GOVERNMENT OF THE DISTRICT OF COLUMBIA

APPLICANT PROFILE

FY 2005 Homeland Security Grant Program: Urban Areas Security Initiative	
PROJECT TITLE:	National Capital Region Syndromic Surveillance Network
EMERGENCY SUPPORT FUNCTION:	Disease Surveillance
PROJECT PERIOD:	05/01/2005 - 01/31/2007
PROJECT SYNOPSIS:	While the architecture of the NCR Syndromic Surveillance Network is fully functional at this time, there are foreseeable enhancements and additions that need to be made and more comprehensive testing and evaluation must be performed before all components are transitioned over to the states. In the event of an intentional release of a bioagent, these improvements are essential to support preparedness and to deploy public health resources optimally to the affected regions.
IMPLEMENTING JURISDICTION:	Maryland (NCR member counties), Virginia (NCR member counties), and Washington, DC

AGENCY: The Johns Hopkins University Applied Physics Laboratory (JHU/APL)
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AUTHORIZATION OFFICIAL

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DV Kalbaugh — 2/23/05

Signature of Authorized Official — **Date**

GRANT PROPOSAL

National Capital Region Syndromic Surveillance Network

23 February 2005

Submitted to

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Director for Homeland Security Grants Administration
Office of the Deputy Mayor for Public Safety and Justice
1350 Pennsylvania Avenue, NW
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PROPOSAL SUMMARY

Background

This effort is focused on improving the existing National Capital Region Syndromic Surveillance Network (NCR SSN) developed with FY 2004 UASI funding. The first year of this system has been extremely effective, thanks to the contribution of the participating state and local health departments. Among the accomplishments of the NCR SSN are 1) the creation of the Enhanced Surveillance Operating Committee (NCR ESOG), which determines policies, operating procedures, and functionality of the system; 2) the signed data sharing agreement allowing the three jurisdictions to view each other's data; 3) electronic capture of data from the majority of the 32 hospitals in the NCR; 4) enhanced functionality to the ESSENCE system; and 5) presentations at technical conferences and publications. Additionally, a tabletop exercise was conducted to start the dialogue on the response protocol for the system and a large-scale exercise will be conducted in April 2005. Dr. Charles Konigsberg, representing the Metropolitan Washington Council of Government's Health Officials Committee, chairs the NCR ESOG. This collaborative group is composed of local and state senior epidemiologists and subject matter experts as requested by the collaborative to enhance outcomes.

The program uses the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) technology developed at The Johns Hopkins University Applied Physics Laboratory (JHU/APL). ESSENCE uses both traditional and non-traditional data such as hospital Emergency Room chief complaints, military outpatient encounters, physician office visit claims, and over-the-counter medication sales; feeds them through sophisticated algorithms, and displays data anomalies for end-user analysis. Stand-alone ESSENCE systems in Washington D.C., Maryland, and Virginia receive, house, and make available fully identifiable data to respective local health departments. A central integrated node was built and hosted at the JHU/APL so that regional surveillance nodes could transmit de-identified data for aggregation and viewing at the cross-jurisdictional level. As proposed, this system was built and a fully operational NCR Syndromic Surveillance Network was deployed in the summer of 2004.

Regional problem/deficiency in preparedness and response that this application will assist public health officials in addressing:
While the architecture of the NCR Syndromic Surveillance Network is fully functional at this time, there are foreseeable enhancements and additions that need to be made and more comprehensive testing and evaluation must be performed before all components are transitioned over to the states. In the event of an intentional release of a bioagent, these improvements will better assist public health officials in preparedness efforts and to deploy public health resources optimally to the affected regions.

Proposed enhancements and maintenance features that assist in the resolution of the above problem/deficiency:

- **Optimized alerting algorithms and hypothesis generation tools:** Propose and, upon government approval, implement optimizations in alerting algorithms and

hypothesis generation tools: Propose and, upon government approval, implement refined alerting algorithms to capture outbreaks early while minimizing nuisance alerts and multivariate modeling techniques that integrate multiple data sources. Additionally, algorithms that fuse air and water sampling to support investigations will be proposed as those data sources are added. Hypothesis generation tools will be created to help quantify the distribution of chief complaints and sub-syndromes to allow comparison between multiple days.

- **Develop formal training material:** Develop and submit for government review and approval formal training material to include a training video and complementary online training tool to support states efforts to train their staff on the state ESSENCE system as well as the Aggregated National Capital Region (ANCR) system.

- **Chief complaint mapping protocol:** Modify the way chief complaints are parsed into syndrome groups based on the chief complaint study that will be completed and approved by the government at the end of FY 2004 UASI funds.

- **Build an effective alert-notification communications tool:** Often, health departments lack the staffing resources to monitor systems continuously. Based on government review and approval, this enhancement will automatically alert an "on-call" staff member on a wireless communications device when a high-level alert, as defined by the government, is noted and further investigation is warranted.

- **Integrate the NCR-Syndromic Surveillance Network with PHINMS:** Implement PHINMS standard data transfers for exchange of data between public health partners and potentially federal partners.

- **Formalize NCR response framework:** Formalize the protocols established and approved by the government in the first year of UASI funding to respond to alerts that span across jurisdictions. Support government efforts to thoroughly test out response framework with outbreak simulations and training exercises.

- **Integrate case management tools to assist public health practitioners**: Develop and submit for government review and approval tools to support health department's efforts to track patients for the purpose of outbreak investigations, coordinate tri-jurisdictional responses to a bio-event, and track public health actions taken. In conjunction, a government approved process of documenting actions to particular alerts will be automated.

- **Incorporate new data sources:** After researching validity and ease of accessibility of data sources, such as water quality indicators and environmental samples, as well as obtaining government approval for their implementation, they will be incorporated into system. Examples: lab requests, school nurse data, feeds from supporting HMOs.

- **Continue system maintenance and upgrades:** Assist in the maintenance of state nodes and central surveillance node as needed and install all system upgrades per the government's request.

- **Integrate BioWatch indicators into overall disease surveillance analysis tools as directed by the government.**

- **Design ANCR transition to Health Departments**: Develop documentation and training materials that will enable states to operate the NCR syndromic surveillance node independently.

- **Support in-field collection of data for special events:** Provide health departments with a government approved mechanism to automatically enter data from special events through small wireless entry devices into their state surveillance systems.

JHU/APL shall have a continuing obligation to warn the Office of the Deputy Mayor for Public Safety and Justice as well as the member jurisdictions of the National Capital Region of known problems and issues in implementation of the National Capital Region Syndromic Surveillance Network, and make disclosure of known risks associated with the systems' performance and with any of the other activities to be conducted under the contract.

PROJECT GOALS, OBJECTIVES AND IMPLEMENTATION STEPS

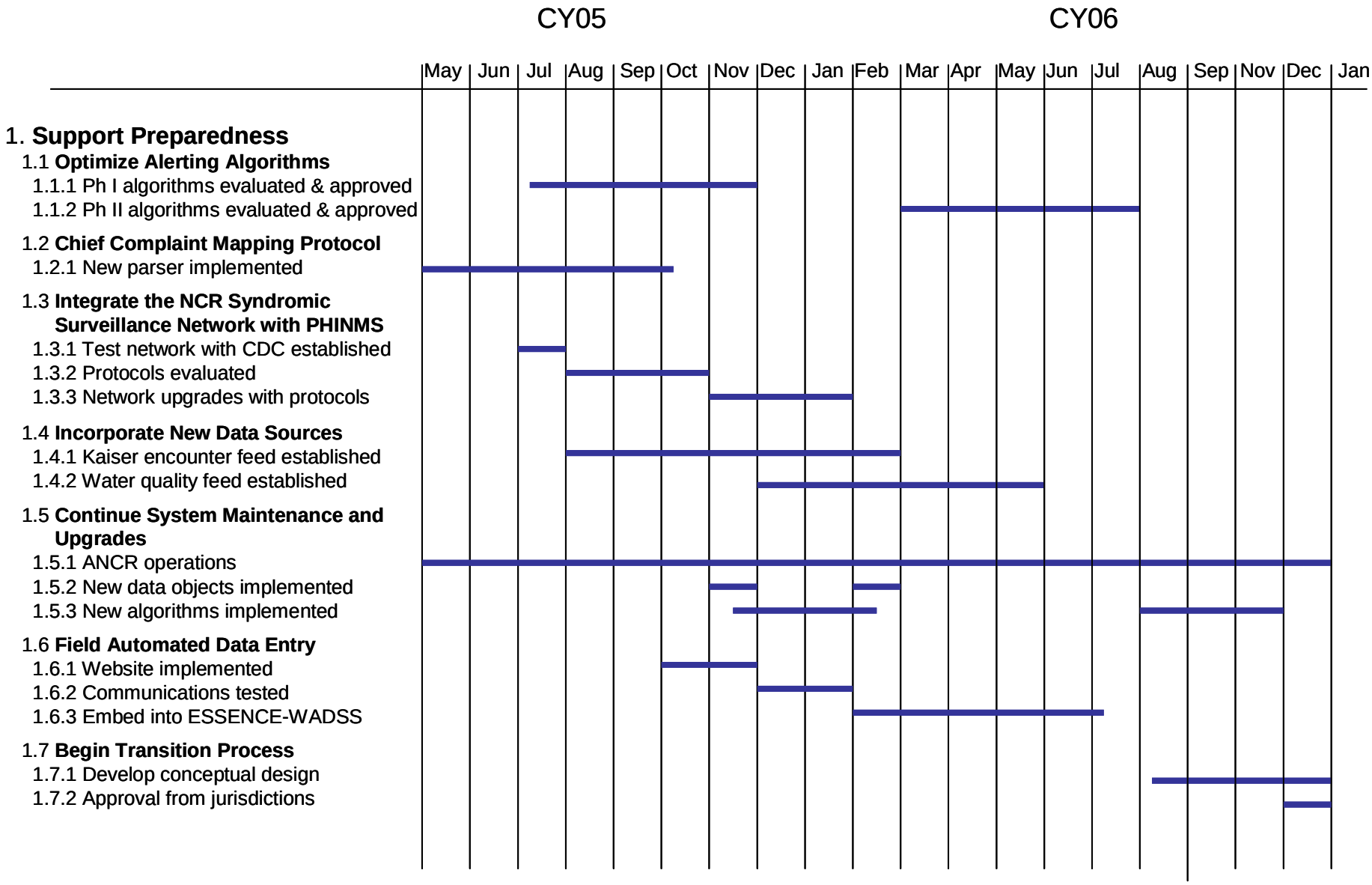
The NCR SSN plans to achieve a number of goals during the 21-month period of performance. These goals are in keeping with the NCR Urban Area Homeland Security Strategy and the NCR Eight Commitments to Action.

In keeping with the NCR/HHS goals which aim to ensure preparedness, provide training to all involved, exercise response capabilities, and standardize systems, the NCR SSN has and will continue to achieve these goals as it pertains to disease surveillance. To that end, JHU/APL, with the cooperation and coordination of NCR member jurisdictions, stood up a sustainable disease surveillance network. This network is in place individually in Maryland, Virginia, and the District of Columbia and jointly within the Aggregated National Capital Region (ANCR) node housed at JHU/APL. As part of this NCR SSN, training has been provided to end users and response protocols have been drafted to ensure standardized practices.

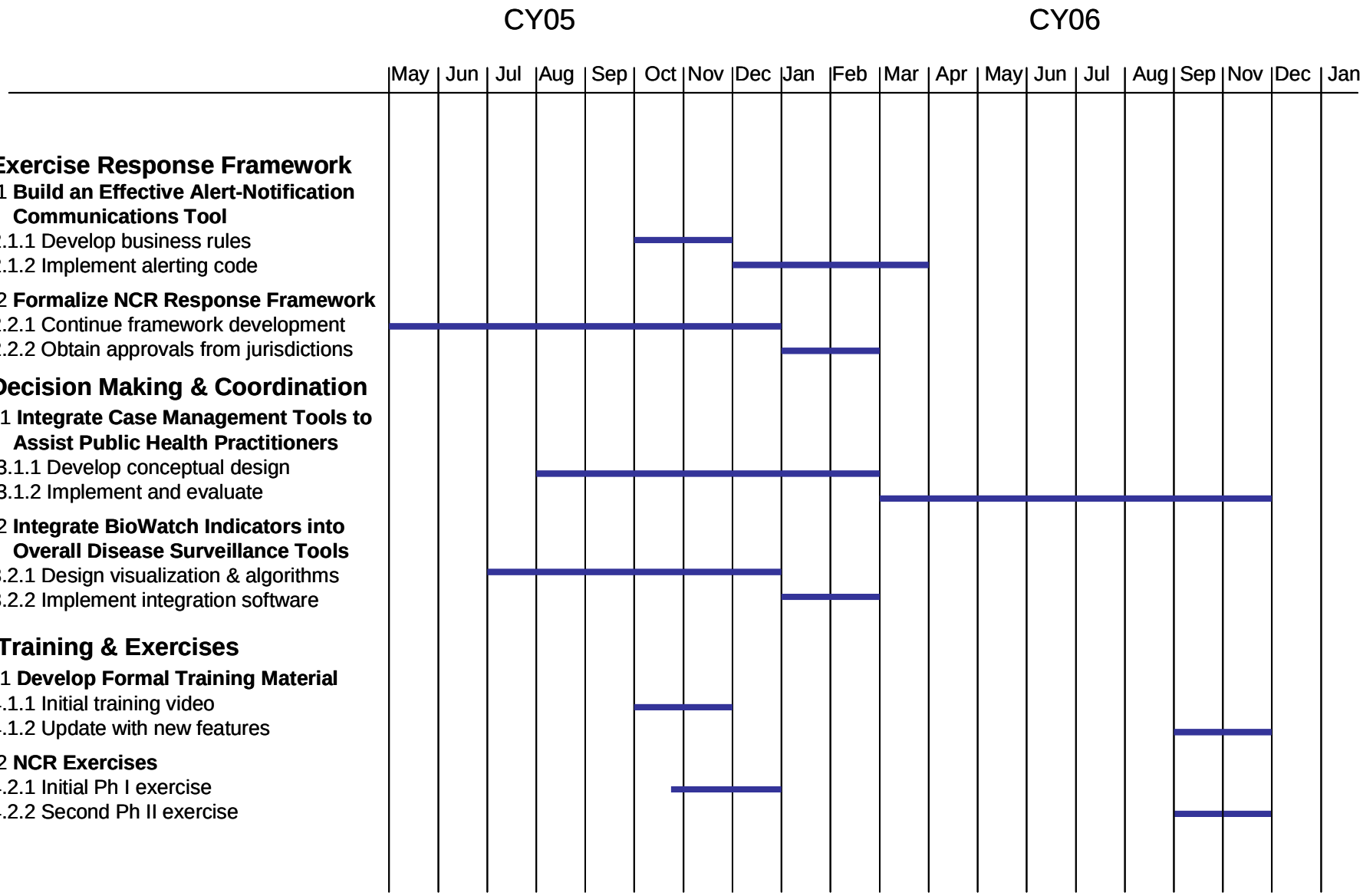
With respect to the NCR Eight Commitments to Action, the NCR SSN is an excellent example of decision-making and coordination. The member jurisdictions of the NCR have come together by forming the Enhanced Surveillance Operating Group (ESOG), which governs all decisions regarding the NCR SSN, and have signed a data sharing agreement to allow the sharing of data cross-jurisdictionally. This excellent example of coordination is the backbone of the NCR SSN's success and will remain as such in the next funding cycle. Similarly, the NCR SSN is committed to continual training and exercising of the system to ensure that it is functioning optimally and that all users are up-to-date on the system's functionality. This will be strengthened during this current project with the proposed development of formal training tools.

The following chart outlines the tasks that will be undertaken to achieve these goals.

Task Timeline



Task Timeline (cont.)



PROJECT DESCRIPTION

Background

The NCR Syndromic Surveillance Network Project will be executed to enhance the existing public health surveillance system. To that end, JHU/APL will build upon the work that was performed during the first Urban Areas Security Initiative Grant.

During that period of performance, JHU/APL supported the Enhanced Surveillance Operating Group (ESOG) that provided governance for the NCR Syndromic Surveillance Network operations. At the conclusion of the first funding cycle two tabletop exercises will have been conducted with public health departments in each jurisdiction to evaluate network performance. JHU/APL developed the material for group consideration and documented group decisions required to operate the surveillance network.

Additionally, JHU/APL assisted the DC, Maryland, and Virginia public health departments in establishing ESSENCE surveillance nodes, acquiring health care indicator data sources, and accessing the Aggregated National Capital Region (ANCR) site. Then, after receiving government approval, JHU/APL implemented and operated the regional surveillance node, which performs surveillance across jurisdictional boundaries. This node functions 24/7 with backup functions.

Finally, based upon operational experiences and user/government feedback, outcomes of local exercises, research and analysis performed by JHU/APL, and upon direction from the government, improvements in system functionality were made to the surveillance network.

Support Preparedness

A number of tasks are required to improve support for preparedness in the NCR Syndromic Surveillance Network. These tasks include optimization of alerting algorithms, finalizing the chief complaint mapping protocol once it has been approved by the government, integrating the network with the CDC's Public Health Information Network Messaging System (PHINMS), incorporating new data sources at the request of the government, continued system maintenance and upgrades, field automated data entry, and the transition process to the individual states. All upgrades and enhancements are subject to government review and approval.

<u>Optimization of Alerting Algorithms</u>
Based on the results of research into alerting algorithms, it is possible to continually refine alerting algorithms to minimize nuisance alerts while still improving the chances of obtaining early notification of disease outbreaks. Additionally, more data sources are available for incorporation into syndromic surveillance systems. In order to effectively utilize these data, multivariate modeling techniques offer unique methods to integrate multiple data sources. In addition to optimizing the existing alerting algorithms, new algorithms that fuse data sources, such as air and water, will be necessary. Similarly, hypothesis generation tools will employ new algorithms that will assist the public health professional in quantifying an outbreak and allow comparison of data between multiple days. All algorithm updates will be reviewed and approved by the government.

Chief Complaint Mapping Protocol

During the first year of UASI funding numerous decisions were made by the government regarding the chief complaint mapping protocol used within the NCR Syndromic Surveillance Network. For instance, it was decided that the ANCR site would employ a modified version of the CDC syndrome groups. As a result, a new chief complaint mapping protocol needed to be established. As part of this effort, a chief complaint mapping study was undertaken. Upon government approval,, the results of this study will be implemented into the system. In addition, refinements to this mapping protocol will be made on an as needed basis per government direction.

Integration of CDC's Public Health Information Network Messaging System (PHINMS)

The CDC PHIN system employs a standard messaging system to send messages and data to and from the CDC. By providing that capability with the NCR Syndromic Surveillance Network, member jurisdictions will be able to transmit data and communicate with the CDC as necessary as well as share data among the surveillance nodes in the jurisdictions. Integration of PHINMS will be reviewed and approved by the government.

Incorporation of New Data Sources

As more data sources become available in electronic format, it is advantageous to review these data sources for possible incorporation into the NCR Syndromic Surveillance Network. To do this, it is necessary for analysts to review the data to ascertain their usability and value to the overall system, public health community, and the government. The data are assessed for timeliness, completeness, signal to noise ratio, etc. For the NCR Syndromic Surveillance Network, JHU/APL will subcontract to Kaiser Permanente of the MidAtlantic States (KPMAS) to establish a real-time data feed of encounter visit data. This is especially useful in the NCR due to the number of covered members residing in the region. Similarly, other data sources such as water quality data will be evaluated during the project. All potential data sources will be reviewed and approved by the government prior to implementation.

Continued System Maintenance and Upgrades

Continued system maintenance and upgrades to the state sites supports the governments goals for the NCR Syndromic Surveillance Network as a tool for the DC, Maryland, and Virginia public health departments to conduct local and regional. Following government approval, JHU/APL will implement modifications to the network based on operational experiences, outcomes of local evaluation exercises, and research and analysis of jurisdictional data to ensure that the detection algorithms are performing as specified. JHU/APL's research in advanced detection algorithms and non-traditional health care indicators will also be used to help improve network capabilities as advances in technology become available.

Each state will be responsible for system operations including security and backups. At the government's request, JHU/APL will provide at least one upgrade to the node software based on operational experience and exercise results. The government will approve all upgrades prior to their development and implementation.

Field Automated Data Entry

As requested by the government of a member jurisdiction, JHU/APL will develop the capability for field automated data entry for use during special events. This request came as a result of a public health department's inability to efficiently enter data into their state system during a special event. Software for Personal Digital Assistants (PDAs) will be developed and tested to enable the public health professionals to remotely enter data into their ESSENCE system.

Conceptual Design for Transition of System

A consensus decision from the government will determine when JHU/APL begins the transition of the NCR Syndromic Surveillance System to the states. JHU/APL will develop a conceptual plan to perform this transition that will incorporate the ANCR node into each individual state site.

Exercise Response Framework

A response framework is imperative to the continued success of operations of the NCR Syndromic Surveillance Network. Two key tasks that represent an integral part of developing the response framework are the refinement and formalization of the NCR response framework and the development of an alert-notification tool.

Develop an Effective Alert Notification Tool

Health departments lack the staffing resources to continually monitor surveillance systems. Once the alerting algorithm optimization has taken place, an alert notification tool will be created, vetted through the ESOG, and pending government approval, implemented into the NCR Syndromic Surveillance System. This tool will notify the predetermined individuals when a high level alert, as defined by the government, is noted and further investigation is warranted.

Refine and Formalize the Response Framework

During the first year of UASI funding, draft response protocols for dealing with cross-jurisdictional alerts were established and approved by the ESOG. These protocols must be exercised and refined to ensure completeness. In addition, JHU/APL needs to incorporate generalized portions of the response framework activities that are taking place within the CDC BioSense project for the purposes of completeness. The response framework will be reviewed and approved by the government.

Decision Making and Coordination

A public health professional's ability to coordinate and respond to alerts noted by the NCR Syndromic Surveillance system is critical. Following government approval, the NCR Syndromic Surveillance Network will integrate case management tools as well as BioWatch indicators into the overall suite of disease surveillance tools.

Integrate Case Management Tools

In an effort to support health department's efforts to track patients for the purpose of outbreak investigations, coordination of tri-jurisdictional responses to a bioevent, and track public health actions taken, case management tools will be developed, reviewed and approved by the government and implemented into the NCR Syndromic Surveillance System. An example of these tools would be providing the epidemiologist a mechanism by which they can flag patients who presented with similar symptoms but were seen at different hospital emergency departments. By allowing an epidemiologist to flag these individuals, they are able to quickly assess the magnitude of the potential problem.

Integrate BioWatch Indicators

BioWatch is an environmental sampling program that is funded by the Department of Homeland Security. When there is a positive hit on an environmental detector, it would be beneficial to have this information fed into the NCR Syndromic Surveillance Network for the purposes of follow-up from the public health professionals and coordination with the lab personnel in each of the jurisdictions. How these indicators will be integrated will be determined by the ESOG at a later date at which point all capabilities will be reviewed and approved by the government.

Training and Exercises

As previously mentioned, it is critical to have the appropriate staff trained and educated on both their state sites as well as the NCR Syndromic Surveillance Network. To that end, exercises of the system will be conducted, and formal training materials will be developed and approved by the government.

Develop Formal Training Material

Formal training material will be developed by JHU/APL, reviewed and approved by the government, and made available to the NCR member jurisdictions. These training materials will support the health departments' efforts to quickly and easily train new staff on their state-based syndromic surveillance system as well as the NCR Syndromic Surveillance Network. These materials will include, but not be limited to, a training video and a complementary online training tool.

Exercises

In order to make improvements and ensure that the NCR Syndromic Surveillance System is functioning as required, it is necessary to exercise the system and the personnel involved in the day to day monitoring activities. To that end, the NCR Syndromic Surveillance System will be exercised two times during the course of this project – once at the end of calendar year 2005 and once at the end of calendar year 2006. The government will determine the participation and scope of these exercise activities. APL will support these exercises.

ORGANIZATION, EXPERIENCE, AND QUALIFICATIONS OF APPLICANT

Related Experience and Qualifications

As a part of The Johns Hopkins University (JHU), the Applied Physics Laboratory (APL) has a long history of collaboration with its sister divisions at the Schools of Medicine and Public Health in the development of technology to improve the delivery of health care.
In 1997, JHU/APL collaborated with the Maryland Department of Health and Mental Hygiene (DHMH) to develop new technologies to support early recognition of bioterrorism. In working with the Maryland State and County health departments, JHU/APL assembled the concept for a syndromic surveillance system that alerts epidemiologists to the onset of early symptoms (*Reference 1*).

In 1999, JHU/APL submitted a proposal for seedling efforts to the Governor's Office as a pilot project providing information technology to support public health under the State of Maryland Task Force on High-Speed Network Development's net.work.Maryland Telecommunications Initiative (*Reference 2*). This pilot project proposed to develop and implement a Maryland Disease Surveillance and Response System (MDSRS) that used both clinical and behavioral data for early indicators. MDSRS used standard desktop NT platforms located at state agencies and facilities to support data collections. Funding was approved but not made available until FY 2001.

Also in 1999, the Defense Advanced Research Projects Agency (DARPA) funded JHU/APL to assemble a prototype surveillance capability for the State of Maryland for the 1999–2000 winter illness season that included the Y2K celebrations. Based on the success of that pilot, research funding was awarded to implement a surveillance test bed, known as ESSENCE II, for the National Capital Region (NCR). The U.S. military and their dependents make up a significant component of the NCR population. The ESSENCE program's objective was the integration of both military and civilian data to increase the sensitivity for early detection of a disease abnormality. To this end, JHU/APL collaborated with the Walter Reed Army Institute of Research (WRAIR) in developing the ESSENCE II test bed. As a result of this collaboration, ESSENCE became the first project to be able to integrate military and civilian health indicators. Details on the ESSENCE system are provided in *References 3* through *9*.

In FY 2004, JHU/APL received funding through the Urban Area Security Initiative Grant to set up the existing National Capital Region Syndromic Surveillance Network (NCR SSN). The first year of this system has been extremely effective, thanks to the contribution of the state and local health departments participating in the system. Among the accomplishments of the NCR SSN, are 1) the creation of the Enhanced Surveillance Operating Committee (NCR ESOG) which determines policies, operating procedures, and functionality of the system; 2) the signed data sharing agreement allowing the three jurisdictions to view each other's data; 3) electronic capture of data from the majority of the 32 hospitals in the NCR; 4) enhanced functionality to the ESSENCE system; and 5) presentations at technical conferences and publications. Additionally, a tabletop exercise was conducted to start the dialogue on the response protocol for the system and a large scale exercise will be conducted in April 2005. The NCR ESOG is chaired by Dr. Charles Konigsberg, representing the Metropolitan Washington Council of Government's

Health Officials Committee. This collaborative group is composed of local and state senior epidemiologists, researchers from JHU/APL and subject matter experts as requested by the collaborative to enhance outcomes.

Organization

The Applied Physics Laboratory (APL), a division of The Johns Hopkins University (JHU), serves as a technical resource to Federal and State agencies to provide innovative research and development. Located on 365 acres in Laurel, Maryland, APL has more than 3,000 employees whose expertise includes a wide spectrum of sciences from engineering and information sciences to oceanography and space physics. The Laboratory's breadth of capabilities and depth of technological expertise create a dynamic environment for pioneering new concepts to solve real problems in real environments.

Our not-for-profit status enables JHU/APL to investigate complex problems without the pressures to find solutions based solely on economic interests. Customers value JHU/APL as a source of independent, objective technical advice, assessment, and evaluation. JHU/APL's outstanding creative staff, experienced leadership, and world-class facilities have built a tradition of excellence in our work, making the Laboratory a major asset to the nation for more than five decades.

The Laboratory's sustained high levels of technical performance and reliability have been built on a strong foundation of systems engineering and interdisciplinary team building. JHU/APL accomplishments encompass a broad body of knowledge and technical specialties including missile, radar, and sonar systems, space, environmental, and undersea technologies; hardware and software development; information management; microelectronics; transportation; communications; navigation; modeling and simulation; materials research; and biomedical engineering.

Programs typically run from basic research to full-scale operational testing, through all phases of project life cycles, providing authoritative, cost-effective solutions to customers. JHU/APL fulfills a complete range of customer needs: working a problem from "cradle to grave," or responding to quick-reaction missions and developing rapid prototypes for specific needs. We work directly with product or system users to ensure satisfaction, from thoroughly testing systems to training users.

JHU/APL is committed to solving challenging problems through the model of applied technical excellence developed through 50 years of experience. Changes in the world's geopolitical structure represent both challenges and opportunities to this country. We are applying the tools of science and technology to solve problems today and to secure the future as well. The same characteristics that defined our record of achievement are now moving us forward with confidence into the 21st century.

References

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STAFFING PLAN

NAME	POSTION TITLE	FILLED / VACANT	ANNUAL SALARY*	% OF EFFORT	START DATE
Joe Lombardo	Project Director	FILLED	$130,853	6%	Apr 2005
Sheri Lewis	Project Manager	FILLED	$88,442	51%	Apr 2005
Lynn Frank	Public Health Consultant	FILLED	24,045/entire project		Apr 2005
Jacki Coberly	Epidemiologist for Response Framework	FILLED	$88,442	10%	Apr 2005
Rekha Holtry	Epidemiologist	FILLED	$75,358	51%	Apr 2005
Brian Feighner	Public Health Analyst	FILLED	$111,675	10%	Apr 2005
Marty Sikes	Exercise Coordinator	FILLED	$111,675	7%	Apr 2005
Unknown	Public Health Generalist	VACANT	$75,358	75%	Jul 2005
Rich Wojcik	IT Project Lead	FILLED	$130,853	24%	Apr 2005
Wayne Loschen	Chief Software Engineer	FILLED	$88,442	50%	Apr 2005
Tina Higgins	Software Project Manager	FILLED	$111,675	10%	Apr 2005
Raj Ashar	Asst. Software Engineer	FILLED	$75,358	19%	Apr 2005
Carol Sniegoski	Computer Science Linguist	FILLED	$88,442	14%	Apr 2005
Nathan Tabernero	GIS Specialist	FILLED	$75,358	14%	Apr 2005
Logan Hauenstein	Asst. Software Engineer	FILLED	$75,358	19%	Apr 2005
David Reed	System Administrator	FILLED	$75,358	50%	Apr 2005
Howard Burkom	Technical Lead for Algorithm Development	FILLED	$130,853	42%	Apr 2005
Sean Murphy	Analyst	FILLED	$75,358	13%	Apr 2005
Steve Babin	Public Health Analyst	FILLED	$88,442	20%	Apr 2005
Michael Thompson	Technical Lead for Data Analysis	FILLED	$88,442	48%	Apr 2005
Tia Gao	Specialist in Wireless Network	FILLED	$75,358	7%	Apr 2005
Chantal Loyer	Administrative Assistant	FILLED	$41,766	8%	Apr 2005
Linda Huntt	Business Manager	FILLED	$88,442	5%	Apr 2005

*This is representative of the average salary for the staff level of each individual.

Staff Qualifications

Joseph Lombardo – Project Director

- Mr. Lombardo is JHU/APL's Program Manager for Medical Bio-Informatics Programs. As such, he is responsible for overseeing the overall project and tasks.

Sheri Lewis – Project Manager

- Ms. Lewis is responsible for the daily coordination and operation of the project elements. Additionally, she is the lead for all activities relating to Public Health Practice.

Lynn Frank – Public Health Consultant

- Ms. Frank is a consultant for the public health practice areas of the NCR project. She is instrumental in consensus building and overall project planning.

Jacki Coberly – Epidemiologist for Response Framework

- Dr. Coberly will be assisting with the formalization of the NCR response framework based on her similar work for CDC's BioSense project.

Rekha Holtry – Epidemiologist

- Ms. Holtry is an epidemiologist that assists in all public health practice aspects of the NCR Syndromic Surveillance Network. She will be working on the development of the formal training materials, formalization of the NCR response network, and the integration of the case management tools for public health practitioners.

Brian Feighner – Public Health Analyst

- Dr. Feighner will assist in the completion of the chief complaint mapping protocol.

Marty Sikes – Exercise Coordinator

- Mr. Sikes is experienced in the area of emergency management and exercise development. As such, he will assist in the all aspects of the exercise planning for the NCR SSN.

Unknown – Public Health Generalist

- This individual will be responsible for public health activities required for the day to day operation of the NCR system. Example tasks include daily/weekly work associated with the OTC products, presentation and abstract development, data analysis tasks, etc.

Richard Wojcik. – Information Technology Project Lead

- Mr. Wojcik is the software lead for the NCR and state nodes, responsible for requirements, database development and data ingestion.

Wayne Loschen – Chief Software Engineer

- Mr. Loschen is the chief software engineer for the web development for the NCR node, and is responsible for the development and implementation of all system enhancements to the NCR node.

Tina Higgins- Software Project Manager

- Ms. Higgins is responsible for the software project management for the NCR and state node development.

Raj Ashar – Assistant Software Engineer

- Mr. Ashar is responsible for the IT development of simulation web sites for the purposes of exercise and training.

Carol Sniegoski- Computer Science Linguist

- Ms. Sniegoski is the lead technical developer for the Chief Complaint Parser which utilizes free text, and will be the lead developer on the implementation of the chief complaint mapping protocol.

Nathaniel Tabernero – GIS Specialist

- Mr. Tabernero is responsible for the ESSENCE GIS capability (to include mapping of disease activity, population overlays, etc.)

Logan Hauenstein – Assistant Software Engineer

- Mr. Hauenstein will assist Mr. Wojcik in the data ingestion tasks associated with the NCR Syndromic Surveillance Network.

David Reed – System Administrator

- Mr. Reed is responsible for the daily system maintenance for the NCR node hosted at JHU/APL.

Howard Burkom – Technical Lead for Algorithm Development

- Dr. Burkom is the lead for algorithm development and is responsible for the optimization and implementation of the alerting algorithms as part of the NCR network modifications and upgrades.

Sean Murphy – Analyst

- Mr. Murphy will be working with Dr. Burkom in the development and implementation of the alerting algorithms. Additionally, he works on the development of simulation software.

Steve Babin – Public Health Analyst

- Dr. Babin is assisting in the daily monitoring of the NCR Syndromic Surveillance Network. He will also be working on analyzing new data sources such as water quality data.

Michael Thompson – Technical Lead for Data Analysis

- Mr. Thompson is working on analytical aspects of the NCR node, including cluster algorithms which would possibly link “like alerts” to minimize the burden on the epidemiologists using the system. He will also be instrumental in the evaluation of potential data sources.

Tia Gao – Specialist in Wireless Networks

- Ms. Gao will be the lead software engineer responsible for the development of the input software needed for the field data entry of data.

Chantal Loyer – Administrative Assistant

- Ms. Loyer assists in the coordination of meetings at JHU/APL.

Linda Huntt – Business Manager

- Ms. Huntt is the Business Manager for the Homeland Protection Business Area. Ms. Huntt handles business and financial management issues for the business area.

PROJECT BUDGET AND BUDGET JUSTIFICATION

Budget Summary

Budget Category		Amount
A.	**Personnel**	**757,537**
B.	**Fringe Benefits**	**358,315**
C.	**Travel**	**49,383**
D.	**Equipment**	**0**
E.	**Supplies**	**0**
F.	**Consultants/Contracts (249,475 Subcontracts; 24,045 Consultants)**	**273,520**
G.	**Other (Claims Data Purchases)**	**162,287**
	Total Direct Costs	**1,601,042**
H.	**Indirect Costs**	**748,957**
	TOTAL PROJECT COSTS	**2,349,999**

NOTE: Full details of all budget categories can be found in a separate document, entitled Budget Detail.

CERTIFICATIONS

GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE DEPUTY MAYOR FOR PUBLIC SAFETY AND JUSTICE

Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; and Drug-Free Workplace Requirements

Applicants should refer to the regulations cited below to determine the certification to which they are required to attest. Applicants should also review the instructions for certification included in the regulations before completing this form. Signature of this form provides for compliance with certification requirements under 28 CFR Part 69, "New Restrictions on Lobbying" and 28 CFR Part 67, "Government-wide Debarment and Suspension (Non-procurement) and Government-wide Requirements for Drug-Free Workplace (Grants)." The certifications shall be treated as a material representation of fact.

1. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code. and implemented at 28 CFR Part 69, for persons entering into a grant or cooperative agreement over $100,000, as defined at 28 CFR Part 69, The applicant certifies that:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement;

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form - lll, "Disclosure of Lobbying Activities," in accordance with its instructions;

(c) The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers including sub grants, contracts under grants and cooperative agreements, and subcontracts) and that all sub-recipients shall certify and disclose accordingly.

2. DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS (DIRECT RECIPIENT)

As required by Executive Order 12549, Debarment and Suspension, and implemented at 28 CFR Part 67, for prospective participants in primary covered transactions, as defined at 28 CFR Part 67, Section 67.510—

A. The applicant certifies that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of Federal benefits by a State or Federal court, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c.) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default; and

B. Where the applicant is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this application.

3. DRUG-FREE WORKPLACE (GRANTEES OTHER THAN INDIVIDUALS)

As required by the Drug Free Workplace Act of 1988, and implemented at 28 CFR Part 67, Subpart F. for grantees, as defined at 28 CFR Part 67 Sections 67.615 and 67.620—

A. The applicant certifies that it will or will continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in The applicant's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an on-going drug-free awareness program to inform employees about—

(1) The dangers of drug abuse in the workplace;
(2) The applicant's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and

(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will—

(1) Abide by the terms of the statement; and

(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency, in writing, within 10 calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title to: Office of Grants Management and Development, 717 14th St., NW, Suite 1200, Washington, DC 20005. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted—

(1) Taking appropriate personnel action against such an employee, up to and incising termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(3) Making a good faith effort to continue to maintain a drug free workplace through implementation of paragraphs (a), (1), (c), (d), and (e). and (f)

B. The applicant may insert in the space provided below the sites for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city. county, state, zip code)

11100 Johns Hopkins Road

Laurel, Maryland 20723

As the duly authorized representative of the applications, I hereby certify that the applicant will comply with the above certifications.

1. Grantee Name and Address:

   Johns Hopkins University/Applied Physics Laboratory
   11100 Johns Hopkins Road
   Laurel, Maryland 20723

2. Application Number and/or Project Name: #05 HSGP-UASI/NCR Capital Region Syndromic Surveillance
3. Grantee IRS/Vendor Number: 52-0595111

Julie K. Walker, Senior Grants Administrator

4. Typed Name and Title of Authorized Representative

Julie K Walker

5. Signature

February 22, 2005

6. Date

STANDARD ASSURANCES

GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE DEPUTY MAYOR FOR PUBLIC SAFETY AND JUSTICE

STANDARD ASSURANCES

The applicant hereby assures and certifies compliance with all Federal statutes, regulations, policies, guidelines and requirements, including OMB Circulars No. A-21, A-110, A-122, A-128, A-87; E.O. 12372 and Uniform Administrative Requirements for Grants and Cooperative Agreements - 28 CFR, Part 66, Common Rule, that govern the application, acceptance and use of Federal funds for this federally-assisted project.

Also, the Application assures and certifies that:

1. It possesses legal authority to apply for the grant; that a resolution, motion or similar action has been duly adopted or passed as an official act of The applicant's governing body, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of The applicant to act in connection with the application and to provide such additional information as may be required.

2. It will comply with requirements of the provisions of the Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 P.L. 91-646 which provides for fair and equitable treatment of persons displaced as a result of Federal and federally-assisted programs.

3. It will comply with provisions of Federal law which limit certain political activities of employees of a State or local unit of government whose principal employment is in connection with an activity financed in whole or in part by Federal grants. (5 USC 1501, et. seq.).

4. It will comply with the minimum wage and maximum hour's provisions of the Federal Fair Labor Standards Act if applicable.

5. It will establish safeguards to prohibit employees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.

6. It will give the sponsoring agency of the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the grant.

7. It will comply with all requirements imposed by the Federal-sponsoring agency concerning special requirements of Law, program requirements, and other administrative requirements.

8. It will insure that the facilities under its ownership, lease or supervision which shall be utilized in the accomplishment of the project are not listed on the Environmental Protection Agency's (EPA), list of Violating Facilities and that it will notify the Federal grantor agency of the receipt of any communication from the Director of the EPA Office of Federal Activities indicating that a facility to be used in the project is under consideration for listing by the EPA.

9. It will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973, Public Law 93-234-, 87 Stat. 975, approved December 31, 1976. Section 102(a) requires, on and after March 2, 1975, the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area that has been identified by the Secretary of the Department of Housing and Urban Development as an area having special flood hazards. The phrase "Federal Financial Assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance.

10. It will assist the Federal grantor agency in its compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 USC 470), Executive Order 11593, and the Archeological and Historical Preservation Act of 1966 (16 USC 569a-1 et. seq.) By (a) consulting with the State Historic Preservation Officer on the conduct of investigations, as necessary, to identify properties listed in or eligible for inclusion in the National Register of Historic Places that are subject to adverse effects (see 36 CFR Part 800.8) by the activity, and notifying the Federal grantor agency of the existence of any such properties, and by (b) complying with all requirements established by the Federal grantor agency to avoid or mitigate adverse effects upon such properties.

11. It will comply, and assure the compliance of all its sub grantees and contractors, with the applicable provisions of Title I of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, the Juvenile Justice and Delinquency Prevention Act, or the Victims of Crime Act, as appropriate; the provisions of the current edition of the Office of Justice Programs Financial and Administrative Guide for Grants; and all other applicable Federal laws, orders, circulars, or regulations.

12. It will comply with the provisions of 28 CFR applicable to grants and cooperative agreements including Part 18. Administrative Review Procedure; Part 20, Criminal Justice Information Systems; Part 22, Confidentiality of Identifiable Research and Statistical Information; Part 23, Criminal Intelligence Systems Operating Policies; Part 30, Intergovernmental Review of Department of Justice Programs and Activities; Part 42, Nondiscrimination/Equal Employment Opportunity Policies and Procedures; Part 61, Procedures for Implementing the National Environmental Policy Act; Part 63, Flood Plain Management and Wetland Protection Procedures; and Federal laws or regulations applicable to Federal Assistance Programs.

13. It will comply, and all its contractors will comply, with the non-discrimination requirements of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, 42 USC 3789(d),

or Victims of Crime Act (as appropriate); Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973, as amended; Subtitle A, Title II of the Americans with Disabilities Act (ADA) (1990); Title IX of the Education Amendments of 1972; the Age Discrimination Act of 1975; Department of Justice Non-Discrimination Regulations, 28 CFR Part 42, Subparts C, D, E and G; and Department of Justice regulations on disability discrimination, 28 CFR Part 35 and Part 39.

14. In the event a Federal or State court or Federal or State administrative agency makes a finding of discrimination after a due process hearing on the grounds of race, color, religion, national origin, sex, or disability against a recipient of funds, the recipient will forward a copy of the finding to the Office for Civil Rights, Office of Justice Programs.

15. It will provide an Equal Employment Opportunity Program if required to maintain one, where the application is for $500,000 or more.

16. It will comply with the provisions of the Coastal Barrier Resources Act (P.L 97-348), dated October 19, 1982, (16 USC 3501 et. seq.) which prohibits the expenditure of most new Federal funds within the units of the Coastal Barrier Resources System.

Julie K. Walker	Senior Grants Administrator
Print Name	Print Title
Julie K Walker	February 22, 2005
Signature	Date

APPENDIX A: AUDITED FINANCIAL STATEMENT

Attached are The Johns Hopkins University Applied Physics Laboratory's Financial Statements dated June 30, 2003 and 2002 (with Independent Auditor Report Thereon).

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY

Balance Sheets

June 30, 2003 and 2002

Assets	2003	2002
Cash and cash equivalents	$ 21,640,273	32,133,322
Receivables:		
Naval Sea Systems Command and other contracts	71,662,353	66,700,689
The Johns Hopkins University	2,572,546	2,889,760
Accrued interest	720,109	692,413
Other	92,108	94,040
Total receivables	75,047,116	70,376,902
Prepaid expenses	133,924	162,452
Investments (note 3)	63,988,465	65,864,786
Investment in plant assets, net (note 4)	132,206,178	104,988,996
Total assets	$ 293,015,956	273,526,458
Liabilities and Net Assets		
Liabilities:		
Accounts and retainage payable	$ 24,717,605	19,843,395
Salaries, wages, payroll taxes, and employee benefits payable (note 9)	9,303,648	10,837,338
Accrued vacation pay	23,349,135	21,132,107
Total liabilities	57,370,388	51,812,840
Net assets:		
Unrestricted:		
Stabilization, Contingency, and Research Fund (note 1):		
Operations	49,544,889	57,876,430
Fund functioning as endowment	53,374,821	55,522,218
Net investment in plant assets	126,537,465	101,385,436
Development fund (note 5)	1,857,027	2,673,331
	231,314,202	217,457,415
Temporarily restricted funds (note 6)	4,331,366	4,256,203
Total net assets	235,645,568	221,713,618
Total liabilities and net assets	$ 293,015,956	273,526,458

See accompanying notes to financial statements.

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY

Statements of Activities

Years ended June 30, 2003 and 2002

	2003			2002		
	Unrestricted net assets	Temporarily restricted net assets	Total	Unrestricted net assets	Temporarily restricted net assets	Total
Contract revenues	$ 588,062,722	—	588,062,722	541,136,762	—	541,136,762
Contract expenditures:						
Salaries and wages	246,167,978	—	246,167,978	230,160,777	—	230,160,777
Employee benefits	120,884,558	—	120,884,558	108,189,779	—	108,189,779
Subcontract costs	87,340,465	—	87,340,465	74,521,957	—	74,521,957
Equipment, materials, and supplies	47,891,671	—	47,891,671	49,719,746	—	49,719,746
Travel	12,656,363	—	12,656,363	12,206,413	—	12,206,413
Depreciation	22,652,425	—	22,652,425	21,352,829	—	21,352,829
Other	26,179,687	—	26,179,687	23,183,825	—	23,183,825
Total contract expenditures	563,773,147	—	563,773,147	519,335,326	—	519,335,326
Excess of contract revenues over contract expenditures	24,289,575	—	24,289,575	21,801,436	—	21,801,436
Other revenues (expenses):						
Cost of capital fees	4,132,619	—	4,132,619	4,903,120	—	4,903,120
Investment income/(loss) (note 3)	1,159,067	(145,501)	1,013,566	(3,325,372)	(461,087)	(3,786,459)
Interest expense	—	—	—	(15,925)	—	(15,925)
Other expenses	(4,259,449)	—	(4,259,449)	(4,679,922)	—	(4,679,922)
Development fund revenues	1,151,421	—	1,151,421	1,720,959	—	1,720,959
Development fund expenses	(1,967,726)	—	(1,967,726)	(2,112,731)	—	(2,112,731)
Temporarily restricted funds additions, net	—	220,664	220,664	—	230,557	230,557
Net other revenues (expenses)	215,932	75,163	291,095	(3,509,871)	(230,530)	(3,740,401)
Increase (decrease) in net assets	24,505,507	75,163	24,580,670	18,291,565	(230,530)	18,061,035
Net assets at beginning of year	217,457,415	4,256,203	221,713,618	209,045,850	4,486,733	213,532,583
Payments to The Johns Hopkins University (note 8)	(10,648,720)	—	(10,648,720)	(9,880,000)	—	(9,880,000)
Net assets at end of year	$ 231,314,202	4,331,366	235,645,568	217,457,415	4,256,203	221,713,618

See accompanying notes to financial statements.

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY

Statements of Cash Flows

Years ended June 30, 2003 and 2002

	2003	2002
Cash flows from operating activities:		
Increase in net assets	$ 24,580,670	18,061,035
Adjustments to reconcile increase in net assets to net cash provided by operating activities:		
Non cash contract expenditures — depreciation of property and equipment	22,652,425	21,352,829
Increase in receivables	(4,670,214)	(2,160,693)
Decrease (increase) in prepaid expenses	28,528	(33,179)
Net realized and unrealized loss on investments	2,214,617	7,122,992
Increase in accounts and retainage payable	2,809,057	1,848,165
(Decrease) increase in salaries, wages, payroll taxes, and employee benefits payable	(1,533,690)	233,472
Increase in accrued vacation pay	2,217,028	2,469,782
Payments to The Johns Hopkins University	(10,648,720)	(9,880,000)
Other	(277,812)	144,722
Net cash provided by operating activities	37,371,889	39,159,125
Cash flows from investing activities:		
Proceeds from sales and maturities of investments	3,419,719	4,130,445
Purchases of investments	(3,758,015)	(4,508,635)
Purchases of property and equipment	(47,526,642)	(32,874,373)
Net cash used by investing activities	(47,864,938)	(33,252,563)
Net increase (decrease) in cash and cash equivalents	(10,493,049)	5,906,562
Cash and cash equivalents at beginning of year	32,133,322	26,226,760
Cash and cash equivalents at end of year	$ 21,640,273	32,133,322
Supplemental information:		
Interest paid	$ —	15,925

See accompanying notes to financial statements.

(1) General

The Applied Physics Laboratory (Laboratory) is a division of The Johns Hopkins University (the University) and is engaged in research and development work, principally under an omnibus contract with the Naval Sea Systems Command of the United States Navy (NAVSEA). Revenues and expenses under the omnibus contract and contracts with other agencies of the United States Government represent substantially all of the contract revenues and expenses of the Laboratory. The omnibus contract and other contracts define reimbursable costs and provide for fees to the University, which are included in contract revenues of the Laboratory. The omnibus contract also requires that a portion of the fees earned by the University thereunder be retained and used for various Laboratory-related purposes. The current contract with NAVSEA continues until September 30, 2007 subject to extension at the option of NAVSEA to September 30, 2012. Laboratory management expects that a contractual relationship with the Navy will continue after expiration of the current contract.

In accordance with an agreement between the United States Government and the University, the Laboratory has been designated a national resource. Under the agreement, if the University should determine that it can no longer sponsor the Laboratory or if the Secretary of the Navy should determine that the Navy can no longer contract with the University with respect to the Laboratory, the University will establish a charitable trust to provide for the continued availability of the Laboratory. The trust would be administered by five trustees and the corpus would consist of the University's interest in the Laboratory's facilities, including land to the extent necessary, and the balances in the University's APL stabilization, contingency, and research fund on the date the trust is established, less certain costs. Upon termination of the trust, the corpus, in whole or in part as determined by the trustees, would be returned to and held and used by the University for such educational or research purposes and in such manner as the trustees and University agree.

(2) Summary of Significant Accounting Policies

(a) Basis of Presentation

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and judgments that affect the reported amounts of assets and liabilities and disclosures of contingencies at the date of the financial statements and revenues and expenses recognized during the reporting period. Actual results could differ from those estimates.

Net assets and revenues, expenses, gains, and losses are classified based on the existence or absence of donor-imposed restrictions. Accordingly, net assets of the Laboratory and changes therein are classified and reported as follows:

Permanently restricted net assets – Net assets subject to donor-imposed stipulations that they be maintained permanently by the Laboratory.

Temporarily restricted net assets – Net assets subject to donor-imposed stipulations that may or will be met either by actions of the Laboratory and/or the passage of time.

Unrestricted net assets – Net assets that are not subject to donor-imposed stipulations.

(Continued)

Revenues from sources other than contributions are reported as increases in unrestricted net assets. Contributions are reported as increases in the appropriate category of net assets except that contributions which impose restrictions that are met in the same fiscal year they are received are included in unrestricted revenues. Expenses are reported as decreases in unrestricted net assets. Gains and losses on investments are reported as increases or decreases in unrestricted net assets unless their use is restricted by explicit donor stipulations or by law. Expirations of temporary restrictions recognized on net assets (i.e., the donor-stipulated purpose has been fulfilled and/or the stipulated time period has elapsed) are reported as reclassifications between temporarily restricted and unrestricted net assets.

(b) Cash and Cash Equivalents

Short-term investments with maturities at dates of purchase of three months or less are classified as cash equivalents except that any such investments purchased with funds held by investment managers are classified as investments. Cash equivalents include short-term, highly liquid investments and are carried at cost, which approximates market value.

(c) Investments

Investments are stated at their fair values which are generally determined based on quoted market prices or estimates provided by external investment managers or other independent sources.

The Laboratory's investments are primarily included in the University's common investment pool known as the Endowment Investment Pool (EIP). The EIP's assets are managed by various investment managers and consist primarily of fixed-income and equity securities. Individual funds are allocated shares of the EIP based on the market value per share at the end of the quarter during which the transaction takes place. Income and realized and unrealized gains and losses are allocated to individual funds on a per share basis. Distributions are made quarterly to the individual funds using a payout rate based on the EIP's average market value.

Retiree Life Insurance Program investment assets are managed by CIGNA and other unrestricted net asset investments are managed by Riggs Investment Management Corporation.

(d) Investment in Plant Assets

Investment in plant assets are stated at cost less accumulated depreciation. Depreciation is computed using the straight-line or declining balance methods over the estimated useful lives of the assets which range from 20 to 30 years for buildings and improvements and 3 to 15 years for equipment. Depreciation of property and equipment which is recoverable under contracts is included in contract expenditures. Depreciation of other property and equipment, including equipment acquired with contract funds, is reported as other expenses.

Certain government-owned equipment, which is not included in the balance sheet, is used by the Laboratory in connection with its performance under the contract with NAVSEA. The Laboratory is accountable to the government for such equipment.

(Continued)

(e) Reclassifications

Certain amounts for 2002 have been reclassified to conform to the presentation for 2003.

(3) Investments

Investments are summarized as follows at June 30:

	2003	2002
Cash and short-term investments held by managers	$ 3,264,747	3,197,995
Deposit Administration Fund	3,162,309	3,112,269
Investment in Endowment Investment Pool	57,561,409	59,554,522
	$ 63,988,465	65,864,786

Investment income (loss) for 2003 and 2002 is summarized as follows:

	2003	2002
Dividend and interest income	$ 347,745	567,162
Distributions from Endowment Investment Pool	2,880,438	2,769,371
Net realized and unrealized gains (losses) on investments	(2,214,617)	(7,122,992)
	$ 1,013,566	(3,786,459)

(4) Investment in Plant Assets

Investment in plant assets, net, is summarized as follows at June 30:

	2003	2002
Land	$ 302,159	302,159
Buildings, improvements, and noncontract equipment	287,406,672	241,320,869
Contract equipment	737,469	737,469
	288,446,300	242,360,497
Less accumulated depreciation	156,240,122	137,371,501
	$ 132,206,178	104,988,996

(5) Development Fund

The Development Fund includes gifts to the Laboratory, patent revenues, interest income, and miscellaneous income. The purposes of the Development Fund are to support the development of ideas and concepts originated by the Laboratory's staff and other activities related to research and development. The Development Fund Committee is able to allocate resources to any study that is deemed worthy of further consideration. The Development Fund's net assets are not subject to donor- or sponsor-imposed restrictions and are unrestricted funds.

(Continued)

(6) Temporarily Restricted Funds

Temporarily restricted funds include the Alfred E. Mann Fund (Mann Fund), the J.H.F. Dunning Memorial Fund (Dunning Fund), the R. B. Kershner Memorial Fund (Kershner Fund), the Mahan Fund, and the Maryland MESA Fund. The Mann Fund was established to support the conduct of research and development in applying advanced technology in the field of medicine and medical equipment. The earnings of the Dunning Fund are used to support the research needs of J.H.F. Dunning Professorship recipients. The Kershner Fund was established to further the education of young students who are extraordinarily gifted in mathematical reasoning ability. The Mahan Fund was established to provide seminars for dissemination of scientific information. The Maryland MESA Fund was established to encourage and support elementary and secondary school students, especially underrepresented minority and female students, to prepare for careers in technical fields.

(7) Short-Term Financing Arrangements

Under terms of a master note agreement with a commercial bank, the Laboratory may borrow up to $50,000,000 under a line of credit for working capital purposes. Advances under the line of credit are unsecured, due on demand and bear interest at a rate which varies based on certain specified market indices. There were no borrowings outstanding under the line of credit at June 30, 2003 or 2002.

(8) Payments to The Johns Hopkins University

In accordance with established University practices, the various operating divisions, including the Laboratory, provide financial support for general operations of the University. In this regard, the Laboratory made payments to the University of $10,648,720 and $9,880,000 in 2003 and 2002, respectively. The contract with NAVSEA limits transfers to the University to a specified percentage of reimbursable contract expenditures during each contract year beginning with the government fiscal year ended September 30, 1995. In keeping with the substance of the internal financial arrangements, the Laboratory's payments to the University are reported as distributions from net assets in the statement of activities.

(9) Pension and Postretirement Benefit Plans

The Laboratory has two voluntary, defined contribution pension plans covering substantially all employees. Benefits are provided through the purchase of annuity contracts or other cash distributions. The Laboratory funds pension costs based on a policy of contributing 2.5% of compensation for all eligible employees and an additional $2.00 for each $1.00 contributed by employees, subject to a limit on such employee contributions of 4% of their compensation. Total pension expense was $27,859,000 in 2003 and $25,179,000 in 2002, including certain costs of administering the plans.

(Continued)

The Laboratory has a retiree benefits plan that provides postretirement medical benefits to employees who meet specified minimum age and service requirements at the time they retire. The Laboratory pays a portion of the cost of participants' medical insurance coverage ranging from 30% to 75%, depending on the participant's age and years of service (subject to specified minimums for participants who were retired, eligible for early retirement or over age 50 prior to January 1, 1993). The University has established a trust fund for its retiree benefits plan. Effective with the contract period beginning October 1, 1994, the Laboratory makes contributions to the trust fund equal to its annual net postretirement benefit cost, including amortization of the transition obligation (calculated as of September 30, 1994) over a period of 20 years.

The Laboratory's retiree benefits plan includes a retiree life insurance program for retirees who have participated in the contributory group term life program at least 5 years immediately prior to retirement. The premium required for the coverage is withdrawn from amounts deposited by the Laboratory in a Deposit Administration Fund maintained at the CIGNA.

Information relating to obligations, assets, and funded status of the retiree benefits plan at June 30, 2003 and 2002 and for the years then ended is summarized as follows:

	2003	2002
Change in benefit obligation:		
Benefit obligation at beginning of year	$ 83,945,000	61,167,000
Service cost	2,606,000	1,523,000
Interest cost	5,598,000	5,553,000
Plan participant contributions	1,420,000	1,331,000
Actuarial loss	21,590,000	18,911,000
Benefits paid	(4,968,000)	(4,540,000)
Benefit obligation at end of year	110,191,000	83,945,000
Change in plan assets:		
Fair value of plan assets at beginning of year	30,160,000	28,516,000
Actual return on plan assets	2,102,000	(2,046,000)
Laboratory contributions	8,094,000	6,899,000
Plan participant contributions	1,420,000	1,331,000
Benefits paid	(4,968,000)	(4,540,000)
Fair value of plan assets at end of year	36,808,000	30,160,000
Funded status	(73,383,000)	(53,785,000)
Unrecognized transition obligation	10,554,000	11,610,000
Unrecognized net actuarial loss	60,670,000	39,830,000
Net amount recognized as accrued benefit liability	$ (2,159,000)	(2,345,000)

(Continued)

	2003	2002
Weighted average assumptions as of June 30:		
Discount rate	6.00%	7.25%
Expected rate of return on plan assets	7.00%	8.50%
Expected rate of return on postretirement life insurance plan assets	6.50%	6.50%
Rate of increase in health care costs used to measure postretirement benefit for next year:		
Participants over age 65	12.00%	10.00%
Participants under age 65	12.00%	10.00%

The rates of increase in health care costs used to measure postretirement benefit costs were assumed to decrease by 0.5% per year to 5.5% in 2003 for participants over age 65 and 7% in 2003 for participants under age 65 and remain at those levels thereafter. Assumed health care cost trend rates have a significant effect on the reported postretirement benefit cost and obligation. A 1% point change in the assumed rates used at June 30, 2003 would have the following effects:

	1% increase	1% decrease
Total service and interest cost components	$ 1,618,000	(1,263,000)
Postretirement benefit obligation	20,028,000	(15,874,000)

The postretirement benefit cost includes the following components for the years ended June 30:

	2003	2002
Service cost	$ 2,606,000	1,523,000
Interest cost	5,598,000	5,553,000
Expected return on plan assets	(2,706,000)	(2,549,000)
Amortization of transition obligation	1,056,000	1,056,000
Amortization of net actuarial loss	1,550,000	1,120,000
Net postretirement benefit cost	$ 8,104,000	6,703,000

(10) Leases

The Laboratory is obligated to pay minimum rents under noncancelable operating leases expiring in 2007. Annual future minimum payments under the operating leases as of June 30, 2003 are summarized as follows:

2004	$ 1,682,400
2005	1,726,800
2006	1,665,700
2007	1,075,900
Total	$ 6,150,800

Rent expense was $1,679,000 and $931,000 for the years ended June 30, 2003 and 2002, respectively.

(Continued)

(11) Commitments

At June 30, 2003, purchase commitments amounted to approximately $105,700,000. In the opinion of management, substantially all of such amounts will be recoverable by the Laboratory under the contract with NAVSEA or other contracts.

(12) Contingencies

Amounts received and expended by the Laboratory under federal contracts are subject to audit by governmental agencies. In the opinion of management, audit adjustments, if any, will not have a significant effect on the financial position of the Laboratory.

The Laboratory is a party to various litigation and other claims in the ordinary course of business. In the opinion of management, appropriate provision has been made for possible losses and the ultimate resolution of these matters will not have a significant effect on the financial position of the Laboratory.

(13) Subsequent Events

In September 2003, the Laboratory borrowed $10,000,000 under a long-term borrowing arrangement with the University to fund the construction of new buildings. Under this arrangement, the borrowings are to be in increments of $10,000,000 with interest compounding and accruing annually. The interest rate will be 4.85% for 2004, and revised annually. Payments of both principal and interest will begin when the Laboratory ceases borrowing. The total cost of new construction for 2004-2008 is expected to be approximately $162,000,000 of which $80,000,000 will be borrowed from the University.

APPENDIX B: INDICATION OF NONPROFIT CORPORATION STATUS

As a division of The Johns Hopkins University, the Applied Physics Laboratory is not a separate legal entity and, as such, maintains a not-for-profit status.

APPENDIX C: ROSTER OF BOARD OF DIRECTORS

As a not-for-profit division of The Johns Hopkins University, the Applied Physics Laboratory does not have an official Board of Directors. APL's Director is Dr. Richard Roca; Assistant Director, Programs is Mr. David Kalbaugh; and Assistant Director, Operations is Ms. Ruth Nimmo.

APPENDIX D: PROPOSED ORGANIZATIONAL CHART FOR THE PROJECT

Figure D-1 shows the proposed organizational chart for the NCR Syndromic Surveillance Network.

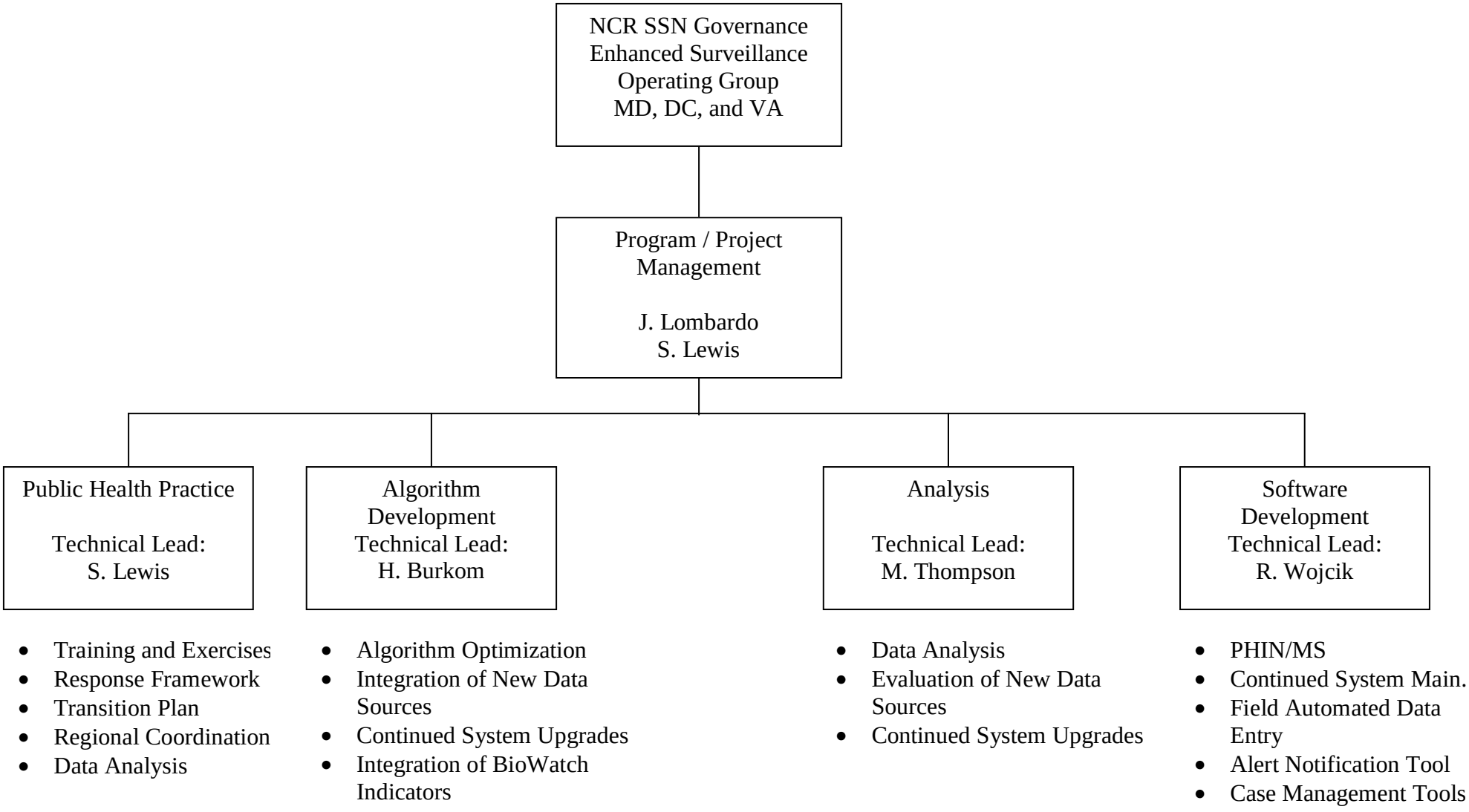

Figure D-1 Proposed Organizational Chart for NCR Syndromic Network Project

APPENDIX E: STAFF RESUMES

Staff resumes are provided for the Project Director, Project Manager and the Technical Leads identified in Figure D-1, Proposed Organizational Chart for NCR Syndromic Network Project:

Joseph S. Lombardo
Sheryl L. Happel Lewis
Howard S. Burkom
Michael W. Thompson
Richard A. Wojcik

NAME: Joseph S. Lombardo

POSITION TITLE: Program Manager, Bio Information Systems (JHU/APL)

ROLE ON PROJECT: Project Director

EDUCATION: The Johns Hopkins University, M.S., 1974, Electrical Engineering
University of Illinois, B.S., 1969, Electrical Engineering

SUMMARY: Joseph S. Lombardo has extensive background in concept development, implementation, and testing of medical information systems. He has managed efforts both as a program manager and a line supervisor. He has experience in distributed interactive simulation, virtual prototyping, and information systems. For the past two decades he has been developing new business initiatives that have led to substantial programs at the Laboratory.

WORK EXPERIENCE

1970–Present: The Johns Hopkins University Applied Physics Laboratory

1998–Present: Program manager for Bio Information Systems. Responsibilities the development of a biosurveillance system that can provide early warning of a covert terrorist event using pathogenic agents; the development, implementation, and evaluation of a remote treatment planning system for oncology using next generation Internet technologies; the development of cardiac diagnostic aids using advanced signal processing techniques; and the implementation and overseeing the execution of an advanced disease surveillance network for the National Capital Region. Also responsible for implementing an Oncology Network for the State of Maryland.

1997–1998: William S. Parsons Sabbatical Fellow with the Johns Hopkins School of Medicine. Responsibilities include the development and implementation of the Faculty Information System.

1990–1997: Responsible for expanding and managing business in the area of healthcare information systems. The APL representative to Johns Hopkins Medicine Center for Information Services. Projects include the introduction of wireless networks into The Johns Hopkins Hospital so that mobile workstations can be bring access to electronic patient records to the point of care, development of automatic recognition algorithms for heart and lung sounds, and hospital information systems. Organized and conducted the Maritime Synthetic Theater of War simulation for the Defense Advanced Research Projects Agency. The demonstration was the first major naval exercise on the Defense Simulation Internet, using the emerging Distributed Interactive Simulation Protocols. Conducted the Collaborative Virtual Prototyping (CVP) Study for the Naval Air Systems Command. The study examined the potential for CVP technologies to assist in the reform of the DoD acquisition system. The study focused on applying this technology to the next generation surveillance aircraft.

1984–1993: Responsible for all technical and programmatic aspects of the Surveillance Towed Array Sensor System (SURTASS) program, a U.S. Navy Antisubmarine program. Many significant experiments and developments were achieved in undersea surveillance with surface towed acoustic arrays. Included in these are the SURTASS 3X series of experiments that examined the limits of array performance in differing environments. APL was the lead laboratory for the development of the SURTASS Reduced Diameter Array and the second source SURTASS production array. APL experiments and analytical investigations resulted in design innovations that increased the performance and durability of these sensors. Joined the Undersea Surveillance program in 1990 as SURTASS Program Manager.

1981–1990: Scientific Investigations Section Supervisor within the Acoustics Group of the Submarine Technology Department. Project Director for a number of large-scale oceanographic experiments for the U.S. Navy's SSBN Security Technology Program. Appointed to the Principal Professional Staff in 1987.

1970-1980: Systems engineer responsible for the development of instrumentation and computer systems for collecting and analyzing acoustic data for U.S. Navy research and development programs. Promoted to the Senior Professional Staff in 1977.

HONORS

Recipient of the 1997 Association for the Advancement of Medical Instrumentation award for the best manuscript in Technology and Management. "An Evaluation of Mobile Computing for Information Access at the Point of Care," AAMI Journal, September–October 1997.

Eta Kappa Nu	Electrical Engineering Honorary since 1968
Sigma Tau	Engineering Honorary since 1968
Tau Beta Pi	Engineering Honorary since 1977

SELECTED PUBLICATIONS

Hurt-Mullen, K., Happel Lewis, S., Edwards, C., Jordan, C., Wojcik, R. A., and Lombardo, J., "Local Health Department Applications of ESSENCE Biosurveillance System," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004, http://apha.confex.com/apha/132am/techprogram/paper_93642.htm

Lombardo, J. S., Happel Lewis, S. L., Wojcik, R. A., Loschen, W., Burkom, H. S., and Magruder, S. F., "Health Monitoring System for San Diego, California," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004, http://apha.confex.com/apha/132am/techprogram/paper_88997.htm

Konigsberg, C., Happel-Lewis, S., Holtry, R., Casani, J., Blythe, D., Davies-Cole, J., Glymph, C., Sockwell, D., Woolard, D., Lombardo, J. and Frank, L., "Overcoming Obstacles to Data Sharing: A Success Story in the National Capital Region," Presented at the National Syndromic Surveillance Conference (NSSC), 03–04 November 2004, http://syndromic.org/con_2004.html

Wagner, M., Pavlin, J., Brillman, J., Magruder, S., Campbell, M., Stetson, D., Babin, S., Brinkman, J., Chapman, W., Cheng, K. Espino, J. Florio, E., Foster, V., Hogan, W., Johnson, H., Kress, A., Lombardo, J., Shah, G., Siegrist, D., and Wallstom, G., "Synthesis of Research on the Value of Unconventional Data for Early Detection of Disease Outbreaks," Final Report of the DARPA BioALIRT Program, July 2004.

Babin, S., Witt, C., Casper, J., Wojcik, R., Lewis, S., and Lombardo, J., "Syndromic Animal Surveillance in the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE)," Presented at the National Multi-Hazard Symposium: "One Medicine" Approach to Homeland Security, Research Triangle Park, NC, 11-12 December 2003.

Happel Lewis, S., Hurt-Mullen, K., Loschen, W., Wojcik, R.A., and Lombardo, J. S., "Active Biosurveillance in a Suburban Metropolitan Area," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68532.htm

Happel Lewis, S., Babin, S. M., Casper, J., Witt, C., Wojcik, R. A., Magruder, S. F., Burkom, H. S. , Weitzel, J., and Lombardo, J., "Early Detection of Possible Bioterrorist Events Using Sentinel Animals," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68443.htm

Lombardo, J. et al., "National Capital Region Disease Surveillance Network Using ESSENCE," An Overview of Performance and Implementation Issues for the National Syndromic Surveillance Conference, 22 October 2003, http://www.syndromic.org/pdf/con2-JL-2.pdf

"The ESSENCE II Disease Surveillance Test bed for the National Capital Region," Submitted for publication in the special CP issue of the JHUAPL Technical Digest, October 2003.

"Wavelet Processing of Systolic Murmurs to Assist with Clinical Diagnosis of Heart Disease," Biomedical Instrumentation & Technology, July/August 2003, pp: 263-270.

Lombardo, J. and Pavlin, J., "Bio Surveillance: Utilizing ESSENCE II in Emergency Response," Presented at the 2003 NDMS Conference, 9 March 2003, http://ndms.umbc.edu/conference2003/Proceedings/confl2_Biosurveillance_Lombardo.pdf

Babin, S., Casper, J., Witt, C., and Lombardo, J., "Animal Biosurveillance," Invited Presentation to the National Park Service Interprogram Response to Zoonotic/Environmentally Transmitted Diseases Workshop, Ft. Collins, CO, 7–8 January 2003.

Lombardo, J. et al., "A Systems Overview of the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE II)," Journal of Urban Health, Vol. 80, No. 2, Supplement 1, 2003, pp. i31–i41, http://jurban.oupjournals.org/cgi/reprint/80/suppl_1/i32.pdf

Lombardo, J. et al., "ESSENCE II and the Framework for Evaluating Syndromic Surveillance Systems," Morbidity and Mortality Weekly Report (MMWR), Vol. 53 Supplement, Syndromic Surveillance: Reports from a National Conference, 2003, pp 159–165, http://syndromic.org/syndromicconference/2003/mmwr/mm53su01_full.pdf

Lombardo, J., "The ESSENCE II Disease Surveillance Test Bed for the National Capital Area," Johns Hopkins APL Technical Digest, Vol. 24, No. 4, 2003, http://techdigest.jhuapl.edu/td2404/Lombardo.pdf

"Using Modern Information Technology to Profile Faculty Activities," Academic Medicine, Vol.73, No.12/ December 1998.

"Time-Frequency Analysis of Pediatric Murmurs," Biomedical Sensing and Imaging Technologies, SPIE Vol. 3253, January 1998.

"An Evaluation of Mobile Computing for Information Access at the Point of Care," Biomedical Instrumentation & Technology, Vol. 31, No. 5, September /October 1997 pp-465 to 475.

"Time-Frequency Analysis of Heart and Lung Sounds," proceedings of the conference on Advanced Technology Applications to Combat Casualty Care 97', May 1997.

"Report on the Findings and Recommendations of the Wireless and Handheld Computing Focus Group," http://jhmcis.med.jhu.edu/, Research Reports, June 1996.

"Collaborative Virtual Prototyping," Johns Hopkins APL Technical Digest, Volume 17, Number 3 (1996).

"Collaborative Virtual Prototyping: An Assessment for the Common Support Aircraft Initiative," AIR-1.3/96-014, 24 October 1995.

"Automated Cardiac Auscultation for Detection of Pathologic Heart Murmurs," Pediatric Cardiology, Vol. 22, No. 5 pp: 373-379.

NAME: Sheryl L. Happel Lewis

POSITION TITLE: Public Health Analyst

ROLE ON PROJECT: Project Manager

EDUCATION: The George Washington University, 2000, M.P.H. International Health Policy and Programs
Loyola College in Maryland, 1997, B.S. Biology

SUMMARY: Sheryl Lewis has expertise in the field of biosurveillance. As the technical lead for public health across the APL ESSENCE program, Ms. Lewis networks and interfaces with public health officials, both locally in the National Capitol Region (NCR), as well as in other areas of the country. Ms. Lewis works with counties in both the data collection aspects of biosurveillance as well as assisting them in the investigation of abnormal analysis results. Additionally, she serves as a trainer to the public health users of ESSENCE.

From the programmatic point of view, Ms. Lewis assists with the development and implementation of transition plans, coordinates administrative details of public health consultants for the program, assists in the negotiation of Memorandums of Understanding and Data Sharing Agreements, and writes abstracts and proposals as necessary. Additionally, she serves as a project manager for the ESSENCE program.

Prior to working at APL, Ms. Lewis worked in the field of pharmaceuticals. As a consultant, she was responsible for various aspects of epidemiological studies including study design, data analysis, presentation design, and authoring of technical documents. Additional experience includes serving as team lead on a government funded health project, writing proposals, assisting in marketing and strategic planning efforts, and interacting with public health agencies. She has extensive knowledge of public health policy and legislative processes.

WORK EXPERIENCE

November 2001–Present: The Johns Hopkins University Applied Physics Laboratory
As ESSENCE Project Manager for the National Capital Region Syndromic Surveillance Network responsible for fiscal and staff management of the project. Additionally serves as backup point of contact on all programmatic issues for the ESSENCE program manager. Public Health lead for the ESSENCE program. Prior tasks include daily indicator processing and analysis and county health office coordination for both the DARPA ESSENCE II project and the Maryland Disease Surveillance and Response System.

March–October 2001: Bristol Myers Squibb Company, Regulatory Relations and Policy Office
Responsible for reviewing policy for inclusion in a regulatory action database; assisted in development of comments to various regulatory bodies; responsible for the design/implementation/maintenance of the Regulatory Relations and Policy web site; monitored U.S. government, international regulatory bodies, and other groups for industry-related policy.

July 2000–March 2001: International Science and Technology Institute, Inc.
Program Associate responsible for writing/coordinating proposals and Expressions of Interest for international funding opportunities; assisted in the technical analysis of international public health activities; prepared budgets; coordinated aspects of international travel activities and prepared corresponding expense reports; monitored U.S. government, international donor agencies, and various non-governmental organizations for possible funding opportunities.

June 1997–July 2000: The Degge Group, Ltd.
As a research associate, assisted in the design and implementation of epidemiological and pharmaceutical research projects; wrote grant applications for funding from the National Institutes of Health; lead project team on National Institutes of Health / National Cancer Institute grant; represented company at pharmaceutical industry meetings and conferences; designed figures and tables for technical reports; wrote pieces of technical reports. As a Junior Research Associate, pursued all aspects of research projects and co-authored associated reports; organized yearly/occasional supplement to the Pharmacoepidemiology and Drug Safety Journal; member of marketing committee; organized company presence at pharmaceutical meetings and conferences. As Special Assistant to the President, assisted president in her duties as Regional Editor for Pharmacoepidemiology and Drug Safety Journal, worked on selected research, regulatory, and legal projects; coordinated strategic planning efforts. As Research Assistant, maintained legal database and legal materials, compiled tables, charts, forms, and graphs for presentations, reports, and manuscripts; worked with research managers on regulatory and research projects; designed posters for academic poster sessions.

January–April 1997: Office of Maryland Attorney General Consumer Health Division
As a Health Advocacy Specialist, mediated patient complaints via letters and phone communication; learned about health related legislative processes.

HONORS

Montgomery's Best Honor Awards Program, 2004
Presidential Management Intern Finalist, 2000
Tri-Beta Biological Honor Society, 1995–Present
Johns Hopkins University/Applied Physics Laboratory Scholarship, 9/93–5/97
Loyola Scholarship, 9/93–5/97
Maryland Distinguished Scholar Honorable Mention, 1993

PROFESSIONAL SOCIETY MEMBERSHIPS

American Public Health Association, 1999–Present

SELECTED PUBLICATIONS

Happel Lewis, S. L. et al., "National Capital Region Syndromic Surveillance Network," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004,
http://apha.confex.com/apha/132am/techprogram/paper_88684.htm

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Florio, E. N., Magruder, S. F., Happel Lewis, S. L., and Wojcik, R. A., "Improving Over-the-Counter Medication Sales Monitoring by Modeling Related Factors," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_63095.htm

Happel Lewis, S., Hurt-Mullen, K., Loschen, W., Wojcik, R.A., and Lombardo, J. S., "Active Biosurveillance in a Suburban Metropolitan Area," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68532.htm

Happel Lewis, S., Babin, S. M., Casper, J., Witt, C., Wojcik, R. A., Magruder, S. F., Burkom, H. S. , Weitzel, J., and Lombardo, J., "Early Detection of Possible Bioterrorist Events Using Sentinel Animals," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68443.htm

Happel Lewis, S. L., Cutchis, P. N., Babin, S. M., and Burkom, H. S., "Simulated Release of Plague in Montgomery County, Maryland," Johns Hopkins APL Technical Digest, Vol. 24, No. 4, 2003, http://techdigest.jhuapl.edu/td2404/Happel_Lewis.pdf

Magruder, S., Happel Lewis, S., Najmi, A., and Florio, E., "Progress in Understanding and Using Over-the-Counter Pharmaceuticals for Syndromic Surveillance of Public Health," Morbidity and Mortality Weekly Report (MMWR), Vol. 53 Supplement, Syndromic Surveillance: Reports from a National Conference, 2003, pp 117–122, http://syndromic.org/syndromicconference/2003/mmwr/mm53su01_full.pdf

NAME: Howard S. Burkom

POSITION TITLE: Bio Statistician

ROLE ON PROJECT: Technical Lead for Algorithm Development

EDUCATION: University of Illinois, Champaign, IL, 1976, Ph.D. Mathematics
University of Illinois, Champaign, IL, 1971, M.S. Mathematics
Lehigh University, Bethlehem, PA, 1970, B.S. Mathematics (magna cum laude),
Recent coursework at the Johns Hopkins Bloomberg School of Public Health: Principals of Epidemiology, Intermediate Epidemiology

SUMMARY: Over 25 years of experience designing and implementing solutions to applied problems in the physical sciences and recently epidemiology using numerous theoretical approaches in mathematics, biostatistics, computer simulations and modeling, artificial intelligence, signal processing, and operations research; extensive software accomplishments as developer/supervisor; eight years as teacher of mathematics and programming.

WORK EXPERIENCE

1996–Present: The Johns Hopkins University Applied Physics Laboratory
Electromagnetics and Acoustics Group, Submarine Technology Department technical lead in biosurveillance coordination project involving disease modeling, time series modeling of background data, and cluster analysis; developed mathematical description of underwater waveforms from customized acoustic sources; developed Monte Carlo methodology for sonar system spreadsheet simulations; analyzed noise characteristics of passive sonar data; investigated active beamforming methods on new source technology; developed detectability and vulnerability algorithms for optics project; recent work in biosurveillance on disease modeling, background noise estimation, and early outbreak detection using matched-filter methods.

1979–1996: SFA, Inc. (formerly Sachs/Freeman Associates) subcontracting at JHU/APL
Acoustics Group, Submarine Technology Department (1986–1996) did mathematical modeling to predict and analyze performance of customized acoustic projectors; modified the model for numerous subsequent applications; derived and implemented signal processing methods to increase effectiveness of target detection algorithms; served as principal investigator for project to build (in C++) automated track planner based on fuzzy logic; pioneered departmental use of object-oriented methodology for computer simulations; developed (in SMALLTALK) acoustic detection system simulator; designed and supervised development (in Visual Basic) of shipboard and post-test Doppler processing systems for analysis of sea-test data.

Environmental Group, Submarine Technology Department (1979–1986) developed mathematical concepts in tactical oceanography for use by the U.S. Navy; supervised proof-of-principal studies and documented results in the form of fleet guidance; modified electromagnetic atmospheric transmission loss model to improve radar predictions for U.S. Air Force; applied a variety of

techniques to the numerical solution of hydrodynamic differential equation systems; developed image-processing techniques to improve visualization of sea-test data.

1977–1979: American Totalisator Systems, Inc., Hunt Valley, MD, Software Division
Designed, wrote, tested, and documented much of a wagering software system on 16-bit minicomputers; provided internal and external liaison for specifications, troubleshooting, and testing.

1978–1979: Community College of Baltimore
Taught evening algebra courses to adult undergraduates.

1976–1977: Southern Illinois University, Carbondale, IL, Mathematics Department
Assistant professor of mathematics; taught various levels of mathematics and served on departmental committees.

1971–1976: University of Illinois, Champaign-Urbana, IL, Mathematics Department
Graduate teaching assistant; had sole responsibility for teaching numerous sections of undergraduate mathematics and programming, from remedial algebra to honors calculus.

HONORS

Phi Beta Kappa, 1970
Dean's List, Lehigh University, 1966–1970
Graduate Fellowship, University of Illinois, 1970 and 1971

SELECTED PUBLICATIONS

Burkom, H. S., Elbert, E., Feldman, A., Lin, J., and Murphy, S. P., "Statistical and Epidemiological Management of Complex, Multilevel ESSENCE Biosurveillance Systems," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004,
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Burkom, H., "Estimation of Late Reporting Corrections for Health Indicator Surveillance," Presented at the 131st Annual Meeting of APHA, San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_63031.htm

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Hutwagner, L. and Burkom, H. S., "Practical Issues in Applying Alerting Algorithms for Biosurveillance," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15–19 November 2003, http//apha.confex.com/apha/131am/techprogram/paper_63089.htm

Burkom, H. S., "Biosurveillance Applying Scan Statistics with Multiple, Disparate Data Sources," Journal of Urban Health, Vol. 80, No. 2, Supplement 1, April 2003, pp. i57–i65, http://www.nyam.org/events/syndromicconference/2002/Supplementpdf/Burkom.pdf

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Burkom, H. S., "Development, Adaptation, and Assessment of Alerting Algorithms for Biosurveillance," Johns Hopkins APL Technical Digest, Vol. 24, No. 4, 2003, http://techdigest.jhuapl.edu/td2404/Burkom.pdf

Happel Lewis, S. L., Cutchis, P. N., Babin, S. M., and Burkom, H. S., "Simulated Release of Plague in Montgomery County, Maryland," Johns Hopkins APL Technical Digest, Vol. 24, No. 4, 2003, http://techdigest.jhuapl.edu/td2404/Happel_Lewis.pdf

NAME: Michael W. Thompson

POSITION TITLE: Physicist

ROLE ON PROJECT: Technical Lead for Data Analysis

EDUCATION: The Pennsylvania State University, Ph.D., 2004, Acoustics
Brigham Young University, M.S., 2000, Physics
Brigham Young University, B.S., 1996, Applied Physics Selected Options (with a minor in Mathematics)
Brigham Young University, B.A., 1998, Music

SUMMARY: Michael Thompson is currently developing clustering and detection algorithms for the ESSENCE project. Other recent experience includes: designing, conducting, and evaluating experimental studies of nonlinear acoustic phenomena; developing, testing, and evaluating signal-processing algorithms for the analysis of acoustical data; developing, testing, and evaluating physical models of nonlinear acoustic phenomena; and teaching acoustics and physics at the undergraduate level.

WORK EXPERIENCE

2004–Present: The Johns Hopkins University Applied Physics Laboratory
Responsible for developing an algorithm for temporal clustering of temporal alerts generated by the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE); and investigating methods for multidimensional clustering of temporal alerts generated by ESSENCE. In addition, maintained detailed records of research procedures, data, and results. Wrote technical documents and gave technical presentations.

2000–2004: The Pennsylvania State University Applied Research Laboratory
As a research assistant, developed a highly accurate and robust signal-processing algorithm for analyzing acoustical data acquired by laser Doppler anemometry (LDA) with burst spectrum analysis (BSA). Developed highly accurate techniques for measuring acoustic streaming (steady fluid currents generated nonlinearly by sound) using LDA/BSA. Designed and constructed an experimental apparatus for studying acoustic streaming. Experimentally tested available theories on acoustic streaming. Discovered experimentally a new relationship between small temperature gradients and acoustic streaming in an enclosed acoustic resonator. Maintained detailed records of research procedures, data, and results. Wrote technical documents and gave technical presentations.

2002–2004: The Pennsylvania State University Graduate Program in Acoustics
Teaching assistant responsible for co-teaching a multidisciplinary senior-level undergraduate course on acoustics. Responsibilities included developing the course syllabus; preparing and presenting lectures; and preparing, administering, and grading homework and exams. Graded homework and exams for a graduate-level distance-education course on linear acoustics.

1998–2000: Brigham Young University Department of Physics and Astronomy
As a research assistant, developed a hybrid physical model/signal-processing algorithm for accurately predicting the influence of nonlinear waveform steepening in trombone sound production. Measured the mouthpiece pressure and radiated pressure produced by a trombone under performance conditions in order to validate the model. Programmed an application for real-time visualization of speech for use as a lip-reading aid by the hearing impaired. Maintained detailed records of research procedures, data, and results. Wrote technical documents and gave technical presentations.

1998–2000: Brigham Young University Department of Physics and Astronomy,
Assisted in teaching a multidisciplinary freshman-level course on the acoustics of hearing, speech, music, and audio from the perspectives of psychoacoustics, audiology, speech pathology, music, sound recording, engineering, and physics. Responsibilities included preparing exams, preparing and teaching hands-on laboratory sections, and tutoring students during regular office hours. Tutored undergraduate students in various physics and physical science courses.

HONORS

Kenneth T. Simowitz Memorial Citation, The Pennsylvania State University Graduate Program in Acoustics, 2003 and 2004
Dean's Fellowship in Engineering, The Pennsylvania State University College of Engineering, 2000–2003
Outstanding Teaching Assistant, American Association of Physics Teachers, 1999
G. Walter and Katie F. Gasser Scholarship, Brigham Young University, 1998
Spring/Summer Academic Scholarship, Brigham Young University, 1998
Dean's List of Honor Students, Brigham Young University College of Fine Arts and Communications, 1998
Trustees Scholarship, Brigham Young University, 1991–1993

PROFESSIONAL SOCIETY MEMBERSHIP

Acoustical Society of America, 1999–Present
Audio Engineering Society, 2003–2004
American Physical Society, 2000–2001
American Association of Physics Teachers, 1999–2000

SELECTED PUBLICATIONS

M. W. Thompson and A. A. Atchley, "Influences of a temperature gradient and fluid inertia on acoustic streaming in a standing wave" (accepted for publication in the Journal of the Acoustical Society of America).

M. W. Thompson and A. A. Atchley, "Simultaneous measurement of acoustic and streaming velocities in a standing wave using laser Doppler anemometry" (accepted for publication in the Journal of the Acoustical Society of America).

M. W. Thompson and S. F. Magruder, Results of "ESSENCE alert clustering" IR&D project (Internal report STX-04-056, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland, 2004).

M. W. Thompson, Measurement of acoustic streaming in a standing wave using laser Doppler anemometry (Ph.D. dissertation, The Pennsylvania State University, 2004).

M. W. Thompson and A. A. Atchley, "Measurement of acoustic streaming using laser Doppler anemometry," Proceedings of the 18th International Congress on Acoustics, Kyoto, Japan, 4–9 April 2004 (paper presented by Anthony A. Atchley).

T. Biwa, M. W. Thompson, and A. A. Atchley, "Optical measurement of traveling-wave acoustic streaming in a wave guide," Proceedings of the 18th International Congress on Acoustics, Kyoto, Japan, 4–9 April 2004 (paper presented by Tetsushi Biwa).

Colloquium of the Brigham Young University Department of Physics and Astronomy, Provo, Utah, 2 March 2004.

146th Meeting of the Acoustical Society of America, Austin, Texas, 10–14 November 2003 (invited paper).

First Pan-American/Iberian Meeting on Acoustics, Cancun, Mexico, 2–6 December 2002 (paper presented by Anthony A. Atchley).

M. W. Thompson and A. A. Atchley, "Measurements of Rayleigh streaming in high-amplitude standing waves," in Nonlinear Acoustics at the Beginning of the 21st Century, edited by O. V. Rudenko and O. A. Sapozhnikov (Faculty of Physics, MSU, Moscow, 2002), Vol. 1, pp. 183–190. Proceedings of the 16th International Symposium on Nonlinear Acoustics, Moscow, Russia, 19–23 August 2002 (paper presented by Anthony A. Atchley).

143rd Meeting of the Acoustical Society of America, Pittsburgh, Pennsylvania, 3–7 June 2002.

Seminar of The Pennsylvania State University Graduate Program in Acoustics, University Park, Pennsylvania, 21 February 2002.

M. W. Thompson and W. J. Strong, "Inclusion of wave steepening in a frequency-domain model of trombone sound production," Journal of the Acoustical Society of America, Vol. 110, pp. 556–562 (2001).

M. W. Thompson, Inclusion of wave steepening in a frequency-domain model of trombone sound production (M.S. thesis, Brigham Young University, 2000).

139th Meeting of the Acoustical Society of America, Atlanta, Georgia, 30 May – 3 June 2000 (paper presented by William J. Strong).

14th Annual Spring Research Conference of the Brigham Young University College of Physical and Mathematical Sciences, Provo, Utah, 18 March 2000.

NAME: Richard A. Wojcik

POSITION TITLE: Programmer and Section Supervisor

ROLE ON PROJECT: Information Technology Project Lead

EDUCATION: JHU/Whiting School of Engineering, 1985, M.S. Computer Science
Pennsylvania State University, 1980, B.S. Computer Science

SUMMARY: Richard A. Wojcik has a diverse background in computer system programming, design, and integration. His recent work is focused on the integration, storage, security, and distribution of information. Most recently he has applied these skills in developing alerting systems for biological surveillance activities.

He has also applied these skills in developing, implementing and supporting several activities with the Johns Hopkins University School of Medicine. These activities include the SoM Faculty Information System, the Johns Hopkins Hospital Wireless Mobile Computing initiative, SoM Applicant Admissions System, and the Radiation Oncology Next Generation Internet remote radiation treatment planning system.

His past work was focused on the development of real-time data acquisition systems for the Critical Sea Test Program, Maritime Simulation Demonstration, NAVAIR NUAMP/EDMP, Full Spectrum, and Transient Self Monitoring programs. His past analysis work has focused on the effects of line distortion on sonar arrays for the SURTASS Improvement Program. He has led efforts as a facility manager, a systems manager, a project task leader, and a line supervisor. Richard A. Wojcik was promoted to the Principal Professional Staff in 1999.

WORK EXPERIENCE

1980–Present: The Johns Hopkins University Applied Physics Laboratory

2004–Present: Acted at Information Technology lead for NCR Syndromic Surveillance Network responsible for acquiring regional data feeds, assisting local jurisdictions with the acquisition of regional data feeds, assisting in software installation in each jurisdiction, archiving data, continuing development on ESSENCE software, and setting up the NCR network.

1998–2004: Studied information gathering and distribution requirements needed to ascertain regional health conditions and warn health officials of a biological agent attack for the Counter Proliferation Homeland Defense–Biological Agent Surveillance System to demonstrate to health officials how the system can be used as a tool in their surveillance activities. Responsibilities included work on net.work.Maryland's Maryland Disease and Response System (MDSRS), DARPA's Bio-ALIRT ESSENCE II project, Joint Service Installation Protection Project (JSSIP), and Guardian.

1998–Present: Worked with the Johns Hopkins University School of Medicine in designing and developing the Applicant Admissions System. Activities included system study, design, data

integration, and deployment of an Admissions information system using desktop database tools to process applicants to the School of Medicine.

1998–2001: National Library of Medicine - Biomedical Applications for the Next Generation Internet. Collaborated with the Johns Hopkins Medicine Radiation Oncology to implement remote treatment planning using proposed NGI capabilities of network security and quality of service.

1996–1998: Johns Hopkins University School of Medicine - Faculty Information System
Responsible for system study, design, data integration, and deployment of a faculty information system, using a Web document server, database publishing, data encryption, and browser technologies to deliver information about a faculty member's academic and clinical practice activities.

1996–2001: Information Technologies Group, Submarine Technology Department
Line supervisor responsible for providing guidance in project direction, scheduling, and programming. The section is responsible for developing, integrating, and deploying information systems.

1996–1997: Johns Hopkins Medicine - Mobile Computing Network Deployment
Provided system design and electromagnetic site study for the wireless mobile computing network enabling healthcare providers to access central hospital information from laptop computers at the patient's bedside.

1996: Johns Hopkins Medicine - Mobile Computing Investigation
Investigated various network and platform technologies available for mobile computing, and assisted in leading a JHM focus group in the feasibility of deploying mobile computer applications.

1996: Johns Hopkins Medicine - Cardiac Evaluation Unit Investigation
Responsible for system study and design of a prototype patient tracking system for the Emergency Department to aid in outcome analysis and the development of new patient care protocols.

1985–1996: Acoustics Group, Submarine Technology Department
Section Supervisor, Computer Systems Development (1986)
System Manager, Acoustics Processing Laboratory (1986)

1980–1985: Instrumentation Group, Submarine Technology Department

SELECTED PUBLICATIONS

Hurt-Mullen, K., Happel Lewis, S., Edwards, C., Jordan, C., Wojcik, R. A., and Lombardo, J., "Local Health Department Applications of ESSENCE Biosurveillance System," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004, http://apha.confex.com/apha/132am/techprogram/paper_93642.htm

Lombardo, J. S., Happel Lewis, S. L., Wojcik, R. A., Loschen, W., Burkom, H. S., and Magruder, S. F., "Health Monitoring System for San Diego, California," Presented at the 132nd Annual Meeting of the American Public Health Association (APHA), Washington, DC, 06–10 November 2004, http://apha.confex.com/apha/132am/techprogram/paper_88997.htm

Happel Lewis, S., Babin, S. M., Casper, J., Witt, C., Wojcik, R. A., Magruder, S. F., Burkom, H. S. , Weitzel, J., and Lombardo, J., "Early Detection of Possible Bioterrorist Events Using Sentinel Animals," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68443.htm

Happel Lewis, S., Hurt-Mullen, K., Loschen, W., Wojcik, R.A., and Lombardo, J. S., "Active Biosurveillance in a Suburban Metropolitan Area," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15-19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_68532.htm

Florio, E. N., Magruder, S. F., Happel Lewis, S. L., and Wojcik, R. A., "Improving Over-the-Counter Medication Sales Monitoring by Modeling Related Factors," Presented at the 131st Annual Meeting of the American Public Health Association (APHA), San Francisco, CA, 15–19 November 2003, http://apha.confex.com/apha/131am/techprogram/paper_63095.htm

Lombardo, J., Burkom, H., Elbert, E., Magruder, S., Lewis, S., Loschen, W., Sari, J., Sniegoski, C., Wojcik, R., and Pavlin, J., "A Systems Overview of the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE II)," Journal of Urban Health: Bulletin of the New York Academy of Medicine, Vol. 80, No. 2, Supplement 1, 2003.

Lombardo, J. S., White, C.H., Wojcik, R. A., "Using Modern Information Technology to Profile Faculty Activities," Academic Medicine, Vol. 73, No. 12, December 1998.

Lombardo, J. S., Wojcik, R. A., Proposal to JHU School of Medicine, "School of Medicine Admissions System," AD-17509, November 1998.

Lombardo, J. S., McCarty, M., Wojcik, R. A., "An Evaluation of Mobile Computing for Information Access at the Point of Care," Journal of the Association for the Advancement of Medical Instrumentation, Vol. 31, No. 5, September/October 1997.

Lombardo, J. S., Wojcik, R. A., Proposal to National Library of Medicine, "Biomedical Applications for the Next Generation Internet (NGI)," AD-16641, May 1998.

Lombardo, J. S., Wojcik, R. A., Bogard, L. L., Gieszl, L. R., "Specification for a Faculty Information System for the Johns Hopkins University School of Medicine," TR-97-002, January 1997.

PATENT APPLICATIONS

Lombardo, J. S., Newhall, B. K., Wojcik, R. A., Loschen, W. A., Burkom, H. S., "Method and System for Bio-Surveillance Detection and Alerting," April 2002

White, C. H., Golding, S. D., Johns, R. J., Lombardo, J. S., Wojcik, R. A., Bogard, L. L., Reed, S., "Faculty Information System," March 1998, P01404

Lombardo, J. S., Wojcik, R. A., Cooperman, C. B., "Mobile Computing for Information Entry and Access at the Worksite," September 1997, P01368

Lombardo, J. S., Dicello, J., Meyer, L., Gaudette, R., Loschen, W., Wojcik, R. A., "Cooperative Planning System and Method," P01557

Lombardo, J. S., Loschen, W., Wojcik, R. A., "Method and System for Bio-Surveillance Detection and Alerting," P01560

Lombardo, J. S., Burkom, H., Wojcik, R. A., "Information System-Based Absentee Monitor," P01655

APPENDIX F: POSITION/JOB DESCRIPTIONS

Project Director

The Project Director, Joe Lombardo, will be responsible for overseeing the overall project and tasks for the NCR Syndromic Surveillance Network.

Project Manager

The Project Manager, Sheri Lewis, will be responsible for the daily coordination and operation of the project elements. Additionally, she is the lead for all activities related to Public Health Practice.

Public Health Consultant

The Public Health Consultant, Lynn Frank, will advise the NCR project in public health practice areas. She is instrumental in consensus building and overall project planning.

Epidemiologist for Response Framework

Dr. Jacki Coberly will be assisting with the formalization of the NCR response framework based on her similar work for CDC's BioSense project.

Epidemiologist

The epidemiologist, Rekha Holtry, will assist in all public health practice aspects of the NCR Syndromic Surveillance Network. She will be developing formal training materials, formalizing the NCR response network, and integrating the case management tools for public health practitioners.

Public Health Analyst

Two Public Health Analysts have been identified for this project. Dr. Brian Feighner will assist in the completion of the chief complaint mapping protocol. Dr. Steven Babin will assist in the daily monitoring of the NCR Snydromic Surveillance Network. He will also analyze new data sources such as water quality data.

Exercise Coordinator

Marty Sikes will assist in all aspects of exercise planning for the NCR SSN based on his experience in the area of emergency management and exercise development.

Public Health Generalist

The Public Health Generalist, who has yet to be hired, will be responsible for public health activities required for the day-to-day operation of the NCR system. Tasks include daily/weekly

work associated with the OTC products, presentation and abstract development, and data analysis.

Information Technology Project Lead

Richard Wojcik is the software lead for the NCR and state nodes. He will be responsible for requirements, database development, and data ingestion.

Chief Software Engineer

As the chief software engineer for the NCR node web development, Wayne Loschen will be responsible for the development and implementation of all system enhancements to the NCR node.

Software Project Engineer

The Software Project Engineer, Tina Higgins, will be responsible for the software project management for the development of the NCR and state nodes.

Assistant Software Engineer

Two assistant software engineers have been identified for this project. Raj Ashar will be responsible for the IT development of simulation web sites for exercises and training. Logan Hauenstein will assist Mr. Wojcik in the data ingestion tasks associated with the NCR Syndromic Surveillance Network.

Computer Science Linguist

Carol Sniegoski is the lead technical developer for the Chief Complaint Parser, which uses free text, and will be the lead developer for implementing the chief complaint mapping protocol.

GIS Specialist

Nathaniel Tabernero will be responsible for the ESSENCE GIS capability, which includes the mapping of disease activity and population overlays.

System Administrator

David Reed will perform the daily system maintenance for the NCR node hosted at JHU/APL.

Technical Lead for Algorithm Development

As the technical lead for algorithm development, Dr. Howard Burkom will be responsible for optimizing and implementing the alerting algorithms as part of the NCR network modifications and upgrades.

Analyst

The analyst, Sean Murphy, will be working with Dr. Burkom in the development and implementation of the alerting algorithms. He will also work on the development of simulation software.

Technical Lead for Data Analysis

Michael Thompson will be working on analytical aspects of the NCR node, including cluster algorithms, which would possibly link "like alerts" to minimize the burden on the epidemiologists using the system. He will also be instrumental in the evaluation of potential data sources.

Specialist in Wireless Networks

Tia Gao will be the lead software engineer responsible for developing input software needed for the field data entry of data.

Administrative Assistant

Chantal Loyer will assist in the coordination of meetings at JHU/APL.

Business Manager

As the Business Manager for the Homeland Protection Business Area, Linda Huntt is responsible for handling business and financial management issues for the business area.