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AUDIT

BUREAU OF AUDIT

April 27, 2015

By Electronic Mail

Commissioner William J. Bratton
New York City Police Department
One Police Plaza
New York, NY 10038

Re: Letter Audit Report on the Implementation of the Computer Aided Dispatch System by the New York City Police Department (Audit Number 7I13-122AL)

Dear Commissioner Bratton:

This Letter Audit Report contains the findings of our audit on the implementation of the Intergraph Computer Aided Dispatch System (ICAD) by the New York City Police Department (NYPD), a key component of the City's emergency 911 system. The objective of this audit was to determine whether the ICAD has been implemented and integrated into the City's Emergency Communications Transformation Program (ECTP) successfully in accordance with the NYPD's contract with Intergraph Corporation (Intergraph).

Background

ECTP is an ongoing multi-year initiative developed by the City after the 9-11 attack to improve the City's emergency response capability and the sharing of data between first responders. The goals of ECTP include enhancing call taking and dispatch operations for the New York City Police Department, Fire Department (FDNY), and the Fire Department's Emergency Medical Services Bureau (EMS). The ICAD is the NYPD's portion of an improved Computer-Aided Dispatch (CAD) system that was designed to replace an earlier attempt at a unified CAD that was never successfully implemented.¹

CAD systems are needed in public safety communications to manage the vast amount of information processed and shared in emergency response situations. They are critical for the management of calls for assistance and to enhance emergency response times and the allocation of responding emergency resources. CAD systems generally connect to computer databases that

¹ The original April 2004 ECTP concept included a single "Unified CAD" for the NYPD, FDNY and EMS which would combine technologies and business processes of the three agencies. By April 2007, the ECTP abandoned the goal of a unified CAD due to technical obstacles. As a result, the NYPD, FDNY, and EMS have had to independently upgrade their respective CAD systems.

track locations' call histories and provide an electronic map showing the location of the call and physical locations of police, fire or EMS units available for response to a call for assistance.

In 2008, the NYPD contracted with Intergraph to implement the ICAD. The contract required Intergraph to supply computer hardware and commercial off-the-shelf software for modification, establish interfaces to all relevant systems, and provide program management and support. The contract also required Intergraph to provide user training, give a systems warranty with the option to extend the warranty, and provide ongoing maintenance, including software license agreements and upgrades for installation of the ICAD at Public Safety Answering Center 1 (PSAC 1) and at One Police Plaza (1PP).

Objective

The objective of this audit was to determine whether the ICAD has been implemented and integrated successfully into the ECTP system.

Findings and Recommendations

We generally found that the NYPD's implementation and integration of the ICAD into ECTP has been successful. Project monitoring and quality assurance have been adequately provided within the framework of the ECTP program. The NYPD established test parameters and conducted numerous simulation tests on the ICAD system prior to going online on May 29, 2013.

While several system problems occurred shortly after the installation, our review of ICAD data (application logs) found that these problems were alleviated after software fixes were applied on May 30, 2013. Specifically, when the ICAD went live on May 29, 2013, 911 operators experienced blank screens at various ICAD workstations; this required the 911 operators to revert to the prior manual system of recording call details for emergency response for the first two days. An NYPD analysis showed the ICAD application shutting down on its own for 30-60 seconds, and then restarting. However, voice and data were not lost during these interruptions. According to the NYPD, when these shutdowns occurred, NYPD staff would use a manual process using paper and radios. On May 30, 2013, Intergraph installed a software update designed to resolve the automatic shutdown/restart issue. In addition, two formal System Acceptance Tests (each with four and eight-week cycles), including the ICAD's electronic links to the FDNY CAD and the EMS CAD, were conducted prior to the NYPD's final acceptance of ICAD in August 2013.

Other Issues

In connection with the audit, we have certain observations and four related recommendations which we are calling to the NYPD's attention for consideration. We also found that the current ICAD contract provides for relocation of the ICAD system, with a contract modification at additional cost, from 1PP to Public Safety Answering Center 2 (PSAC 2) when the PSAC 2 physical plant becomes available for systems implementation. At the time the NYPD contracted with Intergraph to develop the ICAD, PSAC 2 was supposed to be available for system

implementation in 2014. That did not occur and PSAC 2 is now scheduled to become operational in 2018.

Further, we note that the planned relocation of the ICAD system, from 1PP to PSAC 2 when the PSAC 2 physical plant is ready, also involves a risk under the current contract that there will be insufficient back-up capacity during the period of transition from 1PP to PSAC 2. Installing the ICAD at PSAC 2 means moving the current ICAD function from 1PP in the current Intergraph contract. However, by doing so 1PP may not be able to function as a full back-up during this transition period, which could leave the City vulnerable in an emergency. In addition, it may not be cost effective to relocate the older ICAD supporting computer technology into a new PSAC 2 environment.

The matters covered in this letter report were discussed with NYPD officials during and at the conclusion of this audit. On April 6, 2015, we submitted a draft letter report providing the NYPD with an opportunity to formally respond. The NYPD's response was received on April 20, 2015. In its written response, the NYPD stated that they are in agreement with all four audit recommendations.

Recommendations

1. Since the current ICAD support components are based on 2012-2013 technologies, we recommend that the NYPD's continued project management of the ICAD include an assessment of the ICAD component upgrades that would be appropriate for PSAC 2 in 2018.

NYPD Response: The NYPD agrees with this recommendation.

2. We recommend that the NYPD prepare computer hardware life cycle analyses, as it relates to the ICAD, to better track IT component upgrade needs in order to accommodate potential near-term needs of agency projects at PSAC 1 (e.g., the FDNY interface requirements).

NYPD Response: The NYPD agrees with this recommendation.

3. We also recommend that the NYPD develop a strategy for the ICAD component upgrades, to include provision for technology improvements, for future deployment of the ICAD at PSAC 2.

NYPD Response: The NYPD agrees with this recommendation.

4. Finally, we note that the CAD systems at the FDNY and EMS are due to be upgraded. These upgraded systems will eventually interconnect with the NYPD's ICAD. Therefore, the NYPD should assess its current capacity and

anticipate possible infrastructure upgrades that will be needed to accommodate the FDNY and EMS interface requirements.

NYPD Response: The NYPD agrees with this recommendation.

In addition, the NYPD responded with regard to the planned relocation of the ICAD system, from 1PP to PSAC 2, that “the transition will, in fact, not leave the City vulnerable, since the plan is to deploy, test and accept new ICAD backend servers and infrastructure at PSAC2 prior to the decommissioning of servers that support day-to-day 911 operations and ICAD mission critical interfaces (EMS, FDNY, RTCC). There will be no degradation to back-up capacity or impact to the ‘Disaster recovery’ model. We will continue to have fully redundant intra-site and inter-site capabilities.” In response to the planned relocation of ICAD from 1PP to PSAC 2 as not cost effective, the NYPD responded that “there is no plan to relocate the current ICAD servers to PSAC2.” The NYPD also responded “that the current PSAC2 schedule has ICAD operations beginning in 2016.”

The full text of the NYPD’s response is included as an addendum to this letter report.

Scope and Methodology

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The scope of this audit was from the installation of the ICAD in 2013 through May 2014. Our fieldwork was conducted from November 2013 through May 2014. To achieve our audit objectives, we:

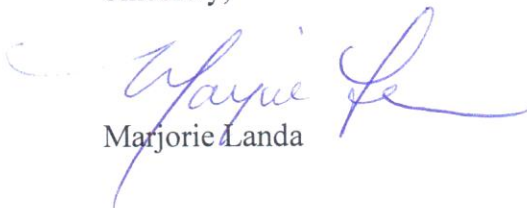
- Interviewed NYPD officials, and NYPD personnel associated with the ICAD project for background information;
- Reviewed the Agreement for the Provision of a Computer Aided Dispatch System for the New York City Police Department, executed between the NYPD and Intergraph and registered in September 2008, for information on the project scope;
- Reviewed and analyzed the ICAD project task schedules for information on project timeline;
- Conducted a system walk-through of the NYPD’s Public Safety Answering Center where ICAD is running to observe its working environment;

- Examined test documents for evidence of the NYPD having employed a comprehensive testing strategy prior to system deployment;
- Examined test documents for evidence of having conducted pre-system deployment tests;
- Analyzed results from pre-system deployment tests for proper test results handling and problem resolution;
- Reviewed quality assurance strategy to be used during system implementation as a basis for evaluating quality assurance data;
- Reviewed and analyzed the contractor's quality assurance criterion used during project implementation for information on the vendor's approach to promote application quality;
- Reviewed and analyzed the NYPD's quality assurance plan used during project implementation for information on controls used by the NYPD to promote project implementation quality;
- Reviewed and analyzed the NYPD's Acceptance Test Procedure for baseline information on dates and sequence of tests conducted, number of sessions conducted, and correlation to contract statement of work items;
- Reviewed and analyzed acceptance test results for validity and support which lead to the NYPD's acceptance of the ICAD project in August 2013;
- Examined the ICAD link to the FDNY's acceptance document for evidence of a satisfactorily functioning and accepted ICAD to FDNY Starfire CAD link;
- Examined the ICAD link to the FDNY-EMS acceptance document for evidence of a satisfactorily functioning and accepted ICAD to EMS CAD link;
- Reviewed and analyzed ICAD data for ICAD issues that were reported to have occurred on May 29 and 31, 2013, and on July 22 and 24, 2013, for an understanding of the nature of the issues;
- Examined NYPD Production Environment Change Logs for changes (fixes) made to alleviate the ICAD issues experienced during its installation on May 29, 2013;
- Examined the ICAD quality assurance data for reasonable assurance that the reported issues were alleviated; and

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- Examined the ICAD application logs of May 22, 26, and 30, 2014, for assurance of current ICAD performance stability.

Sincerely,



Marjorie Landa

c: Lauren Cable, Director of Audit Functions
Kenneth Wesley, Audit Coordinator
Mindy Tarlow, Director, Mayor's Office of Operations
George Davis, III, Deputy Director, Mayor's Office of Operations



POLICE DEPARTMENT

Commanding Officer, Risk Management Bureau
One Police Plaza, Room 1206
New York, New York 10038

April 17, 2015

Marjorie Landa
Deputy Comptroller for Audit
Office of the Comptroller
1 Centre Street, Room 1100
New York, N.Y. 10007

**Re: Response to Draft
Audit Report on the
Implementation
Of the Computer Aided
Dispatch System, Audit
Number 7113-122AL**

Dear Deputy Comptroller Landa:

I am responding to the Draft Report of an audit on the Implementation of the Intergraph Computer Aided Dispatch System which was conducted by the Bureau of Audit, New York City Comptroller's Office. The scope of this audit was from the installation of the ICAD in May, 2013 through May, 2014.

We are pleased that the Comptroller's Office found that the ICAD implementation was successful, that project management and quality assurance "best practices" were followed, and that the Police Department has developed detailed test scripts that were successfully executed on several occasions prior to the system's activation. The report included four recommendations to be considered by the NYPD. The recommendations and Police Department's responses are stated as follows:

1. **Recommendation:** With the understanding that current ICAD support components are based on 2012-2013 technologies, it is recommended that the PD's continued project management of the ICAD system include an assessment of ICAD component upgrades that would be appropriate for PSAC 2 in 2018.

Response: The Police Department agrees with the recommendation. The Police Department has conducted an assessment of the current components (i.e. the buildup of PSAC 2) and has identified upgrades that will be evaluated for inclusion in the ICAD Technology Refresh scheduled for 2018. For example:

- Migration to the newest suitable desktop OS
- Migration to the newest suitable server OS
- Migration to the newest suitable SQL server version
- Migration of the PDCAD software to a more current Microsoft platform.
- Review of the current hardware platform to assess the feasibility of deploying virtual servers where appropriate.

2. **Recommendation:** Prepare a computer hardware lifecycle analysis as it relates to ICAD, to better track IT component upgrade needs in order to accommodate near term needs of agency projects at PSAC 1.

Response: The Police Department agrees with the recommendation. The Police Department is tracking both critical and non-critical hardware lifecycles and is planning to procure new hardware as a component of the ICAD Technology Refresh, scheduled for 2018. The FDNY CAD to NYPD CAD interface will require both new technology and hardware platforms to implement successfully. As such, necessary IT component upgrades have been identified and are being procured via the NYC Department of Information Technology & Telecommunications (DoITT) sponsored FDNY CAD contract.

3. **Recommendation:** Develop a strategy for ICAD component upgrades to include provisions for technology improvements for future deployment of ICAD at PSAC2.

Response: The Police Department agrees with the recommendation. The Police department has developed a strategy for technology upgrades required for the deployment of ICAD at PSAC2. Funding for components has been included in the Police Department's capital plan and the DoITT budget.

4. **Recommendation:** With the understanding that the CAD systems at the FDNY and EMS are due to be upgraded and will eventually interconnect with ICAD, the PD should assess its current capacity and anticipate possible infrastructure upgrades which will be needed to accommodate FDNY and EMS interface requirements.

Response: The Police Department agrees with the recommendation. The NYPD CAD system currently is interconnected with the FDNY and EMS CAD systems. There is no expectation that the call volume will increase as a result of the implementation of a new single FDNY CAD system supporting both FDNY and EMS. In fact, we anticipate message capacity to decrease as we migrate from legacy "fixed length" message formats to xml delimiters.

In addition to the recommendations cited above, the report makes reference to three observations which are stated as follows, along with our commentary:


Regarding the observation in the report that relocation of ICAD from 1PP to PSAC2 may leave the City vulnerable to an emergency, please be informed that the transition will, in fact, not leave the City vulnerable, since the plan is to deploy, test and accept new ICAD backend servers and infrastructure at PSAC2 prior to the decommissioning of servers that support day-to-day 911 operations and ICAD mission critical interfaces (EMS, FDNY, RTCC). There will be no degradation to back-up capacity or impact to the "Disaster Recovery" model. We will continue to have fully redundant intra-site and inter-site capabilities.

Regarding the observation cited in the report that the planned relocation of ICAD from 1 PP to PSAC2 is not cost effective, please be informed that there is no plan to relocate the current ICAD servers to PSAC2.

Regarding the observation that PSAC2 will not become available for ICAD operations until 2018, please be informed that the current PSAC2 schedule has ICAD operations beginning in 2016. However, the build-out of PSAC2 is not an NYPD managed project. All issues relevant to the construction of PSAC2 should be directed to the City Department of Technology & Telecommunications (DoITT), as they are managing the project.

We appreciate the time and effort the auditors gave to complete this audit. If you have any questions concerning this response please contact Kenneth Wesley, Audit Liaison, Audit Management Unit at 646-610-8366.

Sincerely,


Matthew V. Pontillo
Assistant Chief
Risk Management Bureau