State of Alaska Election Security Project: Project Proposal Summary (Phase 2 Final Version January 18, 2008)

January 18, 2008- Phase 2 Amendment to Original October 26, 2007 Phase 1 Project Summary

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PROPOSED PROJECT:

ANALYZE ALASKA DIVISION OF ELECTIONS' TECHNOLOGIES, SYSTEMS, AND PROCEDURES TO COUNT AND TABULATE BALLOTS BY OPTICAL SCANNING AND TOUCHSCREEN SYTEMS. DEVELOP PROJECT PLAN TO ADDRESS VULNERABILITIES.

 The University of Alaska has been asked to review the current system and determine if there are security problems that could jeopardize the results of elections. Ten years ago Alaska became the first state in the nation to use optical scanning on a statewide basis. It is appropriate to review whether the technology and the procedures and practices used in Alaska are secure and still constitute "best practice" in vote processing.

Recent studies conducted by the University of California and Florida State University to compare a variety of vote tabulation systems, including one similar to Alaska's, have concluded that significant problems exist with all of the systems they tested. They concluded that several of the systems could be certified by the state with certain procedural protections, highlighting the importance of the business practices that are utilized with technology.

After consultation with the evaluation teams from University of California and Florida State University, we propose the following phased project to identify and address issues that may impact the integrity of Alaska's election process:

Phase 1a: Overview-level evaluation of recent studies relative to existing Alaska systems, technologies and procedures
  <u>Inclusions:</u>
  - A brief review of studies and tests that have been undertaken that might be relevant to Alaska's situation.
  - A summary of the University of California's and Florida State University's tests and conclusions, analyzing the recommendations that were made and are applicable to Alaska's optical scanning technology.
  - Research and assess improvements made by Premier (formerly Diebold) based on California and Florida studies and their applicability to our systems
  - Assessment of existing Alaska systems and equipment and ability to upgrade security functionality
  - Research other states that are conducting similar research. Determine potential points of collaboration, partnership and leverage
  - General evaluation of Alaska's election policies, processes and procedures
  - Provide repository for public input via Division of Elections website. Use this input to guide suggested approach for interactive public input/response in Phase 2. Ensure that both UAA and Division of Elections have record of public input.   Provide automated response message that thanks public for input as follows (or as otherwise agreed): "Thank you for your interest in the Election Security Project being conducted by

the University of Alaska at the request of Lieutenant Governor Parnell and the Division of Elections. We value your suggestions, ideas and questions. During the initial phase of this project, comments are being collected that may be studied in future phases. Phase 1 will consist of an overview-level evaluation of recent studies relative to existing Alaska voting systems, technologies and procedures that will give the Division of Elections a high-level vulnerability assessment and preliminary recommendations for implementation prior to the 2008 elections. During a later phase of the project, we will also provide a more interactive mechanism to answer questions and field suggestions."

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Exclusions:
  • Detailed analysis, hands-on operational and technical evaluation of systems.
  • Detailed study of Alaska's election policies, processes and procedures
  • Direct responses to public input.

Deliverables: High-level vulnerability assessment and preliminary recommendations. Proposed statement of work for Phase 2 detailed analysis and recommendations.
Timeframe: September 18-November 30, 2007
Cost estimate: $50,000

Phase 1b: Additional overview evaluation of security related issues for touch-screen voting systems
Inclusions
• Evaluation of existing studies of security issues for touch screen systems and implications for Alaska
Exclusions
• Evaluation of usability issues for touch screen systems including ease of use, training, set-up, removal, quality, transportation, etc.

Deliverables: Extension of high-level vulnerability assessment of touch-screen systems.
Proposed statement of work for Phase 2 detailed analysis and recommendations to include touch-screen systems.
Timeframe: September 18-December 15, 2007
Cost Estimate: $10,000

Total Phase 1 (a &b) budget estimate: $60,000

RESULT: Phase 1 A&B deliverables completed and final report delivered to Lt. Governor and Division of Elections on December 14, 2007. Final report posted to Division of Elections website.

Phase 2: Detailed Analysis, Validation and Prioritized Recommendations

Purpose: Detailed analysis of equipment and procedures and prioritized recommendations to improve Alaska election security.

1. **Defense in Depth**

   1.1. Evaluate the cost and process to upgrade existing Premier system software and firmware if newer versions are available and certified in time to prepare for the 2008 election cycle. This analysis will be completed regardless of whether the software revisions are certified in time to implement the upgrades during the 2008 election cycle. Evaluate existing service and maintenance agreements with Premier.

   1.2. Evaluate the upgraded Premier system software and firmware changes that have been submitted to the EAC for VSS 2002 Certification against potential and known security vulnerabilities identified in the Phase 1 report and as they relate to the security enhancements proposed by the Division of Elections. Summarize the original issue or concern and how the new version of Premier software and firmware may address (or may not address) the issues. (See attached document provided by Division of Elections for detailed list of items.)

   1.3. Evaluate the existing Premier system software and firmware currently in use in Alaska. Determine if the security enhancements proposed by the Division of Elections can be implemented if current versions of tabulation software and firmware remain in use.

   1.4. Provide recommendations to the Division of Elections on how existing procedures can be improved to address any identified security issues.

   1.5. Evaluate password management options, recommend alternatives and propose appropriate processes and procedures.

   1.6. Document inter-election chain-of-custody for voting equipment. With the knowledge that voting equipment is out of the DOE's custody during points in the election process, assess the risks of tampering, damage, and loss and provide recommendations to mitigate those risks.

   1.7. With the knowledge that Alaska, for logistical purposes, stores touch screen and optical scan units off site between elections, determine best practices for storage and determine whether they would be feasible in Alaska communities. Recommend solutions that can meet security requirements and can also be practically implemented in the Alaska environment.

1.8. Identify trusted personnel within the Division of Elections and their points of access to equipment. Identify points of equipment access where only one person has access or authorization.

1.9. Determine points in election system where more redundancy in personnel, processes and /or joint review processes should be implemented.

1.10.   Assess vulnerability of paper ballots to tampering. Contrast with risks in electronic system.

1.11.   Summarize the security vulnerabilities of the equipment and procedures.   To the extent possible, demonstrate the level to which proposed enhancements (equipment and procedures) mitigate security risks.

1.12.   Develop security training procedures that can be included as an addendum to existing training documentation.

2. **Fortification of Systems**

2.1 Assess the integrity of the hardware and software of the electronic voting systems and their ability to accurately tabulate and report results.

2.2 Evaluate communication protocols and make recommendations regarding data transmittal to GEMS to avoid the introduction of viruses and longtime delays in election returns.

2.3. Evaluate the reliability and accuracy of the optical scanning and touch screen systems and their ability to function properly in Alaska weather and transportation/handling conditions. Study existing Premier reliability testing levels and equipment maintenance procedures to identify any concerns.

3. **Confidence in Outcome**

3.1 Evaluate processes and procedures DOE uses for functionality testing and logic and accuracy testing of systems and memory cards.

3.2 Identify methods DOE can use to increase voter confidence.

3.3 Establish metrics that the DOE can use to demonstrate continuous improvement of election security and predictability of results over time.

3.4 Provide a weekly review of emails from the public on security issues and summarize and publish general responses to them on Division of Elections website. Participate in other forums as requested by Division of Elections.

3.5 Provide a description of the absentee and questioned ballot process.

3.6 Research other random sampling methodologies that might provide additional confidence in election results. These recommendations would be proposed for future consideration and evaluation.

4. Evaluation and Implementation Plan

4.1 Synchronize Phase 2 work-plan with 2008 election process timeline to ensure that completion of critical evaluation deliverables and recommendations are phased with implementation deadlines as determined by the Division of Elections.

4.2 Develop project plan to implement prioritized recommendations (technology, systems and procedural) developed during Phase 2 work phased to meet 2008 election process timeline. If approved, this plan would be the basis of "Phase 3: Execution of Phased Deliverables."

Time Frame: Mid January 2008-end April 2008.
(Completion of deliverables will be phased throughout Phase 2 in accordance with section 4.1).

Deliverable: Recommendations and Project Plan to address prioritized list of technology, systems and procedural vulnerabilities phased to meet 2008 election process timeline

Cost (Est.): $250,000

 Exclusions:

1. Detailed hands-on testing of the equipment in operation.
2. Destructive testing of equipment.
3. Payment for equipment, hardware, software firmware, tools, personnel, packaging, etc. required to upgrade election systems and procedures.
4. Usability analysis of touch screen systems (e.g. ease of use, language, user interface, set-up/tear-down, etc.)
5. Inventory analysis of existing equipment.
6. Documentation review and analysis.
7.   Analysis of voter registration process.

Movement to the next phase dependent on agreement between the State of Alaska Division of Elections and the University of Alaska Anchorage.

Phase 3: Execution of Phased Project Deliverables

- Develop and test prototype systems and processes in partnership with users
- Oversee implementation of key technology, system, process, training, documentation, etc. recommendations phased with 2008 election process timeline
- Audit completion of key deliverables and procedures to ensure conformance

Deliverables: Completion of key deliverables as defined and agreed in project plan.
Timeframe: March 31, 2008+ (deliverables completion phased with 2008 election process timeline)
Cost: TBD based on project scope defined in Phase 2.

Movement to the next phase dependent on agreement between the State of Alaska Division of Elections and the University of Alaska Anchorage.

Phase 4 (optional): Live audit of systems and procedures during election
- Audit systems and election process in real-time
- Test for and identify additional gaps and issues
- Propose future corrective action

Deliverables: Collaborate with Division of Elections to conduct real-time analysis and assessment of actual system and procedure use during election. "Post Mortem" analysis to determine lessons-learned and identify opportunities for additional corrective action.
Timeframe: November 2008-January 2009
Cost: TBD

Movement to the next phase dependent on agreement between the State of Alaska Division of Elections and the University of Alaska Anchorage.

Over the course of the three- to four-phase project, the project leader and participants will interact and confer with relevant state and regional election officials, as well as industry and academic experts in voting system security and voting system vendors. Each phase of the project will provide a written report on findings and recommendations. Minor modifications of the phases may be necessary dependent on findings from the previous phase. All final reports will be made available to the public through the Division of Elections website and other agreed public forums (e.g. University of Alaska library, Division of Elections offices, etc.). The Alaska State Division of Elections will make the final determination of what information will be made public in order to safeguard the election process and systems from criminal activity and to protect confidential vendor information. All work will be done in consultation with the Lieutenant Governor's office as needed.