Introduction

In the aftermath of the March 11, 2004, train bombing in Madrid, Spain, personnel from the FBI Latent Print Unit performed a fingerprint analysis and reported an individualization of a latent print with a candidate print from an Integrated Automated Fingerprint Identification (IAFIS) search. It was subsequently determined that the individualization was in error, and the latent print was ultimately identified with a different subject.

This report provides information regarding the corrective actions the FBI Laboratory implemented upon recognizing the error, an outline of significant events surrounding the FBI's fingerprint investigation, and a synopsis of the comments by an international committee regarding the erroneous fingerprint conclusion.

Corrective Action

In accordance with American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) guidelines and FBI Laboratory policies, the FBI's Quality Assurance and Training Unit was notified upon discovery of the Class I error. The ASCLD/LAB Accreditation Manual defines Class I as, "The nature and cause of the discrepancy raises immediate concern regarding the quality of the Laboratory's work product." (ASCLD/LAB 2003)

The Unit implemented a corrective-action process that included the following:

- Suspending all casework assignments for the three FBI examiners.
- Reviewing the three examiners' casework for periods of not less than two years.
- Appointing different examiners in the Laboratory to review the case and prepare a revised report.
- Forming an external review committee.
- Implementing remediation measures, as deemed appropriate.
Additional corrective actions may be implemented.

**International Review Committee**

As part of the corrective-action process, an international committee of distinguished latent print examiners and forensic experts was formed. Their task was to review the analysis performed by the FBI Laboratory and make recommendations that will help prevent this type of error from occurring in the future. The Quality Assurance and Training Unit established seven assessment objectives for the committee to discuss.

The committee met at the FBI Laboratory at Quantico, Virginia, on June 17 and 18, 2004. They were given access to the FBI case file, case documentation, and Laboratory operational and quality assurance manuals. The committee also met with the Laboratory personnel involved in the case. The committee members prepared individual reports and submitted them to Quality Assurance and Training Unit personnel. This report is a synopsis of the major points made in the reports submitted by the committee members.

The committee members consisted of Mr. Alan McRoberts, who is retired from the Los Angeles County Sheriff's Department and is the chairman of the Scientific Working Group on Friction Ridge Analysis, Study, and Technology. Mr. McRoberts also served as the committee chairman. Messrs. Ron Smith of Ron Smith and Associates, Bruce Grant of New Scotland Yard, Gregoire P. Michaud of the Michigan State Police, Chandler Lee Fraser of the Royal Canadian Mounted Police, Frank Fitzpatrick of the Orange County Sheriff-Coroner Laboratory, and Ken Smith of the U. S. Postal Inspection Service, Forensic and Technical Services Division were the other committee members.

Mr. Frank Fitzpatrick was selected by the American Society of Crime Laboratory Directors, and Mr. Ken Smith was selected by the International Association for Identification to serve on the committee. Mr. Juan Antonio Rodriguez San Roman of the Spanish National Police Latent Print Unit served as a resource for the committee. Dr. Richard Vorder Bruegge from the FBI's Investigative Technology Division and Mr. Thomas Hopper of the FBI's Criminal Justice Information Services Division also served as resources for the committee.

**Time Line**

**March 11, 2004**  
Train bombing occurred in Madrid, Spain.

**March 13, 2004**  
Interpol Washington requested the analysis of latent fingerprints that had been collected during the bombing investigation. An FBI Latent Print Unit Chief assigned the case to a supervisory fingerprint examiner. The Spanish National Police through Interpol Madrid sent electronic images of the latent prints to the supervisor. Eight latent images were of low resolution and without a scale. IAFIS searches were conducted without effecting an identification. Latent Print Unit personnel asked Interpol Washington to obtain higher resolution
latent images with a scale so that the ridge detail would be more visible and the latent prints could be printed in their natural size to ensure the reliability of IAFIS searches.

March 14, 2004
Interpol Washington submitted additional emails with the latent prints and the known fingerprints of five individuals. The latent print images were high resolution and displayed a scale. They were compared with the five suspects insofar as possible, but no conclusion could be made because the images of the known prints were of low resolution.

March 15, 2004
The supervisory fingerprint examiner encoded seven minutiae points for the high-resolution image of latent fingerprint #17 and initiated an IAFIS search.

March 16, 2004
The supervisory fingerprint examiner reviewed the candidate list. The misidentified subject was the number four candidate. The supervisory fingerprint examiner identified the subject on the basis of a comparison using the on-screen images and examination of the high-resolution digital printouts of the latent fingerprint and the known fingerprint record from IAFIS. The Unit Chief was notified and reviewed the on-screen images.

The Unit Chief assigned the case to a verifier (a retired supervisory fingerprint examiner working as a contractor). The verifier requested original fingerprint cards from the FBI's Criminal Justice Information Services Division.

March 19, 2004
The contractor verified the supervisory fingerprint examiner's identification on the basis of his examination of the same high-resolution digital copy of the latent fingerprint and the original fingerprint cards that were forwarded to the Latent Print Unit by the Criminal Justice Information Services Division.

The Latent Print Unit provided their initial report confirming that latent fingerprint #17 was the same as the known prints of the number four candidate. The Unit Chief provided this information by telephone to Interpol Washington. The Unit Chief did not complete a thorough examination of the identification prior to making the telephone call.

March 20, 2004
The Spanish National Police confirmed that latent fingerprint #17 was collected from a plastic bag.

An official FBI Laboratory report was issued identifying latent fingerprint #17 with the number four candidate.

April 2, 2004
In response to an official request made by the Spanish National Police, the FBI Legal Attache in Madrid provided copies of the known fingerprints of the number four candidate to the Spanish National Police.

April 13, 2004
Spanish National Police fingerprint examiners arrived at an inconclusive finding that the latent fingerprint discovered on a plastic bag belonged to the number four candidate. Consequently, the
Spanish requested further clarification of the FBI Laboratory's analysis.

The FBI Legal Attaché in Madrid informed the FBI of the Spanish National Police report. Although the FBI Laboratory expressed confidence in their findings, they agreed to prepare a detailed exhibit delineating their analysis of the fingerprint in question. A three-page exhibit was shipped overnight to the Spanish National Police.

April 21, 2004
The Unit Chief met with the Spanish National Police fingerprint examiners. He demonstrated the comparison process using the images from the three-page exhibit. He left the meeting thinking that the Spanish would continue their comparison of latent fingerprint #17 to the number four candidate.

May 17, 2004
The FBI received a court order for latent fingerprint #17 from the bag obtained in the Spanish investigation. The latent print was subsequently provided to the United States Attorney’s Office for submission to the Court. According to the Court's order, the prints were to be independently compared to the number four candidate's known prints.

May 18, 2004
The Court appointed the independent examiner.

May 19, 2004
The Court’s independent examiner reported in telephonic testimony that latent fingerprint #17 was that of the number four candidate.

The Spanish National Police provided a letter to the FBI Legal Attaché in Madrid advising that the Spanish Laboratory had identified latent fingerprint #17 as belonging to another person.

May 21, 2004
According to FBI Laboratory policies, Quality Assurance and Training Unit personnel were notified of the situation.

Personnel from the FBI Latent Print Unit traveled to Madrid to resolve the conflicting identifications. They were given access to all photographs and the original evidence that bore latent fingerprint #17. (Latent fingerprint #17 was no longer visible on the evidence because it had been destroyed during subsequent fingerprint processing techniques.)

May 23, 2004
FBI Latent Print Unit personnel returned from Spain. An overnight review of the case was conducted, and the error was recognized.

May 24, 2004
A corrective-action plan was initiated by the Laboratory’s Quality Assurance and Training Unit. The Unit took control of all related evidence and documentation and formed an international committee to review the procedures and factors.

May 27, 2004
A new team of FBI examiners, under the direction of a different Unit Chief, began a comprehensive examination of the Madrid latent prints.
June 9, 2004
FBI Laboratory personnel traveled to Spain and obtained a photograph from the original negative.

June 17-18, 2004
The international committee was convened and conducted a two-day review.

July 14, 2004
A final FBI Laboratory report was completed. This report excluded the number four candidate and concurred with the Spanish National Police individualization of latent fingerprint #17 to a different suspect.

August 2, 2004
The Quality Assurance and Training Unit's report regarding the international committee was completed.

Committee Assessment Objectives and Synopses

1. Determine whether the process and procedures used in this matter were appropriate.

   The case assignment and general operational procedures were applied in a manner that was consistent with the established FBI Latent Print Unit's normal operational procedures and are consistent with many other latent print units' operational procedures.

   If the FBI had insisted on more information (e.g., an image with scale for proper enlarging and an overall shot for orientation and proper finger determination), this error may have been avoided. (Object photographs that were available to the committee established that the candidate's finger determination was not probable.) This comment was not meant to mitigate the error. The error was a "human" failure and not a methodology or technology failure.

   The prescribed methodology (Analysis, Comparison, and Evaluation–Verification or ACE-V) used for this examination was appropriate. It was the examiners' application of this methodology that failed.

2. Determine where and how the examination faltered.

   The IAFIS search of latent fingerprint #17 involved the encoding of seven Level II details. The search results provided digit seven of the fourth candidate. Upon reviewing the encoded detail and the candidate's print, it was understandable why IAFIS provided him as a candidate and why the initial examiner did not immediately dismiss him.

   The power of the IAFIS match, coupled with the inherent pressure of working an extremely high-profile case, was thought to have influenced the initial examiner's judgment and subsequent examination. This influence was recognized as confirmation bias (or context effect) and describes the mind-set in which the expectations with which people approach a task of observation will affect their perceptions and interpretations of what they observe.

   The apparent mind-set of the initial examiner after reviewing the results of the IAFIS search was that a match did exist; therefore, it
would be reasonable to assume that the other characteristics must match as well. In the absence of a detailed analysis of the print, it can be a short distance from finding only seven characteristics sufficient for plotting, prior to the automated search, to the position of 12 or 13 matching characteristics once the mind-set of identification has become dominant. This would not be an intentional misinterpretation of the data, but it would be an incorrect interpretation nevertheless.

Once the mind-set occurred with the initial examiner, the subsequent examinations were tainted. Latent print examiners routinely conduct verifications in which they know the previous examiners' results without influencing their conclusions. However, because of the inherent pressure of such a high-profile case, the power of an IAFIS match in conjunction with the similarities in the candidate's print, and the knowledge of the previous examiners' conclusions (especially since the initial examiner was a highly respected supervisor with many years of experience), it was concluded that subsequent examinations were incomplete and inaccurate. To disagree was not an expected response.

Additionally, this erroneous individualization was not made by an examiner alone, but by an agency that for many years has considered itself, rightfully so, as one of the best latent print units in the world. Confidence is a vital element of forensics, but humility is too. It was considered by the committee that when the individualization had been made by the examiner, it became increasingly difficult for others in the agency to disagree. This is supported because the Latent Print Unit immediately entered into a defensive posture when the Spanish National Police issued its statements that the FBI was wrong.

Latent Print Unit personnel responded by preparing charted enlargements using both Level II and Level III detail, and the Unit Chiefs traveled to Spain to demonstrate to the Spanish National Police that the FBI results were correct. This was interesting, considering that the identification is filled with dissimilarities that were easily observed when a detailed analysis of the latent print was conducted.

3. Assess the effects that digital image capture, compression, and transmission on friction ridge detail may have had on this examination.

All of the committee members agree that the quality of the images that were used to make the erroneous identification was not a factor.

4. Assess the general risks of conducting forensic examinations in parallel with another agency.

If forensic examinations are conducted properly, there should be no risks involved. Both agencies should come to the same conclusions. When both agencies come to the same conclusion, the independent conclusions become supportive. If the conclusions conflict (e.g., individualization versus exclusion), an error can then be discovered and remedied (as in this case) to the benefit of all concerned. If one examination is conclusive and the other examination is not conclusive (e.g., as the result of conflicting procedural or legal requirements), the examination that occurred by the agency with legal jurisdiction will most likely prevail.
Based upon what occurred in this case, it appears that an agency that is in a position to conduct parallel analyses with another country should have a written protocol for sharing results and issuing formal reports. If forensic examinations are conducted in accordance with agency procedures and by well-trained fingerprint experts, then there should be no risks involved. If those differences are anticipated, there seems to be no inherent risk in conducting parallel examinations.

5. Identify policies, procedures, and guidelines to help avoid a situation like this in the future.

The evidence surface, processing techniques, imaging resolution, and compression are examples of things that should be known and documented during the analysis stage of the examination.

Procedures that require descriptive documentation (graphic, textual, or a combination of both) of the ACE-V process and blind verification (i.e., previous results unknown to the verifier) should be implemented on designated cases. This documentation should also note areas of discrepancies in the prints and explanations for these discrepancies. The original examiner's document should be sealed or withheld from the verifier. The verifier would then conduct his or her examination independently and document the characteristics and discrepancies that were considered during the examination. Technical reviews of each examiner's descriptive documentation would then reveal any conflicting analyses and results, would require open communication and discussion among examiners, and would require resolution.

The verifiers must do an independent and complete ACE-V examination of each print that they are verifying. The verifiers must be willing to oppose any examiner if they do not see the details needed to effect the identification decision. The quality assurance program should make examiners feel that they can disagree about any identification. The examiners should be encouraged to step forward, without fear of reprisal if they disagree. This part of the scientific method must be institutionalized.

The current quality assurance rule requiring supervisor verification of latent prints with less than 12 Level II characteristics needs to be revised. A policy incorporating a definable quality and quantity standard, rather than the current 12-point standard, needs to be instituted for quality assurance. A high-point-count print of poor quality may be more dangerous than some low-point-count, high-quality latent prints. Points or any concept of points should be removed from any policy manual. It may take years for this ingrained and habitual methodology to change, but leaving the concept of points anywhere in the manual will just delay it further.

A new quality assurance rule is needed regarding high-profile or high-pressure cases. This would include supervisory verification of conclusions regardless of the normal quality and quantity standard. These and all supervisory verifications must be independent and complete ACE-V examinations.

The case assignment process should be revised. Comparison ability should be a primary consideration, especially in high-profile cases. It must also be recognized that years on the job may not always reflect ability. The organizational relationship should be considered in
making assignments. Daily examination practitioners should be the primary analysts, and situations with a supervisor as a primary examiner and a subordinate as a verifier should be avoided. (A subordinate may not feel comfortable challenging the conclusion of a supervisor.)

Verifiers should be given challenging exclusions during blind proficiency tests to ensure that they are independently applying ACE-V methodology correctly and to detect skill atrophy.

A new approach to quality assurance and quality control needs to be fostered. Personnel who are responsible for reviews of comparisons need to be considered as checkers and not verifiers. They must be trained to look for discrepancies as well as similarities. They also need to be extensively trained to do checking on-screen as well as with standard magnifiers.

Visual acuity is also a significant consideration. The visual acuity of all examiners should be evaluated on a periodic basis. Although there was no indication that the visual capability of the examiners in this case was a factor, the early detection of visual problems could help to avoid future errors.

There should be a written policy that clearly defines the protocols to follow when dealing with international agencies. Included in this policy should be language that dictates the reporting of results through proper channels (administration) and states specifically who is to be notified when dealing with terrorist cases.

6. Identify guidelines, if any, for the general latent print community as a result of the lessons learned from this matter.

There has been reluctance for the majority of latent print units to document the characteristics used in the examination by charting latent prints and exemplars or providing a written description of the areas of identification and discrepancies in designated cases (i.e., high-profile cases or cases with latents of poor quality). Such a document would provide a useful quality management tool to determine what the examiner and verifier were using as a basis for their conclusion.

The recommendations in Section 5 apply to the general latent print community. Additionally, agencies should adopt Scientific Working Group on Friction Ridge Analysis, Study, and Technology and Scientific Working Group on Digital Imaging guidelines for latent print analysis and imaging as the backbone for their operational manuals. Erroneous identifications, when found, need to be admitted and reported to the agency as well as to the certifying and accrediting bodies. Many agencies are slow to do this or refuse to admit that errors have occurred. Admitting the error is the first step in the remediation process. A remediation process must be included in the quality assurance manual so that when it is needed, the process can begin promptly. The FBI had this in place.

7. Determine additional assessment objectives that the panel members deem appropriate.

The committee examined the latent impression and determined that it did contain sufficient ridge detail to be correctly individualized.
An erroneous individualization is considered the most serious error a latent print examiner can make in casework and cannot be tolerated or minimized by an agency or the forensic community. The consequences to any examiner for any such error should reflect the agency's seriousness about issues involving quality assurance.

Conclusion

The consensus of the committee was that the failure was in the application of the ACE-V methodology during this particular examination.

The committee also extended its appreciation to FBI Latent Print Unit personnel for their forthright manner in accepting responsibility and to the Laboratory, which took immediate steps to remedy the situation. The candor of the personnel reporting to the committee was appreciated and important to the credibility of the Laboratory.

The committee also recognized that although this erroneous conclusion gained worldwide recognition and that it was very unsettling, the FBI Laboratory set an excellent example in taking corrective actions.

Acknowledgments

On behalf of the FBI Laboratory, the author thanks the committee members for reviewing this case and making recommendations. The Laboratory is taking the committee's recommendations seriously and believes that it will improve as a result of the committee's work.

Reference