

**JUSTIFICATION FOR NON-COMPETITIVE PROCUREMENT**

**COMPLETE THIS SECTION IF NEW CONTRACT**

For contract(s) in this request, answer applicable questions in each of the 4 major subject areas below in accordance with the Instructions for Preparation of Non-Competitive Procurement Form on the reverse side.

Request that negotiations be conducted only with Argonne National Labs, for the product and/or services described herein.  
 (Name of Person or Firm)

This is a request for \_\_\_\_\_ (One-Time Contractor Requisition # 36255, copy attached) or \_\_\_\_\_ Term Agreement or \_\_\_\_\_ Delegate Agency (Check one). If Delegate Agency, this request is for "blanket approval" of all contracts within the Emergency Health and Preparedness (Attach List) Pre-Assigned Specification No. \_\_\_\_\_  
 (Program Name) Pre-Assigned Contract No. \_\_\_\_\_

**COMPLETE THIS SECTION IF AMENDMENT OR MODIFICATION TO CONTRACT**

Describe in detail the change in terms of dollars, time period, scope of services, etc., its relationship to the original contract and the specific reasons for the change. Indicate both the original and the adjusted contract amount and/or expiration date with this change, as applicable. Attach copy of all supporting documents. Request approval for a contract amendment or modification to the following:

Contract #: \_\_\_\_\_ Company or Agency Name: \_\_\_\_\_  
 Specification #: \_\_\_\_\_ Contract or Program Description: \_\_\_\_\_  
 Mod. #: \_\_\_\_\_ (Attach List, if multiple)

Richard W. Rzeszutko  
 Originator Name

312-745-3504  
 Telephone

[Signature]  
 Signature

11-28-07  
Chicago Department of Public Health  
 Department Date

Indicate SEE ATTACHED in each box below if additional space needed:

<input type="checkbox"/> PROCUREMENT HISTORY	
<input checked="" type="checkbox"/> ESTIMATED COST	See ATTACHED
<input checked="" type="checkbox"/> SCHEDULE REQUIREMENTS	See ATTACHED
<input checked="" type="checkbox"/> EXCLUSIVE OR UNIQUE CAPABILITY	See ATTACHED
<input type="checkbox"/> OTHER	

**S. S. R. B.**  
 DATE 2/5/8  
 RECOMMENDED 1/4/8  
 CONDITIONALLY APPROVED \_\_\_\_\_  
 RETURN TO DEPT \_\_\_\_\_  
 DISAPPROVED \_\_\_\_\_

[Signature]  
 APPROVED BY: Carlo Govia  
 DEPARTMENT HEAD OR DESIGNEE

01/08/08  
 DATE

[Signature]  
 BOARD CHAIRPERSON

2/5/8  
 DATE

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\_\_\_\_ Delegate Agency (Check one). If Delegate Agency, this request is for "blanket approval" of all contracts within the

Emergency Health and Preparedness (Attach List)

Pre-Assigned Specification No. \_\_\_\_\_

(Program Name)

Pre-Assigned Contract No. \_\_\_\_\_

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Company or Agency Name: \_\_\_\_\_

Specification #: \_\_\_\_\_

Contract or Program Description: \_\_\_\_\_

Mod. #: \_\_\_\_\_ (Attach List, if multiple)

Richard W. Rzeszutko  
Originator Name

312-745-3504  
Telephone

Richard W. Rzeszutko  
Signature

11-28-07  
Chicago Department of Public Health  
Department Date

Indicate SEE ATTACHED in each box below if additional space needed:

<input type="checkbox"/> <b>PROCUREMENT HISTORY</b>
<input checked="" type="checkbox"/> <b>ESTIMATED COST</b> <p style="text-align: center;">See ATTACHED</p>
<input checked="" type="checkbox"/> <b>SCHEDULE REQUIREMENTS</b> <p style="text-align: center;">See ATTACHED</p>
<input checked="" type="checkbox"/> <b>EXCLUSIVE OR UNIQUE CAPABILITY</b> <p style="text-align: center;">See ATTACHED</p>
<input type="checkbox"/> <b>OTHER</b> <p style="text-align: center;"><u>Carlo M. Govia</u></p>

APPROVED BY: Carlo Govia  
DEPARTMENT HEAD  
OR DESIGNEE

01/08/08  
DATE

[Signature]  
BOARD CHAIRPERSON

2/9/08  
DATE

# Memo

**To** **MONTEL M. GAYLES**

Chief Procurement Officer

City of Chicago Department of Procurement Services

*Handwritten signature: M. Mason*  
*Handwritten text: FOR:*

**From:** **Terry Mason, M.D., F.A.C.S**

Commissioner, Chicago Department of Public Health

**Date:** 1/14/2008

**Re:** Sole Source Contract request with Argonne

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The Department of Public Health (CDPH) has requested to enter into a Sole Source contract with Argonne to. Design and construct a medical information fusion system, implement a WEB based disaster response training program, co-design, facilitate and evaluate a full scale exercise. We feel that based on the documents attached, Argonne is the only source to provide the services requested.

Thank you for your assistance in this matter. If you have any questions or need additional information, please contact Richard Rzeszutko at 312-745-3504 or Rosemary Lebron at 312-747-9657.

cc. Rosemary Lebron

Claude Humphrey

Lorel Blalmeuser

# DPS PROJECT CHECKLIST

For DPS Use Only	
Date Received	_____
Date Returned	_____
Date Accepted	_____
CA/CN's Name	_____

**IMPORTANT:** PLEASE READ AND FOLLOW THE INSTRUCTIONS FOR COMPLETING THE PROJECT CHECKLIST AND CONTACT THE APPROPRIATE UNIT MANAGER IF YOU HAVE ANY FURTHER QUESTIONS. ALL INFORMATION SHOULD BE COMPLETED, ATTACH ALL REQUIRED MATERIALS AND SUBMIT FOR HANDLING TO THE DEPARTMENT OF PROCUREMENT SERVICES, ROOM 403, CITY HALL, 121 N. LASALLE STREET, CHICAGO, ILLINOIS 60602.

**GENERAL INFORMATION:**

Date: <u>DECEMBER 11, 2007</u>	Contact Person: <b>R.RZESZUTKO</b>
REQ #: <u>36255</u>	Tel: 5-3504 Fax: _____
Specification #: <u>62420</u>	E-mail: rzeszutko_richard@cdph.org
PO #: (if known): _____	Project Manager: <b>STEVE MIER</b>
Modification #: (if known) _____	Tel: 7-3361 Fax: _____
	E-mail: mier_steve @cdph.org
	Previous PO(s)#: (if known) T26369

**Project Description:** SOLE SOURCE CONTRACT WITH ARGONNE NATIONAL LABORATORY TO DESIGN AND CONSTRUCT A MEDICAL INFORMATION FUSION SYSTEM, IMPLEMENT A WEB BASED DISASTER RESPONSE TRAINING PROGRAM, CO-DESIGN, FACILITATE AND EVALUATE A FULL SCALE EXERCISE.

**FUNDING:**

City:	<input type="checkbox"/> Corporate	<input type="checkbox"/> Bond	<input type="checkbox"/> Enterprise	<input type="checkbox"/> Grant*	<input type="checkbox"/> Other
State:	<input type="checkbox"/> IDOT/Transit	<input type="checkbox"/> IDOT/Highway	<input type="checkbox"/> Grant*	<input type="checkbox"/> Other	
Federal:	<input checked="" type="checkbox"/> FHWA	<input type="checkbox"/> FTA	<input type="checkbox"/> FAA	<input checked="" type="checkbox"/> Grant*	<input type="checkbox"/> Other

LINE	FY	FUND	DEPT	ORGN	APPR	ACTV	OBJT	PROJECT	RPTG	\$ DOLLAR AMOUNT
1	007	0847	041		O140				07E142	200,000
2	007	0847	041		O140				07E143	485,000
3	007	0847	041		O140				07E140	295,659

**Estimated Value \$ 980,659**

\* IF GRANT FUNDED, A COPY OF THE APPROVED GRANT AND APPLICATION ARE REQUIRED and any other Terms and Conditions that may apply.

**SCOPE STATEMENT**

Attached are a **Detailed Scope of Services** and/or **Specification(s)**.

**IMPORTANT:** THIS IS A CRITICAL PORTION OF YOUR SUBMITTAL. IN ORDER FOR DPS TO ACCEPT YOUR SUBMITTAL YOU MUST COMPLETE THE SPECIFIC SCOPE REQUIREMENTS AS SET FORTH IN THE SUPPLEMENTAL CHECKLIST FOR THAT UNIT.

**The following is a general description of what should be included in a Scope of Services or Specification:**  
 A clear description of all anticipated services and products, include: timeframe for completion, special qualifications of prospective vendors, special requirements or needs of the project, locations, anticipated participating user departments, citation of any applicable City ordinance or state/federal regulation or statute.

**TYPE OF PROCUREMENT REQUESTED (check all that apply)**

**NEW REQUEST**

Blanket Agreement  
 Standard Agreement  
 Small Orders

**MOD/AMENDMENT**

Time Extension  
 Vendor Limit Increase  
 Scope Change/Price Increase/Additional Line Item(s)  
 Other (specify): \_\_\_\_\_

FORMS:  Requisition  Special Approvals  Non-Competitive Review Board (NCRB)

CONTRACT TERM: Requested Term (number of months): 36 Months

# DPS PROJECT CHECKLIST

## PRE BID/SUBMITTAL REQUIREMENTS:

Requesting Pre Bid/Submittal Conference?  Yes  No Requesting Site Visit?  Yes  No

## ARCHITECTURAL/ENGINEERING SUPPLEMENTAL CHECKLIST

**Required Attachment:** Scope of Services, including location, description of project, services required, deliverables, and other information as required.

### Risk Management

Will services be performed within 50 feet of CTA train or other railroad property?  Yes  No

Will services be performed on or near a waterway?  Yes  No

**If applicable, Pre-Qualification** Category #: \_\_\_\_\_ Category Description: \_\_\_\_\_

For Pre-Qualification Program, attach list of suggested firms to be solicited

**Other Agency concurrence Required:** None State Federal Other (fill in)

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## AVIATION CONSTRUCTION SUPPLEMENTAL CHECKLIST

DOA sign-off for final design documents:  Yes  No

### Required Attachments:

Copy of Draft Contract Documents and Detailed Specifications.

### Risk Management:

Current Insurance Requirements prepared/approved by Risk Management:  Yes  No

Will work be performed within 50 feet of CTA or ATS structure or property?  Yes  No

Will work be performed airside?  Yes  No

**\*NOTE:** Any non-construction Aviation request, complete the applicable section.

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## COMMODITIES SUPPLEMENTAL CHECKLIST

**Required Attachments:** Detailed Specifications (Scope of Services) including description of the product, delivery location, user department contract, price escalation considerations, Bidder's qualification, contract term and extension options, Contractor's qualifications, citation of any applicable City/State/Federal statutes or regulations, citation of any applicable technical standards and Price Lists/Catalogs, technical drawings and other exhibits and attachments as appropriate.

**If Modification request,** please verify and provide the following:

Contractor's Name:

Contractor's Address:

Contractor's E-mail Address:

Contractor's Phone Number:

Contractor's Contact Person:

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## CONSTRUCTION SUPPLEMENTAL CHECKLIST

### Required attachments:

Copy of Draft (80% Completion), Contract Documents and Detailed Specifications

### Risk Management

Will services be performed within 50 feet of CTA train or other railroad property?  Yes  No

Will services be performed on or near a waterway?  Yes  No

# DPS PROJECT CHECKLIST

## VEHICLES/HEAVY EQUIPMENT SUPPLEMENTAL CHECKLIST

**Required Attachments**

- Detailed Specifications including detailed description of the vehicle(s) or equipment, mounted equipment, if any, and options/accessories.
- Special Provisions (delivery, Warranty, Manuals, Training, Additional Unit Purchase Options, Bid Submittal Information, etc.
- Delivery Location(s)
- Technical Literature
- Drawings, if any
- Part Number List (          Manufacturer; or                                  Dealer;                                  or Other Source:                                  )
- Current Price List(s) Catalog(s)
- Special Approval Form
- Exhibits and Attachments

**If Modification request,** please verify and provide the following:

Contractor's Name:

Contractor's Address:

Contractor's E-mail Address:

Contractor's Phone Number:

Contractor's Contact Person

## PROFESSIONAL SERVICES SUPPLEMENTAL CHECKLIST

- Detailed description of project listing obligations of each party.
- The Schedule of Compensation
- Deliverables
- Request for individual contract services (if applicable)
- The appropriate EPS form
- ITSC (approved by BIS)
- OBM (approved by Budget form/memo)
- Grant Document attached

Attach any documentation indicating any previous purchase activity to assist in the procurement process

## TELECOMMUNICATIONS AND UTILITIES SUPPLEMENTAL CHECKLIST

**Required Attachments:** Detailed Scope of Services/Specification which sets forth all of the anticipated services and products the user department wants provided, including timeframe for completion, specification qualifications of prospective vendors, special requirements or needs of the project, locations, anticipated participating user departments, citation of any applicable City ordinance or state/federal regulation or statute.

Has the project been reviewed by DGS?                                   Yes     No

Attach copy of DGS Recommendation; Reservation(s); or participate under current contract.

Does the project include software?                                   Yes     No

If yes, is signed ITSC form attached?                                   Yes     No

Does the location involve:

A public way?     Yes     No

Any concession in the City's facilities?                                   Yes     No

Is it anticipated City Council approval of the project or contract will be required?

# DPS PROJECT CHECKLIST

## WORK SERVICES/FACILITY MAINTENANCE SUPPLEMENTAL CHECKLIST

**Required Attachments:** Detailed Specifications (Scope of Services) including detailed description of the work, locations (with supporting detailed), user department contacts, work hours/days, laborer/supervisor mix, compensation and price escalation considerations, Bidder's qualification, contract term and extension options, Contractor's qualifications, citation of any applicable City/State/Federal statutes or regulations, citation of any applicable technical standards and Price Lists/Catalogs, technical drawings and other exhibits and attachments as appropriate.

**Risk Management:**

Will services be performed within 50 feet (50') of CTA train or other railroad property?  Yes  No

Will services be performed on or near a waterway?  Yes  No

Will services require the handling of hazardous/bio-waste material?  Yes  No

Will services require the blocking of streets or sidewalks which may affect public safety?  Yes  No

**If Modification or Amendment request, please verify and provide the following:**

Contractor's Name:

Contractor's Address:

Contractor's E-mail Address:

Contractor's Phone Number:

Contractor's Contact Person

## Argonne Unique Capability Summary

### **Summary:**

The following is a statement by CDPH outlining the unique capabilities of Argonne to perform two projects proposed by CDPH:

- Development of medical intelligence fusion software and,
- An exercise to test community readiness for pandemic influenza.

Section A will give a high level overview of the projects and some of Argonne's unique capabilities. Section B is a more detailed analysis of the same.

### ***Section A: Brief Overview of the projects and Argonne's Unique Qualifications***

#### **Medical Fusion Center**

With regard to the medical fusion center, CDPH is proposing to work with Argonne to further develop an existing Department of Homeland Security (DHS)/Argonne proprietary software by expanding it from the current biodetection and response system to a chemical, biological, radiological /nuclear system (CBRNE). Again, this is a DHS funded project contracted to Argonne for development. CDPH does not want to "reinvent the wheel" by using a different vendor to create a separate system for CBRNE. The existing biodetection system is also connected to a system of national laboratories funded by DHS to provide jurisdictions technical assistance and support if the detection system detects a possible release of an agent. Argonne also has contracts with the military to develop sophisticated modeling and artificial intelligence software to enhance the software by providing models that assist in determining the possible areas affected by a release, impact of the release etc. Because Argonne is the developer of the current bio detection software and has developed the intelligence and modeling, and has a current contractual relationship with DHS and the military, we believe they have a unique capacity that no other vendor would have.

#### **Community Readiness for Pandemic Influenza**

CDPH proposes to contract with Argonne National Labs to assist CDPH in developing and conducting a full scale exercise to test our readiness for a worldwide pandemic flu outbreak. Argonne has developed proprietary software to assist CDPH in modeling and testing our capacity to open 55 medication dispensing centers in Chicago. Additionally, Argonne has developed software that assists jurisdictions in developing operational plans. This software, funded by DHS was used by CDPH to assist in the development of the plan that we are proposing the test- large scale medication dispensing. This project is a natural extension of the unique work that CDPH and Argonne have partnered on already.



## *Section B: Detailed Statement of Unique Capacity-Argonne*

### **1. CDPH MEDICAL INTELLIGENCE FUSION**

CDPH has a need for an information fusion system that combines several data feeds with analytical tools that can help to provide early indications of potential public health events. Argonne has established a firm reputation as a leader in this field of integrative, modular, and interdisciplinary systems application development. They have over 15 years of R&D in the development and application of integrated computational techniques and approaches to a wide variety of subject areas related to our work in CDPH (see list of proprietary software below). In particular, the BWIC system that is installed and operational in CDPH already has many capabilities that are a good start for our fusion system. We anticipate starting with the existing BWIC system and building additional features to broaden its scope to full medical information and analysis tools.

Not only does Argonne possess unique skills in developing integrative computational architectures, they also have a deep understanding of what data and intelligence is needed in a public health emergency through their many years of planning and conducting public health preparedness exercises. It is this combination of expertise in complex integrative system development and public health emergency preparedness that makes Argonne a unique performer for our medical information fusion system.

For more information on the breadth of Argonne's programs and experience in advanced computer application development, see <http://www.dis.anl.gov/index.html>.

#### **EXPERTISE:**

The following are brief bios on the two major principle investigators for this proposed work:

**Pamela Sydelko:** Pamela Sydelko is the Deputy Director of the Decision and Information Sciences Division. She is responsible for managing projects and coordinating research activities aimed at developing innovative modeling, analysis and decision support tools/technologies including the development of integrated multi-component software systems. She received her B.S. in Botany from North Dakota State University, an M.S. in Soil Science from the University of Illinois, and an MBA from the University of Chicago. Pamela is the program lead for the Biological Warning and Incident Characterization System work at Argonne. She also has lead PI responsibilities for many other integrative systems software programs at Argonne teams that developed advanced applications for national security, logistics, and critical infrastructure problems. Sponsoring organizations for this work include Department of Defense, Department of Homeland Security, U.S. Environmental Protection Agency, and Department of Energy.

**CHARLES M. MACAL:** Charles Macal is the Director of the Center for Complex Adaptive Agent Systems Simulation (CAS2) at Argonne National Laboratory. Dr. Macal is also the co-director of the Joint Threat Anticipation Center (JTAC), collaboration between the University of Chicago and Argonne. The Defense Threat Reduction Agency (DTRA) supported the establishment of this center to support efforts to understand and anticipate threats to U.S. national security. He is a member of the INFORMS-Simulation Society, Society for Computer Simulation Int'l., the Systems Dynamics Society and a founding member of the North American Computational Social and Organization Sciences. Dr. Macal has a Ph.D. in Industrial Engineering & Management Sciences from Northwestern University.

## SPECIFIC EXAMPLES OF INTEGRATIVE COMPUTATIONAL APPLICATIONS:

The following selection of Argonne's proprietary computer technologies illustrate a record for developing integrative computational architectures and for applying these tools in the domain areas needed to advance the CDPH data fusion center concept:

- 1) **Biological Warning and Incident Characterization System (BWIC):** Funded by DHS, BWIC is a support system for timely warning attack assessment, communications and effective response in the event of a biological attack. Chicago is the first pilot city (two other major cities are also BWIC pilots). Argonne is solely responsible for developing the integrating architecture for BWIC that integrates a set of data feeds and a diverse group of computer modeling programs. Argonne also developed the main BWIC GIS-based Situational Awareness Tool, a sophisticated collaborative interface that provides individual analysis workspaces for each user participating in event characterization and allows all users to view (and borrow results from) other workspaces.
  
- 2) **Simphony:** Simphony is an open source suite of tools developed by Argonne National Laboratory that work together to a unified platform for developing advanced integrated computer applications. Simphony includes capabilities for:
  - a. Analytical modeling
  - b. Complex adaptive systems modeling
  - c. Geographic information systems
  - d. Embedded real-time data import
  - e. Data mining and exploration
  - f. Artificial intelligence
  - g. Statistical modeling,
  - h. Advanced visualization

This robust architecture provides the core tools needed for developing the CDPH data fusion platform. Many of Argonne's integrated decision support applications (including BWIC) were developed using the Simphony tool set. The Simphony open source community is made up of an impressive 2500 users, all using and contributing to the further development of the toolset.
  
- 3) **PROTECT:** Funded by DOE, DHS and a various city agencies, PROTECT is an Argonne-developed early-warning crisis management system for chemical attacks in high-threat interior infrastructures (PROTECT now being implemented in Chicago Pedway and blue line). The system is mainly aimed at high-threat subways, transportation terminals, buildings, and airports. The system includes (a) chemical detectors for rapid alert, (b) video cameras and video communications for verification of detector activations, (c) an event-driven command and control system, (d) modeling of below (for subways) and aboveground hazard plumes, (e) Conops and SOPs for responders, and (f) training and exercises. The system is in operation in the Washington DC subway and a large transportation terminal in New York City and Boston.
  
- 4) **Community Vaccination and Mass Dispensing Model (CVMDM):** Argonne has developed the CVMDM to simulate the allocation and distribution of pharmaceutical materials across a jurisdiction and the dispensing of those materials through points of dispensing (PODs).
  
- 5) **Fort Future Virtual Installation (FFVI):** Argonne provided the integrating framework that synthesizes military logistics, infrastructure interdependencies and Chem/Bio/Rad models onto one system that is used to support decision making related to threats to our military installations. This has been funded by the U.S. Army.

- 6) **Threat Ensemble Vulnerability Assessment (TEVA):** Sponsored by the EPA Center for Homeland Security, Argonne also developed the TEVA software framework that integrates a drinking water hydraulic system model with data and analysis tools to predict human health impacts and with a sensor location model to provide for the design of early warning system, performance of consequence analysis, and insight into response strategies for drinking water distribution system security.

## 2. COMMUNITY READINESS INITIATIVE FULL-SCALE EXERCISE

Argonne is at the forefront of exercise policy development and methods research. Argonne assisted FEMA in developing its Radiological Emergency Preparedness (REP) exercise program by designing its exercise methodology and evaluation criteria. Argonne also developed and taught the REP exercise evaluation course at FEMA's Emergency Management Institute until December 2000. Building on their REP experience, in 1989, Argonne assisted the Army and FEMA in developing their CSEPP exercise program. In 1996, Argonne researched and designed an innovative exercise process called Integrated Performance Evaluation that became the standard exercise process for both REP and CSEPP. In 2002, with Argonne's assistance, the Department of Homeland Security adopted and adapted the IPE concept into the Homeland Security Exercise Evaluation Program (HSEEP). Argonne continues to be involved in exercise policy development by providing research and technical support to FEMA in the areas of exercise reporting systems, corrective action programs, lessons-learned, organization learning, and knowledge management constructs as part of DHS efforts to implement the HSEEP methodology. Additionally, Argonne sits on the FEMA HSEEP Toolkit Integration Committee, ensuring that current and future HSEEP automation systems comply with DHS guidelines and with external standards when appropriate.

The strongest qualifications that Argonne brings to designing and conducting the 2008 Cities Readiness Initiative (CRI) exercise are unique familiarity with CDPH plans and processes, as well as the use of as unique proprietary software for planning and executing the exercise. Through DHS-funded technical assistance, using proprietary software (Sync Matrix and the Logistics Process Analysis Tool) Argonne has helped CDPH develop a detailed prophylaxis distribution plan and more general pandemic/bio-outbreak response plans. Similarly, the FluNami 2007 and 2008 exercises created both an exercise platform and a skilled team that serve as a natural lead-into the design and conduct of the CRI full-scale exercise. Additionally, tools that Argonne uses in the CSEPP program (such as the Exercise Management Tool and the Exercise News Network) will be applied to the design and execution of the CRI exercise. No other organization has either the knowledge or the software, much less both. Consequently, Argonne's unique knowledge and tools will enable it to design an exercise assesses and provides deeper insight into strong and weak aspects of their response to a simulated event more cost-effectively than any other organization

### EXPERTISE:

The following are brief bios on the two major principle investigators for this proposed work:

**Paul Hewett:** Paul Hewett is the Deputy Director of the Center for Integrated Emergency Preparedness, Decision and Information Sciences Division. He is responsible for developing programs, conducting research, and developing and implementing innovative approaches to resolving a wide spectrum of emergency preparedness issues. Mr. Hewett has been at Argonne for 14 years. Prior to coming to Argonne, Mr. Hewett worked at the Maryland Emergency Management Agency as an Exercise and Training Officer and Program Manager for the Chemical Stockpile Emergency Preparedness Program. Mr. Hewett has more than 30 years experience in operations planning, designing and conducting training, and designing and conducting performance-based readiness assessments. He received his B.A. in Political Science from Western Maryland College, a M.Ed. in Training and Organization Development from Boston University, and a Graduate Certificate in Emergency Management from Jacksonville State University. He is also a graduate of the U.S. Army Command and General Staff College and is Adjunct Faculty for the University of Illinois – Chicago's Emergency Management and Continuity Planning graduate

certificate program. He is the author or co-author of numerous journal articles and reports on emergency planning, evaluations systems, and lessons-learned processes.

Paul is the Principal Investigator/Program Manager for Argonne's support to DHS FEMA's National Exercise Division (NED) and National Preparedness Directorate (NPD). He leads teams that assist NED in developing national emergency preparedness exercise policy, specifically focusing on evaluation methodology, reporting systems, and corrective action programs. He also leads teams providing NED-funded logistics planning, operational planning, and risk communications technical assistance to state and local governments. Paul heads the team rewriting the State and Local Guide for Emergency Operations Planning for DHS FEMA.

**Christopher Kramer:** Christopher Kramer has worked in the communication field for 25 years. He currently works in the Risk Communication and Management Program for Argonne National Laboratory's Decision and Information Sciences Division and is responsible for assisting multiple government agencies and jurisdictions with plans, training, exercises, and support materials relating to media relations before, during and after a crisis / emergency. He served for ten years as Public Information Officer for the Utah Department of Public Safety where he regularly responded to thousands media inquiries annually. He also served as lead Public Information Officer for the Utah Olympic Public Safety Command effectively supporting 20 federal, state and local agencies in preparation of the 2002 Olympic Winter Games.

Christopher has been a communication consultant/instructor for the FBI, FEMA, Secret Service, Department of the Interior, DOE, U.S. Army, CDC, Maryland Hospital Association, and the States of Kansas, Montana, Iowa, Michigan, Florida and Hawaii. He is an adjunct instructor for the Department of Homeland Security's National Emergency Training Center where he teaches Advanced Public Information Officer (APIO) and Integrated Emergency Management (IEMC) courses. He was primary author of public safety public information plans for the 2002 Olympic Winter Games and is a past president of the Utah Public Information Officers Association. He is the co-author of the Basic Public Information Officers Course used by the Department of Homeland Security and all 50 States. Christopher started with a career in broadcast news and performance that spanned ten years and five states and won numerous awards from the Associated Press and other news organizations. He has a B.S. in Communication with an Internet Communication Certification from the University of Utah and is currently working on his M.A. at Marist College.

#### SPECIFIC EXAMPLES OF EXERCISE DESIGN, EXECUTION, AND ANALYSIS:

Argonne's experience and expertise comes from significant participation in designing, executing, and analyzing all types (table-top, functional, full scale) of exercises conducted by Federal, state, and local governments. Some recent examples include:

- 1) **The Top Officials (TOPOFF) 2 Exercise.** [Master and venue control cell support, inject development and review, design and implementation of five software programs for exercise support, real-world media support].
- 2) **Operation SafeRail (2001),** a full-scale exercise focusing on response to a terrorist attack for on the Washington, DC Metro system. This exercise served as the PROTECT proof-of-concept and assessed the National Capitol Region's ability to coordinate and execute a response initiated by sensor activation. [Design, observation, analysis, and reporting].
- 3) **Chemical Stockpile Emergency Preparedness Program (CSEPP).** More than 50 full-scale exercises conducted between 1993 and 2007 at U.S. Army chemical weapons storage installations for the Federal Emergency Management Agency and the Department of the Army. These are multijurisdictional exercises that include participants from state and local governments and multiple Army facilities and organizations. [Inject design, simulated media, JIC/JIS assessment, exercise control, observation, analysis, report preparation, props and incident simulation.]

- 4) **Service Response Force Exercises in 2000, 2002, 2004, 2006 and for 2008.** The SRFX is a biannual exercise that assesses the Army's ability to respond to a catastrophic release of chemical warfare agents from a storage installation into a surrounding community. Participants include Army commands from the Department of the Army to the installation level, numerous Federal agencies and affected state and local governments. [All aspects of exercise design, administration, logistics, observation, analysis, and reporting, simulated media, JIC/JIS assessment.]

Similarly, Argonne has expertise in planning and conducting public health preparedness exercises:

- 1) **The Rotunda Thunda 2006 full-scale exercise for Clark County and Las Vegas, NV** assessing response to a multi-agent bio-outbreak in Las Vegas casinos and McCarran International Airport. [Design, control, observation, and analysis.]
- 2) **The Cities Readiness Exercise (table-top)** focusing on a H5N1 outbreak with human transfer on Hawaii Island for the 2006 Asia-Pacific Homeland Security Summit. [Design and control.]
- 3) **More than 15 table-top exercises involving individual Chicago area hospitals,** regional groups of hospitals, CDPH, and IDPH. [All aspects of exercise design, administration, logistics, observation, analysis, and reporting.]
- 4) **The "FluNami" Chicago Disease Outbreak Distance Tabletop Exercise,** in which four health departments and six hospitals participated in four interactive web-based exercise sessions from their home facilities over a four-week period. [All aspects of exercise design, administration, logistics, observation, analysis, and reporting.]



**Pamela J. Sydelko**  
Deputy Division Director

**Decision and Information Sciences Division**  
Argonne National Laboratory  
9700 South Cass Avenue, Bldg. 900  
Argonne, IL 60439-xxxx

November 20, 2007

1-630-252-6727 phone  
1-630-252-6073 fax  
psydelko@anl.gov

Mr. Steve Mier  
Chicago Department of Public Health  
DePaul Center Room 200  
333 South State Street  
Chicago, IL 60604

Dear Mr. Mier:

I am writing at your request to submit a draft proposal that documents how Argonne National Laboratory (Argonne) will support multiple Chicago Department of Public Health (CDPH) Office of Public Health Preparedness and Response (PHPR) planning initiatives in FY2008. Specifically, this *Integrated Public Health Planning and Response Proposal* denotes how Argonne will develop and apply new and existing methodologies and technologies to enhance CDPH's ability to respond to bioterrorism, natural disease outbreaks, and other public health disaster situations by integrating the following projects:

- Design/construct a prototype Medical Information Fusion System (MIFS)
- Design/construct and co-implement a web-based interactive disaster response training program
- Co-design, facilitate and evaluate a full-scale exercise (FSE).

Argonne proposes use of its multi-disciplinary knowledge, experience, technology, and successful four-year preparedness planning partnership with CDPH to unite these tasks into one cohesive preparedness program for the PHPR Program. As described in this integrated proposal, the draft Statements of Work (SOW) demonstrate how Argonne will use its research and development expertise, field experience and technologies to unify these tasks into an effective preparedness program that advances the PHRP mission: health promotion and protection of the public before/during/after a public health disaster.

Argonne appreciates your consideration of this proposal and welcomes the opportunity to continue its successful relationship with the Chicago Department of Public Health's Office of Public Health Preparedness and Response.

Sincerely yours,

A handwritten signature in black ink that reads "Pamela J. Sydelko". The signature is written in a cursive, flowing style.

Pamela Sydelko  
Deputy Division Director

## **Integrated Public Health Planning and Response Proposal Draft Statement of Work**

### **Task 1: CDPH Medical Information Fusion System**

**Submitted by: Argonne National Laboratory  
Principal Investigator: Pamela Sydelko**

#### **BACKGROUND:**

Per CDPH's request, Argonne has developed two possible solutions to CDPH's data integration and informatics needs. The first solution, the CDPH Medical Information Fusion System, is described below.

State and local Public Health Departments have access to an ever-increasing number of data and information sources that can be useful in providing better preventive or more reactive public health decision making. Currently, this data comes to public health departments in a myriad of sources, in disparate formats, and with varying levels of secure protocols. The Chicago Department of Public Health would like to have data feeds provided from a variety of pertinent sources and stored in a system that would enable data mining and analysis capabilities that will help in timely public health decision-making.

Argonne is committed to meeting the FY2008 informatics and data integration objectives of CDPH. Additionally, based on CDPH's preparedness and response funding, Argonne can continue to provide these services to CDPH on a continuous, multi-year basis. For example, if funding permits, Argonne will continue to provide future informatics and data integration tasks and services to help CDPH meet its preparedness and response goals over the next three to five year period. Additionally, with a multi-year approach, Argonne and CDPH will be able to address unforeseen needs and adjust tasks to meet new or changing goals and objectives as federal, State and local grant requirements continue to evolve or other contingencies.

#### **STATEMENT OF WORK:**

Argonne National Laboratory proposes to develop a prototype Medical Information Fusion System (MIFS) that will collect information from a variety of sources, convert and store this information into a central data server, run automatic data mining and pattern recognition algorithms on these data, and provide simplified user interface for users to create their own information filters. Argonne will leverage from technologies developed for other applications in order to create the MIFS architecture. These technologies include:

**Simphony:** open source suite of tools that work together to provide analysts and modelers with a unified platform for developing analytical tools and models and applying them to problems of national importance. Simphony leverages existing technologies, including many free and open source tools (including data mining, statistical, and visualization tools). Simphony also includes built in user interfaces that enable users to directly create simple models and data analysis tools without having to be computer programmers.

**Biological Warning and Incident Characterization (BWIC) System:** BWIC is a support system for timely warning attack assessment, communications and effective response in the event of a biological attack. Funded by the Department of Homeland Security, BWIC is an integral part of the agency's BioWatch program. Chicago is a prototype city, and therefore already has an operating prototype of BWIC working at CDPH. Argonne's role in the BWIC project was to take a diverse group of data feeds

and computer modeling programs – written in a variety of computer languages by research teams at a number of national laboratories – and integrated them to work seamlessly for an entire emergency response team. They also developed the main BWIC Situational Awareness Tool (SAT) that keeps the public health emergency manager apprised of the latest estimates determined by analysts using modeling components. This MIFS project will leverage heavily from the BWIC data feed architecture and the Graphical User Interface (GUI) elements of the BWIC SAT.

**Task 1: Research and document existing information sources**

This task consists of research into a variety of data sources deemed pertinent to CDPH's daily operations. These data sources include, but are not limited to:

- Chicago Health Event Surveillance System (CHESS: a disease surveillance system that utilizes electronic laboratory reporting and internet-based reporting from hospitals to improve the timeliness and accuracy of disease reporting and early detection surveillance in Chicago; launched in Spring 2007)
- Electronic Laboratory Reporting: Electronic surveillance systems that use existing clinical laboratory information systems to transmit electronic laboratory results to appropriate public health agencies; involves researching private laboratories and hospital laboratories not associated with CHESS yet.
- Emergency Medical Services data
- Syndromic Surveillance data
- Hospital Available Beds for Emergencies and Disasters (HAvBED) System
- Zoonotic data feeds
- Medical examiner health surveillance data
- BioWatch collector data
- Protect chemical sensor feeds
- Radiological sensor data feeds

Data feeds will be evaluated for incorporation into the MIFS prototype based upon:

- Type of feed (must be truly electronic)
- HIPA Compliance issues
- Data format issues
- CDPH Information Technologies (IT) issues

CDPH personnel will be consulted on the data feed research and a summary report will be produced that summarizes these feeds and recommends which of the feeds will be used in the prototype MIFS (based on evaluation criteria listed above and CDPH input).

**Task 2: Design and Implementation of MIFS data server**

This task consists of the design and implementation of the core MIFS data server. Subtasks include:

Subtask A: Implementation of data feeds identified in Task 1.

Subtask B: Design and implementation of a data transformation service that parses the incoming data and prepares them for the MIFS repository.

Subtask C: Design and development of the MIFS data repository that will utilize the existing Postgres database used in the Biological Warning and Incident Characterization (BWIC) currently running in CDPH. This database will be designed to store raw data feeds for a temporary period of time and will not require full-time database management.



### **Task 3: Research and identify rules and patterns to implement in data mining and pattern recognition algorithms**

Subtask A: Literature research into trends and patterns of concern for medical and public health professionals.

Subtask B: Workshop with CDPH to 1) present the results from the literature search, and 2) collect input and identifies trends and patterns to code into the MIFS prototype.

### **Task 4: Design and Implementation of MIFS Data Sweeper**

This task includes the implementation of automatic data mining and pattern recognition algorithms on the data stored in the MIFS data repository. This Data Sweeper will be built to utilize the open-source data-mining tool (WEKA) which is an integral part of the Symphony architecture. Weka is a collection of machine learning algorithms for data mining tasks and contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization. The Data Sweeper will provide periodic results that meet the criteria programmed into Weka (based upon output from Task 3.) Timing of data sweeping algorithms will be decided with consultation with CDPH. This task is comprised of two subtasks:

Subtask A: Implementation of automated Data Sweeper algorithms based on Task 3 research and workshop.

Subtask B: Use of Symphony model-building tools to provide CDPH users with a user-friendly method to implement their own new set of rules and create custom data filters.

### **Task 5: Design and Implementation of MIFS Graphical User Interface**

This task will borrow heavily from the previously designed and implemented BWIC Situational Awareness Tool (SAT).

- BioWatch data display, query and entry will be reused.
- Hospital data entry will be reused and possible merged with new MIFS data relating to hospitals.
- The general set of base GIS data layers already imported for CDPH will remain (with the same functionality for managing this GIS data that includes adding new layers).
- Additional live GIS data layers will be displayed and queried (for those MIFS data that can be geographically referenced)
- New menu options will be generated to users to create their own custom data filters
- Output reports will be designed and implemented that will present the user with Data Sweeper results (periodically performed on the MIFS dataset).
- Options for the user to dismiss or save specific MIFS Data Sweeper output will be implemented.

### **Task 6: Installation and Training**

This task will consist of installation of the MIFS server into CDPH (includes hardware/software), installation of MIFS client onto CDPH desktops/laptops, the development and delivery of a MIFS users guide, and a one-day training course on MIFS use.

**BUDGET:**

<b>Task</b>	<b>Effort (\$K)</b>	<b>M&amp;S (K)</b>	<b>Total Cost (\$K)</b>
<b>Task 1: Research and document existing information sources</b>	53	0	53
<b>Task 2: Design and Implementation of MIFS data server</b>	23	0	23
<b>Task 3: Research and identify rules and patterns to implement in data mining and pattern recognition algorithms</b>	30	0	30
<b>Task 4: Design and Implementation of MIFS Data Sweeper</b>	83	0	83
<b>Task 5: Design and Implementation of MIFS Graphical User Interface</b>	60	0	60
<b>Task 6: Installation and Training</b>	21	10	31
<b>TOTAL</b>	270	10	280

**MILESTONES:**

<b>Task</b>	<b>Milestone</b>
<b>Task 1: Research and document existing information sources</b>	End of Month 1.5
<b>Task 2: Design and Implementation of MIFS data server</b>	End of Month 3
<b>Task 3: Research and identify rules and patterns to implement in data mining and pattern recognition algorithms</b>	End of Month 4
<b>Task 4: Design and Implementation of MIFS Data Sweeper</b>	End of Month 6
<b>Task 5: Design and Implementation of MIFS Graphical User Interface</b>	End of Month 7
<b>Task 6: Installation and Training</b>	End of Month 8

Please note that milestones are given in months from the initiation of the project.

## **Integrated Public Health Planning and Response Proposal Draft Statement of Work**

### **Task 1: Computational Processing of Unstructured Data for Real-Time Public Health Analysis and Indicators**

**Submitted by: Argonne National Laboratory  
Principal Investigator: Charles Macal**

#### **BACKGROUND:**

Per CDPH's request, Argonne has developed two possible solutions to CDPH's data integration and informatics needs. The second solution, the computational processing of unstructured data for real-time public health analysis and indicators, is described below.

State and local Public Health Departments have access to an increasing number of unstructured information sources that can provide critical information for preventive or reactive public health decision-making. Unlike standard types of data and databases that contain data in structured formats (e.g., alphanumeric data), there is a need to process information from unstructured information sources (e.g., free form text). Unstructured data includes textual reports, newsletters, messages, web pages, etc. Often it is only this type of unstructured information that is available in the early phases of an unfolding public health situation, as unstructured information is available long before the data can be encoded and put into the standard structured databases. The Chicago Department of Public Health would like to have the capability to process and analyze such unstructured information on a real-time basis.

Argonne is committed to meeting the FY2008 informatics and data integration objectives of CDPH. Additionally, based on CDPH's preparedness and response funding, Argonne can continue to provide these services to CDPH on a continuous, multi-year basis. For example, if funding permits, Argonne will continue to provide future informatics and data integration tasks and services to help CDPH meet its preparedness and response goals over the next three to five year period. Additionally, with a multi-year approach, Argonne and CDPH will be able to address unforeseen needs and adjust tasks to meet new or changing goals and objectives as federal, State and local grant requirements continue to evolve or other contingencies.

#### **STATEMENT OF WORK:**

Argonne National Laboratory proposes to develop a prototype computational prototype system, the Medical Unstructured Information System (MUIS), and demonstrate the utility of the prototype for processing and analyzing information in unstructured formats. Connections of seemingly unrelated events could have significant consequences for public health. MUIS will demonstrate how a computational framework can be invoked in a particular context, such as in looking for connections of seemingly unrelated events that could have significant consequences for public health.

**Task 1: Identify Relevant Unstructured Data Sources.** This task consists of research into a variety of unstructured data sources deemed pertinent to CDPH's daily operations. The relevant unstructured data sources for public health awareness will be identified in conjunction with the City of Chicago. It is assumed the documents assumed are in electronic form as structured, character-based documents of some type, for example, Microsoft Word documents, web pages,

XML files, etc. (i.e., documents are not in image-based form such as PDF files). These data sources include, but are not limited to text documents, newsletters, web pages, etc.

Data feeds will be evaluated for incorporation into the MUIS prototype based upon the type of feed. Not it is assumed that all unstructured information will be available in some type of electronic representation. A summary report will be provided that summarizes these sources and feeds and recommends which of them will be used in the prototype.

**Task 2: Design and Implement Computational Engine for Processing Unstructured Information.** This task consists of the design and implementation of the core MUIS information parser. Our approach to analyzing unstructured public health data uses techniques from the fields of conceptual analysis and knowledge representation (Berry and Browne, 2005; Gardenfors 2000; Widdows 2004; Berners-Lee et al. 2001). Using exemplar public health information in unstructured form, we reduce the text to vector space representations and implement additional filters for mapping nominal information into equivalent representations. Then, meta-information is extracted and used to invoke the relevant information cases in their appropriate contexts, as established by the user.

The task of developing the computational engine is broken down into five major subtasks.

**Task 2.1:** *Develop software for ingestion according to source protocols.* The unstructured information will be ingested from their original sources, for example, connecting to the appropriate web pages and establishing connections to downloading the information. This will require establishing links to the sources according to the protocols of the sources.

**Task 2.2:** *Develop common representation scheme for unstructured data.* The unstructured information will be processed and transformed into a common representation scheme. This includes parsing the information into semantic representations. For example, the output of this task will be a semantic network representation that relates significant terms. Effectively, this task consists of structuring the unstructured information.

**Task 2.3:** *Develop automated indexing scheme.* Once the unstructured data have been reduced to the common representation, it is necessary to index the information. Indexing is based on a subset of information extracted from the full data representation.

**Task 2.4:** *Develop semantic equivalence layer.* Many terms and concepts are semantically equivalent. This task consists of mapping unstructured data terms onto common semantic representations for the public health domain.

**Task 2.5:** *Design and Implement Context Invocation Engine.* This task includes the implementation of automatic identification and invocation of appropriate cases in the context described by the user.

### **Task 3: Design and Implement MUIS Graphical User Interface**

MUIS will have a simple graphical user interface with which users may be able to input various kinds of information and receive responses from the MUIS, specifically through the Context Invocation Engine.

#### Task 4: Install MUIS and Train CDPH Personnel

This task will consist of installation of the MUIS into CDPH (includes hardware/software), the development and delivery of a MUIS users guide, and a one-day training course on MUIS use.

#### BUDGET:

Task	Effort (\$K)	M&S (\$K)	Total Cost (\$K)
<b>Task 1: Identify Relevant Unstructured Data Sources</b>	50	0	50
<b>Task 2.1:</b> <i>Develop software for ingestion according to source protocols.</i>	30	0	30
<b>Task 2.2:</b> <i>Develop common representation scheme for unstructured data.</i>	30	0	30
<b>Task 2.3:</b> <i>Develop automated indexing scheme.</i>	29	0	29
<b>Task 2.4:</b> <i>Develop semantic equivalence layer.</i>	30	0	30
<b>Task 2.5:</b> <i>Design and Implement Context Invocation Engine.</i>	20	0	20
<b>Task 3: Design and Implement MUIS Graphical User Interface</b>	60	0	60
<b>Task 4: Install MUIS and Train CDPH Personnel</b>	21	10	31
<b>TOTAL</b>	<b>270</b>	<b>10</b>	<b>280</b>

#### MILESTONES

Task	Milestone
<b>Task 1: Identify Relevant Unstructured Data Sources</b>	End of Month 1.5
<b>Task 2: Design and Implement Computational Engine for Processing Unstructured Information</b>	End of Month 6
<b>Task 3: Design and Implement MUIS Graphical User Interface</b>	End of Month 7
<b>Task 4: Install MUIS and Train CDPH Personnel</b>	End of Month 8

Please note that milestones are given in months from the initiation of the project.

#### References

- Berry, M. W. and M. Browne, 2005, *Understanding Search Engines*, Society for Industrial and Applied Mathematics: Philadelphia, PA, 2nd edition.
- Gardenfors, P., 2000, *Conceptual Spaces: The Geometry of Thought*, MIT Press: Cambridge, MA.
- Widdows, D., 2004, *Geometry and Meaning*, Center for the Study of Language and Information: Stanford, CA.
- Berners-Lee, T., J. Hendler and O. Lassila, 2001, "The Semantic Web," *Scientific American*, 284(5):35-43.

**Integrated Public Health Planning and Response Proposal  
Draft Statement of Work for the**

**Chicago Department of Public Health**

**Task 2: Emergency Planning Training Assurance Program**

**Submitted by: Argonne National Laboratory  
Project Leader: Daniel Walsh**

**BACKGROUND:**

Emergency response organizations, like the Chicago Department of Public Health (CDPH), face the challenge of preparing their staffs to respond to natural, technological, and human-caused hazards. Recognizing that the foundation of a successful response is a well trained staff, CDPH seeks to develop and implement a training program that meets its emergency preparedness needs.

Argonne is committed to meeting the FY2008 planning and training objectives of CDPH. Additionally, based on CDPH's preparedness and response funding, Argonne can continue to provide these services to CDPH on a continuous, multi-year basis. For example, if funding permits, Argonne will continue to provide future planning and training tasks and services to help CDPH meet its preparedness and response goals over the next three to five year period. Additionally, with a multi-year approach, Argonne and CDPH will be able to address unforeseen needs and adjust tasks to meet new or changing goals and objectives as federal, State and local grant requirements continue to evolve or other contingencies.

**STATEMENT OF WORK:**

Argonne National Laboratory (Argonne) proposes to develop a web-based Emergency Planning Training Assurance Tool (EPTAT) that will enhance the CDPH's emergency preparedness and response training program. Specifically, Argonne will work with CDPH to develop a computer-based training strategy to improve the CDPH staff's ability to implement various response plans. Argonne will work with CDPH to integrate EPTAT into existing CDPH training management and delivery processes. Additionally, EPTAT will allow for interaction with Argonne developed emergency management tools (e.g., Sync Matrix) used by CDPH.

Tasks associated with developing the EPTAT are listed below:

**Tasks 1: Assessment and Design**

To ensure a successful project, Argonne staff will work with CDPH's Director of Training and other relevant personnel to solidify design. Argonne will produce a requirements document that outlines how EPTAT will integrate into CDPH's existing training management and delivery systems and describes concept, interaction, and screen designs. Argonne and CDPH will use the requirements document to guide EPTAT development. Subsequent tasks and estimates may need adjustment depending upon the outcome of this assessment.

**Task 2: Develop & Produce Emergency Planning Training Tool Program**

Guided by the requirements document, Argonne will build an interactive, web-based, multi-media emergency planning training tool for CDPH. Specifically, Argonne will use its Emergency Management Tools (EMTools), which utilizes Microsoft SharePoint technology, to assist in the

development of EPTAT. EMTools consists of Argonne's emergency management products (Sync Matrix, XMT, and Watchboard).

During this step, the training development team will identify delivery media (e.g., computer based training, Internet based training, or DVD/CD's) appropriate for the cognitive skill required to achieve a particular training objective. Argonne and CDPH will use a 3-4 week development cycle for each training element. Initial focus areas include:

- Hazard awareness (short summaries of natural, technological and human-caused threats)
- The CDPH All-Hazards Plan
- The CDPH Continuity of Operations Plan
- Roles and responsibilities during CDPH response operations
- Resource management

The Argonne/CDPH development team will also collect and analyze training evaluations to adjust training, identify lessons-learned, and to prepare "just-in-time" training sessions prior to an incident response.

### **Task 3: Training Sessions**

As each portion of the training program is completed, Argonne will engage CDPH staff in a series of training sessions to test the EPTAT. Based on the feedback, garnered from CDPH staff to the training tools developed for EPTAT, Argonne will revise and upgrade the training program so it meets CDPH preparedness training goals and objectives. Argonne will conduct both group and individual training sessions to ensure that EPTAT is flexible enough for use during group training sessions and for an individual sitting at his or her own computer.

### **Other Budget Items**

To support the development of EPTAT, Argonne will need to purchase software (\$7,500) and hardware (\$2,500). Also, Argonne estimates travel expenses at \$5,000 for meetings, workshops and training sessions in Chicago.

## **BUDGET & MILESTONES**

The table below describe the milestones (date a task will be completed) and effort cost associated with this project. Please note that milestones are given in months from the initiation of the project.

**Budget & Milestones Table**

<b>Task</b>	<b>Milestone</b>	<b>Monthly Effort</b>	<b>Total Budget</b>
<b>Task 1: Assessment &amp; Design</b>	Completed by end of Month 1	2 staff @ 1.125 month	\$45,000
<b>Task 2: Develop &amp; Produce Emergency Planning Training Assurance Tool Program</b>	Completed by end of Month 12 (task will start in month 2 and continues through end of project)	3 staff @ 5 months	\$300,000
<b>Task 3: Training Sessions</b>	Completed by end of Month 11 (task will begin by month 7 and continue through month 11)	2 staff @ 1.125 months	\$45,000
<i>Effort Subtotal</i>			\$390,000
<b>Software Purchases</b>	Completed by end of Month 1		\$7,500
<b>Hardware Purchases</b>	Completed by end of Month 1		\$2,500
<b>Travel</b>	Ongoing throughout the project		\$5,000
<b>TOTAL BUDGET</b>			\$405,000

**Integrated Public Health Planning and Response Proposal  
Draft Statement of Work for the**

**Chicago Department of Public Health**

**Task 3: Provide Full-Scale Exercise Assistance**

**Submitted by: Argonne National Laboratory**

**Principal Investigator: Paul Hewett**

**BACKGROUND:**

Argonne will provide a project team to plan and execute a Homeland Security Exercise and Evaluation Program (HSEEP) compliant Strategic National Stockpile (SNS)/Cities Readiness Initiative (CRI)/pandemic-focused full-scale exercise for the Chicago Department of Public Health (CDPH).

Argonne is committed to meeting the FY2008 exercise objectives of CDPH. Additionally, based on CDPH's preparedness and response funding, Argonne can continue to provide these services to CDPH on a continuous, multi-year basis. For example, if funding permits, Argonne will continue to provide future exercise design, control and evaluation services to help CDPH meet its preparedness and response goals over the next three to five year period. Additionally, with a multi-year approach, Argonne and CDPH will be able to address unforeseen needs and adjust tasks to meet new or changing exercise goals and objectives as federal, State and local grant requirements continue to evolve or other contingencies.

**STATEMENT OF WORK**

The exercise is tentatively scheduled for the month of July 2008, to occur over a 48-hour period. Expected areas for evaluation include:

- Activation of an Receipt, Stage, and Storage (RSS) facility and RSS operations;
- Transport of materiel from RSS to dispensing and vaccination centers (DVCs);
- Security of RSS and DVC;
- Direction, control, and communications processes and protocols;
- Joint Information System/Joint Information Center operations; and
- Dispensing strategies to the homebound

Argonne will assist CDPH in the following areas:

(1) Exercise planning, including but not limited to:

- developing exercise goals and objectives;
- designing the scenario;
- developing exercise injects and simulated news media broadcasts, actor guides, and other materials needed to present an operational picture to exercise players;
- coordinating extent-of-play agreements;
- producing exercise documents such as schedules, briefing materials, Exercise Plan, Control Staff Instructions, and Communications Directories; and
- conducting initial, mid-project, and final planning conference/meetings.



## (2) Exercise operations, including but not limited to:

- organizing, staffing, and operating a Simulation Cell (SIMCELL), to include mock media;
- controlling the continuity of exercise play;
- providing exercise support and control cells,
- observing exercise play; and
- collecting, organizing, and validating player products resulting from exercise play; and
- equipment and supplies.

## (3) Administrative and logistics support, including but not limited to:

- providing support staff and services;
- coordinating exercise logistics;
- coordinating exercise administrative planning with CDPH;
- training exercise actors, controllers and data collectors, but not players; and
- facilitating information sharing about exercise plans and operations among trusted agents/exercise planners from organizations involved in the exercise.

## (4) Post-exercise analysis and reporting, including but not limited to:

- analyzing exercise observations and player products using subject matter experts; and
- developing lessons-learned and assisting in the preparation of a draft after action report and corrective action plan.

**Projected Exercise Expense Items**Planning

1. Cost of props to simulate SNS package (if not available through CDC or other source)
2. Scientific effort for:
  - Developing
    - Controller/Evaluator Handbook
    - Exercise goals and objectives (to include scope)
    - Support to developing exercise design:
      - Scenario
      - Injects and simulations
      - Design of accident site props
      - Simulated media news broadcasts
    - Master Scenario Events List (MSEL)
    - Exercise Plan
    - Exercise Public Affairs Plan
    - Exercise Safety Plan
    - Exercise Communications Plan and Directories
    - Developing Extent of Play Agreements
  - Organize/facilitate coordination meetings
  - Training Evaluators, Controllers, and Actors
  - Facilitating information sharing

Execution

1. Facilities, equipment, and supplies for SIMCELL and Control Cell.
2. Life support for actors, SIMCELL, and Control Cell personnel.
3. Scientific effort for Argonne staff in actor, controller, evaluator roles.

Assessment

Scientific effort for conducting analysis and writing the exercise after action report and corrective action plan.

**Scientific Staff**

The following Argonne scientific staff may participate in the project. This list may change at the project manager's discretion and does not include part-time employees.

- Timothy Bourdess
- Brett Hansard
- Paul Hewett
- Ken Lerner
- William C. Metz
- Leslie Nieves
- Edward Tanzman
- Daniel Walsh
- Linda Zander

**BUDGET: (please see table on next page.)**

## BUDGET TABLE

<b>EXERCISE PLANNING</b>			
<b>Category</b>	<b>Calculation Rate</b>	<b>Calculation Variable</b>	<b>Estimated Cost</b>
<b>Scientific Effort</b>			
Scientist 7	25,804	1	25,804
Scientist 6	23,335	1	23,335
Assistant Scientist 5	21,024	1	21,024
Associate Scientist 4	18,756	1	18,756
Secretarial	14,209	0.36	5,115
STA (Avg. hourly rate)	85.86	200	17,172
<b>Travel</b>			
Stay in Argonne Area	1640	6	9,840
Stay in Chicago Area	2025	0	0
Other Direct Costs	121,046	0.05	6,052
<i>Planning Subtotal</i>			127,099
<b>EXERCISE EXECUTION</b>			
<b>Scientific Effort</b>			
Scientist 9	32,606	0.25	8,152
Scientist 7	25,804	0.5	12,902
Scientist 6	23,335	1	23,335
Assistant Scientist 5	21,024	1	21,024
Associate Scientist 4	18,756	1	18,756
Secretarial	14,209	0.34	4,831
STA (Avg. hourly rate)	85.86	200	17,172
<b>Travel</b>			
Stay in Argonne Area	1,640	8	13,120
Stay in Chicago Area	2,025	2	4,050
Other Direct Costs	123,342	0.05	6,167
<i>Execution Subtotal</i>			129,509
<b>EXERCISE ANALYSIS/REPORT</b>			
<b>Scientific Effort</b>			
Scientist 7	25,804	0.25	6,451
Scientist 6	23,335	0.5	11,668
Secretarial	14,209	0.07	995.00
Other Direct Costs	19,113	0.1	1,911
<i>Analysis/Report Subtotal</i>			21,024
<b>PROJECT MANAGEMENT EFFORT</b>			
<b>Scientific Effort</b>			
Scientist 7	25,804	0.25	6,451
Secretarial	14,209	0.02	284.00
<i>Management Subtotal</i>			6,735
<b>MANAGEMENT RESERVE</b>			
<b>Scientific Effort</b>			
Avg. FTE Rate	22,583	0.5	11,292
<i>Reserve Subtotal</i>			11,292
<b>TOTAL BUDGET</b>			295,659.00



City of Chicago  
Richard M. Daley, Mayor

Department of Public Health

Terry Mason, M.D., F.A.C.S.  
Commissioner

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<http://www.cityofchicago.org/health>

## Argonne Unique Capability Summary

### **Summary:**

The following is a statement by CDPH outlining the unique capabilities of Argonne to perform two projects proposed by CDPH:

- Development of medical intelligence fusion software and,
- An exercise to test community readiness for pandemic influenza.

Section A will give a high level overview of the projects and some of Argonne's unique capabilities. Section B is a more detailed analysis of the same.

### ***Section A: Brief Overview of the projects and Argonne's Unique Qualifications***

#### **Medical Fusion Center**

With regard to the medical fusion center, CDPH is proposing to work with Argonne to further develop an existing Department of Homeland Security (DHS)/Argonne proprietary software by expanding it from the current biodetection and response system to a chemical, biological, radiological /nuclear system (CBRNE). Again, this is a DHS funded project contracted to Argonne for development. CDPH does not want to "reinvent the wheel" by using a different vendor to create a separate system for CBRNE. The existing biodetection system is also connected to a system of national laboratories funded by DHS to provide jurisdictions technical assistance and support if the detection system detects a possible release of an agent. Argonne also has contracts with the military to develop sophisticated modeling and artificial intelligence software to enhance the software by providing models that assist in determining the possible areas affected by a release, impact of the release etc. Because Argonne is the developer of the current bio detection software and has developed the intelligence and modeling, and has a current contractual relationship with DHS and the military, we believe they have a unique capacity that no other vendor would have.

## **Community Readiness for Pandemic Influenza**

CDPH proposes to contract with Argonne National Labs to assist CDPH in developing and conducting a full scale exercise to test our readiness for a worldwide pandemic flu outbreak. Argonne has developed proprietary software to assist CDPH in modeling and testing our capacity to open 55 medication dispensing centers in Chicago. Additionally, Argonne has developed software that assists jurisdictions in developing operational plans. This software, funded by DHS was used by CDPH to assist in the development of the plan that we are proposing the test- large scale medication dispensing. This project is a natural extension of the unique work that CDPH and Argonne have partnered on already.

### ***Section B: Detailed Statement of Unique Capacity-Argonne***

#### **1. CDPH MEDICAL INTELLIGENCE FUSION**

CDPH has a need for an information fusion system that combines several data feeds with analytical tools that can help to provide early indications of potential public health events. Argonne has established a firm reputation as a leader in this field of integrative, modular, and interdisciplinary systems application development. They have over 15 years of R&D in the development and application of integrated computational techniques and approaches to a wide variety of subject areas related to our work in CDPH (see list of proprietary software below). In particular, the BWIC system that is installed and operational in CDPH already has many capabilities that are a good start for our fusion system. We anticipate starting with the existing BWIC system and building additional features to broaden its scope to full medical information and analysis tools.

Not only does Argonne possess unique skills in developing integrative computational architectures, they also have a deep understanding of what data and intelligence is needed in a public health emergency through their many years of planning and conducting public health preparedness exercises. It is this combination of expertise in complex integrative system development and public health emergency preparedness that makes Argonne a unique performer for our medical information fusion system.

For more information on the breadth of Argonne's programs and experience in advanced computer application development, see <http://www.dis.anl.gov/index.html>.

EXPERTISE:

The following are brief bios on the two major principle investigators for this proposed work:

**Pamela Sydelko:** Pamela Sydelko is the Deputy Director of the Decision and Information Sciences Division. She is responsible for managing projects and coordinating research activities aimed at developing innovative modeling, analysis and decision support tools/technologies including the development of integrated multi-component software systems. She received her B.S. in Botany from North Dakota State University, an M.S. in Soil Science from the University of Illinois, and an MBA from the University of Chicago. Pamela is the program lead for the Biological Warning and Incident Characterization System work at Argonne. She also has lead PI responsibilities for many other integrative systems software programs at Argonne teams that developed advanced applications for national security, logistics, and critical infrastructure problems. Sponsoring organizations for this work include Department of Defense, Department of Homeland Security, U.S. Environmental Protection Agency, and Department of Energy.

**CHARLES M. MACAL:** Charles Macal is the Director of the Center for Complex Adaptive Agent Systems Simulation (CAS2) at Argonne National Laboratory. Dr. Macal is also the co-director of the Joint Threat Anticipation Center (JTAC), collaboration between the University of Chicago and Argonne. The Defense Threat Reduction Agency (DTRA) supported the establishment of this center to support efforts to understand and anticipate threats to U.S. national security. He is a member of the INFORMS-Simulation Society, Society for Computer Simulation Int'l., the Systems Dynamics Society and a founding member of the North American Computational Social and Organization Sciences. Dr. Macal has a Ph.D. in Industrial Engineering & Management Sciences from Northwestern University.

## SPECIFIC EXAMPLES OF INTEGRATIVE COMPUTATIONAL APPLICATIONS:

The following selection of Argonne's proprietary computer technologies illustrate a record for developing integrative computational architectures and for applying these tools in the domain areas needed to advance the CDPH data fusion center concept:

- 1) **Biological Warning and Incident Characterization System (BWIC):** Funded by DHS, BWIC is a support system for timely warning attack assessment, communications and effective response in the event of a biological attack. Chicago is the first pilot city (two other major cities are also BWIC pilots). Argonne is solely responsible for developing the integrating architecture for BWIC that integrates a set of data feeds and a diverse group of computer modeling programs. Argonne also developed the main BWIC GIS-based Situational Awareness Tool, a sophisticated collaborative interface that provides individual analysis workspaces for each user participating in event characterization and allows all users to view (and borrow results from) other workspaces.
- 2) **Simphony:** Simphony is an open source suite of tools developed by Argonne National Laboratory that work together to a unified platform for developing advanced integrated computer applications. Simphony includes capabilities for:
  - a. Analytical modeling
  - b. Complex adaptive systems modeling
  - c. Geographic information systems
  - d. Embedded real-time data import
  - e. Data mining and exploration
  - f. Artificial intelligence
  - g. Statistical modeling,
  - h. Advanced visualization

This robust architecture provides the core tools needed for developing the CDPH data fusion platform. Many of Argonne's integrated decision support applications (including BWIC) were developed using the Simphony tool set. The Simphony open source community is made up of an impressive 2500 users, all using and contributing to the further development of the toolset.

- 3) **PROTECT:** Funded by DOE, DHS and a various city agencies, PROTECT is an Argonne-developed early-warning crisis management system for chemical attacks in high-threat interior infrastructures (PROTECT now being implemented in Chicago Pedway and blue line). The system is mainly aimed at high-threat subways, transportation terminals, buildings, and airports. The system includes

(a) chemical detectors for rapid alert, (b) video cameras and video communications for verification of detector activations, (c) an event-driven command and control system, (d) modeling of below (for subways) and aboveground hazard plumes, (e) Conops and SOPs for responders, and (f) training and exercises. The system is in operation in the Washington DC subway and a large transportation terminal in New York City and Boston.

- 4) **Community Vaccination and Mass Dispensing Model (CVMDM):** Argonne has developed the CVMDM to simulate the allocation and distribution of pharmaceutical materials across a jurisdiction and the dispensing of those materials through points of dispensing (PODs).
- 5) **Fort Future Virtual Installation (FFVI):** Argonne provided the integrating framework that synthesizes military logistics, infrastructure interdependencies and Chem/Bio/Rad models onto one system that is used to support decision making related to threats to our military installations. This has been funded by the U.S. Army.
- 6) **Threat Ensemble Vulnerability Assessment (TEVA):** Sponsored by the EPA Center for Homeland Security, Argonne also developed the TEVA software framework that integrates a drinking water hydraulic system model with data and analysis tools to predict human health impacts and with a sensor location model to provide for the design of early warning system, performance of consequence analysis, and insight into response strategies for drinking water distribution system security.

## 2. COMMUNITY READINESS INITIATIVE FULL-SCALE EXERCISE

Argonne is at the forefront of exercise policy development and methods research. Argonne assisted FEMA in developing its Radiological Emergency Preparedness (REP) exercise program by designing its exercise methodology and evaluation criteria. Argonne also developed and taught the REP exercise evaluation course at FEMA's Emergency Management Institute until December 2000. Building on their REP experience, in 1989, Argonne assisted the Army and FEMA in developing their CSEPP exercise program. In 1996, Argonne researched and designed an innovative exercise process called Integrated Performance Evaluation that became the standard exercise process for both REP and CSEPP. In 2002, with Argonne's assistance, the Department of Homeland Security adopted and adapted the IPE concept into the Homeland Security Exercise Evaluation Program (HSEEP). Argonne continues to be involved in exercise policy development by providing research and technical support to FEMA in the areas of exercise reporting systems, corrective action programs, lessons-learned, organization learning, and knowledge management



constructs as part of DHS efforts to implement the HSEEP methodology. Additionally, Argonne sits on the FEMA HSEEP Toolkit Integration Committee, ensuring that current and future HSEEP automation systems comply with DHS guidelines and with external standards when appropriate.

The strongest qualifications that Argonne brings to designing and conducting the 2008 Cities Readiness Initiative (CRI) exercise are unique familiarity with CDPH plans and processes, as well as the use of a unique proprietary software for planning and executing the exercise. Through DHS-funded technical assistance, using proprietary software (Sync Matrix and the Logistics Process Analysis Tool) Argonne has helped CDPH develop a detailed prophylaxis distribution plan and more general pandemic/bio-outbreak response plans. Similarly, the FluNami 2007 and 2008 exercises created both an exercise platform and a skilled team that serve as a natural lead-into the design and conduct of the CRI full-scale exercise. Additionally, tools that Argonne uses in the CSEPP program (such as the Exercise Management Tool and the Exercise News Network) will be applied to the design and execution of the CRI exercise. No other organization has either the knowledge or the software, much less both. Consequently, Argonne's unique knowledge and tools will enable it to design an exercise assesses and provides deeper insight into strong and weak aspects of their response to a simulated event more cost-effectively than any other organization

#### EXPERTISE:

The following are brief bios on the two major principle investigators for this proposed work:

**Paul Hewett:** Paul Hewett is the Deputy Director of the Center for Integrated Emergency Preparedness, Decision and Information Sciences Division. He is responsible for developing programs, conducting research, and developing and implementing innovative approaches to resolving a wide spectrum of emergency preparedness issues. Mr. Hewett has been at Argonne for 14 years. Prior to coming to Argonne, Mr. Hewett worked at the Maryland Emergency Management Agency as an Exercise and Training Officer and Program Manager for the Chemical Stockpile Emergency Preparedness Program. Mr. Hewett has more than 30 years experience in operations planning, designing and conducting training, and designing and conducting performance-based readiness assessments. He received his B.A. in Political Science from Western Maryland College, a M.Ed. in Training and Organization Development from Boston University, and a Graduate Certificate in Emergency Management from Jacksonville State University. He is also a graduate of the U.S. Army Command and General Staff College and is Adjunct Faculty for the University of Illinois – Chicago's Emergency Management and Continuity Planning graduate certificate program. He is the author or co-author of

numerous journal articles and reports on emergency planning, evaluations systems, and lessons-learned processes.

Paul is the Principal Investigator/Program Manager for Argonne's support to DHS FEMA's National Exercise Division (NED) and National Preparedness Directorate (NPD). He leads teams that assist NED in developing national emergency preparedness exercise policy, specifically focusing on evaluation methodology, reporting systems, and corrective action programs. He also leads teams providing NED-funded logistics planning, operational planning, and risk communications technical assistance to state and local governments. Paul heads the team rewriting the State and Local Guide for Emergency Operations Planning for DHS FEMA.

**Christopher Kramer:** Christopher Kramer has worked in the communication field for 25 years. He currently works in the Risk Communication and Management Program for Argonne National Laboratory's Decision and Information Sciences Division and is responsible for assisting multiple government agencies and jurisdictions with plans, training, exercises, and support materials relating to media relations before, during and after a crisis / emergency. He served for ten years as Public Information Officer for the Utah Department of Public Safety where he regularly responded to thousands media inquiries annually. He also served as lead Public Information Officer for the Utah Olympic Public Safety Command effectively supporting 20 federal, state and local agencies in preparation of the 2002 Olympic Winter Games.

Christopher has been a communication consultant/instructor for the FBI, FEMA, Secret Service, Department of the Interior, DOE, U.S. Army, CDC, Maryland Hospital Association, and the States of Kansas, Montana, Iowa, Michigan, Florida and Hawaii. He is an adjunct instructor for the Department of Homeland Security's National Emergency Training Center where he teaches Advanced Public Information Officer (APIO) and Integrated Emergency Management (IEMC) courses. He was primary author of public safety public information plans for the 2002 Olympic Winter Games and is a past president of the Utah Public Information Officers Association. He is the co-author of the Basic Public Information Officers Course used by the Department of Homeland Security and all 50 States. Christopher started with a career in broadcast news and performance that spanned ten years and five states and won numerous awards from the Associated Press and other news organizations. He has a B.S. in Communication with an Internet Communication Certification from the University of Utah and is currently working on his M.A. at Marist College.

#### SPECIFIC EXAMPLES OF EXERCISE DESIGN, EXECUTION, AND ANALYSIS:

Argonne's experience and expertise comes from significant participation in designing, executing, and analyzing all types (table-top, functional, full

scale) of exercises conducted by Federal, state, and local governments. Some recent examples include:

- 1) **The Top Officials (TOPOFF) 2 Exercise.** [Master and venue control cell support, inject development and review, design and implementation of five software programs for exercise support, real-world media support].
- 2) **Operation SafeRail (2001)**, a full-scale exercise focusing on response to a terrorist attack for on the Washington, DC Metro system. This exercise served as the PROTECT proof-of-concept and assessed the National Capitol Region's ability to coordinate and execute a response initiated by sensor activation. [Design, observation, analysis, and reporting].
- 3) **Chemical Stockpile Emergency Preparedness Program (CSEPP).** More than 50 full-scale exercises conducted between 1993 and 2007 at U.S. Army chemical weapons storage installations for the Federal Emergency Management Agency and the Department of the Army. These are multijurisdictional exercises that include participants from state and local governments and multiple Army facilities and organizations. [Inject design, simulated media, JIC/JIS assessment, exercise control, observation, analysis, report preparation, props and incident simulation.]
- 4) **Service Response Force Exercises in 2000, 2002, 2004, 2006 and for 2008.** The SRFX is a biannual exercise that assesses the Army's ability to respond to a catastrophic release of chemical warfare agents from a storage installation into a surrounding community. Participants include Army commands from the Department of the Army to the installation level, numerous Federal agencies and affected state and local governments. [All aspects of exercise design, administration, logistics, observation, analysis, and reporting, simulated media, JIC/JIS assessment.]

Similarly, Argonne has expertise in planning and conducting public health preparedness exercises:

- 1) **The Rotunda Thunda 2006 full-scale exercise for Clark County and Las Vegas, NV** assessing response to a multi-agent bio-outbreak in Las Vegas casinos and McCarran International Airport. [Design, control, observation, and analysis.]
- 2) **The Cities Readiness Exercise (table-top)** focusing on a H5N1 outbreak with human transfer on Hawaii Island for the 2006 Asia-Pacific Homeland Security Summit. [Design and control.]
- 3) **More than 15 table-top exercises involving individual Chicago area hospitals**, regional groups of hospitals, CDPH, and IDPH. [All aspects of

exercise design, administration, logistics, observation, analysis, and reporting.]

- 4) **The “FluNami” Chicago Disease Outbreak Distance Tabletop Exercise,** in which four health departments and six hospitals participated in four interactive web-based exercise sessions from their home facilities over a four-week period. [All aspects of exercise design, administration, logistics, observation, analysis, and reporting.]