



AFRL-RI-RS-TR-2010-108

AUDIO SPECTRAL PROCESSING

L-3 Services, Inc.

May 2010

FINAL TECHNICAL REPORT

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1. BACKGROUND

This report is being submitted by L-3 Global Security & Engineering Solutions (GS&ES), a Division of L-3 Services, Inc., (an L-3 Communications company) which is referred to as “L-3” throughout the remainder of this report¹.

The mission of the National Law Enforcement and Corrections Technology Center–Northeast (NLECTC-NE) Region, in conjunction with the Air Force Research Laboratory/Information Directorate (AFRL/RI), is to facilitate the identification, development, and adoption of new products and technologies specifically designed for law enforcement, corrections, and other criminal justice and public safety applications. The technology thrust areas for the Northeast Region supported under this contract include Audio/Video Processing and Intelligence Exploitation.

The Law Enforcement Analysis Facility (LEAF) is a component of the NLECTC-NE Region, and will subsequently be referred to as the NLECTC-NE/LEAF. The NLECTC-NE/LEAF provides a facility to test, evaluate, demonstrate, and facilitate the transition of mature and appropriate technologies from AFRL and other research & development entities to state and local criminal justice agencies. This report outlines the major accomplishments of the NLECTC-NE/LEAF performed by L-3 under contract F30602-06-C-0232. Activities described in this report are divided into three sections: Outreach activities, Technical Assistance, which includes the performance of forensic demonstrations, and one special project; support to the Forensic Audio Video Image Analysis Unit (FAVIAU) of the Federal Bureau of Investigation’s (FBI) Digital Evidence Laboratory (DEL). FAVIAU support activities described in this report were funded by the FBI and routed through the National Institute of Justice under Interagency Agreement 2000-IJ-R-019 between the Office of Justice Programs NIJ and AFRL - Information Directorate.

¹ At the time of the award of the contract under which this work was performed, the organizational entity was named L-3 Government Services, Inc. Due to a subsequent corporate reorganization, the business unit that performed the work described in this report became part of L-3 GS&ES.

The overall scope of this effort is to coordinate a comprehensive program for the development and deployment of advanced audio processing, video surveillance, timeline analysis, and forensic validation technology to the criminal justice and public safety community by accomplishing the following:

- Identify law enforcement and corrections requirements generated by law enforcement working groups for intelligence exploitation technologies.
- Work with AFRL scientists and engineers to identify potential technology and product solutions to meet the requirements generated by the law enforcement working groups.
- Test, evaluate and demonstrate technology and product solutions on real world data examples.
- Evaluate what modifications need to be made to existing AFRL technologies to put them into a real world operational environment.
- Deploy new technologies to criminal justice and public safety agencies.
- Attend conferences and give briefings to the criminal justice/public safety community and demonstrate prototype products and technologies.
- Document and disseminate findings, best practices and lessons learned to the criminal justice/public safety community.

All activities described in the remainder of this report were performed by L-3 GS&ES personnel in support of the NLECTC-NE and the LEAF.

2. SITE ADMINISTRATION

On a monthly basis, NLECTC-NE/LEAF personnel performed the following administrative tasks in support of the NLECTC-NE/LEAF:

- Maintained a database of forensic demonstrations performed for the benefit of criminal justice agencies. This database allowed searches (queries) on a variety of parameters, including but not limited to; submitting agent name, submitting agency, agency type, address, date, demo type, and equipment used.
- Completed a cover letter and a report of results for each forensic demonstration completed, and mailed the same to the associated criminal justice agency. The report documented the processes and technologies utilized during the forensic demonstration. The procedures used in the demonstration were given in detail, along with problems encountered and solutions provided. Lastly, it included possible suggestions to improve the original data collection if appropriate.
- Completed a post analysis survey for each forensic demonstration completed, and mailed the same to the associated agency. The Post Analysis Survey was included for the investigating official to complete and return. This provided the NLECTC-NE/LEAF with valuable statistical information including how the case was resolved, how much time and/or money was saved by the demonstration, along with any additional comments.
- Maintained an inventory of Government Furnished Equipment (GFE) located at the NLECTC-NE/LEAF.
- Attended weekly NLECTC-NE staff meetings.
- Inputted forensic demonstration and other requests for assistance into the NIJ CaptureNet database to provide an exchange of information between the NIJ NLECTC Regional Centers and the NIJ National Center.

Personnel performed other administrative tasks in support of the NLECTC-NE/LEAF including the following:

- Maintained both GFE and corporate provided equipment. Periodic equipment inventories and turn-ins were coordinated with US Air Force appointed equipment custodian(s). In addition to AFRL and NIJ supplied GFE, additional equipment was supplied by the FBI. Periodic inventories of this equipment were also conducted with FBI equipment custodian(s).
- Updated forms used in the normal course of business, forwarding them to the NLECTC-NE for approval and when appropriate, posting to the NIJ website.
- Created two (2) interim contract reports that were submitted to the Air Force Research Laboratory – Information Directorate (AFRL/RI) Program Manager. The reports were contractually mandated and documented L-3 activities in support of the AFRL-RI NLECTC-NE/LEAF contract.
- Compiled Technical Working Group (TWG) needs and requirements, and prepared binders for distribution to the AFRL/RIEC Program Manager to facilitate identification and transfer of relevant AFRL technology and transfer.

- Completed an Engineering Change Proposal (ECP) which expanded the scope of the original L-3 proposal in response to AFRL BAA 03-09-IFKA. The ECP was subsequently accepted and modification P00006, dated 31 Dec 2008, increased the contract ceiling by \$600,033 resulting in a new ceiling of \$2,096,281. Additional funding in the amount of \$151,000 raised the funded amount of the contact to \$1,536,000.

15 Nov 06 - The NLECTC-NE/LEAF hosted the contract kickoff meeting which was attended by the NLECTC-NE Director, NLECTC-NE members, program managers and technical personnel from the Air Force Research Laboratory, and a representative from the Federal Bureau of Investigation (FBI).

24 Jan 08 - The NLECTC-NE/LEAF hosted the new AFRL Program Manager to review the status of the contracts and provide demonstrations of LEAF capabilities.

3. OUTREACH

3.1 REGIONAL ADVISORY COUNCIL/TECHNICAL WORKING GROUP

3.1.1 Regional Advisory Council (RAC)

The NLECTC-NE/LEAF supported the NLECTC-NE Regional Advisory Council (RAC). A RAC is a group of state and local criminal justice practitioners that provide input to the NIJ in defining the technology needs and requirements of the criminal justice community. Specific RAC support activities included the following:

Oct 06 - Assisted in preparations for the Regional Advisory Councils 10th year anniversary, including preparation of materials, briefings and photographs.

08 Nov 06 - Supported the NLECTC-NE RAC meeting and 10 Year RAC Anniversary. NLECTC-NE/LEAF personnel provided administrative support and also provided demonstrations of the AFRL developed Speech Enhancement Unit and a commercially developed automated video object tracking technology.

14-16 May 07 - Attended the NLECTC-NE RAC meeting in St. Petersburg, Florida. A briefing was provided to the RAC on the status of the NLECTC-NE/LEAF. This included an overview of new technologies currently being evaluated, a technology demonstration, and an update regarding NLECTC-NE/LEAF support to the FBI. A WebTAS briefing was also provided to the RAC.

17-20 March 08 - Attended the NIJ Applied Technology Conference, Point Clear, AL. Presentations were prepared and a booth was manned to display the US Air Force Speech Enhancement Unit. NLECTC-NE/LEAF was requested to demonstrate to a class on Incident Commander how localized maps can be employed in the program and also provided a status briefing at the RAC.

15-16 Apr 09 - Supported a technology booth at the NIJ Applied Technology Conference held in Kansas City, MO. In addition, a status briefing was provided to the NLECTC-NE RAC at the same venue on 17 April 2009.

3.1.2 Technical Working Group (TWG)

The NLECTC-NE/LEAF supported the NIJ Biometrics Technology Working Group (TWG) and Sensor and Surveillance TWG. A TWG is comprised of federal, state, and local criminal justice practitioners who are also subject matter experts in a given technology field. The TWG provides input to the NIJ in defining requirements of the criminal justice community in a particular technology arena. Specific activities of TWG support included the following:

Compiled Technical Working Group (TWG) needs and requirements, and prepared binders for distribution to the AFRL/RIEC Program Manager to facilitate identification and transfer of relevant AFRL technology and transfer.

Provided a peer review for an NIJ Sensors and Surveillance TWG project on Gun Shot Detection for to the NIJ Portfolio Manager.

Traveled to Albany, NY for review and demonstration of General Electric (GE) Securities integration of the Millimeter Wave Energy (MMWE) and Smart Camera System.

28-29 Mar 07 - Participated in the Biometrics Portfolio Final Proposal Review on Panel B, to review a total of 15 proposals for funding by the NIJ with lead reviewer responsibility for three of the proposals.

2-5 Apr 07 - Attended the NIJ Applied Technology Conference and Biometrics TWG held in Garden Grove, CA.

17-19 Apr 07 - Attended Sensors and Surveillance TWG at George Mason University, Fairfax, VA. The TWG meeting included on-site evaluation and review of the Shot Spotter gunshot location sensor installation at the Washington DC Police department Head Quarters and the Safe View active millimeter wave Concealed Weapons Detection portal at the United States Court House. TWG members completed review of technology requirements and the 2007 solicitations.

23-25 Oct 07 – Attended the Sensors and Surveillance Technical Working Group meetings in Orlando, FL. The NLECTC-NE/LEAF was responsible for collection of presentations and projection of same. The collected briefings, attendees list, agenda and photographs taken were put on disc for distribution to attendees and briefers.

Conducted a Peer Review of proposals for Biometric Fingerprint Panel. This is a two step process where concept papers are submitted and reviewed, and then those selected are invited to submit full proposals for funding. Ten concept papers were reviewed and results submitted to NIJ. Seven proposals were reviewed with primary reviewer responsibility for two. The proposals were submitted to a consensus review by all participating reviewers. The consensus review was conducted by teleconference.

3.2 GENERAL OUTREACH

The NLECTC-NE/LEAF conducted outreach activities to inform and educate the criminal justice community on emerging technologies and their capabilities. Outreach activities included the following:

22 Jan 09 - Attended a briefing at AFRL by BAE Systems regarding Video Exploitation.

30 Jan 09 - Attended the Image Processing Working Group (IPWG) meeting at AFRL. The IPWG is comprised of AFRL/RI personnel who are actively working in the Motion Imagery Processing and Exploitation (MIPE) arena.

10 Feb 09 - Provided a briefing at the E-Crime Seminar held at the Oneida County NY Child Advocacy Center (CAC). The briefing included an overview of what digital and multimedia evidence may be encountered during an E-Crime investigation, how to collect it, and how quality will impact processing and its presentation in court.

17 Mar 09 - Provided the Image Processing Working Group briefings outlining NLECTC-NE/LEAF capabilities in the MIPE arena. The briefing also included examples of forensic video and image data encountered at the NLECTC-NE/LEAF.

26 Mar 09 - Participated in the Mohawk Valley Engineers Executive Council (MVEEC), Project Sites student mentoring program. The NLECTC-NE/LEAF hosted two students, briefing them on how technology is applied to criminal justice operations.

26 Apr 09 - Staffed a booth at the TAC EXPO held at the Turning Stone Conference Center, in Verona NY. The AFRL developed Speech Enhancement Unit (SEU) audio processing software was highlighted.

3.2.1 Electronic Recording of Interrogations (ERI) Tech Fair

Local law enforcement agencies requested that the NLECTC-NE/LEAF provide assistance with reviewing systems designed to record audio and video data of police interviews and interrogations of suspects and witnesses. Legislation is pending in several states that will require all in-custody interviews be recorded. NLECTC-NE/LEAF personnel reviewed the pending changes in the law, laws and requirements from other states and commercial systems available. It was decided that the best method of educating the local agencies was to conduct a “Tech Fair” where the commercial systems could be displayed and compared. A tech fair was held at the NLECTC-NE/LEAF as part of support for the ERI effort. Three commercial vendors were provided simulated interrogation settings in which to display and demonstrate their systems. Agencies were invited to come in and view the systems in operation. In addition to the ERI vendors, there were displays from the CyberScience Lab, CommTech and Thru-the-Wall Surveillance programs. Fifty members of law enforcement, corrections, and prosecutors from 24 agencies attended (See table 1 below).

Table 1

Broome County (NY) D.A.’s Office	NY State Police -Troop D Oneida (NY)
Central Security	Oneida County (NY) Child Advocacy Center
Colonie (NY) Police Department	Oneida County (NY) DA’s Office
Criminal Intelligence Service Ontario	Oneida County (NY) Sheriff’s Office
East Greenbush (NY) Police Department	Oneida Indian Nation
Elmira (NY) Police Department	Onondaga County (NY) Sheriff’s Office
Erie County (NY) D.A.’s Office	Queens D.A.’s Office
Gloversville (NY) Police Department	Rome (NY) Police Department
Madison County (NY) Sheriffs Dept.	Rotterdam (NY) Police Department
Manhattan D.A.’s Office	Suffolk County (NY) Police Department
New Hartford (NY) Police Department	Syracuse (NY) Police Department
New York State University Police-Morrisville	Ulster County (NY) D.A.’s Office

As a follow-on to the tech fair, briefing slides were prepared for inclusion in both general NLECTC-NE/LEAF briefings and an ERI specific briefing.

3.2.2 Digital In-Car Camera (DICC) Tech Fair

The NLECTC-NE/LEAF was requested to provide technical assistance in the reviewing of digital in-car camera recording systems. Many agencies in the area had analog based recorders in patrol cars, but few had experience with the new digital recording systems. The NLECTC-NE/LEAF reviewed research materials compiled by the International Association of Chiefs of Police (IACP) from studies that they had conducted. The NLECTC-NE/LEAF then conducted independent research into the DICC systems and compared the proposed standards of the IACP to their specifications. The Rome Police Department hosted a Digital In-Car Systems Tech Fair at the Rome Free Academy in Rome, NY. Seven vendors participated in the event displaying systems within the building and in some cases vehicle installed systems. The vendors that participated were OEM Micro Solutions, L-3 Communications Mobile-Vision Inc., Digital Ally, Fleet Safety, WatchGuard Video, and ICOP. Other booths included displays from the NLECTC-NE, Sensors and Surveillance, the NLECTC-NE/LEAF, and the Cyber Science Lab. The event also included a presentation regarding best practices for the in-car systems given by representatives of the IACP and a panel discussion by current users of DICC systems. Thirty-two officers from sixteen agencies attended the event (See Table 2 below).

Table 2

Cortland (NY) Police Department	New York City Dept. of Environmental Protection
Dewitt (NY) Police Department	New York State University Police - Morrisville
Gates (NY) Police Department	Onondaga County (NY) Sheriff Department
Herkimer/Oneida Co (NY) Combined Planning Panel	Poughkeepsie (NY) Police Department
Kirkland (NY) Police Department	Rome (NY) Police Department
Manlius (NY) Police Department	Town of Clay (NY) Police Department
New York State Police	United States Department Of Veteran's Affairs
Niskayuna (NY) Police Department	New York State University Police SUNY-IT

3.2.3 Conferences/Workshops/Meetings

NLECTC-NE/LEAF attended or hosted several conferences, meetings, and workshops in support of the mission of the NLECTC-NE. General technology demonstrations were performed at multiple venues, including the NLECTC-NE/LEAF facility, where personnel operated, displayed, briefed, and discussed emerging technologies for the benefit of the criminal justice practitioner. The following summarize outreach activities conducted at conferences, workshops, and meetings:

09 Oct 06 - Hosted four high school students, from Sauquoit Valley NY school district in support of the School and Business Alliance (SABA) Program. The students were given a briefing on the mission of the NLECTC-NE and the NLECTC-NE/LEAF, demonstrations of some of the in-house technologies and how the efforts of the NLECTC-NE and the NLECTC-NE/LEAF have been useful to the criminal justice community.

Oct 06 - Met with personnel from the National Science, Technology, and Law Center in Largo, Florida about supporting a “best practices” for evidence collection, in the area of audio and video data. Two levels were discussed, a procedures manual and a quick reference book. Also discussed was the need for more in-depth training for examiners presenting processed or examined audio evidence. The National Science, Technology, and Law Center have resources to research current processes and help prepare training for presenting this evidence.

12 Oct 06 – Provided a presentation at the New York State Office of Attorney General’s Medicaid Fraud Investigators meeting in New Hartford, NY.

09 Jan 07 - Attended the Oneida County Police Chief’s Coalition Meeting and informed agencies of the upcoming Electronic Recording of Interrogations (ERI) Tech Fair at the NLECTC-NE/LEAF.

13 Feb 07 - Attended the Oneida County Chiefs of Police Coalition Meeting in Whitestown, NY.

21 Feb 07 – The NLECTC-NE/LEAF hosted Critical Technologies, Inc., headquartered in Utica New York, at the NLECTC-NE/LEAF to discuss their network connectivity research.

02 Mar 07 - Attended Language Assistance Technology Roundtable sponsored by Vera Institute of Justice, New York City, NY. Presentations on types of Spoken Language Translation techniques and systems were made. As part of a panel discussion, briefed on suggested evaluation procedures for agencies looking at Language Translation systems.

13 Mar 07 - Attended Chiefs of Police Coalition meeting at the Clark Energy Center, Marcy, NY.

20 Mar 07 - Hosted three students from the Oneida County SABA Program at the NLECTC-NE/LEAF.

30 Mar 07 - Attended a meeting with Rome Police Department regarding the placement of a video camera for a security system at the Rome Police Department office.

10 Apr 07 – Attended Chiefs of Police Coalition Meeting at Dibble’s Inn, Vernon, NY.

24 Apr 07 - Attended the kick-off meeting of Southern Tier Computer Prosecution Task Force (STCPTF) in Binghamton, NY. STCPTF is an effort involving local, state and federal law enforcement agencies and prosecutors to handle internet-based crimes, with priority on child exploitation. The Task Force will be setting up office space with the Broome Co. Computer and Technical Services (CAT) lab, in Binghamton.

8 May 07 - Attended the Chiefs of Police Coalition Meeting and Award Ceremony held in Rome, NY.

15-17 May 07 - Attended the Gatlinburg Law Enforcement Conference held in Gatlinburg, TN. Participated in the Interactive Display on May 16, demonstrating the AFRL developed Speech Enhancement Unit (SEU) and the DAIS software program. Also, NLECTC-NE/LEAF personnel attended other conference sessions.

12 Jun 07 - Attended the Oneida County Law Enforcement Coalition Meeting, held at the Child Advocacy Center in Utica.

20 Jun 07 - NYSP Marcy contacted the NLECTC-NE/LEAF to discuss State Police participation in operational evaluations and the Incident Commander program.

28 Jun 07 - Provided a tour of the NLECTC-NE/LEAF and demonstrations of technologies to six teachers from the Teacher Enrichment/Professional Development Program.

25 Jul 07 - Attended the Madison County Law Enforcement Coalition Meeting in Canastota NY. Invitations for the In-Car Camera Tech Fair were provided.

31 Jul 07 - Hosted Assistant Chief Dillon of the State University of New York (SUNY) - Brockport Police Department. Mr. Dillon was given a tour of the NLECTC-NE/LEAF and received technology demonstrations in audio enhancement, video enhancement, video annotation, video motion detection, and deception detection (voice stress analysis).

11 Sep 07 - Attended the Oneida County Law Enforcement Coalition meeting at Hamilton College, Clinton, NY.

14-18 Jan 08 –Attended the Scientific Working Group – Imaging Technology (SWGIT) meeting in Orlando, FL. During the meeting, Best Practices documents were developed for the following forensic disciplines: Forensic Video Analysis and Forensic Photographic Comparison. A third document was created that discussed issues related to resolution and dynamic range.

12-14 Feb 08 –Attended the IACP CCTV Symposium in San Diego, CA. The symposium covered technical, planning, procedural and privacy issues associated with enterprise video surveillance systems.

03-04 Jun 08 – Manned a display booth at the Mohawk Valley Community College/AFRL Information Challenges Conference and Exposition. The conference highlighted AFRL technologies and provided an opportunity to showcase successful transfer of AFRL technology to law enforcement and corrections.

Provided a tour of the NLECTC-NE/LEAF facility and an overview briefing to Debra Jasinski, Serologist, Vermont Forensic Laboratory, in Waterbury, VT.

Attended the Oneida County Law Enforcement Coalition meeting at the Ramada Inn in Oriskany, NY. This meeting was also the Stop DWI awards breakfast. Prior to the meeting, contact was made with a member of the NYS Preparedness Training Center regarding the NIJ Incident Commander.

Attended a meeting with AFRL/RIEC personnel regarding possible future initiatives.

26 Mar 09 - Participated in Mohawk Valley Engineers Executive Council (MVEEC), Project Sites student mentoring program. The NLECTC-NE/LEAF hosted two students, briefing them on how technology is applied to law enforcement and corrections operations.

3.2.4 NLECTC-NE/LEAF Guidebook

NLECTC-NE/LEAF created a guidelines document regarding the establishment of a facility to process forensic audio, video and image data, for the National Law Enforcement and Corrections Technology Center – Northeast Region. The purpose of the document was to provide definitions, recommendations, and guidelines relative to the establishment of a dedicated facility to process forensic data. Additionally, the document addressed requirements needed to ensure the successful introduction of the processed data into a court of law. The document was initially provided to the NLECTC-NE in printed form and as a pdf². A second version was produced as a movie on DVD and provided to the NLECTC-NE in December 2009.

² Portable Document Format (PDF) is a file format created by Adobe Systems in 1993 for document exchange.

3.3 CAPACITY BUILDING

An important facet of the NLECTC-NE/LEAF mission is to enhance the internal capabilities of criminal justice agencies. This is accomplished through the transfer of relevant technologies to the practitioner and providing training in its use. Predominately, technologies developed at the Air Force Research Laboratory – Information Directorate are transferred to the criminal justice community, however, technologies developed by other federal laboratories, academia, and the private sector are also eligible. In addition to providing training as part of the technology transfer process, the NLECTC-NE/LEAF also provided training in specific areas such as audio processing or standard operating procedures (SOP) development.

3.3.1 Technology Transfer

Technology transfer is the process by which knowledge, facilities, or capabilities, developed in one place or for one purpose are transferred and utilized in another place for another purpose to fulfill actual or potential public or domestic needs.

Technology transfer benefits the Air Force by helping in meeting mission requirements and leveraging of commercial resources. This in turn aids in building industrial base, lowering costs, increasing the rate of return of federal R&D resources, and expanding the knowledge base. Additionally, several public laws including: the Small Business Act of 1982, the Federal T2 Act of 1986, and the Technology Transfer Commercialization Act of 2000 have established requirements pertaining to Federal participation in the technology transfer process.

The following technology transfer-related activities were performed during the contract period:

Prepared a list of current Speech Enhancement Unit (SEU) users for re-issuance of the transfer agreements. The SEU was transferred to approximately 20 separate agencies during the previous contract period via a Memorandum of Understanding (MOU) between the receiving agency and AFRL. The original MOU was in effect for five (5) years. Agencies wishing to continue to possess and utilize the SEU following the expiration of the MOU needed to renew it with AFRL. The current users were contacted by the NLECTC-NE/LEAF and a list of those agencies wishing to continue using the software was forwarded to the NLECTC-NE office for action.

14-16 May 07 - The NLECTC-NE/LEAF facilitated the distribution of 50 copies of the Digital Automotive Image System (DAIS) software to RAC members at the St. Petersburg (FL) RAC meeting. DIAS is a searchable image database of vehicles. It can be searched by vehicle type, make, model, and accessories that can be used to identify unknown vehicles. It was co-funded by the FBI and NIJ and is available for transfer to law enforcement agencies.

15-17 May 07 - The NLECTC-NE/LEAF facilitated the distribution of 130 copies of the DAIS software to attendees at the Gatlinburg Law Enforcement Conference held in Gatlinburg, TN.

12 Jun 07 - Attended the Oneida County Law Enforcement Coalition Meeting, held at the Child Advocacy Center in Utica. Fifteen copies of the DAIS software program were distributed to coalition members.

25 Jul 07 - Attended the Madison County Law Enforcement Coalition Meeting in Canastota NY and distributed 11 copies of Incident Commander and DAIS software programs.

Received a request from the Connecticut Department of Corrections for Speech Enhancement Unit (SEU) Transfer and forwarded copy of Transfer Agreement.

3.3.2 Technology Training

NLECTC-NE/LEAF personnel provided training to federal, state, and local criminal justice practitioners throughout the period of performance. The training was designed to provide the practitioner the opportunity to learn and use new processes, procedures, systems and other tools efficiently and effectively in the performance of their work. The following training-related activities were performed during the contract period:

Based upon previous work with the NIJ Incident Commander software, the NLECTC-NE/LEAF received a request from the Director of the NLECTC-NW to create a guide for using local maps in the Incident Commander program. These maps will be more meaningful than the ones supplied with the program. By employing “localized” scenarios agencies can train using resources that would actually be available to them in a real world emergency response. The Director commended the efforts at the NLECTC-NE/LEAF to create these maps and he was interested in sharing this technique with other users. NLECTC-NE/LEAF reviewed the process for creating/revising Area and Tactical Maps and modified existing Tactical Maps to learn the process for creation of new Tactical Maps. NLECTC-NE/LEAF next examined the Event editor and modified events within the scenario to change sequence of events, resource point availability and timings to make scenarios more engaging.

NLECTC-NE/LEAF spoke with staff from the NY State Preparedness Training Center (SPTC) regarding Incident Commander and the SPTC’s efforts to create a training agenda for Incident Command.

10 May 08 - Met with SPTC and demonstrated the Incident Commander with localized scenarios.

19 Sep 08 - Attended a meeting of the Incident Command Education Focus Group at the SPTC.

Completed an outline for Train the Trainer course in Incident Commander.

Created a scenario for the Incident Commander program using a local map and different agencies to replicate expected response times and unit availability.

18-22 Jun 07 – Attended the Advanced Digital Audio Corporation (DAC) School training for the Cardinal audio tool in Raleigh, NC.

3.3.3 New York State Police Quality Assurance Support Program

In 2009, the NLECTC-NE/LEAF began providing quality assurance support to the New York State Police Forensic Video/Multimedia Services Unit (NYSP FV/MSU). This program was funded by the National Law Enforcement and Corrections Technology Center-Northeast Region in response to a request for assistance from NYSP FV/MSU in securing laboratory accreditation. By leveraging previously established forensic laboratory quality assurance procedures, the NLECTC-NE/LEAF was able to provide the support affordably and efficiently. It is hoped that this program will be a model for future public forensic laboratory quality assurance initiatives. Specific activities related to the program are provided below:

28 Jan 09 - Spoke with the Director of the Forensic Video/Multimedia Services Unit of the New York State Police (NYSP) regarding the Quality Assurance Support Program. The NYSP has been selected as the pilot agency for this program. After canvassing the NLECTC-NE RAC, no other agency was able to meet the previously established criteria. The NYSP is currently performing forensic examinations in the target area (image, audio, and video), and are pursuing ASCLD-LAB accreditation in that discipline (digital and multimedia evidence).

03 Feb 09 - Participated in a teleconference with the Director regarding the Quality Assurance Support Program.

18 Feb 09 – Met with the Director regarding Quality Assurance Support Program at the LEAF. A request letter from NYSP was sent to NLECTC-NE/LEAF and a scope letter outlining NLECTC-NE/LEAF support to NYSP was created.

23 Mar 09 - Participated in a teleconference with the Director regarding the Quality Assurance Support Program.

07 Apr 09 - Hosted the Director regarding the Quality Assurance Support Program.

4. TECHNICAL ASSISTANCE

Many criminal justice agencies do not have the resources or personnel to research technology-related questions. The NLECTC-NE/LEAF fills that gap by providing technical assistance to the agencies in several forms through technology demonstrations, evaluation of technology, and response to requests for assistance in identifying available tools for use. The LEAF demonstrates emerging technologies to provide the criminal justice practitioner an awareness of the current state-of-the-art in a particular technology field. General technology demonstrations are performed at conferences, technology fairs, exhibits, agency facilities, and at the LEAF where our personnel operate, display, brief, and discuss emerging technologies for the benefit of the criminal justice practitioner. We provide forensic demonstrations to the criminal justice community in audio, video, and database technologies applying those tools to forensic case data. Listed below are examples of the general technology assistance provided.

Traveled to PLE Communications, LLC in Rochester, NY to receive software and training on their VMD (video motion detection) technology. This is the commercial version of an Air Force funded and directed technology. NLECTC-NE/LEAF reviewed material related to PL E-Communications AVT234 system for video monitoring and created datasets to be used for testing with this system.

Reviewed the free software program Audacity and evaluated the tool's ability to enhance audio samples for forensic data. A review of the performance of the software was written.

Received a request from Lt. Eisenberg of the Pennsylvania Department of Corrections for information on how to convert .wma audio files to .wav audio files for processing in the Speech Enhancement Unit. Located freeware programs and sent information to Eisenberg regarding their use.

Received a request from the NYS Department of Corrections, Inspector General's office for information about Polygraph training. Researched and found website listing several options and provided the information to Investigator Pelosi.

Received a request from NLECTC-National to provide information to Wichita (KA) Police Department regarding scanners for negative archiving. Reviewed current scanners and provided recommendations on appropriate systems and techniques (via email).

10 May 2008 – Met with staff from the NY State Preparedness Training Center (SPTC) and demonstrated the Incident Commander software with localized scenarios. Incident Commander was a training tool that employed PC game technology to allow first responders to train anytime, anywhere to coordinate a multi-agency response to a natural or manmade disaster. It was developed by BreakAway, LTD with funding from the National Institute of Justice's National Law Enforcement and Corrections Technology Center—Northwest under award number 2001-IJ-R-079. This program is under consideration to replace traditional training using a board containing miniature buildings, autos, etc.

Received a request from the US Attorney's Office (USAO), Newark, NJ for information regarding requirements to do in-house audio processing. Discussed their request with senior center personnel and determined that a seminar on establishing an audio enhancement capability would be an appropriate means to satisfy this request. On 18 December 2007, a seminar was held at the USAO in Newark, NJ and attendees from three different Federal District courts discussed various aspects of audio enhancement and possible tools to use. The USAO office in Newark has Sound Forge 9.0 and this program was explored to locate the tools most commonly used. A briefing on the center system and the Northeast Center was included.

Received a request from Shawn McCormick, NYS Attorney General's Office Sex Offender Mitigation Unit, Buffalo, NY for assistance in determining what equipment would be needed to record interviews of offenders and psychologists. Provided Mr. McCormick with information from the Electronic Recording of Interrogation Tech Fair.

The New York State Division of Criminal Justice Services requested that the NLECTC-NE/LEAF assist in the creation of a DVD that describes the problems that develop from youth participation in violent games. The NLECTC-NE/LEAF provided assistance in getting video clips and other information into a presentation.

Received a request for information on Information Extraction from the South Carolina Intelligence Fusion Center. Datasheets were provided as well as information and contact on WebTAS.

Received a request from Linda Tartaglia, Organized Crime Unit Coordinator, New Jersey State Commission of Investigation for information on cell phone detection in correctional facilities. From attendance at Northeast Technology Product Assessment Committee (NTPAC) meetings, the NLECTC-NE/LEAF was aware of an evaluation of the technology being conducted by the Pennsylvania Department of Correction. She was referred to Capt. James Zaccarelli of Pennsylvania Department of Corrections for information about a system installed at Graterford Prison. Follow up with Ms. Tartaglia confirmed that Capt. Zaccarelli had been very helpful and that they continued to exchange messages and visits regarding this technology.

Received a phone request from Alex Fox, Massachusetts Department of Corrections, for assistance in identifying procedures for proper collection of video within their department and demonstration to investigators on how to process collected data. Mr. Fox was directed to write a letter to the Center Director requesting the NLECTC-NE/LEAF's assistance. Letter was received and a scope letter forwarded to Fox. Since the request, Alex Fox is no longer working in that area and no further interest was made in continuing this effort.

The NLECTC-NE/LEAF was contacted by the New York State Division of Criminal Justice Services (DCJS), who requested assistance with editing material for a presentation they are preparing on "Operation Impact". "Operation Impact" is a targeted enforcement program supported by the DCJS to provide funds to local agencies for extra patrols. This video was produced to explain the program and provide results from previous efforts under that title. NLECTC-NE/LEAF provided assistance with overlaying graphics and other editing.

The NYS Department of Environmental Conservation (NYSDEC) requested assistance from the NLECTC-NE/LEAF in researching historical aerial imagery for Oneida County. NYSDEC has two sites in the Oneida County they are investigating. In order to prosecute an environmental case, the NYSDEC needed to depict how the alleged perpetrator used property over an extended period of time. NLECTC-NE/LEAF identified two readily available sources: NYS 2003 1 foot, natural color, and USGS c. 1996 1m, color IR. Otherwise, annual un-rectified imagery could be available from two sources: Oneida County Soil and Water Conservation District (SWCD), and US Dept. of Agriculture Farm Services Administration. NLECTC-NE/LEAF visited the Oneida County agricultural service center and scanned aerial photography from 1957, 1977, 1984, and 1995 where it was available for the two sites that NYS DEC had requested information on. Combined with other aerial image sources from 2003 and 2006, there was a good baseline of information for DEC to use. Further investigation continues to fill in additional years.

Received a request for technical assistance from the Rensselaer Co. (NY) Sheriff's Department to examine the video surveillance system in their current correctional facility and the new expansion to the facility. The project coordinator was contacted to determine the scope of the project. The NLECTC-NE/LEAF spoke with the point of contact at Rensselaer County Jail regarding the technical assistance. The scope of work was created and forwarded to the Center for staffing. The NLECTC-NE/LEAF visited the facility and recommendations were made for correcting focus problems.

Received a request for technical assistance from the Gaithersburg (MD) Police Department to provide assistance in setting up a surveillance system. The project coordinator was contacted to determine the scope of the project. A scope letter was created and a site visit made. Since the request there has been a change of management in the city and focus has been moved away from the video project.

4.1 SPECIAL PROJECTS

4.1.1 State University of New York (SUNY) Morrisville

The NLECTC-NE/LEAF received a request from Chief Enrico D'Alessandro of the SUNY Morrisville Campus Police, for assistance in developing a plan for expanding the college's video surveillance system. NLECTC-NE/LEAF personnel visited the college to discuss how the NLECTC-NE/LEAF could provide assistance. Chief D'Alessandro described how there was no centralized method or control for video recording and listed several associated problems. On 03 July 2008, a site survey was conducted at SUNY Morrisville as part of this project. Follow-up included review of the various sites where cameras and recorders are placed and the method of review at the Campus Police office. A written report was created and submitted and a presentation to college administration and staff explaining the results was made.

4.1.2 Oklahoma County Sherriff's Department

The NLECTC-NE/LEAF received a request from Oklahoma County, OK, Sheriff's Department (OCSO) regarding a video survey. A scope of work letter was prepared and transmitted to the OCSO. Travel arrangements were coordinated with the National Law Enforcement and Corrections Technology Center - Rocky Mountain Region as they are the center responsible for Oklahoma.

9–12 Mar 09 - Conducted an on-site survey of the Oklahoma County Jail, Oklahoma City, OK to review current video capabilities, discuss needs and assist in developing a strategy for enhancing the collection of video in the jail housing units. Capt Baisden, Oklahoma Co. Sheriff's Office provided the NLECTC-NE/LEAF with information on the operations of the facility and other pertinent facts. In addition to conducting the site survey, the NLECTC-NE/LEAF provided members of the Sheriff's Department Crime Scene Investigation team with a briefing on the technologies used by the NLECTC-NE/LEAF to collect, process, and examine multimedia data.

A technical memorandum (NLECTC-NE L09-001), entitled "Oklahoma City, Oklahoma Video Surveillance System Technical Assistance," was completed by the NLECTC-NE/LEAF. The memorandum was forwarded to the requesting agency, completing this assistance activity.

4.1.3 University of New Hampshire

The NLECTC-NE/LEAF received a verbal request from University of New Hampshire (UNH) Police Department, Durham, NH to conduct a survey of their current video system and make suggestions on how to improve their surveillance capabilities. They were instructed to make the request in writing and were provided with an example request letter.

20 Apr 09 - Received a request letter from the Chief of Police, University of New Hampshire, University Police (UP). The Chief is requesting a review of their current video surveillance system and recommendations for improvements. A scope of work letter was written and submitted. During a conversation with the Chief of Police, he indicated that he had scheduling conflicts in May for any on-site review arrangements so a June 2009 visit is planned.

08-09 Jun 09 - Visited the University of New Hampshire and conducted a site survey to determine what video surveillance systems were in use, examine the infrastructure that would support a new system, survey the campus to provide suggestions for prioritization and location of video systems and met with UP staff to get their input on what is needed and provide an overview of what to expect from recording systems.

A draft technical assistance memo regarding the video surveillance project was completed by the LEAF and forwarded to the NLECTC-NE for review and approval. Upon completion, the memo will be provided to the UNH police department.

The final technical memorandum regarding this project was completed by the NLECTC-NE/LEAF (NLECTC-NE Technical Memorandum L09-003). The memorandum was forwarded to the requesting agency, completing this assistance activity.

4.2 DIRECT ASSISTANCE/FORENSIC DEMONSTRATIONS

In addition to the above support, the NLECTC-NE/LEAF conducted 218 forensic demonstrations for the period of October 1, 2007 to December 31, 2009. Forensic demonstrations are provided to the criminal justice community in audio, video, image, and database analysis and exploitation technologies as a method of applying those emerging tools to forensic case data. Forensic demonstrations utilize a wide variety of technologies that have been developed by federal research laboratories, academia, and commercial developers. This approach will allow for the application of otherwise unavailable technologies to criminal investigative case data for the benefit of state and local criminal justice practitioners. Further, it criminal justice agencies what hardware/software systems were available to conduct forensic analysis, what the systems were capable of when real-world data was processed and lastly what information the data collected was capable of providing.

The agencies, types of demonstration and crimes are listed in Table 3 below.

Table 3

Albany County (NY) District Attorney's Office	NY	Audio Enhancement	Rape
Altamont Police Department	NY	Speaker ID	Harassment
Atlanta (TX) Police Department	TX	Video Enhancement	Robbery
Auburn Police Department	NY	Audio Enhancement	Criminal Contempt
Barberton Police Department	IL	Audio Enhancement	Burglary
Batavia Police Department	NY	Audio Enhancement	Larceny
Bremen Police Department	IN	Video Enhancement	Theft
Bridgeport (CT) Police Department	CT	Speaker ID	Internal Affairs
Broome County District Attorney's Office	NY	Audio Enhancement	Burglary
Broome County Sheriff's Office	NY	Audio Enhancement	Conspiracy
Broome County Sheriff's Office	NY	Audio Enhancement	Employee Misconduct
California Highway Patrol - South Los Angeles	CA	Audio Enhancement	Terrorism
Cazenovia Police Department	NY	Video Enhancement	Larceny
Chemung Co. Sheriff's Dept	NY	Video Enhancement	Burglary
Chemung Co. Sheriff's Dept	NY	Audio Enhancement	Suspicious Death
Clay Town Police Department	NY	Video Enhancement	Larceny
Connecticut State Police	NY	Video Enhancement	Burglary
Department of Homeland Security	DC	Audio Enhancement	Alien Smuggling
Department of Homeland Security	NY	Audio Enhancement	Counterfeit Merchandise
DES Fort Drum	NY	Video Enhancement	Missing Person
Dewitt Police Department	NY	Video Enhancement	Burglary
Endicott Police Department	NY	Audio Enhancement	Homicide
Federal Bureau of Investigation	DC	Captioning	Drug Distribution
Federal Bureau of Investigation	DC	Video Enhancement	ATM Theft
Fulton Police Department	NY	Audio Enhancement	Grand Larceny
Greece Police Department	NY	Audio Enhancement	Internal Affairs
Greece Police Department	NY	Video Enhancement	Robbery
Greenburg Police Department	NY	Video Enhancement	Robbery
Herkimer County District Attorney's Office	NY	Audio Enhancement	Stolen Property
Herkimer Police Department	NY	Video Enhancement	Burglary
Herkimer Police Department	NY	Video Enhancement	Grand Larceny
Herkimer Police Department	NY	Audio/Video	Grand Larceny
Holyoke, Police Department	NY	Audio/Video	Sexual Abuse
Ilion Police Department	NY	Video Enhancement	Assault
Iowa Department of Public Safety	IA	Video Enhancement	Homicide
Irondequoit Police Department	NY	Video Enhancement	Missing Person
Laclede County Sheriff's Office	MO	Video Enhancement	Robbery
Lewis County Sheriff's Department	NY	Video Enhancement	Larceny
Lewis County Sheriff's Department	NY	Video Enhancement	Grand Larceny
Lockport Police Department	NY	Audio Enhancement	Homicide
Madison County Sheriff's Department	NY	Video Enhancement	Larceny
Massachusetts Department of Corrections	MA	Audio Enhancement	Misconduct/Staff
Massachusetts Department of Corrections	MA	Video Enhancement	Assault
Milwaukee Police Department	WI	Video Enhancement	Homicide
Monroe Co. Economic Crime Unit	NY	Audio Enhancement	Forgery
Monroe County District Attorney's Office	NY	Audio Enhancement	Fraud
Monroe County District Attorney's Office	NY	Audio Enhancement	
Mount Pleasant Police Department	NY	Video Enhancement	Burglary
Nassau County Police Department	NY	Audio Enhancement	Homicide
Nassau County Police Department	NY	Audio Enhancement	Murder
Nazareth College	NY	Video Enhancement	Burglary
New Hartford Police Department	NY	Video Enhancement	Burglary
New Hartford Police Department	NY	Video Enhancement	Robbery
New Hartford Police Department	NY	Video Enhancement	Burglary
New York County District Attorney's Office	NY	Audio Enhancement	

New York County District Attorney's Office	NY	Audio Enhancement	Rape
New York County District Attorney's Office	NY	Audio Enhancement	
New York State Attorney General	NY	Audio Enhancement	Fraud
New York State Attorney General	NY	Audio Enhancement	Fraud
New York State Attorney General	NY	Audio Enhancement	Organized Crime
New York State Attorney General	NY	Audio Enhancement	Organized Crime
New York State Attorney General	NY	Video Enhancement	Litigation Support
NYS Bureau of Narcotics Enforcement	NY	Video Enhancement	Burglary
NYS Bureau of Narcotics Enforcement	NY	Video Enhancement	Criminal Possession of Controlled Substance
NYS Bureau of Narcotics Enforcement	NY	Video Enhancement	Criminal Possession of Controlled Substance
New York State Department of Corrections	NY	Video Enhancement	Fraud
New York State Department of Corrections	NY	Video Enhancement	Fraud
New York State Department of Corrections	NY	Audio Enhancement	Sexual Abuse
New York State Department of Corrections	NY	Video Enhancement	Assault
New York State Department of Corrections	NY	Audio Enhancement	Official Misconduct
New York State Department of Corrections	NY	Video Enhancement	Official Misconduct
New York State Department of Corrections	NY	Video Enhancement	Assault
New York State Department of Corrections	NY	Audio Enhancement	Official Misconduct
New York State Department of Corrections	NY	Audio Enhancement	Misconduct/Staff
New York State Department of Corrections	NY	Audio Enhancement	Assault
New York State Department of Corrections	NY	Video Enhancement	Assault
New York State Department of Corrections	NY	Audio/Video	Assault
New York State Department of Corrections	NY	Video Enhancement	Employee Misconduct
New York State Department of Corrections	NY	Video Enhancement	Assault
New York State Department of Corrections	NY	0	Misconduct/Staff
New York State Department of Corrections	NY	Video Enhancement	Criminal Impersonation
New York State Department of Corrections	NY	Video Enhancement	Assault
New York State Department of Corrections	NY	Video Enhancement	Official Misconduct
New York State Department of Corrections	NY	Video Enhancement	Internal Affairs
NYS Department of Environmental Conservation	NY	Video Enhancement	Burglary
NYS Department of Environmental Conservation	NY	Audio Enhancement	Burglary
NYS Department of Environmental Conservation	NY	Image Enhancement	Illegal Disposal
NYS Department of Environmental Conservation	NY	Image Enhancement	Illegal Disposal
New York State Dept. of Transportation	NY	Video Enhancement	Employee Misconduct
New York State Inspector General	NY	Audio/Video	Assault
New York State Inspector General	NY	Video Enhancement	Rape
New York State Lottery Commission	NY	Audio Enhancement	Fraud
New York State Parks Police	NY	Video Enhancement	
New York State Police	NY	Video Enhancement	Hit & Run
New York State Police	NY	Video Enhancement	Drug Distribution
New York State Police	NY	Audio Enhancement	Burglary
New York State Police	NY	Image Enhancement	Forgery
New York State Police	NY	Video Enhancement	Fatal Accident Investigation
New York State Police	NY	Tape Copy	Arson
New York State Police	NY	Tape Copy	Homicide
New York State Police	NY	Image Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Grand Larceny
New York State Police	NY	Audio Enhancement	Internal Affairs
New York State Police	NY	Image Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Video Enhancement	Assault
New York State Police	NY	Image Enhancement	Fraud
New York State Police	NY	Audio Enhancement	Conspiracy
New York State Police	NY	Image Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Larceny

New York State Police	NY	Tape Copy	Aggravated Harassment
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Fraud
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Audio Enhancement	Rape
New York State Police	NY	Audio Enhancement	Official Misconduct
New York State Police	NY	Video Enhancement	Identity Theft
New York State Police	NY	Video Enhancement	Murder
New York State Police	NY	Video Enhancement	Forgery
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Video Enhancement	Murder
New York State Police	NY	Video Enhancement	Larceny
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Audio Enhancement	Child Exploitation
New York State Police	NY	Audio Enhancement	
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Criminal Mischief
New York State Police	NY	Video Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Burglary
New York State Police	NY	Video Enhancement	Petty Larceny
New York State Police	NY	Video Enhancement	Grand Larceny
New York State Police	NY	Video Enhancement	Robbery
New York State Police	NY	Audio/Video	Grand Larceny
New York State Police	NY	Audio/Video	Burglary
Office of the Attorney General	Dc	Audio Enhancement	Scheme to defraud
Ogle Co. Sheriff's Dept.	NY	Audio Enhancement	Assault
Oneida City Police Department	NY	Audio Enhancement	Arson
Oneida County Child Advocacy Center	NY	Video Conversion	Rape
Oneida County Child Advocacy Center	NY	Audio Enhancement	Sexual Abuse
Oneida County District Attorney	NY	Audio Enhancement	Grand Larceny
Oneida County District Attorney's Office	NY	Video Enhancement	Fraud
Oneida County Sheriff's Department	NY	Audio Enhancement	Homicide
Oneida Indian Nation Police	NY	Video Enhancement	Larceny
Onondaga County District Attorney's Office	NY	Audio Enhancement	Homicide
Onondaga County District Attorney's Office	NY	Video Enhancement	Larceny
Onondaga County District Attorney's Office	NY	Video Enhancement	Assault
Onondaga County District Attorney's Office	NY	Video Enhancement	Robbery
Onondaga County District Attorney's Office	NY	Video Enhancement	Robbery
Onondaga County District Attorney's Office	NY	Video Enhancement	Murder
Oswego County Sheriff's Department	NY	Video Enhancement	Robbery
Otsego County Sheriff's Department	NY	Video Enhancement	Burglary
Poughkeepsie Police Department	NY	Audio Enhancement	Homicide
Putnam County Sheriff's Department	NY	Video Enhancement	Homicide
Putnam County Sheriff's Department	NY	Audio Enhancement	Sexual Abuse
Putnam County Sheriff's Department	NY	Video Enhancement	Burglary
Queens County District Attorney's Office	NY	Video Enhancement	Robbery
Queens County District Attorney's Office	NY	video authentication	Misconduct/Staff
Ravenna Police Department	NY	Audio Enhancement	Robbery
Rochester Police Department	NY	Audio Enhancement	Assault
Rome Police Department	NY	Video Enhancement	Grand Larceny
Rome Police Department	NY	Audio Enhancement	Sexual Abuse
Rome Police Department	NY	Video Enhancement	Larceny

Rome Police Department	NY	Video Enhancement	Homicide
Rome Police Department	NY	Video Enhancement	Possession of Controlled Substance
Rome Police Department	NY	Tape Copy	Robbery
San Francisco Police Department	CA	Video Enhancement	Homicide
San Francisco Police Department	CA	Video Enhancement	Homicide
San Francisco Police Department	CA	Video Enhancement	Homicide
Schenectady Police Department	NY	Audio Enhancement	Unknown
State of CT - Litchfield State's Attorney General	CT	Audio/Video	Narcotics
Suffolk County Police Department	NY	Video Enhancement	Murder
Suffolk County Police Department	NY	Audio Enhancement	Murder
Sullivan Co. Sheriff's Department	NY	Audio Enhancement	Attempted Murder
Sullivan County District Attorney's Office	NY	Video Enhancement	Attempted Murder
Syracuse Police Department	NY	Video Enhancement	Attempted Murder
Syracuse Police Department	NY	Video Enhancement	Attempted Murder
Syracuse Police Department	NY	Video Enhancement	Homicide
Syracuse Police Department	NY	Video Enhancement	Homicide
Town of Cicero Police Department	NY	Video Enhancement	Burglary
Town of Kent Police Department	NY	Video Enhancement	Burglary
Troy Police Department	NY	Video Enhancement	Grand Larceny
Troy Police Department	NY	Image Enhancement	Attempted Murder
Troy Police Department	NY	Video Enhancement	Possession of Stolen Property
Troy Police Department	NY	Video Enhancement	Burglary
Troy Police Department	NY	Video Enhancement	Grand Larceny
Troy Police Department	NY	Video Enhancement	Assault
Troy Police Department	NY	Audio/Video	Murder
United States Attorney's Office	DC	Video Enhancement	Assault
United States Attorney's Office	DC	Audio Enhancement	Fraud
United States Attorney's Office	DC	Audio Enhancement	Firearm Possession
United States Postal Inspectors	DC	Video Enhancement	Distribution of Illegal Drug
United States Postal Inspectors	DC	Image Enhancement	Fraud
Utica Police Department	NY	Audio Enhancement	Arson
Utica Police Department	NY	Audio/Video	Robbery
Utica Police Department	NY	Audio Enhancement	Assault
Vermillion Police Department	NY	Speaker ID	Stalking
Village of Endicott Police Department	NY	Audio Enhancement	Murder
Warren Co (NY) Sheriff's Dept.	NY	Audio Enhancement	Conspiracy
Wethersfield Police Department	935	Speaker ID	Aggravated Harassment
Whitesboro Police Department	NY	Video Enhancement	Larceny
Whitesboro Police Department	NY	Video Enhancement	Larceny
Whitesboro Police Department	NY	Video Enhancement	Robbery
Whitesboro Police Department	NY	Video Enhancement	Counterfeiting
Whitestown Police Department	NY	Video Enhancement	Larceny
Whitestown Police Department	NY	Video Enhancement	Grand Larceny
Wilton Police Department	CT	Audio Enhancement	Death Investigation
Yellowstone National Park (Dept of the Interior)	DC	Video Enhancement	Felony
Yorkville Police Department	NY	Video Enhancement	Burglary
Yorkville Police Department	NY	Video Enhancement	Robbery

5. FBI SUPPORT

In 2004, the FBI, through its Forensic Support Unit (FSU) requested that the NLECTC-NE/LEAF provide quality assurance support to its Forensic Audio Video Image Analysis Unit (FAVIAU). FAVIAU assists the FBI, national and international law enforcement agencies, and the courts with forensic examinations of recorded audio, video, and photographic media.

Specific support provided by the NLECTC-NE/LEAF includes; examiner proficiency testing, technician competency testing, forensic tool validation, and technology evaluation. In addition to improving the quality of FAVIAU, the FBI is using the support provided by the NLECTC-NE/LEAF to maintain American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) (<http://www.asclld-lab.org>) laboratory accreditation.

NLECTC-NE/LEAF participated in the following meetings to review program goals and objective:

21-23 Mar 07 – Met with FBI Forensic Support Unit Chief, Mr. Dale Linden at the NLECTC-NE/LEAF to review project status.

10-15 Mar 08 – Met with the FSU Unit Chief at the NLECTC-NE/LEAF to provide the new FBI Digital Evidence Section Chief and the Forensic Support Unit Chief a briefing and tour of the LEAF.

11 Sep 08 - Hosted a meeting between the FSU Unit Chief, the NLECTC-NE Region Director and the NLECTC-NE/LEAF AFRL Program Manager. The meeting was held to review the status of the support program, and to introduce the new FBI Digital Evidence Section Chief, Thomas Greg Motta, to the NLECTC-NE, LEAF, Cyber Science Laboratory (CSL), and AFRL.

23 Feb 09 - Conducted a Program Review with FBI FSU Unit Chief.

Attended a meeting with the Directors of the National Law Enforcement and Corrections Technology Center – Northeast Region to discuss the status and direction of the FBI Quality Assurance Support Program.

5.1 PROFICIENCY TESTING

The NLECTC-NE/LEAF conducts proficiency testing for forensic examiners in FAVIAU and competency testing for technicians in the Regional Computer Forensic Laboratories (RCFL). Initially, tests are designed for each forensic discipline to be tested in a given year. Test instructions and the associated data sets are created, and tested at the NLECTC-NE/LEAF prior to being forwarded to FSU for approval. In addition, grading material for each test is also created and provided to FSU for approval prior to the dissemination of the tests. After the tests are approved for use, they are duplicated and disseminated to the examiners in FAVIAU and the field. When completed, the tests are returned to the NLECTC-NE/LEAF for grading using the aforementioned previously approved grading material. If necessary, remedial materials are provided and new tests created, disseminated and graded. Lastly, a report summarizing the test program is provided to the FSU Unit Chief. The report includes the results of examiner testing, general observations and specific concerns, and recommendations for future testing.

The following details the efforts provided by the NLECTC-NE/LEAF related to Proficiency Testing:

5.1.1 2006 Proficiency Testing Program

Based on feedback from the Forensic Support Unit, NLECTC-NE/LEAF personnel finalized the grading material regarding the 2006 Proficiency Test program. Proficiency test grading material included:

- *Standard Operating Procedures (SOP) Rubric* – Used to determine test subject compliance with organizational standard operating procedures relative to the functional area tested.
- *Grading Spreadsheet* – Used to document testing results based on criteria established in the Grading Key. Successful completion of the proficiency test requires the test subject to receive a minimum of 75 out of a possible 100 points.
- *Proficiency Test Results* – Used to provide feedback to the test subject regarding proficiency test performance.

Test preparation documents were completed and provided to FAVIAU in the following functional areas: Audio Reconstruction/Enhancement, Audio Reconstruction/Enhancement/Signal Analysis, Video Reconstruction/Enhancement, and Video Enhancement/Image Comparison. Both hard and soft copies of the preparation documents were provided.

The NLECTC-NE/LEAF developed the 2006 Proficiency Test summary memo and forwarded it to the Forensic Support Unit Chief. The memo is a synopsis of the 2006 Internal Proficiency Testing program, and includes the results of the examiner testing, general observations and concerns, and recommendations for future testing. Hard and soft copies of the memo were provided.

5.1.2 2007 Proficiency Testing Program

21 Mar 07 – Met with the FSU Unit Chief at the NLECTC-NE/LEAF to determine functional areas to be tested during the 2007 proficiency test program. Pursuant to that meeting, the following areas will be tested in 2007: Voice Comparison, Audio Duplication, Audio Enhancement, Video Enhancement, Video Duplication, Video De-Multiplexing, Image Enhancement, and Film Conversion.

Audio Enhancement

The Audio Enhancement test required the examiner to clarify a recorded conversation, stored in MP3 format, contained on a compact disc. The NLECTC-NE/LEAF utilized FBI supplied equipment to collect and record the data. The test audio data was a two-party conversation between a male and female collected under controlled conditions at the NLECTC-NE/LEAF. The audio test was peer reviewed by NLECTC-NE/LEAF personnel following its generation. The audio data and accompanying instruction form were sent to the Forensic Support Unit for review.

Voice Verification

The voice verification test required the examiner to perform a verification exam between 2 separate data sets. An unknown speaker was recorded digitally and compared to 3 known voice exemplars recorded on analog standard cassette. The test parameters were established during a teleconference between the Forensic Support Unit and NLECTC-NE/LEAF staff.

Video Enhancement

The video enhancement test required the examiner to enhance a multiplexed analog video cassette. The NLECTC-NE/LEAF utilized FBI supplied equipment to collect and record the data. The test video data to be enhanced contained a target individual, captured by a 7-camera, multiplexed video surveillance system, and observed committing a simulated crime. The data was recorded under controlled conditions at the NLECTC-NE/LEAF.

Image Enhancement

The image enhancement test required the examiner to enhance previously developed 35mm color negatives. The test data was collected at the NLECTC-NE/LEAF with a 35mm color camera. Supporting documentation (test instructions) was also completed.

The NLECTC-NE/LEAF completed a video enhancement proficiency test for FBI field examiners. The video enhancement test will require the examiner to enhance a multiplexed analog video cassette. Supporting documentation was also completed. The test was sent to the Forensic Support Unit for their review.

The NLECTC-NE/LEAF completed and sent the 2007 voice comparison proficiency test to the Forensic Support Unit for their review. Supporting documentation was also completed. Based on Forensic Support Unit comments, a second 2007 voice comparison proficiency test was created and sent to the Forensic Support Unit for review.

The NLECTC-NE/LEAF sent the following proficiency tests to the Forensic Support Unit;

- Seven (7) 2007 Image Enhancement/Film Conversion.
- Ten (10) 2007 Video Enhancement proficiency tests to the Forensic Support Unit.
- Nine (9) 2007 Audio Enhancement proficiency tests to the Forensic Support Unit.

The NLECTC-NE/LEAF completed a number of documents to support Image Enhancement, Video Enhancement, Audio Enhancement, and Voice Comparison proficiency tests. Specifically, the following documents were provided to the Forensic Support Unit for their review and revised as necessary:

- Proficiency Test Preparation – Used to document the proficiency test data preparation process.
- Proficiency Test Media Quality Check – Used to independently verify the quality of the proficiency test data.
- Proficiency Test Verification - Used to verify the quality of each proficiency test. The verification process will determine that; the test is suitable for testing, the test documentation and materials are complete and accurate, the test data is of sufficient quality and the anticipated results are achievable.

The above documents supported the following proficiency tests:

- 07IE01 – Image Enhancement
- 07VE01 – Video Enhancement (Test 1)
- 07VE02 – Video Enhancement (Test 2)
- 07AE01 – Audio Enhancement (Test 1)
- 07AE02 – Audio Enhancement (Test 2)
- 07VC01 – Voice Comparison (Test 1)
- 07VC02 – Voice Comparison (Test 2)

The NLECTC-NE/LEAF also finalized the following Proficiency Test Grading documents:

- 07IE01 – Image Enhancement
- 07VE01 – Video Enhancement (Test 1)
- 07VE02 – Video Enhancement (Test 2)
- 07AE01 – Audio Enhancement (Test 1)
- 07AE02 – Audio Enhancement (Test 2)
- 07VC01 – Voice Comparison (Test 1)
- 07VC02 – Voice Comparison (Test 2)

The grading material included the following documents: Answer key, Standard Operating Procedure RUBRIC, Points Structure, and Examiner Comments.

The NLECTC-NE/LEAF submitted the following proficiency tests to the Forensic Support Unit:

- Ten (10) Video Enhancement (Field) Proficiency Test data sets were provided to the FSU. The data sets were in VHS format. The VHS tests were duplicated from an original digital master copy in Mini-DV format.
- One (1) Audio Enhancement Proficiency Test data set was provided to the FSU. The data set was a digital file on compact disc.

The NLECTC-NE/LEAF created a second Voice Comparison Proficiency Test. The test will require the tested examiner to compare a speech sample from an unknown speaker against speech samples from three known speakers and determine which one of the known exemplars (if any) is the unknown speaker.

Two (2) copies of the second Voice Comparison Proficiency Tests were sent to the FSU. The tests were contained on eight (8) compact discs. Two (2) discs contain the unknown caller. Six (6) discs contain known exemplars.

The NLECTC-NE/LEAF developed a web-based interface, dynamically linked to the proficiency test grading documents, which will facilitate the grading of the above proficiency tests.

The NLECTC-NE/LEAF discussed with FBI FSU Unit Chief, the policy for grading previously disseminated examiner proficiency tests. It was decided that the Unit Chief will be present during the grading of the tests by NLECTC-NE/LEAF personnel.

The NLECTC-NE/LEAF received eight (8) completed 2007 examiner proficiency tests from the FSU. The tests have been entered into the NLECTC-NE/LEAF proficiency test tracking database.

The NLECTC-NE/LEAF participated in a teleconference with the FSU Unit Chief and the Quality Assurance Manager. Pursuant to the Unit Chiefs request, the Proficiency Test Media Quality Check forms were revised and FedEx'd to the Forensic Support Unit. The Proficiency Test Media Quality Check forms confirmed test data quality for the follow 2007 proficiency tests:

- 07VC01 - Voice Comparison
- 07VC02 – Voice Comparison
- 07VE01 - Video Enhancement
- 07VE02 – Video Enhancement
- 07AE01 – Audio Enhancement
- 07AE02 – Audio Enhancement
- 07IE01 – Image Enhancement

The NLECTC-NE/LEAF developed a second set of proficiency test grading documents for Proficiency Test 07VE01. The Field Examiners (FAVP) utilize different Standard Operating Procedures (SOP) than those used by the Forensic Audio Video and Image Analysis Unit (FAVIAU) examiners. It was therefore necessary to revise the grading documents for the FAVP personnel. The Proficiency Test grading system is based on examiner adherence to Standard Operating Procedures (SOP), documentation of the examination process, and the quality of the processed data. The grading system includes the following documents: SOP Rubric, Grading Structure, and Examiner Results. The revised grading material was sent to the Forensic Support Unit for their review.

The NLECTC-NE/LEAF completed the grading documentation for the 2007 proficiency test series, and staff finalized the 2007 examiner proficiency test grading documents. The hard copy grading was sent to the FBI Forensic Support Unit for their review.

The NLECTC-NE/LEAF received four (4) remedial Proficiency Tests from the Forensic Support Unit and graded same. The remedial tests were created in response to four 2007 proficiency tests that were unsuccessful completed. The tests and associated grading materials were sent to the Forensic Support Unit for their review. The grading material included a Standard Operating Procedures Rubric, an Examiners Feedback document, and Scoring (Results) document for each examiner.

The Internal Proficiency Test Results document was completed for the Forensic Support Unit. This document was a synopsis of the 2007 Internal Proficiency Testing program and included the results of examiner testing, general observations and specific concerns, and recommendations for future testing. The document was provided in electronic format to the Forensic Support Unit for their review. Upon review, the Forensic Support Unit Chief made recommendations for change.

Per a request from the FSU Unit Chief, the 2007 Proficiency Test preparation documents were resent to the Unit for their review. This included Proficiency Tests for the following forensic disciplines: Audio Enhancement, Video Enhancement, Voice Comparison, and Image Enhancement/Film Conversion.

The NLECTC-NE/LEAF provided proficiency tests to two examiners from the Wisconsin Department of Justice. The examiners were evaluated based on three criteria: Adherence to agency Standard Operating Procedures, the correct application of appropriate video and image processing techniques, and the level of enhancement/improvement of the submitted data. The grading material and a certificate of successful completion were sent to the Wisconsin State Crime Laboratory on 26 January 2007.

Pursuant to their request, the NLECTC-NE/LEAF provided three documents regarding proficiency test creation quality assurance to the Forensic Support Unit. The Proficiency Test Verification and Approval, Proficiency Test Data Peer Review, and Preparing Proficiency Test Administrative Review documents were emailed to the FBI program manager.

5.1.3 FBI Proficiency Testing 2008 Test Series

The NLECTC-NE/LEAF and Forensic Support Unit Chief determined the forensic disciplines to be tested for the 2008 proficiency test spiral. The disciplines to be tested were:

- Audio Enhancement
- Video Enhancement
- Image Comparison/Height Determination
- Audio Authenticity
- Video Authenticity

Audio Enhancement

The Audio Enhancement test required that the examiner clarify a recorded conversation, stored in MP3 format, contained on a compact disc. The test audio data to be enhanced was a two-party conversation between a male and female. The examiner was supplied with a compact disc containing a proprietary format audio file and an audio playback application (Digital Voice Player). The following actions were completed as part of this process:

NLECTC-NE/LEAF purchased a hand-held Digital Audio Recorder that was used to collect audio data for the proficiency test.

- The NLECTC-NE/LEAF collected the audio data used for the proficiency test. The data was collected under controlled conditions at the LEAF.
- Created the test instruction material.
- Completed the audio enhancement grading methodology and the Proficiency Test Grading System document. The document details the testing approach, functional areas tested, quality review process, review of testing results, and documentation. The Grading Systems document was forwarded to the Forensic Support Unit for their review.
- The audio test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test audio data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF created duplicate examiner proficiency test data sets for the audio proficiency test.

Video Enhancement

The video enhancement test required the examiner to clarify a digitally recorded video sequence. The test video data to be enhanced will simulate a quad video surveillance collection and will be recorded digitally with a Digital Video Recorder (DVR). The examiner was supplied with a compact disc containing a proprietary format video file and the file playback application. The following actions were completed as part of this process:

- Purchased a Digital Video Recorder that was used to collect video data for the proficiency test.
- Collected the video data used for the proficiency test. The data was collected under controlled conditions at the LEAF
- Created the test instruction material.
- Completed the video enhancement grading methodology.
- The video test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test video data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF created duplicate examiner proficiency test data sets for the video proficiency test.

Image Comparison/Height Determination

The Image Comparison/Height determination test required the examiner to perform two tasks. Task one was to compare printed images of a known individual with digital images of an unknown individual. Based on the comparison, the examiner must make a determination whether the compared data contained images of the same individual. Task two required the examiner to determine the height of the individual in the digital images based on known measurements from within the scene. The examiners were supplied with a CD-ROM containing 18 digital images and 3 printed images. The following actions were completed as part of this process:

- Collected the video and image data used for the proficiency test. The data was collected under controlled conditions at the LEAF
- Created the test instruction material.
- Completed the Image Comparison/Height determination grading methodology.
- The Image Comparison/Height determination test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF created duplicate examiner proficiency test data sets for the Image Comparison/Height determination proficiency test.

Audio Authenticity

The purpose of the Audio Authentication process is to examine an audio data set to determine if the data had been tampered with either by adding or removing speech in such a manner as to have it represent something that the original data did not. The audio authenticity test required the examiner to determine whether an audio data set had been manipulated. The examiners were supplied with a standard audio cassette containing recorded audio material. The following actions were completed as part of this process:

- Collected the audio data used for the proficiency test. The data was collected under controlled conditions at the NLECTC-NE/LEAF using FBI supplied hardware.
- Created the test instruction material.
- Completed the audio authentication grading methodology.
- The audio authentication test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF created duplicate examiner proficiency test data sets for the audio authentication proficiency test.

Video Authenticity

The purpose of the Video Authentication process is to examine a video data set to determine if the data had been tampered with either by adding or removing material in such a manner as to have it represent something that the original data did not. The video authenticity test required the examiner to determine whether a video data set had been manipulated. The examiners were supplied with a 6MM (MiniDV) format digital video cassette containing recorded video material. The following actions were completed as part of this process:

- Collected the video data used for the proficiency test. The data was collected under controlled conditions at the NLECTC-NE/LEAF using FBI supplied hardware.
- Created the test instruction material.
- Completed the video authentication grading methodology.
- The video authentication test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF created duplicate examiner proficiency test data sets for the video authentication proficiency test.

The NLECTC-NE/LEAF created remedial proficiency tests for FAVIAU examiners and field personnel who did not successfully complete their 2008 Proficiency Tests. Specifically, remedial proficiency tests were provided in the video enhancement and video authentication forensic disciplines. Each proficiency test included a unique test data set, instruction material, and other supporting documentation.

5.1.4 FBI Proficiency Testing 2009 Test Series

Participated in a teleconference with the Forensic Support Unit (FSU) to determine what forensic disciplines will be tested in the 2009 proficiency test program. The forensic disciplines to be tested are as follows:

- Audio Enhancement/Reconstruction
- Video Enhancement/Reconstruction/Duplication
- Voice Comparison
- Video Enhancement for select Regional Computer Forensic Lab (RCFL) personnel
- Video Enhancement/Audio Enhancement for select RCFL personnel

The NLECTC-NE/LEAF began creating data sets for the voice comparison and video enhancement proficiency tests.

The NLECTC-NE/LEAF provided the FSU a revised set of instructions for the Video Reconstruction/Enhancement proficiency test. The instructions were based on feedback from a Forensic Audio Video Image Analysis Unit (FAVIAU) examiner.

The NLECTC-NE/LEAF:

Created and sent nine (9) video proficiency test data sets to the Forensic Support Unit. The data sets were 8MM format and will be used to test the following forensic disciplines: Video Enhancement, Magnetic (video) Tape Repair, and Format Conversion. The tapes were purposefully cut prior to shipment.

Created and sent fifteen (15) Field Audio Video Program (FAVP) proficiency test data sets to the Forensic Support Unit. The data sets were contained on compact disc and will test the field audio enhancement and field video enhancement forensic disciplines. Specifically, ten data sets will be used for video only proficiency tests, and five will be used for video and audio proficiency tests.

Created and sent nine (9) Audio proficiency test data sets to the Forensic Support Unit. The data sets were standard audio cassette tapes and will be used to test the following forensic disciplines: Audio Enhancement, Magnetic (audio) Tape Repair, Duplication, and Format Conversion. The tapes were purposefully cut prior to shipment

The NLECTC-NE/LEAF created the following support documents related to the 2009 proficiency testing program:

- 2009 Proficiency Test Designee Form
- VC-09 Test Media Quality Check Form (Test 1)
- VE-09 MediaQualityCheck (Pre Test)
- VE-09 MediaQualityCheck (Test 1,2,3,4,5,6,7,8,9)
- AE-09 Test Media Quality Check Form (Pre Test)
- AE-09 Test Media Quality Check Form (Test 1,2,3,4,5,6,7,8,9)
- FAVP Test Media Quality Check Form (Pre Test)
- FAVP Test Media Quality Check Form (Test 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15)
- FAVP Test Media Quality Check Form (Test 16,17,18,19,20,21,22,23)
- Sargent Qualifications
- Spadea Qualifications
- Galotti Qualifications

The documents were sent to the Forensic Support Unit for review.

The Forensic Support Unit was provided with a revised set of instructions for the Video Reconstruction/Enhancement proficiency test from the NLECTC-NE/LEAF. The instructions were based on feedback from a Forensic Audio Video Image Analysis Unit (FAVIAU) examiner.

The NLECTC-NE/LEAF created and sent nine (9) video proficiency test data sets to the Forensic Support Unit. The data sets were 8MM format and will be used to test the following forensic disciplines: Video Enhancement, Magnetic (video) Tape Repair, and Format Conversion. The tapes were purposefully cut prior to shipment.

The NLECTC-NE/LEAF created and sent fifteen (15) Field Audio Video Program (FAVP) proficiency test data sets to the Forensic Support Unit. The data sets were contained on compact disc and will test the field audio enhancement and field video enhancement forensic disciplines. Specifically, ten data sets will be used for video only proficiency tests, and five will be used for video and audio proficiency tests.

Nine (9) Audio proficiency test data sets were created and sent to the Forensic Support Unit. The data sets were standard audio cassette tapes and will be used to test the following forensic disciplines: Audio Enhancement, Magnetic (audio) Tape Repair, Duplication, and Format Conversion. The tapes were purposefully cut prior to shipment.

Pursuant to a request from the Forensic Support Unit (FSU), the NLECTC-NE/LEAF will provide an Image analysis related proficiency test as part of the 2009 test series. Initially, the image test was going to be created by the office of the National Institute of Standards Technology (NIST), however that effort has fallen through. Specifically, an Image Enhancement/Image Content Authentication Test will be created by the NLECTC-NE/LEAF.

Image Enhancement/Image Content Authentication

The purpose of the Image Content Authentication process is to examine an image data set to determine if all or part of the data had been altered either by adding or removing content in such a manner as to have it represent something that the original data did not. It can also include the analysis of images, to determine if it, or a portion of it, had been generated by a computer. The following actions were completed by NLECTC-NE/LEAF as part of this process:

- Collected the image and video data used for the proficiency test. The data was collected under controlled conditions at the LEAF using FBI supplied hardware.
- Created the test instruction material.
- Completed the Image Enhancement/Image Content Authentication grading methodology.
- The Image Enhancement/Image Content Authentication test was peer reviewed by the NLECTC-NE/LEAF following its generation.
- The test data and the associated instruction and grading materials were sent to the Forensic Support Unit for review.
- Based on a feedback from the Forensic Support Unit, the NLECTC-NE/LEAF modified the original test instruction material.

The NLECTC-NE/LEAF created and sent five (5) Image Enhancement/Image Content Authentication proficiency tests to the Forensic Support Unit.

The NLECTC-NE/LEAF received forty-five (45) completed proficiency tests for grading.

Utilizing the previously established grading material, the NLECTC-NE/LEAF graded the 45 proficiency tests. The results were provided to the Forensic Support Unit.

The NLECTC-NE/LEAF discussed the feasibility of providing an image authentication proficiency test to the United States Army Crime Laboratory with Amy Corrigan, Proficiency Test Program Manager. It was agreed that the NLECTC-NE/LEAF will provide the test and that the US Army Crime Laboratory will contact the NLECTC-NE/LEAF with their requirements. Subsequently, the NLECTC-NE/LEAF developed an image authentication proficiency test that required an examiner to determine if a digital image had been intentionally altered by altering or compositing.

5.2 COMPETENCY TESTING

Competency Testing is conducted for personnel assigned to Regional Computer Forensic Laboratories (RCFL) who may be called upon to examine video, audio or images and/or provide some preliminary processing of same. Each discipline has a set number of tasks that each technician is expected to be competent in. For Video/Image there are 17 tasks that were to be tested. For Audio there are 7 tasks.

The tests are broken into three phases. Phase I and Phase II cover all of the basic tasks involved in the discipline. Phase III is a comprehensive test where the technicians are provided mock forensic data and asked to identify what tasks are needed for this data and conduct the required examinations.

Two separate groups of examiners were tested during the contract period of performance; Group 2 ending in 2007 and Group 3 in 2009³.

Group 2

The following represent activities performed as part of Group 2:

The NLECTC-NE/LEAF received and graded a Group 1 Phase III test from the Houston Regional Computer Forensic Laboratory. The trainee had been temporarily assigned a different duty station and was unable to complete the test until recently. The results of the testing were forwarded to the Field Audio/Video Program (FAVP) office.

The NLECTC-NE/LEAF:

Shipped all (10) graded competency tests (Group 2, Phase I) and supporting documentation to Dale Linden. Each graded test package included:

- Standard Operating Procedures (SOP) Rubric - Used to determine test subject compliance with organizational standard operating procedures relative to the functional area tested.
- Grading Spreadsheet - Used to document testing results based on criteria established in the Grading Key.
- Proficiency Test Results – Used to provide feedback to the test subject regarding competency test performance.

Developed Group 2 Phase II video competency tests and related test materials and shipped 12 Group 2 Phase II competency tests to the appropriate trainees.

Participated in a teleconference with the Forensic Support Unit Chief and the Field Audio Video Program (FAVP) Manager. The status of the competency testing (Group 2) program was discussed.

Provided the Field Audio Video Program (FAVP) Manager copies of the Phase I A/B test material. The test material included the test data on compact disc and the associated test instructions.

Shipped completed video competency tests (Group 2, Phase II) to the Field Audio/Video Program (FAVP) office. Some of the trainees had experienced a problem in performing the tasks. Utilized the Avid Xpress video enhancement system to process the Group 2, Phase II competency test A. This was done to attempt to recreate difficulties that some trainees had while processing the test data.

Provided Group 2 Phase II video testing results to the Field Audio/Video Program (FAVP) office.

Contacted an FBI Computer Analysis and Response Team (CART) Forensic Examiner, participating in the FBI Competency Testing Program who was experiencing hardware difficulties which may subsequently cause problems with the Phase II video test.

³ Competency Test Group 1 was completed as part of an earlier contract effort.

Created and delivered 11 Group 2, Phase III video competency tests. 9 tests were provided to trainees, and 2 to the Field Audio/Video Program (FAVP) office.

Received and completed grading of Group 2 Phase III video competency tests and returned tests and grading material to the Forensic Audio Video Program (FAVP) office via FedEx.

Graded the following additional video competency tests:

- Two Group 2 Phase II remedial tests from the Chicago RCFL and the New York City field office.
- Two Group 2 Phase I tests were received from the New Jersey RCFL.

Returned five graded competency tests via FedEx'd to the Field Audio Video Program (FAVP) office.

Provided and received one (1) Group 2, Phase III Remedial test to the Chicago Regional Computer Forensic Laboratory (RCFL).

The NLECTC-NE/LEAF held a teleconference with the Field Audio/Video Program (FAVP) office to discuss upcoming audio enhancement competency testing program. The Audio Enhancement test will require the examiner to clarify a recorded conversation contained on a VHS cassette tape. FBI supplied equipment was used to collect and record the data. The test audio data to be enhanced is a two-party conversation between two males collected under controlled conditions at the NLECTC-NE/LEAF. The audio test was peer reviewed by the NLECTC-NE/LEAF following its generation. The instruction forms were sent to the Forensic Support Unit for review. FAVP reviewed the material and approved its use. Based upon the review Six (6) audio competency tests (data set, instruction form, and documentation form) were sent to trainees at:

- Boston FBI Field Office
- Chicago Regional Computer Forensic Laboratory (RCFL)
- Dallas RCFL
- Kansas City RCFL (2 trainees)
- Kansas City RCFL
- San Diego RCFL

The NLECTC-NE/LEAF completed grading of one Group 2 Phase III video competency test from the Chicago Regional Computer Forensic Laboratory (RCFL). A second Group 2 Phase III video competency test, from the New York City field office, was reviewed but not graded. Upon review, the test was determined to be incomplete and grading was not warranted.

The NLECTC-NE/LEAF developed the audio competency test grading system. The grading system is based on examiner adherence to Standard Operating Procedures (SOP), documentation of the examination process, and the quality of the processed data. The grading system includes the following documents: SOP Rubric, Grading Structure, and Examiner Results. Utilizing the audio competency test grading system to grade competency tests from the following offices:

- Boston Field Office
- Chicago Regional Computer Forensic Laboratory (RCFL)
- Dallas RCFL
- Kansas City RCFL (2 separate tests)
- San Diego RCFL

The NLECTC-NE/LEAF:

Sent the graded audio enhancement competency tests to the Forensic Audio Video Image Analysis Unit (FAVIAU) for their review.

Participated in a teleconference with the Field Audio Video Program (FAVP) manager. Pursuant to direction from the FAVP manager, copies of two previously graded video competency tests were sent for review.

Participated in a teleconference with the Field Audio Video Program (FAVP) manager. Requirements for the 2008 Audio Competency Testing Program were discussed.

Pursuant to a request from the Forensic Audio Video Image Analysis Unit Q/A Manager, the NLECTC-NE/LEAF sent copies of completed grading material for two previously tested Forensic Audio/Video Program (FAVP) trainees.

The NLECTC-NE/LEAF staff, the Forensic Support Unit Chief, and the Field Audio/Video (FAVP) Program Manager reviewed the upcoming trainee testing program.

The NLECTC-NE/LEAF received and reviewed the Forensic Audio Video Program (FAVP) Basic Training Course Schedule.

The NLECTC-NE/LEAF attended the two-week program at the FBI facility in Stafford, VA. The program was held 04/14/08 thru 04/25/09.

Based on a request from the Field Audio Video Program (FAVP) Program Manager, the NLECTC-NE/LEAF emailed a copy of the updated version of the Audio/Video Worksheet for her review.

The NLECTC-NE/LEAF developed "Certificates of Completion" for Field Audio Video Program (FAVP) examiners who successfully completed the 2007 proficiency test program. The certificates were sent, via FedEx, to the Forensic Support Unit.

Group 3

The following represent activities performed as part of Group 3:

The NLECTC-NE/LEAF:

Completed grading of the Phase I competency tests. Four Trainees did not successfully complete Phase I.

Interfaced with the FSU to relay the status of all Phase I test participants.

Created and disseminated 3 remedial Phase I tests for trainees who did not successfully complete Phase I. Based on direction from the FSU, one trainee would not be sent a remedial Phase I test.

Created and disseminated a DVD format video test for the Phase II competency test program. 10 Phase II tests were sent.

Sent a Phase I video competency test to the New York field office.

Created and disseminated 2 Phase II video competency tests.

Created and disseminated 4 remedial Phase II video competency tests for trainees who did not successfully complete Phase II.

Graded 15 Phase II video competency tests and remedial video competency tests.

Created and disseminated 9 Phase III video competency tests.

Graded nine Phase II competency tests. All examiners successfully completed the test.

Created and mailed remedial 3 Phase III Competency Tests for FBI Field Audio Video Program personnel. The Competency Tests were sent to the Buffalo and Houston Regional Computer Forensic Laboratories.

Graded a Phase III Competency Test for an FBI Field Audio Video Program trainee at the Salt Lake City RCFL.

Graded a Group 3, Phase III competency test. The examiner had not successfully completed early phase competency tests, which delayed the issuance of the Phase III test. This test was also not successfully completed. The results were provided to the Forensic Support Unit.

Created and sent five video competency tests to FBI Field Audio Video Program (FAVP) examiners. Tests were sent to the Buffalo Regional Computer Forensic Lab (RCFL) and the Cleveland and New York field offices.

Graded 3 remedial competency tests from the Buffalo and Cleveland field offices.

5.3 FORENSIC TOOL VALIDATION

Before hardware/software tools are accepted for use by the FBI FAVIAU they must be evaluated to determine if their usefulness to the units efforts. This evaluation primarily examines the claims of the vendor as to the tools ability to perform. After the tools are accepted for use the individual functions of the tools have to be validated to insure that first they do perform the function correctly and secondly to insure that the tools do not corrupt the data in the process. This process is important for supporting the testimony of the examiners in court.

The NLECTC-NE/LEAF forwards a spreadsheet weekly, detailing the status of the assigned Validation tasks to the FBI FSU. This sheet includes request date, in-progress status, completion, etc. In addition to the weekly status reports, regular teleconferences with FBI Forensic Support Unit Chief are conducted to update the status on various tasks assigned to the NLECTC-NE/LEAF. The weekly call identifies where bottlenecks may be occurring in an effort to move the work forward.

Two Booz Allen Hamilton (BAH) employees visited the NLECTC-NE/LEAF. BAH provides support to the FBI's Digital Evidence Laboratory in Quantico. The FBI has requested that BAH interview all personnel involved in his test/validation program. During their visit, the NLECTC-NE/LEAF staff was separately interviewed regarding their support to the test/validation program. The interviews were approximately one hour in length each. The FBI Forensic Support Unit Chief initiated this process in an attempt to streamline and coordinate (where possible) the disparate test and validation efforts he currently manages.

The NLECTC-NE/LEAF, accompanied by the FBI Forensic Support Unit Chief, traveled to the New York State Police Forensic Laboratory in Albany, New York, to meet with Director of Forensic Video/Multimedia Services for the New York State Police. Discussed at the meeting was the status of the NLECTC-NE/LEAF support to the Forensic Support Unit relative to forensic tool validation, and examiner proficiency testing. The FBI is looking to establish a method to facilitate the dissemination of their technology test/validation documents to state and local criminal justice practitioners.

The FBI's Cryptologic and Electronic Analysis Unit (CEAU) Minor Revision Validation Test Results Summary form was reviewed by the NLECTC-NE-LEAF. Its purpose is to document testing results of minor revisions and/or upgrades of previously tested systems and software. Also included would be any performance changes of the system or software following the installation of an updated computer operating system (OS). The FBI has instructed the NLECTC-NE/LEAF to create a similar form for the Forensic Audio Video Image Analysis Unit (FAVIAU) technology validation program.

Assistance was provided to the FBI Forensic Support Unit Chief in the creation of an FBI Digital Evidence Laboratory overview briefing for the Regional Advisory Council meeting and contract kickoff meeting.

A request was received from the Forensic Support Unit to validate the linear deblurring function of the Signalscape video processing system. In response, an email was sent to Signalscape requesting information regarding performance information of the linear deblurring function amongst the different versions of the software.

The NLECTC-NE/LEAF spoke with the Forensic Support Unit regarding their need to have the Signalscape Star Witness Freeze Frame video processing system validated. Dale Linden will forward a Technology Validation Request form to the NLECTC-NE/LEAF. The NLECTC-NE/LEAF then spoke with the Sales Manager for Forensic Solutions, Signalscape Inc. regarding the FBI validation program. As a result, Signalscape has agreed to provide the NLECTC-NE/LEAF the following items:

- Star Witness Video Pro v. 1.6 - Software update to the 1.5.0.25 version that the NLECTC-NE/NLECTC-NE/LEAF currently possesses.
- Star Witness Freeze Frame - Hardware system. See <http://starwitness.com/Products/FreezeFrame/video.aspx>.
- DVR Pro Recorder (software) – Stand-alone, screen capture (digital) utility.

The Signalscape, the Star Witness (v. 1.6) video enhancement software was received and subsequently installed on the Signalscape PC at the LEAF for testing and demonstration. The software is an upgrade from the 1.5.0.25 version that the NLECTC-NE/LEAF validated in 2006. The software will be tested for possible forensic use by FBI video and image examiners. Signalscape also provided the FreezeFrame (v.1.2) video enhancement system. The system will be tested for possible forensic use by FBI video and image examiners. The system has been set-up at the NLECTC-NE/LEAF for testing and demonstration. The above software will be loaned for the period of the validation only.

Pursuant to a request from FAVIAU, the NLECTC-NE/LEAF provided support in creating technology conformance data sets for use by FAVIAU examiners. Specifically, the NLECTC-NE/LEAF has converted and duplicated a DVD master test data set to the following formats: DVD, VHS, and 8MM and has created 25 copies of the original data in each format.

The NLECTC-NE/LEAF:

Received 2 technology validation requests from the Forensic Support Unit (FSU). FSU has requested that the NLECTC-NE/LEAF test for validation the following audio exploitation tools:

- Digital Audio Corporation (DAC) – Cardinal version 2.0.0
- Intelligent Devices – SES 4 version 2.04a

Spoke with FAVIAU personnel regarding the testing of the Salient Stills and Signalscape digital video screen capture utilities. It was determined that testing requirements will be similar to those utilized for previous (2005-2006 series) validation testing of the Avid screen capture utility.

Received SES 4 software from the FBI and began validation testing. The software, developed by Intelligent Devices, is designed to perform audio enhancement. The software was tested, peer review conducted and documentation provided to FAVIAU.

Created the “Minor Revision Validation Test Results Summary” document for the Forensic Support Unit. A draft version of the document was sent via email for FSU review.

Began validation testing of the Triage-Scan (version 1.6.1) software. The software, developed by ADF Incorporated, is designed to perform image comparisons between a known image file and a database of unknown images. The software can purportedly automatically locate images contained in the comparison database, which are similar to the known image.

Created video data sets for Gaussian De-blur testing. Data sets were recorded in VHS-C and Mini-DV formats.

Completed validation testing of the StarWitness Video Pro video/image enhancement software. The StarWitness product is developed by Signalscape Inc. This testing was peer reviewed and sent validation material for the StarWitness Video Pro to the FBI Forensic Support Unit. The validation material included: 4 test plans, 7 scenario reports, 4 summary reports, 1 summary report approval document, 4 scenario report peer review documents, 1 conformance document, and 1 administrative review checklist.

Participated in a teleconference with the Forensic Audio Video Image Analysis Unit (FAVIAU) to discuss requirements for testing of the following video screen capture utilities: SnagIt, Camtasia, StarWitness DVR Pro, and Salient Stills screen capture. Digital data sets were created for validation testing of screen capture utilities. The data sets were created digitally on a non-linear video editor. Screen capture utilities to be tested include: StarWitness DVR Pro, Salient Stills Video Focus, Camtasia 4, and SnagIt.

Received FSU Test and Validation Test Request Form requesting the validation of the Ocean Systems developed, ClearID Photoshop plug-in. ClearID Photoshop plug-in. The ClearID software was installed on an FBI computer and is being tested with Photoshop CS2. Completed validation testing for the Ocean Systems developed, the test was peer reviewed, scenario reports and sent validation material to the Forensic Support Unit. The validation material included: 6 test plans, 39 scenario reports, 15 summary reports, 1 summary report approval document, 8 scenario report peer review documents, 1 conformance document, and 1 administrative review checklist. Pursuant to their request, an electronic version of the ClearID validation package was FedEx'd to the Forensic Support Unit, in PDF format. The original hard copies of the validation package were also provided to the Forensic Support Unit.

Participated in a teleconference with Amanda Broyles and Dale Linden (FBI) regarding the validation of the ADF Solutions, image examination software. The NLECTC-NE/LEAF will begin limited testing of the tool and will discuss any findings with the FBI the week of March 5th. ADF Solutions was contacted to resolve a technical issue regarding the installation of their software. NLECTC-NE/LEAF completed validation testing of the ADF developed image examination software and reviewed testing status with Forensic Support Unit Chief. The draft report for the Triage Lab image examination software was sent to the Forensic Support Unit for their review. The review was conducted in a teleconference and based on comments from the review. The NLECTC-NE/LEAF revised ADF Solutions Triage-Lab validation documentation and forwarded to the Forensic Support Unit.

Pursuant to their request, the NLECTC-NE/LEAF sent copies of previously completed validation packages on compact disc to the Forensic Support Unit. Specifically, Adobe Photoshop, Avid Media Composer, DAC PCAP II Plus, and Image Lab were sent. Each validation package includes; Test Plans, Test Scenario Reports, Summary Reports, Scenario Report Peer Review Documents, and a Summary Approval Report Document.

Created video data sets to be used to test for validation the Ocean Systems developed dCoder (version 2) software. According to the manufacturer, dCoder v.2 will capture synchronized video and audio from a previously digitized video sequence. The data sets were created by digitizing analog video data that contained audio and overlaying tones at known intervals throughout the sequence. Additionally, a time-code was inserted into the sequence as a visual reference.

Received a new version (VF Source) of the Salient Stills screen capture utility from the manufacturer. VF Source is a stand-alone application that can be utilized outside of the Video Focus environment. The software was installed on the Salient Stills computer workstation. The NLECTC-NE/LEAF conducted the validation testing of the Salient Stills developed VF Source video screen capture utility. Upon completion, Validation Testing Peer Review was conducted; test documentation was finalized and provided to the Forensic Support Unit for review. The documentation material included: 1 test plan, 4 scenario reports, 1 summary report, 1 summary report approval document, 1 scenario report peer review document, and 1 administrative review checklist. The documentation was provided in both printed and electronic formats.

Contacted Salient Stills, the developer of the VF Source screen capture utility. The contact was initiated because of technical issues encountered while performing the validation testing of the VF Source software. Based on the communication, the issues were resolved.

Met with the Forensic Support Unit by teleconference regarding the validation of the SEU, an Air Force developed audio enhancement technology. The purpose of the teleconference was to establish testing requirements.

Continued validation testing of the Digital Audio Corporation developed Cardinal audio enhancement technology. Continued validation testing of the Digital Audio Corporation developed Cardinal audio enhancement technology.

Provided the Forensic Support Unit with specifications and an updated price quote for the Apple computer to be purchased by the NLECTC-NE/LEAF. Once in-house the system will be validated for use within the FSU. An Apple Mac Pro computer was received, configured and readied for validation testing.

Continued validation testing of the Camtasia video screen capture utility. Continued validation testing of the Camtasia video screen capture utility

Reformatted the 2005 validation summary reports for the Video Analyst System 420 linked to the validation summary approval document within Adobe Acrobat. This is part of an evaluation of a new format for technology validation documents on the FBI internal website.

Discussed with FAVIAU personnel video data sets for validation testing of screen capture utilities. As a result, FAVIAU will provide the NLECTC-NE/LEAF with a digital data set from a Digital Video Recorder (DVR) on DVD.

Discussed with FBI FAVIAU personnel additional video exploitation technologies requiring testing for validation. Specifically, the Camsort video de-multiplexing application and QuickTime Pro were discussed. As a result, FAVIAU will provide the NLECTC-NE/LEAF with validation request documents for both applications. NLECTC-NE/LEAF researched documentation on the Camsort video de-multiplexing application. FAVIAU has requested that this software tool be tested for validation.

Received from FAVIAU a digital video data set to be used for the validation testing of screen capture utilities. Also obtained from the Utica Police Department, was a digital video data set to be used for the validation testing of screen capture utilities. The data set was forensic data from an adjudicated criminal investigation.

Conducted validation testing of the Digital Audio Corporation (DAC) developed Cardinal audio processing tool. The testing was Peer Reviewed; test documentation was finalized and provided to the Forensic Support Unit for their review. The documentation material included: 10 test plans, 19 scenario reports, 10 summary reports, 1 summary report approval document, 3 scenario report peer review documents, and 1 administrative review checklist. The documentation was provided in both printed and electronic formats.

Continued to test for validation the Signalscape developed StarWitness DVR Pro screen capture utility.

Received an Avid Mojo Video Non-Linear Editor from FAVIAU. The unit is replacing an older Avid Meridian video system. The NLECTC-NE/LEAF purged the Meridian system of all sensitive material and sent it back to FAVIAU. The NLECTC-NE/LEAF also set up the new system and ensured that it was operational.

Per a request from the Forensic Support Unit, the NLECTC-NE/LEAF provided copies of the 2005-2006 Validation Plan and the 2005-2006 Tool and Functions Document. The documents, in PDF format were sent to the Unit Chief electronically.

Per a request from the Forensic Support Unit, the NLECTC-NE/LEAF provided copies of the Avid Media Composer, Ocean Systems DVR Dcoder, and DC Live Summary Report Approval documents. The documents, in PDF format, were sent to the Unit Chief electronically.

The NLECTC-NE/LEAF:

Developed a web-based interface to facilitate the dissemination of validation test results and documentation materials. A proof of concept video sequence was sent to the Forensic Support Unit for their review.

Provided the Forensic Support Unit with an update on the status of the tool validation effort. This was initially accomplished with a teleconference. A spreadsheet was subsequently provided to the Forensic Support Unit for their records.

Provided the Forensic Support Unit with an updated procedure document for supplemental validation testing.

Participated in a teleconference with FAVIAU to discuss the testing status of the Digital Audio Corporation (DAC) developed Cardinal audio processing technology. Additional testing requirements were also documented.

Conducted validation testing of the DAC developed Cardinal audio processing technology. Hard and soft copy versions of the validation documents were sent to the Forensic Support Unit for their review.

Participated in a teleconference with FAVIAU, and Adobe Systems, Incorporated to review the new features of Photoshop version CS3. The NLECTC-NE/LEAF was tasked by the Forensic Support Unit with validating some processing operations of this image enhancement application.

Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF researched version differences between the 1.0, 1.5, and 2.0 of the Adobe Photoshop image processing software. Version differences were provided to the Forensic Support Unit for their review.

Directed by the Forensic Support Unit to test the validation of the image enhancement software application Adobe Photoshop CS3 immediately. This was a deviation from the normal prioritization procedure which is to test validation of the tools in the order in which their respective test requests are received.

Created image data sets for validation testing. Specifically, images were collected from a Nikon D200 Digital Camera to be used for validation testing of the Photoshop CS3 image processing technology.

Received the image enhancement software Photoshop CS3 (version 10) developed by Adobe Systems, Inc. The software was subsequently installed on a PC and validation testing was conducted. The testing was completed and a peer review was conducted. The completed validation package was sent to the Forensic Support Unit for their review. The Photoshop CS3 validation package included the following: 18 Test Plans, 97 Scenario Reports, 72 Summary Reports, and 20 Scenario Peer Review Tests.

Conducted validation testing of the Signalscape developed DVR Pro screen capture utility. Upon completion of validation testing and peer review testing, hard and soft copy versions of the validation documents were sent to the Forensic Support Unit for their review.

Participated in a teleconference with the Forensic Support Unit Chief and Amanda Broyles, a FAVIAU forensic examiner, regarding the validation testing of QIF version 1.3, an image analysis software application. Based on the meeting, the NLECTC-NE/LEAF created test plans to be used during the validation testing of the software. The test plans were forwarded to the Forensic Support Unit for review.

Tested the Ocean Systems developed Dcoder version 2.0 screen capture utility. Ocean Systems was contacted regarding issues related to the validation testing of Dcoder version 2.0. Based on the contact, the issues were resolved. The validation testing of the Dcoder version 2.0 screen capture utility was completed and the validation package was sent to the Forensic Support Unit for their review.

Contacted Ocean Systems Incorporated regarding their ClearID Photoshop software plug-in. Ocean Systems provided a status of the upcoming new release (version 2.0) of the ClearID software.

Provided hard and soft copy versions of the validation testing material for the ImageLab video/image processing system to the Forensic Support Unit.

Per a Forensic Support Unit request, the NLECTC-NE/LEAF staff provided the Unit Chief a list of all technologies tested for validation by the NLECTC-NE/LEAF in 2007 and a collection of digital images of some of the FBI owned A/V technologies currently housed at the NLECTC-NE/LEAF. The electronic images were sent to the Unit Chief via email.

Participated in a teleconference with the Forensic Support Unit Chief regarding the FBI's intranet validation testing results website.

The NLECTC-NE/LEAF reviewed and catalogued previously created analog and digital test data sets used in the technology validation program. A searchable database, based on the type, format, and characteristics of the data was created. Per a teleconference with the Forensic Support Unit Chief, data sets used for testing must be representative of the types of data encountered by examination personnel, and it must be appropriate for the type of testing conducted. The NLECTC-NE/LEAF and the Forensic Support Unit Chief reviewed the analog and digital test data sets used in the technology validation program. Based on the review, it has been determined that the database needs to be expanded to include data formats not previously collected. A collection plan was forwarded to the Forensic Support Unit Chief for review.

The NLECTC-NE/LEAF developed audio data sets for validation testing. Specifically, data sets were recorded in the MiniDV and VHS formats.

The NLECTC-NE/LEAF attended training on an image enhancement technology at the FBI training facility in Quantico, VA. This technology was tested for validation at the NLECTC-NE/LEAF in 2008.

The NLECTC-NE/LEAF was notified by FAVIAU validation test coordinator that a previously validated image analysis/processing software application will have to be re-validated because of a new version release. Image Pro Plus v. 5.0, developed by Media Cybernetics, was validated by the NLECTC-NE/LEAF during the 2005 test spiral. The NLECTC-NE/LEAF reviewed Media Cybernetics website and determined that a software upgrade would cost \$1,000. Information regarding the new versions capabilities was also reviewed. Pursuant to a request from the Forensic Support Unit, the NLECTC-NE/LEAF contacted Media Cybernetics regarding a possible re-test for validation of their Image Pro Plus software.

The NLECTC-NE/LEAF met with three FAVIAU examiners at the LEAF facility. The purpose of the visit was threefold:

- Provided training in the use of the Apple Inc. developed Final Cut Pro video production software.
- The NLECTC-NE/LEAF and FAVIAU personnel developed requirements for the upcoming validation testing of the Final Cut software.
- FAVIAU personnel provided the NLECTC-NE/LEAF training in the use of the Vision Base developed Video Box Pro and DCR Pro video analysis software applications. These technologies will be tested for validation by the NLECTC-NE/LEAF.

Based on a request from the Forensic Support Unit, an updated status of the NLECTC-NE/LEAF validation testing was provided to the FAVIAU Quality Assurance Manager and the Forensic Support Unit Chief.

The NLECTC-NE/LEAF completed sixteen (16) validation test plans relative to the Apple Inc. developed Final Cut Pro video/image processing technology. The test plans were mailed to the Forensic Support Unit Chief for his approval. Once approved, validation testing on the Final Cut software was conducted and upon completion peer review testing of the Final Cut Pro was performed. The completed validation package was sent to the Forensic Support Unit for their review. The Apple Final Cut Pro validation package included the following: 16 Test Plans, 81 Scenario Reports, 71 Summary Reports, and 16 Scenario Peer Review Tests.

The NLECTC-NE/LEAF developed validation test plans for the QIF Image Analysis Software. Data sets were designed specifically for validation testing of the QIF software. The NLECTC-NE/LEAF completed validation test plans for the QIF image analysis software.

The NLECTC-NE/LEAF participated in a teleconference with the Forensic Support Unit to determine validation requirements and test data sets for the following technologies:

- Ulead Video Studio version 11.5
- Adobe Audition version 3.0
- Sony Soundforge version 9.0
- Adobe Premiere version CS3

In addition to establishing test requirements and data sets, testing milestones, including completion dates were also determined.

Based on comments from FAVIAU, the Test Plans for QIF were revised and returned to the Forensic Support Unit for review.

The NLECTC-NE/LEAF developed eleven test plans testing of the Ulead Video Studio video processing and software.

FAVIAU approved the revised test plans regarding the QIF software. The NLECTC-NE/LEAF began the validation process of QIF.

Based on a request by the Forensic Support Unit, the NLECTC-NE/LEAF provided system specifications for a “validation platform”. This is a generic computer that will be used to test non-turnkey based software applications.

The NLECTC-NE/LEAF received and configured a new PC to be used as a software validation platform for future testing.

The DCR Pro video exploitation software was received from the Forensic Support Unit for validation. The NLECTC-NE/LEAF developed validation test plans for the DCR Pro, version 3.0, video processing software as well as for the Adobe Premiere Image/Video processing and software.

The NLECTC-NE/LEAF contacted the Air Force Research Laboratory requesting an updated version of the FASR audio analysis software application. FASR is a technology developed by AFRL for the FBI. The FBI has requested that the NLECTC-NE/LEAF validate FASR.

The NLECTC-NE/LEAF participated in a teleconference with the Forensic Support Unit to determine validation requirements and test data sets for the Image Pro Plus version 6.3 image analysis software. In addition, testing milestones, including a test completion date were also determined.

The NLECTC-NE/LEAF developed validation test plans for the Adobe Photoshop CS3 (Mac OS X) image processing software. Eighteen test plans were forwarded to the Forensic Support Unit for review.

Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF revised the Validation Summary Report Approval Document. Specifically, a signature block was added to include a FAVIAU Technical Reviewer. A new Final Cut Pro version 6.0.3 Summary Report Approval document was created and printed for inclusion in the Forensic Support Units validation package related to this technology. All subsequent validation packages will utilize the revised Summary Report Approval document.

The NLECTC-NE/LEAF participated in a teleconference with the Forensic Support Unit to determine validation requirements and test data sets for the Spectra Plus version 5.0.26.7 audio processing.

The NLECTC-NE/LEAF completed validation testing of Ocean Systems dCoder version 2.5.1 screen capture utility. The validation package sent to the FSU consisted of the following items: 1 Test Plan, 20 Procedure Reports, 2 Test Reports, and 4 Procedure Peer Review documents.

The NLECTC-NE/LEAF completed validation testing of Video Base DCR Pro Video Processing System. The validation package sent to FBI-FSU included: 2 Test Plans, 24 Procedure Reports, 4 Test Reports, and 5 Procedure Peer Review documents.

The NLECTC-NE/LEAF:

Received and installed the Air Force Research Laboratory (AFRL) developed Find Camera version 2.3.1 image/video analysis software. The software transfer was facilitated by Mr. Chad Heitzenrater, AFRL Steganographic Intelligence Technologies Program Manager. The transfer was in response to a request for validation testing from the FBI's Forensic Audio Video Image Analysis Unit (FAVIAU).

Completed validation testing of the Signalscape Starwitness DVR Recorder Pro screen capture utility. Validation package sent to the Forensic Support Unit included: 1 Test Plans, 16 Procedure Reports, 4 Test Reports, and 3 Procedure Peer Review documents.

Began developing test plans for testing of the Adobe Systems developed After Effects CS4 video/image processing software.

Began developing test data sets for testing of the Adobe Systems developed After Effects CS4 video/image processing software. The data sets were recorded in 6MM (MiniDV) format.

Began validation testing of the Apple Inc. developed QuickTime video processing software application. Per FAVIAU request, both the Windows and Mac versions of the software will be tested.

Began validation testing of the AFRL developed Find Camera software. The software is an image analysis application developed for the FBI.

Completed validation testing of the Techsmith developed SnagIt version 9.0, screen capture utility. Validation package sent to the Forensic Support Unit included: 1 Test Plan, 24 Procedure Reports, 6 Test Reports, and 5 Procedure Peer Review documents.

Completed testing of the Apple Inc. developed QuickTime video processing software application. Per FAVIAU request, both the Windows and Mac versions of the software were tested. Validation package sent to the Forensic Support Unit included: 6 Test Plans, 26 Procedure Reports, 14 Test Reports, and 5 Procedure Peer Review documents.

Began validation testing of the Adobe Systems developed After Effects CS4 video/image processing software.

Received a software update for the Vision Base developed Video Box Pro system. Specifically, software version 4.0.8 will replace version 4.0.6. Because the update is significant, above and beyond the definition of a minor deviation, updated test plans will be developed and approved by FAVIAU prior to testing.

The NLECTC-NE/LEAF (pursuant to direction from the FAVIAU Unit Chief) modified previously submitted Test Reports regarding the Vision Base developed DCR Pro version 3.0 screen capture utility. The changes added limitations regarding the forensic use of the tool.

Received and reviewed testing documentation from FAVIAU regarding validation testing of the NEXIDIA AudioFinder software. Because the software cannot be transferred to the NLECTC-NE/LEAF, FAVIAU will conduct the testing in-house with the NLECTC-NE/LEAF providing testing guidance and documentation support.

The NLECTC-NE/LEAF, FAVIAU, and the Forensic Support Unit (FSU) participated in a kickoff meeting (teleconference) regarding the Apple developed Sound Track Pro version 1.0 audio enhancement software. Based on the meeting, the NLECTC-NE/LEAF will develop Test Plans and provide them to FAVIAU for review and comment.

The NLECTC-NE/LEAF completed test plans to be used for validation testing of the Apple Inc. developed Sound Track Pro audio editing software. The test plans were provided to the Forensic Support Unit (FSU) for review and approval.

The NLECTC-NE/LEAF completed validation testing of the AFRL developed Find Camera software version 2.3.1. The software is an image analysis application developed for the FBI. Validation package sent to FBI included: 2 Test Plans, 7 Procedure Reports, 7 Test Reports, and 2 Procedure Peer Review documents.

The NLECTC-NE/LEAF began creating test plans for validation testing of Apple Sound Track Pro.

The NLECTC-NE/LEAF completed validation testing and peer review testing of the Adobe Systems developed Premiere CS3 video processing technology. The complete validation package was sent to the Forensic Support Unit for review.

The NLECTC-NE/LEAF completed test plans for the Sony SoundForge version 9.0.3 audio enhancement software applications. Test Plans were sent to the Forensic Support Unit for review and were approved for use.

Completed validation testing of Sony Soundforge version 9.0 audio enhancement software application. The validation package sent to the FSU consisted of the following items: 15 Test Plans, 18 Procedure Reports, 18 Test Reports, and 4 Procedure Peer Review documents.

The NLECTC-NE/LEAF completed Test Plans for the Apple QuickTime Pro video processing software application. Specifically, Test Plans were created for the Windows versions 7.2 and 7.5, and Mac version 7.5. The Test Plans were sent to the Forensic Support Unit for review. The test plans were approved and the validation testing of the software was completed. Per FAVIAU request, both the Windows and Mac versions of the software will be tested.

17-18 Nov 08 - Two Forensic Examiners from FAVIAU visited the NLECTC-NE/LEAF. A review was conducted of the results of validation testing of dCoder v. 2.0, and SnagIt 8.2 screen capture utilities. In addition, new requirements were developed for future testing of all screen capture utilities. Lastly, data sets to be used for future testing were established.

The NLECTC-NE/LEAF developed test plans for Salient Stills Video Focus v 3.0.1 video/image processing software. The test plans included the new requirements and data sets established during the FBI/FAVIAU meeting held 17 November 2008. Completed test plans were sent to the Forensic Support Unit for their review.

The NLECTC-NE/LEAF developed new test plans for dCoder v. 2.5.1, and SnagIt v. 9.0 screen capture utilities. Test plans included the new requirements and data sets established during the FBI/FAVIAU meeting held 17 November 2008.

The NLECTC-NE/LEAF:

Completed Test Plans for the Adobe Audition version 3.0 audio enhancement software application. Test Plans were sent to the Forensic Support Unit for review and approved for use.

Completed validation testing of Adobe Audition version 3.0 audio enhancement software application. The validation package sent to FBI-FSU consisted of the following items: 18 Test Plans, 21 Procedure Reports, 21 Test Reports, and 3 Procedure Peer Review documents.

Conducted validation testing of the Media Cybernetics developed Premiere Image Pro Plus version 6.3 image processing technology.

Updated the video examination software on the FBI Avid Xpress computer system. The video examination software now running on that computer is Media Composer v 2.8.1.

Feb 09 –participated in a teleconference with FBI FAVIAU personnel regarding validation testing on video screen capture utilities.

Mar 09 –participated in a teleconference with the FSU to establish priorities of forensic tools to be validated. Based on that conversation, a priorities list was created and will be used by the NLECTC-NE/LEAF to determine future testing priorities.

Completed validation testing of Video Base DCR Pro Video Processing System. The validation package sent to FBI-FSU included: 2 Test Plans, 24 Procedure Reports, 4 Test Reports, and 5 Procedure Peer Review documents.

Completed validation testing of the Salient Stills developed Video Focus version 3.0 video/image enhancement system. Validation package sent to the Forensic Support Unit included: 14 Test Plans, 49 Procedure Reports, 18 Test Reports, and 8 Procedure Peer Review documents.

Completed validation of the Spectra audio processing software. Validation package sent to the Forensic Support Unit included: 6 Test Plans, 6 Procedure Reports, 6 Test Reports, and 3 Procedure Peer Review documents.

Completed validation testing of the Adobe Systems developed After Effects CS4 video/image processing software. The completed validation package sent to FSU included: 1 Test Plan, 3 Procedure Reports, 1 Test Report, and 1 Procedure Peer Review document.

5.4 TECHNOLOGY EVALUATION

NLECTC-NE/LEAF personnel began an operational evaluation of Digital Heaven - DH_Subtitle, a Final Cut software plug-in, designed to create professional quality subtitles. The evaluation is being conducted by utilizing the plug-in to facilitate the insertion of transcribed audio information into forensic video data.

Demonstrated the Salient Stills developed Video Focus image enhancement system at the Regional Advisory Council/10 Year Anniversary Conference. This system was previously evaluated and validated at the NLECTC-NE/LEAF.

In response to a request from the Forensic Support Unit, NLECTC-NE/LEAF personnel have been exploring mass storage options for audio, video, and imagery data. Apple Computer Inc. was contacted and has agreed to place an X-Serve RAID system at the NLECTC-NE/LEAF testing. In addition, the following Apple technologies were also evaluated for criminal justice applicability:

- Mac Book Pro (laptop)
- 30" flat-panel Monitor
- Mac Pro (desktop)

The NLECTC-NE/LEAF received Apple XServe and Apple XServe Redundant Array of Independent Disks (RAID) storage for evaluation. The system was set up and configured for the NLECTC-NE/LEAF computer network. The XServe RAID received is a mass storage system capable of storing 4 terabytes of data and is currently configured as a data-protected 2 terabyte mirrored RAID. The NLECTC-NE/LEAF has completed an evaluation of the Apple X-Serve technology and reviewed status with Forensic Support Unit Chief. The Apple X-Serve and Raid mass storage device was returned to manufacturer.

The NLECTC-NE/LEAF returned the Signalscape developed FreezeFrame workstation to the manufacturer. The FreezeFrame exhibited some technical problems that the manufacturer will attempt to address.

The NLECTC-NE/LEAF provided the Forensic Support Unit three price quotes for technologies to address digital mass storage requirements for the NLECTC-NE/LEAF's archived audio, video, and image data.

The NLECTC-NE/LEAF provided the Forensic Support Unit a comparisons/functions breakdown between several video/image enhancement systems. The systems are being reviewed for possible use in the Regional Computer Forensic Laboratories and FBI field offices.

The NLECTC-NE/LEAF evaluated the Apple, Inc. developed Final Cut Pro software for its ability to convert PowerPoint presentation data into a digital video sequence residing on DVD. The software was applied to training data supplied by the New York State Department of Criminal Justice Services, Missing and Exploited Children Clearinghouse.

5.5 FBI OTHER

8-11 Jan 07 – NLECTC-NE/LEAF personnel attended the Scientific Working Group – Imaging Technologies (SWGIT) semi-annual meeting hosted by the National Center for Forensic Science (NCFS) in Orlando, Florida. Members participated in the creation of best practices related to Video Processing, Image Authentication, Maintaining the Integrity of Digital Images, and Archiving Digital and Multimedia Evidence.

The NLECTC-NE/LEAF sent a VHS, multiplexed test tape to the Forensic Audio Video Image Analysis Unit (FAVIAU) per their request. The tape had been previously created by the NLECTC-NE/LEAF to test and evaluate video exploitation tools of interest to the FBI. FAVIAU is currently testing a universal de-multiplexing technology and required video test data.

NLECTC-NE/LEAF personnel attended the Scientific Working Group – Digital Evidence (SWGDE) quarterly meeting. The meeting was hosted by the National Center for Forensic Science (NCFS) in Orlando, Florida. SWGDE was created to provide leadership to the law enforcement community by developing guidelines for good practices for the use of digital evidence technologies within the criminal justice system. During the meeting, members participated in subcommittee meetings related to; Forensic Analysis, Audio, Training, Research and Development, and Standards and Accreditation. NLECTC-NE/LEAF personnel attended the Audio subcommittee and participated in the creation of a best practices document related to Forensic Audio.

The NLECTC-NE/LEAF provided a presentation on the NLECTC-NE/LEAF and the FBI support program to members of the Northeast Technical Product Assessment Committee (NTPAC) held in Sturbridge, MA.

In response to a video non-linear editing computer system failure, the NLECTC-NE/LEAF re-formatted the computer system drive, and re-installed the software applications. The re-installation of the software also required contacting the original system integrator for support.

The NLECTC-NE/LEAF worked with the Forensic Support Unit to create a memo for distribution to the National Institute of Justice. The memo is a synopsis of NLECTC-NE/LEAF support to the Forensic Support Unit.

The NLECTC-NE/LEAF hosted a teleconference between the FBI Forensic Support Unit and the New York State Police (NYSP) Multimedia Services Unit. The purpose of the teleconference was to discuss the feasibility of having the NLECTC-NE/LEAF provide the NYSP quality assurance support to facilitate ASCLD-LAB accreditation under the digital evidence discipline.

The NLECTC-NE/LEAF met with the FBI Forensic Support Unit Chief at the NLECTC-NE Regional Advisory Council meeting. Status of the NLECTC-NE/LEAF support program to the FBI was discussed.

The NLECTC-NE/LEAF configured and incorporated into the NLECTC-NE/LEAF lab local area network (LAN) a 4 terabyte server/mass storage system. The server will be a central repository for audio, video, and image data to be used for product evaluation and validation testing, and competency and proficiency testing.

The NLECTC-NE/LEAF determined feasibility of processing classified material for the FBI at the L-3 GSI facility in Rome, NY. Determined the hardware needed included a 250GB external hard drive and an IEEE 1394 PC interface. The hardware was subsequently ordered.

The NLECTC-NE/LEAF performed maintenance on two Mac video/audio processing workstations. This included installation of software upgrades and optimization of the workstations hard drives.

The NLECTC-NE/LEAF ordered Adobe Audition v 2.0. The software will be tested for validation both as an independent software application, and in conjunction with the Digital Audio Corporation (DAC) Cardinal audio enhancement technology.

The NLECTC-NE/LEAF performed a forensic demonstration of the Apple developed Final Cut Pro software where it was utilized to annotate forensic video data. Test data utilized was provided by the FBI Los Angeles field office, and was related to an ongoing espionage investigation. Following the demonstration, the annotated video data was returned to the submitting agency.

The NLECTC-NE/LEAF provided a forensic demonstration of the Image Pro Plus software application specifically regarding its ability to register multiple digital images. The images to be registered were provided by the Rochester, NY police department, and were related to an ongoing homicide investigation. The Image Pro Plus software was tested for validation during the 2005-2006 validation series. The information and data collected will be utilized as part of a subsequent evaluation of the technology.

The NLECTC-NE/LEAF received a request from the FAVIAU Quality Assurance Manager to duplicate test signal data sets used to confirm the correct operation of audio, image, and video processing computers. The original data sets are in VHS, CD, and DVD formats and were supplied by FAVIAU. Specifically, it is requested to duplicate the test signals onto VHS, Mini DV, 8MM (Hi 8 and Digital 8), DVD-R and CD-R formats. Duplication began 01 October 2007 and was completed 23 October 2007. The data sets were then forwarded to FAVIAU.

The NLECTC-NE/LEAF staff provided the Forensic Support Unit with a spreadsheet containing a complete list (by dollar amount and IAA Modification number) of monies sent to the NLECTC-NE since the inception of the FBI support project in 2000. The information was provided to the LEAF by the NLECTC-NE and had been requested by the Forensic Support Unit.

Based on an inquiry from the Forensic Support Unit, the NLECTC-NE/LEAF conducted an inventory of FBI owned equipment. All equipment was accounted for and the results provided to Eugenia Gray at the Forensic Support Unit.

The NLECTC-NE/LEAF staff returned the DAC Cardinal audio enhancement device to the FBI. The Cardinal had been at the NLECTC-NE/LEAF for validation testing.

Pursuant to a request from the NLECTC-NE Center, the NLECTC-NE/LEAF staff requested that a copy of the Purchase Order from FSU relative to the 2008 FBI funds be provided. The request was sent to the FSU Chief.

The NLECTC-NE/LEAF completed a web interface to be used to track and monitor the status of Validation Testing and Examiner Proficiency Testing. This will be accessible by the customer and will facilitate the exchange of information between the NLECTC-NE/LEAF and the FBI.

Based on feedback from the FBI, the NLECTC-NE/LEAF modified the appearance and content of the NLECTC-NE/LEAF internal website that is used to track and monitor the status of Validation Testing and Examiner Proficiency Testing. The modifications will align our website with the FBI intranet.

Based on a request from the Forensic Support Unit, the NLECTC-NE/LEAF provided data sets to facilitate the testing of an object tracking software application. Specifically, three 6MM (MiniDV) video data sets were created and shipped to Forensic Support Unit.

Based on a request from the Forensic Support Unit Chief, the NLECTC-NE/LEAF provided a synopsis document detailing all support provided to the FBI over the last three years.

The NLECTC-NE/LEAF staff began developing Standard Operating Procedures (SOP) to be used to conduct internal and external test validation studies of tools and procedures used to perform forensic examinations. The SOPs will be utilized by the FBI's Digital Evidence Laboratory.

The NLECTC-NE/LEAF was requested to evaluate the Apple, Inc. developed Final Cut Pro software for its ability to convert PowerPoint presentation data into a digital video sequence residing on DVD. The software was applied to training data supplied by the New York State Department of Criminal Justice Services, Missing and Exploited Children Clearinghouse. This request was completed and the results report to the FAVIAU.

The NLECTC-NE/LEAF evaluated the Video Focus video/image processing system for its ability to process and clarify a digital video sequence. New test data was provided by the FBI Indianapolis Field Office and was related to an ongoing robbery investigation. The Video Focus system was developed by Salient Stills Incorporated, and was previously validated by the NLECTC-NE/LEAF.

29 Jan 09 – The NLECTC-NE/LEAF delivered a report, to the FSU unit chief, summarizing program support efforts to the FBI for the 4th quarter 2008.

14 Apr 09 – The NLECTC-NE/LEAF ordered the ASCLD-LAB supplement for the ISO 9000 quality assurance manual.

The NLECTC-NE/LEAF received a request from the Forensic Support Unit to provide video annotation support to FBI Special Agent Scott Baber from the Norfolk FBI field office. The data to be processed was approximately 3 hours in length and was contained on 3 separate DVD's. The annotation required approximately 300 hours of work, and was delivered to S/A Baber upon completion. Pursuant to S/A Baber, Jared's support was "extraordinarily useful" and helped to secure guilty pleas from the defendants.

23 – 25 June 09 – Hosted the FBI FAVIAU Unit Chief and members of the Forensic Support Unit. The purpose of the meeting was a program review and planning session.

Pursuant to a request from the Forensic Support Unit Chief, the NLECTC-NE/LEAF provided an updated financial statement outlining expenses related to the FBI support program.

The NLECTC-NE/LEAF received shipment of additional hardware from FAVIAU. The following items were received:

- (4) Seagate Barracuda 750 GB Serial ATA Hard Drives
- Pelco DX4004160 4 Channel 160GB DVR Recorder
- Primera Bravo II DVD Duplicator/Printer
- Panasonic AG-1970 SVHS Video Cassette Recorder
- (5) Panasonic AG-6740 SVHS Video Cassette Recorder
- Panasonic AG-6730 SVHS Video Cassette Recorder
- (2) Viewsonic VP9506 Monitor
- (2) Canon Powershot SX10 Digital Camera

The NLECTC-NE/LEAF installed and configured the above Seagate hard drives into the FBI server located at the NLECTC-NE/LEAF.

The Primera Bravo DVD Duplicator/Printer was damaged out of the box. After conferring with the Forensic Support Unit, the NLECTC-NE/LEAF interfaced with the developer, ultimately sending the unit back for repair. Repairs were completed and the unit returned. NLECTC-NE/LEAF tested the unit and found it operating correctly.

6. CONCLUSIONS AND FUTURE WORK

The NLECTC-NE/LEAF worked with criminal justice across the country providing them with assistance and resources in the area of audio, video and image technologies. The majority of the agencies in the United States have 14 officers or less. Many of these agencies lacked staff with the appropriate technical background required to develop effective solutions to their problems. The NLECTC-NE/LEAF served to provide that resource and as assist them in locating and acquiring appropriate technologies. Through demonstration of both COTS and GOTS technologies, agencies were able to learn what tools were available to them, and how much useful information can be derived from the data (evidence) examined or analyzed. By being able to reach back to the Air Force Research Laboratory, other federal laboratories, academia and the private sector for technologies and engineering support, the NLECTC-NE/LEAF brought value added to the client agencies. In addition, AFRL had in the NLECTC-NE/LEAF, a source of real world data that to test systems and a sounding board for ideas on how to apply the government technologies to civilian public safety applications.

The work performed for the FBI had application in local agencies as well. The NLECTC-NE/LEAF was able to develop a plan to transfer the evaluation/validation process as well as the examiner testing to the state and local criminal justice agencies.

7. **DISTRIBUTION LIST**
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