Hit value is considered a grey area where there are candidates worthy of consideration for verification and manual intervention is required to determine whether an ident can be proposed.
 - b. TP Match 1:1 Thresholds – The AFIS renewal solution must provide a score threshold for a System Declared Hit and a No-Hit; where:

- i. Any score above the System Declared Hit value indicates an ident by the AFIS renewal solution for the candidate;
 - ii. Any score below the No-Hit value indicates a non-ident by the AFIS renewal solution for the candidate; and
 - iii. A score between the System Declared Hit value and the No-Hit value is considered a grey area where there are candidates worthy of consideration for verification and manual intervention is required to determine whether an ident can be proposed for the candidate.
- c. Latent Search Thresholds – The AFIS renewal solution must provide a score threshold for Potential Candidates; where any candidate with a score above the threshold must be available for the user.
- d. Reverse Search Thresholds – The AFIS renewal solution must provide a score threshold for Potential Candidates where any Reverse Search transaction that includes at least one candidate with a score above this threshold must be available for the user. To further clarify, a Reverse Search transaction could have many candidates that are below this threshold; however, all candidates must be available up to the Default Maximum Number of Reverse Search Candidates To Review configurable parameter.
- e. WIP Number of Candidates – The AFIS renewal solution must provide a threshold for the number of candidates that are in TP-TP WIP to be included in a candidate list.

8.1.2 QUALITY MEASURE

1. The following are the minimum quality measure parameters that must be configurable by the AFIS renewal solution: (M)
 - a. Quality threshold – The AFIS renewal solution must automatically determine a quality measure for fingerprints (i.e. rolled/plain, ID Flats) received for search. This quality threshold must be able to consistently determine the quality of any fingerprint and assign a quality score for the fingerprint. The AFIS renewal solution must be able to use this quality score to compare against the quality threshold to determine if the finger meets the minimum quality for search;
 - b. Number of Quality Fingers – The AFIS renewal solution must provide the ability to identify how many fingers (i.e. rolled/plain, ID Flats) must meet the minimum quality threshold to be considered for search. For example, if the quality fingers number is three (3) fingers (e.g.: could be two (2) rolled and one (1) plain), then at least three (3) fingers of the prints submitted for search must meet the minimum quality threshold. If the minimum number of fingers has not been met and the Allowed to Auto Reject Indicator is “Yes”, then the transaction will be rejected as poor quality;
 - c. The above two (2) configurable parameters must be considered together by the AFIS renewal solution to determine whether a set of fingerprint meets the minimum quality for search;

- d. If Auto Reject Indicator is “No” and the fingerprints do not meet the minimum quality for search, then the transaction must go to a Wait for Quality Check state requiring manual intervention by a fingerprint technician;
- e. The “Plain Quality Indicator” identifies the quality value by which the plain impressions must exceed the rolled impression before the plain impressions will be used in the search instead of the rolled impressions. The result of the processing by the AFIS renewal solution using this configurable parameter could have a mix of rolled and plain impressions used in the search. Or alternatively, use all rolled and plain impressions in the search; and
- f. Any size limitations (e.g.: minimum size for finger) that affect the AFIS renewal solution processing must be clearly indicated in the Contractor’s proposal, as well, as the impact of changing the size. For example, a quality check fails resulting from a print being too small. These box sizes must be configurable.

8.1.3 OUT OF SEQUENCE

1. The AFIS renewal solution must have a configurable parameter that allows out of sequence errors to go to wait for manual segmentation / manual QC regardless of whether or not the Allowed to Auto Reject Indicator is “Yes”. This allows RCMP to correct out of sequence errors if desired. (M)

8.1.4 LIST LIMIT PARAMETERS

1. The following are the minimum quality measure parameters that must be configurable by the AFIS renewal solution: (M)
 - a. Default Minimum Number of Latent Forward Search Candidates – The AFIS renewal solution must have a configurable parameter that identifies the minimum number of TP (ULF-TP) or ULF (ULF-ULF) candidates that will be presented to the user (i.e. short list with one set of prints per subject and an initial value of six (6));
 - b. Default Maximum Number of Latent Forward Search Candidates – The AFIS renewal solution must have a configurable parameter that identifies the maximum number of TP or ULF candidates that will be presented to the user (i.e.: long list with all prints for all subjects and an initial value of fifty (50));
 - c. Default Minimum Number of Latent Forward Search Candidates To Review – The AFIS renewal solution must have a configurable parameter that identifies the minimum number of TP or ULF candidates that the user must review before the transaction can be dispositioned;
 - d. Default Minimum Number of Reverse Search Candidates To Review – The AFIS renewal solution must have a configurable parameter that identifies the minimum number of reverse search ULF candidates that the user must review before the transaction can be dispositioned (i.e. short list with an initial value of two (2));
 - e. Default Maximum Number of Reverse Search Candidates To Review – The AFIS renewal solution must have a configurable parameter that identifies the maximum

- number of reverse search ULF candidates that the user might review before the transaction can be dispositioned (i.e.: long list with an initial value of forty (40)).
- f. Default Minimum Number of Latent Certifiers – The AFIS renewal solution must have a configurable parameter that identifies the minimum number of latent certifiers (initial value = two (2));
 - g. Default Minimum Number of Fingers to be Examined – The AFIS renewal solution must have a configurable parameter that identifies the minimum number of fingers to be examined to consider a transaction reviewed (initial value = one (1));
 - h. Maximum Number of File Numbers in a Fetch – The AFIS renewal solution must have a configurable parameter that identifies the maximum number of file numbers that can be retrieved when a database fetch is performed (initial value = one thousand (1,000)); and
 - i. Threshold for number of unsuccessful login attempts before a user account is locked out (initial value = three (3)),

8.1.5 REGIONS

1. The AFIS renewal solution must be configurable with a concept of regions, where a region is defined as an area within which a set of transactions will be processed. The AFIS renewal solution must allow each region to have separate configurable parameters that allow the thresholds, quality measures and other configurable parameters to be applied per region. (M)
2. The AFIS renewal solution must be initially configured with at least the following regions and they must process the transactions specified in each region: (M)
 - a. TP region, supporting all TP transactions, except IMM and REF;
 - b. IMM region supporting IMM and REF transactions;
 - c. Latent region supporting all Central Latent and Reverse Search transactions;
 - d. RNSC region supporting all Remote Latent transactions; and
 - e. Direct Filing region supporting Direct Filing and Direct Scanning transactions.
3. The AFIS renewal solution must also support the creation of at least 5 additional regions without affecting the overall performance requirements stated in this SOW and its accompanying documents. (M)
4. Each AFIS user must be able to select the region within which they want to work as part of their login process. AFIS users normally work in either TP or Latent at one time depending on their role. Since the IMM region includes special TP transactions, with different thresholds and quality measures, the AFIS renewal solution must allow an AFIS user to select a combined region within which they want to work as part of the login process that will allow them to work on TP transactions from the TP region and the IMM region. (M)

5. The AFIS renewal solution must support adding regions, deleting regions and changing which type of transactions are processed in a specific region with minimal effort. (M)
6. As with all requirements in this SOW and its accompanying documents, each region must be available in French. The AFIS user must be able to select the French version of the region within which to login or the French version of the region must be presented to the user based on their language preference identified in the User Management Function of the AFIS renewal solution. (M)
7. There must be a correlation between regions and work queues. This correlation and the queues will be determined through a collaborative effort between the RCMP and the Contractor. The Contractor must present a proposed approach for queues that best supports the requirements stated in this SOW and its accompanying documents. (M)
8. The AFIS renewal solution should allow an authorized user to toggle between regions/work queues without requiring the user to login again. (R)

8.1.6 REPOSITORIES

1. The AFIS renewal solution must be configurable with a concept of repositories, where a repository is used to retain specific sets of prints under a file type. (M)
2. The AFIS renewal solution must be initially configured with at least the following repositories: (M)
 - a. TP Repositories:
 - i. Criminal;
 - ii. Refugee (Legacy Refugee);
 - iii. Employee;
 - iv. Immigration; and
 - v. Two (2) additional special TP repositories for special purposes.
 - b. Latent Repositories:
 - i. ULF (finger & palm); and
 - ii. Five (5) additional special latent repositories for special purposes.
3. The AFIS renewal solution must also support the creation of at least six (6) additional TP repositories and six (6) additional latent repositories, of varying sizes at any given time, without affecting the overall performance requirements stated in this SOW and its accompanying documents. (M)
4. The AFIS renewal solution shall enable AFIS users to file and search against these repositories apart from the routine workload. (M)
5. The AFIS renewal solution shall also enable these repositories to be targeted for search as part of the routine workload. (M)

6. If used for routine processing, the Internal Ten Print Request will indicate which of these repositories to search against. (M)
7. The AFIS renewal solution shall assign a Logical Name (File Type Code) to each Special Repository. This code shall be used to indicate which repository to target for search, deletion, amend, file to or other applicable functions. (M)
8. The AFIS renewal solution must allow special repositories to be set up for testing program effectiveness. (M)
9. The AFIS renewal solution shall enable the entries in these special repositories to be searched against the TPF and the ULF. (M)
10. The AFIS renewal solution shall provide the ability to selectively manage, backup and delete a special repository database and a special repository definition. (M)
11. The AFIS renewal solution shall perform all searches available for other repositories. Refer to subsection 3.1, item 8 for the list of searches that must be supported. (M)

8.1.7 TIME RELATED PARAMETERS

1. The AFIS renewal solution must have configurable parameters for at least the following time related parameters: (M)
 - a. Time after a transaction has been completed that it stays in the queue (initial value = 24 hours);
 - b. The frequency that reports are automatically generated (initial value = 24 hours);
 - c. Retention period before data, transactions and transaction log automatically move to an administrative archive for audit purposes (initial value 2 years);
 - d. Retention period for maintaining the Audit Log (initial value = indefinite);
 - e. Time AFIS UI is refreshed automatically (initial value = 30 seconds);
 - f. Time for UI inactivity before screen is locked (initial value = 30 minutes);
 - g. Time for UI inactivity, after the screen has been locked, before a user is automatically logged off (initial value 30 minutes); and
 - h. Note: The Contractor's Entire AFIS renewal solution must require a user login after the screen has been locked.

8.1.8 TOGGLE RELATED PARAMETERS

1. The AFIS renewal solution must have configurable parameters for at least the following toggle related parameters: (M)
 - a. Toggle to turn on auto segmentation; and
 - b. Toggle to turn on Manual Biometric Consent.

8.1.9 SIZE BASED PARAMETERS

1. The AFIS renewal solution must have configurable parameters for at least the following size related parameters: (M)
 - a. Magnification size for prints.

8.1.10 TABLE BASED PARAMETERS

1. The AFIS renewal solution must have configurable tables/fields, with unlimited expansion, that an authorized user can add, change or delete, where separate tables/fields are available for at least the following: (M)
 - a. Agency ORI table (list of all ORIs);
 - b. Authorized Agency ORI table (list of ORIs authorized to submit AFIS transactions);
 - c. Civil application types and sub types;
 - d. Missing fingerprint reason codes and descriptions;
 - e. Sex selection options;
 - f. Province codes and description;
 - g. Complexion codes and descriptions;
 - h. Hair colour;
 - i. Eye colour;
 - j. Scars, marks and tattoo codes and descriptions;
 - k. Race codes and descriptions;
 - l. Next of kin codes and descriptions;
 - m. Country codes and descriptions;
 - n. Vulnerable sector codes and descriptions;
 - o. Language codes and descriptions;
 - p. Province of birth codes and descriptions;
 - q. Fingerprint quality reasons codes and descriptions;
 - r. Authority to release codes and descriptions;
 - s. Fingerprint codes and descriptions;
 - t. Internal priority codes and descriptions;
 - u. File number prefixes codes and descriptions;
 - v. Crime type codes and descriptions;

- w. Repository codes and descriptions; and
 - x. Internal TOT codes and descriptions.
2. Note: The use of this data is identified throughout the SOW and its accompanying documents. (I)

8.1.11 RATED CONFIGURABLE PARAMETERS

1. The AFIS renewal solution should have additional configurable parameters that allow adjustments to support operational changes without requiring any code changes. These parameters are described throughout Annex B within the context of their use. The following identifies the additional configurable parameters that will be evaluated as rated criteria: (R)
- a. Magnify portion of print configurable parameter: A configurable parameter that will magnify the isolated portion of each print to enable more detailed analysis. This should magnify by a percentage. A variable method of magnification (e.g.: slider) is considered inherently configurable and more desirable;
 - b. Search only best “x” number of sets of prints: A configurable parameter used to identify that only the best “x” number of sets of prints should be searched when an individual has many sets of prints; and
 - c. The AFIS renewal should have a button for Latent analysis that allows a specific configurable percentage adjustment of the size of the print based on the most common percentage change. This button should allow a percentage increase (e.g.: fifteen percent (15%)) each time the button is clicked, as well as a decrease button to reduce the size of the print each time the button is clicked.

8.2 User Management and Role Based Access Controls (RBAC)

1. The AFIS renewal solution must support user management through a Windows based intuitive, easy to use UI for production administrators and any other user authorized to use the user management capabilities. The UI must allow the data identified herein to be easily managed (i.e.: add, change, delete, disable, enable). (M)
2. The AFIS renewal solution must support the Role Based Access Controls (RBAC) requirements stated herein and throughout this SOW and its accompanying documents. (M)
3. This user management UI must also support all user management capabilities required for the Verification Subsystem (VSS). Refer to Annex D for detailed requirements concerning VSS. (M)
4. The System shall include application-specific user IDs and passwords. (M)
5. The passwords shall not be hard-coded and must be stored in an encrypted form that satisfies Government of Canada requirements (i.e.: Communication Security Establishment (CSE) standards ISA-11(b) or later). (M)
6. AFIS users shall only be presented with options and resources for which they have authorized access, based on their user profile and group membership. (M)

7. The System shall uniquely identify and authenticate all users and resources that require access to AFIS resources. (M)
8. The System shall not store or cache identification and accreditation (I&A) information on platforms other than those explicitly sanctioned by RCMP Security Infrastructure Services. (M)
9. The System shall not cache sensitive information after use. (M)
10. The System shall provide auto-alarming of unauthorized access attempts to designated roles, such as the System Administration subsystem operating under the root password. (M)
11. Any fields listed in the user management UI that have a list to choose from should be presented in the UI through a drop-down pick list, or similar user friendly method, for any fields that have values that are available for a pick list. (R)
12. The user management UI must allow the authorized user to add, change or delete at least the following data in support of managing access to the AFIS renewal solution: (M)
 - a. Roles
 - b. Groups
 - c. User ID
 - d. User name
 - e. Change password
 - f. Language of work
 - g. Trainee designation
 - h. Permissions – work specialties, type of work, functions (e.g.: Ten Print QC, Ten Print Verification, Ten Print Certification, Ten Print Supervisor). These permissions will be based on the functions identified in the RBAC subsection herein.
13. The AFIS renewal solution's admin function shall enable an authorized user to release locked transactions, which will be returned to the queue. (M)
14. The Contractor shall determine which user profile items are configurable at the user level or at the group level in collaboration with RCMP. (M)

8.2.1 ROLE BASED ACCESS CONTROLS

1. For purpose of explaining the access control requirements stated herein and throughout the AFIS renewal SOW and its accompanying documents, the following definition for access control is used. Access Control is any mechanism by which a system grants or revokes the right to access some data, or perform some action. (I)
2. The approach to providing AFIS renewal solution access control requirements that the AFIS renewal solution must provide are in accordance with the NIST Role-Based

Access Control (RBAC) Standard as stated herein. Central to this standard is the concept of assigning a role to a user. This is a fundamental mechanism that must be employed by the AFIS renewal solution to ensure that the relevant policies, operating procedures, and overall transaction security are enforced. (M)

3. These requirements that must be satisfied by the AFIS renewal solution have been developed with reference to the NIST Core RBAC Model as shown in Figure 8-1. This model provides the key semantic concepts on the subject of access control, is the conceptual basis for the NIST standard, and has been largely adopted and implemented by many different vendor communities. These reasons illustrate why the Core RBAC model is considered to be an excellent starting point for developing a concise set of access control requirements to serve the present business requirements. (M)

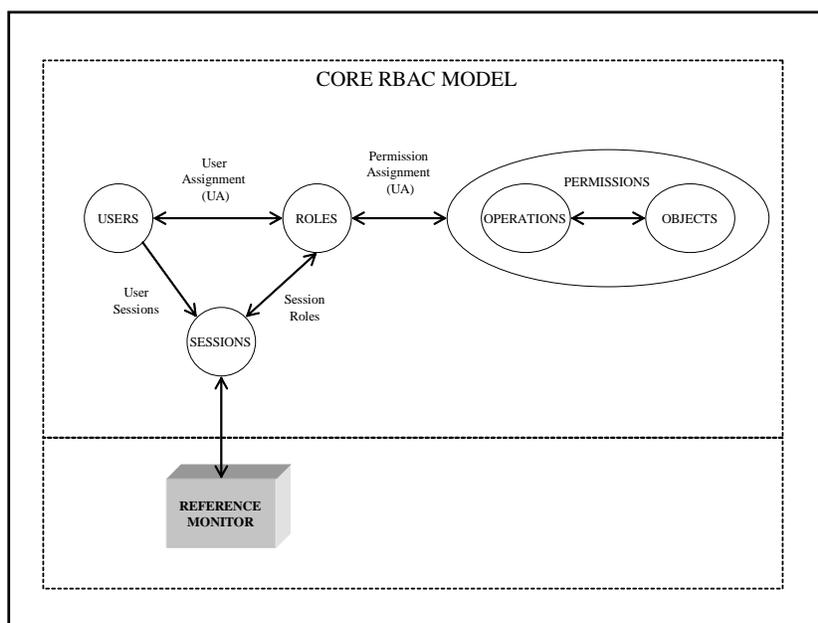


Figure 8-1: Core RBAC Model Concepts

4. The following is a description of the key elements and relationships within the model:
 - (I)
 - a. **USER** – a user (in the majority of cases) is an individual who is an employee of Canadian Criminal Real Time Identification Services (CCRTIS). However, in certain cases, where automated processes transact across several systems, a user may also be an automated system agent that has been granted a user account;
 - b. **ROLE** – a role is a job function within the context of an organization where authorities and responsibilities have been conferred to the user assigned to the role. Groups are expected to exist for larger systems where multiple roles will be contained within a group. This concept of a group is simply a mechanism to organize multiple roles to ease the overall user management;
 - c. **SESSION** – the active system context in which the user is requesting and executing transactions;

- d. **OBJECT** – an object is anything that must be protected by the system. A protected object may be any system resource, personal and sensitive information (e.g.: file, attribute, image), or parts thereof. Objects may vary in granularity; an object may range from being considered as an entire system component, an entire record, or a specific attribute or flag within a record;
- e. **OPERATION** – an operation is any function that may be performed upon an object (e.g.: read, write, delete, append); and
- f. **PERMISSION** – can be viewed as a composite of operation and object. An assignment of permissions to a role implies the approval of this role to perform this operation on an object.

8.2.2 ROLES, GROUPS AND OBJECTS

1. The following identifies the roles, groups and objects that must be supported by the AFIS renewal solution within the RBAC model. Most of the objects are identified within the context of a role function whereby the function is controlling access to the object. (M)
2. The user ID must be definable by the User Management user. Typically, this will be an RCMP assigned number for the user. (M)
3. The following are the minimum role functions (privileges) that must be available in the AFIS renewal solution. This list implicitly identifies the objects and the level of granularity that must be managed/controlled by the AFIS renewal solution: (M)
 - a. AFIS Related
 - i. Work queue access (queue view only),
 - ii. Work queue management (transaction processing),
 - iii. Work queue transaction reset,
 - iv. Work queue transaction reject,
 - v. TP Quality Control (QC) (includes manual segmentation and quality control capabilities),
 - vi. TP verification,
 - vii. TP certification,
 - viii. Latent verification (performs verify/first certify),
 - ix. Latent 1st certification (performs second certify),
 - x. Latent 2nd certification (performs Latent third certify),
 - xi. Latent data entry,
 - xii. Latent edit,
 - xiii. Latent insert,

- xiv. Latent database delete,
 - xv. TP database access/view,
 - xvi. TP database update and reprocess,
 - xvii. TP database delete,
 - xviii. Latent database access/view,
 - xix. Latent database update,
 - xx. TP Palm database access/view,
 - xxi. TP Palm database update,
 - xxii. Latent Palm database access/view,
 - xxiii. Latent Palm database update,
 - xxiv. Sensitive access/view (i.e. allowed to view sensitive subject data),
 - xxv. Trainee,
 - xxvi. Supervisor,
 - xxvii. TP to Latent verification,
 - xxviii. TP to Latent 1st certification,
 - xxix. TP to Latent 2nd certification,
 - xxx. Manual consolidation,
 - xxxi. Work queue delete,
 - xxxii. Work In Progress verification,
 - xxxiii. View match score in UI,
 - xxxiv. LCMC contributor data update,
 - xxxv. Assign transactions,
 - xxxvi. Post response, and
 - xxxvii. Reverse search re-sort by score;
- b. Verification Subsystem Related:
- i. VSS monitoring,
 - ii. VSS audit log access,
 - iii. VSS post-match analysis,
 - iv. VSS operations table configuration/access/update, and
 - v. VSS system table configuration/access/update;

- c. Direct File/Scan Related:
 - i. Process transactions,
 - ii. Delete transactions, and
 - iii. Transaction reset;
 - d. Query transactions;
 - e. User Management Related:
 - i. User management view,
 - ii. User management access (add, change, delete, enable, disable), and
 - iii. Group management access (add, change, delete);
 - f. Table configuration access (add, change, delete); and
 - g. Operational reporting and statistics – each level of reporting must be separately controlled based on the report grouping identified in 3.5 Operational Reporting and Statistics (i.e., hourly statistics reporting, daily statistics reporting, TP transaction logging).
4. The above role functions must be used to select from to create specific roles. The following are examples of existing roles that must continue to be available in the AFIS renewal solution that have one or more role functions (privileges) assigned to them. It is understood and expected that some vendors may represent these functions in a more granular manner. It would still satisfy the requirements if multiple role functions had to be selected to achieve the higher level granularity identified herein. The Contractor must explain how the AFIS renewal solution supports these requirements. (M)
- a. Employee File Analyst
 - b. Employee Fingerprint Manager
 - c. Production Administrator
 - d. AFIS Program Analyst
 - e. TP/IMM Verification Technician
 - f. TP/IMM Certification Technician
 - g. TP/IMM Verification Technician Trainee
 - h. TP Manager;
 - i. TP/IMM Supervisor
 - j. Latent Analyst
 - k. Latent Checker
 - l. Latent supervisor

- m. Direct file/scan user
 - n. RNS Coordinator
 - o. Report Manager
 - p. User Manager
 - q. CPSIC User
 - r. Central Help Desk Agent;
 - s. NCO/IC Latents;
 - t. SACSS Security Admin;
 - u. Training Coordinator; and
 - v. IMM Full Access
5. The roles created from the above function must be able to be organized into groups that allow a specific user to be in a group where access to multiple roles is granted through that group. For example, a user can be assigned to the senior analyst group which includes the following roles: fingerprint technician (including all fingerprint functions), supervisor, report manager (including access to all operational reporting and statistics). (M)
 6. The final roles, groups and objects will be finalized in consultation with RCMP prior to implementation. (M)

8.2.3 USER MANAGEMENT DATA CONVERSION

1. The existing user management data must be converted to the AFIS renewal solution in a form usable by the AFIS renewal solution. The existing AFIS supports the RBAC model identified herein. Since it is a requirement to support this model, it is expected that this required conversion would be able to use virtually all of the data from the existing AFIS. Any data that cannot be converted automatically must be converted by the Contractor manually in a manner that ensures all the access controls required throughout this SOW and its accompanying documents are satisfied. The Contractor's proposal must explain how the RBAC data will be converted to the proposed AFIS renewal solution and satisfy the requirements stated in this SOW and its accompanying documents. Refer to the AFIS renewal SOW, section 13, for more detailed database conversion requirements. (M)

8.3 Subject with Multiple Files and Composites

1. The AFIS renewal solution must support the structure of a unique identifier for a subject; where the subject can have multiple files associated with the same subject. As indicated in the AFIS ICD, the AFIS renewal solution must initially support six (6) different file types for any subject. Refer to the AFIS ICD for the list of initial file types or subsection 8.1.6. (M)

2. The AFIS renewal solution must be able to support at least twelve (12) different file types without affecting the overall performance requirements stated in this SOW and its accompanying documents. (M)
3. The AFIS renewal solution must support a set of composite fingerprints for each type of file associated with a subject, if the AFIS renewal solution includes composites. This set of composite prints must be the best quality prints from all the prints recorded under each type of file. For example, for three (3) file types, there would be three sets of composites. If composites are not used, all prints must be searched. (M)
4. When a subject has many sets of prints (e.g.: fifty (50)) under a specific file type and a TP search request requires all files to be searched, the AFIS renewal solution should only search the top best sets of prints (e.g.: thirty (30)) for the specific file type based on a configurable parameter. The precise number will be determined in consultation with the RCMP prior to implementation. Refer to subsection 8.1.11 for details concerning this configurable parameter. (R)

8.4 NIST Packet Viewer

1. The AFIS renewal solution must provide a NIST packet viewer which can be used at any time during the processing of TP or Latent transactions. This NIST viewer must allow all NIST packet data to be viewed, printed and downloaded. (M)

8.5 Availability / Reliability

1. Availability, as outlined in this document, will be measured once Site Acceptance has taken place and the AFIS is deemed to be Ready for Production. It is included herein as part of the performance criteria that the AFIS renewal solution will be designed to fulfill. The performance of the AFIS renewal solution will be tested as part of the benchmark testing and again as part of the site acceptance. (M)
2. Availability, in the context of the AFIS, is defined as both user and system-driven functions (versus user-initiated) having the ability to perform add, change, delete and enquire functions on AFIS data. If any of the core equipment, system software, database software, COTS software or application software necessary for the user to perform these functions fails, then the AFIS renewal solution is deemed to be unavailable until such time as these functions are fully restored. (I)
3. Planned service outages agreed upon between the Contractor and RCMP do not constitute unavailability of the AFIS renewal solution. (I)
4. Network security and data communications services will be furnished by RCMP, and any failure in these security and/or communications components directly causing the AFIS to be "Unavailable" or "Operate in Reduced Capacity" will not be the responsibility of the Contractor, nor will it be considered in calculating incident based or monthly totals. (I)
5. Failure of individual workstations, printers, scanners and like peripheral devices will not be considered as required for availability, as there is more than one such peripheral device in the configuration of the AFIS renewal solution. In the event that

there is only one such device, then the device will be considered as core equipment.
 (I)

6. The AFIS renewal solution shall be a high availability system that operates on a twenty-four hours per day, seven days per week, 365 days per year basis (24 x 7 x 365). The AFIS renewal solution shall meet, at a minimum, 99.5% availability on a monthly basis. That is, for a 30-day month, it will not be unavailable on an unplanned basis for more than a cumulative maximum of 3.6 hours in the month. On a daily basis, the AFIS renewal solution unavailability shall not exceed two (2) hours. Within a given month, the maximum number of periods of unavailability permitted is two (2), with a total cumulative duration between them not to exceed 3.6 hours (for a 30-day month). (M)

7. Mathematically, availability is calculated as: (I)

$$\text{Availability} = \text{Available Time in Month} - \text{Total Downtime in Month}$$

Available Time in Month

Where:

*Available time in month = Number of days in month * 24 hours, less any periods of planned downtime.*

Total Downtime in Month = Total amount of hours system was unavailable during the month.

8. System availability is measured on a monthly basis, starting at 00:00 Eastern Standard Time (EST) on the first day of each month. Note that allowable downtime does not accumulate from month to month, but is reset at the beginning of each month. The AFIS renewal solution must satisfy these system availability requirements. (M)

Table 8-1: Unplanned System Outages		
Cumulative Maximum AFIS Renewal Solution Downtime Permitted		
24 hour Period	Calendar Month (30 Day)	Frequency of Downtime
2 hours	3.6 hours	Twice per Month

9. The AFIS renewal solution might occasionally operate in a reduced capacity mode on an unplanned basis. Reduced Capacity is defined as: a slower performing system whose functions and data are still available to the users. An example of Reduced Capacity is when one of several processors in a server fails, no data is lost or corrupted, the users can perform all system functions but response times may be slower. (I)
10. In a Reduced Capacity mode, at a minimum, 50% of the total volume of transactions, including 100% of the Priority 1 and Priority 2 transactions, shall be processed within

their normal response time. If the AFIS renewal solution fails to meet these minimum requirements, it shall be deemed Unavailable. (M)

11. At a minimum, the AFIS renewal solution shall only function in a Reduced Capacity mode for a cumulative maximum of 43.8 hours per year, for a duration not to exceed 12 hours in peak operating hours or 24 hours in off-peak, within one month. Peak operating hours for the AFIS are from 07:00 – 23:00 EST (Ottawa Time). Off-peak hours are from 23:00 – 07:00 EST. This is summarized in Table 8-2 below. (M)

Table 8-2: Reduced System Capacity		
	Cumulative Maximum Time AFIS Renewal Solution Can Operate in a Reduced Capacity Mode	
Operating Period (Eastern Standard Time)	Within a Calendar Month	Within a Calendar Year
Peak Operating Hours 07:00 – 23:00	12 Hours	43.8 Hours
Off-Peak Operating Hours 23:00 – 07:00	24 hours	

12. The AFIS renewal solution must support the supply of statistics to RCMP's reporting service. At a minimum, the following must be supported: (M)
 - a. Transaction number
 - b. File number
 - c. DCN
 - d. Transaction start date/time
 - e. Transaction end date/time
 - f. Note: other fields to be included will be identified during implementation
13. Availability and Reduced Capacity times are mutually exclusive. That is, time that the AFIS renewal solution is unavailable is not included in the calculation of time in Reduced Capacity mode, and vice-versa. Further, Reduced Capacity or complete Unavailability will be recorded independently and associated only with the actual system status. For example, a problem causing two (2) hours of Reduced Capacity leading to a system failure resulting in a subsequent one (1) hour of unavailability would be recorded as two (2) hours of reduced capacity and one (1) hour of unavailability. (I)
14. The AFIS renewal solution must be fully operational within at least one (1) hour period after a power restoration. From an operational view, the time from when power was lost (at no fault of the Contractor) to when it is fully restored will not be counted in determining system availability. The RCMP will inform the Contractor when power has been restored. The restoration start time will be measured based on the Contractor

being on-site at RCMP HQ and being informed of the power restoration. Any time the AFIS renewal solution is not fully operational beyond this period shall count as the system being unavailable. (M)

15. The Contractor’s on-call support resource must be able to arrive at RCMP HQ within at least thirty (30) minutes after being notified of a requirement for support after a planned outage. Consequently, if the Contractor on-call support resource is contacted thirty (30) minutes before the power is restored, then the restoration time is expected to be one (1) hour. (M)

8.6 System Response Times for Local Workstations

1. This section deals with response time specifications for workstations operating at RCMP HQ. Refer to Annex A for a description of the existing environment within which the AFIS renewal solution must operate. (M)
2. Response times will be measured from the instant of the request to the moment the data is displayed, or the instant the cursor moves to the next field, whichever is applicable. (I)
3. The fingerprint-related functions listed in Table 5.3 below identify graphical user interface (GUI) required response time in displaying data that must be supported. (M)
4. All GUI fingerprint and palm related functions must be, at a minimum, as fast in the AFIS renewal solution. These apply to both Ten Print and latent functions. (M)

Table 8-3: GUI Response Times for Select User Functions	
Function	Required Response Time
Log into any region with all WIP transactions viewable and accessible to user based on queue size of 5000	15 seconds or less
Select and display a single Ten Print or latent transaction from the main work queue	3.0 seconds or less
Return back to main work queue	1.0 second or less
Upon completion of a Quality Check, Manual Segmentation or Palm check of one transaction, display of the next transaction to be viewed	3.0 seconds or less
When performing TP or LT verification/certification, advancing from one candidate to the next	2.0 second or less
Select and display of a single Ten Print/Latent print from the verification candidate list	2.0 second or less
Presentation of next TP or LT verification/certification after disposition	2.0 seconds or less
Fetch Ten Print Image File Number	6.0 seconds or less
Delete Ten Print Image File Number	10 seconds or less

Table 8-3: GUI Response Times for Select User Functions	
Function	Required Response Time
Fetch a range of Ten Print Image File Numbers (e.g.: 1000 – Maximum Number of File Numbers in a Fetch)	10 seconds or less
Fetch Latent Image File Number	2.0 seconds or less
Delete Latent Image File Number	5.0 seconds or less
Delete a transaction from the work queue	2.0 second or less
Delete a range of 100 transactions from the work queue	60 seconds or less
Fetch a range of Latent Image File Numbers (e.g.: 1000 – Maximum Number of File Numbers in a Fetch)	5.0 seconds or less
User Interface Features such as image adjustments, edited features, edited descriptors, forward to supervisor, view transaction history, view NIST packet	1.0 second or less

5. The response times in this section are response times that include the Local Area Network (LAN) response time. In case of dispute, the Contractor shall be required to demonstrate user response times matching the requirements, less 0.1 seconds (100 milliseconds) exclusive of the LAN response time. For example, the Contractor would demonstrate 2.9 seconds (2900 milliseconds) response time or less, instead of 3.0 seconds. (M)
6. Response times in this section will be measured with an one-day (16 hours) maximum peak load sample based on the Peak Hourly Load as found in subsection 3.6 Volumetrics and Service Delivery. This testing will be done during benchmark testing and again during Site Acceptance Testing. (I)

8.7 NPSNet Network Architectural Constraints

1. This subsection details a number of specific constraints for the Contractor to adhere to. (I)
2. The Contractor’s System shall conform to the following NPSNet Network Architecture constraints for all data communications: (M)
 - a. The System shall use the Transmission Control Protocol/Internet Protocol (TCP/IP) suite of protocols for data communications.
 - b. The System must use static destination TCP/UDP ports, which must be well defined. For example, dynamic port allocation such as is done by Remote

- Procedure Calls (RPC) is difficult to filter on firewalls, thus RPC-based solutions are not permitted.
- c. Note: In some cases RCMP will require the Contractor to use specific port numbers not typically used for certain protocols for security reasons. These port numbers will be provided upon request.
 - d. The use of IP Multicast protocols such as Internet Group Management Protocol (IGMP) or Multicast OSPF (MOSPF) is only permitted between servers that are located on the same physical LAN segment. The use of these protocols outside of the LAN segment assigned to the AFIS renewal solution is not permitted.
 - e. IP addresses shall not be hard-coded in any applications or scripts, either client or server.
3. Additionally, the Contractor's System should conform to the following network architecture constraints: (R)
- a. The System should use Domain Name Services (DNS) to identify system components on the network infrastructure. Should the IP address of any system component need to be changed, only the Domain Name Server should require updating. If the Contractor uses the RCMP DNS, the Contractor is still responsible for satisfying all the requirements in this SOW and its accompanying documents.
 - b. Interactive and batch traffic should be assigned different port numbers to ensure the impact of batch activity does not affect interactive performance. It is the Contractor's responsibility to ensure the performance requirements in this SOW and its accompanying documents regardless of whether there is batch processing occurring.
4. The NPSNet Technical Authority maintains a list of port numbers in use and assigns new ports as required. (I)
5. The assignment of IP addresses for all network elements connected to the NPSNet is controlled by the NPSNet Technical Authority within the RCMP. (I)
6. All data communications destined to traverse the NPSNet/NSP/SCNet shall function seamlessly within secure MPLS or an IPSec tunnel. (M)
7. The AFIS renewal solution shall not rely on an Internet Control Message Protocol (ICMP) message, because of the possibility of a firewall or other security device blocking the ICMP message. (M)
8. Current RCMP security policy does not allow for connection(s) between the Contractor's data network and any network either owned or managed by the RCMP, including, but not limited to the NPSNet, RCMP Campus or in-building networks. Refer to the SOW for a description of a potential ability to temporarily connect to the RCMP network from the Contractor's site for very restrictive access for urgent support reasons. The Contractor may be required to make changes to their networking infrastructure and/or practices to meet RCMP's security requirements that enable this temporary connection. If approved, any costs associated with either changes to the Contractor's network or connection to RCMP-owned or managed network(s) will be at the expense of the Contractor. (I)

9. The Contractor's solution shall not employ any wireless communications devices for workstation-to-server, server-to-server, or any other communication between devices. (M)

8.7.1 LOCAL AREA NETWORK CONNECTIVITY

1. The AFIS renewal solution servers, workstations, scanners and printers will be implemented in three separate buildings, two buildings at the primary site and at the DR site. Refer to Annex A for additional details. (M)
2. The AFIS workstation LAN connections are industry standard 10/100/1000 Mbps, capable of Full Duplex and Half Duplex Ethernet, and compatible with the Institute for Electrical and Electronic Engineering (IEEE) 802.3 Ethernet standard. (I)
 - a. 10/100/1000 Mbps LAN connections provided by the RCMP utilize unshielded twisted pair (UTP) Category 5e cabling as physical media.
 - b. Workstations connectivity to the LAN is via an RJ45 outlet at the workspace with 1,000 Mbps (Gigabit) Ethernet connections.
3. The AFIS renewal solution server connections to the LAN shall employ 1,000 Mbps (Gigabit) Ethernet connections. Any new server provided in the Contractor's proposed solution must include Gbps NICs capable of auto-sensing redundantly configured to support the HA requirements stated in this SOW and its accompanying documents. (M)
4. The physical media for Gigabit Ethernet (1,000 Mbps) connections are unshielded twisted pair (UTP) Category 5e cabling. (I)

8.8 Confidentiality and Integrity

1. The AFIS renewal solution must ensure the confidentiality and integrity of the RCMP fingerprints and fingerprint related data. Confidentiality and integrity are key elements of RCMP operations. (M)
2. Through a combination of RCMP provided security architecture and security processes combined with authorization and authentication requirements that must be provided by the AFIS renewal solution, the confidentiality is expected to be effective. The Contractor is encouraged to identify any aspects of their solution which could improve the confidentiality of the solution. (M)
3. The Contractor must explain all aspects of their AFIS renewal solution that ensures the integrity of the RCMP fingerprint and fingerprint related data to justify that the integrity of the data will be maintained. This must include at least the following: (M)
 - a. Transaction processing with units of work and phased commits;
 - b. Managing concurrent processing;
 - c. Error recovery;

- d. Any aspects of the database design that ensures data integrity. For example, to ensure no duplicates are recorded for a field, the database field would be defined as unique;
- e. Any aspects of the design that ensure referential integrity. For example, if minutia is recorded separately from fingerprint images, how both are maintained to ensure searches are against all valid sets of fingerprints must be explained;
- f. Discrepancy reporting frequency and use; and
- g. Tools, utilities and/or monitoring used to ensure any data integrity issues are identified and resolved as soon as possible with at least the following:
 - i. Daily completed searches run against the AFIS renewal solution to identify potential misses (reviewed by a program analyst),
 - ii. Daily report to identify any duplicate DCNs. The AFIS renewal solution must include design and/or processing that ensure duplicate DCNs are not created; however, since the DCN is so critical the RCMP want to ensure there is a regular check for duplicate DCNs,
 - iii. Daily report to identify if the same file number is filed under more than one Subject ID,
 - iv. Daily report to identify invalid or missing file numbers, and
 - v. Monthly report to verify file number prefixes correctly match the file record type (e.g.: all criminal record file types have a prefix of 20000).

8.9 Auditing

1. The AFIS renewal solution shall record when, where and why, whatever happened and by whom, related to any request processed on the AFIS renewal solution. (M)
2. The AFIS renewal solution shall implement audit trails for all successful and unsuccessful access logins. (M)
3. The AFIS renewal solution shall have the capability of auditing the following resources: (M)
 - a. Application;
 - b. File;
 - c. Database;
 - d. Field within a database;
 - e. Table within a database;
 - f. System accessed; and
 - g. System interfaces.

4. The AFIS renewal solution shall have user authorization for controlling access to the following resources: (M)
 - a. Programs;
 - b. Data;
 - c. Functions;
 - d. Options; and
 - e. Parameters.
5. The AFIS renewal solution shall have configurable auditing capabilities, whereby the accesses, resources, and users that will be included in the audit trail can be specified by the RCMP. Refer to subsection 3.5 Operational Reporting and Statistics for examples of reporting that is used for audit purposes. (M)
6. The AFIS renewal solution shall have an audit trail, for each user, that identifies the following: (M)
 - a. User;
 - b. Resource that was accessed by the user;
 - c. Date, time and type of access to the resource; and
 - d. Whether the access to the resource was successful or unsuccessful.
7. The AFIS renewal solution shall have an audit trail, for each resource, that identifies the following: (M)
 - a. Resource ID;
 - b. User or role that accessed the resource;
 - c. Date, time and type of access requested; and
 - d. Whether the access was successful or unsuccessful.
8. The AFIS renewal solution shall have an audit trail, for each subsystem accessed, that identifies the following: (M)
 - a. Subsystem;
 - b. User, role or resource that accessed the subsystem;
 - c. Date, time and type of access requested; and
 - d. Whether the access was successful or unsuccessful.
9. The Contractor shall describe how it plans to implement security measures on all audit trails generated by the AFIS renewal solution in accordance with the Protected B designation. (M)

10. The AFIS renewal solution shall implement security measures on all audit trails generated by the System in accordance with the Protected B designation. The audit trail logs shall be tamperproof. (M)
11. The audit trail is considered tamperproof if the System includes the following three key elements: (I)
 - a. The System has the application writing to the audit log(s) in a verifiable manner.
 - b. The System has access to the audit log(s) restricted to an authorized trusted person (i.e. Administrator or Security Officer). Access to audit logs will be configured at the operating system level for the following policy: Access by an Administrator operating under super user rights, limited to read only for the audit.
 - c. The System includes protection of the electronic log file by storing it in a secure repository on the source server.