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LLNL-TR-737597

Assessment of Veritainer's Spreader-Bar-Mounted Radiation Detection Systems Final Report CRADA No. TC02150.0

S. Labov, J. I. Alioto

August 28, 2017

Disclaimer

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Assessment of Veritainer's Spreader-Bar-Mounted Radiation Detection Systems

Final Report
CRADA No. TC02150.0
Date Technical Work Ended: March 20, 2012

Date: May 29, 2012 Revision: 2

A. Parties

This project was a relationship between Lawrence Livermore National Laboratory (LLNL) and VeriTainer Corporation.

Lawrence Livermore National Security, LLC
Lawrence Livermore National Laboratory
7000 East Avenue
Livermore, CA 94550
Simon Labov, Principal Investigator
Tel: (925) 423-3818
Fax: (925) 423-6394
Email: labov1@llnl.gov

VeriTainer Corporation
1127 Pope Street, Suite 201
St. Helena, CA 94574
John I. Alioto
Tel: (707) 963-0606
Fax: (707) 963-9234
Email: jalioto@veritainer.com

B. Project Scope

This was a collaborative effort between Lawrence Livermore National Security, LLC as manager and operator of Lawrence Livermore National Laboratory (LLNL) and VeriTainer Corporation, to develop algorithms and testing of VeriTainer's spreader-bar mounted radiation detection system, the VeriSpreader™.

The goal of the project was to improve the VeriSpreader™ System to the point where it would meet or exceed "DOE Guidance" for radiation detection, in order to be deployed for commercial and government applications. The VeriSpreader™ had gone through several rounds of testing by DHS and DOE. NNSA had requested that VeriTainer engage in a CRADA with a national lab in order to further develop and test the VeriSpreader™ System.

The proposed project consisted of four Phases. In Phase 1, LLNL would work with VeriTainer to write a proposal to be submitted to U.S. Government agencies to develop a crane-mounted radiation sensor system. The goal of Phase 2 was to complete a set of tasks that involve analysis of the VeriSpreader™ System by LLNL as well as tasks that involve improving the system to be closer to DOE Guidance and/or in response to proposal selection. This included tasks that do not require large design changes to the system or large scale testing programs. Phases 3 and 4 included tasks that were considered "future plans" and tasks that might require large hardware and software redesigns. Depending on the results of Phase 1 and any proposals submitted, Phases 2, 3 and 4 would be updated.

This project was originally designated as a forty-two month project, which consisted of 26 tasks and the following major deliverables:

Phase 1

1.1 Text input and editing of proposal as required to meet agency specified deadlines (LLNL), Due Date: March – July 2010

1.2 Final proposal (VeriTainer), Due Date: July 2010

1.3 Meeting to reevaluate phases 2-4 of CRADA and amend as necessary (VeriTainer/LLNL), Due Date: August 2010

Phase 2

2.1 Input from previous studies (VeriTainer), Due Date: August 2010

2.2 List of hardware for test for Deliverable 2.3 (VerTainer/LLNL), Due Date: August 2010

2.3 Supply hardware for tests (VeriTainer), Due Date: October 2010

2.4 Report: Results of Phase 2 study and evaluation of previous study in light of Phase 2 study (LLNL), Due Date: August 2011

2.5 Report: Design optimization, parameters and conclusions for system enhancements (LLNL), Due Date: August 2011

Phase 3

3.1 Input regarding test requirements (VeriTainer), Due Date: August 2011

3.2 List of hardware for test for Deliverable 3.2 (VerTainer/LLNL), Due Date: August 2011

3.3 Supply hardware for tests (VeriTainer), Due Date: October 2011

3.4 Report: Results of Phase 3 tests (LLNL), Due Date: August 2012

3.5 Report: Design optimization, parameters and conclusions for system enhancements (LLNL), Due Date: August 2012

Phase 4

4.1 Input regarding test requirements (VeriTainer), Due Date: August 2012

4.2 List of hardware for test for Deliverable 4.3 (VerTainer/LLNL), Due Date: August 2012

4.3 Supply hardware for tests (VeriTainer), Due Date: October 2012

4.4 Report: Results of Phase 4 tests (LLNL), Due Date: August 2013

4.5 Report: Design optimization, parameters and conclusions for system enhancements (LLNL), Due Date: August 2013

4.6 Final Report and Abstract due within thirty (30) days of completion or termination of the project, as required under Article XI of the CRADA (LLNL/VeriTainer), Due Date: November 2013

Amendment One was executed on January 7, 2011, and extended the project for an additional eight months, to July 6, 2014; thereby also extending the due dates for the deliverables by eight months.

A second amendment was executed on September 16, 2011, extending the term of the CRADA by nine months, to April 6, 2015, thereby extending the dues dates for the deliverables by an additional nine months.

Due to a short fall in funding, the company was unable to continue work on the CRADA project. LLNL personnel decided to terminate the CRADA until future resources become available perceiving that the Statement of Work may change significantly due to the amount of time that has elapsed without work progress.

C. Technical Accomplishments

LLNL reviewed pervious testing and analysis of the VeriTainer system and provided briefings to various branches of DOE/NNSA as well as DHS/DNDO on this topic. LLNL also provide consultations with VeriTainer in support of developing proposals to support this CRADA. All funds spent at LLNL were for labor in support of these efforts.

D. Expected Economic Impact

Most of the CRADA tasks were not executed as external funding was not secured during the time the CRADA was operating. Had the tasks been completed, the CRADA would have produced an effective crane-mounted radiation detection system that would have provided a viable nuclear and radiological screening capability that could be deployed with zero impact on commercial shipping operations. Such a system would create a new commercial product that would likely be purchased by ports worldwide to increase their security and safety of operations. Sales of these devices would produce new jobs in production, and operations would allow ports to operate without redirecting cargo through radiation portal monitors saving time, increasing loading and unloading efficiency saving ports money.

D.1 Specific Benefits

Benefits to DOE
The development of radiation detection devices for shipping containers is fundamental to national security.

Benefits to Industry
To make the technology fast and effective is of paramount importance to the U.S commercial sector.

E. Partner Contribution

VeriTainer provided continuous monitoring of U.S. Government agencies interest and activities related to this CRADA. They investigated numerous potential proposal opportunities and worked with LLNL on developing proposal strategies, and submitted proposal materials as appropriate.

No subject inventions were created during the CRADA project.

F. Documents/Reference List

Reports
No reports were created.

Copyright Activity
No software or drawings were developed.

Subject Inventions
None

Background Intellectual Property

LLNL disclosed the following Background Intellectual Property (BIP) for this project:

IL-11754 – Patent not pursued

IL-12161 – Patent pending

IL-12162 – Patent pending

CP01320 – *RNAK (Radionuclide Identification Kit)*; Inventors: Karl E. Nelson, Brock R. Beauchamp

VeriTainer disclosed the following BIP for this project:

U.S. Patents:

U.S. Patent No. 6,768,421 - *Container Crane Radiation Detection Systems and Methods*; Inventors: Alioto et al.; Issue Date: 7/27/04

U.S. Patent No. 7,026,944 - *Apparatus and Method for Detecting Radiation or Radiation Shielding in Containers*; Inventors: Alioto et al.; Issue Date: 4/11/06

U.S. Patent No. 7,116,235 - *Inverse Ratio of Gamma-Ray and Neutron Emissions in the Detection of Radiation Shielding in Containers*; Inventors: Alioto et al., Issue Date: 10/3/06

U.S. Patent No. 7,612,338 - *Real Time System for Monitoring Containers from a Quayside Crane*; Inventors: Alioto et al.; Issue Date: 11/3/09

U.S. Patent No. 7,661,738 - *Radiation Detection Unit for Mounting a Radiation Sensor to a Container Crane*; Inventors: Alioto et al.; Issue Date: 2/16/10

Foreign Patents:

Singapore Patent No. 113322 - *Apparatus and Method for Detecting Radiation or Radiation Shielding in Shipping Containers*; Inventors: Alioto et al.; Issue Date: 9/28/07

Singapore Patent No. 136988 - *Inverse Ratio of Gamma-Ray and Neutron Emissions in the Detection of Radiation Shielding in Containers*; Inventors: Alioto et al.; Issued 3/31/08

Taiwan Patent No. I267762 - *Apparatus and Method for Detecting Radiation or Radiation Shielding in Shipping Containers*; Inventors: Alioto et al.; Issue Date: 12/1/06

New Zealand Patent No. 542012 - *Apparatus and Method for Detecting Radiation or Radiation Shielding in Shipping Containers*; Inventors: Alioto et al.; Issue Date: 10/11/07

Software:

VeriSpreader® System Software comprising: VeriTainer Analysis Service, VeriTainer Background Service, VeriTainer Crane Service, VeriTainer Enterprise Bus Service, VeriTainer database and VeriTainer data analysis tools.

Trademarks:

The mark “VeriTainer” U.S. Registration No. 3,294,571 registered on September 18, 2007; U.S. Customs and Border Protection Recordation No. TMK 07-00962.

The mark “VeriSpreader” U.S. Registration No. 3,684,404 registered on September 15, 2009; U.S. Customs and Border Protection Recordation No. TMK 09-00979.

The mark “Trust But Verify” U.S. Registration No. 3,694,129 registered on October 6, 2009; U.S. Customs and Border Protection Recordation No. TMK 09-01024.

G. Acknowledgement

Industrial Participant's signature of the final report indicates the following:

1) The Participant has reviewed the final report and concurs with the statements made therein.
2) The Participant agrees that any modifications or changes from the initial proposal were discussed and agreed to during the term of the project.
3) The Participant certifies that all reports either completed or in process are listed and all subject inventions and the associated intellectual property protection measures generated by his/her respective company and attributable to the project have been disclosed and included in Section E or are included on a list attached to this report.
4) The Participant certifies that if tangible personal property was exchanged during the agreement, all has either been returned to the initial custodian or transferred permanently.
5) The Participant certifies that proprietary information has been returned or destroyed by LLNL.

7/31/12

John J. Alioto, CEO — Date
VeriTainer Corporation

8/13/12

Simon Labov, Principal Investigator — Date
Lawrence Livermore National Laboratory

Veronica Lozier — August 24 2012

for Erik J. Stenehjem, Industrial Partnerships Director — Date
Lawrence Livermore National Laboratory

Attachment I – Final Abstract

Assessment of VeriTainer's Spreader-Bar-Mounted Radiation Detection Systems

Final Abstract (Attachment I)
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Due to a short fall in funding the company was unable to continue work on the CRADA project, and therefore decided to terminate the CRADA until future resources become available.

C. Benefit to Industry

To make the technology fast and effective is of paramount importance to the U.S commercial sector.

D. Benefit to DOE/LLNL

The development of radiation detection devices for shipping containers is fundamental to national security.

E. Project Dates

May 6, 2010 through March 20, 2012